City of Puyallup
Building
ACCEPTED
JMontgomery
08/19/2022
9:10:46 AM
CITY OF PUYALLUP
STATE OF WASHINGTON

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

PERMIT SET

VOLUME 1 OF 2:
STRUCTURAL CALCULATIONS

PIERCE COLLEGE PUYALLUP
NEW STEM BUILDING
PUYALLUP, WASHINGTON

INTEGRUS PROJECT NO. 22135.00

PREPARED FOR:

PIERCE COLLEGE
1601 139TH AVE SE
PUYALLUP, WA 98374

PREPARED BY:

integrus
ARCHITECTURE

117 S. MAIN STREET, SUITE 100
SEATTLE, WA 98104

THERESA H. DANIEL
STATE OF WASHINGTON
38621
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER

JUNE 30, 2022

PRCNC20221036

Table of Contents

Pierce College Puyallup New STEM Building
22135.00

integrus ARCHITECTURE

PRCNC20221036

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Codes, Loads, & Material

PRCNC20221036

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Codes, Loads, & Material - Codes

PRCNC20221036

2018

INTERNATIONAL CODES®

IBC®

A Member of the International Code Family®

INTERNATIONAL
BUILDING CODE®

ICC
INTERNATIONAL CODE COUNCIL®

ASCE STANDARD

ASCE/SEI

7-16

Minimum Design Loads and Associated Criteria for Buildings and Other Structures

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

SEI
ASCE
STRUCTURAL ENGINEERING INSTITUTE

a complete lateral force-resisting system with adequate strength to resist the forces indicated in Section 1.4.2. All members of the structural system shall be connected to their supporting members in accordance with Section 1.4.3. Structural walls shall be anchored to diaphragms and supports in accordance with Section 1.4.4. The effects on the structure and its components caused by the forces stipulated in this section shall be taken as the notional load, N, and combined with the effects of other loads in accordance with the load combinations of Section 2.6. Where material resistance depends on load duration, notional loads are permitted to be taken as having a duration of 10 minutes. Structures designed in conformance with the requirements of this standard for Seismic Design Categories B, C, D, E, or F shall be deemed to comply with the requirements of Sections 1.4.2, 1.4.3, and 1.4.4.

1.4.1 Load Path Connections. All parts of the structure between separation joints shall be interconnected to form a continuous path to the lateral force-resisting system, and the connections shall be capable of transmitting the lateral forces induced by the parts being connected. Any smaller portion of the structure shall be tied to the remainder of the structure with elements having the strength to resist a force of not less than 5% of the portion's weight.

1.4.2 Lateral Forces. Each structure shall be analyzed for the effects of static lateral forces applied independently in each of two orthogonal directions. In each direction, the static lateral forces at all levels shall be applied simultaneously. For purposes of analysis, the force at each level shall be determined using Eq. (1.4-1):

$$F_x = 0.01 W_x \qquad (1.4\text{-}1)$$

where

F_x = the design lateral force applied at story x, and
W_x = the portion of the total dead load of the structure, D, located or assigned to level x.

Structures explicitly designed for stability, including second-order effects, shall be deemed to comply with the requirements of this section.

1.4.3 Connection to Supports. A positive connection for resisting a horizontal force acting parallel to the member shall be provided for each beam, girder, or truss either directly to its supporting elements or to slabs designed to act as diaphragms. Where the connection is through a diaphragm, the member's supporting element shall also be connected to the diaphragm. The connection shall have the strength to resist a force of 5% of the unfactored dead load plus live load reaction imposed by the supported member on the supporting member.

1.4.4 Anchorage of Structural Walls. Walls that provide vertical load bearing or lateral shear resistance for a portion of the structure shall be anchored to the roof and all floors and members that provide lateral support for the wall or that are supported by the wall. The anchorage shall provide a direct connection between the walls and the roof or floor construction. The connections shall be capable of resisting a strength level horizontal force perpendicular to the plane of the wall equal to 0.2 times the weight of the wall tributary to the connection, but not less than 5 psf (0.24 kN/m^2).

1.4.5 Extraordinary Loads and Events. When considered, design for resistance to extraordinary loads and events shall be in accordance with the procedures of Section 2.5.

1.5 CLASSIFICATION OF BUILDINGS AND OTHER STRUCTURES

1.5.1 Risk Categorization. Buildings and other structures shall be classified, based on the risk to human life, health, and welfare associated with their damage or failure by nature of their occupancy or use, according to Table 1.5-1 for the purposes of applying flood, wind, snow, earthquake, and ice provisions. Each building or other structure shall be assigned to the highest applicable Risk Category or Categories. Minimum design loads for structures shall incorporate the applicable importance factors given in Table 1.5-2, as required by other sections of this standard. Assignment of a building or other structure to multiple Risk Categories based on the type of load condition being evaluated (e.g., snow or seismic) shall be permitted.

When the building code or other referenced standard specifies an Occupancy Category, the Risk Category shall not be taken as lower than the Occupancy Category specified therein.

Table 1.5-1 Risk Category of Buildings and Other Structures for Flood, Wind, Snow, Earthquake, and Ice Loads

Use or Occupancy of Buildings and Structures	Risk Category
Buildings and other structures that represent low risk to human life in the event of failure	I
All buildings and other structures except those listed in Risk Categories I, III, and IV	II
Buildings and other structures, the failure of which could pose a substantial risk to human life	III
Buildings and other structures, not included in Risk Category IV, with potential to cause a substantial economic impact and/or mass disruption of day-to-day civilian life in the event of failure	
Buildings and other structures not included in Risk Category IV (including, but not limited to, facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, hazardous waste, or explosives) containing toxic or explosive substances where the quantity of the material exceeds a threshold quantity established by the Authority Having Jurisdiction and is sufficient to pose a threat to the public if released[a]	
Buildings and other structures designated as essential facilities	IV
Buildings and other structures, the failure of which could pose a substantial hazard to the community	
Buildings and other structures (including, but not limited to, facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, or hazardous waste) containing sufficient quantities of highly toxic substances where the quantity of the material exceeds a threshold quantity established by the Authority Having Jurisdiction and is sufficient to pose a threat to the public if released[a]	
Buildings and other structures required to maintain the functionality of other Risk Category IV structures	

[a]Buildings and other structures containing toxic, highly toxic, or explosive substances shall be eligible for classification to a lower Risk Category if it can be demonstrated to the satisfaction of the Authority Having Jurisdiction by a hazard assessment as described in Section 1.5.3 that a release of the substances is commensurate with the risk associated with that Risk Category.

Table 1.5-2 Importance Factors by Risk Category of Buildings and Other Structures for Snow, Ice, and Earthquake Loads

Risk Category from Table 1.5-1	Snow Importance Factor, I_s	Ice Importance Factor—Thickness, I_i	Ice Importance Factor—Wind, I_w	Seismic Importance Factor, I_e
I	0.80	0.80	1.00	1.00
II	1.00	1.00	1.00	1.00
III	1.10	1.15	1.00	1.25
IV	1.20	1.25	1.00	1.50

Note: The component importance factor, I_p, applicable to earthquake loads, is not included in this table because it depends on the importance of the individual component rather than that of the building as a whole, or its occupancy. Refer to Section 13.1.3.

1.5.2 Multiple Risk Categories. Where buildings or other structures are divided into portions with independent structural systems, the classification for each portion shall be permitted to be determined independently. Where building systems, such as required egress, HVAC, or electrical power, for a portion with a higher Risk Category pass through or depend on other portions of the building or other structure having a lower Risk Category, those portions shall be assigned to the higher Risk Category.

1.5.3 Toxic, Highly Toxic, and Explosive Substances. Buildings and other structures containing toxic, highly toxic, or explosive substances are permitted to be classified as Risk Category II structures if it can be demonstrated to the satisfaction of the Authority Having Jurisdiction by a hazard assessment as part of an overall risk management plan (RMP) that a release of the toxic, highly toxic, or explosive substances is not sufficient to pose a threat to the public.

To qualify for this reduced classification, the owner or operator of the buildings or other structures containing the toxic, highly toxic, or explosive substances shall have an RMP that incorporates three elements as a minimum: a hazard assessment, a prevention program, and an emergency response plan.

As a minimum, the hazard assessment shall include the preparation and reporting of worst-case release scenarios for each structure under consideration, showing the potential effect on the public for each. As a minimum, the worst-case event shall include the complete failure e.g., instantaneous release of entire contents of a vessel, piping system, or other storage structure. A worst-case event includes, but is not limited to, a release during the design wind or design seismic event. In this assessment, the evaluation of the effectiveness of subsequent measures for accident mitigation shall be based on the assumption that the complete failure of the primary storage structure has occurred. The off-site impact shall be defined in terms of population within the potentially affected area. To qualify for the reduced classification, the hazard assessment shall demonstrate that a release of the toxic, highly toxic, or explosive substances from a worst-case event does not pose a threat to the public outside the property boundary of the facility.

As a minimum, the prevention program shall consist of the comprehensive elements of process safety management, which is based upon accident prevention through the application of management controls in the key areas of design, construction, operation, and maintenance. Secondary containment of the toxic, highly toxic, or explosive substances; including, but not limited to, double-wall tank, dike of sufficient size to contain a spill, or other means to contain a release of the toxic, highly toxic, or explosive substances within the property boundary of the facility and prevent release of harmful quantities of contaminants to the air, soil, groundwater, or surface water; are permitted to be used to mitigate the risk of release. Where secondary containment is provided, it shall be designed for all environmental loads and is not eligible for this reduced classification. In hurricane-prone regions, mandatory practices and procedures that effectively diminish the effects of wind on critical structural elements or that alternatively protect against harmful releases during and after hurricanes are permitted to be used to mitigate the risk of release.

As a minimum, the emergency response plan shall address public notification, emergency medical treatment for accidental exposure to humans, and procedures for emergency response to releases that have consequences beyond the property boundary of the facility. The emergency response plan shall address the potential that resources for response could be compromised by the event that has caused the emergency.

1.6 ADDITIONS AND ALTERATIONS TO EXISTING STRUCTURES

When an existing building or other structure is enlarged or otherwise altered, structural members affected shall be strengthened if necessary so that the factored loads defined in this document will be supported without exceeding the specified design strength for the materials of construction. When using allowable stress design, strengthening is required when the stresses caused by nominal loads exceed the specified allowable stresses for the materials of construction.

1.7 LOAD TESTS

A load test of any construction shall be conducted when required by the Authority Having Jurisdiction whenever there is reason to question its safety for the intended use.

1.8 CONSENSUS STANDARDS AND OTHER REFERENCED DOCUMENTS

This section lists the consensus standards and other documents that shall be considered part of this standard to the extent referenced in this chapter.

OSHA Standards for General Industry, 29 CFR (Code of Federal Regulations) Part 1910.1200. Appendix A, with Amendments as of February 1, 2000, U.S. Department of Labor, Occupational Safety and Health Administration, 2005.

Cited in: Section 1.2

Seismic Force-Resisting System	ASCE 7 Section Where Detailing Requirements Are Specified	Response Modification Coefficient, R^a	Overstrength Factor, $\Omega_0^{\,b}$	Deflection Amplification Factor, $C_d^{\,c}$	Structural System Limitations Including Structural Height, h_n (ft) Limits[d]				
					Seismic Design Category				
					B	C	D[e]	E[e]	F[f]
18. Ordinary reinforced masonry shear walls	14.4	2	2½	2	NL	160	NP	NP	NP
19. Detailed plain masonry shear walls	14.4	2	2½	2	NL	NP	NP	NP	NP
20. Ordinary plain masonry shear walls	14.4	1½	2½	1¼	NL	NP	NP	NP	NP
21. Prestressed masonry shear walls	14.4	1½	2½	1¾	NL	NP	NP	NP	NP
22. Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance	14.5	7	2½	4½	NL	NL	65	65	65
23. Light-frame (cold-formed steel) walls sheathed with wood structural panels rated for shear resistance or steel sheets	14.1	7	2½	4½	NL	NL	65	65	65
24. Light-frame walls with shear panels of all other materials	14.1 and 14.5	2½	2½	2½	NL	NL	35	NP	NP
25. Steel buckling-restrained braced frames	14.1	8	2½	5	NL	NL	160	160	100
26. Steel special plate shear walls	14.1	7	2	6	NL	NL	160	160	100
C. MOMENT-RESISTING FRAME SYSTEMS									
1. Steel special moment frames	14.1 and 12.2.5.5	8	3	5½	NL	NL	NL	NL	NL
2. Steel special truss moment frames	14.1	7	3	5½	NL	NL	160	100	NP
3. Steel intermediate moment frames	12.2.5.7 and 14.1	4½	3	4	NL	NL	35[k]	NP[k]	NP[k]
4. Steel ordinary moment frames	12.2.5.6 and 14.1	3½	3	3	NL	NL	NP[l]	NP[l]	NP[l]
5. Special reinforced concrete moment frames[m]	12.2.5.5 and 14.2	8	3	5½	NL	NL	NL	NL	NL
6. Intermediate reinforced concrete moment frames	14.2	5	3	4½	NL	NL	NP	NP	NP
7. Ordinary reinforced concrete moment frames	14.2	3	3	2½	NL	NP	NP	NP	NP
8. Steel and concrete composite special moment frames	12.2.5.5 and 14.3	8	3	5½	NL	NL	NL	NL	NL
9. Steel and concrete composite intermediate moment frames	14.3	5	3	4½	NL	NL	NP	NP	NP
10. Steel and concrete composite partially restrained moment frames	14.3	6	3	5½	160	160	100	NP	NP
11. Steel and concrete composite ordinary moment frames	14.3	3	3	2½	NL	NP	NP	NP	NP
12. Cold-formed steel—special bolted moment frame[n]	14.1	3½	3[o]	3½	35	35	35	35	35
D. DUAL SYSTEMS WITH SPECIAL MOMENT FRAMES CAPABLE OF RESISTING AT LEAST 25% OF PRESCRIBED SEISMIC FORCES	12.2.5.1								
1. Steel eccentrically braced frames	14.1	8	2½	4	NL	NL	NL	NL	NL
2. Steel special concentrically braced frames	14.1	7	2½	5½	NL	NL	NL	NL	NL
3. Special reinforced concrete shear walls[g,h]	14.2	7	2½	5½	NL	NL	NL	NL	NL
4. Ordinary reinforced concrete shear walls[g]	14.2	6	2½	5	NL	NL	NP	NP	NP
5. Steel and concrete composite eccentrically braced frames	14.3	8	2½	4	NL	NL	NL	NL	NL
6. Steel and concrete composite special concentrically braced frames	14.3	6	2½	5	NL	NL	NL	NL	NL
7. Steel and concrete composite plate shear walls	14.3	7½	2½	6	NL	NL	NL	NL	NL
8. Steel and concrete composite special shear walls	14.3	7	2½	6	NL	NL	NL	NL	NL
9. Steel and concrete composite ordinary shear walls	14.3	6	2½	5	NL	NL	NP	NP	NP
10. Special reinforced masonry shear walls	14.4	5½	3	5	NL	NL	NL	NL	NL
11. Intermediate reinforced masonry shear walls	14.4	4	3	3½	NL	NL	NP	NP	NP
12. Steel buckling-restrained braced frames	14.1	8	2½	5	NL	NL	NL	NL	NL
13. Steel special plate shear walls	14.1	8	2½	6½	NL	NL	NL	NL	NL
E. DUAL SYSTEMS WITH INTERMEDIATE MOMENT FRAMES CAPABLE OF RESISTING AT LEAST 25% OF PRESCRIBED SEISMIC FORCES	12.2.5.1								
1. Steel special concentrically braced frames[p]	14.1	6	2½	5	NL	NL	35	NP	NP
2. Special reinforced concrete shear walls[g,h]	14.2	6½	2½	5	NL	NL	160	100	100
3. Ordinary reinforced masonry shear walls	14.4	3	3	2½	NL	160	NP	NP	NP
4. Intermediate reinforced masonry shear walls	14.4	3½	3	3	NL	NL	NP	NP	NP

continues

Table 12.3-1 Horizontal Structural Irregularities

Type	Description	Reference Section	Seismic Design Category Application
1a.	**Torsional Irregularity:** Torsional irregularity is defined to exist where the maximum story drift, computed including accidental torsion with $A_x = 1.0$, at one end of the structure transverse to an axis is more than 1.2 times the average of the story drifts at the two ends of the structure. Torsional irregularity requirements in the reference sections apply only to structures in which the diaphragms are rigid or semirigid.	12.3.3.4 12.7.3 12.8.4.3 12.12.1 Table 12.6-1 16.3.4	D, E, and F B, C, D, E, and F C, D, E, and F C, D, E, and F D, E, and F B, C, D, E, and F
1b.	**Extreme Torsional Irregularity:** Extreme torsional irregularity is defined to exist where the maximum story drift, computed including accidental torsion with $A_x = 1.0$, at one end of the structure transverse to an axis is more than 1.4 times the average of the story drifts at the two ends of the structure. Extreme torsional irregularity requirements in the reference sections apply only to structures in which the diaphragms are rigid or semirigid.	12.3.3.1 12.3.3.4 12.3.4.2 12.7.3 12.8.4.3 12.12.1 Table 12.6-1 16.3.4	E and F D D B, C, and D C and D C and D D B, C, and D
2.	**Reentrant Corner Irregularity:** Reentrant corner irregularity is defined to exist where both plan projections of the structure beyond a reentrant corner are greater than 15% of the plan dimension of the structure in the given direction.	12.3.3.4 Table 12.6-1	D, E, and F D, E, and F
3.	**Diaphragm Discontinuity Irregularity:** Diaphragm discontinuity irregularity is defined to exist where there is a diaphragm with an abrupt discontinuity or variation in stiffness, including one that has a cutout or open area greater than 50% of the gross enclosed diaphragm area, or a change in effective diaphragm stiffness of more than 50% from one story to the next.	12.3.3.4 Table 12.6-1	D, E, and F D, E, and F
4.	**Out-of-Plane Offset Irregularity:** Out-of-plane offset irregularity is defined to exist where there is a discontinuity in a lateral force-resistance path, such as an out-of-plane offset of at least one of the vertical elements.	12.3.3.3 12.3.3.4 12.7.3 Table 12.6-1 16.3.4	B, C, D, E, and F D, E, and F B, C, D, E, and F D, E, and F B, C, D, E, and F
5.	**Nonparallel System Irregularity:** Nonparallel system irregularity is defined to exist where vertical lateral force-resisting elements are not parallel to the major orthogonal axes of the seismic force-resisting system.	12.5.3 12.7.3 Table 12.6-1 16.3.4	C, D, E, and F B, C, D, E, and F D, E, and F B, C, D, E, and F

Applies to Project, see torsional amplification in loads section

Applies to Project, see torsional amplification in loads section

Applies to Project.

Does not apply.

Does not apply.

Applies to Project.

12.2.5.6.2 Seismic Design Category F. Single-story steel ordinary moment frames in structures assigned to Seismic Design Category F are permitted up to a structural height, h_n, of 65 ft (20 m) where the dead load supported by and tributary to the roof does not exceed 20 psf (0.96 kN/m^2). In addition, the dead load of the exterior walls tributary to the moment frames shall not exceed 20 psf (0.96 kN/m^2).

12.2.5.7 Steel Intermediate Moment Frames

12.2.5.7.1 Seismic Design Category D

a. Single-story steel intermediate moment frames in structures assigned to Seismic Design Category D are permitted up to a structural height, h_n, of 65 ft (20 m) where the dead load supported by and tributary to the roof does not exceed 20 psf (0.96 kN/m^2). In addition, the dead load of the exterior walls more than 35 ft (10.6 m) above the base tributary to the moment frames shall not exceed 20 psf (0.96 kN/m^2).

EXCEPTION: Single-story structures with steel intermediate moment frames whose purpose is to enclose equipment or machinery and whose occupants are engaged in maintenance or monitoring of that equipment, machinery, or their associated processes shall be permitted to be of unlimited height where the sum of the dead and equipment loads supported by and tributary to the roof does not exceed 20 psf (0.96 kN/m^2). In addition, the dead load of the exterior wall system, including exterior columns more than 35 ft (10.6 m) above the base, shall not exceed 20 psf (0.96 kN/m^2). For determining compliance with the exterior wall or roof load limits, the weight of equipment or machinery, including cranes, not self-supporting for all loads shall be assumed to be fully tributary to the area of the adjacent exterior wall or roof not to exceed 600 ft^2 (55.8 m^2), regardless of its height above the base of the structure.

b. Steel intermediate moment frames in structures assigned to Seismic Design Category D not meeting the limitations set forth in Section 12.2.5.7.1.a are permitted up to a structural height, h_n, of 35 ft (10.6 m).

12.2.5.7.2 Seismic Design Category E

a. Single-story steel intermediate moment frames in structures assigned to Seismic Design Category E are permitted up to a structural height, h_n, of 65 ft (20 m) where the dead load supported by and tributary to the roof does not exceed 20 psf (0.96 kN/m^2). In addition, the dead load of the exterior walls more than 35 ft (10.6 m) above the base tributary

PRCNC20221036

Table 12.3-2 Vertical Structural Irregularities

Type	Description	Reference Section	Seismic Design Category Application
1a.	**Stiffness–Soft Story Irregularity:** Stiffness–soft story irregularity is defined to exist where there is a story in which the lateral stiffness is less than 70% of that in the story above or less than 80% of the average stiffness of the three stories above.	Table 12.6-1	D, E, and F
1b.	**Stiffness–Extreme Soft Story Irregularity:** Stiffness–extreme soft story irregularity is defined to exist where there is a story in which the lateral stiffness is less than 60% of that in the story above or less than 70% of the average stiffness of the three stories above.	12.3.3.1 Table 12.6-1	E and F D, E, and F
2.	**Weight (Mass) Irregularity:** Weight (mass) irregularity is defined to exist where the effective mass of any story is more than 150% of the effective mass of an adjacent story. A roof that is lighter than the floor below need not be considered.	Table 12.6-1	D, E, and F
3.	**Vertical Geometric Irregularity:** Vertical geometric irregularity is defined to exist where the horizontal dimension of the seismic force-resisting system in any story is more than 130% of that in an adjacent story.	Table 12.6-1	D, E, and F
4.	**In-Plane Discontinuity in Vertical Lateral Force-Resisting Element Irregularity:** In-plane discontinuity in vertical lateral force-resisting element irregularity is defined to exist where there is an in-plane offset of a vertical seismic force-resisting element resulting in overturning demands on supporting structural elements.	12.3.3.3 12.3.3.4 Table 12.6-1	B, C, D, E, and F D, E, and F D, E, and F
5a.	**Discontinuity in Lateral Strength–Weak Story Irregularity:** Discontinuity in lateral strength–weak story irregularity is defined to exist where the story lateral strength is less than 80% of that in the story above. The story lateral strength is the total lateral strength of all seismic-resisting elements sharing the story shear for the direction under consideration.	12.3.3.1 Table 12.6-1	E and F D, E, and F
5b.	**Discontinuity in Lateral Strength–Extreme Weak Story Irregularity:** Discontinuity in lateral strength–extreme weak story irregularity is defined to exist where the story lateral strength is less than 65% of that in the story above. The story strength is the total strength of all seismic-resisting elements sharing the story shear for the direction under consideration.	12.3.3.1 12.3.3.2 Table 12.6-1	D, E, and F B and C D, E, and F

Does not apply.

Does not apply.

Does not apply.

Does not apply.

Does not apply.

Does not apply.

Does not apply.

Design Forces increased as required. Increase does not apply to collector forces since the collector forces are increased by the overstrength factor

EXCEPTIONS:

1. Vertical structural irregularities of Types 1a, 1b, and 2 in Table 12.3-2 do not apply where no story drift ratio under design lateral seismic force is greater than 130% of the story drift ratio of the next story above. Torsional effects need not be considered in the calculation of story drifts. The story–drift ratio relationship for the top two stories of the structure are not required to be evaluated.
2. Vertical structural irregularities of Types 1a, 1b, and 2 in Table 12.3-2 are not required to be considered for one-story buildings in any Seismic Design Category or for two-story buildings assigned to Seismic Design Categories B, C, or D.

Structure is Seismic Design Category D

12.3.3 Limitations and Additional Requirements for Systems with Structural Irregularities

12.3.3.1 Prohibited Horizontal and Vertical Irregularities for Seismic Design Categories D through F. Structures assigned to Seismic Design Category E or F that have horizontal irregularity Type 1b of Table 12.3-1 or vertical irregularities Type 1b, 5a, or 5b of Table 12.3-2 shall not be permitted. Structures assigned to Seismic Design Category D that have vertical irregularity Type 5b of Table 12.3-2 shall not be permitted.

12.3.3.2 Extreme Weak Stories. Structures with a vertical irregularity Type 5b, as defined in Table 12.3-2, shall not be more than two stories or 30 ft (9 m) in structural height, h_n.

EXCEPTION: The limit does not apply where the "weak" story is capable of resisting a total seismic force equal to Ω_0 times the design force prescribed in Section 12.8.

12.3.3.3 Elements Supporting Discontinuous Walls or Frames. Structural elements supporting discontinuous walls or frames of structures that have horizontal irregularity Type 4 of Table 12.3-1 or vertical irregularity Type 4 of Table 12.3-2 shall be designed to resist the seismic load effects, including overstrength of Section 12.4.3. The connections of such discontinuous walls or frames to the supporting members shall be adequate to transmit the forces for which the discontinuous walls or frames were required to be designed.

12.3.3.4 Increase in Forces Caused by Irregularities for Seismic Design Categories D through F. For structures assigned to Seismic Design Category D, E, or F and having a horizontal structural irregularity of Type 1a, 1b, 2, 3, or 4 in Table 12.3-1 or a vertical structural irregularity of Type 4 in Table 12.3-2, the design forces determined from Section 12.10.1.1 shall be increased 25% for the following elements of the seismic force-resisting system:

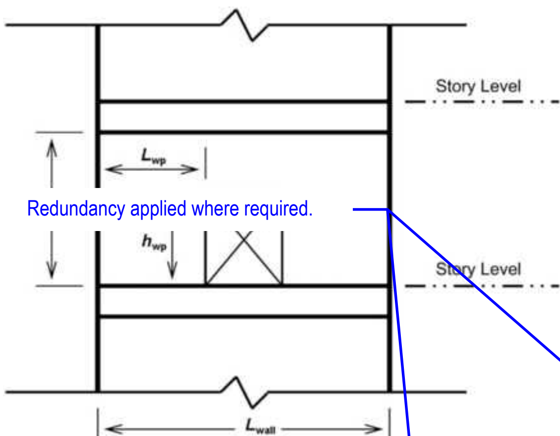
1. Connections of diaphragms to vertical elements and to collectors and
2. Collectors and their connections, including connections to vertical elements, of the seismic force-resisting system.

EXCEPTION: Forces calculated using the seismic load effects, including overstrength of Section 12.4.3, need not be increased.

PRCNC20221036

Table 12.3-3 Requirements for Each Story Resisting More than 35% of the Base Shear

Lateral Force-Resisting Element	Requirement
Braced frames	Removal of an individual brace, or connection thereto, would not result in more than a 33% reduction in story strength, nor does the resulting system have an extreme torsional irregularity (horizontal structural irregularity Type 1b).
Moment frames	Loss of moment resistance at the beam-to-column connections at both ends of a single beam would not result in more than a 33% reduction in story strength; nor does the resulting system have an extreme torsional irregularity (horizontal structural irregularity Type 1b).
Shear walls or wall piers with a height-to-length ratio greater than 1.0	Removal of a shear wall or wall pier with a height-to-length ratio greater than 1.0 within any story, or collector connections thereto, would not result in more than a 33% reduction in story strength; nor does the resulting system have an extreme torsional irregularity (horizontal structural irregularity Type 1b). The shear wall and wall pier height-to-length ratios are determined as shown in Fig. 12.3-2.
Cantilever columns	Loss of moment resistance at the base connections of any single cantilever column would not result in more than a 33% reduction in story strength; nor does the resulting system have an extreme torsional irregularity (horizontal structural irregularity Type 1b).
Other	No requirements.



Notes: h_{wall} = height of shear wall; h_{wp} = height of wall pier; L_{wall} = length of shear wall; L_{wp} = length of wall pier. Shear wall height-to-length ratio: h_{wall}/L_{wall}. Wall pier height-to-length ratio: h_{wp}/L_{wp}.

FIGURE 12.3-2 Shear Wall and Wall Pier Height-to-Length Ratio Determination

12.3.4 Redundancy. A redundancy factor, ρ, shall be assigned to the seismic force-resisting system in each of two orthogonal directions for all structures in accordance with this section.

12.3.4.1 Conditions Where Value of ρ is 1.0. The value of ρ is permitted to equal 1.0 for the following:

1. Structures assigned to Seismic Design Category B or C;
2. Drift calculation and P-delta effects;
3. Design of nonstructural components;
4. Design of nonbuilding structures that are not similar to buildings;
5. Design of collector elements, splices, and their connections for which the seismic load effects, including overstrength of Section 12.4.3, are used;
6. Design of members or connections where the seismic load effects, including overstrength of Section 12.4.3, are required for design;
7. Diaphragm loads determined using Eq. (12.10-1), including the limits imposed by Eqs. (12.10-2) and (12.10-3);
8. Structures with damping systems designed in accordance with Chapter 18; and
9. Design of structural walls for out-of-plane forces, including their anchorage.

12.3.4.2 Redundancy Factor, ρ, for Seismic Design Categories D through F. For structures assigned to Seismic Design Category D and having extreme torsional irregularity as defined in Table 12.3-1, Type 1b, ρ shall equal 1.3. For other structures assigned to Seismic Design Category D and for structures assigned to Seismic Design Categories E or F, ρ shall equal 1.3 unless one of the following two conditions is met, whereby ρ is permitted to be taken as 1.0. A reduction in the value of ρ from 1.3 is not permitted for structures assigned to Seismic Design Category D that have an extreme torsional irregularity (Type 1b). Seismic Design Categories E and F are not also specified because extreme torsional irregularities are prohibited (see Section 12.3.3.1).

a. Each story resisting more than 35% of the base shear in the direction of interest shall comply with Table 12.3-3.
b. Structures are regular in plan at all levels provided that the seismic force-resisting systems consist of at least two bays of seismic force-resisting perimeter framing on each side of the structure in each orthogonal direction at each story resisting more than 35% of the base shear. The number of bays for a shear wall shall be calculated as the length of shear wall divided by the story height or two times the length of shear wall divided by the story height, h_{sx}, for light-frame construction.

12.4 SEISMIC LOAD EFFECTS AND COMBINATIONS

12.4.1 Applicability. All members of the structure, including those not part of the seismic force-resisting system, shall be designed using the seismic load effects of Section 12.4 unless otherwise exempted by this standard. Seismic load effects are the axial, shear, and flexural member forces resulting from application of horizontal and vertical seismic forces as set forth in Section 12.4.2. Where required, seismic load effects shall include overstrength, as set forth in Section 12.4.3.

12.4.2 Seismic Load Effect. The seismic load effect, E, shall be determined in accordance with the following:

1. For use in load combination 6 in Section 2.3.6 or load combinations 8 and 9 in Section 2.4.5, E shall be determined in accordance with Eq. (12.4-1) as follows:

$$E = E_h + E_v \tag{12.4-1}$$

2. For use in load combination 7 in Section 2.3.6 or load combination 10 in Section 2.4.5, E shall be determined in accordance with Eq. (12.4-2) as follows:

$$E = E_h - E_v \tag{12.4-2}$$

PRCNC20221036

12.5.3 Seismic Design Category C. Loading applied to structures assigned to Seismic Design Category C shall, as a minimum, conform to the requirements of Section 12.5.2 for Seismic Design Category B and the requirements of this section.

12.5.3.1 Structures with Nonparallel System Irregularities. Structures that have horizontal structural irregularity of Type 5 in Table 12.3-1 shall use one of the following procedures:

a. **Orthogonal Combination Procedure.** The structure shall be analyzed using the equivalent lateral force analysis procedure of Section 12.8, the modal response spectrum analysis (MRSA) procedure of Section 12.9.1, or the linear response history procedure of Section 12.9.2, as permitted under Section 12.6, with the loading applied independently in any two orthogonal directions. The requirement of Section 12.5.1 is deemed satisfied if members and their foundations are designed for 100% of the forces for one direction plus 30% of the forces for the perpendicular direction. The combination requiring the maximum component strength shall be used.

b. **Simultaneous Application of Orthogonal Ground Motion.** The structure shall be analyzed using the linear response history procedure of Section 12.9.2 or the nonlinear response history procedure of Chapter 16, as permitted by Section 12.6, with orthogonal pairs of ground motion acceleration histories applied simultaneously.

12.5.4 Seismic Design Categories D through F. Structures assigned to Seismic Design Category D, E, or F shall, as a minimum, conform to the requirements of Section 12.5.3. In addition, any column or wall that forms part of two or more intersecting seismic force-resisting systems and is subjected to axial load due to seismic forces acting along either principal plan axis equaling or exceeding 20% of the axial design strength of the column or wall shall be designed for the most critical load effect due to application of seismic forces in any direction. Either of the procedures of Section 12.5.3.a or 12.5.3.b are permitted to be used to satisfy this requirement. Except as required by Section 12.7.3, 2D analyses are permitted for structures with flexible diaphragms.

12.6 ANALYSIS PROCEDURE SELECTION

The structural analysis required by Chapter 12 shall consist of one of the types permitted in Table 12.6-1, based on the structure's Seismic Design Category, structural system, dynamic properties, and regularity, or with the approval of the authority having jurisdiction, an alternative generally accepted procedure is permitted to be used. The analysis procedure selected shall be completed in accordance with the requirements of the corresponding section referenced in Table 12.6-1.

12.7 MODELING CRITERIA

12.7.1 Foundation Modeling. For purposes of determining seismic loads, it is permitted to consider the structure to be fixed at the base. Alternatively, where foundation flexibility is considered, it shall be in accordance with Section 12.13.3 or Chapter 19.

12.7.2 Effective Seismic Weight. The effective seismic weight, W, of a structure shall include the dead load, as defined in Section 3.1, above the base and other loads above the base as listed below:

1. In areas used for storage, a minimum of 25% of the floor live load shall be included.
   EXCEPTIONS:
   a. Where the inclusion of storage loads adds no more than 5% to the effective seismic weight at that level, it need not be included in the effective seismic weight.
   b. Floor live load in public garages and open parking structures need not be included.
2. Where provision for partitions is required by Section 4.3.2 in the floor load design, the actual partition weight or a minimum weight of 10 psf (0.48 kN/m^2) of floor area, whichever is greater.
3. Total operating weight of permanent equipment.
4. Where the flat roof snow load, P_f, exceeds 30 psf (1.44 kN/m^2), 20% of the uniform design snow load, regardless of actual roof slope.
5. Weight of landscaping and other materials at roof gardens and similar areas.

Table 12.6-1 Permitted Analytical Procedures

Seismic Design Category	Structural Characteristics	Equivalent Lateral Force Procedure, Section 12.8[a]	Modal Response Spectrum Analysis, Section 12.9.1, or Linear Response History Analysis, Section 12.9.2[a]	Nonlinear Response History Procedures, Chapter 16[a]
B, C	All structures	P	P	P
D, E, F	Risk Category I or II buildings not exceeding two stories above the base	P	P	P
	Structures of light-frame construction	P	P	P
	Structures with no structural irregularities and not exceeding 160 ft (48.8 m) in structural height	P	P	P
	Structures exceeding 160 ft (48.8 m) in structural height with no structural irregularities and with $T < 3.5T_s$	P	P	P
	Structures not exceeding 160 ft (48.8 m) in structural height and having only horizontal irregularities of Type 2, 3, 4, or 5 in Table 12.3-1 or vertical irregularities of Type 4, 5a, or 5b in Table 12.3-2	P	P	P
	All other structures	NP	P	P

[a]P: Permitted; NP: Not Permitted; $T_s = S_{D1}/S_{DS}$.

where F_i = the portion of the seismic base shear (V) [kip (kN)] induced at level i.

The seismic design story shear (V_x) [kip (kN)] shall be distributed to the various vertical elements of the seismic force-resisting system in the story under consideration based on the relative lateral stiffness of the vertical resisting elements and the diaphragm.

Torsion is amplified as required. See lateral loads section for amplification check

12.8.4.1 Inherent Torsion. For diaphragms that are not flexible, the distribution of lateral forces at each level shall consider the effect of the inherent torsional moment, M_t, resulting from eccentricity between the locations of the center of mass and the center of rigidity. For flexible diaphragms, the distribution of forces to the vertical elements shall account for the position and distribution of the masses supported.

12.8.4.2 Accidental Torsion. Where diaphragms are not flexible, the design shall include the inherent torsional moment (M_t) resulting from the location of the structure masses plus the accidental torsional moments (M_{ta}) caused by assumed displacement of the center of mass each way from its actual location by a distance equal to 5% of the dimension of the structure perpendicular to the direction of the applied forces.

Where earthquake forces are applied concurrently in two orthogonal directions, the required 5% displacement of the center of mass need not be applied in both of the orthogonal directions at the same time but shall be applied in the direction that produces the greater effect.

Accidental torsion shall be applied to all structures for determination if a horizontal irregularity exists as specified in Table 12.3-1. Accidental torsion moments (M_{ta}) need not be included when determining the seismic forces E in the design of the structure and in the determination of the design story drift in Sections 12.8.6, 12.9.1.2, or Chapter 16, or limits of Section 12.12.1, except for the following structures:

1. Structures assigned to Seismic Category B with Type 1b horizontal structural irregularity.
2. Structures assigned to Seismic Category C, D, E, and F with Type 1a or Type 1b horizontal structural irregularity.

12.8.4.3 Amplification of Accidental Torsional Moment. Structures assigned to Seismic Design Category C, D, E, or F, where Type 1a or 1b torsional irregularity exists as defined in Table 12.3-1 shall have the effects accounted for by multiplying M_{ta} at each level by a torsional amplification factor (A_x) as illustrated in Fig. 12.8-1 and determined from the following equation:

$$A_x = \left(\frac{\delta_{\max}}{1.2\delta_{\text{avg}}}\right)^2 \tag{12.8-14}$$

where

$\delta_{\max}$ = maximum displacement at level x computed assuming $A_x = 1$ [in. (mm)], and

δ_{avg} = average of the displacements at the extreme points of the structure at level x computed assuming $A_x = 1$ [in. (mm)].

The torsional amplification factor (A_x) shall not be less than 1 and is not required to exceed 3.0. The more severe loading for each element shall be considered for design.

12.8.5 Overturning. The structure shall be designed to resist overturning effects caused by the seismic forces determined in Section 12.8.3.

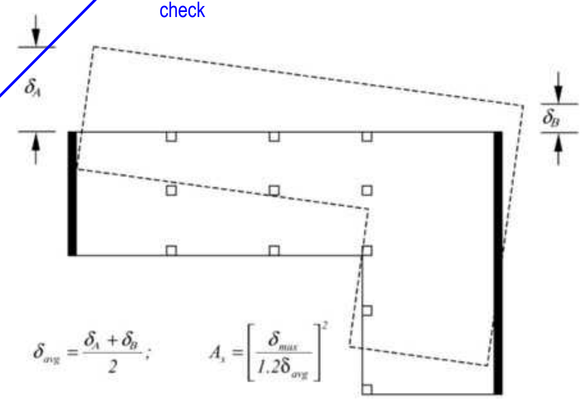
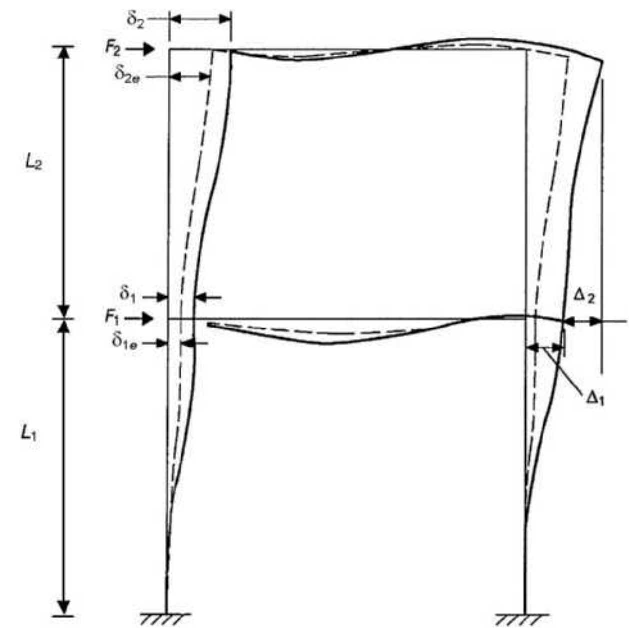


FIGURE 12.8-1 Torsional Amplification Factor, A_x



Note: Δ_i = story drift; Δ_i/L_i = story drift ratio; δ_x = total displacement; i = level under consideration.
Story Level 1: F_1 = strength-level design earthquake force; δ_{1e} = elastic displacement computed under strength-level design earthquake forces; $\delta_1 = C_d\delta_{1e}/I_E$ = amplified displacement; $\Delta_1 = \delta_1 \le \Delta_a$ (Table 12.12-1).
Story Level 2: F_2 = strength-level design earthquake force; δ_{2e} = elastic displacement computed under strength-level design earthquake forces; $\delta_2 = C_d\delta_{2e}/I_E$ = amplified displacement; $\Delta_2 = C_d(\delta_{2e} - \delta_{1e})/I_E \le \Delta_a$ (Table 12.12-1).

FIGURE 12.8-2 Story Drift Determination

12.8.6 Story Drift Determination. The design story drift (Δ) shall be computed as the difference of the deflections at the centers of mass at the top and bottom of the story under consideration (Fig. 12.8-2). Where centers of mass do not align vertically, it is permitted to compute the deflection at the bottom of the story based on the vertical projection of the center of mass at the top of the story. Where allowable stress design is used, Δ shall be computed using the strength level seismic forces specified in Section 12.8 without reduction for allowable stress design.

For structures assigned to Seismic Design Category C, D, E, or F that have horizontal irregularity Type 1a or 1b of Table 12.3-1, the design story drift, Δ, shall be computed as the largest difference of the deflections of vertically aligned points at the top and bottom of the story under consideration along any of the edges of the structure.

The deflection at level x (δ_x) (in. or mm) used to compute the design story drift, Δ, shall be determined in accordance with the following equation:

$$\delta_x = \frac{C_d \delta_{xe}}{I_e} \qquad (12.8\text{-}15)$$

where

C_d = deflection amplification factor in Table 12.2-1;
δ_{xe} = deflection at the location required by this section determined by an elastic analysis; and
I_e = Importance Factor determined in accordance with Section 11.5.1.

12.8.6.1 Minimum Base Shear for Computing Drift. The elastic analysis of the seismic force-resisting system for computing drift shall be made using the prescribed seismic design forces of Section 12.8.

EXCEPTION: Eq. (12.8-5) need not be considered for computing drift.

12.8.6.2 Period for Computing Drift. For determining compliance with the story drift limits of Section 12.12.1, it is permitted to determine the elastic drifts (δ_{xe}) using seismic design forces based on the computed fundamental period of the structure without the upper limit ($C_u T_a$) specified in Section 12.8.2.

12.8.7 P-Delta Effects. P-delta effects on story shears and moments, the resulting member forces and moments, and the story drifts induced by these effects are not required to be considered where the stability coefficient (θ) as determined by the following equation is equal to or less than 0.10:

$$\theta = \frac{P_x \Delta I_e}{V_x h_{sx} C_d} \qquad (12.8\text{-}16)$$

where

P_x = total vertical design load at and above level x [kip (kN)]; where computing P_x, no individual load factor need exceed 1.0;
Δ = design story drift as defined in Section 12.8.6 occurring simultaneously with V_x [in. (mm)];
I_e = Importance Factor determined in accordance with Section 11.5.1;
V_x = seismic shear force acting between levels x and $x-1$ [kip (kN)];
h_{sx} = story height below level x [in. (mm)]; and
C_d = deflection amplification factor in Table 12.2-1.

The stability coefficient (θ) shall not exceed θ_{max}, determined as follows:

$$\theta_{max} = \frac{0.5}{\beta C_d} \le 0.25 \qquad (12.8\text{-}17)$$

where β is the ratio of shear demand to shear capacity for the story between levels x and $x-1$. This ratio is permitted to be conservatively taken as 1.0.

Where the stability coefficient (θ) is greater than 0.10 but less than or equal to θ_{max}, the incremental factor related to P-delta effects on displacements and member forces shall be determined by rational analysis. Alternatively, it is permitted to multiply displacements and member forces by $1.0/(1-\theta)$.

Where θ is greater than θ_{max}, the structure is potentially unstable and shall be redesigned.

Where the P-delta effect is included in an automated analysis, Eq. (12.8-17) shall still be satisfied; however, the value of θ computed from Eq. (12.8-16) using the results of the P-delta analysis is permitted to be divided by $(1+\theta)$ before checking Eq. (12.8-17).

12.9 LINEAR DYNAMIC ANALYSIS

12.9.1 Modal Response Spectrum Analysis

12.9.1.1 Number of Modes. An analysis shall be conducted to determine the natural modes of vibration for the structure. The analysis shall include a sufficient number of modes to obtain a combined modal mass participation of 100% of the structure's mass. For this purpose, it shall be permitted to represent all modes with periods less than 0.05 s in a single rigid body mode that has a period of 0.05 s.

EXCEPTION: Alternatively, the analysis shall be permitted to include a minimum number of modes to obtain a combined modal mass participation of at least 90% of the actual mass in each orthogonal horizontal direction of response considered in the model.

12.9.1.2 Modal Response Parameters. The value for each force-related design parameter of interest, including story drifts, support forces, and individual member forces for each mode of response, shall be computed using the properties of each mode and the response spectra defined in either Section 11.4.6 or 21.2 divided by the quantity R/I_e. The value for displacement and drift quantities shall be multiplied by the quantity C_d/I_e.

12.9.1.3 Combined Response Parameters. The value for each parameter of interest calculated for the various modes shall be combined using the square root of the sum of the squares (SRSS) method, the complete quadratic combination (CQC) method, the complete quadratic combination method as modified by ASCE 4 (CQC-4), or an approved equivalent approach. The CQC or the CQC-4 method shall be used for each of the modal values where closely spaced modes have significant cross-correlation of translational and torsional response.

12.9.1.4 Scaling Design Values of Combined Response. A base shear (V) shall be calculated in each of the two orthogonal horizontal directions using the calculated fundamental period of the structure T in each direction and the procedures of Section 12.8.

12.9.1.4.1 Scaling of Forces. Where the calculated fundamental period exceeds $C_u T_a$ in a given direction, $C_u T_a$ shall be used in lieu of T in that direction. Where the combined response for the modal base shear (V_t) is less than 100% of the calculated base shear (V) using the equivalent lateral force procedure, the forces shall be multiplied by V/V_t where

V = the equivalent lateral force procedure base shear, calculated in accordance with this section and Section 12.8, and
V_t = the base shear from the required modal combination.

12.9.1.4.2 Scaling of Drifts. Where the combined response for the modal base shear (V_t) is less than $C_s W$, and where C_s is

For structures assigned to Seismic Design Category C, D, E, or F that have horizontal irregularity Type 1a or 1b of Table 12.3-1, the design story drift, Δ, shall be computed as the largest difference of the deflections of vertically aligned points at the top and bottom of the story under consideration along any of the edges of the structure.

The deflection at level x (δ_x) (in. or mm) used to compute the design story drift, Δ, shall be determined in accordance with the following equation:

$$\delta_x = \frac{C_d \delta_{xe}}{I_e} \qquad (12.8\text{-}15)$$

where

C_d = deflection amplification factor in Table 12.2-1;
δ_{xe} = deflection at the location required by this section determined by an elastic analysis; and
I_e = Importance Factor determined in accordance with Section 11.5.1.

12.8.6.1 Minimum Base Shear for Computing Drift. The elastic analysis of the seismic force-resisting system for computing drift shall be made using the prescribed seismic design forces of Section 12.8.

EXCEPTION: Eq. (12.8-5) need not be considered for computing drift.

12.8.6.2 Period for Computing Drift. For determining compliance with the story drift limits of Section 12.12.1, it is permitted to determine the elastic drifts (δ_{xe}) using seismic design forces based on the computed fundamental period of the structure without the upper limit ($C_u T_a$) specified in Section 12.8.2.

12.8.7 P-Delta Effects. P-delta effects on story shears and moments, the resulting member forces and moments, and the story drifts induced by these effects are not required to be considered where the stability coefficient (θ) as determined by the following equation is equal to or less than 0.10:

$$\theta = \frac{P_x \Delta I_e}{V_x h_{sx} C_d} \qquad (12.8\text{-}16)$$

where

P_x = total vertical design load at and above level x [kip (kN)]; where computing P_x, no individual load factor need exceed 1.0;
Δ = design story drift as defined in Section 12.8.6 occurring simultaneously with V_x [in. (mm)];
I_e = Importance Factor determined in accordance with Section 11.5.1;
V_x = seismic shear force acting between levels x and $x-1$ [kip (kN)];
h_{sx} = story height below level x [in. (mm)]; and
C_d = deflection amplification factor in Table 12.2-1.

The stability coefficient (θ) shall not exceed θ_{max}, determined as follows:

$$\theta_{max} = \frac{0.5}{\beta C_d} \le 0.25 \qquad (12.8\text{-}17)$$

where β is the ratio of shear demand to shear capacity for the story between levels x and $x-1$. This ratio is permitted to be conservatively taken as 1.0.

Where the stability coefficient (θ) is greater than 0.10 but less than or equal to θ_{max}, the incremental factor related to P-delta effects on displacements and member forces shall be determined by rational analysis. Alternatively, it is permitted to multiply displacements and member forces by $1.0/(1-\theta)$.

Where θ is greater than θ_{max}, the structure is potentially unstable and shall be redesigned.

Where the P-delta effect is included in an automated analysis, Eq. (12.8-17) shall still be satisfied; however, the value of θ computed from Eq. (12.8-16) using the results of the P-delta analysis is permitted to be divided by $(1+\theta)$ before checking Eq. (12.8-17).

12.9 LINEAR DYNAMIC ANALYSIS

12.9.1 Modal Response Spectrum Analysis

12.9.1.1 Number of Modes. An analysis shall be conducted to determine the natural modes of vibration for the structure. The analysis shall include a sufficient number of modes to obtain a combined modal mass participation of 100% of the structure's mass. For this purpose, it shall be permitted to represent all modes with periods less than 0.05 s in a single rigid body mode that has a period of 0.05 s.

EXCEPTION: Alternatively, the analysis shall be permitted to include a minimum number of modes to obtain a combined modal mass participation of at least 90% of the actual mass in each orthogonal horizontal direction of response considered in the model.

12.9.1.2 Modal Response Parameters. The value for each force-related design parameter of interest, including story drifts, support forces, and individual member forces for each mode of response, shall be computed using the properties of each mode and the response spectra defined in either Section 11.4.6 or 21.2 divided by the quantity R/I_e. The value for displacement and drift quantities shall be multiplied by the quantity C_d/I_e.

12.9.1.3 Combined Response Parameters. The value for each parameter of interest calculated for the various modes shall be combined using the square root of the sum of the squares (SRSS) method, the complete quadratic combination (CQC) method, the complete quadratic combination method as modified by ASCE 4 (CQC-4), or an approved equivalent approach. The CQC or the CQC-4 method shall be used for each of the modal values where closely spaced modes have significant cross-correlation of translational and torsional response.

12.9.1.4 Scaling Design Values of Combined Response. A base shear (V) shall be calculated in each of the two orthogonal horizontal directions using the calculated fundamental period of the structure T in each direction and the procedures of Section 12.8.

12.9.1.4.1 Scaling of Forces. Where the calculated fundamental period exceeds $C_u T_a$ in a given direction, $C_u T_a$ shall be used in lieu of T in that direction. Where the combined response for the modal base shear (V_t) is less than 100% of the calculated base shear (V) using the equivalent lateral force procedure, the forces shall be multiplied by V/V_t where

V = the equivalent lateral force procedure base shear, calculated in accordance with this section and Section 12.8, and
V_t = the base shear from the required modal combination.

12.9.1.4.2 Scaling of Drifts. Where the combined response for the modal base shear (V_t) is less than $C_s W$, and where C_s is

Modal model was scaled accordingly.
see lateral loads section for scaling

PRCNC20221036

determined in accordance with Eq. (12.8-6), drifts shall be multiplied by $C_s W/V_t$.

12.9.1.5 Horizontal Shear Distribution. The distribution of horizontal shear shall be in accordance with Section 12.8.4, except that amplification of torsion in accordance with Section 12.8.4.3 is not required where accidental torsion effects are included in the dynamic analysis model.

12.9.1.6 P-Delta Effects. The P-delta effects shall be determined in accordance with Section 12.8.7. The base shear used to determine the story shears and the story drifts shall be determined in accordance with Section 12.8.6.

12.9.1.7 Soil–Structure Interaction Reduction. A soil–structure interaction reduction is permitted where determined using Chapter 19 or other generally accepted procedures approved by the authority having jurisdiction.

12.9.1.8 Structural Modeling. A mathematical model of the structure shall be constructed in accordance with Section 12.7.3, except that all structures designed in accordance with this section shall be analyzed using a 3D representation. Where the diaphragms have not been classified as rigid in accordance with Section 12.3.1, the model shall include representation of the diaphragm's stiffness characteristics and additional dynamic degrees of freedom as required to account for the participation of the diaphragm in the structure's dynamic response.

12.9.2 Linear Response History Analysis

12.9.2.1 General Requirements. Linear response history analysis shall consist of an analysis of a linear mathematical model of the structure to determine its response through methods of numerical integration, to suites of spectrally matched acceleration histories compatible with the design response spectrum for the site. The analysis shall be performed in accordance with the requirements of this section.

12.9.2.2 General Modeling Requirements. Three-dimensional (3D) models of the structure shall be required. Modeling the distribution of stiffness and mass throughout the structure's lateral load-resisting system and diaphragms shall be in accordance with Section 12.7.3.

12.9.2.2.1 P-Delta Effects. The mathematical model shall include P-delta effects. Limits on the stability coefficient, θ, shall be satisfied in accordance with Section 12.8.7.

12.9.2.2.2 Accidental Torsion. Accidental torsion, where required by Section 12.8.4.2, shall be included by offsetting the center of mass in each direction (i.e., plus or minus) from its expected location by a distance equal to 5% of the horizontal dimension of the structure at the given floor measured perpendicular to the direction of loading. Amplification of accidental torsion in accordance with Section 12.8.4.3 is not required.

12.9.2.2.3 Foundation Modeling. Where foundation flexibility is included in the analysis, modeling of the foundation shall be in accordance with Section 12.13.3.

12.9.2.2.4 Number of Modes to Include in Modal Response History Analysis. Where the modal response history analysis procedure is used, the number of modes to include in the analysis shall be in accordance with Section 12.9.1.1.

12.9.2.2.5 Damping. Linear viscous damping shall not exceed 5% critical for any mode with a vibration period greater than or equal to T_{lower}.

12.9.2.3 Ground Motion Selection and Modification. Ground acceleration histories used for analysis shall consist of a suite of no fewer than three pairs of spectrally matched orthogonal components derived from artificial or recorded ground motion events. The target response spectrum for each spectrally matched set shall be developed in accordance with Sections 11.4.6 or 21.3, as applicable.

12.9.2.3.1 Procedure for Spectrum Matching. Each component of ground motion shall be spectrally matched over the period range $0.8T_{\text{lower}}$ to $1.2T_{\text{upper}}$. Over the same period range and in each direction of response, the average of the 5% damped pseudoacceleration ordinates computed using the spectrum-matched records shall not fall above or below the target spectrum by more than 10% in each direction of response.

12.9.2.4 Application of Ground Acceleration Histories. Two orthogonal directions of response, designated as X and Y, shall be selected and used for all response history analysis. Ground motions shall be applied independently in the X and Y directions.

12.9.2.5 Modification of Response for Design

12.9.2.5.1 Determination of Maximum Elastic and Inelastic Base Shear. For each ground motion analyzed, a maximum elastic base shear, designated as V_{EX} and V_{EY} in the X and Y directions, respectively, shall be determined. The mathematical model used for computing the maximum elastic base shear shall not include accidental torsion.

For each ground motion analyzed, a maximum inelastic base shear, designated as V_{IX} and V_{IY} in the X and Y directions, respectively, shall be determined as follows:

$$V_{IX} = \frac{V_{EX} I_e}{R_X} \qquad (12.9\text{-}1)$$

$$V_{IY} = \frac{V_{EY} I_e}{R_Y} \qquad (12.9\text{-}2)$$

where I_e is the Importance Factor and R_X and R_Y are the response modifications coefficients for the X and Y directions, respectively.

12.9.2.5.2 Determination of Base Shear Scale Factor. Design base shears, V_X, and V_Y, shall be computed in the X and Y directions, respectively, in accordance with Section 12.8.1. For each ground motion analyzed, base shear scale factors in each direction of response shall be determined as follows:

$$\eta_X = \frac{V_X}{V_{IX}} \geq 1.0 \qquad (12.9\text{-}3)$$

$$\eta_Y = \frac{V_Y}{V_{IY}} \geq 1.0 \qquad (12.9\text{-}4)$$

12.9.2.5.3 Determination of Combined Force Response. For each direction of response and for each ground motion analyzed, the combined force response shall be determined as follows:

a. The combined force response in the X direction shall be determined as $I_e \eta_X / R_X$ times the computed elastic response in the X direction using the mathematical model with accidental torsion (where required) plus $I_e \eta_Y / R_Y$ times the computed elastic response in the Y direction using the mathematical model without accidental torsion.
b. The combined force response in the Y direction shall be determined as $I_e \eta_Y / R_Y$ times the computed elastic response in the Y direction using the mathematical model with accidental torsion (where required), plus $I_e \eta_X / R_X$ times

the computed elastic response in the X direction using the mathematical model without accidental torsion.

12.9.2.5.4 Determination of Combined Displacement Response. Response modification factors C_{dX} and C_{dY} shall be assigned in the X and Y directions, respectively. For each direction of response and for each ground motion analyzed, the combined displacement responses shall be determined as follows:

a. The combined displacement response in the X direction shall be determined as $\eta_X C_{dX}/R_X$ times the computed elastic response in the X direction using the mathematical model with accidental torsion (where required), plus $\eta_Y C_{dY}/R_Y$ times the computed elastic response in the Y direction using the mathematical model without accidental torsion.
b. The combined displacement response in the Y direction shall be determined as $\eta_Y C_{dY}/R_Y$ times the computed elastic response in the Y direction using the mathematical model with accidental torsion (where required), plus $\eta_X C_{dX}/R_X$ times the computed elastic response in the X direction using the mathematical model without accidental torsion.

EXCEPTION: Where the design base shear in the given direction is not controlled by Eq. (12.8-6), the factors η_X or η_Y, as applicable, are permitted to be taken as 1.0 for the purpose of determining combined displacements.

12.9.2.6 Enveloping of Force Response Quantities. Design force response quantities shall be taken as the envelope of the combined force response quantities computed in both orthogonal directions and for all ground motions considered. Where force interaction effects are considered, demand to capacity ratios are permitted to be enveloped in lieu of individual force quantities.

12.9.2.7 Enveloping of Displacement Response Quantities. Story drift quantities shall be determined for each ground motion analyzed and in each direction of response using the combined displacement responses defined in Section 12.9.2.5.4. For the purpose of complying with the drift limits specified in Section 12.12, the envelope of story drifts computed in both orthogonal directions and for all ground motions analyzed shall be used.

12.10 DIAPHRAGMS, CHORDS, AND COLLECTORS

Diaphragms, chords, and collectors shall be designed in accordance with Sections 12.10.1 and 12.10.2.

EXCEPTIONS:

1. Precast concrete diaphragms, including chords and collectors in structures assigned to Seismic Design Categories C, D, E, or F, shall be designed in accordance with Section 12.10.3.
2. Precast concrete diaphragms in Seismic Design Category B, cast-in-place concrete diaphragms, and wood-sheathed diaphragms supported by wood diaphragm framing are permitted to be designed in accordance with Section 12.10.3.

12.10.1 Diaphragm Design. Diaphragms shall be designed for both the shear and bending stresses resulting from design forces. At diaphragm discontinuities, such as openings and reentrant corners, the design shall ensure that the dissipation or transfer of edge (chord) forces combined with other forces in the diaphragm is within shear and tension capacity of the diaphragm.

12.10.1.1 Diaphragm Design Forces. Floor and roof diaphragms shall be designed to resist design seismic forces from the structural analysis but shall not be less than that determined in accordance with Eq. (12.10-1) as follows:

$$F_{px} = \frac{\sum_{i=x}^{n} F_i}{\sum_{i=x}^{n} w_i} w_{px} \tag{12.10-1}$$

where

F_{px} = the diaphragm design force at level x;
F_i = the design force applied to level i;
w_i = the weight tributary to level i; and
w_{px} = the weight tributary to the diaphragm at level x.

The force determined from Eq. (12.10-1) shall not be less than

$$F_{px} = 0.2 S_{DS} I_e w_{px} \tag{12.10-2}$$

The force determined from Eq. (12.10-1) need not exceed

$$F_{px} = 0.4 S_{DS} I_e w_{px} \tag{12.10-3}$$

All diaphragms shall be designed for the inertial forces determined from Eqs. (12.10-1) through (12.10-3) and for all applicable transfer forces. For structures that have a horizontal structural irregularity of Type 4 in Table 12.3-1, the transfer forces from the vertical seismic force-resisting elements above the diaphragm to other vertical seismic force-resisting elements below the diaphragm shall be increased by the overstrength factor of Section 12.4.3 before being added to the diaphragm inertial forces. For structures that have horizontal or vertical structural irregularities of the types indicated in Section 12.3.3.4, the requirements of that section shall also apply.

EXCEPTION: One- and two-family dwellings of light-frame construction shall be permitted to use $\Omega_0 = 1.0$.

12.10.2 Collector Elements. Collector elements shall be provided that are capable of transferring the seismic forces originating in other portions of the structure to the element providing the resistance to those forces.

12.10.2.1 Collector Elements Requiring Load Combinations Including Overstrength for Seismic Design Categories C through F. In structures assigned to Seismic Design Category C, D, E, or F, collector elements (Fig. 12.10-1) and their

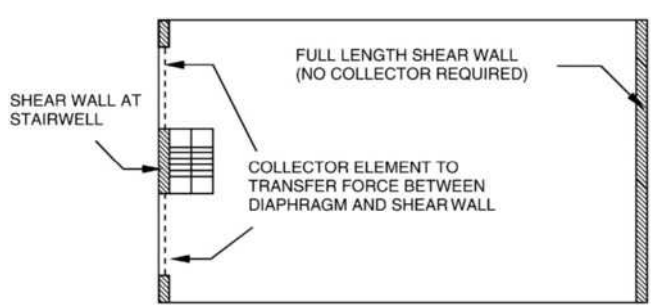


FIGURE 12.10-1 Collectors

connections, including connections to vertical elements, shall be designed to resist the maximum of the following:

1. Forces calculated using the seismic load effects including overstrength of Section 12.4.3 with seismic forces determined by the equivalent lateral force procedure of Section 12.8 or the modal response spectrum analysis procedure of Section 12.9.1;
2. Forces calculated using the seismic load effects including overstrength of Section 12.4.3 with seismic forces determined by Eq. (12.10-1); and
3. Forces calculated using the load combinations of Section 2.3.6 with seismic forces determined by Eq. (12.10-2).

Transfer forces as described in Section 12.10.1.1 shall be considered.

EXCEPTION:

1. In structures or portions thereof braced entirely by wood light-frame shear walls, collector elements and their connections, including connections to vertical elements, need only be designed to resist forces using the load combinations of Section 2.3.6 with seismic forces determined in accordance with Section 12.10.1.1.

12.10.3 Alternative Design Provisions for Diaphragms, Including Chords and Collectors. Where required or permitted in Section 12.10, diaphragms, including chords and collectors, shall be designed using the provisions in Section 12.10.3.1 through 12.10.3.5 and the following:

1. Footnote *b* to Table 12.2-1 shall not apply.
2. Section 12.3.3.4 shall not apply.
3. Section 12.3.4.1, Item 5, shall be replaced with the following: "Design of diaphragms, including chords, collectors, and their connections to the vertical elements" are used.
4. Section 12.3.4.1, Item 7, shall not apply.

12.10.3.1 Design. Diaphragms, including chords, collectors, and their connections to the vertical elements, shall be designed in two orthogonal directions to resist the in-plane design seismic forces determined in Section 12.10.3.2. Collectors shall be provided that are capable of transferring the seismic forces originating in other portions of the structure to the vertical elements providing the resistance to those forces. Design shall provide for transfer of forces at diaphragm discontinuities, such as openings and reentrant corners.

12.10.3.2 Seismic Design Forces for Diaphragms, Including Chords and Collectors. Diaphragms, including chords, collectors, and their connections to the vertical elements, shall be designed to resist in-plane seismic design forces given by Eq. (12.10-4):

$$F_{px} = \frac{C_{px}}{R_s} w_{px} \qquad (12.10\text{-}4)$$

The force F_{px} determined from Eq. (12.10-4) shall not be less than:

$$F_{px} = 0.2 S_{DS} I_e w_{px} \qquad (12.10\text{-}5)$$

C_{px} shall be determined as illustrated in Fig. 12.10-2.

12.10.3.2.1 Design Acceleration Coefficients C_{p0}, C_{pi}, and C_{pn}. Design acceleration coefficients C_{p0} and C_{pn} shall be calculated by Eqs. (12.10-6) and (12.10-7):

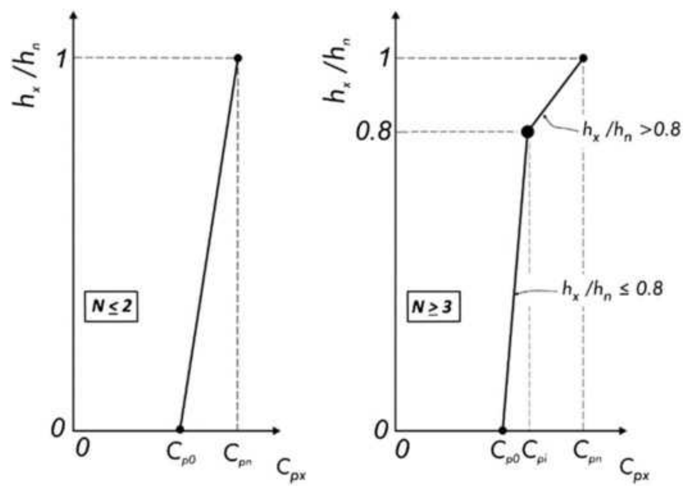


FIGURE 12.10-2 Calculating the Design Acceleration Coefficient C_{px} in Buildings with $N \le 2$ and in Buildings with $N \ge 3$

$$C_{p0} = 0.4 S_{DS} I_e \qquad (12.10\text{-}6)$$

and

$$C_{pn} = \sqrt{(\Gamma_{m1}\Omega_0 C_s)^2 + (\Gamma_{m2} C_{s2})^2} \ge C_{pi} \qquad (12.10\text{-}7)$$

Design acceleration coefficient C_{pi} shall be the greater of values given by Eqs. (12.10-8) and (12.10-9):

$$C_{pi} = 0.8 C_{p0} \qquad (12.10\text{-}8)$$

$$C_{pi} = 0.9 \Gamma_{m1} \Omega_0 C_s \qquad (12.10\text{-}9)$$

where Ω_0 is the overstrength factor given in Table 12.2-1, C_s is determined in accordance with Section 12.8 or 12.9, and C_{s2} shall be the smallest of values calculated from Eqs. (12.10-10), (12.10-11), and (12.10-12):

$$C_{s2} = (0.15N + 0.25) I_e S_{DS} \qquad (12.10\text{-}10)$$

$$C_{s2} = I_e S_{DS} \qquad (12.10\text{-}11)$$

$$\text{For } N \ge 2 \qquad C_{s2} = \frac{I_e S_{D1}}{0.03(N-1)} \qquad (12.10\text{-}12a)$$

$$\text{For } N = 1 \qquad C_{s2} = 0 \qquad (12.10\text{-}12b)$$

The modal contribution factors Γ_{m1} and Γ_{m2} in Eq. (12.10-7) shall be calculated from Eqs. (12.10-13) and (12.10-14):

$$\Gamma_{m1} = 1 + \frac{z_s}{2}\left(1 - \frac{1}{N}\right) \qquad (12.10\text{-}13)$$

and

$$\Gamma_{m2} = 0.9 z_s \left(1 - \frac{1}{N}\right)^2 \qquad (12.10\text{-}14)$$

rotational capacity, and ductility to resist shrinkage, thermal changes, and differential foundation settlement when combined with seismic forces.

12.11.2.2 Additional Requirements for Anchorage of Concrete or Masonry Structural Walls to Diaphragms in Structures Assigned to Seismic Design Categories C through F

12.11.2.2.1 Transfer of Anchorage Forces into Diaphragm. Diaphragms shall be provided with continuous ties or struts between diaphragm chords to distribute these anchorage forces into the diaphragms. Diaphragm connections shall be positive, mechanical, or welded. Added chords are permitted to be used to form subdiaphragms to transmit the anchorage forces to the main continuous crossties. The maximum length-to-width ratio of structural subdiaphragms that serve as part of the continuous tie system shall be 2.5 to 1. Connections and anchorages capable of resisting the prescribed forces shall be provided between the diaphragm and the attached components. Connections shall extend into the diaphragm a sufficient distance to develop the force transferred into the diaphragm.

12.11.2.2.2 Steel Elements of Structural Wall Anchorage System. The strength design forces for steel elements of the structural wall anchorage system, with the exception of anchor bolts and reinforcing steel, shall be increased by 1.4 times the forces otherwise required by this section.

12.11.2.2.3 Wood Diaphragms. The anchorage of concrete or masonry structural walls to wood diaphragms shall be in accordance with AWC SDPWS 4.1.5.1 and this section. Continuous ties required by this section shall be in addition to the diaphragm sheathing. Anchorage shall not be accomplished by use of toenails or nails subject to withdrawal, nor shall wood ledgers or framing be used in cross-grain bending or cross-grain tension. The diaphragm sheathing shall not be considered effective for providing the ties or struts required by this section.

12.11.2.2.4 Metal Deck Diaphragms. In metal deck diaphragms, the metal deck shall not be used as the continuous ties required by this section in the direction perpendicular to the deck span.

12.11.2.2.5 Embedded Straps. Diaphragm to structural wall anchorage using embedded straps shall be attached to, or hooked around, the reinforcing steel or otherwise terminated so as to effectively transfer forces to the reinforcing steel.

12.11.2.2.6 Eccentrically Loaded Anchorage System. Where elements of the wall anchorage system are loaded eccentrically or are not perpendicular to the wall, the system shall be designed to resist all components of the forces induced by the eccentricity.

12.11.2.2.7 Walls with Pilasters. Where pilasters are present in the wall, the anchorage force at the pilasters shall be calculated considering the additional load transferred from the wall panels to the pilasters. However, the minimum anchorage force at a floor or roof shall not be reduced.

12.12 DRIFT AND DEFORMATION

12.12.1 Story Drift Limit. The design story drift (Δ) as determined in Sections 12.8.6, 12.9.1, or 12.9.2 shall not exceed the allowable story drift (Δ_a) as obtained from Table 12.12-1 for any story.

12.12.1.1 Moment Frames in Structures Assigned to Seismic Design Categories D through F. For seismic force-resisting systems solely comprising moment frames in structures assigned to Seismic Design Categories D, E, or F, the design story drift (Δ) shall not exceed Δ_a/ρ for any story. ρ shall be determined in accordance with Section 12.3.4.2.

12.12.2 Diaphragm Deflection. The deflection in the plane of the diaphragm, as determined by engineering analysis, shall not exceed the permissible deflection of the attached elements. Permissible deflection shall be that deflection that will permit the attached element to maintain its structural integrity under the individual loading and continue to support the prescribed loads.

12.12.3 Structural Separation. All portions of the structure shall be designed and constructed to act as an integral unit in resisting seismic forces unless separated structurally by a distance sufficient to avoid damaging contact as set forth in this section.

Separations shall allow for the maximum inelastic response displacement (δ_M). δ_M shall be determined at critical locations with consideration for translational and torsional displacements of the structure including torsional amplifications, where applicable, using the following equation:

$$\delta_M = \frac{C_d \delta_{max}}{I_e} \qquad (12.12\text{-}1)$$

where δ_{max} = maximum elastic displacement at the critical location.

Table 12.12-1 Allowable Story Drift, Δ_a[a,b]

Structure	Risk Category: I or II	III	IV
Structures, other than masonry shear wall structures, four stories or less above the base as defined in Section 11.2, with interior walls, partitions, ceilings, and exterior wall systems that have been designed to accommodate the story drifts	$0.025h_{sx}$[c]	$0.020h_{sx}$	$0.015h_{sx}$
Masonry cantilever shear wall structures[d]	$0.010h_{sx}$	$0.010h_{sx}$	$0.010h_{sx}$
Other masonry shear wall structures	$0.007h_{sx}$	$0.007h_{sx}$	$0.007h_{sx}$
All other structures	$0.020h_{sx}$	$0.015h_{sx}$	$0.010h_{sx}$

[a]h_{sx} is the story height below level x.
[b]For seismic force-resisting systems solely comprising moment frames in Seismic Design Categories D, E, and F, the allowable story drift shall comply with the requirements of Section 12.12.1.1.
[c]There shall be no drift limit for single-story structures with interior walls, partitions, ceilings, and exterior wall systems that have been designed to accommodate the story drifts. The structure separation requirement of Section 12.12.3 is not waived.
[d]Structures in which the basic structural system consists of masonry shear walls designed as vertical elements cantilevered from their base or foundation support that are so constructed that moment transfer between shear walls (coupling) is negligible.

integrus
ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Codes, Loads, & Material -
Gravity Loads

PRCNC20221036

Building Loads

8"METAL STUD EXTERIOR WALL WITH METAL PANEL	
8" Metal Stud Framing	3 psf
5/8" Gyp	2.5 psf
WRB Sheathing	2.5 psf
Insulation + Clips	4 psf
Metal Panel Sytem	3 psf
Misc	2 psf
Total Dead Load	**17 psf**

8"METAL STUD EXTERIOR WALL WITH MASONRY VENEER	
8" Metal Stud Framing	3 psf
5/8" Gyp	2.5 psf
WRB Sheathing	2.5 psf
Insulation + Clips	4 psf
4" Masonry Veneer	40 psf
Misc	2 psf
Total Dead Load	**54 psf**

STOREFRONT GLAZING	
Storefront Glazing	10 psf
Total Dead Load	**10 psf**

PRCNC20221036

Building Loads

TYPICAL COMPOSITE DECK FLOOR					
Gravity			Seismic		
W2 18ga metal deck with 3" concrete		51 psf	W2 18ga metal deck with 3" concrete		51 psf
MEP		10 psf	MEP		6 psf
Ceiling		4 psf	Ceiling		4 psf
Misc		3 psf	Misc		1.5 psf
Beams + Columns		Included	Beams + Columns		Included
Ceiling		4 psf	Ceiling		4 psf
Misc		3 psf	Misc		3 psf
Beams + Columns		Included	Beams + Columns		Included
4" Concrete Housekeeping Pad (where occurs)		50 psf	4" Concrete Housekeeping Pad (where occurs)		50 psf
MEP Equipment		Varies	MEP Equipment		Varies
Total Dead Load	**MEP Equipment +**	**118 psf**	**Total Dead Load**	**MEP Equipment +**	**118 psf**

TYPICAL STAIR LANDINGS			
Gravity		Seismic	
3" Precast panels	47 psf	W2 18ga metal deck with 3" concrete	47 psf
MEP	2 psf	MEP	2 psf
Misc	3 psf	Misc	3 psf
Beams + Columns	Included	Beams + Columns	Included
Total Dead Load	**52 psf**	**Total Dead Load**	**52 psf**

PRCNC20221036

Building Loads

TYPICAL METAL ROOF DECK - PV READY			
Gravity		Seismic	
1.5" Metal Deck	3 psf	1.5" Metal Deck	3 psf
MEP	5 psf	MEP	3 psf
Roofing, Insulation, Misc	8 psf	Roofing, Insulation, Misc	8 psf
Misc	3 psf	Misc	3 psf
Beams + Columns	Included	Beams + Columns	Included
Ceiling	4 psf	Ceiling	4 psf
MEP	10 psf	MEP	6 psf
Roofing, Insulation, Misc	8 psf	Roofing, Insulation, Misc	8 psf
Misc	3 psf	Misc	3 psf
Beams + Columns	Included	Beams + Columns	Included
Ceiling	4 psf	Ceiling	4 psf
Partitons	0 psf	Partitons	5 psf
PV Ready	8 psf	PV Ready	8 psf
MEP Equipment	Varies		
Total Dead Load	**36 psf**	**Total Dead Load**	**37 psf**

LEVEL 3 COMPOSITE DECK LOW ROOF - PV READY			
Gravity		Seismic	
W2 18ga metal deck with 3" concrete	51 psf	W2 18ga metal deck with 3" concrete	51 psf
MEP	5 psf	MEP	5 psf
Roofing, Insulation, Misc	13 psf	Roofing, Insulation, Misc	13 psf
Misc	3 psf	Misc	3 psf
Beams + Columns	Included	Beams + Columns	Included
Ceiling	4 psf	Ceiling	4 psf
Partitons	0 psf	Partitons	5 psf
PV Ready	8 psf	PV Ready	8 psf
MEP Equipment	Varies	MEP Equipment	Varies
Total Dead Load	**84 psf**	**Total Dead Load**	**89 psf**

LEVEL 3 COMPOSITE DECK LOW ROOF EXTENSION ABOVE FRONT ENTRY			
Gravity		Seismic	
W2 18ga metal deck un-topped	3 psf	W2 18ga metal deck un-topped	3 psf
MEP	2 psf	MEP	2 psf
Roofing, Insulation, Misc	6 psf	Roofing, Insulation, Misc	6 psf
Misc	2 psf	Misc	2 psf
Beams + Columns	Included	Beams + Columns	Included
Total Dead Load	**13 psf**	**Total Dead Load**	**13 psf**

PENTHOUSE METAL ROOF DECK			
Gravity		Seismic	
1.5" Metal Deck	3 psf	1.5" Metal Deck	3 psf
MEP	50 psf	MEP	50 psf
Roofing, Insulation, Misc	8 psf	Roofing, Insulation, Misc	8 psf
Misc	3 psf	Misc	3 psf
Beams + Columns	Included	Beams + Columns	Included
Total Dead Load	**64 psf**	**Total Dead Load**	**64 psf**

PRCNC20221036

Live Loads
ASCE 7-16

All floors are designed for 100psf Live load for future flexibility

Table 4.3-1 Minimum Uniformly Distributed Live Loads, L_o, and Minimum Concentrated Live Loads

Occupancy or Use	Uniform, L_o psf (kN/m^2)	Live Load Reduction Permitted? (Sec. No.)	Multiple-Story Live Load Reduction Permitted? (Sec. No.)	Concentrated lb (kN)	Also See Section
Apartments (See Residential)					
Access floor systems					
Office use	50 (2.40)	Yes (4.7.2)	Yes (4.7.2)	2,000 (8.90)	
Computer use	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)	2,000 (8.90)	
Armories and drill rooms	150 (7.18)	No (4.7.5)	No (4.7.5)		
Assembly areas					
Fixed seats (fastened to floors)	60 (2.87)	No (4.7.5)	No (4.7.5)		
Lobbies	100 (4.79)	No (4.7.5)	No (4.7.5)		
Movable seats	100 (4.79)	No (4.7.5)	No (4.7.5)		
Platforms (assembly)	100 (4.79)	No (4.7.5)	No (4.7.5)		
Stage floors	150 (7.18)	No (4.7.5)	No (4.7.5)		
Reviewing stands, grandstands, and bleachers	100 (4.79)	No (4.7.5)	No (4.7.5)		4.14
Stadiums and arenas with fixed seats (fastened to the floor)	60 (2.87)	No (4.7.5)	No (4.7.5)		4.14
Other assembly areas	100 (4.79)	No (4.7.5)	No (4.7.5)		
Balconies and decks	1.5 times the live load for the area served. Not required to exceed 100 psf (4.79 kN/m^2)	Yes (4.7.2)	Yes (4.7.2)		
Catwalks for maintenance access	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)	300 (1.33)	
Corridors					
First floor	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)		
Other floors	Same as occupancy served except as indicated				
Dining rooms and restaurants	100 (4.79)	No (4.7.5)	No (4.7.5)		
Dwellings (See Residential)					
Elevator machine room grating (on area of 2 in. by 2 in. (50 mm by 50 mm))		—	—	300 (1.33)	
Finish light floor plate construction (on area of 1 in. by 1 in. (25 mm by 25 mm))		—	—	200 (0.89)	
Fire escapes	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)		
On single-family dwellings only	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)		
Fixed ladders		—	—	See Sec. 4.5.4	
Garages (See Section 4.10)					
Passenger vehicles only	40 (1.92)	No (4.7.4)	Yes (4.7.4)	See Sec. 4.10.1	
Trucks and buses	See Sec. 4.10.2	—	—	See Sec. 4.10.2	
Handrails and Guardrails	See Sec. 4.5.1	—	—	See Sec. 4.5.1	
Grab bars		—	—	See Sec. 4.5.2	
Helipads (See Section 4.11)					
Helicopter takeoff weight 3,000 lb (13.35 kN) or less	40 (1.92)	No (4.11.1)	—	See Sec. 4.11.2	
Helicopter takeoff weight more than 3,000 lb (13.35 kN)	60 (2.87)	No (4.11.1)	—	See Sec. 4.11.2	
Hospitals					
Operating rooms, laboratories	60 (2.87)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Patient rooms	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Corridors above first floor	80 (3.83)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Hotels (See Residential)					
Libraries					
Reading rooms	60 (2.87)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Stack rooms	150 (7.18)	No (4.7.3)	Yes (4.7.3)	1,000 (4.45)	4.13
Corridors above first floor	80 (3.83)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Manufacturing					
Light	125 (6.00)	No (4.7.3)	Yes (4.7.3)	2,000 (8.90)	
Heavy	250 (11.97)	No (4.7.3)	Yes (4.7.3)	3,000 (13.35)	
Office buildings					
File and computer rooms shall be designed for heavier loads based on anticipated occupancy					
Lobbies and first-floor corridors	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)	2,000 (8.90)	
Offices	50 (2.40)	Yes (4.7.2)	Yes (4.7.2)	2,000 (8.90)	
Corridors above first floor	80 (3.83)	Yes (4.7.2)	Yes (4.7.2)	2,000 (8.90)	

continues

PRCNC20221036

Table 4.3-1. ***(Continued)*** **Minimum Uniformly Distributed Live Loads, L_o, and Minimum Concentrated Live Loads**

Occupancy or Use	Uniform, L_o psf (kN/m^2)	Live Load Reduction Permitted? (Sec. No.)	Multiple-Story Live Load Reduction Permitted? (Sec. No.)	Concentrated lb (kN)	Also See Section
Penal institutions					
Cell blocks	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)		
Corridors	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)		
Recreational uses					
Bowling alleys, poolrooms, and similar uses	75 (3.59)	No (4.7.5)	No (4.7.5)		
Dance halls and ballrooms	100 (4.79)	No (4.7.5)	No (4.7.5)		
Gymnasiums	100 (4.79)	No (4.7.5)	No (4.7.5)		
Residential					
One- and two-family dwellings					
Uninhabitable attics without storage	10 (0.48)	Yes (4.7.2)	Yes (4.7.2)		4.12.1
Uninhabitable attics with storage	20 (0.96)	Yes (4.7.2)	Yes (4.7.2)		4.12.2
Habitable attics and sleeping areas	30 (1.44)	Yes (4.7.2)	Yes (4.7.2)		
All other areas except stairs	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)		
All other residential occupancies					
Private rooms and corridors serving them	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)		
Public rooms	100 (4.79)	No (4.7.5)	No (4.7.5)		
Corridors serving public rooms	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)		
Roofs					
Ordinary flat, pitched, and curved roofs	20 (0.96)	Yes (4.8.2)	—		4.8.1
Roof areas used for occupants	Same as occupancy served	Yes (4.8.3)	—		
Roof areas used for assembly purposes	100 ~~(4.70)~~ (4.79) (Errata, June 2018)	Yes (4.8.3)			
Vegetative and landscaped roofs					
Roof areas not intended for occupancy	20 (0.96)	Yes (4.8.2)	—		
Roof areas used for assembly purposes	100 ~~(4.70)~~ (4.79) (Errata, June 2018)	Yes (4.8.3)	—		
Roof areas used for other occupancies	Same as occupancy served	Yes (4.8.3)	—		
Awnings and canopies					
Fabric construction supported by a skeleton structure	5 (0.24)	No (4.8.2)	—		
Screen enclosure support frame	5 (0.24) based on the tributary area of the roof supported by the frame member	No (4.8.2)	—	200 (0.89)	
All other construction	20 (0.96)	Yes (4.8.2)	—		4.8.1
Primary roof members, exposed to a work floor					
Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages				2,000 (8.90)	
All other primary roof members		—	—	300 (1.33)	
All roof surfaces subject to maintenance workers		—	—	300 (1.33)	
Schools					
Classrooms	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Corridors above first floor	80 (3.83)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
First-floor corridors	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Scuttles, skylight ribs, and accessible ceilings				200 (0.89)	
Sidewalks, vehicular driveways, and yards subject to trucking	250 (11.97)	No (4.7.3)	Yes (4.7.3)	8,000 (35.60)	4.15
Stairs and exit ways	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)	300 (1.33)	4.16
One- and two-family dwellings only	40 (1.92)	Yes (4.7.2)	Yes (4.7.2)	300 (1.33)	4.16
Storage areas above ceilings	20 (0.96)	Yes (4.7.2)	Yes (4.7.2)		
Storage warehouses (shall be designed for heavier loads if required for anticipated storage)					
Light	125 (6.00)	No (4.7.3)	Yes (4.7.3)		
Heavy	250 (11.97)	No (4.7.3)	Yes (4.7.3)		

continues

Table 4.3-1. *(Continued)* Minimum Uniformly Distributed Live Loads, L_o, and Minimum Concentrated Live Loads

Occupancy or Use	Uniform, L_o psf (kN/m^2)	Live Load Reduction Permitted? (Sec. No.)	Multiple-Story Live Load Reduction Permitted? (Sec. No.)	Concentrated lb (kN)	Also See Section
Stores					
Retail					
First floor	100 (4.79)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Upper floors	75 (3.59)	Yes (4.7.2)	Yes (4.7.2)	1,000 (4.45)	
Wholesale, all floors	125 (6.00)	No (4.7.3)	Yes (4.7.3)	1,000 (4.45)	
Vehicle barriers				See Sec. 4.5.3	
Walkways and elevated platforms (other than exit ways)	60 (2.87)	Yes (4.7.2)	Yes (4.7.2)		
Yards and terraces, pedestrian	100 (4.79)	No (4.7.5)	No (4.7.5)		

4.5.1.2 Guardrail System Component Loads. Balusters, panel fillers, and guardrail infill components, including all rails except the handrail and the top rail, shall be designed to resist a horizontally applied normal load of 50 lb (0.22 kN) on an area not to exceed 12 in. by 12 in. (305 mm by 305 mm), including openings and space between rails and located so as to produce the maximum load effects. Reactions due to this loading are not required to be superimposed with the loads specified in Sections 4.5.1 and 4.5.1.1.

4.5.2 Grab Bar Systems. Grab bar systems shall be designed to resist a single concentrated load of 250 lb (1.11 kN) applied in any direction at any point on the grab bar to produce the maximum load effect.

4.5.3 Vehicle Barrier Systems. Vehicle barrier systems for passenger vehicles shall be designed to resist a single load of 6,000 lb (26.70 kN) applied horizontally in any direction to the barrier system and shall have anchorages or attachments capable of transferring this load to the structure. For design of the system, the load shall be assumed to act at heights between 1 ft 6 in. (460 mm) and 2 ft 3 in. (686 mm) above the floor or ramp surface, located to produce the maximum load effects. The load shall be applied on an area not to exceed 12 in. by 12 in. (305 mm by 305 mm). This load is not required to act concurrently with any handrail or guardrail system loadings specified in Section 4.5.1. Vehicle barrier systems in garages accommodating trucks and buses shall be designed in accordance with *AASHTO LRFD Bridge Design Specifications*.

4.5.4 Fixed Ladders. Fixed ladders with rungs shall be designed to … load of 300 lb (1.33 kN) ap… e maximum load effect on th… The number and position of a… units shall be a minimum of … y 10 ft (3.05 m) of ladder height…

RAM SS utilizes live load reduction

Where rails o… … extend above a floor or platform at the top of the ladder, each side rail extension shall be designed to resist a single concentrated live load of 100 lb (0.445 kN) applied in any direction at any height up to the top of the side rail extension. Ships ladders with treads instead of rungs shall be designed to resist the stair loads given in Table 4.3-1.

4.6 IMPACT LOADS

4.6.1 General. The live loads specified in Sections 4.3 through 4.5 shall be assumed to include adequate allowance for ordinary impact conditions. Provision shall be made in the structural design for uses and loads that involve unusual vibration and impact forces.

4.6.2 Elevators. All elements subject to dynamic loads from elevators shall be designed for impact loads and deflection limits prescribed by ASME A17.

4.6.3 Machinery. For the purpose of design, the weight of machinery and moving loads shall be increased as follows to allow for impact: (1) light machinery, shaft- or motor-driven, 20%; and (2) reciprocating machinery or power-driven units, 50%. All percentages shall be increased where specified by the manufacturer.

4.6.4 Elements Supporting Hoists for Façade Access and Building Maintenance Equipment. Structural elements that support hoists for façade and building maintenance equipment shall be designed for a live load of 2.5 times the rated load of the hoist or the stall load of the hoist, whichever is larger.

4.6.5 Fall Arrest and Lifeline Anchorages. Fall arrest and lifeline anchorages and structural elements that support these anchorages shall be designed for a live load of 3,100 lb (13.8 kN) for each attached lifeline in every direction that a fall arrest load may be applied.

4.7 REDUCTION IN UNIFORM LIVE LOADS

4.7.1 General. Except for roof uniform live loads, all other minimum uniformly distributed live loads, L_o in Table 4.3-1, are permitted to be reduced in accordance with the requirements of Sections 4.7.2 through 4.7.6.

4.7.2 Reduction in Uniform Live Loads. Subject to the limitations of Sections 4.7.3 through 4.7.6, members for which a value of $K_{LL}A_T$ is 400 ft^2 (37.16 m^2) or more are permitted to be designed for a reduced live load in accordance with the following formula:

$$L = L_o\left(0.25 + \frac{15}{\sqrt{K_{LL}A_T}}\right) \qquad (4.7\text{-}1)$$

$$L = L_o\left(0.25 + \frac{4.57}{\sqrt{K_{LL}A_T}}\right) \qquad (4.7\text{-}1\text{si})$$

Table 4.7-1 Live Load Element Factor, K_{LL}

Element	K_{LL}[a]
Interior columns	4
Exterior columns without cantilever slabs	4
Edge columns with cantilever slabs	3
Corner columns with cantilever slabs	2
Edge beams without cantilever slabs	2
Interior beams	2
All other members not identified, including	1
Edge beams with cantilever slabs	
Cantilever beams	
One-way slabs	
Two-way slabs	
Members without provisions for continuous shear transfer normal to their span	

[a]In lieu of the preceding values, K_{LL} is permitted to be calculated.

where

L = reduced design live load per ft^2 (m^2) of area supported by the member
L_o = unreduced design live load per ft^2 (m^2) of area supported by the member (see Table 4.3-1)
K_{LL} = live load element factor (see Table 4.7-1)
A_T = tributary area in ft^2 (m^2).

L shall not be less than $0.50L_o$ for members supporting one floor, and L shall not be less than $0.40L_o$ for members supporting two or more floors.

4.7.3 Heavy Live Loads. Live loads that exceed 100 lb/ft^2 (4.79 kN/m^2) shall not be reduced.

EXCEPTION: Live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20%, but the reduced live load shall not be less than L as calculated in Section 4.7.2.

4.7.4 Passenger Vehicle Garages. The live loads shall not be reduced in passenger vehicle garages.

EXCEPTION: Live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20%, but the reduced live load shall not be less than L as calculated in Section 4.7.2.

4.7.5 Assembly Uses. Live loads shall not be reduced in assembly uses.

4.7.6 Limitations on One-Way Slabs. The tributary area, A_T, for one-way slabs shall not exceed an area defined by the slab span times a width normal to the span of 1.5 times the slab span.

4.8 REDUCTION IN ROOF LIVE LOADS

4.8.1 General. The minimum uniformly distributed roof live loads, L_o in Table 4.3-1, are permitted to be reduced in accordance with the requirements of Sections 4.8.2 and 4.8.3.

Where uniform roof live loads are reduced to less than 20 lb/ft^2 (0.96 kN/m^2) in accordance with Section 4.8.2 and are applied to the design of structural members arranged so as to create continuity, the reduced roof live load shall be applied to adjacent spans or to alternate spans, whichever produces the greatest unfavorable load effect.

4.8.2 Ordinary Roofs, Awnings, and Canopies. Ordinary flat, pitched, and curved roofs, and awning and canopies other than those of fabric construction supported by a skeleton structure, are permitted to be designed for a reduced roof live load, as specified in Eq. (4.8-1), or other controlling combinations of loads, as specified in Chapter 2, whichever produces the greater load effect. In structures such as greenhouses, where special scaffolding is used as a work surface for workers and materials during maintenance and repair operations, a lower roof load than specified in Eq. (4.8-1) shall not be used unless approved by the Authority Having Jurisdiction. On such structures, the minimum roof live load shall be 12 psf (0.58 kN/m^2).

$$L_r = L_o R_1 R_2 \quad \text{where} \quad 12 \le L_r \le 20 \qquad (4.8\text{-}1)$$

$$L_r = L_o R_1 R_2 \quad \text{where} \quad 0.58 \le L_r \le 0.96 \qquad (4.8\text{-}1\text{si})$$

where

L_r = reduced roof live load per ft^2 (m^2) of horizontal projection supported by the member and
L_o = unreduced design roof live load per ft^2 (m^2) of horizontal projection supported by the member (see Table 4.3-1).

The reduction factors R_1 and R_2 shall be determined as follows:

$$R_1 = \begin{array}{ll} 1 & \text{for } A_T \le 200 \text{ ft}^2 \\ 1.2 - 0.001A_T & \text{for } 200 \text{ ft}^2 < A_T < 600 \text{ ft}^2 \\ 0.6 & \text{for } A_T \ge 600 \text{ ft}^2 \end{array}$$

in SI:

$$R_1 = \begin{array}{ll} 1 & \text{for } A_T \le 18.58 \text{ m}^2 \\ 1.2 - 0.011A_T & \text{for } 18.58 \text{ m}^2 < A_T < 55.74 \text{ m}^2 \\ 0.6 & \text{for } A_T \ge 55.74 \text{ m}^2 \end{array}$$

where A_T = tributary area in ft^2 (m^2) supported by the member and

$$R_2 = \begin{array}{ll} 1 & \text{for } F \le 4 \\ 1.2 - 0.05F & \text{for } 4 < F < 12 \\ 0.6 & \text{for } F \ge 12 \end{array}$$

where, for a pitched roof, F = number of inches of rise per foot (in SI: $F = 0.12 \times \text{slope}$, with slope expressed in percentage points) and, for an arch or dome, F = rise-to-span ratio multiplied by 32.

4.8.3 Occupiable Roofs. Roofs that have an occupancy function, such as roof gardens or other special purposes, are permitted to have their uniformly distributed live load reduced in accordance with the requirements of Section 4.7.

Roofs used for other special purposes shall be designed for appropriate loads as approved by the Authority Having Jurisdiction.

4.9 CRANE LOADS

4.9.1 General. The crane live load shall be the rated capacity of the crane. Design loads for the runway beams, including connections and support brackets, of moving bridge cranes and monorail cranes shall include the maximum wheel loads

Snow Loads

a complete lateral force-resisting system with adequate strength to resist the forces indicated in Section 1.4.2. All members of the structural system shall be connected to their supporting members in accordance with Section 1.4.3. Structural walls shall be anchored to diaphragms and supports in accordance with Section 1.4.4. The effects on the structure and its components caused by the forces stipulated in this section shall be taken as the notional load, N, and combined with the effects of other loads in accordance with the load combinations of Section 2.6. Where material resistance depends on load duration, notional loads are permitted to be taken as having a duration of 10 minutes. Structures designed in conformance with the requirements of this standard for Seismic Design Categories B, C, D, E, or F shall be deemed to comply with the requirements of Sections 1.4.2, 1.4.3, and 1.4.4.

1.4.1 Load Path Connections. All parts of the structure between separation joints shall be interconnected to form a continuous path to the lateral force-resisting system, and the connections shall be capable of transmitting the lateral forces induced by the parts being connected. Any smaller portion of the structure shall be tied to the remainder of the structure with elements having the strength to resist a force of not less than 5% of the portion's weight.

1.4.2 Lateral Forces. Each structure shall be analyzed for the effects of static lateral forces applied independently in each of two orthogonal directions. In each direction, the static lateral forces at all levels shall be applied simultaneously. For purposes of analysis, the force at each level shall be determined using Eq. (1.4-1):

$$F_x = 0.01 W_x \tag{1.4-1}$$

where

F_x = the design lateral force applied at story x, and
W_x = the portion of the total dead load of the structure, D, located or assigned to level x.

Structures explicitly designed for stability, including second-order effects, shall be deemed to comply with the requirements of this section.

1.4.3 Connection to Supports. A positive connection for resisting a horizontal force acting parallel to the member shall be provided for each beam, girder, or truss either directly to its supporting elements or to slabs designed to act as diaphragms. Where the connection is through a diaphragm, the member's supporting element shall also be connected to the diaphragm. The connection shall have the strength to resist a force of 5% of the unfactored dead load plus live load reaction imposed by the supported member on the supporting member.

1.4.4 Anchorage of Structural Walls. Walls that provide vertical load bearing or lateral shear resistance for a portion of the structure shall be anchored to the roof and all floors and members that provide lateral support for the wall or that are supported by the wall. The anchorage shall provide a direct connection between the walls and the roof or floor construction. The connections shall be capable of resisting a strength level horizontal force perpendicular to the plane of the wall equal to 0.2 times the weight of the wall tributary to the connection, but not less than 5 psf (0.24 kN/m^2).

1.4.5 Extraordinary Loads and Events. When considered, design for resistance to extraordinary loads and events shall be in accordance with the procedures of Section 2.5.

1.5 CLASSIFICATION OF BUILDINGS AND OTHER STRUCTURES

1.5.1 Risk Categorization. Buildings and other structures shall be classified, based on the risk to human life, health, and welfare associated with their damage or failure by nature of their occupancy or use, according to Table 1.5-1 for the purposes of applying flood, wind, snow, earthquake, and ice provisions. Each building or other structure shall be assigned to the highest applicable Risk Category or Categories. Minimum design loads for structures shall incorporate the applicable importance factors given in Table 1.5-2, as required by other sections of this standard. Assignment of a building or other structure to multiple Risk Categories based on the type of load condition being evaluated (e.g., snow or seismic) shall be permitted.

When the building code or other referenced standard specifies an Occupancy Category, the Risk Category shall not be taken as lower than the Occupancy Category specified therein.

Table 1.5-1 Risk Category of Buildings and Other Structures for Flood, Wind, Snow, Earthquake, and Ice Loads

Use or Occupancy of Buildings and Structures	Risk Category
Buildings and other structures that represent low risk to human life in the event of failure	I
All buildings and other structures except those listed in Risk Categories I, III, and IV	II
Buildings and other structures, the failure of which could pose a substantial risk to human life	III
Buildings and other structures, not included in Risk Category IV, with potential to cause a substantial economic impact and/or mass disruption of day-to-day civilian life in the event of failure	
Buildings and other structures not included in Risk Category IV (including, but not limited to, facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, hazardous waste, or explosives) containing toxic or explosive substances where the quantity of the material exceeds a threshold quantity established by the Authority Having Jurisdiction and is sufficient to pose a threat to the public if released[a]	
Buildings and other structures designated as essential facilities	IV
Buildings and other structures, the failure of which could pose a substantial hazard to the community	
Buildings and other structures (including, but not limited to, facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, or hazardous waste) containing sufficient quantities of highly toxic substances where the quantity of the material exceeds a threshold quantity established by the Authority Having Jurisdiction and is sufficient to pose a threat to the public if released[a]	
Buildings and other structures required to maintain the functionality of other Risk Category IV structures	

[a]Buildings and other structures containing toxic, highly toxic, or explosive substances shall be eligible for classification to a lower Risk Category if it can be demonstrated to the satisfaction of the Authority Having Jurisdiction by a hazard assessment as described in Section 1.5.3 that a release of the substances is commensurate with the risk associated with that Risk Category.

PRCNC20221036

Table 1.5-2 Importance Factors by Risk Category of Buildings and Other Structures for Snow, Ice, and Earthquake Loads

Risk Category from Table 1.5-1	Snow Importance Factor, I_s	Ice Importance Factor—Thickness, I_i	Ice Importance Factor—Wind, I_w	Seismic Importance Factor, I_e
I	0.80	0.80	1.00	1.00
II	1.00	1.00	1.00	1.00
III	1.10	1.15	1.00	1.25
IV	1.20	1.25	1.00	1.50

Note: The component importance factor, I_p, applicable to earthquake loads, is not included in this table because it depends on the importance of the individual component rather than that of the building as a whole, or its occupancy. Refer to Section 13.1.3.

1.5.2 Multiple Risk Categories. Where buildings or other structures are divided into portions with independent structural systems, the classification for each portion shall be permitted to be determined independently. Where building systems, such as required egress, HVAC, or electrical power, for a portion with a higher Risk Category pass through or depend on other portions of the building or other structure having a lower Risk Category, those portions shall be assigned to the higher Risk Category.

1.5.3 Toxic, Highly Toxic, and Explosive Substances. Buildings and other structures containing toxic, highly toxic, or explosive substances are permitted to be classified as Risk Category II structures if it can be demonstrated to the satisfaction of the Authority Having Jurisdiction by a hazard assessment as part of an overall risk management plan (RMP) that a release of the toxic, highly toxic, or explosive substances is not sufficient to pose a threat to the public.

To qualify for this reduced classification, the owner or operator of the buildings or other structures containing the toxic, highly toxic, or explosive substances shall have an RMP that incorporates three elements as a minimum: a hazard assessment, a prevention program, and an emergency response plan.

As a minimum, the hazard assessment shall include the preparation and reporting of worst-case release scenarios for each structure under consideration, showing the potential effect on the public for each. As a minimum, the worst-case event shall include the complete failure e.g., instantaneous release of entire contents of a vessel, piping system, or other storage structure. A worst-case event includes, but is not limited to, a release during the design wind or design seismic event. In this assessment, the evaluation of the effectiveness of subsequent measures for accident mitigation shall be based on the assumption that the complete failure of the primary storage structure has occurred. The off-site impact shall be defined in terms of population within the potentially affected area. To qualify for the reduced classification, the hazard assessment shall demonstrate that a release of the toxic, highly toxic, or explosive substances from a worst-case event does not pose a threat to the public outside the property boundary of the facility.

As a minimum, the prevention program shall consist of the comprehensive elements of process safety management, which is based upon accident prevention through the application of management controls in the key areas of design, construction, operation, and maintenance. Secondary containment of the toxic, highly toxic, or explosive substances; including, but not limited to, double-wall tank, dike of sufficient size to contain a spill, or other means to contain a release of the toxic, highly toxic, or explosive substances within the property boundary of the facility and prevent release of harmful quantities of contaminants to the air, soil, groundwater, or surface water; are permitted to be used to mitigate the risk of release. Where secondary containment is provided, it shall be designed for all environmental loads and is not eligible for this reduced classification. In hurricane-prone regions, mandatory practices and procedures that effectively diminish the effects of wind on critical structural elements or that alternatively protect against harmful releases during and after hurricanes are permitted to be used to mitigate the risk of release.

As a minimum, the emergency response plan shall address public notification, emergency medical treatment for accidental exposure to humans, and procedures for emergency response to releases that have consequences beyond the property boundary of the facility. The emergency response plan shall address the potential that resources for response could be compromised by the event that has caused the emergency.

1.6 ADDITIONS AND ALTERATIONS TO EXISTING STRUCTURES

When an existing building or other structure is enlarged or otherwise altered, structural members affected shall be strengthened if necessary so that the factored loads defined in this document will be supported without exceeding the specified design strength for the materials of construction. When using allowable stress design, strengthening is required when the stresses caused by nominal loads exceed the specified allowable stresses for the materials of construction.

1.7 LOAD TESTS

A load test of any construction shall be conducted when required by the Authority Having Jurisdiction whenever there is reason to question its safety for the intended use.

1.8 CONSENSUS STANDARDS AND OTHER REFERENCED DOCUMENTS

This section lists the consensus standards and other documents that shall be considered part of this standard to the extent referenced in this chapter.

OSHA Standards for General Industry, 29 CFR (Code of Federal Regulations) Part 1910.1200. Appendix A, with Amendments as of February 1, 2000, U.S. Department of Labor, Occupational Safety and Health Administration, 2005.

Cited in: Section 1.2

CHAPTER 7
SNOW LOADS

7.1 DEFINITIONS AND SYMBOLS

7.1.1 Definitions

DRIFT: The accumulation of wind-driven snow that results in a local surcharge load on the roof structure at locations such as a parapet or roof step.

FLAT ROOF SNOW LOAD: Uniform load for flat roofs.

FREEZER BUILDINGS: Buildings in which the inside temperature is kept at or below freezing. Buildings with an air space between the roof insulation layer above and a ceiling of the freezer area below are not considered freezer buildings.

GROUND SNOW LOAD: The site-specific weight of the accumulated snow at the ground level used to develop roof snow loads on the structure. It generally has a 50-year mean recurrence interval.

MINIMUM SNOW LOAD: Snow load on low sloped roofs, including the roof snow load immediately after a single snow storm without wind.

PONDING: Refer to definitions in Chapter 8, Rain Loads

PONDING INSTABILITY: Refer to definitions in Chapter 8, Rain Loads.

R-VALUE: A measure of the resistance to heat flow through a roof component or assembly per unit area.

SLIPPERY SURFACE: Membranes with a smooth surface, e.g., glass, metal, or rubber. Membranes with an embedded aggregate or mineral granule surface are not considered a slippery surface.

SLOPED ROOF SNOW LOAD: Uniform load on horizontal projection of a sloped roof, also known as the balanced load.

VENTILATED ROOF: Roof that allows exterior air to naturally circulate between the roof surface above and the insulation layer below. The exterior air commonly flows from the eave to the ridge.

7.1.2 Symbols

C_e = exposure factor as determined from Table 7.3-1.
C_s = slope factor as determined from Fig. 7.4-1.
C_t = thermal factor as determined from Table 7.3-2.
h = vertical separation distance in feet (m) ... edge of a higher roof including any par... edge of a lower adjacent roof excluding...
h_b = height of balanced snow load determin... ing p_s by γ, in ft (m).
h_c = clear height from top of balanced snow load to (1) closest point on adjacent upper roof, (2) top of parapet, or (3) top of a projection on the roof, in ft (m).
h_d = height of snow drift, in ft (m).
h_{d1} or h_{d2} = heights of snow drifts, in ft (m), where two intersecting snow drifts can form.
h_o = height of obstruction above the surface of the roof, in ft (m).
I_s = importance factor as prescribed in Section 7.3.3.
l_u = length of the roof upwind of the drift, in ft (m).
p_d = maximum intensity of drift surcharge load, in lb/ft^2 (kN/m^2).
p_f = snow load on flat roofs ("flat"= roof *slope* $\leq 5°$), in lb/ft^2 (kN/m^2).
p_g = ground snow load as determined from Fig. 7.2-1 and Table 7.2-1; or a site-specific analysis, in lb/ft^2 (kN/m^2).
p_m = minimum snow load for low-slope roofs, in lb/ft^2 (kN/m^2).
p_s = sloped roof (balanced) snow load, in lb/ft^2 (kN/m^2).
s = horizontal separation distance in ft (m) between the edges of two adjacent buildings.
S = roof slope run for a rise of one.
w = width of snow drift, in ft (m).
w_1 or w_2 = widths of snow drifts, in ft (m), where two intersecting snow drifts can form.
W = horizontal distance from eave to ridge, in ft (m).
γ = snow density, in lb/ft^3 (kN/m^3), as determined from Eq. (7.7-1).
θ = roof slope on the leeward side, in degrees.

7.2 GROUND SNOW LOADS, p_g

Ground snow loads, p_g, to be used in the determination of design snow loads for roofs shall be as set forth in Fig. 7.2-1 for the contiguous United States and Table 7.2-1 for Alaska. Site-specific case studies shall be made to determine ground snow loads in areas designated CS in Fig. 7.2-1 (see also Tables 7.2-2 through 7.2-8). Ground snow loads for sites at elevations above the limits indicated in Fig. 7.2-1 and for all sites within the CS areas shall be approved by the Authority Having Jurisdiction. Ground snow load determination for such sites shall be based on an extreme value statistical analysis of data available in the vicinity of the site using a value with a 2% annual probability of being exceeded (50-year mean recurrence interval).

Snow loads are zero for Hawaii, except in mountainous ...y Having Jurisdiction.
...d snow load, $I_s p_g$, shall be ...ow accumulation surfaces, ...r-ground level surfaces or roofs of subterranean spaces, whose height above the ground surface is less than the depth of the ground snow, h_g ($h_g = p_g/\gamma$).

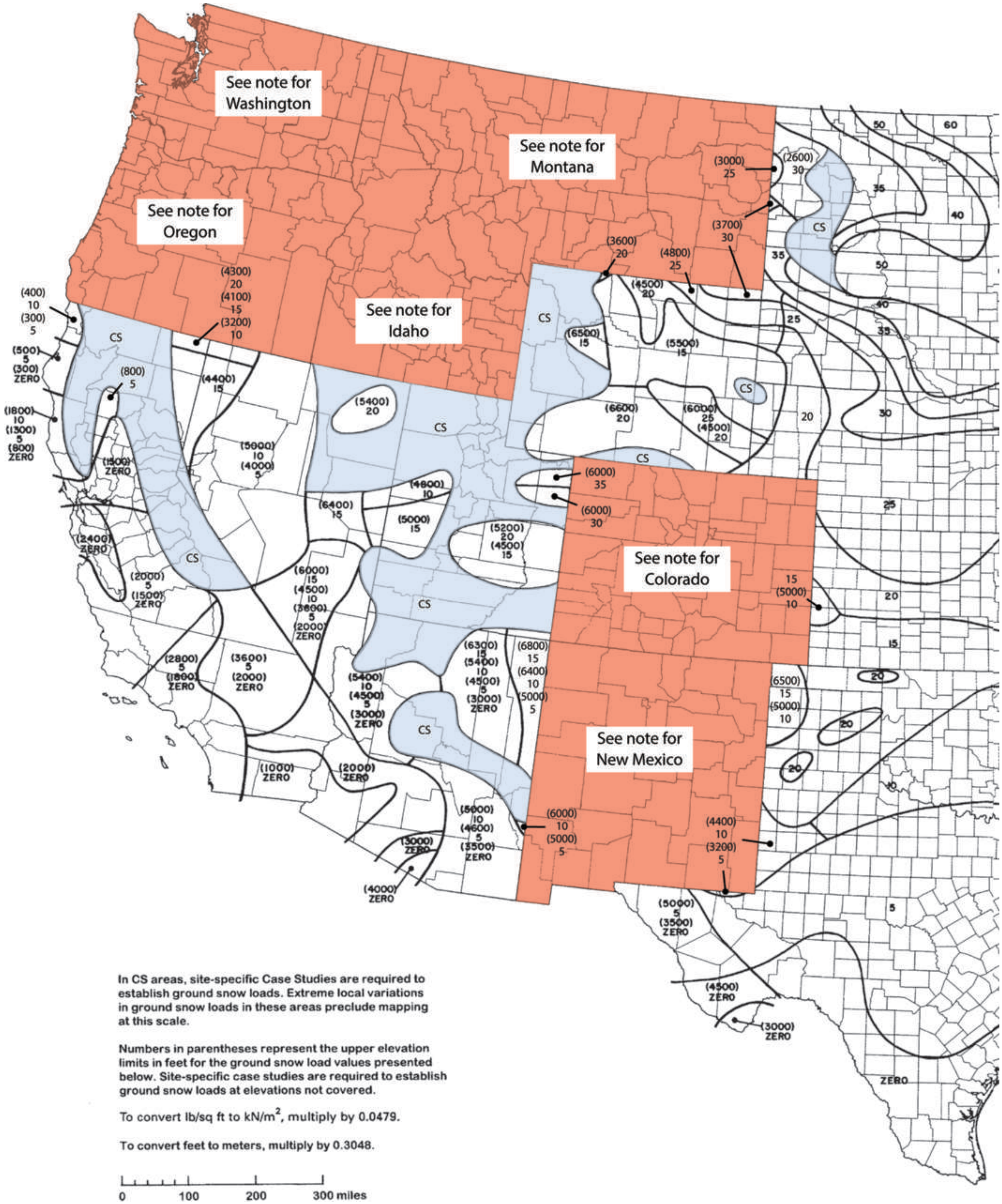
0.7 * 1.0 *1.0 *1.1 * 18 psf = 13.86
25psf is recommend per SEAW white paper

7.3 FLAT ROOF SNOW LOADS, p_f

The flat roof snow load, p_f, shall be calculated in lb/ft^2 (kN/m^2) using the following formula:

$$p_f = 0.7 C_e C_t I_s p_g \qquad (7.3\text{-}1)$$

PRCNC20221036



Note: See Table 7.2-2 for Colorado; see Table 7.2-3 for Idaho; see Table 7.2-4 for Montana; see Table 7.2-5 for Washington; see Table 7.2-6 for New Mexico; see Table 7.2-7 for Oregon; see Table 7.2-8 for New Hampshire.

FIGURE 7.2-1 Ground Snow Loads, p_g, for the United States (lb/ft^2)

7.3.1 Exposure Factor, C_e. The value for C_e shall be determined from Table 7.3-1.

7.3.2 Thermal Factor, C_t. The value for C_t shall be determined from Table 7.3-2.

7.3.3 Importance Factor, I_s. The value for I_s shall be determined from Table 1.5-2 based on the Risk Category from Table 1.5-1.

7.3.4 Minimum Snow Load for Low-Slope Roofs, p_m. A minimum roof snow load, p_m, shall only apply to monoslope,

Table 7.2-4 Ground Snow Loads for Selected Locations in Montana

City/Town	County	Ground Snow Load (lb/ft^2)	Elevation (ft)
Anaconda	Deer Lodge	47	5,676
Baker	Fallon	46	2,966
Belgrade	Gallatin	33	4,446
Big Mt. Resort	Flathead	94	4,464
Big Timber	Sweet Grass	37	4,200
Billings	Yellowstone	29	3,242
Boulder	Jefferson	74	4,948
Bozeman	Gallatin	40	4,823
Butte	Silver Bow	36	5,824
Chinook	Blaine	61	2,418
Choteau	Teton	19	3,799
Colstrip	Rosebud	18	3,232
Columbia Falls	Flathead	71	3,015
Columbus	Stillwater	41	3,599
Conrad	Pondera	16	3,520
Cut Bank	Glacier	17	3,793
Deer Lodge	Powell	27	4,593
Dillon	Beaverhead	23	5,125
East Helena	Lewis and Clark	28	3,904
Forsyth	Rosebud	20	2,510
Fort Benton	Chouteau	29	2,713
Glasgow	Valley	24	2,146
Glendive	Dawson	16	2,067
Great Falls	Cascade	32	3,399
Hamilton	Ravalli	43	3,619
Hardin	Big Horn	15	2,904
Havre	Hill	49	2,500
Helena	Lewis and Clark	27	4,013
Kalispell	Flathead	56	2,992
Laurel	Yellowstone	36	3,356
Lewis Hgts.	Fergus	50	3,914
Libby	Lincoln	76	2,198
Livingston	Park	33	4,544
Malta	Phillips	30	2,284
Manhattan	Gallatin	21	4,242
Miles City	Custer	25	2,362
Missoula	Missoula	34	3,245
Plentywood	Sheridan	73	2,080
Polson	Lake	63	2,999
Red Lodge	Carbon	109	5,610
Ronan	Lake	50	3,077
Roundup	Musselshell	21	3,209
Shelby	Toole	28	3,301
Sidney	Richland	27	1,969
Stevensville	Ravalli	48	3,399
Thompson Falls	Sanders	51	2,507
Three Forks	Gallatin	22	4,085
Townsend	Broadwater	11	3,868
W. Yellowstone	Gallatin	122	6,713
Whitefish	Flathead	67	2,999
Wolf Point	Roosevelt	24	2,057

Note: To convert lb/ft^2 to kN/m^2, multiply by 0.0479. To convert feet to meters, multiply by 0.3048.

1. Statutory requirements of the Authority Having Jurisdiction are not included in this state ground snow load table.
2. For locations where there is substantial change in altitude over the jurisdiction, the load applies at and below the cited elevation, with a tolerance of 100 ft (30 m).
3. For other locations in Montana, see Theisen, G. P., M. J. Keller, J. E. Stephens, F. F. Videon, and J. P. Schilke. (2004). "Snow Loads for Structural Design in Montana," Dept. of Civil Engineering, Bozeman, MT, http://www.coe.montana.edu/snowload/ for ground snow load values.

Table 7.2-5 Ground Snow Loads for Selected Locations in Washington

City/Town	County	Ground Snow Load (lb/ft^2)	Elevation (ft)
Arlington	Snohomish	17	120
Auburn	King	20	85
Bainbridge Island	Kitsap	15	100
Bellevue	King	20	100
Bellingham	Watcom	15	100
Bonney Lake	Pierce	18	40
Bothell	King	20	90
Bremerton	Kitsap	15	100
Burien	King	16	325
Covington	King	20	85
Crystal Mt.	Pierce	438	4,380
Des Moines	King	18	370
Edmonds	Snohomish	20	350
Ellensburg	Kittitas	34	1,540
Everett	Snohomish	15	110
Federal Way	King	20	85
Issaquah	King	20	100
Kenmore	King	20	90
Kennewick	Benton	15	400
Kent	King	20	50
Kirkland	King	20	180
Lacey	Thurston	15	200
Lake Stevens	Snohomish	15	250
Lakewood	Pierce	15	235
Longview	Cowlitz	18	21
Lynnwood	Snohomish	22	435
Maple Valley	King	23	440
Marysville	Snohomish	16	20
Mercer Island	King	16	320
Mt. Baker	Whatcom	588	4,200
Mt. Spokane	Spokane	151	5,800
Mt. Vernon	Skagit	15	180
Oak Harbor	Island	17	120
Olympia	Thurston	15	130
Pasco	Franklin	15	383
Pullman	Whitman	30	2,400
Puyallup	Pierce	18	40
Redmond	King	20	120
Renton	King	20	15
Richland	Benton	15	359
Sammamish	King	28	520
SeaTac	King	22	440
Seattle	King	20	350
Shoreline	King	22	450
Snoqualmie Pass	Kittitas	433	3,000
Spokane	Spokane	39	2,000
Spokane Valley	Spokane	39	2,000
Stevens Pass	Chelan	400	4,060
Tacoma	Pierce	21	380
Tukwila	King	16	325
Univ. Place	Pierce	20	400
Vancouver	Clark	20	150
Walla Walla	Walla Walla	18	1,000
Wenatchee	Chelan	22	780
White Pass	Yakima	244	4,720
Yakima	Yakima	19	1,066

Note: To convert lb/ft^2 to kN/m^2, multiply by 0.0479. To convert feet to meters, multiply by 0.3048.

1. Statutory requirements of the Authority Having Jurisdiction are not included in this state ground snow load table.
2. For locations where there is substantial change in altitude over the jurisdiction, the load applies at and below the cited elevation, with a tolerance of 100 ft (30 m).
3. For other locations in Washington, see Structural Engineers Association of Washington (1995). "Snow Load Analysis for Washington," Seattle, WA, www.seaw.org, for ground snow load values.

Table 7.2-8 Ground Snow Loads for Selected Locations in New Hampshire

Town	County	Ground Snow Load (lb/ft²)	Elevation (ft.)	Town	County	Ground Snow Load (lb/ft²)	Elevation (ft.)
Amherst	Hillsborough	70	600	Keene	Cheshire	70	900
Atkinson	Rockingham	55	400	Laconia	Belknap	80	900
Barrington	Strafford	70	500	Lebanon	Grafton	80	1,200
Bedford	Hillsborough	70	700	Litchfield	Hillsborough	60	250
Belmont	Belknap	80	900	Londonderry	Rockingham	65	500
Berlin	Coos	100	1,600	Manchester	Hillsborough	70	500
Bow	Merrimack	75	800	Merrimack	Hillsborough	60	400
Claremont	Sullivan	85	1,100	Milford	Hillsborough	70	600
Concord	Merrimack	70	600	Nashua	Hillsborough	60	400
Conway	Carroll	95	900	Newmarket	Rockingham	50	200
Derry	Rockingham	65	600	Newport	Sullivan	85	1,200
Dover	Strafford	60	200	Pelham	Hillsborough	55	400
Durham	Strafford	55	150	Pembroke	Merrimack	70	700
Epping	Rockingham	55	300	Plaistow	Rockingham	55	300
Exeter	Rockingham	50	200	Plymouth	Grafton	75	900
Farmington	Strafford	85	800	Portsmouth	Rockingham	50	100
Franklin	Merrimack	75	700	Raymond	Rockingham	60	500
Gilford	Belknap	90	1,200	Rochester	Strafford	70	500
Goffstown	Hillsborough	75	800	Salem	Rockingham	55	300
Hampstead	Rockingham	55	300	Seabrook	Rockingham	50	100
Hampton	Rockingham	50	150	Somersworth	Strafford	60	250
Hanover	Grafton	75	1,300	Stratham	Rockingham	50	150
Hollis	Hillsborough	60	500	Swanzey	Cheshire	65	800
Hooksett	Merrimack	70	600	Weare	Hillsborough	80	900
Hudson	Hillsborough	60	400	Windham	Rockingham	60	400

Note: To convert lb/ft² to kN/m², multiply by 0.0479. To convert feet to meters, multiply by 0.3048.

1. Statutory requirements of the Authority Having Jurisdiction are not included in this state ground snow load table.
2. These loads only apply at the elevation listed. For lower elevations, the ground snow load shall be decreased by 2.1 lb/ft² for every 100 ft of elevation difference (0.32 kN/m² for every 100 m of elevation difference). For higher elevation up to an elevation of 2,500 ft, the ground snow load shall be increased at the same rate. Ground snow loads calculated for a site-specific elevation different than that listed in the table should be rounded to the nearest 5 lb/ft² (0.25 kN/m²)
3. For other locations in New Hampshire, see Tobiasson, W., Buska, J., Greatorex, A., Tirey, J., Fisher, J., and Johnson, S., (2002). "Ground snow loads for New Hampshire." U.S. Army Corps of Engineers, Engineering Research and Development Center (ERDC), Cold Regions Research and Engineering Laboratory (CRREL) Technical Report ERDL/CRREL TR-02-6. Hanover, NH, http://www.senh.org/public-links or http://www.erdc.usace.army.mil/Locations/ColdRegionsResearchandEngineeringLaboratory/Publications.aspx, for ground snow load values.

Table 7.3-1 Exposure Factor, C_e

Surface Roughness Category	Exposure of Roof[a]: Fully Exposed	Partially Exposed	Sheltered
B (see Section 26.7)	0.9	1.0	1.2
C (see Section 26.7)	0.9	1.0	1.1
D (see Section 26.7)	0.8	0.9	1.0
Above the tree line in windswept mountainous areas	0.7	0.8	NA
In Alaska, in areas where trees do not exist within a 2-mi (3-km) radius of the site	0.7	0.8	NA

The terrain category and roof exposure condition chosen shall be representative of the anticipated conditions during the life of the structure. An exposure factor shall be determined for each roof of a structure.

[a]Definitions: Partially Exposed: All roofs except as indicated in the following text. Fully Exposed: Roofs exposed on all sides with no shelter[b] afforded by terrain, higher structures, or trees. Roofs that contain several large pieces of mechanical equipment, parapets that extend above the height of the balanced snow load (h_b), or other obstructions are not in this category. Sheltered: Roofs located tight in among conifers that qualify as obstructions.

[b]Obstructions within a distance of $10h_o$ provide "shelter," where h_o is the height of the obstruction above the roof level. If the only obstructions are a few deciduous trees that are leafless in winter, the "fully exposed" category shall be used. Note that these are heights above the roof. Heights used to establish the Exposure Category in Section 26.7 are heights above the ground.

windward side, p_s on the leeward side plus a rectangular surcharge with magnitude $h_d\gamma/\sqrt{S}$ and horizontal extent from the ridge $8h_d\sqrt{S}/3$ where h_d is the drift height from Fig. 7.6-1 with l_u equal to the eave to ridge distance for the windward portion of the roof, W. For W less than 20 ft (6.1 m), use $W = l_u = 20$ ft (6.1 m) in Fig. 7.6-1. Balanced and unbalanced loading diagrams are presented in Fig. 7.6-2.

Table 7.3-2 Thermal Factor, C_t

Thermal Condition[a]	C_t
All structures except as indicated below	1.0
Structures kept just above freezing and others with cold, ventilated roofs in which the thermal resistance (R-value) between the ventilated space and the heated space exceeds $25°F \times h \times ft^2/Btu$ ($4.4\ K \times m^2/W$)	1.1
Unheated and open air structures	1.2
Freezer building	1.3
Continuously heated greenhouses[b] with a roof having a thermal resistance (R-value) less than $2.0°F \times h \times ft^2/Btu$ ($0.4\ K \times m^2/W$)	0.85

[a]These conditions shall be representative of the anticipated conditions during winters for the life of the structure.

[b]Greenhouses with a constantly maintained interior temperature of 50°F (10°C) or more at any point 3 ft (0.9 m) above the floor level during winters and having either a maintenance attendant on duty at all times or a temperature alarm system to provide warning in the event of a heating failure.

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Codes, Loads, & Material -
Lateral Loads

PRCNC20221036

Wind C+C Loads

integrus ARCHITECTURE
10 S. Cedar Street | Spokane, WA 99201 | 509-838-8681 | Fax 509-838-2194
117 S. Main Street, Suite 100 | Seattle, WA 98104 | 206-628-3137 | Fax 206-628-3138
STRUCTURAL ENGINEERS

Title: Pierce College | Wind C+C Loads | Job Number
By: AM | Date: 4/6/22 | Sheet: 1/3

$$q_z = 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot K_e \cdot v^2$$ (Eqn. 26.10-1)

Exposure Category B, Risk Category III (Section 26.7.2 + 26.7.3)

$v = 105$ mph (Figure 26.5-1C)

$K_{zt} = 1.0$ (Section 26.8.2)

$K_z = 0.822$ (Table 26.10-1)

53 feet	Exposure B
50'	0.81
60'	0.85

$$\frac{0.85-0.81}{60'-50'} = \frac{.04}{10'} \qquad \frac{.04}{10'} \cdot 3' + 0.81 = \underline{0.822}$$

$K_d = 0.85$ (Table 26.6-1)

$K_e = 1.00$ (Table 26.9-1)

$$q_z = 0.00256 \cdot 0.822 \cdot 1.0 \cdot 0.85 \cdot 1.0 \cdot 105^2 = \underline{19.72 \text{ psf @ } 53'\text{-}0''}$$

Chapter 30: Part 1 C+C Forces

$$p = q_h[(GC_p) - (GC_{pi})]$$

Walls (GC_p) = (Figure 30.3-2A-1)

5: $-1.4 \Rightarrow (-1.4 - 0.18) \cdot 19.27\text{psf} = -30.5\text{psf}$

$+1.0 \quad (1.0 + 0.18) \cdot 19.27\text{psf} = +22.8\text{ psf}$

4: $-1.1 \quad (-1.1 - 0.18) \cdot 19.27\text{psf} = -24.7\text{ psf}$

$+1.0 \quad (1.0 + 0.18) \cdot 19.27\text{psf} = +22.8$

$GC_{pi} = \begin{matrix} +0.18 \\ -0.18 \end{matrix}$ (Table 26.13-1)

PRCNC20221036

integrus ARCHITECTURE
10 S. Cedar Street | Spokane, WA 99201 | 509-838-8681 | Fax 509-838-2194
117 S. Main Street, Suite 100 | Seattle, WA 98104 | 206-628-3137 | Fax 206-628-3138
STRUCTURAL ENGINEERS

Title: Wind C+C Loads | Job Number:
By: | Date: | Sheet 2/3

Gable Roofs, Flat Roofs $\theta \le 7^\circ$ Figure 30.3-2A

$$p = q_h[(GC_p) - (GC_{pi})]$$

(GC_p)

1: $-1.7 \Rightarrow 19.27(-1.7-0.18) = -36.3$ psf
$+0.3 \Rightarrow 19.27(0.3+0.18) = +9.3$ psf

1': $-0.9 \Rightarrow 19.27(-0.9-0.18) = -20.9$ psf
$+0.3 \Rightarrow = +9.3$ psf

2: $-2.3 \Rightarrow 19.27(-2.3-0.18) = -47.8$ psf
$+0.3 \Rightarrow = +9.3$ psf

3: $-3.2 \Rightarrow 19.27(-3.2-0.18) = -65.2$ psf
$+0.3 \Rightarrow = +9.3$ psf

$GC_{pi} = {+0.18 \atop -0.18}$ (Table 26.13-1)

30.8 Parapets

Windward + leeward wind loads per Figure 30.8-1

Corner = 65.2 psf + 22.8 psf = 88 psf

Middle = 47.8 psf + 22.8 = 70.6 psf

30.9 Roof Overhangs

$q_{35} = 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot K_e \cdot v^2$

$q_{35} = 0.00256 \cdot 0.73 \cdot 1.0 \cdot 0.85 \cdot 1.00 \cdot 105^2 = 17.52$ psf

$K_z = 0.73$ (Table 26.10-1)

$v = 105$

$K_{zt} = 1.0$

$K_d = 0.85$

$K_e = 1.00$

PRCNC20221036

$p = q_h[(GC_p) - (GC_{pi})]$

Figure 30.3-2A

Figure 30.9-1

① -1.7 ⇒ 17.52·(-1.7-0.18) = 34.9 psf

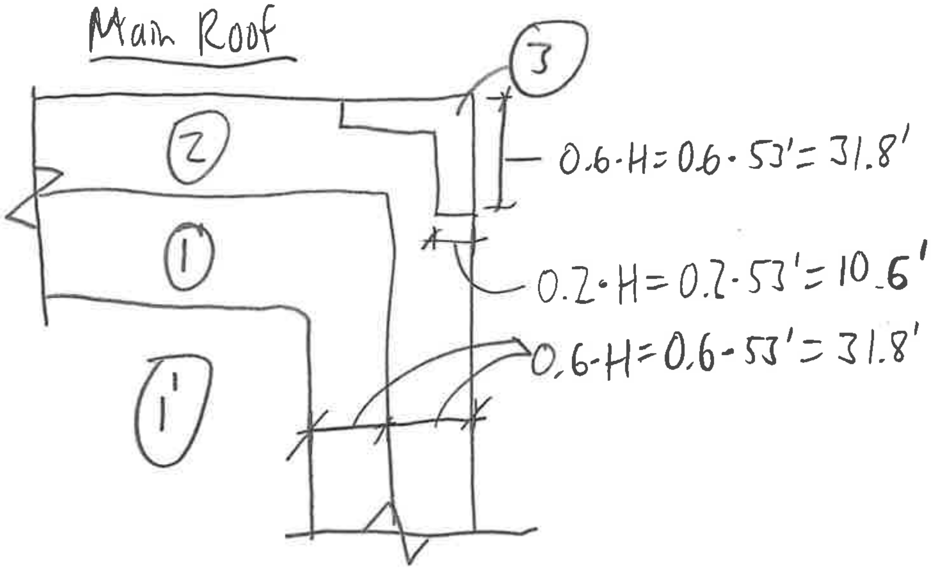
①' -1.7 ⇒ 17.52·(-1.7-0.18) = 34.9 psf

② -2.3 ⇒ 17.52·(-2.3-0.18) = -43.5 psf

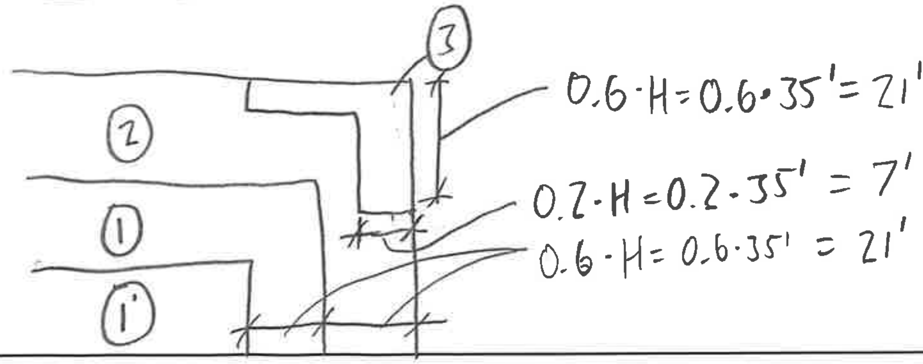
③ -3.2 ⇒ 17.52·(-3.2-0.18) = 59.3 psf

Soffit pressure = wind pressure = -30.5 psf / +22.8 psf

Main Roof



Overhang



PRCNC20221036

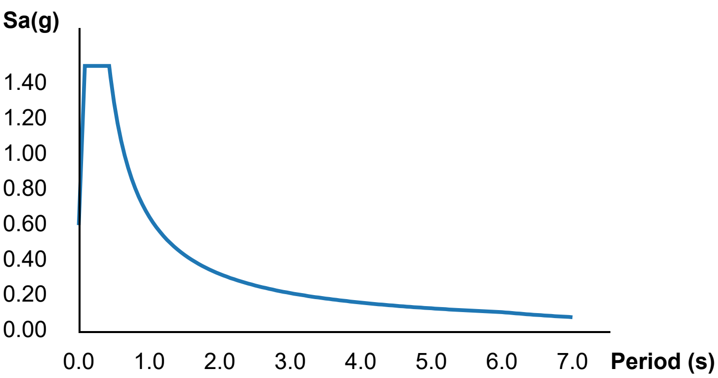
Seismic Design Parameters

ATC Hazards by Location

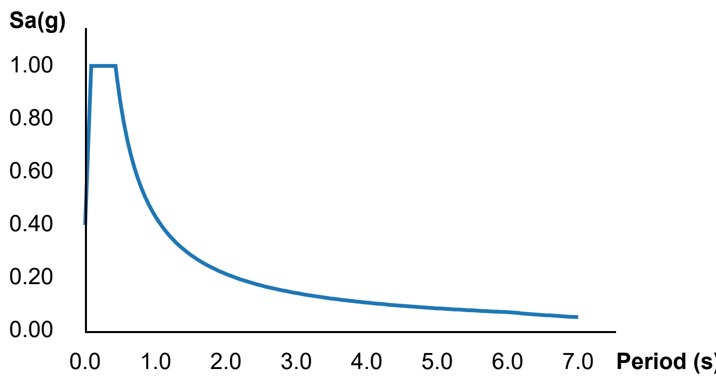
Search Information

Address:	1601 39th Ave SE, Puyallup, WA 98374, USA
Coordinates:	47.155487, -122.2718194
Elevation:	556 ft
Timestamp:	2022-02-04T21:37:16.546Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	III
Site Class:	C

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	1.253	MCE_R ground motion (period=0.2s)
S_1	0.432	MCE_R ground motion (period=1.0s)
S_{MS}	1.503	Site-modified spectral acceleration value
S_{M1}	0.648	Site-modified spectral acceleration value
S_{DS}	1.002	Numeric seismic design value at 0.2s SA
S_{D1}	0.432	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	D	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s

PRCNC20221036

CR_S	0.914	Coefficient of risk (0.2s)
CR_1	0.898	Coefficient of risk (1.0s)
PGA	0.5	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.6	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	1.253	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.371	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.432	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.481	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

PRCNC20221036

Pierce College

Integrus Project #: 22135.00

TOTAL BUILDING WEIGHT/MASS

ENGR AM

Level	Total (kips)	
Roof	1499	From RAM SS
Level 3	2250	From RAM SS
Level 2	1927	From RAM SS
Mezzanine	240	From RAM SS

Total Seismic Weight = 5916 kips

Diaphragm Masses

% Eccentricity

X-Axis 9.00

Y-Axis 9.00

Recalculate

(•) Use Calculated Values ( ) Use Specified Values

Story	Diaph. #	Weight	Mass	Inertia	Xm	Ym	Eccen X	Eccen Y	Combine To
		kips	k-s2/ft	ft-k-s2	ft	ft	ft	ft	
Roof	1	1499.17	46.558	183840	159.34	138.77	18.47	9.91	None
Level 3	1	2250.23	69.883	334992	147.24	124.00	18.47	11.93	None
Level 2	1	1910.18	59.322	271828	143.97	126.93	18.47	11.93	None
Level 2	None	11.94	0.371	2869	157.38	96.29	---	---	1 - Level 2
Mezzanine	1	192.48	5.978	1238	235.19	153.29	2.34	3.83	None
Mezzanine	None	47.33	1.470	7182	194.23	150.13	---	---	1 - Mezzanine
Level 1	None	4.48	0.139	381	216.49	123.50	---	---	1 - Level 2

OK Cancel Help

integrus ARCHITECTURE

Equivalent Lateral Force Procedure for Seismic Design of Buildings - X Direction
(based on ASCE 7-16, section 12.8)

Project Name: Pierce College
Project Number: 22135.00
Designer: AM

INPUT				
Classification of Buildings (ASCE7 table 1-1)			III	
Site Class			C	
Response Modification Factor (Table 12.2-1)				
B26. Buckling-restrained braced frames, moment-re:	R		8.00	
Spectral accel. @ short	S_s	g	1.253	
Spectral accel. @ 1 sec	S_1	g	0.432	
Height above base to highest pt.	h_n	ft	59	
Effective Seismic Weight (See bottom right)	W	k	5916	
Long-period Transition Period (Figure 22-15)	T_L	sec	6	
How is building's period established?			Analysis	
Building Period via analysis	T	sec	0.811	From RAM
OUTPUT				
Seismic Design Category			D	
Building Period Coefficient	C_T		0.030	
Importance Factor	I_E		1.250	
Site Coefficient	F_a		1.20	
Site Coefficient	F_v		1.50	
Max Spectral accel. @ short	S_{MS}	g	1.5036	
Max Spectral accel. @ 1 sec	S_{M1}	g	0.65	
Design Spect. Accel. @ short	S_{DS}	g	1.0024	
Design Spect. Accel. @ 1 sec	S_{D1}	g	0.43	
Approximate Fundamental Period	Ta	sec	0.639	
Coefficient for Upper Limit on Period	Cu		1.40	
Fundamental Period of Structure	T	sec	0.811	
Calculated Cs (eqn 12.8-2)	C_{sCalc}		0.157	
Maximum Cs (eqn's 12.8-3 , 12.8-4)	C_{smax}		0.083	
Minimum Cs (eqn's 12.8-5, 12.8-6)	C_{smin}		0.055	
Seismic Response Coefficient	**Cs**		**0.083**	
Seismic Base Shear	**V(LRFD)**	**k**	**492**	
	V(ASD)	k	352	

Select the C_T Value	Table12.8-2
Moment-resisting frame systems in which the frames resist 100% of the required seismic force and are not enclosed or adjoined by components that are more rigid and will prevent the frames from deflecting where subjected to seismic forces:	
0.028	○ Steel moment-resisting frames
0.016	○ Concrete momen-resisting frames
0.03	◉ Eccentrically braced steel frames or buckling-restrained braced frames
0.02	○ All other building systems

W = The effective seismic weight of the structure, including the total dead load and other loads listed below:

1. In areas used for storage, a minimum or 25% of the reduced floor live load (floor live load in public garages and open parking structures need not be included).
2. Where provision for partitions is required by Section 4.2.2 in the floor load design, the actural partition weight or a minimum weight of 10 psf or floor area, whichever is greater
3. Total operating weight of permanent equipment.
4. Where the flat roof snow load, Pf, exceeds 30psf, 20 percent of the uniform design snow load, regardless of actual roof slope.

12.11 Structural Walls

Out of plane force (sect. 12.11.1) 0.501 x Wp

13.3 Nonstructural Component force for:

ap=2.5, Rp=2.5, Ip=1.0, z = h	Fp	1.203	x Wp
ap=1, Rp=2.5, Ip=1.0, z = h	Fp	0.481	x Wp

See Table 13.5.1

integrus ARCHITECTURE

Equivalent Lateral Force Procedure for Seismic Design of Buildings - Y Direction
(based on ASCE 7-16, section 12.8)

Project Name: Pierce College
Project Number: 22135.00
Designer: AM

INPUT	Classification of Buildings (ASCE7 table 1-1)			III
	Site Class			C
	Response Modification Factor (Table 12.2-1)			
	B26. Buckling-restrained braced frames, moment-re:	R		8.00
	Spectral accel. @ short	S_s	g	1.253
	Spectral accel. @ 1 sec	S_1	g	0.432
	Height above base to highest pt.	h_n	ft	59
	Effective Seismic Weight (See bottom right)	W	k	5916
	Long-period Transition Period (Figure 22-15)	T_L	sec	6
	How is building's period established?			Analysis
	Building Period via analysis	T	sec	0.801
OUTPUT	Seismic Design Category			D
	Building Period Coefficient	C_T		0.030
	Importance Factor	I_E		1.250
	Site Coefficient	F_a		1.20
	Site Coefficient	F_v		1.50
	Max Spectral accel. @ short	S_{MS}	g	1.50
	Max Spectral accel. @ 1 sec	S_{M1}	g	0.65
	Design Spect. Accel. @ short	S_{DS}	g	1.00
	Design Spect. Accel. @ 1 sec	S_{D1}	g	0.43
	Approximate Fundamental Period	Ta	sec	0.639
	Coefficient for Upper Limit on Period	Cu		1.40
	Fundamental Period of Structure	T	sec	0.801
	Calculated Cs (eqn 12.8-2)	C_{sCalc}		0.157
	Maximum Cs (eqn's 12.8-3 , 12.8-4)	C_{smax}		0.084
	Minimum Cs (eqn's 12.8-5, 12.8-6)	C_{smin}		0.055
	Seismic Response Coefficient	**Cs**		**0.084**
	Seismic Base Shear	**V(LRFD)**	**k**	**499**
		V(ASD)	k	356

From RAM

Select the C_T Value Table12.8-2

Moment-resisting frame systems in which the frames resist 100% of the required seismic force and are not enclosed or adjoined by components that are more rigid and will prevent the frames from deflecting where subjected to seismic forces:

0.028	○	Steel moment-resisting frames
0.016	○	Concrete momen-resisting frames
0.03	◉	Eccentrically braced steel frames or buckling-restrained braced frames
0.02	○	All other building systems

W = The effective seismic weight of the structure, including the total dead load and other loads listed below:

1. In areas used for storage, a minimum or 25% of the reduced floor live load (floor live load in public garages and open parking structures need not be included).
2. Where provision for partitions is required by Section 4.2.2 in the floor load design, the actural partition weight or a minimum weight of 10 psf or floor area, whichever is greater
3. Total operating weight of permanent equipment.
4. Where the flat roof snow load, Pf, exceeds 30psf, 20 percent of the uniform design snow load, regardless of actual roof slope.

12.11 Structural Walls

Out of plane force	(sect. 12.11.1)	0.501	x	Wp

13.3 Nonstructural Component force for:

ap=2.5, Rp=2.5, Ip=1.0, z = h	Fp	1.203	x	Wp
ap=1, Rp=2.5, Ip=1.0, z = h	Fp	0.481	x	Wp

See Table 13.5.1

integrus ARCHITECTURE

Vertical Distribution of Seismic Forces - X Direction
(based on ASCE 7-16, section 12.8.3)

Project Name: Pierce College
Project Number: 22135.00 Designer: AM

Level	Weight kips	Height ft	$w_x h_x^k$	Cvx	F_x	Sum Fx			
Roof	1499	59.0000	117345	0.399	197	197	T=	0.639	sec
Level 3	2250	39.3330	114166	0.389	191	388	k =	1.069	
Level 2	1927	24.6667	59348	0.202	99	487	V =	492	kips
Mezzanine	240	10.5000	2964	0.010	5	492			
Sum =	5916	Sum =	293823	1.000					

12.8.3 Vertical Distribution of Seismic Forces. The lateral seismic force (F_x) (kip or kN) induced at any level shall be determined from the following equations:

$$F_x = C_{vx} V \quad (12.8\text{-}11)$$

and

$$C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k} \quad (12.8\text{-}12)$$

where

C_{vx} = vertical distribution factor,
V = total design lateral force or shear at the base of the structure (kip or kN)
w_i and w_x = the portion of the total effective seismic weight of the structure (W) located or assigned to Level i or x
h_i and h_x = the height (ft or m) from the base to Level i or x
k = an exponent related to the structure period as follows:
for structures having a period of 0.5 s or less, $k = 1$
for structures having a period of 2.5 s or more, $k = 2$
for structures having a period between 0.5 and 2.5 s, k shall be 2 or shall be determined by linear interpolation between 1 and 2

PRCNC20221036

integrus ARCHITECTURE

Vertical Distribution of Seismic Forces - Y Direction
(based on ASCE 7-16, section 12.8.3)

Project Name: Pierce College
Project Number: 22135.00 Designer: AM

Level	Weight kips	Height ft	$w_x h_x^k$	Cvx	F_x	Sum Fx			
Roof	1499	59.0000	117345	0.399	199	199	T=	0.639	sec
Level 3	2250	39.3330	114166	0.389	194	393	k =	1.069	
Level 2	1927	24.6667	59348	0.202	101	493	V =	499	kips
Mezzanine	240	10.5000	2964	0.010	5	499			
Sum =	5916	Sum =	293823	1.000					

12.8.3 Vertical Distribution of Seismic Forces. The lateral seismic force (F_x) (kip or kN) induced at any level shall be determined from the following equations:

$$F_x = C_{vx} V \quad (12.8\text{-}11)$$

and

$$C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k} \quad (12.8\text{-}12)$$

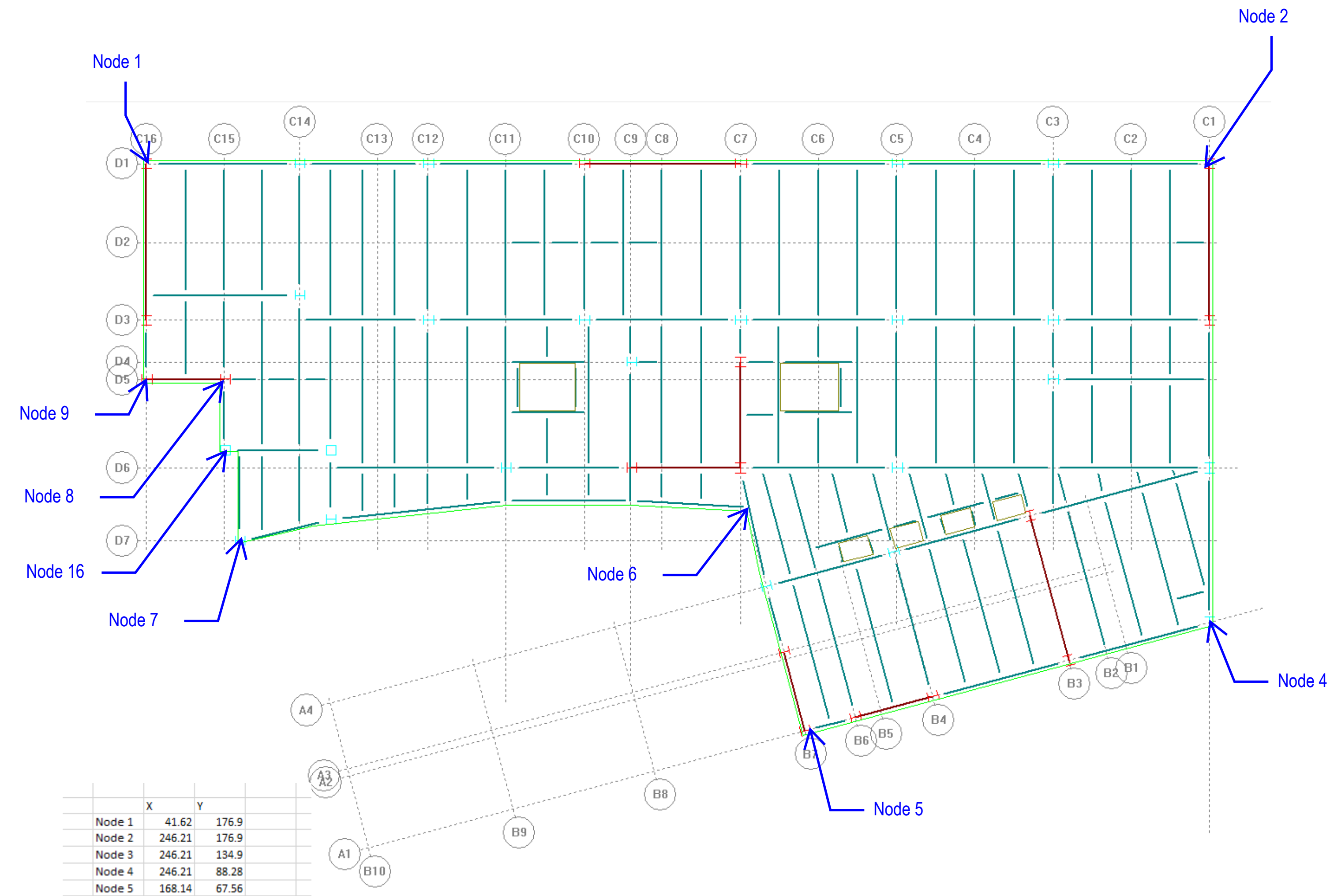
where

C_{vx} = vertical distribution factor,
V = total design lateral force or shear at the base of the structure (kip or kN)
w_i and w_x = the portion of the total effective seismic weight of the structure (W) located or assigned to Level i or x
h_i and h_x = the height (ft or m) from the base to Level i or x
k = an exponent related to the structure period as follows:
for structures having a period of 0.5 s or less, $k = 1$
for structures having a period of 2.5 s or more, $k = 2$
for structures having a period between 0.5 and 2.5 s, k shall be 2 or shall be determined by linear interpolation between 1 and 2

PRCNC20221036

Torsional Amplification Factor Nodes

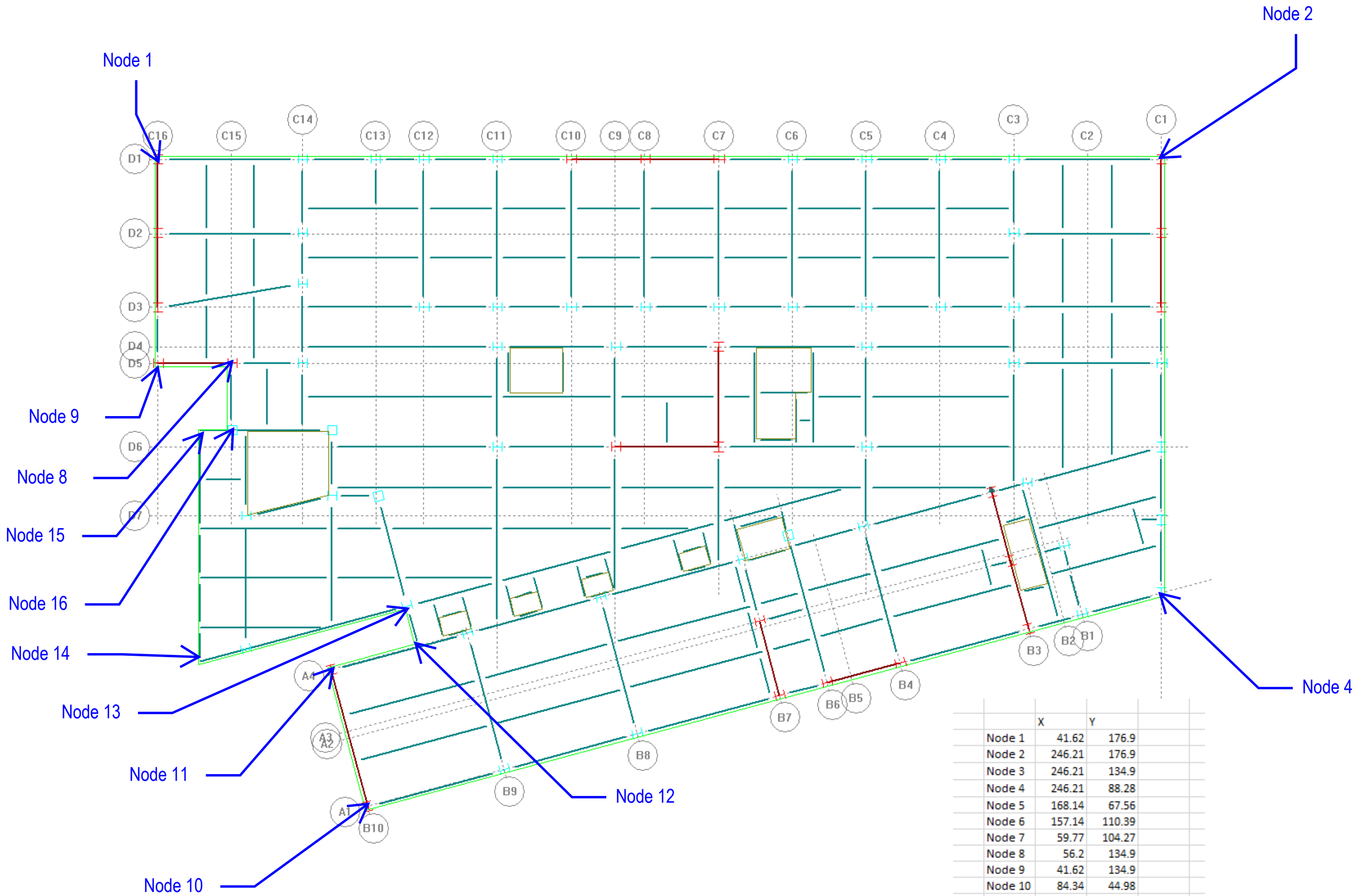
Roof



	X	Y
Node 1	41.62	176.9
Node 2	246.21	176.9
Node 3	246.21	134.9
Node 4	246.21	88.28
Node 5	168.14	67.56
Node 6	157.14	110.39
Node 7	59.77	104.27
Node 8	56.2	134.9
Node 9	41.62	134.9
Node 10	84.34	44.98
Node 11	76.64	73.22
Node 12	94.63	78.22
Node 13	92.28	85.58
Node 14	50.3	74.42
Node 15	50.3	121.66
Node 16	56.2	121.66
Node 17	217.9	134.9
Node 18	217.9	111.1
Node 19	222.23	110.71
Node 20	226.58	98.76
Node 21	216.05	93.88
Node 22	219.02	81.25
Node 23	93.52	83.38
Node 24	128.91	100.77
Node 25	127.06	110.77
Node 26	76.9	108.38
Node 27	76.9	121.69
Node 28	220.79	176.58
Node 29	246.21	171.52
Node 30	220.79	134.9

PRCNC20221036

Level 3



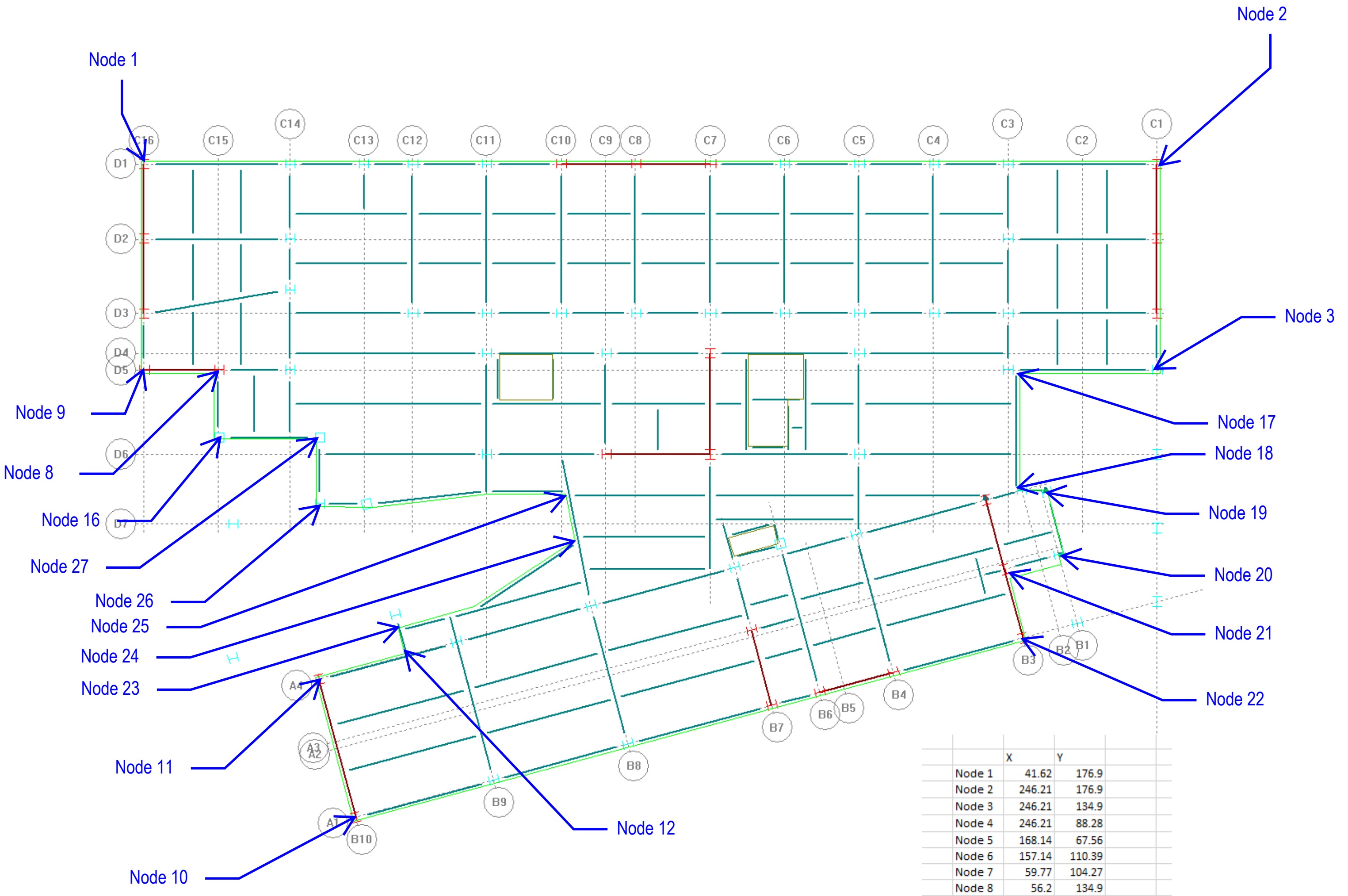
	X	Y
Node 1	41.62	176.9
Node 2	246.21	176.9
Node 3	246.21	134.9
Node 4	246.21	88.28
Node 5	168.14	67.56
Node 6	157.14	110.39
Node 7	59.77	104.27
Node 8	56.2	134.9
Node 9	41.62	134.9
Node 10	84.34	44.98
Node 11	76.64	73.22
Node 12	94.63	78.22
Node 13	92.28	85.58
Node 14	50.3	74.42
Node 15	50.3	121.66
Node 16	56.2	121.66
Node 17	217.9	134.9
Node 18	217.9	111.1
Node 19	222.23	110.71
Node 20	226.58	98.76
Node 21	216.05	93.88
Node 22	219.02	81.25
Node 23	93.52	83.38
Node 24	128.91	100.77
Node 25	127.06	110.77
Node 26	76.9	108.38
Node 27	76.9	121.69
Node 28	220.79	176.58
Node 29	246.21	171.52
Node 30	220.79	134.9

Torsional Amplification Factor Nodes

PRCNC20221036

Torsional Amplification Factor Nodes

Level 2



	X	Y
Node 1	41.62	176.9
Node 2	246.21	176.9
Node 3	246.21	134.9
Node 4	246.21	88.28
Node 5	168.14	67.56
Node 6	157.14	110.39
Node 7	59.77	104.27
Node 8	56.2	134.9
Node 9	41.62	134.9
Node 10	84.34	44.98
Node 11	76.64	73.22
Node 12	94.63	78.22
Node 13	92.28	85.58
Node 14	50.3	74.42
Node 15	50.3	121.66
Node 16	56.2	121.66
Node 17	217.9	134.9
Node 18	217.9	111.1
Node 19	222.23	110.71
Node 20	226.58	98.76
Node 21	216.05	93.88
Node 22	219.02	81.25
Node 23	93.52	83.38
Node 24	128.91	100.77
Node 25	127.06	110.77
Node 26	76.9	108.38
Node 27	76.9	121.69
Node 28	220.79	176.58
Node 29	246.21	171.52
Node 30	220.79	134.9

PRCNC20221036

Drift

RAM Structural System 17.03.00.285
DataBase: Pierce College - 6.14
Building Code: IBC

Nodes 1-10

06/21/22 21:03:03
Steel Code: IBC

CRITERIA:

Rigid End Zones: Ignore Effects
Member Force Output: At Face of Joint
P-Delta: Yes Scale Factor: 1.00
Ground Level: Base

Allowable Drift = 0.015*h

Displacements to be multiplied by Cd/Ie.

Max Drift Ratio = (0.015 * Ie) / Cd = (0.015 * 1.25) / 5
Max Drift Ratio = .00375

LOAD CASE DEFINITIONS:

D	DeadLoad	RAMUSER
Lp	PosLiveLoad	RAMUSER
Sp	PosSnowLoad	RAMUSER
Dyn1	Modal Drift X	Dyn_ASCE716_CQC_X_+E
Dyn2	Modal Drift X	Dyn_ASCE716_CQC_X_-E
Dyn3	Modal Drift Y	Dyn_ASCE716_CQC_Y_+E
Dyn4	Modal Drift Y	Dyn_ASCE716_CQC_Y_-E

All Drift Ratios do not exceed .00375.

Displacements for semirigid diaphragm are reported based on nodal displacements near to selected point.

RESULTS:

Location (ft): (41.620, 176.900)

Story	LdC	Displacement X (in)	Displacement Y (in)	Story Drift X (in)	Story Drift Y (in)	Drift Ratio X	Drift Ratio Y
Roof	D	0.0402	-0.0327	0.0593	-0.0393	0.0003	0.0002
	Lp	0.0667	0.0157	0.0570	-0.0063	0.0002	0.0000
	Sp	-0.0005	-0.0014	-0.0006	-0.0008	0.0000	0.0000
	Dyn1	0.8561	0.1152	0.6062	-0.1025	0.0026	0.0004
	Dyn2	0.7581	-0.1586	0.5340	-0.0838	0.0023	0.0004
	Dyn3	-0.4899	0.3345	-0.4339	0.1269	0.0018	0.0005
	Dyn4	-0.5058	0.5725	-0.5270	0.2574	0.0022	0.0011
Level 3	D	-0.0191	0.0066	0.0049	-0.0036	0.0000	0.0000
	Lp	0.0097	0.0221	0.0138	0.0079	0.0001	0.0000
	Sp	0.0001	-0.0006	0.0000	-0.0001	0.0000	0.0000
	Dyn1	0.3395	-0.0564	0.1904	-0.0270	0.0011	0.0002
	Dyn2	0.2879	-0.1204	0.1633	-0.0588	0.0009	0.0003
	Dyn3	-0.0777	0.2321	-0.0500	0.1143	0.0003	0.0006
	Dyn4	0.0822	0.3600	0.0476	0.1823	0.0003	0.0010
Level 2	D	-0.0240	0.0102	-0.0240	0.0102	0.0001	0.0000
	Lp	-0.0041	0.0141	-0.0041	0.0141	0.0000	0.0000
	Sp	0.0001	-0.0005	0.0001	-0.0005	0.0000	0.0000
	Dyn1	0.1590	-0.0314	0.1590	-0.0314	0.0005	

PRCNC20221036

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1324	-0.0640	0.1324	-0.0640	0.0004	0.0002
	Dyn3	-0.0342	0.1204	-0.0342	0.1204	0.0001	0.0004
	Dyn4	0.0477	0.1823	0.0477	0.1823	0.0002	0.0006
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (246.210, 176.900)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0429	0.0224	0.0619	0.0340	0.0003	0.0001
	Lp	0.0672	-0.1369	0.0575	-0.0645	0.0002	0.0003
	Sp	-0.0005	0.0005	-0.0006	0.0001	0.0000	0.0000
	Dyn1	1.0515	0.0976	0.8296	0.0773	0.0035	0.0003
	Dyn2	0.8474	0.2206	0.6459	-0.0940	0.0027	0.0004
	Dyn3	0.2423	0.5992	-0.2502	0.2382	0.0011	0.0010
	Dyn4	0.2880	0.3396	0.2217	0.1378	0.0009	0.0006
Level 3	D	-0.0190	-0.0115	0.0046	0.0110	0.0000	0.0001
	Lp	0.0097	-0.0725	0.0143	-0.0360	0.0001	0.0002
	Sp	0.0001	0.0005	0.0000	0.0001	0.0000	0.0000
	Dyn1	0.3449	-0.0359	0.1965	0.0162	0.0011	0.0001
	Dyn2	0.2915	0.1436	0.1694	0.0634	0.0010	0.0004
	Dyn3	-0.0709	0.3758	0.0426	0.1655	0.0002	0.0009
	Dyn4	0.0971	0.2147	0.0603	0.0940	0.0003	0.0005
Level 2	D	-0.0236	-0.0226	-0.0236	-0.0226	0.0001	0.0001
	Lp	-0.0046	-0.0365	-0.0046	-0.0365	0.0000	0.0001
	Sp	0.0000	0.0004	0.0000	0.0004	0.0000	0.0000
	Dyn1	0.1628	-0.0217	0.1628	-0.0217	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1322	0.0819	0.1322	0.0819	0.0004	0.0003
	Dyn3	-0.0491	0.2119	-0.0491	0.2119	0.0002	0.0007
	Dyn4	0.0470	0.1218	0.0470	0.1218	0.0002	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (246.210, 134.900)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0518	0.0224	0.0746	0.0338	0.0003	0.0001
	Lp	0.0351	-0.1370	0.0448	-0.0647	0.0002	0.0003
	Sp	-0.0002	0.0006	-0.0005	0.0001	0.0000	0.0000
	Dyn1	0.8772	0.1364	0.6412	-0.1251	0.0027	0.0005
	Dyn2	0.8579	0.2630	0.6126	-0.1463	0.0026	0.0006
	Dyn3	-0.1842	0.7216	-0.1540	0.3630	0.0007	0.0015
	Dyn4	0.1497	0.4089	-0.1345	0.2104	0.0006	0.0009
Level 3	D	-0.0228	-0.0115	0.0085	0.0114	0.0000	0.0001
	Lp	-0.0098	-0.0724	0.0048	-0.0358	0.0000	0.0002
	Sp	0.0003	0.0005	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3348	-0.0360	0.1875	0.0155	0.0011	0.0001
	Dyn2	0.3234	0.1500	0.1800	0.0712	0.0010	0.0004
	Dyn3	0.0577	0.3881	0.0319	0.1810	0.0002	0.0010
	Dyn4	0.0674	0.2222	0.0360	0.1033	0.0002	0.0006
Level 2	D	-0.0313	-0.0229	-0.0315	-0.0197	0.0002	0.0001
	Lp	-0.0145	-0.0366	-0.0141	-0.0336	0.0001	0.0002
	Sp	0.0002	0.0004	0.0002	0.0001	0.0000	0.0000
	Dyn1	0.1585	-0.0219	0.1582	-0.0147	0.0009	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1497	0.0809	0.1453	0.0558	0.0009	0.0003
	Dyn3	0.0282	0.2088	-0.0262	0.1449	0.0002	0.0009
	Dyn4	0.0362	0.1200	0.0376	0.0830	0.0002	0.0005
Mezzanine	D	0.0002	-0.0032	0.0002	-0.0032	0.0000	0.0000
	Lp	-0.0005	-0.0030	-0.0005	-0.0030	0.0000	0.0000
	Sp	0.0000	0.0002	0.0000	0.0002	0.0000	0.0000
	Dyn1	-0.0024	-0.0073	-0.0024	-0.0073	0.0000	0.0001
	Dyn2	0.0061	0.0252	0.0061	0.0252	0.0000	0.0002
	Dyn3	0.0158	0.0641	0.0158	0.0641	0.0001	0.0005
	Dyn4	-0.0114	0.0373	-0.0114	0.0373	0.0001	0.0003
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (246.210, 88.280)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0610	0.0220	0.0879	0.0334	0.0004	0.0001
	Lp	-0.0011	-0.1372	0.0302	-0.0649	0.0001	0.0003
	Sp	0.0003	0.0006	-0.0003	0.0001	0.0000	0.0000
	Dyn1	0.6939	0.1791	0.4225	-0.1720	0.0018	0.0007
	Dyn2	0.9135	0.3032	0.6168	-0.1957	0.0026	0.0008
	Dyn3	0.1906	0.8453	0.1125	0.4932	0.0005	0.0021
	Dyn4	-0.2264	0.4796	-0.1846	0.2853	0.0008	0.0012
Level 3	D	-0.0269	-0.0114	-0.0269	-0.0114	0.0001	0.0000
	Lp	-0.0313	-0.0723	-0.0313	-0.0723	0.0001	0.0002
	Sp	0.0005	0.0005	0.0005	0.0005	0.0000	0.0000
	Dyn1	0.3303	-0.0366	0.3303	-0.0366	0.0007	0.0001
	Dyn2	0.3764	0.1541	0.3764	0.1541	0.0008	0.0003
	Dyn3	0.0965	0.3963	0.0965	0.3963	0.0002	0.0008
	Dyn4	-0.1170	0.2271	-0.1170	0.2271	0.0002	0.0005
Level 2	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (168.140, 67.560)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0633	0.0065	0.0920	0.0110	0.0004	0.0000
	Lp	-0.0179	-0.0770	0.0229	-0.0407	0.0001	0.0002
	Sp	0.0004	-0.0001	-0.0002	-0.0002	0.0000	0.0000
	Dyn1	0.5597	0.1823	0.2720	-0.1507	0.0012	0.0006
	Dyn2	0.7437	0.2029	0.4037	-0.1631	0.0017	0.0007
	Dyn3	0.2018	0.5970	0.0902	0.3135	0.0004	0.0013
	Dyn4	-0.2174	0.4491	-0.1249	0.2204	0.0005	0.0009
Level 3	D	-0.0287	-0.0045	0.0121	0.0051	0.0001	0.0000
	Lp	-0.0408	-0.0363	-0.0094	-0.0187	0.0001	0.0001
	Sp	0.0006	0.0001	0.0001	0.0000	0.0000	0.0000
	Dyn1	0.3257	0.0415	0.1868	0.0263	0.0011	0.0001
	Dyn2	0.3918	0.0815	0.2261	-0.0415	0.0013	0.0002
	Dyn3	0.1225	0.3323	0.0637	0.1807	0.0004	0.0010
	Dyn4	-0.1468	0.2616	-0.0793	0.1426	0.0005	0.0008
Level 2	D	-0.0407	-0.0097	-0.0407	-0.0097	0.0001	0.0000
	Lp	-0.0314	-0.0177	-0.0314	-0.0177	0.0001	0.0001
	Sp	0.0006	0.0000	0.0006	0.0000	0.0000	0.0000
	Dyn1	0.1477	0.0194	0.1477	0.0194	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1775	0.0453	0.1775	0.0453	0.0006	0.0002
	Dyn3	0.0601	0.1602	0.0601	0.1602	0.0002	0.0005
	Dyn4	-0.0744	0.1262	-0.0744	0.1262	0.0003	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (157.140, 110.390)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0583	0.0038	0.0833	0.0074	0.0004	0.0000
	Lp	0.0168	-0.0687	0.0379	-0.0375	0.0002	0.0002
	Sp	0.0001	-0.0002	-0.0003	-0.0003	0.0000	0.0000
	Dyn1	0.6736	-0.1319	0.4248	-0.0982	0.0018	0.0004
	Dyn2	0.7448	-0.0943	0.4666	-0.0884	0.0020	0.0004
	Dyn3	0.1299	0.6252	-0.0900	0.3765	0.0004	0.0016
	Dyn4	-0.1709	0.5438	-0.1723	0.3430	0.0007	0.0015
Level 3	D	-0.0249	-0.0036	0.0095	0.0044	0.0001	0.0000
	Lp	-0.0211	-0.0313	-0.0003	-0.0164	0.0000	0.0001
	Sp	0.0004	0.0000	0.0001	0.0000	0.0000	0.0000
	Dyn1	0.3213	0.0434	0.1801	0.0250	0.0010	0.0001
	Dyn2	0.3403	-0.0748	0.1918	-0.0360	0.0011	0.0002
	Dyn3	0.0712	0.3180	0.0378	0.1792	0.0002	0.0010
	Dyn4	-0.0831	0.2681	-0.0427	0.1525	0.0002	0.0009
Level 2	D	-0.0344	-0.0080	-0.0344	-0.0080	0.0001	0.0000
	Lp	-0.0208	-0.0149	-0.0208	-0.0149	0.0001	0.0001
	Sp	0.0003	-0.0000	0.0003	-0.0000	0.0000	0.0000
	Dyn1	0.1486	0.0208	0.1486	0.0208	0.0005	0.0001

PRCNC20221036

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1557	-0.0427	0.1557	-0.0427	0.0005	0.0001
	Dyn3	0.0342	0.1475	0.0342	0.1475	0.0001	0.0005
	Dyn4	-0.0446	0.1238	-0.0446	0.1238	0.0002	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (59.770, 104.270)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0636	-0.0269	0.0891	-0.0320	0.0004	0.0001
	Lp	0.0134	0.0024	0.0373	-0.0113	0.0002	0.0000
	Sp	0.0002	-0.0012	-0.0003	-0.0007	0.0000	0.0000
	Dyn1	0.6859	0.2188	0.4335	0.2784	0.0018	0.0012
	Dyn2	0.7233	-0.3078	0.4323	-0.3096	0.0018	0.0013
	Dyn3	0.2844	0.5420	-0.2189	0.4112	0.0009	0.0017
	Dyn4	0.2787	0.9349	0.2134	0.7305	0.0009	0.0031
Level 3	D	-0.0255	0.0051	-0.0255	0.0051	0.0001	0.0000
	Lp	-0.0239	0.0137	-0.0239	0.0137	0.0001	0.0000
	Sp	0.0005	-0.0005	0.0005	-0.0005	0.0000	0.0000
	Dyn1	0.3324	-0.0746	0.3324	-0.0746	0.0007	0.0002
	Dyn2	0.3599	-0.1367	0.3599	-0.1367	0.0008	0.0003
	Dyn3	0.0823	0.2751	0.0823	0.2751	0.0002	0.0006
	Dyn4	-0.1001	0.3942	-0.1001	0.3942	0.0002	0.0008
Level 2	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (56.200, 134.900)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0548	-0.0285	0.0776	-0.0339	0.0003	0.0001
	Lp	0.0366	0.0049	0.0463	-0.0105	0.0002	0.0000
	Sp	-0.0002	-0.0013	-0.0005	-0.0008	0.0000	0.0000
	Dyn1	0.5906	0.1886	0.3034	0.2345	0.0013	0.0010
	Dyn2	0.5469	-0.2763	0.2667	-0.2638	0.0011	0.0011
	Dyn3	0.1217	0.4900	0.0750	0.3504	0.0003	0.0015
	Dyn4	0.1625	0.8496	0.1210	0.6293	0.0005	0.0027
Level 3	D	-0.0228	0.0055	0.0079	-0.0024	0.0000	0.0000
	Lp	-0.0098	0.0154	0.0050	0.0050	0.0000	0.0000
	Sp	0.0003	-0.0005	0.0001	-0.0000	0.0000	0.0000
	Dyn1	0.3210	-0.0647	0.1792	-0.0338	0.0010	0.0002
	Dyn2	0.3061	-0.1227	0.1711	-0.0660	0.0010	0.0004
	Dyn3	0.0573	0.2543	0.0333	0.1335	0.0002	0.0008
	Dyn4	0.0622	0.3683	0.0356	0.1975	0.0002	0.0011
Level 2	D	-0.0307	0.0079	-0.0307	0.0079	0.0001	0.0000
	Lp	-0.0148	0.0104	-0.0148	0.0104	0.0000	0.0000
	Sp	0.0002	-0.0005	0.0002	-0.0005	0.0000	0.0000
	Dyn1	0.1476	-0.0331	0.1476	-0.0331	0.0005	0.0001

PRCNC20221036

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1389	-0.0630	0.1389	-0.0630	0.0005	0.0002
	Dyn3	0.0262	0.1288	0.0262	0.1288	0.0001	0.0004
	Dyn4	0.0303	0.1824	0.0303	0.1824	0.0001	0.0006
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (41.620, 134.900)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0548	-0.0328	0.0776	-0.0395	0.0003	0.0002
	Lp	0.0366	0.0156	0.0463	-0.0065	0.0002	0.0000
	Sp	-0.0002	-0.0014	-0.0005	-0.0008	0.0000	0.0000
	Dyn1	0.5879	0.1544	0.2931	-0.1447	0.0012	0.0006
	Dyn2	0.5439	-0.1653	0.2575	-0.1046	0.0011	0.0004
	Dyn3	0.1221	0.3648	0.0743	0.1643	0.0003	0.0007
	Dyn4	0.1654	0.6431	0.1213	0.3397	0.0005	0.0014
Level 3	D	-0.0228	0.0067	0.0079	-0.0035	0.0000	0.0000
	Lp	-0.0097	0.0221	0.0051	0.0080	0.0000	0.0000
	Sp	0.0003	-0.0006	0.0001	-0.0001	0.0000	0.0000
	Dyn1	0.3263	-0.0573	0.1743	-0.0289	0.0010	0.0002
	Dyn2	0.3107	-0.1251	0.1657	-0.0619	0.0009	0.0004
	Dyn3	0.0586	0.2378	0.0329	0.1202	0.0002	0.0007
	Dyn4	0.0635	0.3669	0.0357	0.1901	0.0002	0.0011
Level 2	D	-0.0307	0.0102	-0.0307	0.0102	0.0001	0.0000
	Lp	-0.0148	0.0141	-0.0148	0.0141	0.0000	0.0000
	Sp	0.0002	-0.0005	0.0002	-0.0005	0.0000	0.0000
	Dyn1	0.1579	-0.0304	0.1579	-0.0304	0.0005	0.0001

PRCNC20221036

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1489	-0.0660	0.1489	-0.0660	0.0005	0.0002
	Dyn3	0.0280	0.1215	0.0280	0.1215	0.0001	0.0004
	Dyn4	0.0320	0.1832	0.0320	0.1832	0.0001	0.0006
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (84.340, 44.980)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 3	D	-0.0311	0.0032	0.0125	0.0012	0.0001	0.0000
	Lp	-0.0514	0.0025	-0.0145	-0.0005	0.0001	0.0000
	Sp	0.0007	-0.0003	-0.0001	0.0002	0.0000	0.0000
	Dyn1	0.3226	-0.0639	0.1802	-0.0369	0.0010	0.0002
	Dyn2	0.3996	-0.0846	0.2219	-0.0451	0.0013	0.0003
	Dyn3	0.1813	0.2204	0.1054	0.1197	0.0006	0.0007
	Dyn4	0.1512	0.2750	0.0822	0.1507	0.0005	0.0009
Level 2	D	-0.0436	0.0021	-0.0436	0.0021	0.0001	0.0000
	Lp	-0.0369	0.0029	-0.0369	0.0029	0.0001	0.0000
	Sp	0.0008	-0.0005	0.0008	-0.0005	0.0000	0.0000
	Dyn1	0.1534	-0.0282	0.1534	-0.0282	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1905	-0.0406	0.1905	-0.0406	0.0006	0.0001
	Dyn3	0.0805	0.1026	0.0805	0.1026	0.0003	0.0003
	Dyn4	-0.0737	0.1261	-0.0737	0.1261	0.0002	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TORSIONAL IRREGULARITY DATA:

X-Axis:

Story	**LdC**	**Drift**	**Coord**	**Drift**	**Coord**	**Max/Min**	**Max/Ave**
		in	ft	in	ft		
Roof	Dyn1	0.2720	(168.14 67.56)	0.8296	(246.21 176.90)	3.050	1.506
Level 3	Dyn2	0.3764	(246.21 88.28)	0.1633	(41.62 176.90)	2.305	1.395
Level 2	Dyn2	0.1905	(84.34 44.98)	0.1322	(246.21 176.90)	1.442	1.181
Mezzanin	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999
Level 1	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999

Y-Axis:

Story	**LdC**	**Drift**	**Coord**	**Drift**	**Coord**	**Max/Min**	**Max/Ave**
		in	ft	in	ft		
Roof	Dyn4	0.7305	(59.77 104.27)	0.1378	(246.21 176.90)	5.300	1.683
Level 3	Dyn4	0.3942	(59.77 104.27)	0.0940	(246.21 176.90)	4.193	1.615
Level 2	Dyn3	0.1026	(84.34 44.98)	0.2119	(246.21 176.90)	2.066	1.348
Mezzanin	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999
Level 1	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999

Drift

RAM Structural System 17.03.00.285
DataBase: Pierce College - 6.14
Building Code: IBC

Nodes 11-20

06/21/22 21:03:03
Steel Code: IBC

CRITERIA:

Rigid End Zones: Ignore Effects
Member Force Output: At Face of Joint
P-Delta: Yes Scale Factor: 1.00
Ground Level: Base

Allowable Drift = 0.015*h

Displacements to be multiplied by Cd/Ie.

Max Drift Ratio = (0.015 * Ie) / Cd = (0.015 * 1.25) / 5
Max Drift Ratio = .00375

LOAD CASE DEFINITIONS:

D	DeadLoad	RAMUSER
Lp	PosLiveLoad	RAMUSER
Sp	PosSnowLoad	RAMUSER
Dyn1	Modal Drift X	Dyn_ASCE716_CQC_X_+E
Dyn2	Modal Drift X	Dyn_ASCE716_CQC_X_-E
Dyn3	Modal Drift Y	Dyn_ASCE716_CQC_Y_+E
Dyn4	Modal Drift Y	Dyn_ASCE716_CQC_Y_-E

All Drift Ratios do not exceed .00375.

Displacements for semirigid diaphragm are reported based on nodal displacements near to selected point.

RESULTS:

Location (ft): (76.640, 73.220)

Story	LdC	Displacement X in	Displacement Y in	Story Drift X in	Story Drift Y in	Drift Ratio X	Drift Ratio Y
Roof	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 3	D	-0.0282	0.0036	0.0117	0.0003	0.0001	0.0000
	Lp	-0.0382	0.0060	-0.0082	0.0011	0.0000	0.0000
	Sp	0.0006	-0.0004	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3347	-0.0653	0.1918	-0.0384	0.0011	0.0002
	Dyn2	0.3973	-0.0838	0.2296	-0.0446	0.0013	0.0003
	Dyn3	0.1216	0.2021	0.0639	0.1075	0.0004	0.0006
	Dyn4	-0.1478	0.2629	-0.0827	0.1407	0.0005	0.0008
Level 2	D	-0.0399	0.0034	-0.0399	0.0034	0.0001	0.0000
	Lp	-0.0300	0.0048	-0.0300	0.0048	0.0001	0.0000
	Sp	0.0005	-0.0005	0.0005	-0.0005	0.0000	0.0000
	Dyn1	0.1558	-0.0285	0.1558	-0.0285	0.0005	

PRCNC20221036

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1860	-0.0402	0.1860	-0.0402	0.0006	0.0001
	Dyn3	0.0597	0.0953	0.0597	0.0953	0.0002	0.0003
	Dyn4	-0.0740	0.1228	-0.0740	0.1228	0.0003	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (94.630, 78.220)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 3	D	-0.0278	0.0020	0.0114	0.0012	0.0001	0.0000
	Lp	-0.0359	-0.0024	-0.0071	-0.0028	0.0000	0.0000
	Sp	0.0006	-0.0003	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3337	-0.0645	0.1909	-0.0372	0.0011	0.0002
	Dyn2	0.3913	-0.0929	0.2256	-0.0538	0.0013	0.0003
	Dyn3	0.1133	0.2608	0.0591	0.1518	0.0003	0.0009
	Dyn4	-0.1419	0.3129	-0.0788	0.1854	0.0004	0.0011
Level 2	D	-0.0392	0.0009	-0.0392	0.0009	0.0001	0.0000
	Lp	-0.0288	0.0004	-0.0288	0.0004	0.0001	0.0000
	Sp	0.0005	-0.0004	0.0005	-0.0004	0.0000	0.0000
	Dyn1	0.1551	-0.0286	0.1551	-0.0286	0.0005	0.0001

PRCNC20221036

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1829	-0.0432	0.1829	-0.0432	0.0006	0.0001
	Dyn3	0.0562	0.1141	0.0562	0.1141	0.0002	0.0004
	Dyn4	-0.0726	0.1332	-0.0726	0.1332	0.0002	0.0005
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (92.280, 85.580)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 3	D	-0.0271	0.0022	-0.0271	0.0022	0.0001	0.0000
	Lp	-0.0325	-0.0013	-0.0325	-0.0013	0.0001	0.0000
	Sp	0.0006	-0.0003	0.0006	-0.0003	0.0000	0.0000
	Dyn1	0.3293	-0.0670	0.3293	-0.0670	0.0007	0.0001
	Dyn2	0.3766	-0.0999	0.3766	-0.0999	0.0008	0.0002
	Dyn3	0.1032	0.2696	0.1032	0.2696	0.0002	0.0006
	Dyn4	-0.1249	0.3295	-0.1249	0.3295	0.0003	0.0007
Level 2	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (50.300, 74.420)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 3	D	-0.0282	0.0059	-0.0282	0.0059	0.0001	0.0000
	Lp	-0.0377	0.0181	-0.0377	0.0181	0.0001	0.0000
	Sp	0.0006	-0.0005	0.0006	-0.0005	0.0000	0.0000
	Dyn1	0.3345	-0.0808	0.3345	-0.0808	0.0007	0.0002
	Dyn2	0.3980	-0.1536	0.3980	-0.1536	0.0008	0.0003
	Dyn3	0.1230	0.2810	0.1230	0.2810	0.0003	0.0006
	Dyn4	-0.1547	0.4179	-0.1547	0.4179	0.0003	0.0009
Level 2	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (50.300, 121.660)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 3	D	-0.0240	0.0059	-0.0240	0.0059	0.0001	0.0000
	Lp	-0.0159	0.0181	-0.0159	0.0181	0.0000	0.0000
	Sp	0.0004	-0.0005	0.0004	-0.0005	0.0000	0.0000
	Dyn1	0.3231	-0.0787	0.3231	-0.0787	0.0007	0.0002
	Dyn2	0.3233	-0.1482	0.3233	-0.1482	0.0007	0.0003
	Dyn3	0.0648	0.2725	0.0648	0.2725	0.0001	0.0006
	Dyn4	0.0686	0.4048	0.0686	0.4048	0.0001	0.0009
Level 2	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (56.200, 121.660)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0582	-0.0280	0.0822	-0.0335	0.0003	0.0001
	Lp	0.0263	0.0051	0.0422	-0.0103	0.0002	0.0000
	Sp	-0.0000	-0.0013	-0.0004	-0.0008	0.0000	0.0000
	Dyn1	0.6695	0.2144	0.4008	0.2642	0.0017	0.0011
	Dyn2	0.6626	-0.3071	0.3834	-0.2974	0.0016	0.0013
	Dyn3	0.1744	0.5162	0.1265	0.3804	0.0005	0.0016
	Dyn4	0.1845	0.9026	0.1404	0.6877	0.0006	0.0029
Level 3	D	-0.0240	0.0054	0.0088	-0.0024	0.0000	0.0000
	Lp	-0.0159	0.0154	0.0022	0.0050	0.0000	0.0000
	Sp	0.0004	-0.0005	0.0001	-0.0000	0.0000	0.0000
	Dyn1	0.3228	-0.0667	0.1790	-0.0355	0.0010	0.0002
	Dyn2	0.3230	-0.1260	0.1797	-0.0689	0.0010	0.0004
	Dyn3	0.0647	0.2579	0.0386	0.1364	0.0002	0.0008
	Dyn4	0.0686	0.3737	0.0389	0.2020	0.0002	0.0011
Level 2	D	-0.0328	0.0078	-0.0328	0.0078	0.0001	0.0000
	Lp	-0.0181	0.0104	-0.0181	0.0104	0.0001	0.0000
	Sp	0.0003	-0.0005	0.0003	-0.0005	0.0000	0.0000
	Dyn1	0.1512	-0.0337	0.1512	-0.0337	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1483	-0.0641	0.1483	-0.0641	0.0005	0.0002
	Dyn3	0.0297	0.1301	0.0297	0.1301	0.0001	0.0004
	Dyn4	0.0336	0.1844	0.0336	0.1844	0.0001	0.0006
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (217.900, 134.900)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0519	0.0166	0.0747	0.0255	0.0003	0.0001
	Lp	0.0351	-0.1152	0.0449	-0.0560	0.0002	0.0002
	Sp	-0.0002	0.0003	-0.0005	-0.0000	0.0000	0.0000
	Dyn1	0.8607	0.0680	0.6237	-0.0737	0.0026	0.0003
	Dyn2	0.8413	0.2357	0.5950	-0.1611	0.0025	0.0007
	Dyn3	-0.1741	0.7660	-0.1418	0.4439	0.0006	0.0019
	Dyn4	0.1425	0.4542	-0.1282	0.2535	0.0005	0.0011
Level 3	D	-0.0228	-0.0089	0.0082	0.0086	0.0000	0.0000
	Lp	-0.0098	-0.0592	0.0048	-0.0293	0.0000	0.0002
	Sp	0.0003	0.0003	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3334	0.0289	0.1871	0.0149	0.0011	0.0001
	Dyn2	0.3225	0.1201	0.1807	0.0620	0.0010	0.0004
	Dyn3	0.0575	0.3677	0.0320	0.1904	0.0002	0.0011
	Dyn4	0.0670	0.2277	0.0359	0.1180	0.0002	0.0007
Level 2	D	-0.0309	-0.0175	-0.0309	-0.0175	0.0001	0.0001
	Lp	-0.0146	-0.0300	-0.0146	-0.0300	0.0000	0.0001
	Sp	0.0002	0.0002	0.0002	0.0002	0.0000	0.0000
	Dyn1	0.1568	-0.0182	0.1568	-0.0182	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1486	0.0637	0.1486	0.0637	0.0005	0.0002
	Dyn3	0.0266	0.1827	0.0266	0.1827	0.0001	0.0006
	Dyn4	0.0353	0.1131	0.0353	0.1131	0.0001	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (217.900, 111.100)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0569	0.0165	0.0818	0.0254	0.0003	0.0001
	Lp	0.0167	-0.1153	0.0375	-0.0561	0.0002	0.0002
	Sp	0.0001	0.0003	-0.0004	-0.0000	0.0000	0.0000
	Dyn1	0.7554	0.0592	0.5019	-0.0605	0.0021	0.0003
	Dyn2	0.8611	0.2282	0.5879	0.1472	0.0025	0.0006
	Dyn3	0.1517	0.7011	-0.1095	0.3715	0.0005	0.0016
	Dyn4	-0.1553	0.4178	-0.1385	0.2123	0.0006	0.0009
Level 3	D	-0.0249	-0.0089	0.0094	0.0084	0.0001	0.0000
	Lp	-0.0208	-0.0592	-0.0003	-0.0291	0.0000	0.0002
	Sp	0.0004	0.0003	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3307	0.0287	0.1867	0.0153	0.0011	0.0001
	Dyn2	0.3485	0.1198	0.1973	0.0634	0.0011	0.0004
	Dyn3	0.0720	0.3672	0.0385	0.1926	0.0002	0.0011
	Dyn4	-0.0853	0.2272	-0.0449	0.1187	0.0003	0.0007
Level 2	D	-0.0343	-0.0173	-0.0343	-0.0173	0.0001	0.0001
	Lp	-0.0205	-0.0301	-0.0205	-0.0301	0.0001	0.0001
	Sp	0.0004	0.0002	0.0004	0.0002	0.0000	0.0000
	Dyn1	0.1529	-0.0179	0.1529	-0.0179	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1600	0.0624	0.1600	0.0624	0.0005	0.0002
	Dyn3	0.0348	0.1794	0.0348	0.1794	0.0001	0.0006
	Dyn4	-0.0449	0.1113	-0.0449	0.1113	0.0002	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (222.230, 110.710)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0569	0.0173	0.0818	0.0266	0.0003	0.0001
	Lp	0.0164	-0.1186	0.0374	-0.0574	0.0002	0.0002
	Sp	0.0001	0.0003	-0.0004	0.0000	0.0000	0.0000
	Dyn1	0.7569	0.0541	0.5032	-0.0576	0.0021	0.0002
	Dyn2	0.8650	0.2344	0.5915	-0.1487	0.0025	0.0006
	Dyn3	0.1526	0.7152	-0.1114	0.3815	0.0005	0.0016
	Dyn4	-0.1571	0.4201	-0.1399	0.2160	0.0006	0.0009
Level 3	D	-0.0249	-0.0093	0.0095	0.0086	0.0001	0.0000
	Lp	-0.0210	-0.0612	-0.0003	-0.0300	0.0000	0.0002
	Sp	0.0004	0.0003	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3309	0.0293	0.1870	0.0154	0.0011	0.0001
	Dyn2	0.3491	0.1245	0.1977	0.0663	0.0011	0.0004
	Dyn3	0.0723	0.3710	0.0386	0.1931	0.0002	0.0011
	Dyn4	-0.0858	0.2261	-0.0453	0.1170	0.0003	0.0007
Level 2	D	-0.0344	-0.0179	-0.0344	-0.0179	0.0001	0.0001
	Lp	-0.0206	-0.0312	-0.0206	-0.0312	0.0001	0.0001
	Sp	0.0004	0.0003	0.0004	0.0003	0.0000	0.0000
	Dyn1	0.1529	-0.0183	0.1529	-0.0183	0.0005	0.0001

PRCNC20221036

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1602	0.0648	0.1602	0.0648	0.0005	0.0002
	Dyn3	0.0351	0.1824	0.0351	0.1824	0.0001	0.0006
	Dyn4	-0.0451	0.1116	-0.0451	0.1116	0.0002	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (226.580, 98.760)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0590	0.0181	0.0850	0.0278	0.0004	0.0001
	Lp	0.0071	-0.1220	0.0335	-0.0588	0.0001	0.0002
	Sp	0.0002	0.0004	-0.0003	0.0000	0.0000	0.0000
	Dyn1	0.7126	-0.0621	0.4494	-0.0640	0.0019	0.0003
	Dyn2	0.8752	0.2434	0.5878	-0.1517	0.0025	0.0006
	Dyn3	0.1573	0.7192	0.0959	0.3802	0.0004	0.0016
	Dyn4	-0.1835	0.4177	-0.1532	0.2143	0.0006	0.0009
Level 3	D	-0.0260	-0.0097	0.0101	0.0088	0.0001	0.0001
	Lp	-0.0265	-0.0632	-0.0029	-0.0309	0.0000	0.0002
	Sp	0.0005	0.0004	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3306	0.0302	0.1867	0.0157	0.0011	0.0001
	Dyn2	0.3634	0.1296	0.2062	0.0694	0.0012	0.0004
	Dyn3	0.0842	0.3749	0.0438	0.1950	0.0002	0.0011
	Dyn4	-0.1015	0.2252	-0.0539	0.1162	0.0003	0.0007
Level 2	D	-0.0361	-0.0185	-0.0361	-0.0185	0.0001	0.0001
	Lp	-0.0236	-0.0323	-0.0236	-0.0323	0.0001	0.0001
	Sp	0.0004	0.0003	0.0004	0.0003	0.0000	0.0000
	Dyn1	0.1526	-0.0190	0.1526	-0.0190	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1671	0.0675	0.1671	0.0675	0.0006	0.0002
	Dyn3	0.0419	0.1846	0.0419	0.1846	0.0001	0.0006
	Dyn4	-0.0530	0.1114	-0.0530	0.1114	0.0002	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TORSIONAL IRREGULARITY DATA:

X-Axis:

Story	LdC	Drift in	Coord ft	Drift in	Coord ft	Max/Min	Max/Ave
Roof	Dyn1	0.4008	(56.20 121.66)	0.6237	(217.90 134.90)	1.556	1.218
Level 3	Dyn2	0.3980	(50.30 74.42)	0.1797	(56.20 121.66)	2.215	1.378
Level 2	Dyn2	0.1860	(76.64 73.22)	0.1483	(56.20 121.66)	1.254	1.113
Mezzanin	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999
Level 1	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999

Y-Axis:

Story	LdC	Drift in	Coord ft	Drift in	Coord ft	Max/Min	Max/Ave
Roof	Dyn4	0.2123	(217.90 111.10)	0.6877	(56.20 121.66)	3.239	1.528
Level 3	Dyn4	0.4179	(50.30 74.42)	0.1162	(226.58 98.76)	3.595	1.565
Level 2	Dyn3	0.0953	(76.64 73.22)	0.1846	(226.58 98.76)	1.938	1.319
Mezzanin	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999
Level 1	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999

PRCNC20221036

Drift

RAM Structural System 17.03.00.285
DataBase: Pierce College - 6.14
Building Code: IBC

Nodes 21-30

06/21/22 21:03:03
Steel Code: IBC

CRITERIA:

Rigid End Zones: Ignore Effects
Member Force Output: At Face of Joint
P-Delta: Yes Scale Factor: 1.00
Ground Level: Base

Allowable Drift = 0.015*h

Displacements to be multiplied by Cd/Ie.

Max Drift Ratio = (0.015 * Ie) / Cd = (0.015 * 1.25) / 5
Max Drift Ratio = .00375

LOAD CASE DEFINITIONS:

D	DeadLoad	RAMUSER
Lp	PosLiveLoad	RAMUSER
Sp	PosSnowLoad	RAMUSER
Dyn1	Modal Drift X	Dyn_ASCE716_CQC_X_+E
Dyn2	Modal Drift X	Dyn_ASCE716_CQC_X_-E
Dyn3	Modal Drift Y	Dyn_ASCE716_CQC_Y_+E
Dyn4	Modal Drift Y	Dyn_ASCE716_CQC_Y_-E

All Drift Ratios do not exceed .00375.

Displacements for semirigid diaphragm are reported based on nodal displacements near to selected point.

RESULTS:

Location (ft): (216.050, 93.880)

Story	LdC	Displacement X in	Displacement Y in	Story Drift X in	Story Drift Y in	Drift Ratio X	Drift Ratio Y
Roof	D	0.0599	0.0161	0.0967	0.0330	0.0002	0.0001
	Lp	0.0032	-0.1138	0.0280	-0.0841	0.0001	0.0002
	Sp	0.0002	0.0003	-0.0002	0.0000	0.0000	0.0000
	Dyn1	0.6868	0.0640	0.5707	0.0652	0.0014	0.0002
	Dyn2	0.8623	0.2226	0.7380	0.1842	0.0018	0.0004
	Dyn3	0.1661	0.6517	0.1321	0.4911	0.0003	0.0012
	Dyn4	-0.1929	0.3924	-0.1753	0.2909	0.0004	0.0007
Level 3	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 2	D	-0.0368	-0.0170	-0.0368	-0.0170	0.0001	0.0001
	Lp	-0.0248	-0.0297	-0.0248	-0.0297	0.0001	0.0001
	Sp	0.0004	0.0002	0.0004	0.0002	0.0000	0.0000
	Dyn1	0.1522	-0.0174	0.1522	-0.0174	0.0005	

PRCNC20221036

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1693	0.0610	0.1693	0.0610	0.0006	0.0002
	Dyn3	0.0443	0.1813	0.0443	0.1813	0.0001	0.0006
	Dyn4	-0.0562	0.1133	-0.0562	0.1133	0.0002	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (219.020, 81.250)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0621	0.0166	0.0897	0.0256	0.0004	0.0001
	Lp	-0.0066	-0.1161	0.0279	-0.0564	0.0001	0.0002
	Sp	0.0003	0.0003	-0.0002	-0.0000	0.0000	0.0000
	Dyn1	0.6637	0.0588	0.3883	-0.0558	0.0016	0.0002
	Dyn2	0.8836	0.2298	0.5743	0.1430	0.0024	0.0006
	Dyn3	0.1872	0.6544	0.1055	0.3196	0.0004	0.0014
	Dyn4	-0.2398	0.3898	-0.1913	0.1825	0.0008	0.0008
Level 3	D	-0.0275	-0.0090	0.0111	0.0084	0.0001	0.0000
	Lp	-0.0345	-0.0597	-0.0065	-0.0292	0.0000	0.0002
	Sp	0.0006	0.0003	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3282	0.0286	0.1846	0.0153	0.0010	0.0001
	Dyn2	0.3822	0.1204	0.2173	0.0647	0.0012	0.0004
	Dyn3	0.1044	0.3644	0.0522	0.1972	0.0003	0.0011
	Dyn4	-0.1264	0.2241	-0.0671	0.1209	0.0004	0.0007
Level 2	D	-0.0387	-0.0174	-0.0387	-0.0174	0.0001	0.0001
	Lp	-0.0280	-0.0305	-0.0280	-0.0305	0.0001	0.0001
	Sp	0.0005	0.0003	0.0005	0.0003	0.0000	0.0000
	Dyn1	0.1519	0.0173	0.1519	0.0173	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1753	0.0605	0.1753	0.0605	0.0006	0.0002
	Dyn3	0.0538	0.1705	0.0538	0.1705	0.0002	0.0006
	Dyn4	-0.0666	0.1050	-0.0666	0.1050	0.0002	0.0004
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (93.520, 83.380)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 3	D	-0.0273	0.0021	0.0112	0.0011	0.0001	0.0000
	Lp	-0.0335	-0.0019	-0.0060	-0.0026	0.0000	0.0000
	Sp	0.0006	-0.0003	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3303	-0.0662	0.1879	-0.0390	0.0011	0.0002
	Dyn2	0.3804	-0.0978	0.2169	-0.0590	0.0012	0.0003
	Dyn3	0.1062	0.2682	0.0549	0.1594	0.0003	0.0009
	Dyn4	-0.1292	0.3253	-0.0685	0.1974	0.0004	0.0011
Level 2	D	-0.0385	0.0010	-0.0385	0.0010	0.0001	0.0000
	Lp	-0.0275	0.0007	-0.0275	0.0007	0.0001	0.0000
	Sp	0.0005	-0.0004	0.0005	-0.0004	0.0000	0.0000
	Dyn1	0.1545	-0.0288	0.1545	-0.0288	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1800	-0.0437	0.1800	-0.0437	0.0006	0.0001
	Dyn3	0.0530	0.1138	0.0530	0.1138	0.0002	0.0004
	Dyn4	-0.0707	0.1338	-0.0707	0.1338	0.0002	0.0005
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (128.910, 100.770)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 3	D	-0.0258	-0.0011	0.0101	0.0027	0.0001	0.0000
	Lp	-0.0255	-0.0182	-0.0023	-0.0103	0.0000	0.0001
	Sp	0.0005	-0.0001	0.0001	0.0000	0.0000	0.0000
	Dyn1	0.3238	-0.0537	0.1823	-0.0291	0.0010	0.0002
	Dyn2	0.3532	-0.0778	0.1992	-0.0395	0.0011	0.0002
	Dyn3	0.0825	0.2986	0.0435	0.1685	0.0002	0.0010
	Dyn4	-0.0984	0.2980	-0.0506	0.1694	0.0003	0.0010
Level 2	D	-0.0359	-0.0038	-0.0359	-0.0038	0.0001	0.0000
	Lp	-0.0232	-0.0079	-0.0232	-0.0079	0.0001	0.0000
	Sp	0.0004	-0.0002	0.0004	-0.0002	0.0000	0.0000
	Dyn1	0.1501	-0.0257	0.1501	-0.0257	0.0005	0.0001

PRCNC20221036

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1635	-0.0444	0.1635	-0.0444	0.0006	0.0001
	Dyn3	0.0400	0.1415	0.0400	0.1415	0.0001	0.0005
	Dyn4	-0.0539	0.1405	-0.0539	0.1405	0.0002	0.0005
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (127.060, 110.770)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 3	D	-0.0249	-0.0009	0.0095	0.0025	0.0001	0.0000
	Lp	-0.0209	-0.0174	-0.0001	-0.0099	0.0000	0.0001
	Sp	0.0004	-0.0001	0.0001	0.0000	0.0000	0.0000
	Dyn1	0.3208	-0.0543	0.1790	-0.0291	0.0010	0.0002
	Dyn2	0.3388	-0.0784	0.1905	-0.0396	0.0011	0.0002
	Dyn3	0.0711	0.2973	0.0386	0.1668	0.0002	0.0009
	Dyn4	-0.0840	0.2999	-0.0436	0.1689	0.0002	0.0010
Level 2	D	-0.0344	-0.0034	-0.0344	-0.0034	0.0001	0.0000
	Lp	-0.0207	-0.0075	-0.0207	-0.0075	0.0001	0.0000
	Sp	0.0003	-0.0002	0.0003	-0.0002	0.0000	0.0000
	Dyn1	0.1489	-0.0263	0.1489	-0.0263	0.0005	0.0001

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1544	-0.0455	0.1544	-0.0455	0.0005	0.0002
	Dyn3	0.0332	0.1430	0.0332	0.1430	0.0001	0.0005
	Dyn4	-0.0443	0.1445	-0.0443	0.1445	0.0001	0.0005
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (76.900, 108.380)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0622	-0.0214	0.0874	-0.0249	0.0004	0.0001
	Lp	0.0165	-0.0102	0.0384	-0.0160	0.0002	0.0001
	Sp	0.0001	-0.0011	-0.0003	-0.0007	0.0000	0.0000
	Dyn1	0.6768	0.1767	0.4204	0.2393	0.0018	0.0010
	Dyn2	0.7000	-0.2691	0.4122	-0.2944	0.0017	0.0012
	Dyn3	0.2444	0.6312	0.1851	0.5101	0.0008	0.0022
	Dyn4	0.2397	0.9880	0.1832	0.8177	0.0008	0.0035
Level 3	D	-0.0251	0.0036	0.0097	-0.0010	0.0001	0.0000
	Lp	-0.0220	0.0058	-0.0006	0.0006	0.0000	0.0000
	Sp	0.0004	-0.0004	0.0001	-0.0000	0.0000	0.0000
	Dyn1	0.3251	-0.0710	0.1816	-0.0404	0.0010	0.0002
	Dyn2	0.3446	-0.1173	0.1948	-0.0667	0.0011	0.0004
	Dyn3	0.0754	0.2748	0.0436	0.1493	0.0002	0.0008
	Dyn4	-0.0872	0.3634	-0.0478	0.2008	0.0003	0.0011
Level 2	D	-0.0348	0.0046	-0.0348	0.0046	0.0001	0.0000
	Lp	-0.0214	0.0052	-0.0214	0.0052	0.0001	0.0000
	Sp	0.0003	-0.0004	0.0003	-0.0004	0.0000	0.0000
	Dyn1	0.1511	-0.0335	0.1511	-0.0335	0.0005	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1554	-0.0609	0.1554	-0.0609	0.0005	0.0002
	Dyn3	0.0335	0.1394	0.0335	0.1394	0.0001	0.0005
	Dyn4	-0.0421	0.1813	-0.0421	0.1813	0.0001	0.0006
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (76.900, 121.690)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0580	-0.0213	0.0820	-0.0249	0.0003	0.0001
	Lp	0.0263	-0.0102	0.0421	-0.0160	0.0002	0.0001
	Sp	-0.0000	-0.0011	-0.0004	-0.0007	0.0000	0.0000
	Dyn1	0.6723	0.1772	0.4065	0.2369	0.0017	0.0010
	Dyn2	0.6657	-0.2707	0.3866	-0.2947	0.0016	0.0012
	Dyn3	0.1659	0.6342	0.1166	0.5132	0.0005	0.0022
	Dyn4	0.1681	0.9923	0.1244	0.8221	0.0005	0.0035
Level 3	D	-0.0240	0.0036	0.0088	-0.0010	0.0000	0.0000
	Lp	-0.0158	0.0058	0.0022	0.0006	0.0000	0.0000
	Sp	0.0004	-0.0004	0.0001	-0.0000	0.0000	0.0000
	Dyn1	0.3231	-0.0685	0.1794	-0.0380	0.0010	0.0002
	Dyn2	0.3246	-0.1142	0.1811	-0.0638	0.0010	0.0004
	Dyn3	0.0640	0.2722	0.0372	0.1472	0.0002	0.0008
	Dyn4	0.0694	0.3594	0.0380	0.1975	0.0002	0.0011
Level 2	D	-0.0327	0.0046	-0.0327	0.0046	0.0001	0.0000
	Lp	-0.0181	0.0052	-0.0181	0.0052	0.0001	0.0000
	Sp	0.0003	-0.0004	0.0003	-0.0004	0.0000	0.0000
	Dyn1	0.1511	-0.0331	0.1511	-0.0331	0.0005	0.0001

PRCNC20221036

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1485	-0.0601	0.1485	-0.0601	0.0005	0.0002
	Dyn3	0.0290	0.1383	0.0290	0.1383	0.0001	0.0005
	Dyn4	0.0344	0.1797	0.0344	0.1797	0.0001	0.0006
Mezzanine	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (220.790, 176.580)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0429	0.0172	0.0620	0.0264	0.0003	0.0001
	Lp	0.0670	-0.1174	0.0574	-0.0568	0.0002	0.0002
	Sp	-0.0005	0.0003	-0.0006	0.0000	0.0000	0.0000
	Dyn1	1.0119	0.0588	0.7871	-0.0680	0.0033	0.0003
	Dyn2	0.8079	0.2305	0.6031	-0.1531	0.0026	0.0006
	Dyn3	0.2083	0.7806	-0.2094	0.4573	0.0009	0.0019
	Dyn4	0.2759	0.4581	0.2103	0.2595	0.0009	0.0011
Level 3	D	-0.0191	-0.0092	0.0047	0.0090	0.0000	0.0001
	Lp	0.0095	-0.0606	0.0141	-0.0300	0.0001	0.0002
	Sp	0.0001	0.0003	0.0000	0.0001	0.0000	0.0000
	Dyn1	0.3418	0.0290	0.1928	0.0139	0.0011	0.0001
	Dyn2	0.2883	0.1225	0.1645	0.0613	0.0009	0.0003
	Dyn3	-0.0706	0.3694	0.0388	0.1871	0.0002	0.0011
	Dyn4	0.0950	0.2264	0.0572	0.1149	0.0003	0.0007
Level 2	D	-0.0238	-0.0182	-0.0236	-0.0164	0.0001	0.0001
	Lp	-0.0045	-0.0306	-0.0044	-0.0291	0.0000	0.0002
	Sp	0.0000	0.0003	0.0002	0.0001	0.0000	0.0000
	Dyn1	0.1622	-0.0185	0.1617	-0.0233	0.0010	0.0001

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1324	0.0657	0.1332	0.0566	0.0008	0.0003
	Dyn3	-0.0451	0.1871	-0.0426	0.1569	0.0003	0.0009
	Dyn4	0.0462	0.1145	0.0454	0.0983	0.0003	0.0006
Mezzanine	D	-0.0002	-0.0018	-0.0002	-0.0018	0.0000	0.0000
	Lp	-0.0001	-0.0015	-0.0001	-0.0015	0.0000	0.0000
	Sp	-0.0001	0.0002	-0.0001	0.0002	0.0000	0.0000
	Dyn1	0.0028	0.0169	0.0028	0.0169	0.0000	0.0001
	Dyn2	0.0026	0.0175	0.0026	0.0175	0.0000	0.0001
	Dyn3	-0.0052	0.0391	-0.0052	0.0391	0.0000	0.0003
	Dyn4	-0.0037	0.0342	-0.0037	0.0342	0.0000	0.0003
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (246.210, 171.520)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0440	0.0224	0.0635	0.0340	0.0003	0.0001
	Lp	0.0631	-0.1369	0.0559	-0.0645	0.0002	0.0003
	Sp	-0.0005	0.0005	-0.0006	0.0001	0.0000	0.0000
	Dyn1	1.0293	0.0979	0.8074	0.0784	0.0034	0.0003
	Dyn2	0.8399	0.2207	0.6324	-0.0950	0.0027	0.0004
	Dyn3	0.2158	0.5996	-0.2133	0.2408	0.0009	0.0010
	Dyn4	0.2595	0.3398	0.1988	0.1393	0.0008	0.0006
Level 3	D	-0.0195	-0.0115	0.0050	0.0111	0.0000	0.0001
	Lp	0.0072	-0.0725	0.0130	-0.0360	0.0001	0.0002
	Sp	0.0001	0.0005	0.0000	0.0001	0.0000	0.0000
	Dyn1	0.3428	-0.0356	0.1942	0.0161	0.0011	0.0001
	Dyn2	0.2944	0.1430	0.1684	0.0648	0.0010	0.0004
	Dyn3	-0.0670	0.3739	0.0385	0.1686	0.0002	0.0010
	Dyn4	0.0895	0.2137	0.0541	0.0958	0.0003	0.0005
Level 2	D	-0.0245	-0.0226	-0.0256	-0.0192	0.0002	0.0001
	Lp	-0.0058	-0.0365	-0.0069	-0.0334	0.0000	0.0002
	Sp	0.0001	0.0004	0.0002	0.0002	0.0000	0.0000
	Dyn1	0.1624	-0.0213	0.1648	-0.0143	0.0010	0.0001

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1350	0.0800	0.1437	0.0549	0.0008	0.0003
	Dyn3	-0.0413	0.2069	-0.0550	0.1426	0.0003	0.0008
	Dyn4	0.0434	0.1189	-0.0625	0.0817	0.0004	0.0005
Mezzanine	D	0.0010	-0.0034	0.0010	-0.0034	0.0000	0.0000
	Lp	0.0011	-0.0031	0.0011	-0.0031	0.0000	0.0000
	Sp	-0.0002	0.0002	-0.0002	0.0002	0.0000	0.0000
	Dyn1	0.0470	-0.0072	0.0470	-0.0072	0.0004	0.0001
	Dyn2	0.0360	0.0252	0.0360	0.0252	0.0003	0.0002
	Dyn3	0.0551	0.0645	0.0551	0.0645	0.0004	0.0005
	Dyn4	0.0560	0.0375	0.0560	0.0375	0.0004	0.0003
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Location (ft): (220.790, 134.900)

Story	LdC	Displacement		Story Drift		Drift Ratio	
		X	Y	X	Y	X	Y
		in	in	in	in		
Roof	D	0.0519	0.0172	0.0747	0.0264	0.0003	0.0001
	Lp	0.0351	-0.1175	0.0449	-0.0569	0.0002	0.0002
	Sp	-0.0002	0.0003	-0.0005	0.0000	0.0000	0.0000
	Dyn1	0.8634	0.0610	0.6266	-0.0679	0.0027	0.0003
	Dyn2	0.8428	0.2371	0.5965	-0.1584	0.0025	0.0007
	Dyn3	-0.1765	0.7612	-0.1448	0.4352	0.0006	0.0018
	Dyn4	0.1439	0.4476	-0.1295	0.2470	0.0005	0.0010
Level 3	D	-0.0228	-0.0092	0.0083	0.0089	0.0000	0.0001
	Lp	-0.0098	-0.0606	0.0048	-0.0300	0.0000	0.0002
	Sp	0.0003	0.0003	0.0001	0.0001	0.0000	0.0000
	Dyn1	0.3336	0.0292	0.1870	0.0146	0.0011	0.0001
	Dyn2	0.3226	0.1230	0.1804	0.0627	0.0010	0.0004
	Dyn3	0.0575	0.3696	0.0319	0.1892	0.0002	0.0011
	Dyn4	0.0670	0.2266	0.0359	0.1160	0.0002	0.0007
Level 2	D	-0.0310	-0.0181	-0.0313	-0.0158	0.0002	0.0001
	Lp	-0.0146	-0.0306	-0.0141	-0.0291	0.0001	0.0002
	Sp	0.0002	0.0003	0.0002	0.0002	0.0000	0.0000
	Dyn1	0.1571	-0.0184	0.1568	-0.0347	0.0009	0.0002

Drift

Story	LdC	Displacement		Story Drift		Drift Ratio	
	Dyn2	0.1487	0.0653	0.1443	0.0616	0.0008	0.0004
	Dyn3	0.0269	0.1854	-0.0259	0.1610	0.0002	0.0009
	Dyn4	0.0354	0.1136	0.0363	0.1038	0.0002	0.0006
Mezzanine	D	0.0003	-0.0023	0.0003	-0.0023	0.0000	0.0000
	Lp	-0.0005	-0.0016	-0.0005	-0.0016	0.0000	0.0000
	Sp	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000
	Dyn1	-0.0015	0.0299	-0.0015	0.0299	0.0000	0.0002
	Dyn2	0.0057	0.0249	0.0057	0.0249	0.0000	0.0002
	Dyn3	0.0147	0.0465	0.0147	0.0465	0.0001	0.0004
	Dyn4	0.0094	0.0476	0.0094	0.0476	0.0001	0.0004
Level 1	D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Sp	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Dyn4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TORSIONAL IRREGULARITY DATA:

X-Axis:

Story	LdC	Drift in	Coord ft	Drift in	Coord ft	Max/Min	Max/Ave
Roof	Dyn1	0.3883	(219.02 81.25)	0.8074	(246.21 171.52)	2.079	1.350
Level 3	Dyn2	0.2173	(219.02 81.25)	0.1645	(220.79 176.58)	1.321	1.138
Level 2	Dyn2	0.1800	(93.52 83.38)	0.1332	(220.79 176.58)	1.351	1.149
Mezzanine	Dyn1	-0.0015	(220.79 134.90)	0.0470	(246.21 171.52)	99.999	2.067
Level 1	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999

Y-Axis:

Story	LdC	Drift in	Coord ft	Drift in	Coord ft	Max/Min	Max/Ave
Roof	Dyn4	0.8221	(76.90 121.69)	0.1393	(246.21 171.52)	5.900	1.710
Level 3	Dyn4	0.2008	(76.90 108.38)	0.0958	(246.21 171.52)	2.096	1.354
Level 2	Dyn4	0.1813	(76.90 108.38)	0.0817	(246.21 171.52)	2.220	1.379

Drift

Mezzanine	Dyn3	0.0645	(246.21 171.52)	0.0391	(220.79 176.58)	1.649	1.245
Level 1	———	0.0000	(0.00 0.00)	0.0000	(0.00 0.00)	99.999	99.999

ROOF

Node 1 - Node 2

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.8561	1.0515	0.954	1.10	**No Irreg.**	Node 1	0.8561	0.84	**5.0%**
Node 2	1.0515					Node 2	1.0515		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.5058	0.5058	0.374	1.35	**Irreg. 1a**	Node 1	0.5058	1.27	**6.3%**
Node 2	0.2423					Node 2	0.2423		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.5725	0.5992	0.586	1.02	**No Irreg.**	Node 1	0.5725	0.73	**5.0%**
Node 2	0.5992					Node 2	0.5992		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.1586	0.1586	0.128	1.24	**Irreg. 1a**	Node 1	0.1586	1.06	**5.3%**
Node 2	0.0976					Node 2	0.0976		

Node 2 - Node 4

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	1.0515	1.0515	0.983	1.07	**No Irreg.**	Node 2	1.0515	0.80	**5.0%**
Node 4	0.9135					Node 4	0.9135		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.2423	0.2423	0.234	1.03	**No Irreg.**	Node 2	0.2423	0.74	**5.0%**
Node 4	0.2264					Node 4	0.2264		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.5992	0.8453	0.722	1.17	**No Irreg.**	Node 2	0.5992	0.95	**5.0%**
Node 4	0.8453					Node 4	0.8453		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.0976	0.1791	0.138	1.29	**Irreg. 1a**	Node 2	0.0976	1.16	**5.8%**
Node 4	0.1791					Node 4	0.1791		

PRCNC20221036

Node 4 - Node 5

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 4	0.9135	0.9135	0.829	1.10	**No Irreg.**	Node 4	0.9135	0.84	**5.0%**
Node 5	0.7437					Node 5	0.7437		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 4	0.2264	0.2264	0.222	1.02	**No Irreg.**	Node 4	0.2264	0.72	**5.0%**
Node 5	0.2174					Node 5	0.2174		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 4	0.8453	0.8453	0.721	1.17	**No Irreg.**	Node 4	0.8453	0.95	**5.0%**
Node 5	0.597					Node 5	0.597		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 4	0.1791	0.1823	0.181	1.01	**No Irreg.**	Node 4	0.1791	0.71	**5.0%**
Node 5	0.1823					Node 5	0.1823		

Node 5 - Node 6

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 5	0.7437	0.7448	0.744	1.00	**No Irreg.**	Node 5	0.7437	0.70	**5.0%**
Node 6	0.7448					Node 6	0.7448		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 5	0.2174	0.2174	0.194	1.12	**No Irreg.**	Node 5	0.2174	0.87	**5.0%**
Node 6	0.1709					Node 6	0.1709		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 5	0.597	0.6252	0.611	1.02	**No Irreg.**	Node 5	0.597	0.73	**5.0%**
Node 6	0.6252					Node 6	0.6252		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 5	0.1823	0.1823	0.157	1.16	**No Irreg.**	Node 5	0.1823	0.94	**5.0%**
Node 6	0.1319					Node 6	0.1319		

Node 6 - Node 7

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 6	0.7448	0.7448	0.734	1.01	**No Irreg.**	Node 6	0.7448	0.71	**5.0%**
Node 7	0.7233					Node 7	0.7233		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 6	0.1709	0.2787	0.225	1.24	**Irreg. 1a**	Node 6	0.1709	1.07	**5.3%**
Node 7	0.2787					Node 7	0.2787		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 6	0.6252	0.9349	0.780	1.20	**No Irreg.**	Node 6	0.6252	1.00	**5.0%**
Node 7	0.9349					Node 7	0.9349		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 6	0.1319	0.3078	0.220	1.40	**Irreg. 1b**	Node 6	0.1319	1.36	**6.8%**
Node 7	0.3078					Node 7	0.3078		

Node 7 - Node 16

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 7	0.7233	0.7233	0.696	1.04	**No Irreg.**	Node 7	0.7233	0.75	**5.0%**
Node 16	0.6695					Node 16	0.6695		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 7	0.2787	0.2787	0.227	1.23	**Irreg. 1a**	Node 7	0.2787	1.05	**5.3%**
Node 16	0.1744					Node 16	0.1744		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 7	0.9349	0.9349	0.919	1.02	**No Irreg.**	Node 7	0.9349	0.72	**5.0%**
Node 16	0.9026					Node 16	0.9026		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 7	0.3078	0.3078	0.307	1.00	**No Irreg.**	Node 7	0.3078	0.70	**5.0%**
Node 16	0.3071					Node 16	0.3071		

Node 16 - Node 8

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.6695	0.6695	0.630	1.06	**No Irreg.**	Node 16	0.6695	0.78	**5.0%**
Node 8	0.5906					Node 8	0.5906		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.1744	0.1744	0.148	1.18	**No Irreg.**	Node 16	0.1744	0.96	**5.0%**
Node 8	0.1217					Node 8	0.1217		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.9026	0.9026	0.876	1.03	**No Irreg.**	Node 16	0.9026	0.74	**5.0%**
Node 8	0.8496					Node 8	0.8496		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.3071	0.3071	0.292	1.05	**No Irreg.**	Node 16	0.3071	0.77	**5.0%**
Node 8	0.2763					Node 8	0.2763		

Node 8 - Node 9

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.5906	0.5906	0.589	1.00	**No Irreg.**	Node 8	0.5906	0.70	**5.0%**
Node 9	0.5879					Node 9	0.5879		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.1217	0.1221	0.122	1.00	**No Irreg.**	Node 8	0.1217	0.70	**5.0%**
Node 9	0.1221					Node 9	0.1221		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.8496	0.8496	0.746	1.14	**No Irreg.**	Node 8	0.8496	0.90	**5.0%**
Node 9	0.6431					Node 9	0.6431		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.2763	0.2763	0.221	1.25	**Irreg. 1a**	Node 8	0.2763	1.09	**5.4%**
Node 9	0.1653					Node 9	0.1653		

Node 9 - Node 1

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.5879	0.8561	0.722	1.19	**No Irreg.**	Node 9	0.5879	0.98	**5.0%**
Node 1	0.8561					Node 1	0.8561		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.1221	0.5058	0.314	1.61	**Irreg. 1b**	Node 9	0.1221	1.80	**9.0%**
Node 1	0.5058					Node 1	0.5058		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.6431	0.6431	0.608	1.06	**No Irreg.**	Node 9	0.6431	0.78	**5.0%**
Node 1	0.5725					Node 1	0.5725		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.1653	0.1653	0.162	1.02	**No Irreg.**	Node 9	0.1653	0.72	**5.0%**
Node 1	0.1586					Node 1	0.1586		

A_x = 1.80 $\boxed{9.0\%}$

Max Eccentricity is applied to the diaphragm masses in the RAM SS model.

PRCNC20221036

Level 3

Node 1 - Node 2

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.3395	0.3449	0.342	1.01	**No Irreg.**	Node 1	0.3395	0.71	**5.0%**
Node 2	0.3449					Node 2	0.3449		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.0777	0.0777	0.074	1.05	**No Irreg.**	Node 1	0.0777	0.76	**5.0%**
Node 2	0.0709					Node 2	0.0709		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.36	0.3758	0.368	1.02	**No Irreg.**	Node 1	0.36	0.72	**5.0%**
Node 2	0.3758					Node 2	0.3758		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.1204	0.1204	0.078	1.54	**Irreg. 1b**	Node 1	0.1204	1.65	**8.2%**
Node 2	0.0359					Node 2	0.0359		

Node 2 - Node 4

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.3449	0.3764	0.361	1.04	**No Irreg.**	Node 2	0.3449	0.76	**5.0%**
Node 4	0.3764					Node 4	0.3764		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.0709	0.117	0.094	1.25	**Irreg. 1a**	Node 2	0.0709	1.08	**5.4%**
Node 4	0.117					Node 4	0.117		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.3758	0.3963	0.386	1.03	**No Irreg.**	Node 2	0.3758	0.73	**5.0%**
Node 4	0.3963					Node 4	0.3963		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.0359	0.0366	0.036	1.01	**No Irreg.**	Node 2	0.0359	0.71	**5.0%**
Node 4	0.0366					Node 4	0.0366		

Node 4 - Node 10									
Torsional Irregularity Check						**Amplification of Accidental Torsion**			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 4	0.3764	0.3996	0.388	1.03	**No Irreg.**	Node 4	0.3764	0.74	**5.0%**
Node 10	0.3996					Node 10	0.3996		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 4	0.117	0.1512	0.134	1.13	**No Irreg.**	Node 4	0.117	0.88	**5.0%**
Node 10	0.1512					Node 10	0.1512		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 4	0.3963	0.3963	0.336	1.18	**No Irreg.**	Node 4	0.3963	0.97	**5.0%**
Node 10	0.275					Node 10	0.275		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 4	0.0366	0.0846	0.061	1.40	**Irreg. 1a**	Node 4	0.0366	1.35	**6.8%**
Node 10	0.0846					Node 10	0.0846		

Node 10 - Node 11									
Torsional Irregularity Check						**Amplification of Accidental Torsion**			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 10	0.3996	0.3996	0.398	1.00	**No Irreg.**	Node 10	0.3996	0.70	**5.0%**
Node 11	0.3973					Node 11	0.3973		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 10	0.1512	0.1512	0.150	1.01	**No Irreg.**	Node 10	0.1512	0.71	**5.0%**
Node 11	0.1478					Node 11	0.1478		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 10	0.275	0.275	0.269	1.02	**No Irreg.**	Node 10	0.275	0.73	**5.0%**
Node 11	0.2629					Node 11	0.2629		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 10	0.0846	0.0846	0.084	1.00	**No Irreg.**	Node 10	0.0846	0.70	**5.0%**
Node 11	0.0838					Node 11	0.0838		

Node 11 - Node 12									
Torsional Irregularity Check						**Amplification of Accidental Torsion**			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 11	0.3973	0.3973	0.394	1.01	**No Irreg.**	Node 11	0.3973	0.71	**5.0%**
Node 12	0.3913					Node 12	0.3913		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 11	0.1478	0.1478	0.145	1.02	**No Irreg.**	Node 11	0.1478	0.72	**5.0%**
Node 12	0.1419					Node 12	0.1419		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 11	0.2629	0.3129	0.288	1.09	**No Irreg.**	Node 11	0.2629	0.82	**5.0%**
Node 12	0.3129					Node 12	0.3129		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 11	0.0838	0.0929	0.088	1.05	**No Irreg.**	Node 11	0.0838	0.77	**5.0%**
Node 12	0.0929					Node 12	0.0929		

Node 12 - Node 13

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 12	0.3913	0.3913	0.384	1.02	**No Irreg.**	Node 12	0.3913	0.72	**5.0%**
Node 13	0.3766					Node 13	0.3766		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 12	0.1419	0.1419	0.133	1.06	**No Irreg.**	Node 12	0.1419	0.79	**5.0%**
Node 13	0.1249					Node 13	0.1249		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 12	0.3129	0.3295	0.321	1.03	**No Irreg.**	Node 12	0.3129	0.73	**5.0%**
Node 13	0.3295					Node 13	0.3295		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 12	0.0929	0.0999	0.096	1.04	**No Irreg.**	Node 12	0.0929	0.75	**5.0%**
Node 13	0.0999					Node 13	0.0999		

Node 13 - Node 14

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 13	0.3766	0.398	0.387	1.03	**No Irreg.**	Node 13	0.3766	0.73	**5.0%**
Node 14	0.398					Node 14	0.398		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 13	0.1249	0.1547	0.140	1.11	**No Irreg.**	Node 13	0.1249	0.85	**5.0%**
Node 14	0.1547					Node 14	0.1547		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 13	0.3295	0.4179	0.374	1.12	**No Irreg.**	Node 13	0.3295	0.87	**5.0%**
Node 14	0.4179					Node 14	0.4179		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 13	0.0999	0.1536	0.127	1.21	**Irreg. 1a**	Node 13	0.0999	1.02	**5.1%**
Node 14	0.1536					Node 14	0.1536		

Node 14 - Node 15

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 14	0.398	0.398	0.361	1.10	**No Irreg.**	Node 14	0.398	0.85	**5.0%**
Node 15	0.3233					Node 15	0.3233		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 14	0.1547	0.1547	0.110	1.41	**Irreg. 1b**	Node 14	0.1547	1.38	**6.9%**
Node 15	0.0648					Node 15	0.0648		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 14	0.4179	0.4179	0.411	1.02	**No Irreg.**	Node 14	0.4179	0.72	**5.0%**
Node 15	0.4048					Node 15	0.4048		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	CHECK	Nodes	Displacement (in)	A_x	Ecc. Mod.
Node 14	0.1536	0.1536	0.151	1.02	**No Irreg.**	Node 14	0.1536	0.72	**5.0%**
Node 15	0.1482					Node 15	0.1482		

Node 15 - Node 16

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 15	0.3233	0.3233	0.323	1.00	**No Irreg.**	Node 15	0.3233	0.70	**5.0%**
Node 16	0.323					Node 16	0.323		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 15	0.0648	0.0648	0.065	1.00	**No Irreg.**	Node 15	0.0648	0.70	**5.0%**
Node 16	0.0647					Node 16	0.0647		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 15	0.4048	0.4048	0.389	1.04	**No Irreg.**	Node 15	0.4048	0.75	**5.0%**
Node 16	0.3737					Node 16	0.3737		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 15	0.1482	0.1482	0.137	1.08	**No Irreg.**	Node 15	0.1482	0.81	**5.0%**
Node 16	0.126					Node 16	0.126		

Node 16 - Node 8

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.323	0.323	0.322	1.00	**No Irreg.**	Node 16	0.323	0.70	**5.0%**
Node 8	0.321					Node 8	0.321		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.0647	0.0647	0.061	1.06	**No Irreg.**	Node 16	0.0647	0.78	**5.0%**
Node 8	0.0573					Node 8	0.0573		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.3737	0.3737	0.371	1.01	**No Irreg.**	Node 16	0.3737	0.70	**5.0%**
Node 8	0.3683					Node 8	0.3683		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.126	0.126	0.124	1.01	**No Irreg.**	Node 16	0.126	0.71	**5.0%**
Node 8	0.1227					Node 8	0.1227		

Node 8 - Node 9

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.321	0.3263	0.324	1.01	**No Irreg.**	Node 8	0.321	0.71	**5.0%**
Node 9	0.3263					Node 9	0.3263		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.0573	0.0586	0.058	1.01	**No Irreg.**	Node 8	0.0573	0.71	**5.0%**
Node 9	0.0586					Node 9	0.0586		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.3683	0.3683	0.368	1.00	**No Irreg.**	Node 8	0.3683	0.70	**5.0%**
Node 9	0.3669					Node 9	0.3669		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.1227	0.1251	0.124	1.01	**No Irreg.**	Node 8	0.1227	0.71	**5.0%**
Node 9	0.1251					Node 9	0.1251		

Node 9 - Node 1									
Torsional Irregularity Check						**Amplification of Accidental Torsion**			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.3263	0.3395	0.333	1.02	**No Irreg.**	Node 9	0.3263	0.72	**5.0%**
Node 1	0.3395					Node 1	0.3395		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.0586	0.0777	0.068	1.14	**No Irreg.**	Node 9	0.0586	0.90	**5.0%**
Node 1	0.0777					Node 1	0.0777		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.3669	0.3669	0.363	1.01	**No Irreg.**	Node 9	0.3669	0.71	**5.0%**
Node 1	0.36					Node 1	0.36		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.1251	0.1251	0.123	1.02	**No Irreg.**	Node 9	0.1251	0.72	**5.0%**
Node 1	0.1204					Node 1	0.1204		

A_x = 1.65 8.2%

PRCNC20221036

Level 2

Node 1 - Node 2

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.159	0.1628	0.161	1.01	**No Irreg.**	Node 1	0.159	0.71	**5.0%**
Node 2	0.1628					Node 2	0.1628		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.0342	0.0491	0.042	1.18	**No Irreg.**	Node 1	0.0342	0.97	**5.0%**
Node 2	0.0491					Node 2	0.0491		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.1823	0.2119	0.197	1.08	**No Irreg.**	Node 1	0.1823	0.80	**5.0%**
Node 2	0.2119					Node 2	0.2119		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 1	0.064	0.064	0.043	1.49	**Irreg. 1b**	Node 1	0.064	1.55	**7.7%**
Node 2	0.0217					Node 2	0.0217		

Node 2 - Node 3

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.1628	0.1628	0.161	1.01	**No Irreg.**	Node 2	0.1628	0.71	**5.0%**
Node 3	0.1585					Node 3	0.1585		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.0491	0.0491	0.039	1.27	**Irreg. 1a**	Node 2	0.0491	1.12	**5.6%**
Node 3	0.0282					Node 3	0.0282		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.2119	0.2119	0.210	1.01	**No Irreg.**	Node 2	0.2119	0.70	**5.0%**
Node 3	0.2088					Node 3	0.2088		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 2	0.0217	0.0219	0.022	1.00	**No Irreg.**	Node 2	0.0217	0.70	**5.0%**
Node 3	0.0219					Node 3	0.0219		

Node 3 - Node 17

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 3	0.1585	0.1585	0.158	1.01	**No Irreg.**	Node 3	0.1585	0.70	**5.0%**
Node 17	0.1568					Node 17	0.1568		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 3	0.0282	0.0282	0.027	1.03	**No Irreg.**	Node 3	0.0282	0.74	**5.0%**
Node 17	0.0266					Node 17	0.0266		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 3	0.2088	0.2088	0.196	1.07	**No Irreg.**	Node 3	0.2088	0.79	**5.0%**
Node 17	0.1827					Node 17	0.1827		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 3	0.0219	0.0219	0.020	1.09	**No Irreg.**	Node 3	0.0219	0.83	**5.0%**
Node 17	0.0182					Node 17	0.0182		

Node 17 - Node 18

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 17	0.1568	0.16	0.158	1.01	**No Irreg.**	Node 17	0.1568	0.71	**5.0%**
Node 18	0.16					Node 18	0.16		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 17	0.0266	0.0449	0.036	1.26	**Irreg. 1a**	Node 17	0.0266	1.10	**5.5%**
Node 18	0.0449					Node 18	0.0449		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 17	0.1827	0.1827	0.181	1.01	**No Irreg.**	Node 17	0.1827	0.71	**5.0%**
Node 18	0.1794					Node 18	0.1794		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 17	0.0182	0.0182	0.018	1.01	**No Irreg.**	Node 17	0.0182	0.71	**5.0%**
Node 18	0.0179					Node 18	0.0179		

Node 18 - Node 19

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 18	0.16	0.1602	0.160	1.00	**No Irreg.**	Node 18	0.16	0.70	**5.0%**
Node 19	0.1602					Node 19	0.1602		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 18	0.0449	0.0451	0.045	1.00	**No Irreg.**	Node 18	0.0449	0.70	**5.0%**
Node 19	0.0451					Node 19	0.0451		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 18	0.1794	0.1824	0.181	1.01	**No Irreg.**	Node 18	0.1794	0.71	**5.0%**
Node 19	0.1824					Node 19	0.1824		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 18	0.0179	0.0183	0.018	1.01	**No Irreg.**	Node 18	0.0179	0.71	**5.0%**
Node 19	0.0183					Node 19	0.0183		

Node 19 - Node 20

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 19	0.1602	0.1671	0.164	1.02	**No Irreg.**	Node 19	0.1602	0.72	**5.0%**
Node 20	0.1671					Node 20	0.1671		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 19	0.0451	0.053	0.049	1.08	**No Irreg.**	Node 19	0.0451	0.81	**5.0%**
Node 20	0.053					Node 20	0.053		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 19	0.1824	0.1846	0.184	1.01	**No Irreg.**	Node 19	0.1824	0.70	**5.0%**
Node 20	0.1846					Node 20	0.1846		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 19	0.0183	0.019	0.019	1.02	**No Irreg.**	Node 19	0.0183	0.72	**5.0%**
Node 20	0.019					Node 20	0.019		

Node 20 - Node 21

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 20	0.1671	0.1693	0.168	1.01	**No Irreg.**	Node 20	0.1671	0.70	**5.0%**
Node 21	0.1693					Node 21	0.1693		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 20	0.053	0.0562	0.055	1.03	**No Irreg.**	Node 20	0.053	0.74	**5.0%**
Node 21	0.0562					Node 21	0.0562		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 20	0.1846	0.1846	0.183	1.01	**No Irreg.**	Node 20	0.1846	0.71	**5.0%**
Node 21	0.1813					Node 21	0.1813		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 20	0.019	0.019	0.018	1.04	**No Irreg.**	Node 20	0.019	0.76	**5.0%**
Node 21	0.0174					Node 21	0.0174		

Node 21 - Node 22

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 21	0.1693	0.1753	0.172	1.02	**No Irreg.**	Node 21	0.1693	0.72	**5.0%**
Node 22	0.1753					Node 22	0.1753		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 21	0.0562	0.0666	0.061	1.08	**No Irreg.**	Node 21	0.0562	0.82	**5.0%**
Node 22	0.0666					Node 22	0.0666		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 21	0.1813	0.1813	0.176	1.03	**No Irreg.**	Node 21	0.1813	0.74	**5.0%**
Node 22	0.1705					Node 22	0.1705		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 21	0.0174	0.0174	0.017	1.00	**No Irreg.**	Node 21	0.0174	0.70	**5.0%**
Node 22	0.0173					Node 22	0.0173		

Node 22 - Node 10

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 22	0.1753	0.1905	0.183	1.04	**No Irreg.**	Node 22	0.1753	0.75	**5.0%**
Node 10	0.1905					Node 10	0.1905		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 22	0.0666	0.0737	0.070	1.05	**No Irreg.**	Node 22	0.0666	0.77	**5.0%**
Node 10	0.0737					Node 10	0.0737		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 22	0.1705	0.1705	0.148	1.15	**No Irreg.**	Node 22	0.1705	0.92	**5.0%**
Node 10	0.1261					Node 10	0.1261		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 22	0.0173	0.0406	0.029	1.40	**Irreg. 1b**	Node 22	0.0173	1.37	**6.8%**
Node 10	0.0406					Node 10	0.0406		

Node 10 - Node 11

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 10	0.1905	0.1905	0.188	1.01	**No Irreg.**	Node 10	0.1905	0.71	**5.0%**
Node 11	0.186					Node 11	0.186		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 10	0.0737	0.074	0.074	1.00	**No Irreg.**	Node 10	0.0737	0.70	**5.0%**
Node 11	0.074					Node 11	0.074		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 10	0.1261	0.1261	0.124	1.01	**No Irreg.**	Node 10	0.1261	0.71	**5.0%**
Node 11	0.1228					Node 11	0.1228		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 10	0.0406	0.0406	0.040	1.00	**No Irreg.**	Node 10	0.0406	0.70	**5.0%**
Node 11	0.0402					Node 11	0.0402		

Node 11 - Node 12

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 11	0.186	0.186	0.184	1.01	**No Irreg.**	Node 11	0.186	0.71	**5.0%**
Node 12	0.1829					Node 12	0.1829		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 11	0.074	0.074	0.073	1.01	**No Irreg.**	Node 11	0.074	0.71	**5.0%**
Node 12	0.0726					Node 12	0.0726		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 11	0.1228	0.1332	0.128	1.04	**No Irreg.**	Node 11	0.1228	0.75	**5.0%**
Node 12	0.1332					Node 12	0.1332		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 11	0.0402	0.0432	0.042	1.04	**No Irreg.**	Node 11	0.0402	0.75	**5.0%**
Node 12	0.0432					Node 12	0.0432		

Node 12 - Node 23

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 12	0.1829	0.1829	0.181	1.01	**No Irreg.**	Node 12	0.1829	0.71	**5.0%**
Node 23	0.18					Node 23	0.18		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 12	0.0726	0.0726	0.072	1.01	**No Irreg.**	Node 12	0.0726	0.71	**5.0%**
Node 23	0.0707					Node 23	0.0707		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 12	0.1332	0.1338	0.134	1.00	**No Irreg.**	Node 12	0.1332	0.70	**5.0%**
Node 23	0.1338					Node 23	0.1338		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 12	0.0432	0.0437	0.043	1.01	**No Irreg.**	Node 12	0.0432	0.70	**5.0%**
Node 23	0.0437					Node 23	0.0437		

Node 23 - Node 24

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 23	0.18	0.18	0.172	1.05	**No Irreg.**	Node 23	0.18	0.76	**5.0%**
Node 24	0.1635					Node 24	0.1635		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 23	0.0707	0.0707	0.062	1.13	**No Irreg.**	Node 23	0.0707	0.89	**5.0%**
Node 24	0.0539					Node 24	0.0539		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 23	0.1338	0.1415	0.138	1.03	**No Irreg.**	Node 23	0.1338	0.73	**5.0%**
Node 24	0.1415					Node 24	0.1415		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 23	0.0437	0.0444	0.044	1.01	**No Irreg.**	Node 23	0.0437	0.71	**5.0%**
Node 24	0.0444					Node 24	0.0444		

Node 24 - Node 25

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 24	0.1635	0.1635	0.159	1.03	**No Irreg.**	Node 24	0.1635	0.73	**5.0%**
Node 25	0.1544					Node 25	0.1544		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 24	0.0539	0.0539	0.049	1.10	**No Irreg.**	Node 24	0.0539	0.84	**5.0%**
Node 25	0.0443					Node 25	0.0443		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 24	0.1415	0.1445	0.143	1.01	**No Irreg.**	Node 24	0.1415	0.71	**5.0%**
Node 25	0.1445					Node 25	0.1445		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 24	0.0444	0.0455	0.045	1.01	**No Irreg.**	Node 24	0.0444	0.71	**5.0%**
Node 25	0.0455					Node 25	0.0455		

PRCNC20221036

Node 25 - Node 26

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 25	0.1544	0.1554	0.155	1.00	**No Irreg.**	Node 25	0.1544	0.70	**5.0%**
Node 26	0.1554					Node 26	0.1554		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 25	0.0443	0.0443	0.043	1.03	**No Irreg.**	Node 25	0.0443	0.73	**5.0%**
Node 26	0.0421					Node 26	0.0421		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 25	0.1445	0.1813	0.163	1.11	**No Irreg.**	Node 25	0.1445	0.86	**5.0%**
Node 26	0.1813					Node 26	0.1813		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 25	0.0455	0.0609	0.053	1.14	**No Irreg.**	Node 25	0.0455	0.91	**5.0%**
Node 26	0.0609					Node 26	0.0609		

Node 26 - Node 27

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 26	0.1554	0.1554	0.153	1.01	**No Irreg.**	Node 26	0.1554	0.71	**5.0%**
Node 27	0.1511					Node 27	0.1511		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 26	0.0421	0.0421	0.036	1.18	**No Irreg.**	Node 26	0.0421	0.97	**5.0%**
Node 27	0.029					Node 27	0.029		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 26	0.1813	0.1813	0.181	1.00	**No Irreg.**	Node 26	0.1813	0.70	**5.0%**
Node 27	0.1797					Node 27	0.1797		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 26	0.0609	0.0609	0.061	1.01	**No Irreg.**	Node 26	0.0609	0.70	**5.0%**
Node 27	0.0601					Node 27	0.0601		

Node 27 - Node 16

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 27	0.1511	0.1512	0.151	1.00	**No Irreg.**	Node 27	0.1511	0.69	**5.0%**
Node 16	0.1512					Node 16	0.1512		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 27	0.029	0.0297	0.029	1.01	**No Irreg.**	Node 27	0.029	0.71	**5.0%**
Node 16	0.0297					Node 16	0.0297		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 27	0.1797	0.1844	0.182	1.01	**No Irreg.**	Node 27	0.1797	0.71	**5.0%**
Node 16	0.1844					Node 16	0.1844		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 27	0.0601	0.0641	0.062	1.03	**No Irreg.**	Node 27	0.0601	0.74	**5.0%**
Node 16	0.0641					Node 16	0.0641		

Node 16 - Node 8

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.1512	0.1512	0.149	1.01	**No Irreg.**	Node 16	0.1512	0.71	**5.0%**
Node 8	0.1476					Node 8	0.1476		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.0297	0.0297	0.028	1.06	**No Irreg.**	Node 16	0.0297	0.78	**5.0%**
Node 8	0.0262					Node 8	0.0262		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.1844	0.1844	0.183	1.01	**No Irreg.**	Node 16	0.1844	0.70	**5.0%**
Node 8	0.1824					Node 8	0.1824		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 16	0.0641	0.0641	0.064	1.01	**No Irreg.**	Node 16	0.0641	0.71	**5.0%**
Node 8	0.063					Node 8	0.063		

Node 8 - Node 9

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.1476	0.1579	0.153	1.03	**No Irreg.**	Node 8	0.1476	0.74	**5.0%**
Node 9	0.1579					Node 9	0.1579		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.0262	0.028	0.027	1.03	**No Irreg.**	Node 8	0.0262	0.74	**5.0%**
Node 9	0.028					Node 9	0.028		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.1824	0.1832	0.183	1.00	**No Irreg.**	Node 8	0.1824	0.70	**5.0%**
Node 9	0.1832					Node 9	0.1832		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 8	0.063	0.066	0.065	1.02	**No Irreg.**	Node 8	0.063	0.73	**5.0%**
Node 9	0.066					Node 9	0.066		

Node 9 - Node 1

Torsional Irregularity Check						Amplification of Accidental Torsion			
(+) X-Direction						*(+) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.1579	0.159	0.158	1.00	**No Irreg.**	Node 9	0.1579	0.70	**5.0%**
Node 1	0.159					Node 1	0.159		
(-) X-Direction						*(-) X-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.028	0.0342	0.031	1.10	**No Irreg.**	Node 9	0.028	0.84	**5.0%**
Node 1	0.0342					Node 1	0.0342		
(+) Y-Direction						*(+) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.1832	0.1832	0.183	1.00	**No Irreg.**	Node 9	0.1832	0.70	**5.0%**
Node 1	0.1823					Node 1	0.1823		
(-) Y-Direction						*(-) Y-Direction*			
Nodes	Story Drift	Max Drift	Average Drift	Drift Ratio	**CHECK**	Nodes	Displacement (in)	A_x	**Ecc. Mod.**
Node 9	0.066	0.066	0.065	1.02	**No Irreg.**	Node 9	0.066	0.72	**5.0%**
Node 1	0.064					Node 1	0.064		

A_x = 1.55 7.7%

Frame Reactions

ELF Frame Reaction used to scale Modal analysis in RAM SS

RAM Frame 17.03.00.285
DataBase: Pierce College - 6.14.22 06/21/22 22:06:53
Building Code: IBC

CRITERIA:

Rigid End Zones:		Ignore Effects	
Member Force Output:		At Face of Joint	
P-Delta:	Yes	Scale Factor:	1.00
Ground Level:	Base		

Mesh Criteria :

Max. Distance Between Nodes on Mesh Line (ft) : 3.00
Merge Node Tolerance (in) : 0.0100
Geometry Tolerance (in) : 0.0050

Walls Out-of-plane Stiffness Not Included in Analysis.
Sign considered for Dynamic Load Case Results.
Rigid Links Included at Fixed Beam-to-Wall Locations
Eigenvalue Analysis : Eigen Vectors (Subspace Iteration)

LOAD CASE DEFINITIONS:

D	DeadLoad	RAMUSER
Lp	PosLiveLoad	RAMUSER
Sp	PosSnowLoad	RAMUSER
E1	ELF	EQ_ASCE716_X_+E_F
E2	ELF	EQ_ASCE716_X_-E_F
E3	ELF	EQ_ASCE716_Y_+E_F
E4	ELF	EQ_ASCE716_Y_-E_F
E5	ELF	EQ_ASCE716_X_+E_0.3Y_+E_F
E6	ELF	EQ_ASCE716_X_+E_-0.3Y_+E_F
E7	ELF	EQ_ASCE716_-X_+E_0.3Y_+E_F
E8	ELF	EQ_ASCE716_-X_+E_-0.3Y_+E_F
E9	ELF	EQ_ASCE716_0.3X_+E_Y_+E_F
E10	ELF	EQ_ASCE716_0.3X_+E_-Y_+E_F
E11	ELF	EQ_ASCE716_-0.3X_+E_Y_+E_F
E12	ELF	EQ_ASCE716_-0.3X_+E_-Y_+E_F
E13	ELF	EQ_ASCE716_X_+E_0.3Y_-E_F
E14	ELF	EQ_ASCE716_X_+E_-0.3Y_-E_F
E15	ELF	EQ_ASCE716_-X_+E_0.3Y_-E_F
E16	ELF	EQ_ASCE716_-X_+E_-0.3Y_-E_F
E17	ELF	EQ_ASCE716_0.3X_+E_Y_-E_F
E18	ELF	EQ_ASCE716_0.3X_+E_-Y_-E_F
E19	ELF	EQ_ASCE716_-0.3X_+E_Y_-E_F
E20	ELF	EQ_ASCE716_-0.3X_+E_-Y_-E_F
E21	ELF	EQ_ASCE716_X_-E_0.3Y_+E_F
E22	ELF	EQ_ASCE716_X_-E_-0.3Y_+E_F
E23	ELF	EQ_ASCE716_-X_-E_0.3Y_+E_F
E24	ELF	EQ_ASCE716_-X_-E_-0.3Y_+E_F
E25	ELF	EQ_ASCE716_0.3X_-E_Y_+E_F
E26	ELF	EQ_ASCE716_0.3X_-E_-Y_+E_F
E27	ELF	EQ_ASCE716_-0.3X_-E_Y_+E_F
E28	ELF	EQ_ASCE716_-0.3X_-E_-Y_+E_F

PRCNC20221036

E29	ELF	EQ_ASCE716_X_-E_0.3Y_-E_F
E30	ELF	EQ_ASCE716_X_-E_-0.3Y_-E_F
E31	ELF	EQ_ASCE716_-X_-E_0.3Y_-E_F
E32	ELF	EQ_ASCE716_-X_-E_-0.3Y_-E_F
E33	ELF	EQ_ASCE716_0.3X_-E_Y_-E_F
E34	ELF	EQ_ASCE716_0.3X_-E_-Y_-E_F
E35	ELF	EQ_ASCE716_-0.3X_-E_Y_-E_F
E36	ELF	EQ_ASCE716_-0.3X_-E_-Y_-E_F

Frame #1:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
109	D	-0.03	-0.00	39.49	0.00	0.00	0.00
	Lp	0.00	-0.07	18.88	0.00	0.00	0.00
	Sp	-0.01	0.02	6.91	0.00	0.00	0.00
	E1	-1.08	4.73	-9.29	0.00	0.00	0.00
	E2	-3.51	13.95	-26.37	0.00	0.00	0.00
	E3	4.98	-18.27	35.41	0.00	0.00	0.00
	E4	8.94	-33.25	63.53	0.00	0.00	0.00
	E5	0.42	-0.75	1.34	0.00	0.00	0.00
	E6	-2.57	10.21	-19.91	0.00	0.00	0.00
	E7	2.57	-10.21	19.91	0.00	0.00	0.00
	E8	-0.42	0.75	-1.34	0.00	0.00	0.00
	E9	4.65	-16.85	32.62	0.00	0.00	0.00
	E10	-5.30	19.69	-38.20	0.00	0.00	0.00
	E11	5.30	-19.69	38.20	0.00	0.00	0.00
	E12	-4.65	16.85	-32.62	0.00	0.00	0.00
	E13	1.61	-5.24	9.77	0.00	0.00	0.00
	E14	-3.76	14.71	-28.35	0.00	0.00	0.00
	E15	3.76	-14.71	28.35	0.00	0.00	0.00
	E16	-1.61	5.24	-9.77	0.00	0.00	0.00
	E17	8.62	-31.83	60.74	0.00	0.00	0.00
	E18	-9.26	34.67	-66.31	0.00	0.00	0.00
	E19	9.26	-34.67	66.31	0.00	0.00	0.00
	E20	-8.62	31.83	-60.74	0.00	0.00	0.00
	E21	-2.01	8.47	-15.75	0.00	0.00	0.00
	E22	-5.00	19.43	-37.00	0.00	0.00	0.00
	E23	5.00	-19.43	37.00	0.00	0.00	0.00
	E24	2.01	-8.47	15.75	0.00	0.00	0.00
	E25	3.93	-14.09	27.50	0.00	0.00	0.00
	E26	-6.03	22.46	-43.32	0.00	0.00	0.00
	E27	6.03	-22.46	43.32	0.00	0.00	0.00
	E28	-3.93	14.09	-27.50	0.00	0.00	0.00
	E29	-0.82	3.97	-7.31	0.00	0.00	0.00
	E30	-6.19	23.92	-45.43	0.00	0.00	0.00
	E31	6.19	-23.92	45.43	0.00	0.00	0.00

Frame Reactions

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E32	0.82	-3.97	7.31	0.00	0.00	0.00
	E33	7.89	-29.07	55.62	0.00	0.00	0.00
	E34	-9.99	37.44	-71.44	0.00	0.00	0.00
	E35	9.99	-37.44	71.44	0.00	0.00	0.00
	E36	-7.89	29.07	-55.62	0.00	0.00	0.00
110	D	-0.02	-0.03	38.42	0.00	0.00	0.00
	Lp	-0.04	0.07	18.53	0.00	0.00	0.00
	Sp	0.01	-0.03	6.71	0.00	0.00	0.00
	E1	-1.10	4.73	9.27	0.00	0.00	0.00
	E2	-3.52	13.95	26.35	0.00	0.00	0.00
	E3	5.01	-18.26	-35.42	0.00	0.00	0.00
	E4	8.97	-33.25	-63.53	0.00	0.00	0.00
	E5	0.41	-0.75	-1.36	0.00	0.00	0.00
	E6	-2.60	10.21	19.89	0.00	0.00	0.00
	E7	2.60	-10.21	-19.89	0.00	0.00	0.00
	E8	-0.41	0.75	1.36	0.00	0.00	0.00
	E9	4.68	-16.84	-32.64	0.00	0.00	0.00
	E10	-5.34	19.68	38.20	0.00	0.00	0.00
	E11	5.34	-19.68	-38.20	0.00	0.00	0.00
	E12	-4.68	16.84	32.64	0.00	0.00	0.00
	E13	1.59	-5.24	-9.79	0.00	0.00	0.00
	E14	-3.79	14.71	28.33	0.00	0.00	0.00
	E15	3.79	-14.71	-28.33	0.00	0.00	0.00
	E16	-1.59	5.24	9.79	0.00	0.00	0.00
	E17	8.64	-31.83	-60.75	0.00	0.00	0.00
	E18	-9.30	34.67	66.32	0.00	0.00	0.00
	E19	9.30	-34.67	-66.32	0.00	0.00	0.00
	E20	-8.64	31.83	60.75	0.00	0.00	0.00
	E21	-2.02	8.47	15.73	0.00	0.00	0.00
	E22	-5.03	19.43	36.98	0.00	0.00	0.00
	E23	5.03	-19.43	-36.98	0.00	0.00	0.00
	E24	2.02	-8.47	-15.73	0.00	0.00	0.00
	E25	3.96	-14.08	-27.52	0.00	0.00	0.00
	E26	-6.07	22.45	43.33	0.00	0.00	0.00
	E27	6.07	-22.45	-43.33	0.00	0.00	0.00
	E28	-3.96	14.08	27.52	0.00	0.00	0.00
	E29	-0.83	3.97	7.29	0.00	0.00	0.00
	E30	-6.21	23.93	45.41	0.00	0.00	0.00
	E31	6.21	-23.93	-45.41	0.00	0.00	0.00
	E32	0.83	-3.97	-7.29	0.00	0.00	0.00
	E33	7.91	-29.07	-55.63	0.00	0.00	0.00
	E34	-10.02	37.44	71.44	0.00	0.00	0.00
	E35	10.02	-37.44	-71.44	0.00	0.00	0.00
	E36	-7.91	29.07	55.63	0.00	0.00	0.00

Frame #2:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
104	D	0.10	-0.01	31.25	0.00	0.00	0.00
	Lp	0.06	-0.00	12.23	0.00	0.00	0.00
	Sp	-0.00	0.00	1.80	0.00	0.00	0.00
	E1	-48.29	-0.00	-117.26	0.00	0.00	0.00
	E2	-47.03	-0.01	-112.63	0.00	0.00	0.00
	E3	-2.61	0.01	-10.65	0.00	0.00	0.00
	E4	-2.99	0.00	-14.57	0.00	0.00	0.00
	E5	-49.08	-0.00	-120.45	0.00	0.00	0.00
	E6	-47.51	-0.00	-114.06	0.00	0.00	0.00
	E7	47.51	0.00	114.06	0.00	0.00	0.00
	E8	49.08	0.00	120.45	0.00	0.00	0.00
	E9	-17.10	0.01	-45.83	0.00	0.00	0.00
	E10	-11.88	-0.01	-24.53	0.00	0.00	0.00
	E11	11.88	0.01	24.53	0.00	0.00	0.00
	E12	17.10	-0.01	45.83	0.00	0.00	0.00
	E13	-49.19	-0.00	-121.63	0.00	0.00	0.00
	E14	-47.40	-0.00	-112.89	0.00	0.00	0.00
	E15	47.40	0.00	112.89	0.00	0.00	0.00
	E16	49.19	0.00	121.63	0.00	0.00	0.00
	E17	-17.47	0.00	-49.75	0.00	0.00	0.00
	E18	-11.50	-0.00	-20.61	0.00	0.00	0.00
	E19	11.50	0.00	20.61	0.00	0.00	0.00
	E20	17.47	-0.00	49.75	0.00	0.00	0.00
	E21	-47.81	-0.01	-115.83	0.00	0.00	0.00
	E22	-46.24	-0.01	-109.44	0.00	0.00	0.00
	E23	46.24	0.01	109.44	0.00	0.00	0.00
	E24	47.81	0.01	115.83	0.00	0.00	0.00
	E25	-16.72	0.00	-44.44	0.00	0.00	0.00
	E26	-11.50	-0.01	-23.14	0.00	0.00	0.00
	E27	11.50	0.01	23.14	0.00	0.00	0.00
	E28	16.72	-0.00	44.44	0.00	0.00	0.00
	E29	-47.92	-0.01	-117.00	0.00	0.00	0.00
	E30	-46.13	-0.01	-108.26	0.00	0.00	0.00
	E31	46.13	0.01	108.26	0.00	0.00	0.00
	E32	47.92	0.01	117.00	0.00	0.00	0.00
	E33	-17.09	-0.00	-48.36	0.00	0.00	0.00
	E34	-11.12	-0.00	-19.22	0.00	0.00	0.00
	E35	11.12	0.00	19.22	0.00	0.00	0.00
	E36	17.09	0.00	48.36	0.00	0.00	0.00
108	D	-0.17	0.05	43.23	0.00	0.00	0.00
	Lp	-0.07	0.06	22.72	0.00	0.00	0.00
	Sp	0.00	-0.00	3.72	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E1	1.70	0.19	117.29	0.00	0.00	0.00
	E2	1.67	-0.25	112.73	0.00	0.00	0.00
	E3	0.10	1.08	10.53	0.00	0.00	0.00
	E4	0.10	2.01	14.33	0.00	0.00	0.00
	E5	1.73	0.52	120.45	0.00	0.00	0.00
	E6	1.67	-0.13	114.13	0.00	0.00	0.00
	E7	-1.67	0.13	-114.13	0.00	0.00	0.00
	E8	-1.73	-0.52	-120.45	0.00	0.00	0.00
	E9	0.61	1.14	45.71	0.00	0.00	0.00
	E10	0.41	-1.02	24.66	0.00	0.00	0.00
	E11	-0.41	1.02	-24.66	0.00	0.00	0.00
	E12	-0.61	-1.14	-45.71	0.00	0.00	0.00
	E13	1.73	0.80	121.59	0.00	0.00	0.00
	E14	1.67	-0.41	112.99	0.00	0.00	0.00
	E15	-1.67	0.41	-112.99	0.00	0.00	0.00
	E16	-1.73	-0.80	-121.59	0.00	0.00	0.00
	E17	0.61	2.06	49.51	0.00	0.00	0.00
	E18	0.41	-1.95	20.86	0.00	0.00	0.00
	E19	-0.41	1.95	-20.86	0.00	0.00	0.00
	E20	-0.61	-2.06	-49.51	0.00	0.00	0.00
	E21	1.70	0.07	115.88	0.00	0.00	0.00
	E22	1.64	-0.58	109.57	0.00	0.00	0.00
	E23	-1.64	0.58	-109.57	0.00	0.00	0.00
	E24	-1.70	-0.07	-115.88	0.00	0.00	0.00
	E25	0.60	1.01	44.34	0.00	0.00	0.00
	E26	0.40	-1.16	23.29	0.00	0.00	0.00
	E27	-0.40	1.16	-23.29	0.00	0.00	0.00
	E28	-0.60	-1.01	-44.34	0.00	0.00	0.00
	E29	1.70	0.35	117.02	0.00	0.00	0.00
	E30	1.64	-0.85	108.43	0.00	0.00	0.00
	E31	-1.64	0.85	-108.43	0.00	0.00	0.00
	E32	-1.70	-0.35	-117.02	0.00	0.00	0.00
	E33	0.60	1.93	48.14	0.00	0.00	0.00
	E34	0.40	-2.08	19.49	0.00	0.00	0.00
	E35	-0.40	2.08	-19.49	0.00	0.00	0.00
	E36	-0.60	-1.93	-48.14	0.00	0.00	0.00

Frame #3:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
105	D	0.01	-0.02	62.38	0.00	0.00	0.00
	Lp	0.01	0.00	27.81	0.00	0.00	0.00
	Sp	-0.00	0.00	8.70	0.00	0.00	0.00
	E1	0.15	-8.69	-18.94	0.00	0.00	0.00
	E2	0.15	7.85	16.95	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E3	0.01	-29.02	-66.98	0.00	0.00	0.00
	E4	0.02	-59.04	-138.78	0.00	0.00	0.00
	E5	0.15	-17.39	-39.03	0.00	0.00	0.00
	E6	0.15	0.02	1.16	0.00	0.00	0.00
	E7	-0.15	-0.02	-1.16	0.00	0.00	0.00
	E8	-0.15	17.39	39.03	0.00	0.00	0.00
	E9	0.05	-31.62	-72.66	0.00	0.00	0.00
	E10	0.04	26.41	61.30	0.00	0.00	0.00
	E11	-0.04	-26.41	-61.30	0.00	0.00	0.00
	E12	-0.05	31.62	72.66	0.00	0.00	0.00
	E13	0.16	-26.40	-60.57	0.00	0.00	0.00
	E14	0.14	9.03	22.70	0.00	0.00	0.00
	E15	-0.14	-9.03	-22.70	0.00	0.00	0.00
	E16	-0.16	26.40	60.57	0.00	0.00	0.00
	E17	0.07	-61.64	-144.46	0.00	0.00	0.00
	E18	0.02	56.43	133.10	0.00	0.00	0.00
	E19	-0.02	-56.43	-133.10	0.00	0.00	0.00
	E20	-0.07	61.64	144.46	0.00	0.00	0.00
	E21	0.16	-0.86	-3.14	0.00	0.00	0.00
	E22	0.15	16.55	37.05	0.00	0.00	0.00
	E23	-0.15	-16.55	-37.05	0.00	0.00	0.00
	E24	-0.16	0.86	3.14	0.00	0.00	0.00
	E25	0.05	-26.66	-61.90	0.00	0.00	0.00
	E26	0.04	31.37	72.07	0.00	0.00	0.00
	E27	-0.04	-31.37	-72.07	0.00	0.00	0.00
	E28	-0.05	26.66	61.90	0.00	0.00	0.00
	E29	0.16	-9.86	-24.68	0.00	0.00	0.00
	E30	0.15	25.56	58.59	0.00	0.00	0.00
	E31	-0.15	-25.56	-58.59	0.00	0.00	0.00
	E32	-0.16	9.86	24.68	0.00	0.00	0.00
	E33	0.07	-56.68	-133.69	0.00	0.00	0.00
	E34	0.02	61.39	143.87	0.00	0.00	0.00
	E35	-0.02	-61.39	-143.87	0.00	0.00	0.00
	E36	-0.07	56.68	133.69	0.00	0.00	0.00
106	D	0.02	-0.04	54.95	0.00	0.00	0.00
	Lp	0.01	-0.01	29.47	0.00	0.00	0.00
	Sp	-0.00	0.00	0.01	0.00	0.00	0.00
	E1	0.14	0.02	-0.01	0.00	0.00	0.00
	E2	0.13	-0.04	0.01	0.00	0.00	0.00
	E3	-0.01	0.11	-0.01	0.00	0.00	0.00
	E4	0.01	0.23	-0.07	0.00	0.00	0.00
	E5	0.14	0.05	-0.02	0.00	0.00	0.00
	E6	0.14	-0.01	-0.01	0.00	0.00	0.00
	E7	-0.14	0.01	0.01	0.00	0.00	0.00

PRCNC20221036

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E8	-0.14	-0.05	0.02	0.00	0.00	0.00
	E9	0.04	0.12	-0.02	0.00	0.00	0.00
	E10	0.05	-0.11	0.01	0.00	0.00	0.00
	E11	-0.05	0.11	-0.01	0.00	0.00	0.00
	E12	-0.04	-0.12	0.02	0.00	0.00	0.00
	E13	0.14	0.09	-0.03	0.00	0.00	0.00
	E14	0.14	-0.05	0.01	0.00	0.00	0.00
	E15	-0.14	0.05	-0.01	0.00	0.00	0.00
	E16	-0.14	-0.09	0.03	0.00	0.00	0.00
	E17	0.05	0.23	-0.07	0.00	0.00	0.00
	E18	0.03	-0.22	0.06	0.00	0.00	0.00
	E19	-0.03	0.22	-0.06	0.00	0.00	0.00
	E20	-0.05	-0.23	0.07	0.00	0.00	0.00
	E21	0.13	-0.01	0.01	0.00	0.00	0.00
	E22	0.13	-0.08	0.02	0.00	0.00	0.00
	E23	-0.13	0.08	-0.02	0.00	0.00	0.00
	E24	-0.13	0.01	-0.01	0.00	0.00	0.00
	E25	0.03	0.10	-0.01	0.00	0.00	0.00
	E26	0.05	-0.13	0.02	0.00	0.00	0.00
	E27	-0.05	0.13	-0.02	0.00	0.00	0.00
	E28	-0.03	-0.10	0.01	0.00	0.00	0.00
	E29	0.14	0.03	-0.01	0.00	0.00	0.00
	E30	0.13	-0.11	0.03	0.00	0.00	0.00
	E31	-0.13	0.11	-0.03	0.00	0.00	0.00
	E32	-0.14	-0.03	0.01	0.00	0.00	0.00
	E33	0.05	0.21	-0.06	0.00	0.00	0.00
	E34	0.03	-0.24	0.07	0.00	0.00	0.00
	E35	-0.03	0.24	-0.07	0.00	0.00	0.00
	E36	-0.05	-0.21	0.06	0.00	0.00	0.00
107	D	0.01	-0.02	61.49	0.00	0.00	0.00
	Lp	0.01	-0.01	20.42	0.00	0.00	0.00
	Sp	0.00	0.00	7.51	0.00	0.00	0.00
	E1	0.09	-8.69	18.89	0.00	0.00	0.00
	E2	0.09	7.86	-17.09	0.00	0.00	0.00
	E3	0.01	-29.05	67.12	0.00	0.00	0.00
	E4	0.06	-59.08	139.08	0.00	0.00	0.00
	E5	0.09	-17.40	39.02	0.00	0.00	0.00
	E6	0.09	0.02	-1.25	0.00	0.00	0.00
	E7	-0.09	-0.02	1.25	0.00	0.00	0.00
	E8	-0.09	17.40	-39.02	0.00	0.00	0.00
	E9	0.03	-31.65	72.78	0.00	0.00	0.00
	E10	0.02	26.44	-61.45	0.00	0.00	0.00
	E11	-0.02	-26.44	61.45	0.00	0.00	0.00
	E12	-0.03	31.65	-72.78	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E13	0.11	-26.41	60.61	0.00	0.00	0.00
	E14	0.07	9.03	-22.83	0.00	0.00	0.00
	E15	-0.07	-9.03	22.83	0.00	0.00	0.00
	E16	-0.11	26.41	-60.61	0.00	0.00	0.00
	E17	0.09	-61.69	144.74	0.00	0.00	0.00
	E18	-0.03	56.47	-133.41	0.00	0.00	0.00
	E19	0.03	-56.47	133.41	0.00	0.00	0.00
	E20	-0.09	61.69	-144.74	0.00	0.00	0.00
	E21	0.10	-0.86	3.05	0.00	0.00	0.00
	E22	0.09	16.57	-37.22	0.00	0.00	0.00
	E23	-0.09	-16.57	37.22	0.00	0.00	0.00
	E24	-0.10	0.86	-3.05	0.00	0.00	0.00
	E25	0.03	-26.69	61.99	0.00	0.00	0.00
	E26	0.02	31.40	-72.24	0.00	0.00	0.00
	E27	-0.02	-31.40	72.24	0.00	0.00	0.00
	E28	-0.03	26.69	-61.99	0.00	0.00	0.00
	E29	0.11	-9.87	24.64	0.00	0.00	0.00
	E30	0.08	25.58	-58.81	0.00	0.00	0.00
	E31	-0.08	-25.58	58.81	0.00	0.00	0.00
	E32	-0.11	9.87	-24.64	0.00	0.00	0.00
	E33	0.09	-56.72	133.95	0.00	0.00	0.00
	E34	-0.03	61.44	-144.20	0.00	0.00	0.00
	E35	0.03	-61.44	144.20	0.00	0.00	0.00
	E36	-0.09	56.72	-133.95	0.00	0.00	0.00

Frame #4:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
111	D	0.00	-0.00	95.43	0.00	0.00	0.00
	Lp	0.02	-0.01	32.50	0.00	0.00	0.00
	Sp	0.00	-0.00	14.06	0.00	0.00	0.00
	E1	-96.16	0.05	-227.05	0.00	0.00	0.00
	E2	-82.17	0.01	-192.87	0.00	0.00	0.00
	E3	9.40	0.45	16.00	0.00	0.00	0.00
	E4	-12.02	0.47	-32.46	0.00	0.00	0.00
	E5	-93.34	0.19	-222.25	0.00	0.00	0.00
	E6	-98.98	-0.08	-231.85	0.00	0.00	0.00
	E7	98.98	0.08	231.85	0.00	0.00	0.00
	E8	93.34	-0.19	222.25	0.00	0.00	0.00
	E9	-19.45	0.46	-52.11	0.00	0.00	0.00
	E10	-38.25	-0.43	-84.12	0.00	0.00	0.00
	E11	38.25	0.43	84.12	0.00	0.00	0.00
	E12	19.45	-0.46	52.11	0.00	0.00	0.00
	E13	-99.77	0.19	-236.79	0.00	0.00	0.00
	E14	-92.56	-0.09	-217.31	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E15	92.56	0.09	217.31	0.00	0.00	0.00
	E16	99.77	-0.19	236.79	0.00	0.00	0.00
	E17	-40.87	0.49	-100.57	0.00	0.00	0.00
	E18	-16.83	-0.46	-35.66	0.00	0.00	0.00
	E19	16.83	0.46	35.66	0.00	0.00	0.00
	E20	40.87	-0.49	100.57	0.00	0.00	0.00
	E21	-79.35	0.15	-188.07	0.00	0.00	0.00
	E22	-84.99	-0.12	-197.67	0.00	0.00	0.00
	E23	84.99	0.12	197.67	0.00	0.00	0.00
	E24	79.35	-0.15	188.07	0.00	0.00	0.00
	E25	-15.25	0.45	-41.86	0.00	0.00	0.00
	E26	-34.05	-0.45	-73.86	0.00	0.00	0.00
	E27	34.05	0.45	73.86	0.00	0.00	0.00
	E28	15.25	-0.45	41.86	0.00	0.00	0.00
	E29	-85.78	0.15	-202.61	0.00	0.00	0.00
	E30	-78.57	-0.13	-183.13	0.00	0.00	0.00
	E31	78.57	0.13	183.13	0.00	0.00	0.00
	E32	85.78	-0.15	202.61	0.00	0.00	0.00
	E33	-36.67	0.47	-90.32	0.00	0.00	0.00
	E34	-12.63	-0.47	-25.40	0.00	0.00	0.00
	E35	12.63	0.47	25.40	0.00	0.00	0.00
	E36	36.67	-0.47	90.32	0.00	0.00	0.00
113	D	0.09	0.01	57.44	0.00	0.00	0.00
	Lp	0.04	-0.00	36.14	0.00	0.00	0.00
	Sp	-0.00	0.00	0.02	0.00	0.00	0.00
	E1	0.18	-0.00	0.22	0.00	0.00	0.00
	E2	0.17	-0.01	0.07	0.00	0.00	0.00
	E3	0.00	0.04	-0.41	0.00	0.00	0.00
	E4	0.02	0.05	-0.25	0.00	0.00	0.00
	E5	0.18	0.01	0.10	0.00	0.00	0.00
	E6	0.18	-0.01	0.34	0.00	0.00	0.00
	E7	-0.18	0.01	-0.34	0.00	0.00	0.00
	E8	-0.18	-0.01	-0.10	0.00	0.00	0.00
	E9	0.06	0.04	-0.34	0.00	0.00	0.00
	E10	0.05	-0.04	0.48	0.00	0.00	0.00
	E11	-0.05	0.04	-0.48	0.00	0.00	0.00
	E12	-0.06	-0.04	0.34	0.00	0.00	0.00
	E13	0.19	0.01	0.15	0.00	0.00	0.00
	E14	0.18	-0.02	0.29	0.00	0.00	0.00
	E15	-0.18	0.02	-0.29	0.00	0.00	0.00
	E16	-0.19	-0.01	-0.15	0.00	0.00	0.00
	E17	0.08	0.05	-0.18	0.00	0.00	0.00
	E18	0.03	-0.05	0.31	0.00	0.00	0.00
	E19	-0.03	0.05	-0.31	0.00	0.00	0.00

Frame Reactions

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E20	-0.08	-0.05	0.18	0.00	0.00	0.00
	E21	0.17	0.01	-0.06	0.00	0.00	0.00
	E22	0.17	-0.02	0.19	0.00	0.00	0.00
	E23	-0.17	0.02	-0.19	0.00	0.00	0.00
	E24	-0.17	-0.01	0.06	0.00	0.00	0.00
	E25	0.05	0.04	-0.39	0.00	0.00	0.00
	E26	0.05	-0.04	0.43	0.00	0.00	0.00
	E27	-0.05	0.04	-0.43	0.00	0.00	0.00
	E28	-0.05	-0.04	0.39	0.00	0.00	0.00
	E29	0.17	0.01	-0.01	0.00	0.00	0.00
	E30	0.16	-0.02	0.14	0.00	0.00	0.00
	E31	-0.16	0.02	-0.14	0.00	0.00	0.00
	E32	-0.17	-0.01	0.01	0.00	0.00	0.00
	E33	0.07	0.05	-0.23	0.00	0.00	0.00
	E34	0.03	-0.05	0.27	0.00	0.00	0.00
	E35	-0.03	0.05	-0.27	0.00	0.00	0.00
	E36	-0.07	-0.05	0.23	0.00	0.00	0.00
116	D	0.01	-0.01	89.96	0.00	0.00	0.00
	Lp	0.01	-0.02	46.59	0.00	0.00	0.00
	Sp	0.00	0.00	14.06	0.00	0.00	0.00
	E1	-96.33	0.03	226.82	0.00	0.00	0.00
	E2	-82.27	0.04	192.80	0.00	0.00	0.00
	E3	9.56	0.43	-15.48	0.00	0.00	0.00
	E4	-11.93	0.39	32.83	0.00	0.00	0.00
	E5	-93.46	0.16	222.18	0.00	0.00	0.00
	E6	-99.19	-0.10	231.46	0.00	0.00	0.00
	E7	99.19	0.10	-231.46	0.00	0.00	0.00
	E8	93.46	-0.16	-222.18	0.00	0.00	0.00
	E9	-19.34	0.44	52.57	0.00	0.00	0.00
	E10	-38.46	-0.42	83.53	0.00	0.00	0.00
	E11	38.46	0.42	-83.53	0.00	0.00	0.00
	E12	19.34	-0.44	-52.57	0.00	0.00	0.00
	E13	-99.91	0.15	236.67	0.00	0.00	0.00
	E14	-92.75	-0.09	216.97	0.00	0.00	0.00
	E15	92.75	0.09	-216.97	0.00	0.00	0.00
	E16	99.91	-0.15	-236.67	0.00	0.00	0.00
	E17	-40.83	0.40	100.87	0.00	0.00	0.00
	E18	-16.96	-0.38	35.22	0.00	0.00	0.00
	E19	16.96	0.38	-35.22	0.00	0.00	0.00
	E20	40.83	-0.40	-100.87	0.00	0.00	0.00
	E21	-79.40	0.17	188.15	0.00	0.00	0.00
	E22	-85.14	-0.09	197.44	0.00	0.00	0.00
	E23	85.14	0.09	-197.44	0.00	0.00	0.00
	E24	79.40	-0.17	-188.15	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E25	-15.12	0.44	42.36	0.00	0.00	0.00
	E26	-34.24	-0.42	73.32	0.00	0.00	0.00
	E27	34.24	0.42	-73.32	0.00	0.00	0.00
	E28	15.12	-0.44	-42.36	0.00	0.00	0.00
	E29	-85.85	0.16	202.64	0.00	0.00	0.00
	E30	-78.69	-0.08	182.95	0.00	0.00	0.00
	E31	78.69	0.08	-182.95	0.00	0.00	0.00
	E32	85.85	-0.16	-202.64	0.00	0.00	0.00
	E33	-36.61	0.40	90.67	0.00	0.00	0.00
	E34	-12.75	-0.38	25.01	0.00	0.00	0.00
	E35	12.75	0.38	-25.01	0.00	0.00	0.00
	E36	36.61	-0.40	-90.67	0.00	0.00	0.00

Frame #5:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
139	D	-0.92	-1.30	117.68	0.00	0.00	0.00
	Lp	-0.15	-0.28	32.00	0.00	0.00	0.00
	Sp	0.00	-0.00	13.46	0.00	0.00	0.00
	E1	0.36	2.45	10.93	0.00	0.00	0.00
	E2	0.33	-8.33	-29.47	0.00	0.00	0.00
	E3	-0.00	-42.56	-151.96	0.00	0.00	0.00
	E4	0.02	-24.44	-84.54	0.00	0.00	0.00
	E5	0.35	-10.32	-34.66	0.00	0.00	0.00
	E6	0.36	15.21	56.52	0.00	0.00	0.00
	E7	-0.36	-15.21	-56.52	0.00	0.00	0.00
	E8	-0.35	10.32	34.66	0.00	0.00	0.00
	E9	0.10	-41.82	-148.68	0.00	0.00	0.00
	E10	0.11	43.29	155.24	0.00	0.00	0.00
	E11	-0.11	-43.29	-155.24	0.00	0.00	0.00
	E12	-0.10	41.82	148.68	0.00	0.00	0.00
	E13	0.36	-4.89	-14.43	0.00	0.00	0.00
	E14	0.35	9.78	36.29	0.00	0.00	0.00
	E15	-0.35	-9.78	-36.29	0.00	0.00	0.00
	E16	-0.36	4.89	14.43	0.00	0.00	0.00
	E17	0.12	-23.71	-81.26	0.00	0.00	0.00
	E18	0.09	25.18	87.82	0.00	0.00	0.00
	E19	-0.09	-25.18	-87.82	0.00	0.00	0.00
	E20	-0.12	23.71	81.26	0.00	0.00	0.00
	E21	0.33	-21.09	-75.06	0.00	0.00	0.00
	E22	0.33	4.44	16.11	0.00	0.00	0.00
	E23	-0.33	-4.44	-16.11	0.00	0.00	0.00
	E24	-0.33	21.09	75.06	0.00	0.00	0.00
	E25	0.10	-45.05	-160.80	0.00	0.00	0.00
	E26	0.10	40.06	143.12	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E27	-0.10	-40.06	-143.12	0.00	0.00	0.00
	E28	-0.10	45.05	160.80	0.00	0.00	0.00
	E29	0.34	-15.66	-54.84	0.00	0.00	0.00
	E30	0.33	-0.99	-4.11	0.00	0.00	0.00
	E31	-0.33	0.99	4.11	0.00	0.00	0.00
	E32	-0.34	15.66	54.84	0.00	0.00	0.00
	E33	0.12	-26.94	-93.38	0.00	0.00	0.00
	E34	0.08	21.95	75.70	0.00	0.00	0.00
	E35	-0.08	-21.95	-75.70	0.00	0.00	0.00
	E36	-0.12	26.94	93.38	0.00	0.00	0.00
140	D	0.17	-0.11	83.28	0.00	0.00	0.00
	Lp	0.02	-0.09	31.89	0.00	0.00	0.00
	Sp	0.00	-0.00	0.03	0.00	0.00	0.00
	E1	0.33	-0.02	0.01	0.00	0.00	0.00
	E2	0.32	0.09	0.32	0.00	0.00	0.00
	E3	0.06	0.46	1.22	0.00	0.00	0.00
	E4	0.06	0.25	0.69	0.00	0.00	0.00
	E5	0.35	0.11	0.37	0.00	0.00	0.00
	E6	0.31	-0.16	-0.36	0.00	0.00	0.00
	E7	-0.31	0.16	0.36	0.00	0.00	0.00
	E8	-0.35	-0.11	-0.37	0.00	0.00	0.00
	E9	0.16	0.45	1.22	0.00	0.00	0.00
	E10	0.04	-0.46	-1.22	0.00	0.00	0.00
	E11	-0.04	0.46	1.22	0.00	0.00	0.00
	E12	-0.16	-0.45	-1.22	0.00	0.00	0.00
	E13	0.35	0.05	0.21	0.00	0.00	0.00
	E14	0.31	-0.10	-0.20	0.00	0.00	0.00
	E15	-0.31	0.10	0.20	0.00	0.00	0.00
	E16	-0.35	-0.05	-0.21	0.00	0.00	0.00
	E17	0.16	0.25	0.69	0.00	0.00	0.00
	E18	0.04	-0.26	-0.69	0.00	0.00	0.00
	E19	-0.04	0.26	0.69	0.00	0.00	0.00
	E20	-0.16	-0.25	-0.69	0.00	0.00	0.00
	E21	0.34	0.23	0.68	0.00	0.00	0.00
	E22	0.31	-0.04	-0.05	0.00	0.00	0.00
	E23	-0.31	0.04	0.05	0.00	0.00	0.00
	E24	-0.34	-0.23	-0.68	0.00	0.00	0.00
	E25	0.15	0.48	1.32	0.00	0.00	0.00
	E26	0.04	-0.43	-1.13	0.00	0.00	0.00
	E27	-0.04	0.43	1.13	0.00	0.00	0.00
	E28	-0.15	-0.48	-1.32	0.00	0.00	0.00
	E29	0.34	0.17	0.52	0.00	0.00	0.00
	E30	0.30	0.02	0.11	0.00	0.00	0.00
	E31	-0.30	-0.02	-0.11	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E32	-0.34	-0.17	-0.52	0.00	0.00	0.00
	E33	0.16	0.28	0.78	0.00	0.00	0.00
	E34	0.03	-0.23	-0.59	0.00	0.00	0.00
	E35	-0.03	0.23	0.59	0.00	0.00	0.00
	E36	-0.16	-0.28	-0.78	0.00	0.00	0.00
141	D	-0.05	-0.12	73.70	0.00	0.00	0.00
	Lp	-0.01	-0.12	21.06	0.00	0.00	0.00
	Sp	0.00	-0.00	7.20	0.00	0.00	0.00
	E1	0.41	2.45	-10.88	0.00	0.00	0.00
	E2	0.34	-8.39	29.22	0.00	0.00	0.00
	E3	-0.05	-42.81	150.76	0.00	0.00	0.00
	E4	0.03	-24.59	83.87	0.00	0.00	0.00
	E5	0.39	-10.40	34.35	0.00	0.00	0.00
	E6	0.42	15.29	-56.11	0.00	0.00	0.00
	E7	-0.42	-15.29	56.11	0.00	0.00	0.00
	E8	-0.39	10.40	-34.35	0.00	0.00	0.00
	E9	0.07	-42.08	147.49	0.00	0.00	0.00
	E10	0.17	43.55	-154.02	0.00	0.00	0.00
	E11	-0.17	-43.55	154.02	0.00	0.00	0.00
	E12	-0.07	42.08	-147.49	0.00	0.00	0.00
	E13	0.42	-4.93	14.28	0.00	0.00	0.00
	E14	0.40	9.82	-36.04	0.00	0.00	0.00
	E15	-0.40	-9.82	36.04	0.00	0.00	0.00
	E16	-0.42	4.93	-14.28	0.00	0.00	0.00
	E17	0.16	-23.85	80.61	0.00	0.00	0.00
	E18	0.09	25.32	-87.14	0.00	0.00	0.00
	E19	-0.09	-25.32	87.14	0.00	0.00	0.00
	E20	-0.16	23.85	-80.61	0.00	0.00	0.00
	E21	0.32	-21.24	74.44	0.00	0.00	0.00
	E22	0.35	4.45	-16.01	0.00	0.00	0.00
	E23	-0.35	-4.45	16.01	0.00	0.00	0.00
	E24	-0.32	21.24	-74.44	0.00	0.00	0.00
	E25	0.05	-45.33	159.52	0.00	0.00	0.00
	E26	0.15	40.30	-141.99	0.00	0.00	0.00
	E27	-0.15	-40.30	141.99	0.00	0.00	0.00
	E28	-0.05	45.33	-159.52	0.00	0.00	0.00
	E29	0.35	-15.77	54.38	0.00	0.00	0.00
	E30	0.33	-1.02	4.06	0.00	0.00	0.00
	E31	-0.33	1.02	-4.06	0.00	0.00	0.00
	E32	-0.35	15.77	-54.38	0.00	0.00	0.00
	E33	0.14	-27.11	92.64	0.00	0.00	0.00
	E34	0.07	22.07	-75.11	0.00	0.00	0.00
	E35	-0.07	-22.07	75.11	0.00	0.00	0.00
	E36	-0.14	27.11	-92.64	0.00	0.00	0.00

Frame Reactions

Frame #6:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
124	D	-0.13	0.06	59.07	0.00	0.00	0.00
	Lp	-0.06	0.01	43.21	0.00	0.00	0.00
	Sp	0.00	0.00	9.54	0.00	0.00	0.00
	E1	0.72	-0.02	-30.98	0.00	0.00	0.00
	E2	0.79	0.14	-16.38	0.00	0.00	0.00
	E3	0.11	0.93	125.64	0.00	0.00	0.00
	E4	0.00	0.66	90.42	0.00	0.00	0.00
	E5	0.75	0.26	6.71	0.00	0.00	0.00
	E6	0.69	-0.30	-68.67	0.00	0.00	0.00
	E7	-0.69	0.30	68.67	0.00	0.00	0.00
	E8	-0.75	-0.26	-6.71	0.00	0.00	0.00
	E9	0.32	0.92	116.35	0.00	0.00	0.00
	E10	0.11	-0.93	-134.93	0.00	0.00	0.00
	E11	-0.11	0.93	134.93	0.00	0.00	0.00
	E12	-0.32	-0.92	-116.35	0.00	0.00	0.00
	E13	0.72	0.18	-3.85	0.00	0.00	0.00
	E14	0.72	-0.22	-58.11	0.00	0.00	0.00
	E15	-0.72	0.22	58.11	0.00	0.00	0.00
	E16	-0.72	-0.18	3.85	0.00	0.00	0.00
	E17	0.22	0.65	81.12	0.00	0.00	0.00
	E18	0.22	-0.66	-99.71	0.00	0.00	0.00
	E19	-0.22	0.66	99.71	0.00	0.00	0.00
	E20	-0.22	-0.65	-81.12	0.00	0.00	0.00
	E21	0.82	0.42	21.31	0.00	0.00	0.00
	E22	0.76	-0.14	-54.08	0.00	0.00	0.00
	E23	-0.76	0.14	54.08	0.00	0.00	0.00
	E24	-0.82	-0.42	-21.31	0.00	0.00	0.00
	E25	0.34	0.97	120.72	0.00	0.00	0.00
	E26	0.13	-0.89	-130.55	0.00	0.00	0.00
	E27	-0.13	0.89	130.55	0.00	0.00	0.00
	E28	-0.34	-0.97	-120.72	0.00	0.00	0.00
	E29	0.79	0.34	10.74	0.00	0.00	0.00
	E30	0.79	-0.06	-43.51	0.00	0.00	0.00
	E31	-0.79	0.06	43.51	0.00	0.00	0.00
	E32	-0.79	-0.34	-10.74	0.00	0.00	0.00
	E33	0.24	0.70	85.50	0.00	0.00	0.00
	E34	0.24	-0.62	-95.33	0.00	0.00	0.00
	E35	-0.24	0.62	95.33	0.00	0.00	0.00
	E36	-0.24	-0.70	-85.50	0.00	0.00	0.00
125	D	0.02	0.06	46.68	0.00	0.00	0.00
	Lp	0.00	0.00	42.52	0.00	0.00	0.00
	Sp	-0.00	-0.00	0.02	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E1	-5.60	21.41	0.66	0.00	0.00	0.00
	E2	-1.32	5.55	0.19	0.00	0.00	0.00
	E3	24.42	-90.94	-2.08	0.00	0.00	0.00
	E4	17.12	-63.86	-1.51	0.00	0.00	0.00
	E5	1.73	-5.87	0.04	0.00	0.00	0.00
	E6	-12.92	48.70	1.29	0.00	0.00	0.00
	E7	12.92	-48.70	-1.29	0.00	0.00	0.00
	E8	-1.73	5.87	-0.04	0.00	0.00	0.00
	E9	22.74	-84.51	-1.88	0.00	0.00	0.00
	E10	-26.10	97.36	2.28	0.00	0.00	0.00
	E11	26.10	-97.36	-2.28	0.00	0.00	0.00
	E12	-22.74	84.51	1.88	0.00	0.00	0.00
	E13	-0.46	2.26	0.21	0.00	0.00	0.00
	E14	-10.73	40.57	1.12	0.00	0.00	0.00
	E15	10.73	-40.57	-1.12	0.00	0.00	0.00
	E16	0.46	-2.26	-0.21	0.00	0.00	0.00
	E17	15.44	-57.44	-1.31	0.00	0.00	0.00
	E18	-18.80	70.29	1.71	0.00	0.00	0.00
	E19	18.80	-70.29	-1.71	0.00	0.00	0.00
	E20	-15.44	57.44	1.31	0.00	0.00	0.00
	E21	6.01	-21.74	-0.43	0.00	0.00	0.00
	E22	-8.64	32.83	0.81	0.00	0.00	0.00
	E23	8.64	-32.83	-0.81	0.00	0.00	0.00
	E24	-6.01	21.74	0.43	0.00	0.00	0.00
	E25	24.02	-89.28	-2.02	0.00	0.00	0.00
	E26	-24.82	92.60	2.14	0.00	0.00	0.00
	E27	24.82	-92.60	-2.14	0.00	0.00	0.00
	E28	-24.02	89.28	2.02	0.00	0.00	0.00
	E29	3.82	-13.61	-0.26	0.00	0.00	0.00
	E30	-6.45	24.70	0.64	0.00	0.00	0.00
	E31	6.45	-24.70	-0.64	0.00	0.00	0.00
	E32	-3.82	13.61	0.26	0.00	0.00	0.00
	E33	16.73	-62.20	-1.45	0.00	0.00	0.00
	E34	-17.52	65.53	1.56	0.00	0.00	0.00
	E35	17.52	-65.53	-1.56	0.00	0.00	0.00
	E36	-16.73	62.20	1.45	0.00	0.00	0.00
127	D	0.03	0.06	68.45	0.00	0.00	0.00
	Lp	0.01	0.01	46.04	0.00	0.00	0.00
	Sp	-0.00	-0.00	13.38	0.00	0.00	0.00
	E1	0.03	-0.01	30.40	0.00	0.00	0.00
	E2	0.02	-0.01	16.30	0.00	0.00	0.00
	E3	-0.02	0.09	-123.51	0.00	0.00	0.00
	E4	-0.03	0.08	-88.89	0.00	0.00	0.00
	E5	0.03	0.01	-6.65	0.00	0.00	0.00

PRCNC20221036

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E6	0.04	-0.04	67.45	0.00	0.00	0.00
	E7	-0.04	0.04	-67.45	0.00	0.00	0.00
	E8	-0.03	-0.01	6.65	0.00	0.00	0.00
	E9	-0.01	0.09	-114.39	0.00	0.00	0.00
	E10	0.04	-0.09	132.63	0.00	0.00	0.00
	E11	-0.04	0.09	-132.63	0.00	0.00	0.00
	E12	0.01	-0.09	114.39	0.00	0.00	0.00
	E13	0.03	0.01	3.73	0.00	0.00	0.00
	E14	0.04	-0.04	57.07	0.00	0.00	0.00
	E15	-0.04	0.04	-57.07	0.00	0.00	0.00
	E16	-0.03	-0.01	-3.73	0.00	0.00	0.00
	E17	-0.02	0.08	-79.77	0.00	0.00	0.00
	E18	0.04	-0.09	98.01	0.00	0.00	0.00
	E19	-0.04	0.09	-98.01	0.00	0.00	0.00
	E20	0.02	-0.08	79.77	0.00	0.00	0.00
	E21	0.01	0.02	-20.75	0.00	0.00	0.00
	E22	0.03	-0.04	53.35	0.00	0.00	0.00
	E23	-0.03	0.04	-53.35	0.00	0.00	0.00
	E24	-0.01	-0.02	20.75	0.00	0.00	0.00
	E25	-0.02	0.09	-118.62	0.00	0.00	0.00
	E26	0.03	-0.09	128.40	0.00	0.00	0.00
	E27	-0.03	0.09	-128.40	0.00	0.00	0.00
	E28	0.02	-0.09	118.62	0.00	0.00	0.00
	E29	0.01	0.01	-10.37	0.00	0.00	0.00
	E30	0.03	-0.03	42.97	0.00	0.00	0.00
	E31	-0.03	0.03	-42.97	0.00	0.00	0.00
	E32	-0.01	-0.01	10.37	0.00	0.00	0.00
	E33	-0.02	0.08	-84.00	0.00	0.00	0.00
	E34	0.03	-0.09	93.78	0.00	0.00	0.00
	E35	-0.03	0.09	-93.78	0.00	0.00	0.00
	E36	0.02	-0.08	84.00	0.00	0.00	0.00

Frame #7:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
119	D	0.14	0.05	57.63	0.00	0.00	0.00
	Lp	0.04	0.02	28.18	0.00	0.00	0.00
	Sp	-0.00	-0.00	5.71	0.00	0.00	0.00
	E1	0.30	0.05	-129.10	0.00	0.00	0.00
	E2	0.33	0.06	-171.83	0.00	0.00	0.00
	E3	0.07	0.13	-73.81	0.00	0.00	0.00
	E4	-0.02	0.11	-17.80	0.00	0.00	0.00
	E5	0.32	0.09	-151.25	0.00	0.00	0.00
	E6	0.28	0.01	-106.96	0.00	0.00	0.00
	E7	-0.28	-0.01	106.96	0.00	0.00	0.00

Frame Reactions

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E8	-0.32	-0.09	151.25	0.00	0.00	0.00
	E9	0.16	0.15	-112.54	0.00	0.00	0.00
	E10	0.02	-0.12	35.08	0.00	0.00	0.00
	E11	-0.02	0.12	-35.08	0.00	0.00	0.00
	E12	-0.16	-0.15	112.54	0.00	0.00	0.00
	E13	0.29	0.08	-134.44	0.00	0.00	0.00
	E14	0.31	0.02	-123.77	0.00	0.00	0.00
	E15	-0.31	-0.02	123.77	0.00	0.00	0.00
	E16	-0.29	-0.08	134.44	0.00	0.00	0.00
	E17	0.07	0.13	-56.53	0.00	0.00	0.00
	E18	0.11	-0.10	-20.94	0.00	0.00	0.00
	E19	-0.11	0.10	20.94	0.00	0.00	0.00
	E20	-0.07	-0.13	56.53	0.00	0.00	0.00
	E21	0.35	0.10	-193.98	0.00	0.00	0.00
	E22	0.31	0.02	-149.69	0.00	0.00	0.00
	E23	-0.31	-0.02	149.69	0.00	0.00	0.00
	E24	-0.35	-0.10	193.98	0.00	0.00	0.00
	E25	0.17	0.15	-125.36	0.00	0.00	0.00
	E26	0.03	-0.12	22.26	0.00	0.00	0.00
	E27	-0.03	0.12	-22.26	0.00	0.00	0.00
	E28	-0.17	-0.15	125.36	0.00	0.00	0.00
	E29	0.32	0.10	-177.17	0.00	0.00	0.00
	E30	0.34	0.03	-166.49	0.00	0.00	0.00
	E31	-0.34	-0.03	166.49	0.00	0.00	0.00
	E32	-0.32	-0.10	177.17	0.00	0.00	0.00
	E33	0.08	0.13	-69.34	0.00	0.00	0.00
	E34	0.12	-0.09	-33.75	0.00	0.00	0.00
	E35	-0.12	0.09	33.75	0.00	0.00	0.00
	E36	-0.08	-0.13	69.35	0.00	0.00	0.00
122	D	0.13	0.05	88.49	0.00	0.00	0.00
	Lp	0.02	0.01	38.14	0.00	0.00	0.00
	Sp	-0.00	-0.00	9.52	0.00	0.00	0.00
	E1	-57.87	-15.51	129.41	0.00	0.00	0.00
	E2	-74.77	-20.04	172.23	0.00	0.00	0.00
	E3	-38.75	-10.38	73.79	0.00	0.00	0.00
	E4	-13.18	-3.52	17.68	0.00	0.00	0.00
	E5	-69.50	-18.62	151.55	0.00	0.00	0.00
	E6	-46.25	-12.40	107.27	0.00	0.00	0.00
	E7	46.25	12.40	-107.27	0.00	0.00	0.00
	E8	69.50	18.62	-151.55	0.00	0.00	0.00
	E9	-56.11	-15.03	112.62	0.00	0.00	0.00
	E10	21.39	5.72	-34.97	0.00	0.00	0.00
	E11	-21.39	-5.72	34.97	0.00	0.00	0.00
	E12	56.11	15.03	-112.62	0.00	0.00	0.00

PRCNC20221036

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E13	-61.83	-16.57	134.71	0.00	0.00	0.00
	E14	-53.92	-14.46	124.11	0.00	0.00	0.00
	E15	53.92	14.46	-124.11	0.00	0.00	0.00
	E16	61.83	16.57	-134.71	0.00	0.00	0.00
	E17	-30.54	-8.17	56.50	0.00	0.00	0.00
	E18	-4.18	-1.14	21.15	0.00	0.00	0.00
	E19	4.18	1.14	-21.15	0.00	0.00	0.00
	E20	30.54	8.17	-56.50	0.00	0.00	0.00
	E21	-86.40	-23.15	194.37	0.00	0.00	0.00
	E22	-63.15	-16.93	150.09	0.00	0.00	0.00
	E23	63.15	16.93	-150.09	0.00	0.00	0.00
	E24	86.40	23.15	-194.37	0.00	0.00	0.00
	E25	-61.18	-16.39	125.46	0.00	0.00	0.00
	E26	16.32	4.37	-22.13	0.00	0.00	0.00
	E27	-16.32	-4.37	22.13	0.00	0.00	0.00
	E28	61.18	16.39	-125.46	0.00	0.00	0.00
	E29	-78.73	-21.09	177.53	0.00	0.00	0.00
	E30	-70.82	-18.98	166.92	0.00	0.00	0.00
	E31	70.82	18.98	-166.92	0.00	0.00	0.00
	E32	78.73	21.09	-177.53	0.00	0.00	0.00
	E33	-35.61	-9.53	69.35	0.00	0.00	0.00
	E34	-9.25	-2.50	33.99	0.00	0.00	0.00
	E35	9.25	2.50	-33.99	0.00	0.00	0.00
	E36	35.61	9.53	-69.35	0.00	0.00	0.00

Frame #8:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
117	D	0.06	-0.00	62.15	0.00	0.00	0.00
	Lp	0.01	-0.05	22.29	0.00	0.00	0.00
	Sp	-0.00	0.00	7.14	0.00	0.00	0.00
	E1	0.42	0.03	-12.72	0.00	0.00	0.00
	E2	0.46	0.04	-15.85	0.00	0.00	0.00
	E3	0.11	0.38	87.99	0.00	0.00	0.00
	E4	0.00	0.35	84.47	0.00	0.00	0.00
	E5	0.45	0.14	13.68	0.00	0.00	0.00
	E6	0.39	-0.09	-39.11	0.00	0.00	0.00
	E7	-0.39	0.09	39.11	0.00	0.00	0.00
	E8	-0.45	-0.14	-13.68	0.00	0.00	0.00
	E9	0.24	0.39	84.17	0.00	0.00	0.00
	E10	0.02	-0.37	-91.80	0.00	0.00	0.00
	E11	-0.02	0.37	91.80	0.00	0.00	0.00
	E12	-0.24	-0.39	-84.17	0.00	0.00	0.00
	E13	0.42	0.13	12.63	0.00	0.00	0.00
	E14	0.42	-0.08	-38.06	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E15	-0.42	0.08	38.06	0.00	0.00	0.00
	E16	-0.42	-0.13	-12.63	0.00	0.00	0.00
	E17	0.13	0.36	80.66	0.00	0.00	0.00
	E18	0.12	-0.34	-88.29	0.00	0.00	0.00
	E19	-0.12	0.34	88.29	0.00	0.00	0.00
	E20	-0.13	-0.36	-80.66	0.00	0.00	0.00
	E21	0.49	0.15	10.54	0.00	0.00	0.00
	E22	0.43	-0.08	-42.25	0.00	0.00	0.00
	E23	-0.43	0.08	42.25	0.00	0.00	0.00
	E24	-0.49	-0.15	-10.54	0.00	0.00	0.00
	E25	0.25	0.39	83.23	0.00	0.00	0.00
	E26	0.03	-0.37	-92.74	0.00	0.00	0.00
	E27	-0.03	0.37	92.74	0.00	0.00	0.00
	E28	-0.25	-0.39	-83.23	0.00	0.00	0.00
	E29	0.46	0.14	9.49	0.00	0.00	0.00
	E30	0.46	-0.07	-41.20	0.00	0.00	0.00
	E31	-0.46	0.07	41.20	0.00	0.00	0.00
	E32	-0.46	-0.14	-9.49	0.00	0.00	0.00
	E33	0.14	0.36	79.72	0.00	0.00	0.00
	E34	0.13	-0.34	-89.23	0.00	0.00	0.00
	E35	-0.13	0.34	89.23	0.00	0.00	0.00
	E36	-0.14	-0.36	-79.72	0.00	0.00	0.00
118	D	0.02	0.02	49.60	0.00	0.00	0.00
	Lp	-0.02	0.02	18.48	0.00	0.00	0.00
	Sp	0.00	-0.00	5.99	0.00	0.00	0.00
	E1	-1.66	7.47	12.36	0.00	0.00	0.00
	E2	-1.52	7.18	15.38	0.00	0.00	0.00
	E3	9.48	-34.74	-88.11	0.00	0.00	0.00
	E4	8.98	-33.36	-84.47	0.00	0.00	0.00
	E5	1.19	-2.95	-14.08	0.00	0.00	0.00
	E6	-4.50	17.89	38.79	0.00	0.00	0.00
	E7	4.50	-17.89	-38.79	0.00	0.00	0.00
	E8	-1.19	2.95	14.08	0.00	0.00	0.00
	E9	8.98	-32.50	-84.41	0.00	0.00	0.00
	E10	-9.98	36.98	91.82	0.00	0.00	0.00
	E11	9.98	-36.98	-91.82	0.00	0.00	0.00
	E12	-8.98	32.50	84.41	0.00	0.00	0.00
	E13	1.04	-2.53	-12.98	0.00	0.00	0.00
	E14	-4.35	17.48	37.70	0.00	0.00	0.00
	E15	4.35	-17.48	-37.70	0.00	0.00	0.00
	E16	-1.04	2.53	12.98	0.00	0.00	0.00
	E17	8.48	-31.11	-80.76	0.00	0.00	0.00
	E18	-9.48	35.60	88.17	0.00	0.00	0.00
	E19	9.48	-35.60	-88.17	0.00	0.00	0.00

Frame Reactions

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E20	-8.48	31.11	80.76	0.00	0.00	0.00
	E21	1.33	-3.24	-11.05	0.00	0.00	0.00
	E22	-4.36	17.60	41.82	0.00	0.00	0.00
	E23	4.36	-17.60	-41.82	0.00	0.00	0.00
	E24	-1.33	3.24	11.05	0.00	0.00	0.00
	E25	9.02	-32.58	-83.50	0.00	0.00	0.00
	E26	-9.93	36.89	92.73	0.00	0.00	0.00
	E27	9.93	-36.89	-92.73	0.00	0.00	0.00
	E28	-9.02	32.58	83.50	0.00	0.00	0.00
	E29	1.18	-2.83	-9.96	0.00	0.00	0.00
	E30	-4.21	17.19	40.72	0.00	0.00	0.00
	E31	4.21	-17.19	-40.72	0.00	0.00	0.00
	E32	-1.18	2.83	9.96	0.00	0.00	0.00
	E33	8.52	-31.20	-79.85	0.00	0.00	0.00
	E34	-9.43	35.51	89.08	0.00	0.00	0.00
	E35	9.43	-35.51	-89.08	0.00	0.00	0.00
	E36	-8.52	31.20	79.85	0.00	0.00	0.00

Frame #9:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
112	D	-0.07	-0.02	111.09	0.00	0.00	0.00
	Lp	-0.03	-0.03	42.12	0.00	0.00	0.00
	Sp	0.00	-0.00	19.44	0.00	0.00	0.00
	E1	-96.22	0.10	-307.75	0.00	0.00	0.00
	E2	-102.25	0.05	-328.14	0.00	0.00	0.00
	E3	-11.60	1.06	-37.38	0.00	0.00	0.00
	E4	-2.73	1.10	-1.55	0.00	0.00	0.00
	E5	-99.70	0.42	-318.97	0.00	0.00	0.00
	E6	-92.74	-0.22	-296.54	0.00	0.00	0.00
	E7	92.74	0.22	296.54	0.00	0.00	0.00
	E8	99.70	-0.42	318.97	0.00	0.00	0.00
	E9	-40.46	1.09	-129.70	0.00	0.00	0.00
	E10	-17.27	-1.03	-54.95	0.00	0.00	0.00
	E11	17.27	1.03	54.95	0.00	0.00	0.00
	E12	40.46	-1.09	129.70	0.00	0.00	0.00
	E13	-97.04	0.43	-308.22	0.00	0.00	0.00
	E14	-95.40	-0.23	-307.29	0.00	0.00	0.00
	E15	95.40	0.23	307.29	0.00	0.00	0.00
	E16	97.04	-0.43	308.22	0.00	0.00	0.00
	E17	-31.60	1.13	-93.88	0.00	0.00	0.00
	E18	-26.13	-1.07	-90.78	0.00	0.00	0.00
	E19	26.13	1.07	90.78	0.00	0.00	0.00
	E20	31.60	-1.13	93.88	0.00	0.00	0.00
	E21	-105.73	0.36	-339.35	0.00	0.00	0.00

PRCNC20221036

Frame Reactions

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E22	-98.77	-0.27	-316.92	0.00	0.00	0.00
	E23	98.77	0.27	316.92	0.00	0.00	0.00
	E24	105.73	-0.36	339.35	0.00	0.00	0.00
	E25	-42.27	1.07	-135.82	0.00	0.00	0.00
	E26	-19.08	-1.04	-61.06	0.00	0.00	0.00
	E27	19.08	1.04	61.06	0.00	0.00	0.00
	E28	42.27	-1.07	135.82	0.00	0.00	0.00
	E29	-103.07	0.38	-328.60	0.00	0.00	0.00
	E30	-101.43	-0.28	-327.67	0.00	0.00	0.00
	E31	101.43	0.28	327.67	0.00	0.00	0.00
	E32	103.07	-0.38	328.60	0.00	0.00	0.00
	E33	-33.41	1.11	-99.99	0.00	0.00	0.00
	E34	-27.94	-1.08	-96.89	0.00	0.00	0.00
	E35	27.94	1.08	96.89	0.00	0.00	0.00
	E36	33.41	-1.11	99.99	0.00	0.00	0.00
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	E1	-96.40	-4.69	283.09	0.00	0.00	0.00
	E2	-102.48	-7.16	302.46	0.00	0.00	0.00
	E3	-10.31	-88.35	-244.37	0.00	0.00	0.00
	E4	-1.37	-83.05	-281.71	0.00	0.00	0.00
	E5	-99.50	-31.20	209.78	0.00	0.00	0.00
	E6	-93.31	21.81	356.40	0.00	0.00	0.00
	E7	93.31	-21.81	-356.40	0.00	0.00	0.00
	E8	99.50	31.20	-209.78	0.00	0.00	0.00
	E9	-39.23	-89.76	-159.44	0.00	0.00	0.00
	E10	-18.62	86.94	329.30	0.00	0.00	0.00
	E11	18.62	-86.94	-329.30	0.00	0.00	0.00
	E12	39.23	89.76	159.44	0.00	0.00	0.00
	E13	-96.82	-29.61	198.58	0.00	0.00	0.00
	E14	-95.99	20.22	367.61	0.00	0.00	0.00
	E15	95.99	-20.22	-367.61	0.00	0.00	0.00
	E16	96.82	29.61	-198.58	0.00	0.00	0.00
	E17	-30.29	-84.45	-196.78	0.00	0.00	0.00
	E18	-27.55	81.64	366.63	0.00	0.00	0.00
	E19	27.55	-81.64	-366.63	0.00	0.00	0.00
	E20	30.29	84.45	196.78	0.00	0.00	0.00
	E21	-105.57	-33.66	229.15	0.00	0.00	0.00
	E22	-99.39	19.35	375.77	0.00	0.00	0.00
	E23	99.39	-19.35	-375.77	0.00	0.00	0.00
	E24	105.57	33.66	-229.15	0.00	0.00	0.00
	E25	-41.05	-90.49	-153.63	0.00	0.00	0.00
	E26	-20.44	86.20	335.11	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E27	20.44	-86.20	-335.11	0.00	0.00	0.00
	E28	41.05	90.49	153.63	0.00	0.00	0.00
	E29	-102.89	-32.07	217.95	0.00	0.00	0.00
	E30	-102.07	17.76	386.97	0.00	0.00	0.00
	E31	102.07	-17.76	-386.97	0.00	0.00	0.00
	E32	102.89	32.07	-217.95	0.00	0.00	0.00
	E33	-32.12	-85.19	-190.97	0.00	0.00	0.00
	E34	-29.37	80.90	372.44	0.00	0.00	0.00
	E35	29.37	-80.90	-372.44	0.00	0.00	0.00
	E36	32.12	85.19	190.97	0.00	0.00	0.00

Frame #10:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	E1	-96.40	-4.69	283.09	0.00	0.00	0.00
	E2	-102.48	-7.16	302.46	0.00	0.00	0.00
	E3	-10.31	-88.35	-244.37	0.00	0.00	0.00
	E4	-1.37	-83.05	-281.71	0.00	0.00	0.00
	E5	-99.50	-31.20	209.78	0.00	0.00	0.00
	E6	-93.31	21.81	356.40	0.00	0.00	0.00
	E7	93.31	-21.81	-356.40	0.00	0.00	0.00
	E8	99.50	31.20	-209.78	0.00	0.00	0.00
	E9	-39.23	-89.76	-159.44	0.00	0.00	0.00
	E10	-18.62	86.94	329.30	0.00	0.00	0.00
	E11	18.62	-86.94	-329.30	0.00	0.00	0.00
	E12	39.23	89.76	159.44	0.00	0.00	0.00
	E13	-96.82	-29.61	198.58	0.00	0.00	0.00
	E14	-95.99	20.22	367.61	0.00	0.00	0.00
	E15	95.99	-20.22	-367.61	0.00	0.00	0.00
	E16	96.82	29.61	-198.58	0.00	0.00	0.00
	E17	-30.29	-84.45	-196.78	0.00	0.00	0.00
	E18	-27.55	81.64	366.63	0.00	0.00	0.00
	E19	27.55	-81.64	-366.63	0.00	0.00	0.00
	E20	30.29	84.45	196.78	0.00	0.00	0.00
	E21	-105.57	-33.66	229.15	0.00	0.00	0.00
	E22	-99.39	19.35	375.77	0.00	0.00	0.00
	E23	99.39	-19.35	-375.77	0.00	0.00	0.00
	E24	105.57	33.66	-229.15	0.00	0.00	0.00
	E25	-41.05	-90.49	-153.63	0.00	0.00	0.00
	E26	-20.44	86.20	335.11	0.00	0.00	0.00
	E27	20.44	-86.20	-335.11	0.00	0.00	0.00
	E28	41.05	90.49	153.63	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E29	-102.89	-32.07	217.95	0.00	0.00	0.00
	E30	-102.07	17.76	386.97	0.00	0.00	0.00
	E31	102.07	-17.76	-386.97	0.00	0.00	0.00
	E32	102.89	32.07	-217.95	0.00	0.00	0.00
	E33	-32.12	-85.19	-190.97	0.00	0.00	0.00
	E34	-29.37	80.90	372.44	0.00	0.00	0.00
	E35	29.37	-80.90	-372.44	0.00	0.00	0.00
	E36	32.12	85.19	190.97	0.00	0.00	0.00
115	D	-0.05	0.01	61.44	0.00	0.00	0.00
	Lp	-0.01	-0.02	33.79	0.00	0.00	0.00
	Sp	0.00	0.00	2.95	0.00	0.00	0.00
	E1	0.48	-6.15	24.64	0.00	0.00	0.00
	E2	0.48	-8.68	25.66	0.00	0.00	0.00
	E3	0.02	-89.08	281.73	0.00	0.00	0.00
	E4	0.03	-83.68	283.23	0.00	0.00	0.00
	E5	0.49	-32.88	109.16	0.00	0.00	0.00
	E6	0.47	20.57	-59.88	0.00	0.00	0.00
	E7	-0.47	-20.57	59.88	0.00	0.00	0.00
	E8	-0.49	32.88	-109.16	0.00	0.00	0.00
	E9	0.17	-90.92	289.12	0.00	0.00	0.00
	E10	0.12	87.23	-274.33	0.00	0.00	0.00
	E11	-0.12	-87.23	274.33	0.00	0.00	0.00
	E12	-0.17	90.92	-289.12	0.00	0.00	0.00
	E13	0.49	-31.26	109.61	0.00	0.00	0.00
	E14	0.47	18.95	-60.33	0.00	0.00	0.00
	E15	-0.47	-18.95	60.33	0.00	0.00	0.00
	E16	-0.49	31.26	-109.61	0.00	0.00	0.00
	E17	0.18	-85.53	290.62	0.00	0.00	0.00
	E18	0.11	81.84	-275.84	0.00	0.00	0.00
	E19	-0.11	-81.84	275.84	0.00	0.00	0.00
	E20	-0.18	85.53	-290.62	0.00	0.00	0.00
	E21	0.48	-35.40	110.18	0.00	0.00	0.00
	E22	0.47	18.05	-58.86	0.00	0.00	0.00
	E23	-0.47	-18.05	58.86	0.00	0.00	0.00
	E24	-0.48	35.40	-110.18	0.00	0.00	0.00
	E25	0.16	-91.68	289.42	0.00	0.00	0.00
	E26	0.12	86.47	-274.03	0.00	0.00	0.00
	E27	-0.12	-86.47	274.03	0.00	0.00	0.00
	E28	-0.16	91.68	-289.42	0.00	0.00	0.00
	E29	0.49	-33.78	110.63	0.00	0.00	0.00
	E30	0.47	16.43	-59.31	0.00	0.00	0.00
	E31	-0.47	-16.43	59.31	0.00	0.00	0.00
	E32	-0.49	33.78	-110.63	0.00	0.00	0.00
	E33	0.18	-86.29	290.93	0.00	0.00	0.00

PRCNC20221036

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	E34	0.11	81.08	-275.53	0.00	0.00	0.00
	E35	-0.11	-81.08	275.53	0.00	0.00	0.00
	E36	-0.18	86.29	-290.93	0.00	0.00	0.00

Frame Reactions

RAM Frame 17.03.00.285
DataBase: Pierce College - 6.14.22 06/21/22 22:39:40
Building Code: IBC

Unscaled Modal Frame Reaction used to scale Modal analysis to ELF analysis in RAM SS.

A scale Factor of 0.16 was used (Ie/R)

CRITERIA:

Rigid End Zones:		Ignore Effects	
Member Force Output:		At Face of Joint	
P-Delta:	Yes	Scale Factor:	1.00
Ground Level:	Base		

Mesh Criteria :

Max. Distance Between Nodes on Mesh Line (ft) : 3.00
Merge Node Tolerance (in) : 0.0100
Geometry Tolerance (in) : 0.0050

Walls Out-of-plane Stiffness Not Included in Analysis.
Sign considered for Dynamic Load Case Results.
Rigid Links Included at Fixed Beam-to-Wall Locations
Eigenvalue Analysis : Eigen Vectors (Subspace Iteration)

LOAD CASE DEFINITIONS:

D	DeadLoad	RAMUSER
Lp	PosLiveLoad	RAMUSER
Sp	PosSnowLoad	RAMUSER
Dyn1	Modal Drift X	Dyn_ASCE716_CQC_X_+E
Dyn2	Modal Drift X	Dyn_ASCE716_CQC_X_-E
Dyn3	Modal Drift Y	Dyn_ASCE716_CQC_Y_+E
Dyn4	Modal Drift Y	Dyn_ASCE716_CQC_Y_-E

Frame #1:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
109	D	-0.03	-0.00	39.49	0.00	0.00	0.00
	Lp	0.00	-0.07	18.88	0.00	0.00	0.00
	Sp	-0.01	0.02	6.91	0.00	0.00	0.00
	Dyn1	-2.38	9.17	-17.03	0.00	0.00	0.00
	Dyn2	-4.53	17.46	-32.19	0.00	0.00	0.00
	Dyn3	4.27	-15.85	29.86	0.00	0.00	0.00
	Dyn4	8.07	-30.20	56.61	0.00	0.00	0.00
110	D	-0.02	-0.03	38.42	0.00	0.00	0.00
	Lp	-0.04	0.07	18.53	0.00	0.00	0.00
	Sp	0.01	-0.03	6.71	0.00	0.00	0.00
	Dyn1	-2.39	9.17	17.01	0.00	0.00	0.00
	Dyn2	-4.54	17.46	32.16	0.00	0.00	0.00
	Dyn3	4.29	-15.84	-29.86	0.00	0.00	0.00
	Dyn4	8.09	-30.20	-56.61	0.00	0.00	0.00

Frame #2:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
104	D	0.10	-0.01	31.25	0.00	0.00	0.00

PRCNC20221036

Frame Reactions

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Lp	0.06	-0.00	12.23	0.00	0.00	0.00
	Sp	-0.00	0.00	1.80	0.00	0.00	0.00
	Dyn1	-38.66	-0.01	-86.80	0.00	0.00	0.00
	Dyn2	-34.48	0.03	-77.89	0.00	0.00	0.00
	Dyn3	-8.71	-0.03	-22.41	0.00	0.00	0.00
	Dyn4	-7.10	-0.08	-19.14	0.00	0.00	0.00
108	D	-0.17	0.05	43.23	0.00	0.00	0.00
	Lp	-0.07	0.06	22.72	0.00	0.00	0.00
	Sp	0.00	-0.00	3.72	0.00	0.00	0.00
	Dyn1	1.31	0.32	86.71	0.00	0.00	0.00
	Dyn2	1.20	-0.63	77.88	0.00	0.00	0.00
	Dyn3	0.31	0.83	22.38	0.00	0.00	0.00
	Dyn4	0.23	1.61	19.08	0.00	0.00	0.00

Frame #3:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
105	D	0.01	-0.02	62.38	0.00	0.00	0.00
	Lp	0.01	0.00	27.81	0.00	0.00	0.00
	Sp	-0.00	0.00	8.70	0.00	0.00	0.00
	Dyn1	0.14	-13.01	-26.64	0.00	0.00	0.00
	Dyn2	0.12	22.42	42.91	0.00	0.00	0.00
	Dyn3	0.03	-25.54	-49.32	0.00	0.00	0.00
	Dyn4	-0.04	-52.68	-107.64	0.00	0.00	0.00
106	D	0.02	-0.04	54.95	0.00	0.00	0.00
	Lp	0.01	-0.01	29.47	0.00	0.00	0.00
	Sp	-0.00	0.00	0.01	0.00	0.00	0.00
	Dyn1	0.12	0.05	-0.12	0.00	0.00	0.00
	Dyn2	0.10	-0.10	0.22	0.00	0.00	0.00
	Dyn3	-0.03	0.09	-0.25	0.00	0.00	0.00
	Dyn4	0.03	0.23	-0.56	0.00	0.00	0.00
107	D	0.01	-0.02	61.49	0.00	0.00	0.00
	Lp	0.01	-0.01	20.42	0.00	0.00	0.00
	Sp	0.00	0.00	7.51	0.00	0.00	0.00
	Dyn1	0.13	-13.02	26.59	0.00	0.00	0.00
	Dyn2	0.09	22.42	-43.09	0.00	0.00	0.00
	Dyn3	-0.06	-25.54	49.50	0.00	0.00	0.00
	Dyn4	-0.11	-52.69	107.92	0.00	0.00	0.00

Frame #4:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
111	D	0.00	-0.00	95.43	0.00	0.00	0.00
	Lp	0.02	-0.01	32.50	0.00	0.00	0.00
	Sp	0.00	-0.00	14.06	0.00	0.00	0.00
	Dyn1	-75.19	-0.12	-171.12	0.00	0.00	0.00
	Dyn2	-55.04	-0.17	-124.81	0.00	0.00	0.00
	Dyn3	20.97	0.38	49.35	0.00	0.00	0.00
	Dyn4	-18.33	0.45	-44.96	0.00	0.00	0.00
113	D	0.09	0.01	57.44	0.00	0.00	0.00
	Lp	0.04	-0.00	36.14	0.00	0.00	0.00
	Sp	-0.00	0.00	0.02	0.00	0.00	0.00
	Dyn1	0.21	-0.01	0.31	0.00	0.00	0.00
	Dyn2	0.15	0.03	0.17	0.00	0.00	0.00
	Dyn3	-0.05	-0.09	-0.43	0.00	0.00	0.00
	Dyn4	-0.07	-0.09	-0.24	0.00	0.00	0.00
116	D	0.01	-0.01	89.96	0.00	0.00	0.00
	Lp	0.01	-0.02	46.59	0.00	0.00	0.00
	Sp	0.00	0.00	14.06	0.00	0.00	0.00
	Dyn1	-75.33	-0.06	170.96	0.00	0.00	0.00
	Dyn2	-55.10	0.12	124.80	0.00	0.00	0.00
	Dyn3	21.08	0.35	-49.08	0.00	0.00	0.00
	Dyn4	-18.34	0.32	45.07	0.00	0.00	0.00

Frame #5:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
139	D	-0.92	-1.30	117.68	0.00	0.00	0.00
	Lp	-0.15	-0.28	32.00	0.00	0.00	0.00
	Sp	0.00	-0.00	13.46	0.00	0.00	0.00
	Dyn1	0.30	5.07	22.80	0.00	0.00	0.00
	Dyn2	0.25	-15.35	-53.95	0.00	0.00	0.00
	Dyn3	-0.09	-35.27	-125.31	0.00	0.00	0.00
	Dyn4	-0.07	-16.05	-56.14	0.00	0.00	0.00
140	D	0.17	-0.11	83.28	0.00	0.00	0.00
	Lp	0.02	-0.09	31.89	0.00	0.00	0.00
	Sp	0.00	-0.00	0.03	0.00	0.00	0.00
	Dyn1	0.34	-0.06	0.13	0.00	0.00	0.00
	Dyn2	0.27	0.17	0.47	0.00	0.00	0.00
	Dyn3	-0.17	0.39	1.03	0.00	0.00	0.00
	Dyn4	-0.18	0.17	0.46	0.00	0.00	0.00
141	D	-0.05	-0.12	73.70	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Lp	-0.01	-0.12	21.06	0.00	0.00	0.00
	Sp	0.00	-0.00	7.20	0.00	0.00	0.00
	Dyn1	0.33	5.10	-22.66	0.00	0.00	0.00
	Dyn2	0.24	-15.44	53.61	0.00	0.00	0.00
	Dyn3	-0.11	-35.47	124.41	0.00	0.00	0.00
	Dyn4	0.08	-16.14	55.75	0.00	0.00	0.00

Frame #6:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
124	D	-0.13	0.06	59.07	0.00	0.00	0.00
	Lp	-0.06	0.01	43.21	0.00	0.00	0.00
	Sp	0.00	0.00	9.54	0.00	0.00	0.00
	Dyn1	0.57	0.08	-26.22	0.00	0.00	0.00
	Dyn2	0.62	0.26	-18.33	0.00	0.00	0.00
	Dyn3	0.18	0.74	96.08	0.00	0.00	0.00
	Dyn4	-0.17	0.41	54.81	0.00	0.00	0.00
125	D	0.02	0.06	46.68	0.00	0.00	0.00
	Lp	0.00	0.00	42.52	0.00	0.00	0.00
	Sp	-0.00	-0.00	0.02	0.00	0.00	0.00
	Dyn1	-5.41	20.47	0.64	0.00	0.00	0.00
	Dyn2	-5.50	20.32	-0.58	0.00	0.00	0.00
	Dyn3	20.29	-75.61	-1.96	0.00	0.00	0.00
	Dyn4	12.06	-44.98	-1.22	0.00	0.00	0.00
127	D	0.03	0.06	68.45	0.00	0.00	0.00
	Lp	0.01	0.01	46.04	0.00	0.00	0.00
	Sp	-0.00	-0.00	13.38	0.00	0.00	0.00
	Dyn1	-0.08	0.03	25.66	0.00	0.00	0.00
	Dyn2	-0.10	-0.07	18.00	0.00	0.00	0.00
	Dyn3	0.05	-0.16	-94.77	0.00	0.00	0.00
	Dyn4	0.07	0.08	-53.88	0.00	0.00	0.00

Frame #7:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
119	D	0.14	0.05	57.63	0.00	0.00	0.00
	Lp	0.04	0.02	28.18	0.00	0.00	0.00
	Sp	-0.00	-0.00	5.71	0.00	0.00	0.00
	Dyn1	0.28	0.06	-92.84	0.00	0.00	0.00
	Dyn2	0.38	0.09	-141.02	0.00	0.00	0.00
	Dyn3	0.14	0.13	-76.81	0.00	0.00	0.00
	Dyn4	0.15	0.08	-36.56	0.00	0.00	0.00

Frame Reactions

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
122	D	0.13	0.05	88.49	0.00	0.00	0.00
	Lp	0.02	0.01	38.14	0.00	0.00	0.00
	Sp	-0.00	-0.00	9.52	0.00	0.00	0.00
	Dyn1	-47.34	-12.68	93.07	0.00	0.00	0.00
	Dyn2	-65.87	-17.65	141.34	0.00	0.00	0.00
	Dyn3	-36.97	-9.90	76.85	0.00	0.00	0.00
	Dyn4	-20.15	-5.40	36.65	0.00	0.00	0.00

Frame #8:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
117	D	0.06	-0.00	62.15	0.00	0.00	0.00
	Lp	0.01	-0.05	22.29	0.00	0.00	0.00
	Sp	-0.00	0.00	7.14	0.00	0.00	0.00
	Dyn1	0.37	0.05	-18.65	0.00	0.00	0.00
	Dyn2	0.43	0.10	-15.46	0.00	0.00	0.00
	Dyn3	0.17	0.29	60.90	0.00	0.00	0.00
	Dyn4	-0.16	0.23	53.67	0.00	0.00	0.00
118	D	0.02	0.02	49.60	0.00	0.00	0.00
	Lp	-0.02	0.02	18.48	0.00	0.00	0.00
	Sp	0.00	-0.00	5.99	0.00	0.00	0.00
	Dyn1	-1.86	7.73	18.49	0.00	0.00	0.00
	Dyn2	-2.54	9.75	15.28	0.00	0.00	0.00
	Dyn3	7.84	-28.87	-61.05	0.00	0.00	0.00
	Dyn4	7.14	-26.73	-53.65	0.00	0.00	0.00

Frame #9:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
112	D	-0.07	-0.02	111.09	0.00	0.00	0.00
	Lp	-0.03	-0.03	42.12	0.00	0.00	0.00
	Sp	0.00	-0.00	19.44	0.00	0.00	0.00
	Dyn1	-75.08	-0.19	-223.90	0.00	0.00	0.00
	Dyn2	-77.03	-0.32	-240.42	0.00	0.00	0.00
	Dyn3	-21.99	0.85	-70.69	0.00	0.00	0.00
	Dyn4	19.22	0.91	-48.32	0.00	0.00	0.00
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn1	-75.44	10.23	208.76	0.00	0.00	0.00
	Dyn2	-77.31	-22.22	215.48	0.00	0.00	0.00
	Dyn3	-21.56	-69.64	-175.72	0.00	0.00	0.00
	Dyn4	19.43	-61.43	-192.47	0.00	0.00	0.00

Frame Reactions

Frame #10:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn1	-75.44	10.23	208.76	0.00	0.00	0.00
	Dyn2	-77.31	-22.22	215.48	0.00	0.00	0.00
	Dyn3	-21.56	-69.64	-175.72	0.00	0.00	0.00
	Dyn4	19.43	-61.43	-192.47	0.00	0.00	0.00
115	D	-0.05	0.01	61.44	0.00	0.00	0.00
	Lp	-0.01	-0.02	33.79	0.00	0.00	0.00
	Sp	0.00	0.00	2.95	0.00	0.00	0.00
	Dyn1	0.39	10.75	35.13	0.00	0.00	0.00
	Dyn2	0.35	-22.62	39.54	0.00	0.00	0.00
	Dyn3	0.09	-69.82	195.70	0.00	0.00	0.00
	Dyn4	0.08	-61.44	171.45	0.00	0.00	0.00

Sum	Rx	Ry
E1	506.26	92.13
E2	526.43	116.84
E3	127.6	586.53
E4	77.98	589.4
E5	519.91	181.5
E6	500.09	195.21
E7	500.09	195.21
E8	519.91	181.5
E9	254.54	588.18
E10	174.16	584.83
E11	174.16	584.83
E12	254.54	588.18
E13	511.72	186.88
E14	509.3	200.24
E15	509.3	200.24
E16	511.72	186.88
E17	224.16	591.04
E18	162.05	590.01
E19	162.05	590.01
E20	224.16	591.04
E21	547.25	213.39
E22	520.28	206.35
E23	520.28	206.35
E24	547.25	213.39
E25	260.32	587.55
E26	170.06	585.47
E27	170.06	585.47
E28	260.32	587.55
E29	533.38	196.25
E30	529.48	215.38
E31	529.48	215.38
E32	533.38	196.25
E33	229.97	590.44
E34	168.08	593.35
E35	168.08	593.35
E36	229.97	590.44
	547.25	593.35

6.21.22 Model

Loads and Applied Forces

RAM Frame 17.03.00.285
Bentley DataBase: Pierce College - 6.14.22 06/21/22 22:06:53

LOAD CASE: ELF

Seismic ASCE 7-16 Equivalent Lateral Force
Importance Factor: 1.25 TL: 6.00 s
Site Class C: Very Dense Soil and Soft Rock
Ss: 1.253 g S1: 0.432 g
Fa: 1.200 Fv: 1.500 SDs: 1.002 g SD1: 0.432 g
Risk Category: III Seismic Design Category: D
Provisions for: Force
Ground Level: Base

Dir	Eccent	R	Ta Equation	Building Period-T
X	+ And -	8.0	Std,Ct=0.030,x=0.75	Calculated
Y	+ And -	8.0	Std,Ct=0.030,x=0.75	Calculated

Dir	Ta	Cu	T	T-used	Cs Eq12.8-2	Cs(max) Eq12.8-3	Cs(min) Eq12.8-5	Cs-used	k
X	0.639	1.400	0.793	0.793	0.157	0.085	0.055	0.085	1.146

Dir	Ta	Cu	T	T-used	Cs Eq12.8-2	Cs(max) Eq12.8-3	Cs(min) Eq12.8-5	Cs-used	k
Y	0.639	1.400	0.782	0.782	0.157	0.086	0.055	0.086	1.141

Total Building Weight (kips) = 5889.00

	RAM Cs	
Seismic Mass, kips	5889	From RAM
Cs_x	0.085	From RAM
Cs_y	0.086	From RAM
Base Shear X	500.565	
Base Shear Y	506.454	

ELF Frame Reaction to find base shear

PRCNC20221036

Sum	Rx	Ry
E1	403.9	127.55
E2	408.51	227.25
E3	170.04	480.94
E4	140.47	463.58
E5	0	0
E6	0	0
E7	0	0
E8	0	0
E9	0	0
E10	0	0
E11	0	0
E12	0	0
E13	0	0
E14	0	0
E15	0	0
E16	0	0
E17	0	0
E18	0	0
E19	0	0
E20	0	0
E21	0	0
E22	0	0
E23	0	0
E24	0	0
E25	0	0
E26	0	0
E27	0	0
E28	0	0
E29	0	0
E30	0	0
E31	0	0
E32	0	0
E33	0	0
E34	0	0
E35	0	0
E36	0	0
	408.51	480.94

Loads and Applied Forces

RAM Frame 17.03.00.285
DataBase: Pierce College - 6.14.22 06/21/22 22:06:53

LOAD CASE: ELF

Seismic ASCE 7-16 Equivalent Lateral Force
Importance Factor: 1.25 TL: 6.00 s
Site Class C: Very Dense Soil and Soft Rock
Ss: 1.253 g S1: 0.432 g
Fa: 1.200 Fv: 1.500 SDs: 1.002 g SD1: 0.432 g
Risk Category: III Seismic Design Category: D
Provisions for: Force
Ground Level: Base

Dir	Eccent	R	Ta Equation	Building Period-T
X	+ And -	8.0	Std,Ct=0.030,x=0.75	Calculated
Y	+ And -	8.0	Std,Ct=0.030,x=0.75	Calculated

Dir	Ta	Cu	T	T-used	Cs Eq12.8-2	Cs(max) Eq12.8-3	Cs(min) Eq12.8-5	Cs-used	k
X	0.639	1.400	0.793	0.793	0.157	0.085	0.055	0.085	1.146

Dir	Ta	Cu	T	T-used	Cs Eq12.8-2	Cs(max) Eq12.8-3	Cs(min) Eq12.8-5	Cs-used	k
Y	0.639	1.400	0.782	0.782	0.157	0.086	0.055	0.086	1.141

Total Building Weight (kips) = 5889.00

Scale Modal to These Reactions	ELF Reactions
Base Shear X	**547.25**
Base Shear Y	**593.35**

	RAM Cs	
Seismic Mass, kips	5889	From RAM
Cs_x	0.085	From RAM
Cs_y	0.086	From RAM
Base Shear X	500.565	
Base Shear Y	506.454	

	Modal Not Scaled
X	408.51
Y	480.94

RAM Cs Scale Factor	RAM Reactions Scale Factor
0.1961	0.2143
0.1685	0.1974

6.21.22 Model

Modal model scaled at 0.16 Base Shear to fine correct Modal Scale Factor

Modal Model Scale factors in the X and Y directions

PRCNC20221036

Frame Reactions

RAM Frame 17.03.00.285
DataBase: Pierce College - 6.14.22 06/21/22 23:18:21
Building Code: IBC

Frame Reaction from modal model scaled to ELF model

CRITERIA:

Rigid End Zones: Ignore Effects
Member Force Output: At Face of Joint
P-Delta: Yes Scale Factor: 1.00
Ground Level: Base
Mesh Criteria :
Max. Distance Between Nodes on Mesh Line (ft) : 3.00
Merge Node Tolerance (in) : 0.0100
Geometry Tolerance (in) : 0.0050
Walls Out-of-plane Stiffness Not Included in Analysis.
Sign considered for Dynamic Load Case Results.
Rigid Links Included at Fixed Beam-to-Wall Locations
Eigenvalue Analysis : Eigen Vectors (Subspace Iteration)

LOAD CASE DEFINITIONS:

D	DeadLoad	RAMUSER
Lp	PosLiveLoad	RAMUSER
Sp	PosSnowLoad	RAMUSER
Dyn5	Modal Force X	Dyn_ASCE716_CQC_X_+E
Dyn6	Modal Force X	Dyn_ASCE716_CQC_X_-E
Dyn7	Modal Force Y	Dyn_ASCE716_CQC_Y_+E
Dyn8	Modal Force Y	Dyn_ASCE716_CQC_Y_-E

Frame #1:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
109	D	-0.03	-0.00	39.49	0.00	0.00	0.00
	Lp	0.00	-0.07	18.88	0.00	0.00	0.00
	Sp	-0.01	0.02	6.91	0.00	0.00	0.00
	Dyn5	-3.19	12.28	-22.80	0.00	0.00	0.00
	Dyn6	-6.07	23.39	-43.11	0.00	0.00	0.00
	Dyn7	5.26	-19.55	36.83	0.00	0.00	0.00
	Dyn8	9.96	-37.26	69.84	0.00	0.00	0.00
110	D	-0.02	-0.03	38.42	0.00	0.00	0.00
	Lp	-0.04	0.07	18.53	0.00	0.00	0.00
	Sp	0.01	-0.03	6.71	0.00	0.00	0.00
	Dyn5	-3.20	12.28	22.79	0.00	0.00	0.00
	Dyn6	-6.08	23.39	43.07	0.00	0.00	0.00
	Dyn7	5.29	-19.55	-36.84	0.00	0.00	0.00
	Dyn8	9.98	-37.26	-69.84	0.00	0.00	0.00

Frame #2:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
104	D	0.10	-0.01	31.25	0.00	0.00	0.00

PRCNC20221036

Frame Reactions

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Lp	0.06	-0.00	12.23	0.00	0.00	0.00
	Sp	-0.00	0.00	1.80	0.00	0.00	0.00
	Dyn5	-51.78	-0.02	-116.26	0.00	0.00	0.00
	Dyn6	-46.18	0.05	-104.32	0.00	0.00	0.00
	Dyn7	-10.75	-0.04	-27.65	0.00	0.00	0.00
	Dyn8	-8.76	-0.10	-23.61	0.00	0.00	0.00
108	D	-0.17	0.05	43.23	0.00	0.00	0.00
	Lp	-0.07	0.06	22.72	0.00	0.00	0.00
	Sp	0.00	-0.00	3.72	0.00	0.00	0.00
	Dyn5	1.75	0.43	116.14	0.00	0.00	0.00
	Dyn6	1.61	-0.84	104.31	0.00	0.00	0.00
	Dyn7	0.38	1.03	27.62	0.00	0.00	0.00
	Dyn8	0.29	1.99	23.54	0.00	0.00	0.00

Frame #3:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
105	D	0.01	-0.02	62.38	0.00	0.00	0.00
	Lp	0.01	0.00	27.81	0.00	0.00	0.00
	Sp	-0.00	0.00	8.70	0.00	0.00	0.00
	Dyn5	0.18	-17.42	-35.68	0.00	0.00	0.00
	Dyn6	0.15	30.03	57.47	0.00	0.00	0.00
	Dyn7	0.04	-31.51	-60.85	0.00	0.00	0.00
	Dyn8	-0.05	-64.99	-132.80	0.00	0.00	0.00
106	D	0.02	-0.04	54.95	0.00	0.00	0.00
	Lp	0.01	-0.01	29.47	0.00	0.00	0.00
	Sp	-0.00	0.00	0.01	0.00	0.00	0.00
	Dyn5	0.17	0.07	-0.17	0.00	0.00	0.00
	Dyn6	0.14	-0.13	0.29	0.00	0.00	0.00
	Dyn7	-0.04	0.12	-0.31	0.00	0.00	0.00
	Dyn8	0.04	0.28	-0.69	0.00	0.00	0.00
107	D	0.01	-0.02	61.49	0.00	0.00	0.00
	Lp	0.01	-0.01	20.42	0.00	0.00	0.00
	Sp	0.00	0.00	7.51	0.00	0.00	0.00
	Dyn5	0.17	-17.43	35.61	0.00	0.00	0.00
	Dyn6	0.12	30.03	-57.71	0.00	0.00	0.00
	Dyn7	-0.07	-31.51	61.07	0.00	0.00	0.00
	Dyn8	-0.13	-65.00	133.15	0.00	0.00	0.00

Frame #4:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
111	D	0.00	-0.00	95.43	0.00	0.00	0.00
	Lp	0.02	-0.01	32.50	0.00	0.00	0.00
	Sp	0.00	-0.00	14.06	0.00	0.00	0.00
	Dyn5	-100.71	-0.15	-229.19	0.00	0.00	0.00
	Dyn6	-73.72	-0.23	-167.17	0.00	0.00	0.00
	Dyn7	25.87	0.46	60.88	0.00	0.00	0.00
	Dyn8	-22.62	0.55	-55.48	0.00	0.00	0.00
113	D	0.09	0.01	57.44	0.00	0.00	0.00
	Lp	0.04	-0.00	36.14	0.00	0.00	0.00
	Sp	-0.00	0.00	0.02	0.00	0.00	0.00
	Dyn5	0.28	-0.02	0.41	0.00	0.00	0.00
	Dyn6	0.20	0.05	0.22	0.00	0.00	0.00
	Dyn7	-0.06	-0.11	-0.53	0.00	0.00	0.00
	Dyn8	-0.08	-0.12	-0.30	0.00	0.00	0.00
116	D	0.01	-0.01	89.96	0.00	0.00	0.00
	Lp	0.01	-0.02	46.59	0.00	0.00	0.00
	Sp	0.00	0.00	14.06	0.00	0.00	0.00
	Dyn5	-100.90	-0.08	228.97	0.00	0.00	0.00
	Dyn6	-73.80	0.17	167.16	0.00	0.00	0.00
	Dyn7	26.00	0.43	-60.56	0.00	0.00	0.00
	Dyn8	-22.62	0.39	55.61	0.00	0.00	0.00

Frame #5:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
139	D	-0.92	-1.30	117.68	0.00	0.00	0.00
	Lp	-0.15	-0.28	32.00	0.00	0.00	0.00
	Sp	0.00	-0.00	13.46	0.00	0.00	0.00
	Dyn5	0.40	6.79	30.54	0.00	0.00	0.00
	Dyn6	0.33	-20.56	-72.26	0.00	0.00	0.00
	Dyn7	-0.11	-43.51	-154.60	0.00	0.00	0.00
	Dyn8	-0.08	-19.80	-69.27	0.00	0.00	0.00
140	D	0.17	-0.11	83.28	0.00	0.00	0.00
	Lp	0.02	-0.09	31.89	0.00	0.00	0.00
	Sp	0.00	-0.00	0.03	0.00	0.00	0.00
	Dyn5	0.46	-0.07	0.17	0.00	0.00	0.00
	Dyn6	0.36	0.22	0.63	0.00	0.00	0.00
	Dyn7	-0.21	0.48	1.27	0.00	0.00	0.00
	Dyn8	-0.22	0.21	0.56	0.00	0.00	0.00
141	D	-0.05	-0.12	73.70	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Lp	-0.01	-0.12	21.06	0.00	0.00	0.00
	Sp	0.00	-0.00	7.20	0.00	0.00	0.00
	Dyn5	0.45	6.83	-30.35	0.00	0.00	0.00
	Dyn6	0.32	-20.68	71.80	0.00	0.00	0.00
	Dyn7	-0.13	-43.77	153.49	0.00	0.00	0.00
	Dyn8	0.10	-19.91	68.78	0.00	0.00	0.00

Frame #6:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
124	D	-0.13	0.06	59.07	0.00	0.00	0.00
	Lp	-0.06	0.01	43.21	0.00	0.00	0.00
	Sp	0.00	0.00	9.54	0.00	0.00	0.00
	Dyn5	0.76	0.11	-35.12	0.00	0.00	0.00
	Dyn6	0.82	0.35	-24.55	0.00	0.00	0.00
	Dyn7	0.22	0.91	118.54	0.00	0.00	0.00
	Dyn8	-0.20	0.51	67.62	0.00	0.00	0.00
125	D	0.02	0.06	46.68	0.00	0.00	0.00
	Lp	0.00	0.00	42.52	0.00	0.00	0.00
	Sp	-0.00	-0.00	0.02	0.00	0.00	0.00
	Dyn5	-7.24	27.42	0.86	0.00	0.00	0.00
	Dyn6	-7.37	27.22	-0.77	0.00	0.00	0.00
	Dyn7	25.04	-93.28	-2.41	0.00	0.00	0.00
	Dyn8	14.88	-55.49	-1.51	0.00	0.00	0.00
127	D	0.03	0.06	68.45	0.00	0.00	0.00
	Lp	0.01	0.01	46.04	0.00	0.00	0.00
	Sp	-0.00	-0.00	13.38	0.00	0.00	0.00
	Dyn5	-0.11	0.04	34.37	0.00	0.00	0.00
	Dyn6	-0.14	-0.10	24.11	0.00	0.00	0.00
	Dyn7	0.06	-0.20	-116.92	0.00	0.00	0.00
	Dyn8	0.08	0.10	-66.48	0.00	0.00	0.00

Frame #7:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
119	D	0.14	0.05	57.63	0.00	0.00	0.00
	Lp	0.04	0.02	28.18	0.00	0.00	0.00
	Sp	-0.00	-0.00	5.71	0.00	0.00	0.00
	Dyn5	0.38	0.07	-124.34	0.00	0.00	0.00
	Dyn6	0.51	0.12	-188.88	0.00	0.00	0.00
	Dyn7	0.17	0.16	-94.77	0.00	0.00	0.00
	Dyn8	0.18	0.10	-45.11	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
122	D	0.13	0.05	88.49	0.00	0.00	0.00
	Lp	0.02	0.01	38.14	0.00	0.00	0.00
	Sp	-0.00	-0.00	9.52	0.00	0.00	0.00
	Dyn5	-63.41	-16.99	124.66	0.00	0.00	0.00
	Dyn6	-88.23	-23.64	189.31	0.00	0.00	0.00
	Dyn7	-45.61	-12.21	94.82	0.00	0.00	0.00
	Dyn8	-24.87	-6.66	45.22	0.00	0.00	0.00

Frame #8:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
117	D	0.06	-0.00	62.15	0.00	0.00	0.00
	Lp	0.01	-0.05	22.29	0.00	0.00	0.00
	Sp	-0.00	0.00	7.14	0.00	0.00	0.00
	Dyn5	0.49	0.07	-24.97	0.00	0.00	0.00
	Dyn6	0.58	0.14	-20.71	0.00	0.00	0.00
	Dyn7	0.21	0.36	75.14	0.00	0.00	0.00
	Dyn8	-0.20	0.29	66.21	0.00	0.00	0.00
118	D	0.02	0.02	49.60	0.00	0.00	0.00
	Lp	-0.02	0.02	18.48	0.00	0.00	0.00
	Sp	0.00	-0.00	5.99	0.00	0.00	0.00
	Dyn5	-2.50	10.36	24.77	0.00	0.00	0.00
	Dyn6	-3.40	13.05	20.47	0.00	0.00	0.00
	Dyn7	9.67	-35.62	-75.32	0.00	0.00	0.00
	Dyn8	8.81	-32.98	-66.19	0.00	0.00	0.00

Frame #9:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
112	D	-0.07	-0.02	111.09	0.00	0.00	0.00
	Lp	-0.03	-0.03	42.12	0.00	0.00	0.00
	Sp	0.00	-0.00	19.44	0.00	0.00	0.00
	Dyn5	-100.56	-0.25	-299.88	0.00	0.00	0.00
	Dyn6	-103.17	-0.43	-322.02	0.00	0.00	0.00
	Dyn7	-27.13	1.05	-87.21	0.00	0.00	0.00
	Dyn8	23.72	1.13	-59.62	0.00	0.00	0.00
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn5	-101.04	13.71	279.60	0.00	0.00	0.00
	Dyn6	-103.54	-29.77	288.60	0.00	0.00	0.00
	Dyn7	-26.60	-85.92	-216.79	0.00	0.00	0.00
	Dyn8	23.97	-75.79	-237.46	0.00	0.00	0.00

Frame Reactions

Frame #10:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn5	-101.04	13.71	279.60	0.00	0.00	0.00
	Dyn6	-103.54	-29.77	288.60	0.00	0.00	0.00
	Dyn7	-26.60	-85.92	-216.79	0.00	0.00	0.00
	Dyn8	23.97	-75.79	-237.46	0.00	0.00	0.00
115	D	-0.05	0.01	61.44	0.00	0.00	0.00
	Lp	-0.01	-0.02	33.79	0.00	0.00	0.00
	Sp	0.00	0.00	2.95	0.00	0.00	0.00
	Dyn5	0.52	14.40	47.05	0.00	0.00	0.00
	Dyn6	0.47	-30.29	52.97	0.00	0.00	0.00
	Dyn7	0.11	-86.14	241.44	0.00	0.00	0.00
	Dyn8	0.10	-75.80	211.52	0.00	0.00	0.00

Sum	Rx	Ry
E1	540.98	170.85
E2	547.13	304.42
E3	209.76	593.38
E4	173.29	571.95
E5	0	0
E6	0	0
E7	0	0
E8	0	0
E9	0	0
E10	0	0
E11	0	0
E12	0	0
E13	0	0
E14	0	0
E15	0	0
E16	0	0
E17	0	0
E18	0	0
E19	0	0
E20	0	0
E21	0	0
E22	0	0
E23	0	0
E24	0	0
E25	0	0
E26	0	0
E27	0	0
E28	0	0
E29	0	0
E30	0	0
E31	0	0
E32	0	0
E33	0	0
E34	0	0
E35	0	0
E36	0	0
	547	593

	ELF Reactions
Base Shear X	547
Base Shear Y	593

6.2.22 Model

Loads and Applied Forces

RAM Frame 17.03.00.285
DataBase: Pierce College - 6.14.22 06/21/22 22:06:53

LOAD CASE: ELF

Seismic ASCE 7-16 Equivalent Lateral Force
Importance Factor: 1.25 TL: 6.00 s
Site Class C: Very Dense Soil and Soft Rock
Ss: 1.253 g S1: 0.432 g
Fa: 1.200 Fv: 1.500 SDs: 1.002 g SD1: 0.432 g
Risk Category: III Seismic Design Category: D
Provisions for: Force
Ground Level: Base

Dir	Eccent	R	Ta Equation	Building Period-T
X	+ And -	8.0	Std,Ct=0.030,x=0.75	Calculated
Y	+ And -	8.0	Std,Ct=0.030,x=0.75	Calculated

Dir	Ta	Cu	T	T-used	Cs Eq12.8-2	Cs(max) Eq12.8-3	Cs(min) Eq12.8-5	Cs-used	k
X	0.639	1.400	0.793	0.793	0.157	0.085	0.055	0.085	1.146

Dir	Ta	Cu	T	T-used	Cs Eq12.8-2	Cs(max) Eq12.8-3	Cs(min) Eq12.8-5	Cs-used	k
Y	0.639	1.400	0.782	0.782	0.157	0.086	0.055	0.086	1.141

Total Building Weight (kips) = 5889.00

	RAM Cs	
Seismic Mass, kips	5889	From RAM
Cs_x	0.085	From RAM
Cs_y	0.086	From RAM
Base Shear X	500.565	
Base Shear Y	506.454	

	Modal Scaled	Check
X	547	100.0%
Y	593	100.0%

Scaled modal model base shear compared to ELF model base shear to verify scaling factors.

PRCNC20221036

integrus
ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Codes, Loads, & Material - Materials

PRCNC20221036

PLW2-36 FormLok® Composite Steel Deck-Slab (ASD)

with 5 in. 145 pcf 4000 psi NWC

Typical Composite Slab floor

Maximum Unshored Span

Gage	1 Span	2 Span	3 Span
22	7'-3"	8'-4"	8'-6"
21	7'-10"	8'-11"	9'-3"
20	8'-1"	9'-6"	9'-10"
19	8'-7"	10'-7"	10'-5"
18	8'-10"	11'-5"	10'-8"
16	9'-6"	12'-0"	11'-4"

Maximum Unshored Span based on:

Uniform Construction Load	20.00	psf	Minimum End Bearing	2.00	in.
Concentrated Construction Load	150.00	plf	Minimum Interior Bearing	5.00	in.
Concrete Ponding Allowance	2.00	psf	Maximum Deflection L/	240	≤ 0.5 in.
Concrete Volume	1.23	yd^3 / 100 ft^2 (Note: Does not include allowance for ponding)			

Composite Steel Deck Properties (steel deck only)

Gage	Fy ksi	wdd psf	Se+ $in.^3/ft$	Se- $in.^3/ft$	Id+ $in.^4/ft$	Id- $in.^4/ft$	Vn/Ω kip/ft
22	50	1.80	0.246	0.256	0.341	0.339	1.699
21	50	2.00	0.283	0.294	0.381	0.379	2.056
20	50	2.10	0.323	0.333	0.422	0.419	2.444
19	50	2.40	0.405	0.415	0.503	0.499	2.885
18	50	2.70	0.471	0.481	0.564	0.562	3.224
16	50	3.30	0.623	0.638	0.708	0.708	4.034

Superimposed Allowable Load, Wn/Ω, Limited by L/360 ,psf [1]

Gage	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"
22	658	470	348	264	204	160	126	100	79
21	722	517	384	293	227	179	142	114	91
20	784	562	419	320	250	197	158	127	102
19	906	652	487	374	293	234	188	153	125
18	1005	724	543	418	329	263	212	173	142
16	1234	893	671	519	411	330	269	218	174

Notes: [1] For high loads, commonly in excess of 200 psf, dynamic or impact loading, and long term concrete creep should be considered. Contact Verco for further assistance.

Composite Steel Deck-Slab Properties							Min. Temperature & Shrinkage	
Gage	w_1 psf	Ic $in.^4/ft$	Iu $in.^4/ft$	Id [1] $in.^4/ft$	Mno/Ω kip-ft/ft	Vno/Ω kip/ft	As min [2] $in.^2/ft$	or Dramix® Steel Fiber 4D 65/60BG, lbs/cy
22	50.1	4.77	12.61	8.69	3.19	3.92	0.028	15
21	50.3	5.13	12.78	8.96	3.48	4.25	0.028	15
20	50.4	5.47	12.95	9.21	3.76	4.61	0.028	15
19	50.7	6.13	13.27	9.70	4.31	4.74	0.028	15
18	51.0	6.64	13.54	10.09	4.75	4.74	0.028	15
16	51.6	7.79	14.15	10.97	5.79	4.74	0.028	15

Notes: [1] Id = (Ic + Iu)/2
[2] Minimum area of steel for temperature and shrinkage

Tables generated using calculator V3.2 based on ANSI/SDI C-2017 in accordance with 2018 IBC Section 2210.

Date: 4/25/2022

PRCNC20221036

18 Gage PLW2-36 FormLok® Grade 50

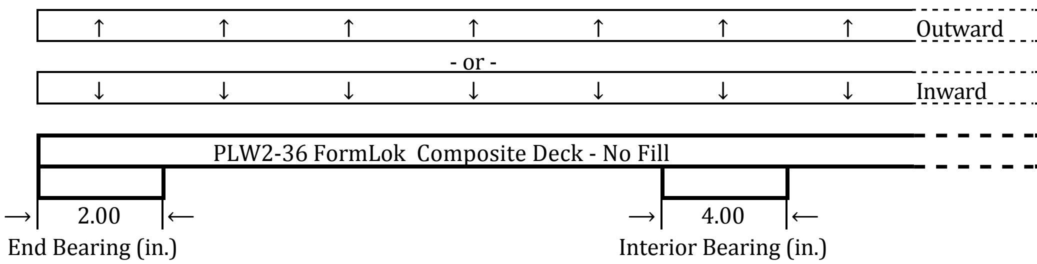
Uniform Allowable Load Table, ASD (psf)

For Butted End Deck

Un-topped W2 deck at front roof Canopy

36/4 Connection Pattern to Supports with
5/8" Visible Dia. Arc Spot Weld

Support Member A572 GR50
$0.125 \leq t_2$ (in.)



Inward Uniform Allowable Load Table, ASD (psf)

Span	Span	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"
1	Wn/Ω	192	167	147	130	116	104	94	85
	L/240	108	88	72	60	51	43	37	32
2	Wn/Ω	189	166	146	130	116	104	94	86
	L/240	-	-	-	-	-	104	89	77
3	Wn/Ω	233	204	181	161	144	129	117	106
	L/240	203	165	136	113	95	81	70	60

Outward (Uplift) Uniform Allowable Load Table, ASD (psf)

Span	Span	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"
1	Wn/Ω	196	171	150	133	119	106	96	87
	Rn/Ω	286	267	250	236	223	211	200	191
	L/240	107	87	72	60	51	43	37	32
2	Wn/Ω	186	162	143	127	114	102	93	84
	Rn/Ω	114	107	100	94	89	84	80	76
	L/240	-	-	-	-	-	-	-	-
3	Wn/Ω	229	201	177	158	141	127	115	104
	Rn/Ω	130	121	114	107	101	96	91	87
	L/240	-	-	-	-	96	81	70	60

Steel Deck Properties

t in	Fy ksi	wdd psf	Id+ $in.^4/ft$	Id- $in.^4/ft$	Se+ $in.^3/ft$	Se- $in.^3/ft$	Mn+/Ω lbs-ft/ft	Mn-/Ω lbs-ft/ft	Vn/Ω lbs/ft
0.047	50	2.70	0.564	0.562	0.471	0.481	1175	1200	3224

Where: $W \leq Wn/\Omega$

W = Required strength of the governing ASD load combination
Wn/Ω = Allowable strength governed by the steel deck
Rn/Ω = Allowable strength governed by connection tension

Steel Deck Uniform V1.0.5 in accordance with AISI S100-16 and AISI S310-16. Date: 6/2/2022

PRCNC20221036

18 ga PLW2-36 FormLok® Grade 50 Composite Deck-Slab (LRFD)

5 in. Total Slab Depth, f'c = 4000 psi, 150 pcf NWC

Un-topped W2 deck at front roof Canopy

5/8" Visible Dia. Arc Spot Weld Connections to Supports
36 / 4 Perpendicular Connection Pattern to Supports
PunchLok II Connection (VSC2) Sidelap Connections

A572 GR50 Support member or equivalent
0.25 ≤ Support Thickness (in.)

Design Diaphragm Shear Strength ΦSn, plf

Sidelap Connection Spacing (in.)	Span								
	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"	15'-0"
4	6227	6216	6207	6200	6194	6190	6186	6182	6179
6	5671	5660	5651	5644	5638	5633	5629	5626	5623
8	5432	5382	5404	5366	5385	5355	5373	5348	5363
12	5115	5103	5095	5088	5082	5077	5073	5070	5067
18	4956	4964	4909	4921	4930	4892	4902	4911	4881
24	4876	4825	4848	4810	4829	4799	4817	4792	4807
36	4797	4723	4596	4716	4612	4526	4624	4549	4484

Dipahragm Shear Stifness, G', kip/in.

Sidelap Connection Spacing (in.)	Span								
	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"	15'-0"
4	3921	3921	3921	3921	3921	3921	3921	3921	3921
6	3917	3917	3917	3917	3917	3917	3917	3917	3917
8	3914	3913	3913	3913	3913	3912	3913	3912	3913
12	3906	3905	3905	3905	3905	3905	3904	3904	3904
18	3898	3899	3895	3896	3897	3894	3895	3896	3893
24	3892	3887	3889	3885	3888	3884	3887	3884	3886
36	3883	3877	3871	3877	3873	3868	3874	3870	3866

Average Connection Spacing to Supports at all Parallel and Perpendicular Chords & Collectors (in.)

Sidelap Connection Spacing (in.)	Span								
	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"	15'-0"
4	3	3	3	3	3	3	3	3	3
6	4	4	4	4	4	4	4	4	4
8	4	4	4	4	4	4	4	4	4
12	4	4	4	4	4	4	4	4	4
18	4	4	4	4	4	4	4	4	4
24	4	4	4	4	4	4	4	4	4
36	4	4	5	4	5	5	5	5	5

Tables generated using calculator V2.1 based on AISI S310-16. Date: 6/6/2022

PRCNC20221036

18 Gage PLB™-36 Grade 50

Uniform Allowable Load Table, ASD (psf)

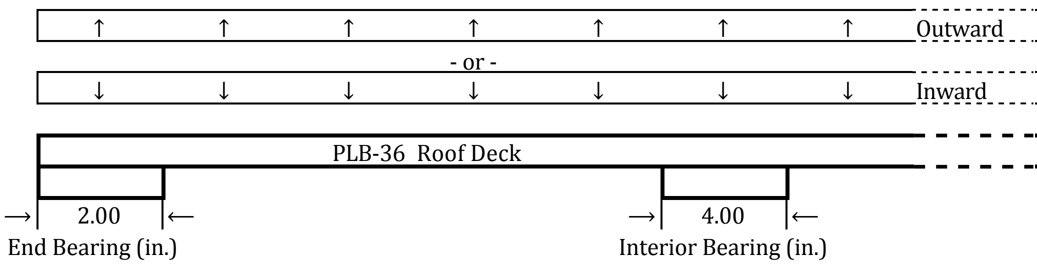
For End Lapped Deck

Typical roof Deck gravity uniform load

36/7/ 4 Connection Pattern to Supports with
5/8" Visible Dia. Arc Spot Weld

Support Member A572 GR50
$0.125 \le t_2$ (in.)

Note: Support welds at interlocking sidelaps may be 3/8" x 1 1/4" arc seam welds in lieu of arc spot welds.



Inward Uniform Allowable Load Table, ASD (psf)

Span	Span	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"
1	Wn/Ω	174	148	128	111	98	87	77	69
	L/240	92	72	58	47	39	32	27	23
2	Wn/Ω	181	155	134	116	102	91	81	73
	L/240	-	-	-	115	94	79	66	56
3	Wn/Ω	225	192	166	145	128	113	101	91
	L/240	175	138	110	90	74	62	52	44

Outward (Uplift) Uniform Allowable Load Table, ASD (psf)

Span	Span	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"
1	Wn/Ω	183	156	135	117	103	91	82	73
	Rn/Ω	538	496	461	430	403	379	358	340
	L/240	93	73	58	48	39	33	28	23
2	Wn/Ω	172	147	127	111	97	86	77	69
	Rn/Ω	136	125	116	108	102	96	90	86
	L/240	-	-	-	-	93	78	65	56
3	Wn/Ω	214	183	158	138	121	108	96	86
	Rn/Ω	154	142	132	123	116	109	103	97
	L/240	-	136	109	89	73	61	51	44

Steel Deck Properties

t in	Fy ksi	wdd psf	Id+ $in.^4/ft$	Id- $in.^4/ft$	Se+ $in.^3/ft$	Se- $in.^3/ft$	Mn+/Ω lbs-ft/ft	Mn-/Ω lbs-ft/ft	Vn/Ω lbs/ft
0.0478	50	2.90	0.302	0.306	0.314	0.331	783	826	4264

Where: $W \le Wn/\Omega$

W = Required strength of the governing ASD load combination
Wn/Ω = Allowable strength governed by the steel deck
Rn/Ω = Allowable strength governed by connection tension

Steel Deck Uniform V1.0.5 in accordance with AISI S100-16 and AISI S310-16. Date: 6/2/2022

PRCNC20221036

18 ga PLB™-36 Grade 50 Roof Deck

Seismic Diaphragm Shear

For Both Ends Lapped Deck

Typical roof Deck Lateral capacity

VERCO DECKING, INC.
A NUCOR COMPANY

5/8" Visible Dia. Arc Spot Weld Connections to Supports
36 / 7 / 4 Perpendicular Connection Pattern to Supports
PunchLok II Connection (VSC2) Sidelap Connections
Note: Support welds at interlocking sidelaps may be 3/8" x 1 1/4" arc seam welds in lieu of arc spot welds.

A572 GR50 Support Member or Equivalent
0.188 ≤ Support Thickness (in.)
3 in. Minimum Deck End Bearing Length

LRFD Design Seismic Diaphragm Shear Strength ΦSn (plf) Generic 3 Span Condition

Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	4340	4317	4299	4286	3820	3018	2445	2021	1698
6	3853	3801	3765	3738	3718	3018	2445	2021	1698
8	3439	3465	3311	3350	3243	3018	2445	2021	1698
12	2841	2733	2659	2604	2562	2528	2445	2021	1698
18	2454	2414	2085	2109	2126	1926	1959	1987	1698
24	2001	2052	1754	1829	1625	1699	1546	1615	1493
36	2001	1648	1396	1528	1352	1205	1325	1209	1108

Average Connection Spacing to Supports at Parallel Chords & Collectors (in.)

Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	4	4	4	4	4	4	4	4	4
6	6	6	6	6	6	6	6	6	6
8	8	8	8	8	8	8	8	8	8
12	10	10	10	11	11	11	11	12	12
18	12	12	14	14	14	15	15	15	16
24	16	15	18	17	19	18	20	17	18
36	16	20	24	21	24	27	24	26	29

Seismic or Wind Diaphragm Shear Stiffness, G' (kip/in.) Generic 3 Span Condition

Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	322	321	321	320	320	320	319	319	319
6	299	298	296	296	295	294	294	294	293
8	281	283	277	279	274	276	273	275	272
12	253	249	246	244	243	242	241	240	239
18	233	233	215	218	219	208	211	213	204
24	206	212	194	200	187	193	183	189	180
36	206	185	167	179	166	155	166	157	149

PRCNC20221036

18 ga PLB™-36 Grade 50 Roof Deck

Wind Diaphragm Shear

For Both Ends Lapped Deck

5/8" Visible Dia. Arc Spot Weld Connections to Supports
36 / 7 / 4 Perpendicular Connection Pattern to Supports
PunchLok II Connection (VSC2) Sidelap Connections

A572 GR50 Support Member or Equivalent
0.188 ≤ Support Thickness (in.)
3 in. Minimum Deck End Bearing Length

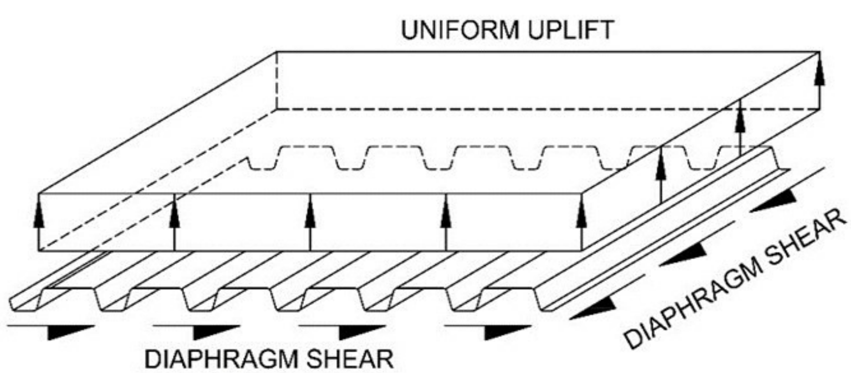
Note: Support welds at interlocking sidelaps may be 3/8" x 1 1/4" arc seam welds in lieu of arc spot welds.

LRFD Design Wind Diaphragm Shear Strength ΦSn (plf) Generic 3 Span Condition

Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	5917	5887	5862	4989	3820	3018	2445	2021	1698
6	5254	5183	5134	4989	3820	3018	2445	2021	1698
8	4689	4725	4516	4569	3820	3018	2445	2021	1698
12	3874	3727	3625	3550	3493	3018	2445	2021	1698
18	3346	3291	2843	2875	2899	2626	2445	2021	1698
24	2729	2798	2392	2494	2216	2317	2108	2021	1698
36	2729	2247	1904	2084	1843	1644	1807	1648	1511

Average Connection Spacing to Supports at Parallel Chords & Collectors (in.)

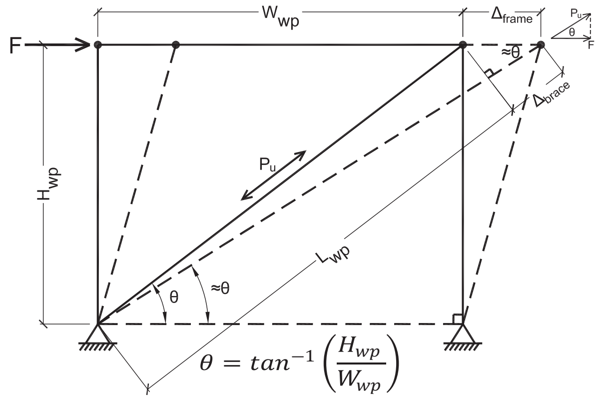
Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	4	4	4	4	4	4	4	4	4
6	6	6	6	6	6	6	6	6	6
8	8	8	8	8	8	8	8	8	8
12	10	10	10	11	11	12	12	12	12
18	12	12	14	14	14	15	15	18	18
24	16	15	18	17	19	18	20	19	24
36	16	20	24	21	24	27	24	26	29



Tables generated using V1.0.3 of calculator based on AISI S310-16. Date: 6/7/2022

PRCNC20221036

Brace Stiffness Calculations



$$\theta = tan^{-1}\left(\frac{H_{wp}}{W_{wp}}\right)$$

EQ# **Brace Force**

❶ $$P_u = {}^{F}\!/_{cos\theta} = F\left(\frac{L_{wp}}{W_{wp}}\right)$$

Brace Elongation & Stiffness (Elastic)

❷ $$\Delta_{brace} = \frac{P_u\ L_{wp}}{A_{sc}\ KF\ E} = {}^{P_u}\!/_{K_{eff}} \Rightarrow$$

❸ $$K_{eff} = {}^{P_u}\!/_{\Delta_{brace}} \Rightarrow K_{eff} = \frac{KF\ A_{sc}\ E}{L_{wp}}$$

Frame Deflection (Elastic)

$$\Delta_{frame} = \frac{\Delta_{brace}}{cos\theta} \xRightarrow{\text{sub from ❷}} \Delta_{frame} = \frac{P_u}{K_{eff}\ cos\theta} \xRightarrow{\text{sub from ❶}}$$

❹ $$\Delta_{frame} = \frac{F}{K_{eff}\ cos^2\theta} \xRightarrow{\text{sub from ❸}} \Delta_{frame} = \frac{F\ L_{wp}}{A_{sc}\ KF\ E\ cos^2\theta}$$

Alternate Forms (Elastic)

$$\Delta_{frame} = \frac{2\Phi({}^{F_y}\!/_{E})\ H_{wp}}{KF\ sin2\theta}$$

$$Story\ Drift = \frac{\Delta_{frame}}{H_{wp}} = \frac{2\Phi({}^{F_y}\!/_{E})}{KF\ sin2\theta}$$

For LRFD design, use $\Phi = 0.9$ in addition to any factor of safety resulting from the ratio of the required A_{SC} to the provided A_{SC}.

Frame Stiffness

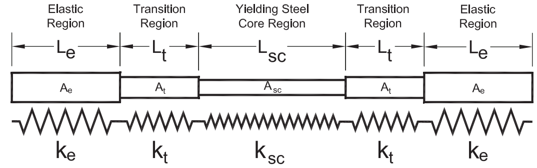
The effective horizontal stiffness can be summarized by the following statement:

$$\Delta_{frame} = {}^{F}\!/_{K_{frame}} \Rightarrow$$

$$K_{frame} = {}^{F}\!/_{\Delta_{frame}} \xRightarrow{\text{sub from ❹}}$$

$$K_{frame} = K_{eff}\ cos^2\theta$$

Stiffness Determination of a Composite Element



$$K_{sc\_wp} = \frac{A_{sc}\ E}{L_{wp}}$$

Axial stiffness of yielding core projected from workpoint to workpoint

$$K_{eff} = \frac{1}{\sum_{i=1}^{n} \frac{1}{k_i}}$$

Effective (Actual) stiffness of composite element

$$KF = \frac{K_{eff}}{K_{sc\_wp}}$$

Axial Stiffness Adjustment Factor supplied by CoreBrace

$$K_{eff} = \frac{A_{sc}\ (KF \cdot E)}{L_{wp}}$$

Effective stiffness of BRB for use in deflection analysis

Rigid Assumption

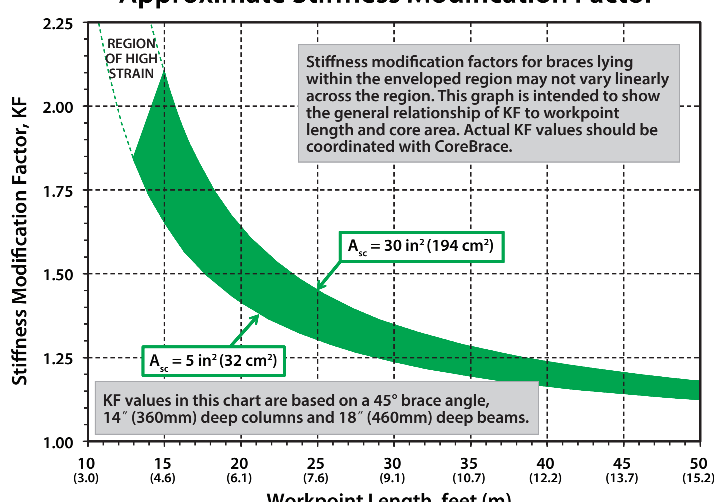
If k_e and k_t are assumed rigid, the above equation for KF simplifies to:

$$KF \cong \frac{L_{wp}}{L_{sc}} = \frac{1}{0.6} = 1.67 \Rightarrow$$

$$K_{eff} \cong 1.67 K_{sc\_wp}$$

This assumption can result in significant error as the ratio of L_{wp}/L_{SC} increases and can underestimate elastic deformations. However, since the elastic deformations of non-yielding regions calculated with non-rigid assumptions are amplified by Cd to calculate their inelastic deformations (which over-predicts these deformations , the rigid assumption may more accurately predict the total inelastic deformations of the element.

Approximate Stiffness Modification Factor



For design assistance please contact CoreBrace:

5789 West Wells Park Road
West Jordan, UT 84081
801.280.0701
www.corebrace.com

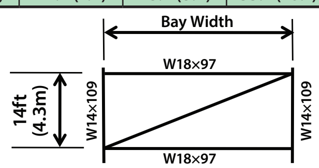
CoreBrace®
SUPERIOR SEISMIC PERFORMANCE

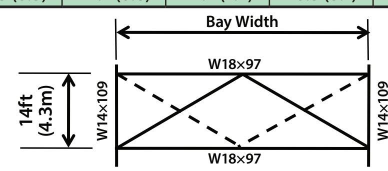
APPROXIMATE STIFFNESS MODIFICATION FACTORS, KF[1,2,7]

Sizes shown are representative of typical BRB sizes. Information on intermediate and larger sizes is available upon request.

STORY HEIGHT: 14ft (4.3m)

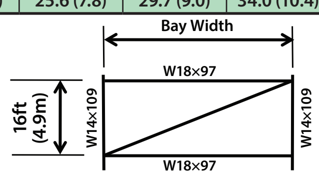
F_{ysc} = 38 ksi (262 MPa)		Bay Width, ft (m)									
A_{sc}[3] in^2 (cm^2)	P_{y_axial}[4] kip (kN)	15 (4.6)	20 (6.1)	25 (7.6)	30 (9.1)	35 (10.7)	30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)
		SINGLE DIAGONAL					CHEVRON/V				
2.0 (13)	68 (306)	1.36	1.33	1.31	1.29	1.32	1.36	1.35	1.33	1.32	1.31
3.0 (19)	103 (448)	1.37	1.34	1.32	1.30	1.33	1.37	1.35	1.34	1.33	1.32
4.0 (26)	137 (613)	1.39	1.36	1.33	1.31	1.34	1.39	1.37	1.36	1.34	1.33
5.0 (32)	171 (754)	1.41	1.38	1.35	1.33	1.35	1.41	1.39	1.38	1.36	1.35
6.0 (39)	205 (919)	1.45	1.41	1.38	1.35	1.37	1.45	1.43	1.41	1.39	1.38
7.0 (45)	239 (1060)	1.43	1.39	1.36	1.34	1.36	1.43	1.41	1.39	1.38	1.36
8.0 (52)	274 (1225)	1.47	1.42	1.39	1.36	1.34	1.47	1.44	1.42	1.40	1.39
9.0 (58)	308 (1367)	1.45	1.40	1.37	1.35	1.33	1.45	1.42	1.40	1.39	1.37
10.0 (65)	342 (1532)	1.43	1.39	1.36	1.34	1.32	1.43	1.41	1.39	1.38	1.36
11.0 (71)	376 (1673)	1.50	1.45	1.41	1.38	1.36	1.50	1.47	1.45	1.43	1.41
12.0 (77)	410 (1814)	1.48	1.43	1.40	1.37	1.35	1.48	1.46	1.43	1.42	1.40
14.0 (90)	479 (2121)	1.49	1.44	1.40	1.38	1.36	1.49	1.46	1.44	1.42	1.40
16.0 (103)	547 (2427)	1.52	1.47	1.43	1.40	1.38	1.52	1.50	1.47	1.45	1.43
18.0 (116)	616 (2733)	1.51	1.45	1.42	1.39	1.37	1.51	1.48	1.45	1.43	1.42
20.0 (129)	684 (3040)	1.56	1.50	1.46	1.43	1.40	1.56	1.53	1.50	1.48	1.46
22.0 (142)	752 (3346)	1.57	1.51	1.46	1.43	1.41	1.57	1.54	1.51	1.49	1.46
24.0 (155)	821 (3652)	1.55	1.50	1.45	1.42	1.40	1.55	1.52	1.50	1.47	1.45
26.0 (168)	889 (3959)	1.63	1.56	1.50	1.47	1.44	1.63	1.59	1.56	1.53	1.50
28.0 (181)	958 (4265)	1.61	1.54	1.49	1.46	1.43	1.61	1.58	1.54	1.52	1.49
30.0 (194)	1026 (4571)	1.62	1.55	1.50	1.46	1.44	1.62	1.58	1.55	1.52	1.50
Workpoint Length, ft (m)		20.5 (6.3)	24.4 (7.4)	28.7 (8.7)	33.1 (10.1)	37.7 (11.5)	20.5 (6.3)	22.4 (6.8)	24.4 (7.4)	26.5 (8.1)	28.7 (8.7)

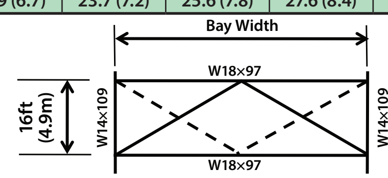




STORY HEIGHT: 16ft (4.9m)

F_{ysc} = 38 ksi (262 MPa)		Bay Width, ft (m)									
A_{sc}[3] in^2 (cm^2)	P_{y_axial}[4] kip (kN)	15 (4.6)	20 (6.1)	25 (7.6)	30 (9.1)	35 (10.7)	30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)
		SINGLE DIAGONAL					CHEVRON/V				
2.0 (13)	68 (306)	1.31	1.29	1.27	1.26	1.28	1.31	1.30	1.29	1.28	1.27
3.0 (19)	103 (448)	1.32	1.30	1.28	1.26	1.29	1.32	1.31	1.30	1.29	1.28
4.0 (26)	137 (613)	1.34	1.31	1.29	1.28	1.30	1.34	1.33	1.31	1.30	1.29
5.0 (32)	171 (754)	1.36	1.33	1.31	1.29	1.31	1.36	1.34	1.33	1.32	1.31
6.0 (39)	205 (919)	1.39	1.36	1.33	1.31	1.33	1.39	1.37	1.36	1.34	1.33
7.0 (45)	239 (1060)	1.37	1.34	1.32	1.30	1.32	1.37	1.36	1.34	1.33	1.32
8.0 (52)	274 (1225)	1.40	1.37	1.34	1.32	1.33	1.40	1.38	1.37	1.35	1.34
9.0 (58)	308 (1367)	1.38	1.35	1.33	1.31	1.33	1.38	1.37	1.35	1.34	1.33
10.0 (65)	342 (1532)	1.37	1.34	1.32	1.30	1.32	1.37	1.36	1.34	1.33	1.32
11.0 (71)	376 (1673)	1.43	1.39	1.36	1.34	1.35	1.43	1.41	1.39	1.37	1.36
12.0 (77)	410 (1814)	1.41	1.38	1.35	1.33	1.34	1.41	1.39	1.38	1.36	1.35
14.0 (90)	479 (2121)	1.42	1.38	1.35	1.33	1.34	1.42	1.40	1.38	1.36	1.35
16.0 (103)	547 (2427)	1.45	1.41	1.38	1.35	1.36	1.45	1.43	1.41	1.39	1.38
18.0 (116)	616 (2733)	1.43	1.39	1.36	1.34	1.35	1.43	1.41	1.39	1.38	1.36
20.0 (129)	684 (3040)	1.48	1.44	1.40	1.37	1.38	1.48	1.46	1.44	1.42	1.40
22.0 (142)	752 (3346)	1.49	1.44	1.40	1.38	1.39	1.49	1.46	1.44	1.42	1.40
24.0 (155)	821 (3652)	1.47	1.43	1.39	1.37	1.38	1.47	1.45	1.43	1.41	1.39
26.0 (168)	889 (3959)	1.53	1.48	1.44	1.41	1.38	1.53	1.51	1.48	1.46	1.44
28.0 (181)	958 (4265)	1.52	1.47	1.43	1.40	1.38	1.52	1.49	1.47	1.45	1.43
30.0 (194)	1026 (4571)	1.53	1.48	1.44	1.40	1.38	1.53	1.50	1.48	1.45	1.44
Workpoint Length, ft (m)		21.9 (6.7)	25.6 (7.8)	29.7 (9.0)	34.0 (10.4)	38.5 (11.7)	21.9 (6.7)	23.7 (7.2)	25.6 (7.8)	27.6 (8.4)	29.7 (9.0)





NOTES:

1. KF = K_{eff} / K_{sc_wp} where K_{eff} is the actual WP to WP stiffness of the installed brace and K_{sc_wp} is the stiffness of the indicated core area if it occurred from WP to WP. The indicated KF factors are expected "base value" (minimums). These can be adjusted upwards somewhat, but doing so can affect overstrength factors and may have undesirable effects. Coordinate with CoreBrace.
2. Indicated KF factors are approx values for the indicated frame geometry and beam/column sizes. Different beam and/or column sizes will result in different KF values.
3. Indicated core area is minimum cross sectional area of yielding portion of BRB core. Rounding increments used are for convenience only. Other core areas can be provided.
4. P_{y_axial} is the design yield strength of the BRB equal to: $\phi F_y A_{sc}$ based on the lower-bound of the yield stress range. Typ yield stress range = 42 ksi ± 4 ksi (290MPa ± 28MPa)
5. Where a KF is not given in the table, the brace orientation may result in an unacceptable level of strain. Contact CoreBrace for project specific details.
6. The area of the "Connection Region" (WP to Tip of gusset) is taken to be on average 5× stiffer than the "End Region" of the brace, which results in a semi-rigid offset.
7. Values given are intended for schematic design only. Contact CoreBrace for project specific information.
8. Brace sizes and Stiffness Modification Factors in addition to those shown are available upon request.
9. This table was created by considering core strain at 2% story drift minimum as required by AISC 341-16. For other story drifts, values may be diff

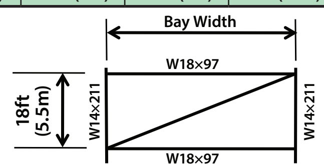
Approximate Stiffness Modification Factors, KF[1,2,7] (cont'd)

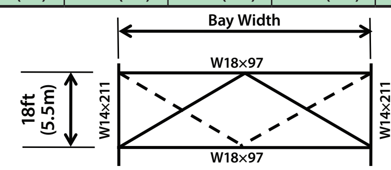
Sizes shown are representative of typical BRB sizes. Information on intermediate and larger sizes is available upon request.

PINNED COREBRACE BRB TABLES

STORY HEIGHT: 18ft (5.5m)

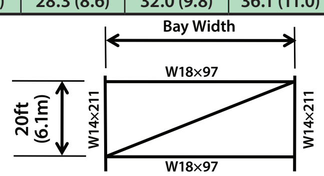
F_{ysc} = 38 ksi (262 MPa)		Bay Width, ft (m)									
A_{sc}[3] in² (cm²)	P_{y_axial}[4] kip (kN)	15 (4.6)	20 (6.1)	25 (7.6)	30 (9.1)	35 (10.7)	30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)
		SINGLE DIAGONAL					CHEVRON/V				
2.0 (13)	68 (306)	1.28	1.26	1.24	1.27	1.25	1.28	1.27	1.26	1.25	1.24
3.0 (19)	103 (448)	1.29	1.26	1.25	1.23	1.26	1.28	1.27	1.26	1.25	1.25
4.0 (26)	137 (613)	1.30	1.28	1.26	1.25	1.27	1.30	1.29	1.28	1.27	1.26
5.0 (32)	171 (754)	1.32	1.29	1.27	1.26	1.28	1.31	1.30	1.29	1.28	1.27
6.0 (39)	205 (919)	1.35	1.32	1.29	1.28	1.30	1.34	1.33	1.32	1.30	1.29
7.0 (45)	239 (1060)	1.33	1.30	1.28	1.27	1.28	1.33	1.32	1.30	1.29	1.28
8.0 (52)	274 (1225)	1.36	1.32	1.30	1.28	1.30	1.35	1.34	1.32	1.31	1.30
9.0 (58)	308 (1367)	1.34	1.31	1.29	1.27	1.29	1.34	1.32	1.31	1.30	1.29
10.0 (65)	342 (1532)	1.33	1.30	1.28	1.27	1.28	1.33	1.31	1.30	1.29	1.28
11.0 (71)	376 (1673)	1.38	1.34	1.32	1.30	1.31	1.37	1.36	1.34	1.33	1.32
12.0 (77)	410 (1814)	1.37	1.33	1.31	1.29	1.31	1.36	1.35	1.33	1.32	1.31
14.0 (90)	479 (2121)	1.37	1.34	1.31	1.29	1.31	1.37	1.35	1.34	1.32	1.31
16.0 (103)	547 (2427)	1.40	1.36	1.33	1.31	1.33	1.39	1.38	1.36	1.35	1.33
18.0 (116)	616 (2733)	1.39	1.35	1.32	1.30	1.32	1.38	1.36	1.35	1.34	1.32
20.0 (129)	684 (3040)	1.43	1.39	1.36	1.33	1.34	1.42	1.40	1.39	1.37	1.36
22.0 (142)	752 (3346)	1.44	1.39	1.36	1.34	1.35	1.43	1.41	1.39	1.37	1.36
24.0 (155)	821 (3652)	1.42	1.38	1.35	1.33	1.34	1.41	1.40	1.38	1.36	1.35
26.0 (168)	889 (3959)	1.48	1.42	1.39	1.36	1.34	1.46	1.44	1.42	1.41	1.39
28.0 (181)	958 (4265)	1.47	1.41	1.38	1.36	1.34	1.45	1.43	1.41	1.40	1.38
30.0 (194)	1026 (4571)	1.47	1.42	1.39	1.36	1.34	1.46	1.44	1.42	1.40	1.39
Workpoint Length, ft (m)		23.4 (7.1)	26.9 (8.2)	30.8 (9.4)	35.0 (10.7)	39.4 (12.0)	23.4 (7.1)	25.1 (7.7)	26.9 (8.2)	28.8 (8.8)	30.8 (9.4)

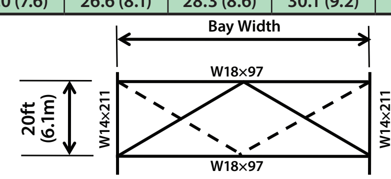




STORY HEIGHT: 20ft (6.1m)

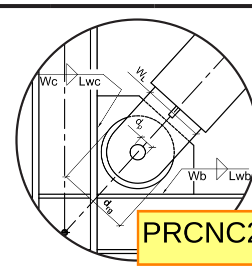
F_{ysc} = 38 ksi (262 MPa)		Bay Width, ft (m)									
A_{sc}[3] in² (cm²)	P_{y_axial}[4] kip (kN)	15 (4.6)	20 (6.1)	25 (7.6)	30 (9.1)	35 (10.7)	30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)
		SINGLE DIAGONAL					CHEVRON/V				
2.0 (13)	68 (306)	1.26	1.23	1.22	1.24	1.23	1.25	1.24	1.23	1.23	1.22
3.0 (19)	103 (448)	1.26	1.24	1.22	1.25	1.24	1.25	1.24	1.24	1.23	1.22
4.0 (26)	137 (613)	1.28	1.25	1.24	1.26	1.24	1.27	1.26	1.25	1.24	1.24
5.0 (32)	171 (754)	1.29	1.26	1.25	1.27	1.26	1.28	1.27	1.26	1.25	1.25
6.0 (39)	205 (919)	1.32	1.28	1.27	1.29	1.27	1.30	1.29	1.28	1.27	1.27
7.0 (45)	239 (1060)	1.31	1.27	1.26	1.27	1.26	1.29	1.28	1.27	1.26	1.26
8.0 (52)	274 (1225)	1.33	1.29	1.27	1.29	1.27	1.31	1.30	1.29	1.28	1.27
9.0 (58)	308 (1367)	1.32	1.28	1.26	1.28	1.27	1.30	1.29	1.28	1.27	1.26
10.0 (65)	342 (1532)	1.31	1.27	1.26	1.27	1.26	1.29	1.28	1.27	1.26	1.26
11.0 (71)	376 (1673)	1.35	1.31	1.29	1.30	1.29	1.33	1.32	1.31	1.30	1.29
12.0 (77)	410 (1814)	1.34	1.30	1.28	1.30	1.28	1.32	1.31	1.30	1.29	1.28
14.0 (90)	479 (2121)	1.34	1.30	1.28	1.30	1.28	1.33	1.31	1.30	1.29	1.28
16.0 (103)	547 (2427)	1.37	1.32	1.30	1.32	1.30	1.35	1.34	1.32	1.31	1.30
18.0 (116)	616 (2733)	1.36	1.31	1.29	1.31	1.29	1.34	1.33	1.31	1.30	1.29
20.0 (129)	684 (3040)	1.40	1.35	1.32	1.33	1.31	1.37	1.36	1.35	1.33	1.32
22.0 (142)	752 (3346)	1.40	1.35	1.32	1.33	1.31	1.38	1.36	1.35	1.34	1.32
24.0 (155)	821 (3652)	1.39	1.34	1.32	1.32	1.31	1.37	1.35	1.34	1.33	1.32
26.0 (168)	889 (3959)	1.44	1.38	1.35	1.33	1.31	1.41	1.39	1.38	1.36	1.35
28.0 (181)	958 (4265)	1.43	1.37	1.34	1.32	1.30	1.40	1.39	1.37	1.36	1.34
30.0 (194)	1026 (4571)	1.43	1.38	1.35	1.33	1.31	1.41	1.39	1.38	1.36	1.35
Workpoint Length, ft (m)		25.0 (7.6)	28.3 (8.6)	32.0 (9.8)	36.1 (11.0)	40.3 (12.3)	25.0 (7.6)	26.6 (8.1)	28.3 (8.6)	30.1 (9.2)	32.0 (9.8)





CoreBrace®
SUPERIOR SEISMIC PERFORMANCE

AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISC
FOUNDED 1921
AISC CERTIFIED FABRICATOR AND ERECTOR



PRCNC20221036

APPROXIMATE CASING SIZES[1,2,8] IN (MM)

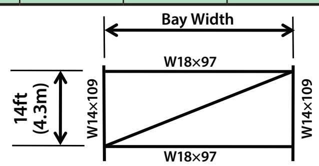
Sizes shown are representative of typical BRB sizes. Information on intermediate and larger sizes is available upon request.

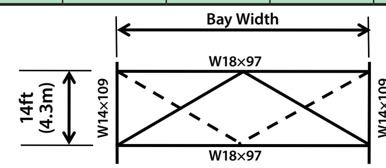
PINNED COREBRACE BRB TABLES

STORY HEIGHT: 14ft (4.3m)

F_{ysc} = 38 ksi (262 MPa)		Bay Width, ft (m)									
A_{sc}[3] in^2 (cm^2)	P_{y_axial}[4] kip (kN)	15 (4.6)	20 (6.1)	25 (7.6)	30 (9.1)	35 (10.7)	30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)
		SINGLE DIAGONAL					CHEVRON/V				
2.0 (13)	68 (306)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
3.0 (19)	103 (448)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
4.0 (26)	137 (613)	t8 (t203)	t8 (t203)	t8 (t203)	t10 (t254)	t10 (t254)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
5.0 (32)	171 (754)	t8 (t203)	t8 (t203)	t10 (t254)	t10 (t254)	t10 (t254)	t8 (t203)	t8 (t203)	t8 (t203)	t10 (t254)	t10 (t254)
6.0 (39)	205 (919)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
7.0 (45)	239 (1060)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
8.0 (52)	274 (1225)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
9.0 (58)	308 (1367)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
10.0 (65)	342 (1532)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
11.0 (71)	376 (1673)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
12.0 (77)	410 (1814)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
14.0 (90)	479 (2121)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
16.0 (103)	547 (2427)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)
18.0 (116)	616 (2733)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)
20.0 (129)	684 (3040)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
22.0 (142)	752 (3346)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
24.0 (155)	821 (3652)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
26.0 (168)	889 (3959)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
28.0 (181)	958 (4265)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
30.0 (194)	1026 (4571)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
Workpoint Length, ft (m)		20.5 (6.3)	24.4 (7.4)	28.7 (8.7)	33.1 (10.1)	37.7 (11.5)	20.5 (6.3)	22.4 (6.8)	24.4 (7.4)	26.5 (8.1)	28.7 (8.7)

t = square tube
p = round pipe
(rectangular casings also available)

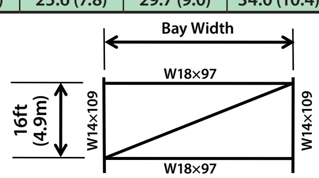


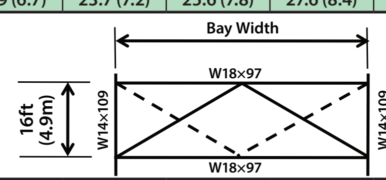


STORY HEIGHT: 16ft (4.9m)

F_{ysc} = 38 ksi (262 MPa)		Bay Width, ft (m)									
A_{sc}[3] in^2 (cm^2)	P_{y_axial}[4] kip (kN)	15 (4.6)	20 (6.1)	25 (7.6)	30 (9.1)	35 (10.7)	30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)
		SINGLE DIAGONAL					CHEVRON/V				
2.0 (13)	68 (306)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
3.0 (19)	103 (448)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
4.0 (26)	137 (613)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t10 (t254)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
5.0 (32)	171 (754)	t8 (t203)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t8 (t203)	t8 (t203)	t10 (t254)	t10 (t254)	t10 (t254)
6.0 (39)	205 (919)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
7.0 (45)	239 (1060)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
8.0 (52)	274 (1225)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
9.0 (58)	308 (1367)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
10.0 (65)	342 (1532)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
11.0 (71)	376 (1673)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
12.0 (77)	410 (1814)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
14.0 (90)	479 (2121)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
16.0 (103)	547 (2427)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)
18.0 (116)	616 (2733)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)
20.0 (129)	684 (3040)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
22.0 (142)	752 (3346)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
24.0 (155)	821 (3652)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
26.0 (168)	889 (3959)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
28.0 (181)	958 (4265)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
30.0 (194)	1026 (4571)	t16 (t406)	t16 (t406)	t16 (t406)	p20 (p508)	p20 (p508)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
Workpoint Length, ft (m)		21.9 (6.7)	25.6 (7.8)	29.7 (9.0)	34.0 (10.4)	38.5 (11.7)	21.9 (6.7)	23.7 (7.2)	25.6 (7.8)	27.6 (8.4)	29.7 (9.0)

t = square tube
p = round pipe
(rectangular casings also available)





NOTES:

1. Casing buckling checks include a FS of 1.3 accounting for code prescribed phi factors and casing initial out-of-straightness. Additionally, casings are designed for BRB overstrength and length effects (for braces longer than 35' (10.7m)), and for self-weight and out-of-plane effects. Where casing size is controlled by buckling, alternate casing configurations must maintain the same minimum moment of inertia about the critical axis. Contact CoreBrace for assistance with alternate configurations.
2. CoreBrace BRB Casing Sizes are approx square minimums for the indicated frame geometry and beam/column sizes. Different beam/column sizes will affect brace length and casing size. More economical sizes or shapes may be used unless specifically required otherwise. Round or rectangular casings are also available.
3. Indicated core area is minimum cross sectional area of yielding portion of BRB core. Rounding increments used are for convenience only. Other core areas can be provided.
4. P_{y_axial} is the calculated yield force of the BRB equal to: $\phi F_y A_{sc}$ based on the lower-bound of the yield stress range. Typ yield stress range = 42 ksi ±4 ksi (290 MPa ±28MPa).
5. Where casing size is controlled by fit up, alternate core configurations (width × thickness) may allow for reduced casing sizes, on a project specific basis. Contact CoreBrace for details.
6. Brace and casing sizes other than those shown are available upon request.
7. This table was created by considering overstrength at 2% story drift as required by AISC 341-16. For other story drifts, values may be different.
8. Casing sizes in table are intended for schematic design only. Contact CoreBrace for project specific sizes.

PRCNC20221036

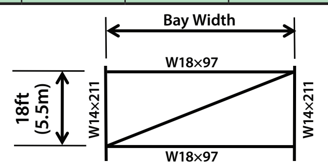
APPROXIMATE CASING SIZES[1,2,8] IN (MM) (CONT'D)

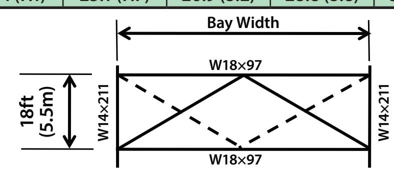
Sizes shown are representative of typical BRB sizes. Information on intermediate and larger sizes is available upon request.

STORY HEIGHT: 18ft (5.5m)

F_{ysc} = 38 ksi (262 MPa)		Bay Width, ft (m)									
A_{sc}[3] in² (cm²)	P_{y_axial}[4] kip (kN)	15 (4.6)	20 (6.1)	25 (7.6)	30 (9.1)	35 (10.7)	30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)
		SINGLE DIAGONAL					CHEVRON/V				
2.0 (13)	68 (306)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
3.0 (19)	103 (448)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
4.0 (26)	137 (613)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t10 (t254)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
5.0 (32)	171 (754)	t8 (t203)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t8 (t203)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
6.0 (39)	205 (919)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
7.0 (45)	239 (1060)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
8.0 (52)	274 (1225)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
9.0 (58)	308 (1367)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
10.0 (65)	342 (1532)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
11.0 (71)	376 (1673)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
12.0 (77)	410 (1814)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
14.0 (90)	479 (2121)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t14 (t356)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
16.0 (103)	547 (2427)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)
18.0 (116)	616 (2733)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)
20.0 (129)	684 (3040)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
22.0 (142)	752 (3346)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
24.0 (155)	821 (3652)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
26.0 (168)	889 (3959)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
28.0 (181)	958 (4265)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
30.0 (194)	1026 (4571)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	p20 (p508)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
Workpoint Length, ft (m)		23.4 (7.1)	26.9 (8.2)	30.8 (9.4)	35.0 (10.7)	39.4 (12.0)	23.4 (7.1)	25.1 (7.7)	26.9 (8.2)	28.8 (8.8)	30.8 (9.4)

t = square tube
p = round pipe
(rectangular casings also available)

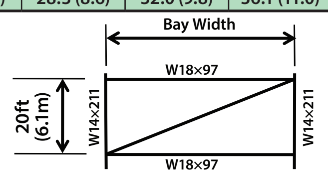


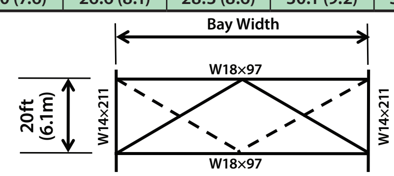


STORY HEIGHT: 20ft (6.1m)

F_{ysc} = 38 ksi (262 MPa)		Bay Width, ft (m)									
A_{sc}[3] in² (cm²)	P_{y_axial}[4] kip (kN)	15 (4.6)	20 (6.1)	25 (7.6)	30 (9.1)	35 (10.7)	30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)
		SINGLE DIAGONAL					CHEVRON/V				
2.0 (13)	68 (306)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
3.0 (19)	103 (448)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t10 (t254)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)	t8 (t203)
4.0 (26)	137 (613)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
5.0 (32)	171 (754)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
6.0 (39)	205 (919)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)
7.0 (45)	239 (1060)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)
8.0 (52)	274 (1225)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)
9.0 (58)	308 (1367)	t10 (t254)	t10 (t254)	t12 (t305)	t12 (t305)	t12 (t305)	t10 (t254)	t10 (t254)	t10 (t254)	t10 (t254)	t12 (t305)
10.0 (65)	342 (1532)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
11.0 (71)	376 (1673)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
12.0 (77)	410 (1814)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
14.0 (90)	479 (2121)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t14 (t356)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)	t12 (t305)
16.0 (103)	547 (2427)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)
18.0 (116)	616 (2733)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)	t14 (t356)
20.0 (129)	684 (3040)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
22.0 (142)	752 (3346)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
24.0 (155)	821 (3652)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
26.0 (168)	889 (3959)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
28.0 (181)	958 (4265)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
30.0 (194)	1026 (4571)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	p20 (p508)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)	t16 (t406)
Workpoint Length, ft (m)		25.0 (7.6)	28.3 (8.6)	32.0 (9.8)	36.1 (11.0)	40.3 (12.3)	25.0 (7.6)	26.6 (8.1)	28.3 (8.6)	30.1 (9.2)	32.0 (9.8)

t = square tube
p = round pipe
(rectangular casings also available)



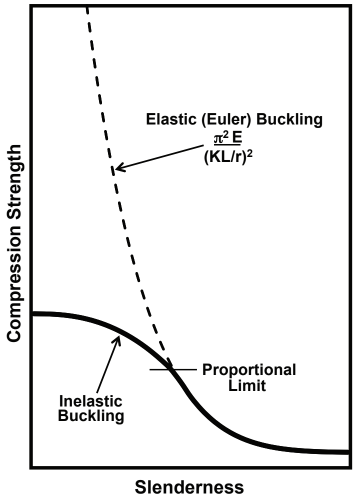


For design assistance please contact CoreBrace:

5789 West Wells Park Road
West Jordan, UT 84081
801.280.0701
www.corebrace.com

PRCNC20221036

Pinned Brace and Casing Information



1st-Mode Euler Buckling

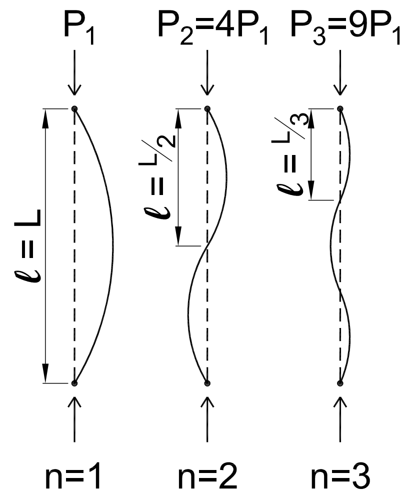
$$P_{cr} = \frac{\pi^2 EI}{(KL)^2} \qquad F_{cr} = \frac{\pi^2 E}{\left(\frac{KL}{r}\right)^2}$$

nth-Mode Euler Buckling

$$P_{cr\_n} = \frac{\pi^2 EI}{(K\ell)^2} = \frac{\pi^2 EI}{\left(\frac{KL}{n}\right)^2} = n^2 \frac{\pi^2 EI}{(KL)^2} = n^2 P_{cr}$$

where $\ell = L/n$

$$P_{cr\_n} = n^2 P_{cr} \qquad F_{cr\_n} = n^2 F_{cr}$$



Casing Demands

$$I_{req'd} = \frac{FS_B P_u (KL_g)^2}{\pi^2 E}$$

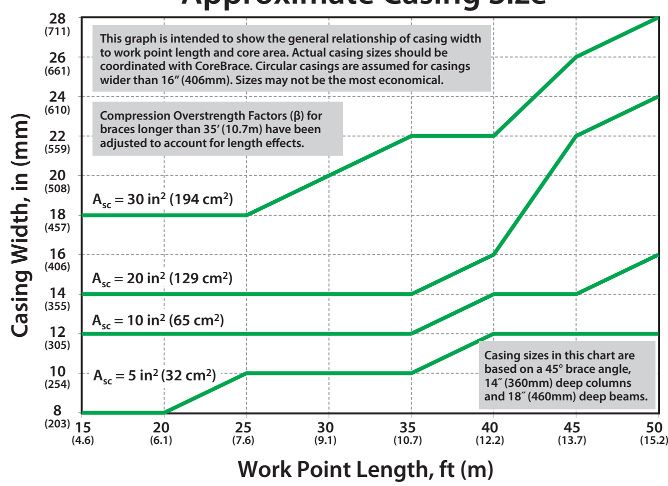
FS_B = Factor of safety against buckling. Should include code-prescribed phi factor, factor to account for initial out-of-straightness, and any additional factors as deemed necessary.

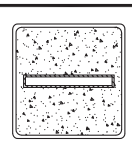
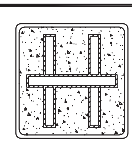
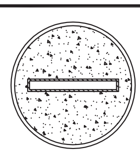
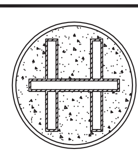
Adjusted Brace Strength Determination

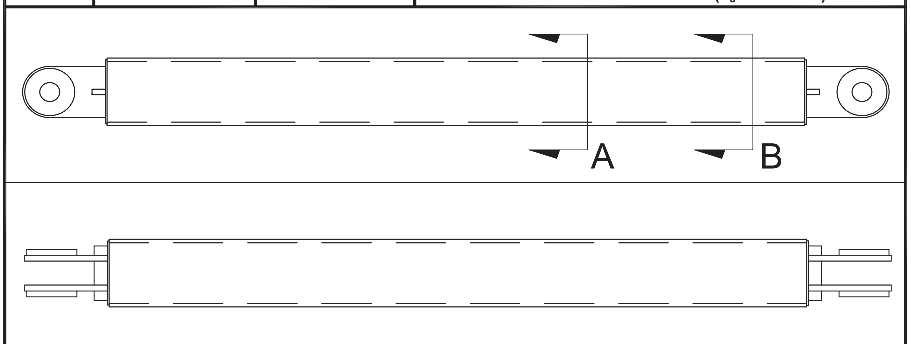
$$P_c = \beta \omega F_y A_{sc} \quad (compression)$$
$$P_t = \omega F_y A_{sc} \quad (tension)$$

F_y of material used to fabricate brace yielding cores to be established based on coupon testing of individual plates. In such cases, R_y may be taken equal to 1.0 in the above equations. (See AISC 341)

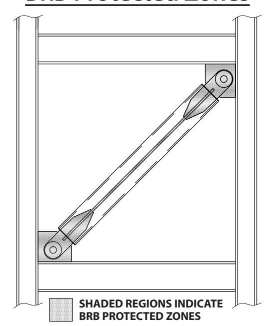
Approximate Casing Size



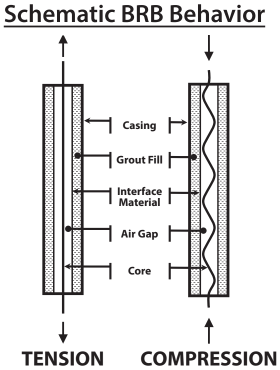
	SECT. A	SECT. B	MATERIAL SPECIFICATIONS	
SQUARE CASING			CORE PL: STIFFENER PL: LUG PL: CASING: GUSSET/REPAD PL: PIN	A36 CONTROLLED YIELD A36 (F_y = 249 MPa) A572 GR-50 (F_y = 345 MPa) A500 GR-B (F_y = 318 MPa) A572 GR-50 (F_y = 345 MPa) A193 GR-B (F_u = 930 MPa) MIN
ROUND CASING			CORE PL: STIFFENER PL: LUG PL: CASING: ROUND HSS: PIPE: GUSSET PL: PIN:	A36 CONTROLLED YIELD A36 (F_y = 249 MPa) A572 GR-50 (F_y = 345 MPa) A500 GR-B (F_y = 290 MPa) A53 GR-B (F_y = 242 MPa) A572 GR-50 (F_y = 345 MPa) A193 GR-B (F_u = 930 MPa) MIN



BRB Protected Zones



Schematic BRB Behavior



5789 West Wells Park Road, West Jordan, UT 84081 ph: 801.280.0701 www.corebrace.com

PRCNC20221036

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Gravity Load Resisting System

PRCNC20221036

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Gravity Load Resisting System -
Horizontal Elements - Decks

PRCNC20221036

Typical Floor/Roof deck
uniform load Capacities

PRCNC20221036

PLW2-36 FormLok® Composite Steel Deck-Slab (ASD)

with 5 in. 145 pcf 4000 psi NWC

Typical Composite Slab floor

Maximum Unshored Span

Gage	1 Span	2 Span	3 Span
22	7'-3"	8'-4"	8'-6"
21	7'-10"	8'-11"	9'-3"
20	8'-1"	9'-6"	9'-10"
19	8'-7"	10'-7"	10'-5"
18	8'-10"	11'-5"	10'-8"
16	9'-6"	12'-0"	11'-4"

Maximum Unshored Span based on:

Uniform Construction Load	20.00	psf	Minimum End Bearing	2.00	in.
Concentrated Construction Load	150.00	plf	Minimum Interior Bearing	5.00	in.
Concrete Ponding Allowance	2.00	psf	Maximum Deflection L/	240	≤ 0.5 in.
Concrete Volume	1.23	yd^3 / 100 ft^2 (Note: Does not include allowance for ponding)			

Composite Steel Deck Properties (steel deck only)

Gage	Fy ksi	wdd psf	Se+ $in.^3/ft$	Se- $in.^3/ft$	Id+ $in.^4/ft$	Id- $in.^4/ft$	Vn/Ω kip/ft
22	50	1.80	0.246	0.256	0.341	0.339	1.699
21	50	2.00	0.283	0.294	0.381	0.379	2.056
20	50	2.10	0.323	0.333	0.422	0.419	2.444
19	50	2.40	0.405	0.415	0.503	0.499	2.885
18	50	2.70	0.471	0.481	0.564	0.562	3.224
16	50	3.30	0.623	0.638	0.708	0.708	4.034

Superimposed Allowable Load, Wn/Ω, Limited by L/360 ,psf [1]

Gage	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"
22	658	470	348	264	204	160	126	100	79
21	722	517	384	293	227	179	142	114	91
20	784	562	419	320	250	197	158	127	102
19	906	652	487	374	293	234	188	153	125
18	1005	724	543	418	329	263	212	173	142
16	1234	893	671	519	411	330	269	218	174

Notes: [1] For high loads, commonly in excess of 200 psf, dynamic or impact loading, and long term concrete creep should be considered. Contact Verco for further assistance.

Composite Steel Deck-Slab Properties							Min. Temperature & Shrinkage	
Gage	w_1 psf	Ic $in.^4/ft$	Iu $in.^4/ft$	Id [1] $in.^4/ft$	Mno/Ω kip-ft/ft	Vno/Ω kip/ft	As min [2] $in.^2/ft$	or Dramix® Steel Fiber 4D 65/60BG, lbs/cy
22	50.1	4.77	12.61	8.69	3.19	3.92	0.028	15
21	50.3	5.13	12.78	8.96	3.48	4.25	0.028	15
20	50.4	5.47	12.95	9.21	3.76	4.61	0.028	15
19	50.7	6.13	13.27	9.70	4.31	4.74	0.028	15
18	51.0	6.64	13.54	10.09	4.75	4.74	0.028	15
16	51.6	7.79	14.15	10.97	5.79	4.74	0.028	15

Notes: [1] Id = (Ic + Iu)/2
[2] Minimum area of steel for temperature and shrinkage

Tables generated using calculator V3.2 based on ANSI/SDI C-2017 in accordance with 2018 IBC Section 2210.

Date: 4/25/2022

PRCNC20221036

18 Gage PLW2-36 FormLok® Grade 50

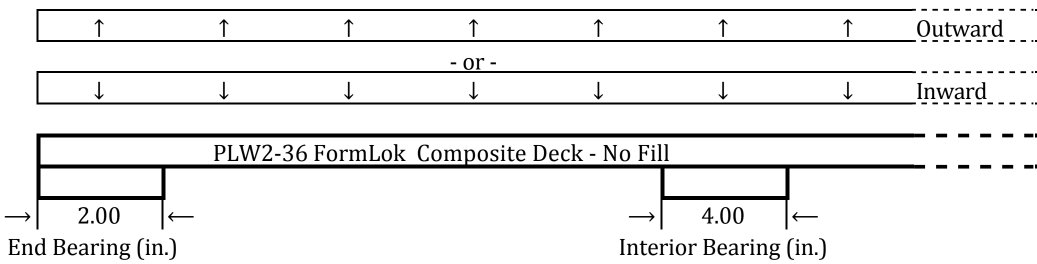
Uniform Allowable Load Table, ASD (psf)

For Butted End Deck

Un-topped W2 deck at front roof Canopy

36/4 Connection Pattern to Supports with
5/8" Visible Dia. Arc Spot Weld

Support Member A572 GR50
$0.125 \leq t_2$ (in.)



Inward Uniform Allowable Load Table, ASD (psf)

Span	Span	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"
1	Wn/Ω	192	167	147	130	116	104	94	85
	L/240	108	88	72	60	51	43	37	32
2	Wn/Ω	189	166	146	130	116	104	94	86
	L/240	-	-	-	-	-	104	89	77
3	Wn/Ω	233	204	181	161	144	129	117	106
	L/240	203	165	136	113	95	81	70	60

Outward (Uplift) Uniform Allowable Load Table, ASD (psf)

Span	Span	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"
1	Wn/Ω	196	171	150	133	119	106	96	87
	Rn/Ω	286	267	250	236	223	211	200	191
	L/240	107	87	72	60	51	43	37	32
2	Wn/Ω	186	162	143	127	114	102	93	84
	Rn/Ω	114	107	100	94	89	84	80	76
	L/240	-	-	-	-	-	-	-	-
3	Wn/Ω	229	201	177	158	141	127	115	104
	Rn/Ω	130	121	114	107	101	96	91	87
	L/240	-	-	-	-	96	81	70	60

Steel Deck Properties

t	Fy	wdd	Id+	Id-	Se+	Se-	Mn+/Ω	Mn-/Ω	Vn/Ω
in	ksi	psf	$in.^4/ft$	$in.^4/ft$	$in.^3/ft$	$in.^3/ft$	lbs-ft/ft	lbs-ft/ft	lbs/ft
0.047	50	2.70	0.564	0.562	0.471	0.481	1175	1200	3224

Where: $W \leq Wn/\Omega$

W = Required strength of the governing ASD load combination
Wn/Ω = Allowable strength governed by the steel deck
Rn/Ω = Allowable strength governed by connection tension

Steel Deck Uniform V1.0.5 in accordance with AISI S100-16 and AISI S310-16. Date: 6/2/2022

PRCNC20221036

18 Gage PLB™-36 Grade 50

Uniform Allowable Load Table, ASD (psf)

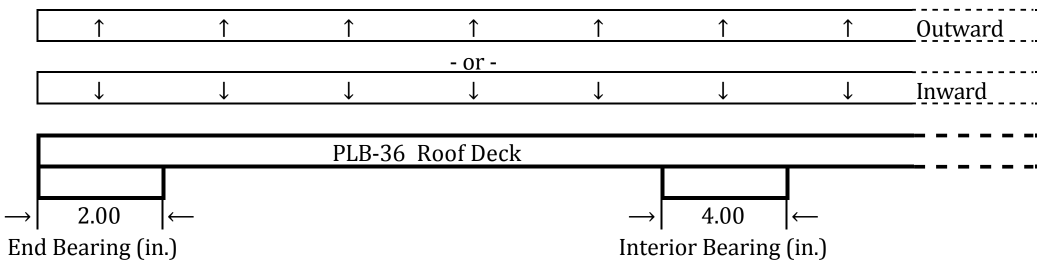
For End Lapped Deck

Typical roof Deck gravity uniform load

36/7/ 4 Connection Pattern to Supports with
5/8" Visible Dia. Arc Spot Weld

Support Member A572 GR50
$0.125 \leq t_2$ (in.)

Note: Support welds at interlocking sidelaps may be 3/8" x 1 1/4" arc seam welds in lieu of arc spot welds.



Inward Uniform Allowable Load Table, ASD (psf)

Span	Span	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"
1	Wn/Ω	174	148	128	111	98	87	77	69
	L/240	92	72	58	47	39	32	27	23
2	Wn/Ω	181	155	134	116	102	91	81	73
	L/240	-	-	-	115	94	79	66	56
3	Wn/Ω	225	192	166	145	128	113	101	91
	L/240	175	138	110	90	74	62	52	44

Outward (Uplift) Uniform Allowable Load Table, ASD (psf)

Span	Span	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"
1	Wn/Ω	183	156	135	117	103	91	82	73
	Rn/Ω	538	496	461	430	403	379	358	340
	L/240	93	73	58	48	39	33	28	23
2	Wn/Ω	172	147	127	111	97	86	77	69
	Rn/Ω	136	125	116	108	102	96	90	86
	L/240	-	-	-	-	93	78	65	56
3	Wn/Ω	214	183	158	138	121	108	96	86
	Rn/Ω	154	142	132	123	116	109	103	97
	L/240	-	136	109	89	73	61	51	44

Steel Deck Properties

t	Fy	wdd	Id+	Id-	Se+	Se-	Mn+/Ω	Mn-/Ω	Vn/Ω
in	ksi	psf	in.^{4}/ft	in.^{4}/ft	in.^{3}/ft	in.^{3}/ft	lbs-ft/ft	lbs-ft/ft	lbs/ft
0.0478	50	2.90	0.302	0.306	0.314	0.331	783	826	4264

Where: $W \leq Wn/\Omega$

W = Required strength of the governing ASD load combination
Wn/Ω = Allowable strength governed by the steel deck
Rn/Ω = Allowable strength governed by connection tension

Steel Deck Uniform V1.0.5 in accordance with AISI S100-16 and AISI S310-16. Date: 6/2/2022

PRCNC20221036

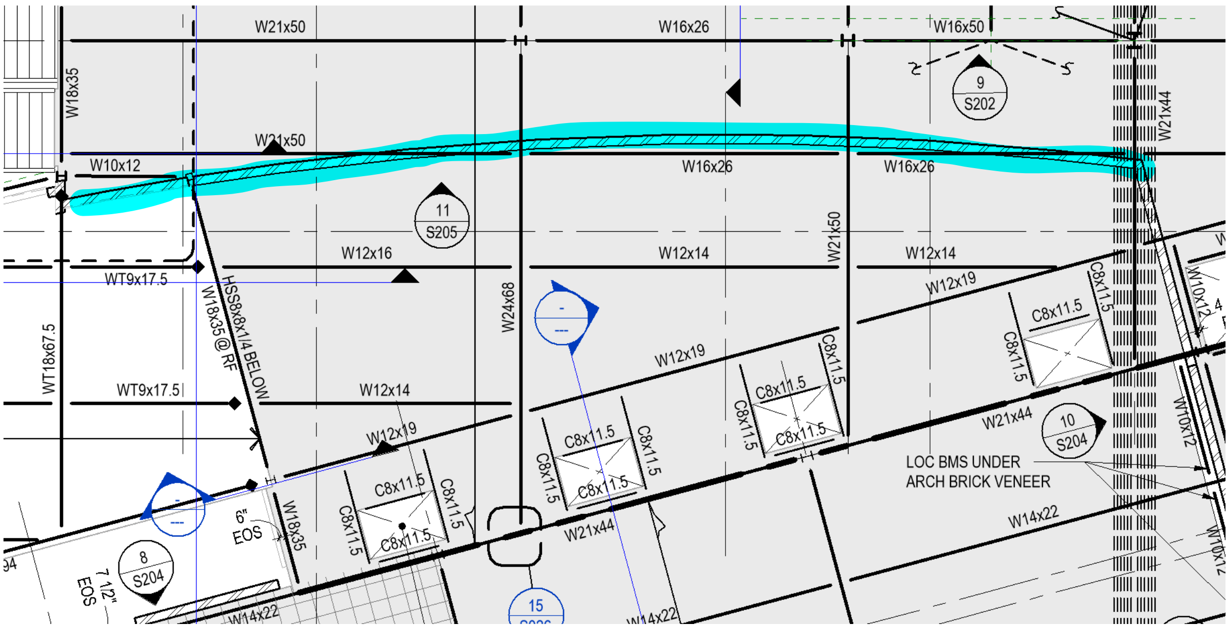
Exterior wall point load on composite deck at Level 3

Back calculate max moment and Shear, conservative to Assume single span

Max super imposed load at 9'-0" span = 418psf = 418 lb/ft

Mmax = (w * L^2)/8 = (418 * 9^2)/8 = 4230 lb-ft

Vmax = (w * L)/2 = (418 * 9)/2 = 1881 lb



Determine max loading of L3 condition with exterior wall up to roof.

DL deck = 84 psf = 84 lb/ft
LL = 100 psf = 100 lb/ft
DL wall = 17 psf * 23' tall = 400 lb point load @ 2'-0" max from support.

Per attached calculations:

Applied Moment = 2284 lb-ft < 4230 lb-ft, deck capacity is sufficient
Applied Shear = 1139 lb < 1181 lb, deck capacity is sufficient

PRCNC20221036

PLW2-36 FormLok® Composite Steel Deck-Slab (ASD)

with 5 in. 145 pcf 4000 psi NWC

VERCO DECKING, INC. a NUCOR company

Maximum Unshored Span

Gage	1 Span	2 Span	3 Span
22	7'-3"	8'-4"	8'-6"
21	7'-10"	8'-11"	9'-3"
20	8'-1"	9'-6"	9'-10"
19	8'-7"	10'-7"	10'-5"
18	8'-10"	11'-5"	10'-8"
16	9'-6"	12'-0"	11'-4"

Maximum Unshored Span based on:

Uniform Construction Load	20.00	psf	Minimum End Bearing	2.00	in.
Concentrated Construction Load	150.00	plf	Minimum Interior Bearing	5.00	in.
Concrete Ponding Allowance	2.00	psf	Maximum Deflection L/	240	≤ 0.5 in.
Concrete Volume	1.23	yd^3 / 100 ft^2 (Note: Does not include allowance for ponding)			

Composite Steel Deck Properties (steel deck only)

Gage	Fy ksi	wdd psf	Se+ $in.^3/ft$	Se- $in.^3/ft$	Id+ $in.^4/ft$	Id- $in.^4/ft$	Vn/Ω kip/ft
22	50	1.80	0.246	0.256	0.341	0.339	1.699
21	50	2.00	0.283	0.294	0.381	0.379	2.056
20	50	2.10	0.323	0.333	0.422	0.419	2.444
19	50	2.40	0.405	0.415	0.503	0.499	2.885
18	50	2.70	0.471	0.481	0.564	0.562	3.224
16	50	3.30	0.623	0.638	0.708	0.708	4.034

Superimposed Allowable Load, Wn/Ω, Limited by L/360 ,psf [1]

Gage	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"
22	658	470	348	264	204	160	126	100	79
21	722	517	384	293	227	179	142	114	91
20	784	562	419	320	250	197	158	127	102
19	906	652	487	374	293	234	188	153	125
18	1005	724	543	418	329	263	212	173	142
16	1234	893	671	519	411	330	269	218	174

Notes: [1] For high loads, commonly in excess of 200 psf, dynamic or impact loading, and long term concrete creep should be considered. Contact Verco for further assistance.

Composite Steel Deck-Slab Properties							Min. Temperature & Shrinkage	
Gage	w_1 psf	Ic $in.^4/ft$	Iu $in.^4/ft$	Id [1] $in.^4/ft$	Mno/Ω kip-ft/ft	Vno/Ω kip/ft	As min [2] $in.^2/ft$	or Dramix® Steel Fiber 4D 65/60BG, lbs/cy
22	50.1	4.77	12.61	8.69	3.19	3.92	0.028	15
21	50.3	5.13	12.78	8.96	3.48	4.25	0.028	15
20	50.4	5.47	12.95	9.21	3.76	4.61	0.028	15
19	50.7	6.13	13.27	9.70	4.31	4.74	0.028	15
18	51.0	6.64	13.54	10.09	4.75	4.74	0.028	15
16	51.6	7.79	14.15	10.97	5.79	4.74	0.028	15

Notes: [1] Id = (Ic + Iu)/2
[2] Minimum area of steel for temperature and shrinkage

Tables generated using calculator V3.2 based on ANSI/SDI C-2017 in accordance with 2018 IBC Section 2210.

Date: 4/25/2022

PRCNC20221036

Steel Beam

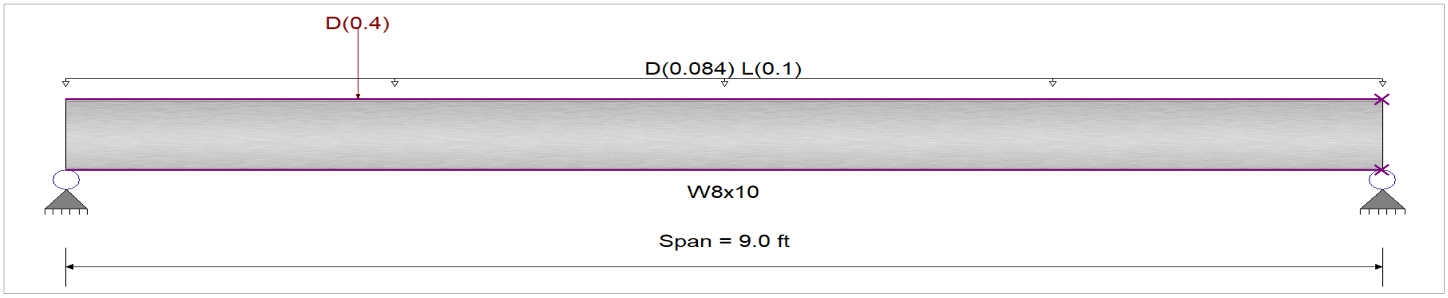
DESCRIPTION: 9' span max moment and shear

CODE REFERENCES

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Uniform Load : D = 0.0840, L = 0.10 k/ft, Tributary Width = 1.0 ft

Point Load : D = 0.40 k @ 2.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.104 : 1	Maximum Shear Stress Ratio =	0.042 : 1
Section used for this span	W8x10	Section used for this span	W8x10
Ma : Applied	2.284 k-ft	Va : Applied	1.139 k
Mn / Omega : Allowable	21.870 k-ft	Vn/Omega : Allowable	26.826 k
Load Combination	+D+L	Load Combination	+D+L
Location of maximum on span	4.011 ft	Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.017 in	Ratio =	6,504 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.038 in	Ratio =	2847 >=180
Max Upward Total Deflection	0.000 in	Ratio =	0 <180

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios		Summary of Moment Values							Summary of Shear Values		
Segment Length	Span #	M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
D Only													
Dsgn. L = 9.00 ft	1	0.059	0.026	1.30		1.30	36.52	21.87	1.00	1.00	0.69	40.24	26.83
+D+L													
Dsgn. L = 9.00 ft	1	0.104	0.042	2.28		2.28	36.52	21.87	1.00	1.00	1.14	40.24	26.83
+D+0.750L													
Dsgn. L = 9.00 ft	1	0.093	0.038	2.03		2.03	36.52	21.87	1.00	1.00	1.03	40.24	26.83
+0.60D													
Dsgn. L = 9.00 ft	1	0.036	0.015	0.78		0.78	36.52	21.87	1.00	1.00	0.41	40.24	26.83

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0379	4.397		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.139	0.917
Overall MINimum	0.413	0.280
D Only	0.689	0.467
+D+L	1.139	0.917
+D+0.750L	1.027	0.804

PRCNC20221036

Steel Beam

DESCRIPTION: 9' span max moment and shear

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

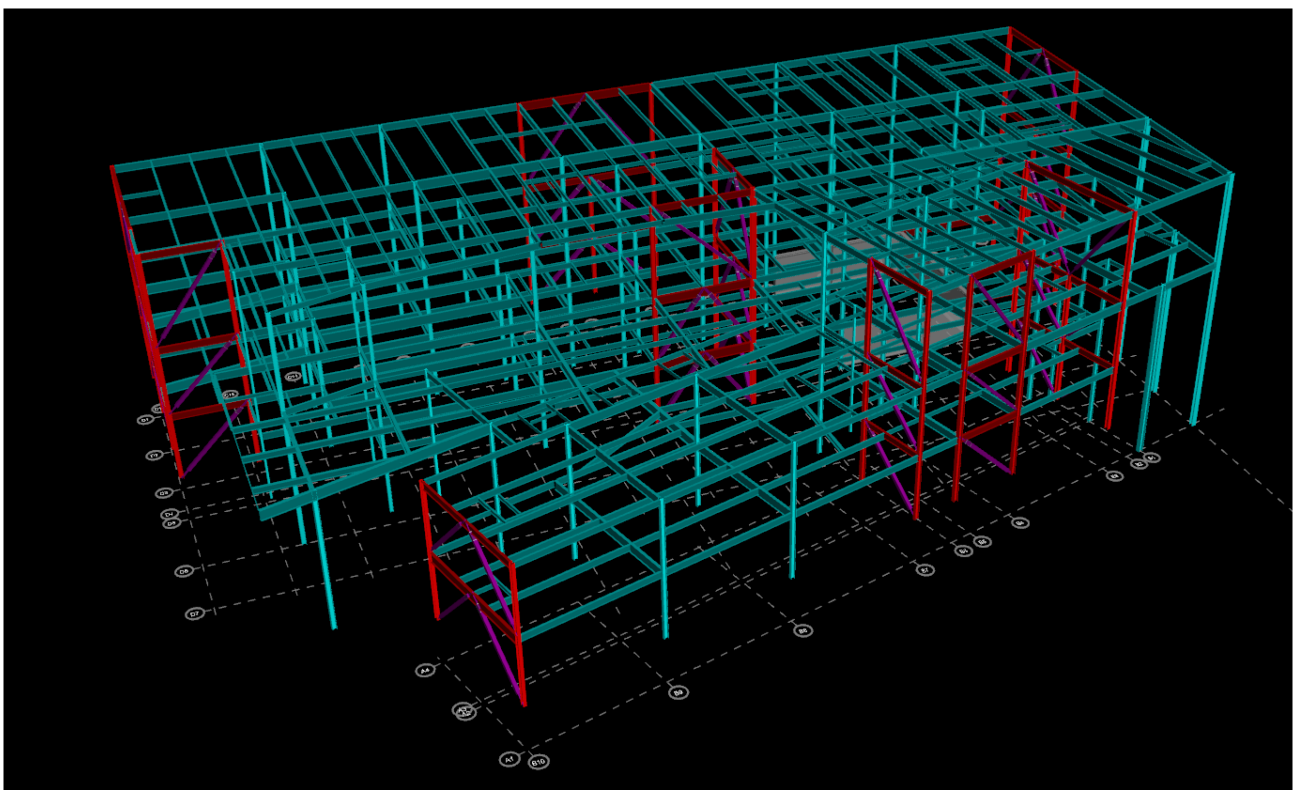
Load Combination	Support 1	Support 2
+0.60D	0.413	0.280
L Only	0.450	0.450

Pierce College Puyallup New STEM Building
22135.00

Gravity Load Resisting System -
Horizontal Elements - Beams

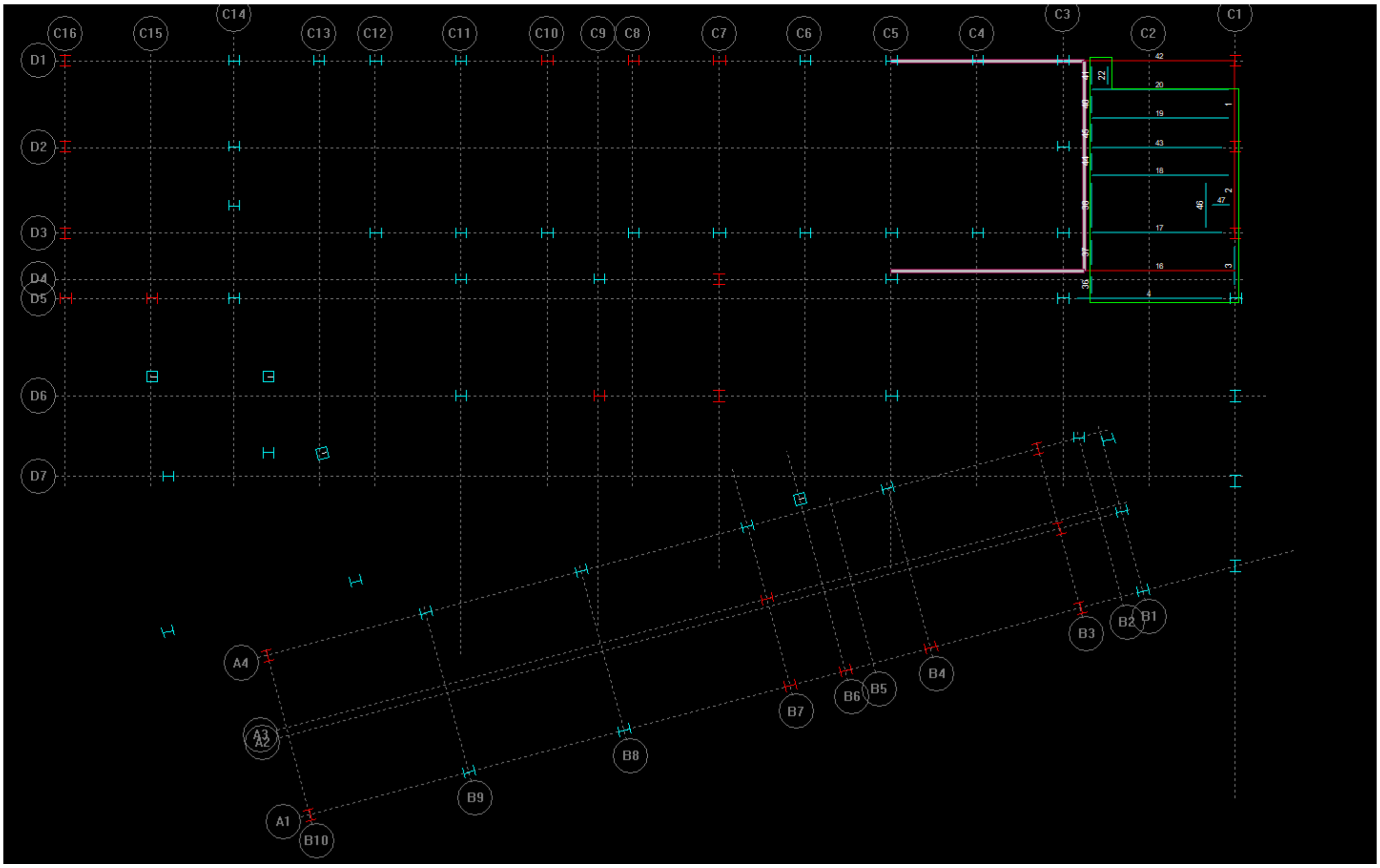
PRCNC20221036

Gravity Beam Design - RAM SS



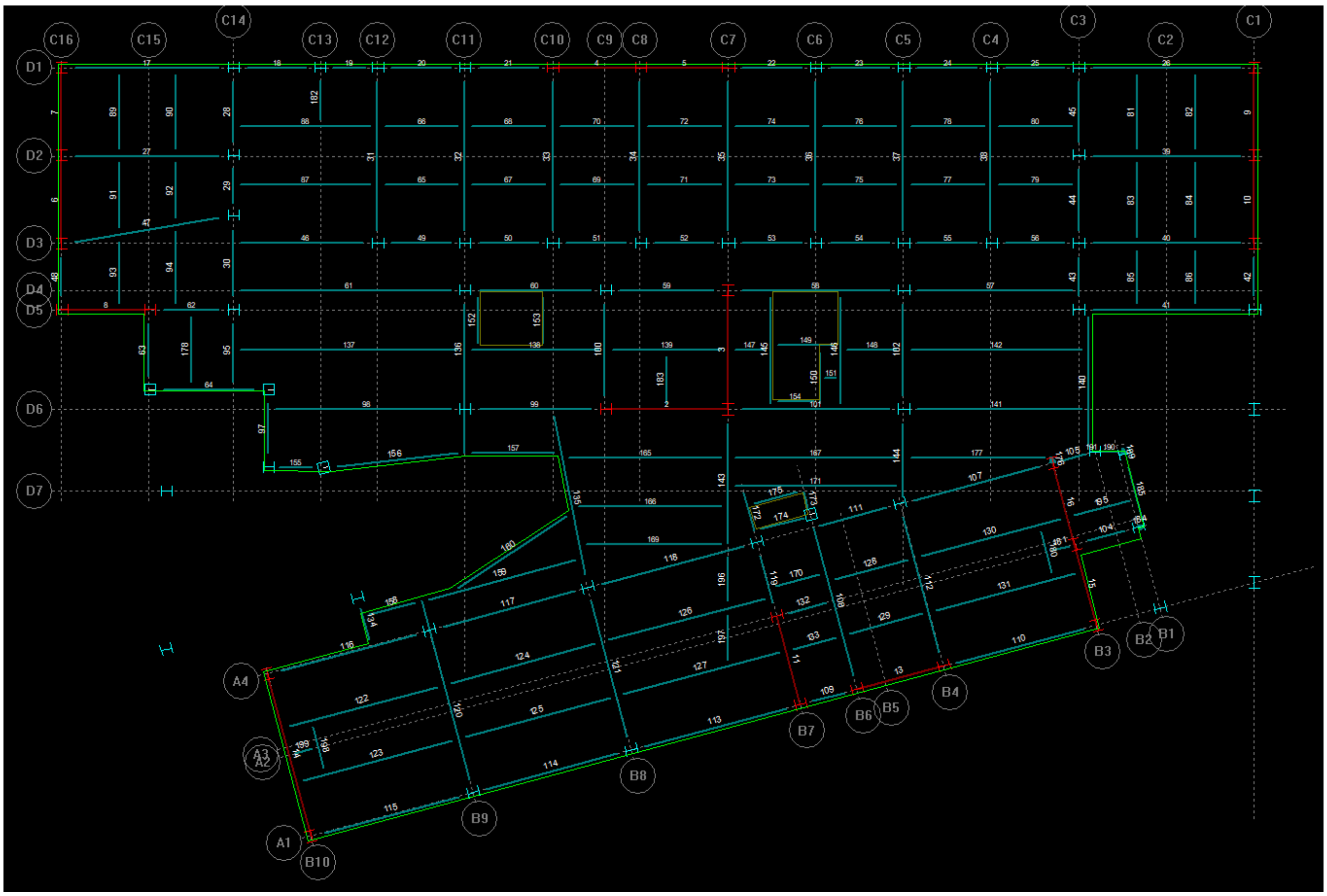
PRCNC20221036

Mezzanine Level Beam Numbers

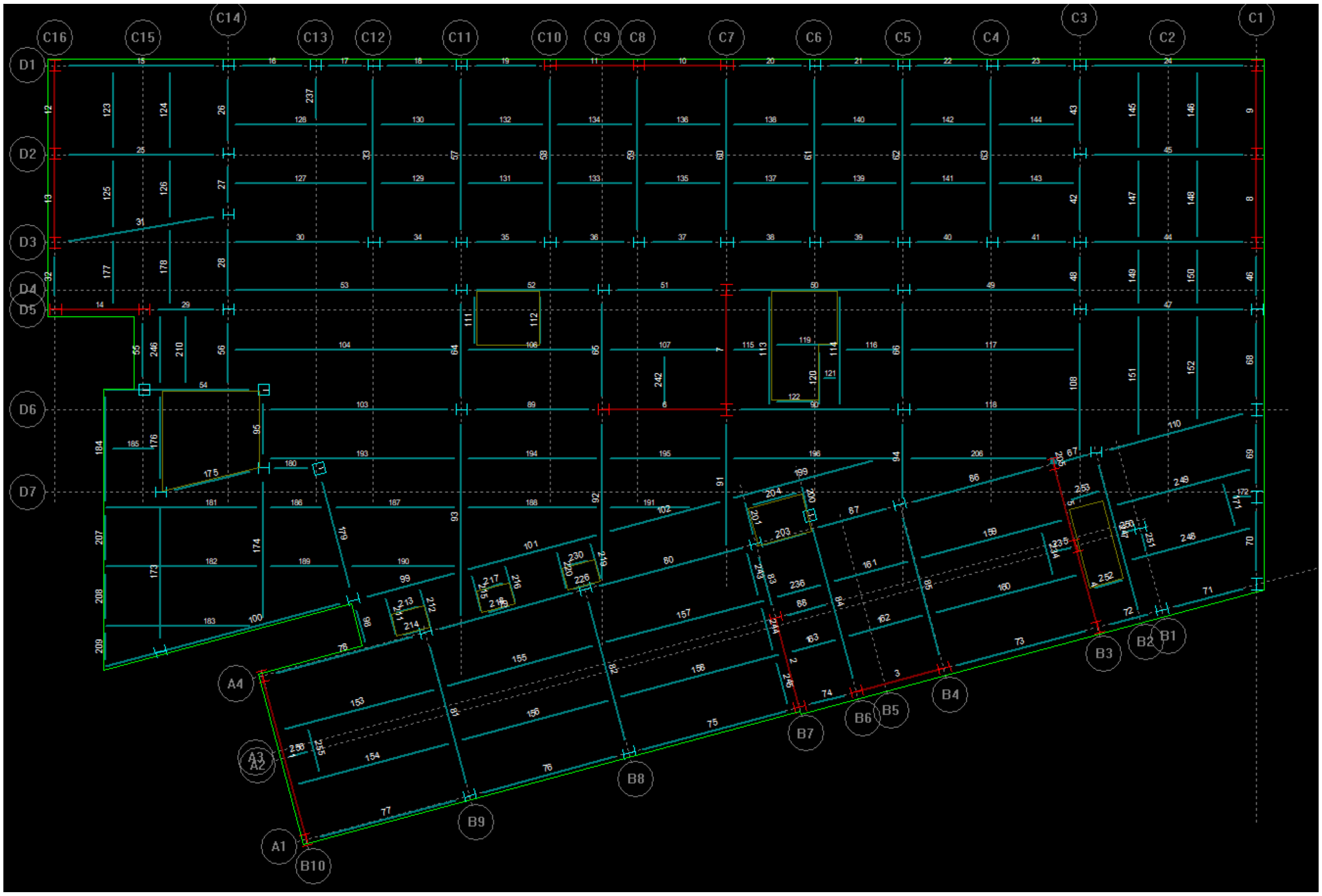


PRCNC20221036

Level 2 Beam Numbers

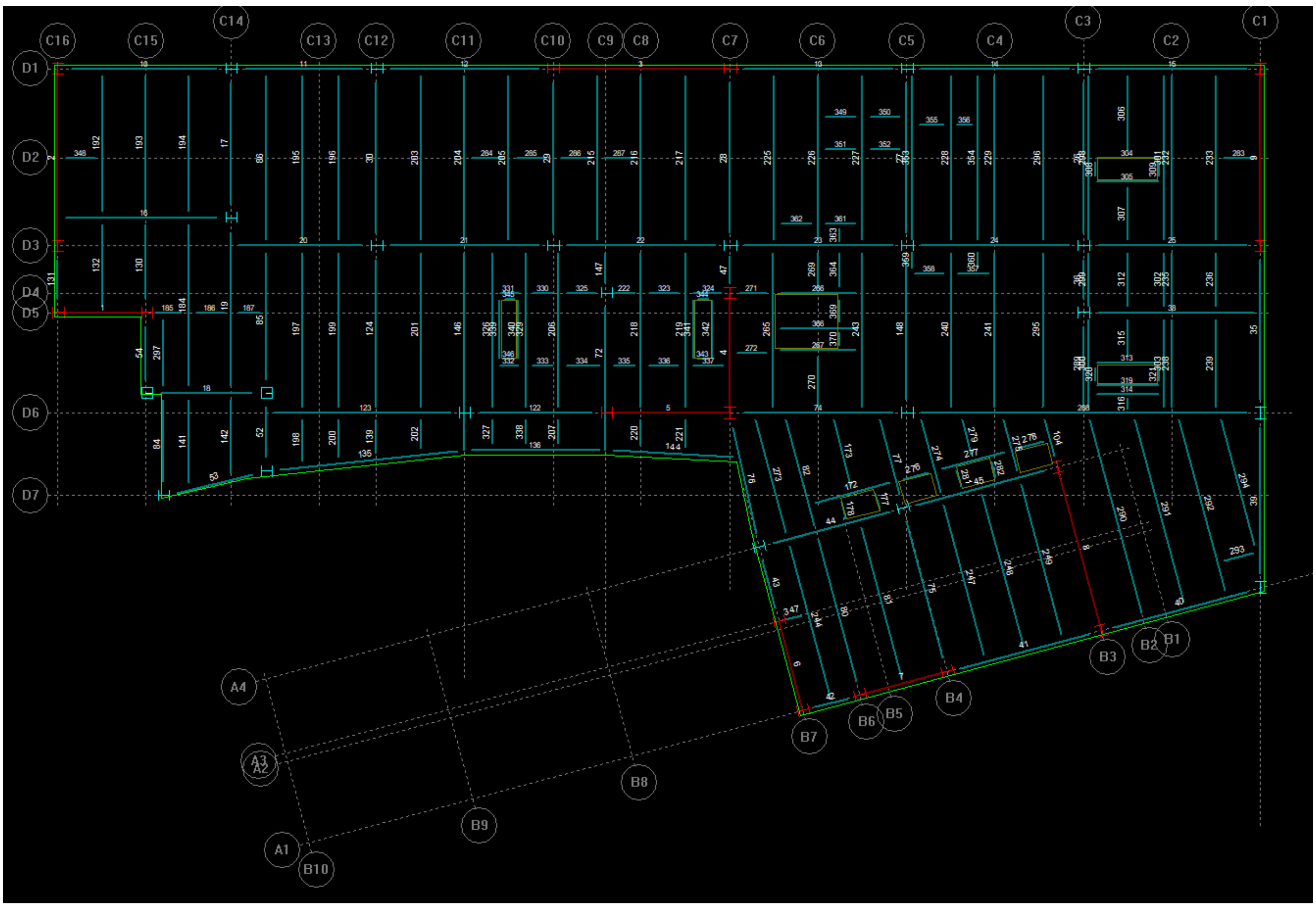


Level 3 Beam Numbers



PRCNC20221036

Roof Beam Numbers

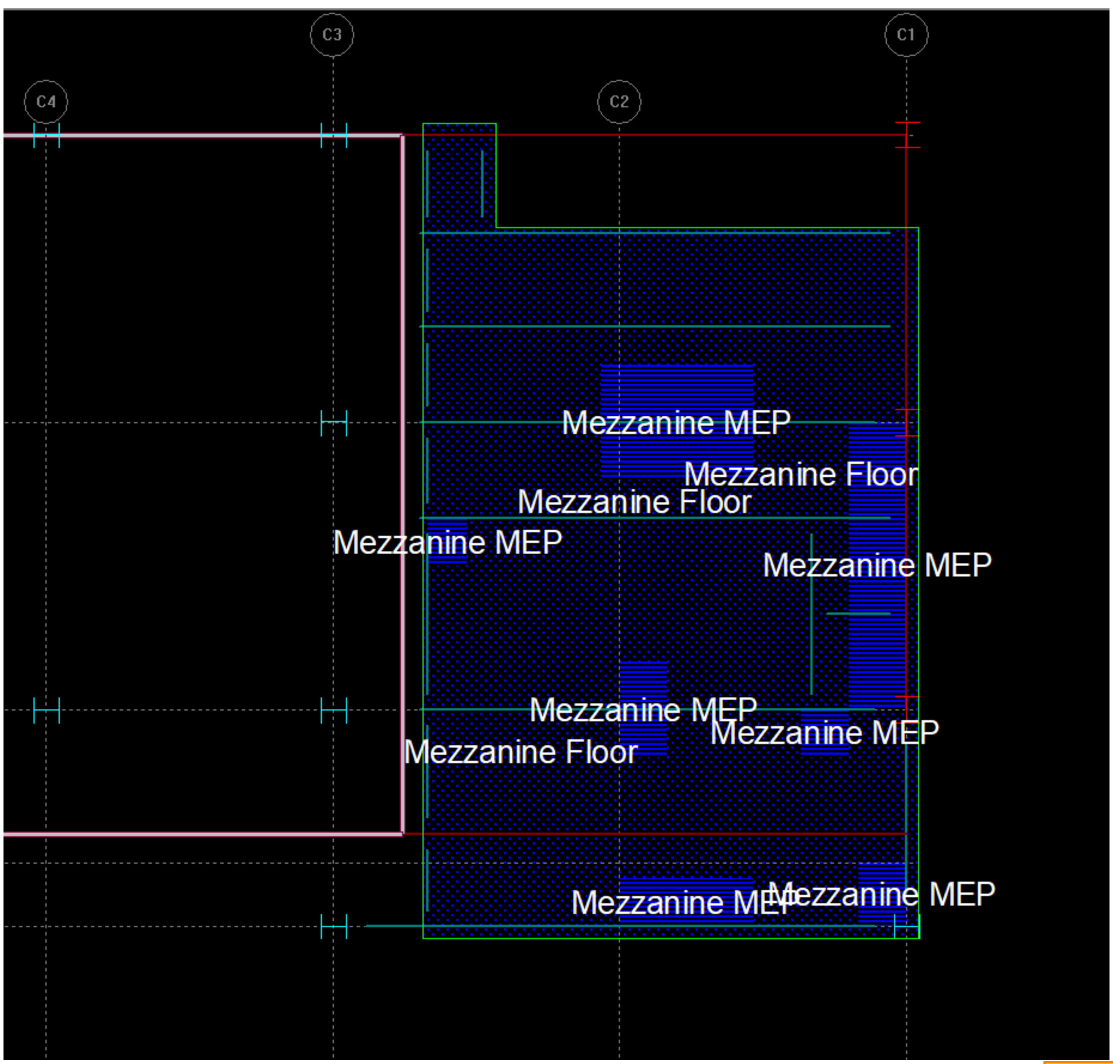


PRCNC20221036

RAM SS Model Surface Loads

Label	DL	Constr DL	LL	Reduction	Partition	Constr LL	Mass DL
Typical Floor	68.0	60.0	100.0	Reducible	0.0	25.0	73.0
Mezzanine Floor	148.0	60.0	40.0	Reducible	0.0	25.0	148.0
Typ Roof - PV Ready	31.0	31.0	20.0	Roof	0.0	25.0	34.0
Corridor Roof	36.0	36.0	20.0	Roof	0.0	25.0	37.0
L3 Low Roof	84.0	60.0	20.0	Roof	0.0	25.0	89.0
L3 Ext Canopy	13.0	13.0	20.0	Roof	0.0	25.0	13.0
MEP Roof	118.0	36.0	20.0	Roof	0.0	25.0	123.0
Storage 125psf	68.0	60.0	125.0	Unreducible	0.0	25.0	73.0
Storage 250psf	68.0	60.0	250.0	Unreducible	0.0	25.0	73.0
Penthouse Roof	148.0	60.0	20.0	Roof	0.0	25.0	148.0
Typ Foof - No PV	23.0	23.0	20.0	Roof	0.0	23.0	23.0
Mezzanine MEP	400.0	60.0	40.0	Reducible	0.0	25.0	400.0

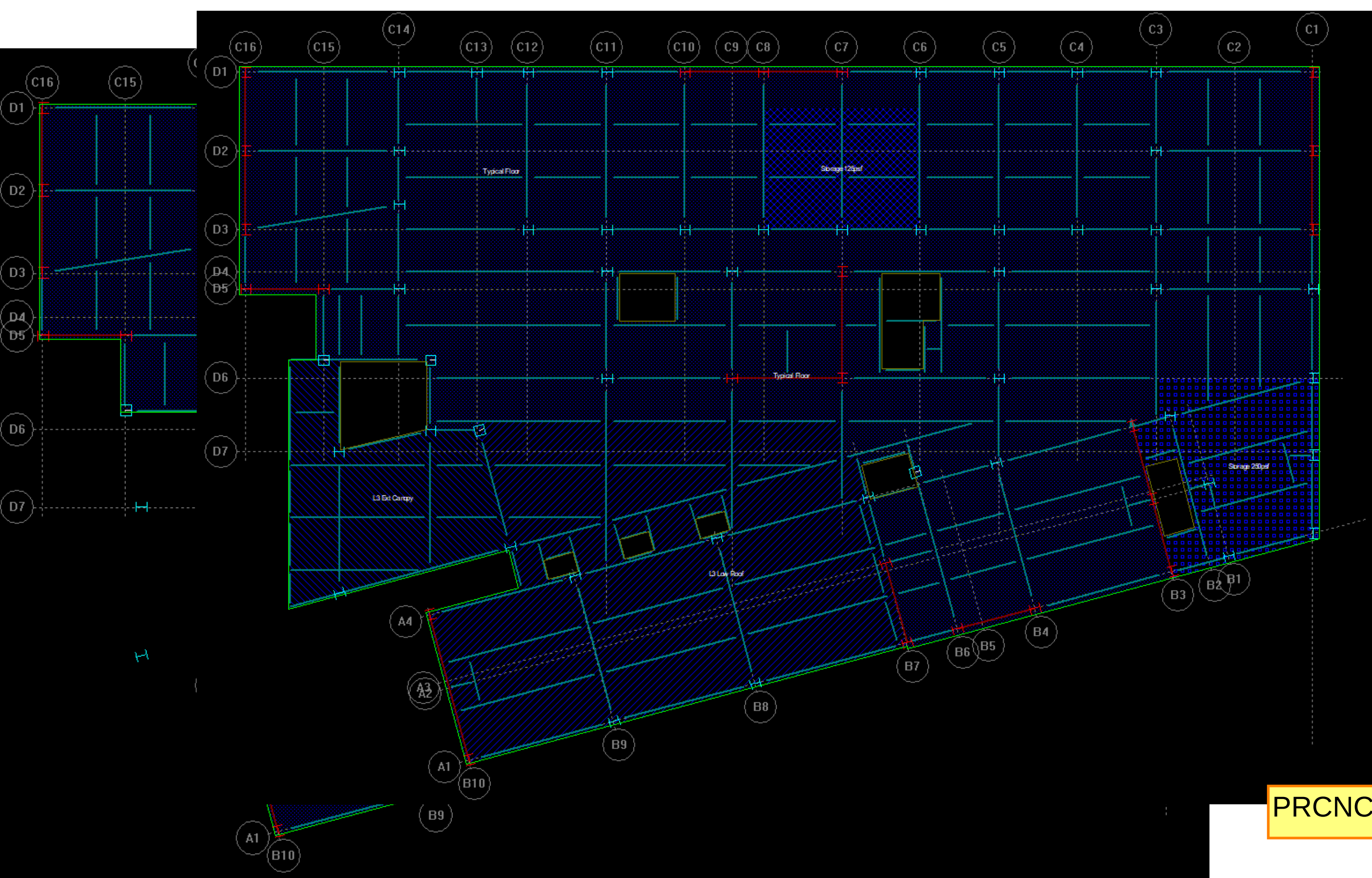
Mezzanine Surface Loads



PRCNC20221036

Level 2 Surface Loads

Level 3 Surface Loads



PRCNC20221036

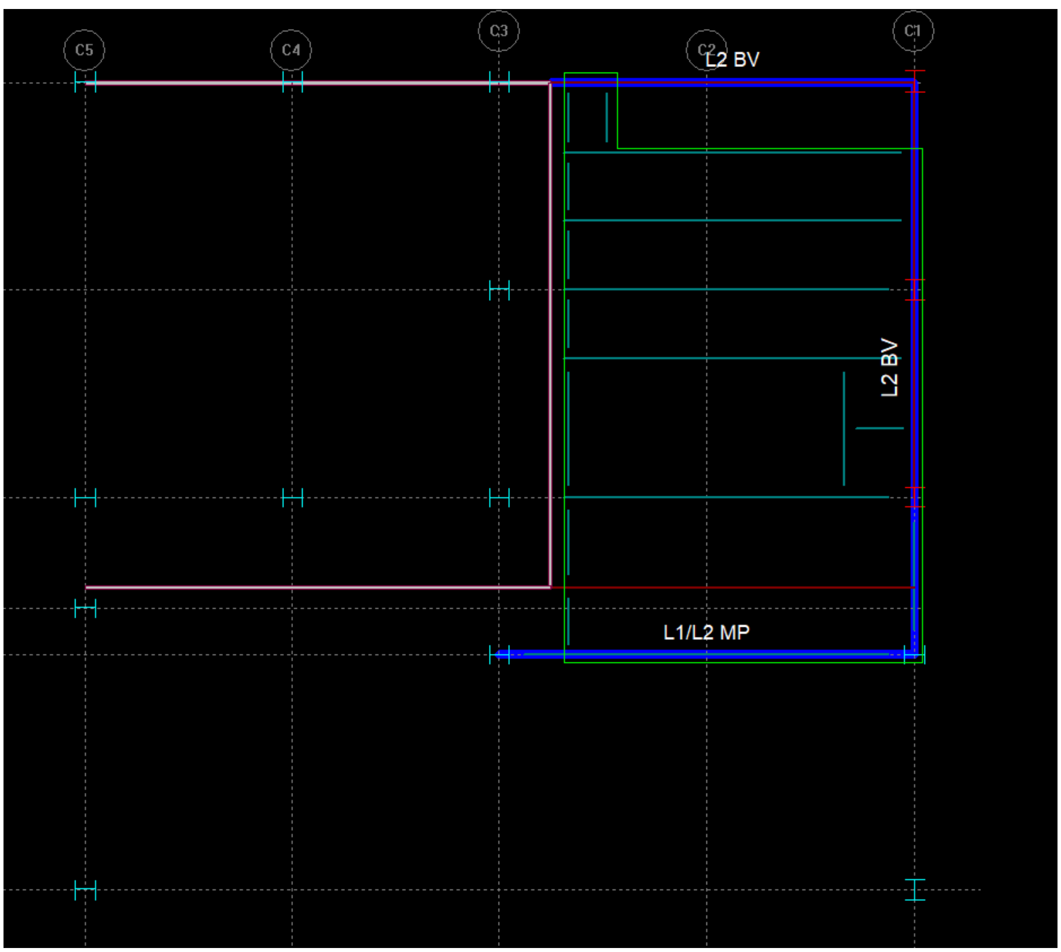
Roof Surface Loads

PRCNC20221036

RAM SS Model Line Loads

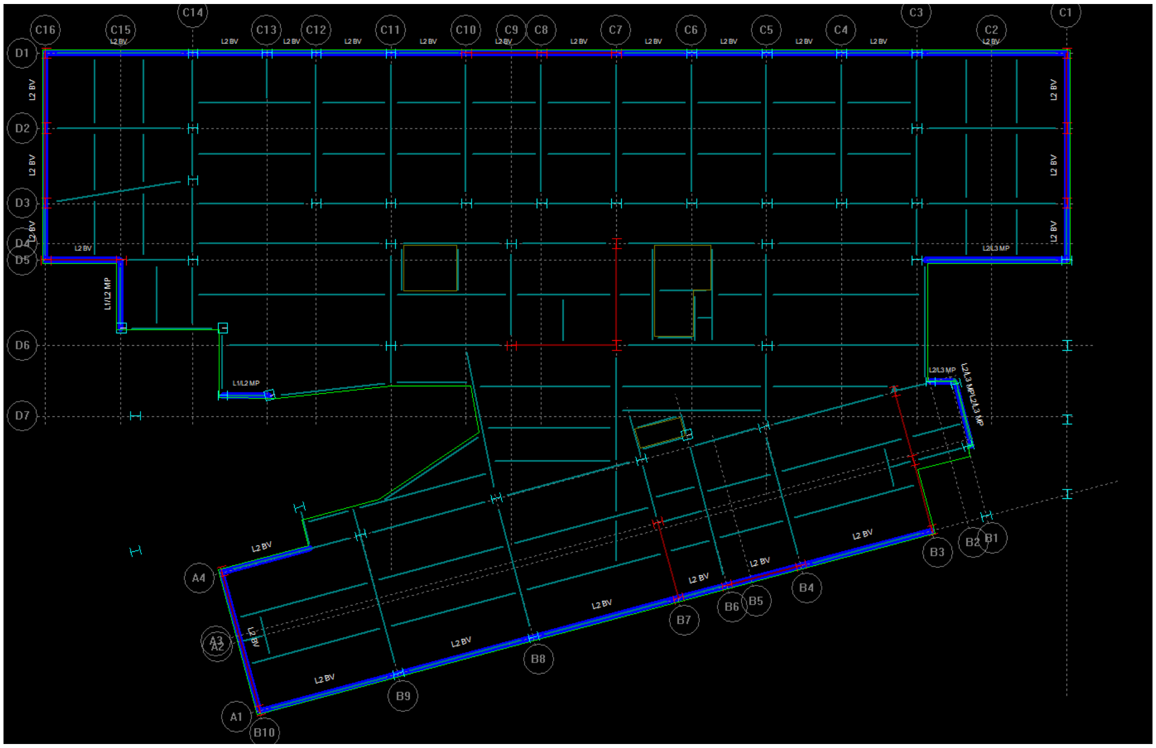
Label	DL	Constr DL	LL	Reduction	Partition	Constr LL	Mass DL
L2 BV	0.010	0.000	0.000	Unreducible	0.000	0.000	0.800
L3 BV Parapet	0.010	0.000	0.000	Unreducible	0.000	0.000	0.620
L1/L2 MP	0.010	0.000	0.000	Unreducible	0.000	0.000	0.250
L2/L3 MP	0.250	0.000	0.000	Unreducible	0.000	0.000	0.250
L3 BV to Roof	1.210	0.000	0.000	Unreducible	0.000	0.000	0.930
L3 BV East Overhang	1.370	0.000	0.000	Unreducible	0.000	0.000	0.700
L3 MP to Roof	0.400	0.000	0.000	Unreducible	0.000	0.000	0.170
RF BV Parapet	0.010	0.000	0.000	Unreducible	0.000	0.000	0.750
RF MP Parapet	0.010	0.000	0.000	Unreducible	0.000	0.000	0.220
Penthouse MP Wall	0.240	0.000	0.000	Unreducible	0.000	0.000	0.240
AHU 320plf	0.320	0.320	0.000	Roof	0.000	0.000	0.320
AHU 350plf	0.350	0.350	0.000	Roof	0.000	0.000	0.350

Mezzanine Line Loads

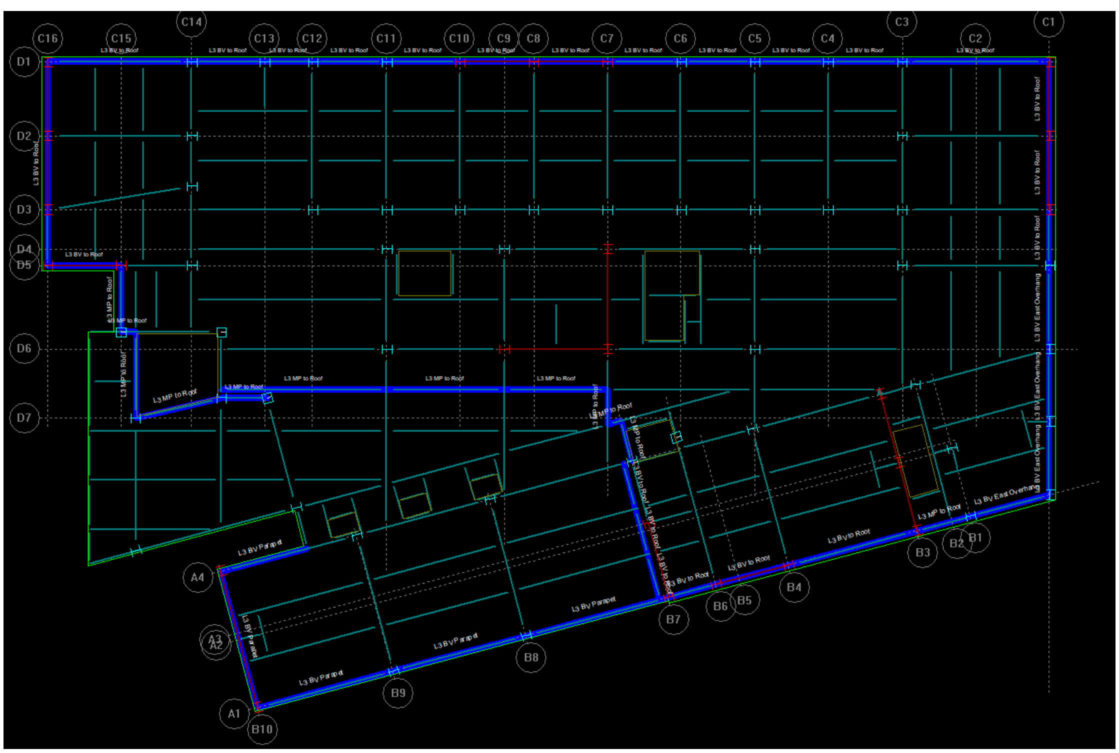


PRCNC20221036

Level 2 Line Loads

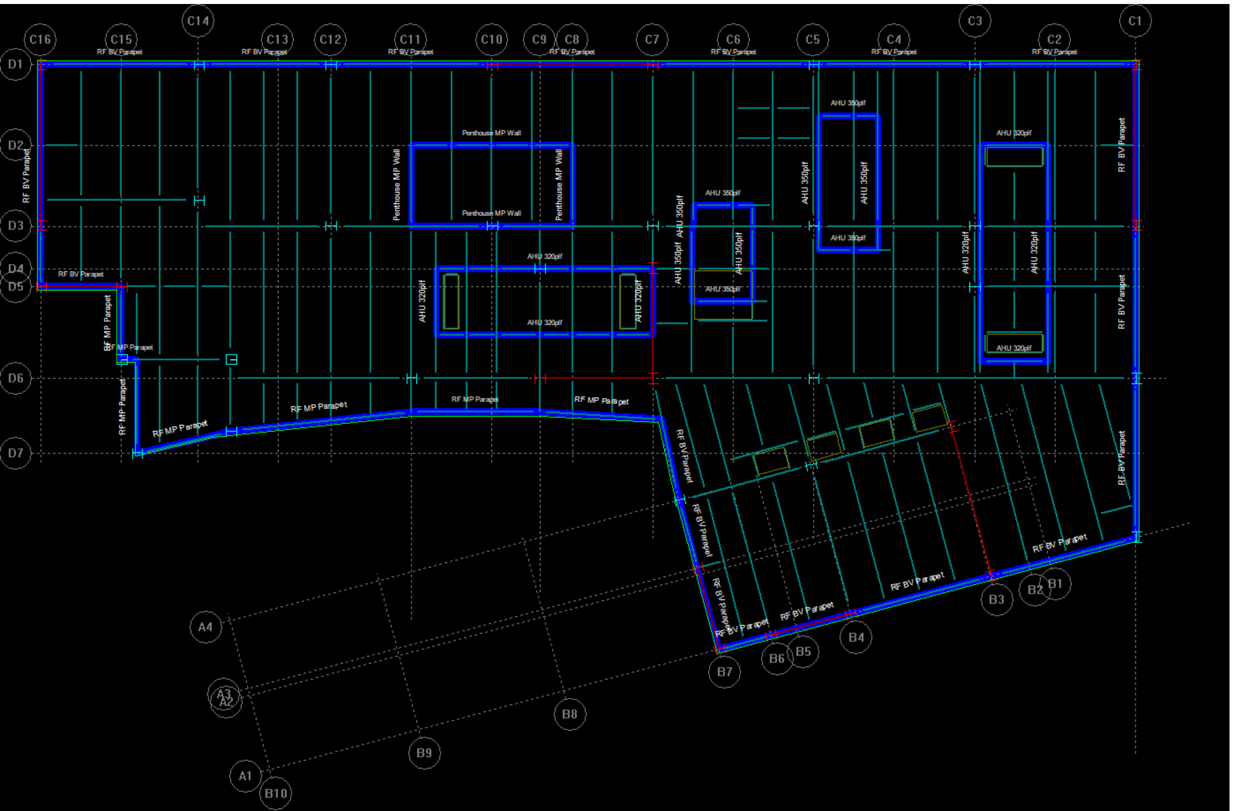


Level 3 Line Loads



PRCNC20221036

Roof Line Loads

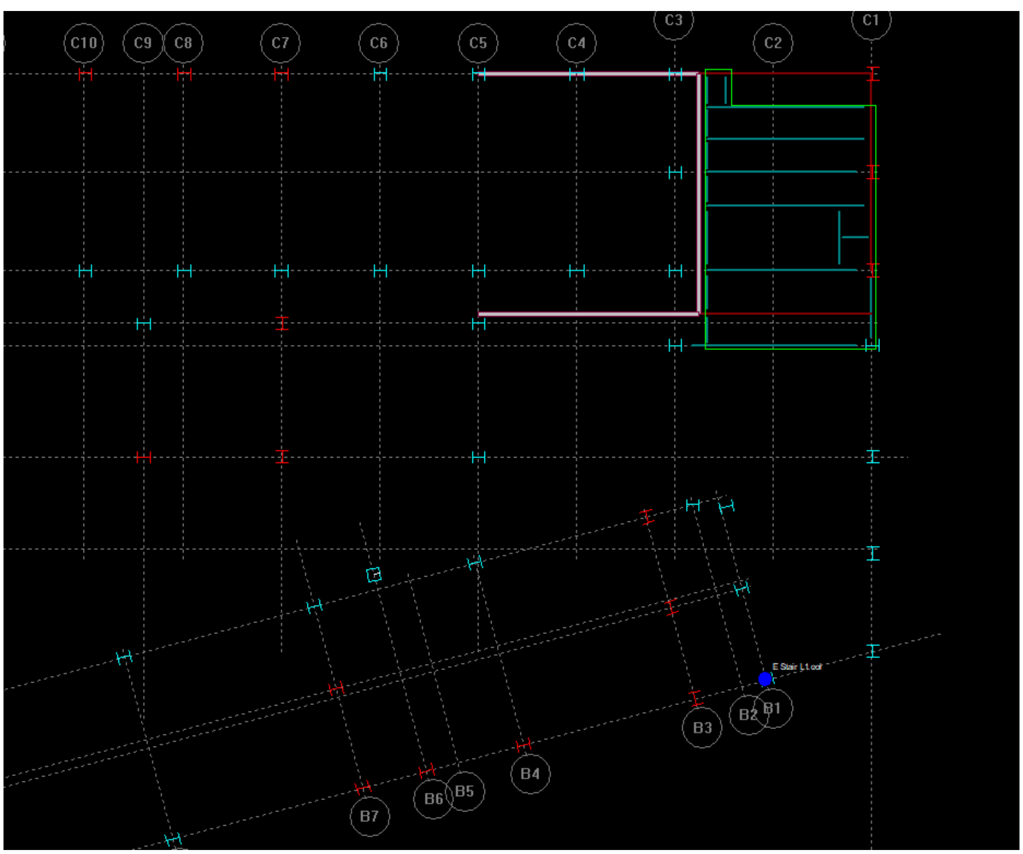


PRCNC20221036

RAM SS Model Point Loads

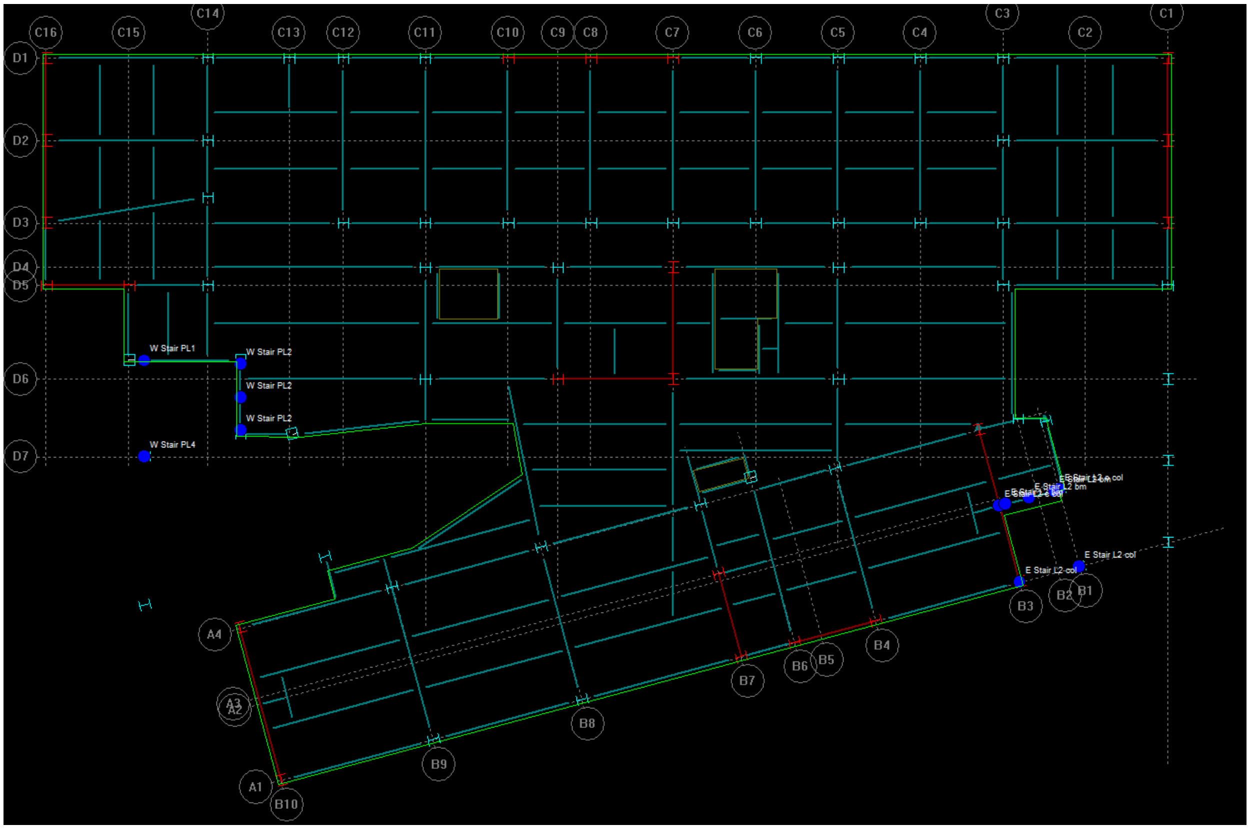
Label	DL	Constr DL	LL	Reduction	Partition	Constr LL	Mass DL
Penthouse Column	8.000	0.000	3.400	Unreducible	0.000	0.000	8.000
W Stair PL1	9.000	9.000	8.000	Unreducible	0.000	3.000	9.000
W Stair PL2	4.000	4.000	4.000	Unreducible	0.000	2.000	4.000
W Stair PL3	2.000	2.000	2.000	Unreducible	0.000	2.000	2.000
W Stair PL4	6.000	3.000	5.000	Unreducible	0.000	3.000	6.000
Lab Ex 1	1.000	0.300	0.000	Reducible	0.000	0.000	1.000
Lab Ex 2	2.000	0.300	0.000	Reducible	0.000	0.000	2.000
E Stair L2 c col	7.000	7.000	5.500	Unreducible	0.000	2.000	7.000
E Stair L1 col	5.000	5.000	3.500	Unreducible	0.000	2.000	5.000
E Stair L2 col	5.000	5.000	3.500	Unreducible	0.000	2.000	5.000
E Stair L2 bm	2.500	2.500	2.500	Unreducible	0.000	2.000	2.500
E Stair L3 bm	3.000	3.000	3.000	Unreducible	0.000	2.000	3.000
E Stair L3 col	6.500	6.500	4.600	Unreducible	0.000	2.000	6.500

Mezzanine Point Loads

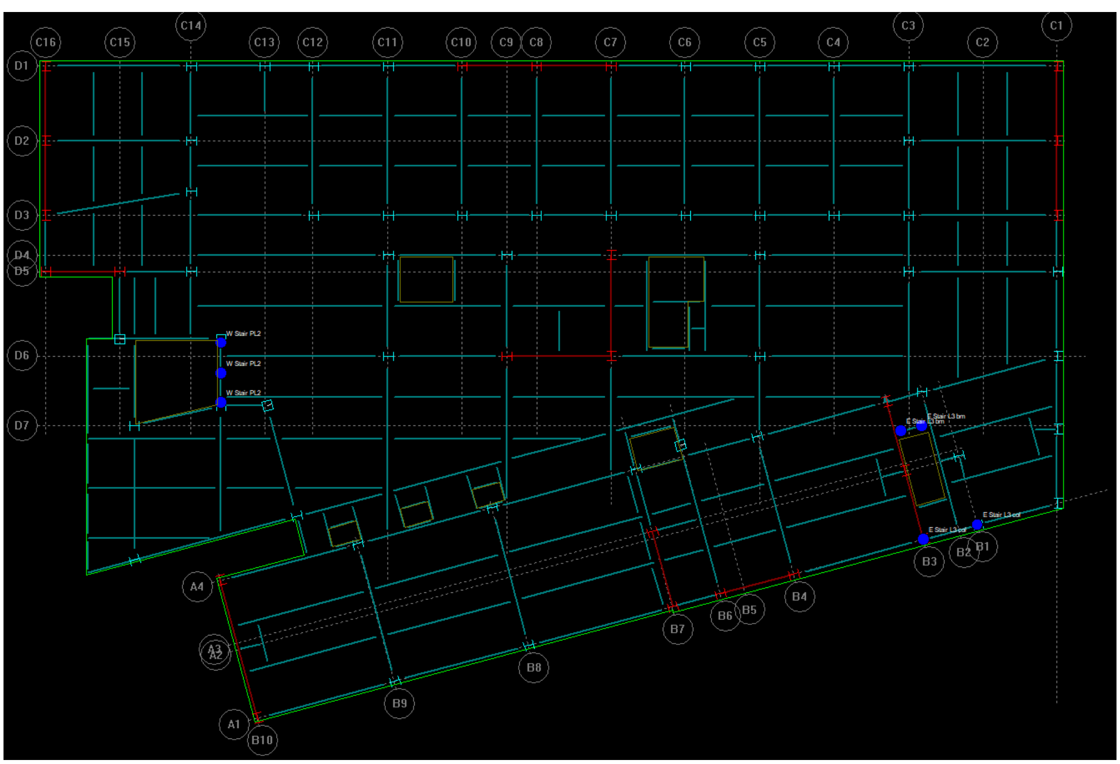


PRCNC20221036

Level 2 Point Loads

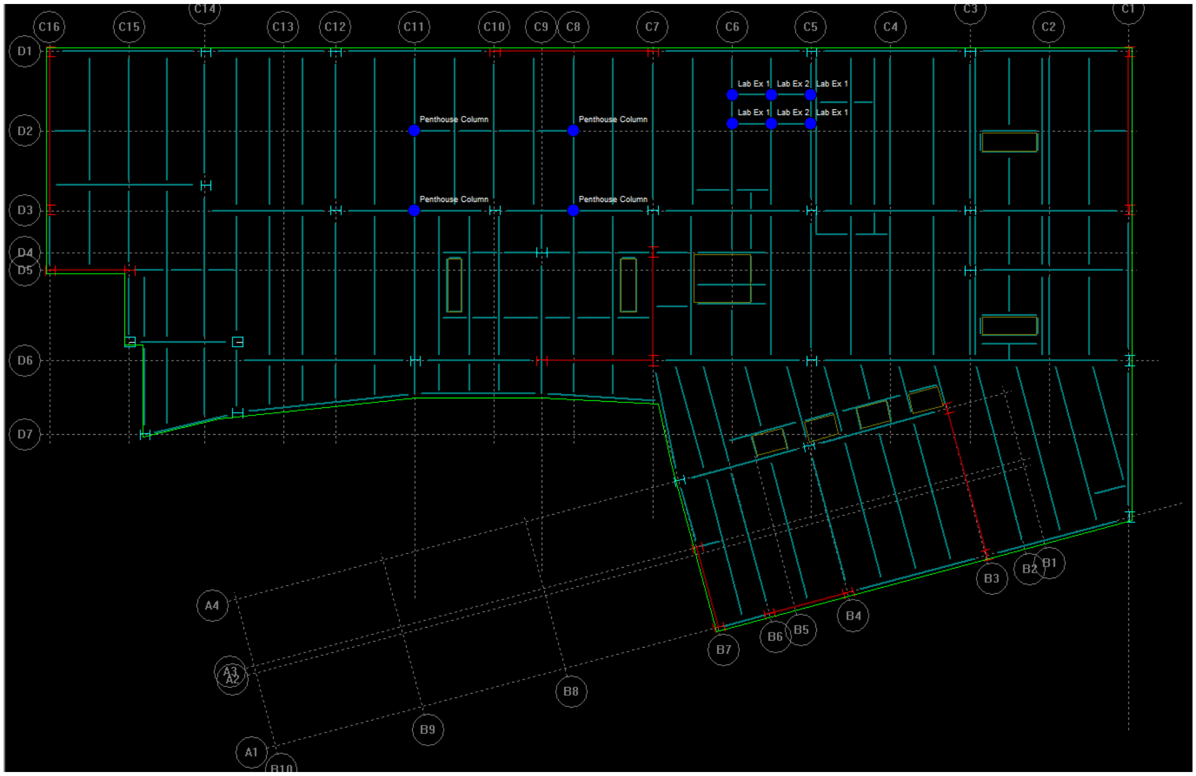


Level 3 Point Loads



PRCNC20221036

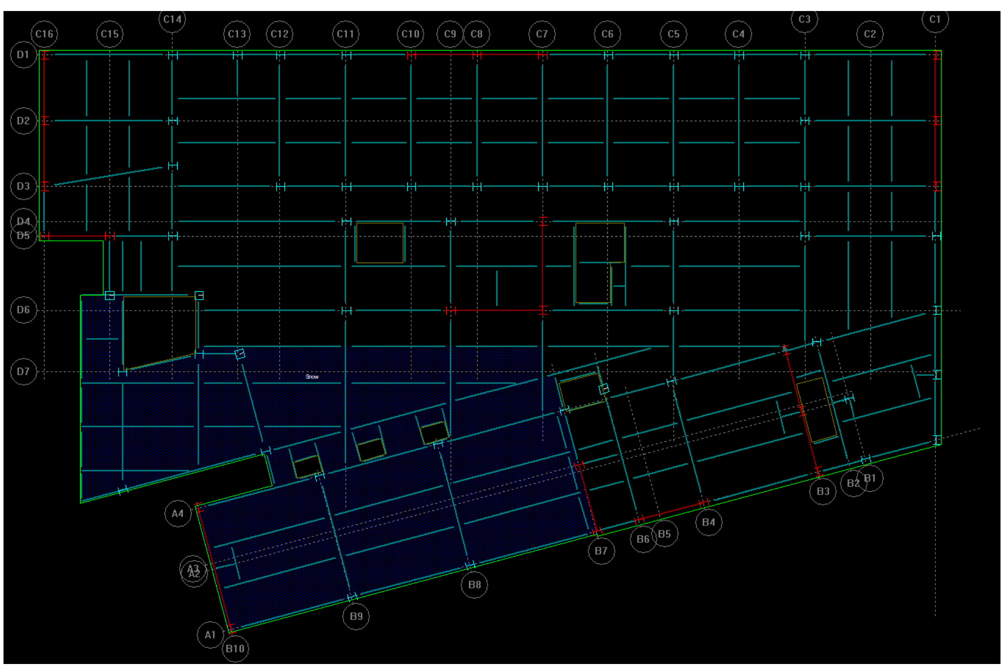
Roof Point Loads



RAM SS Model Uniform Snow Load

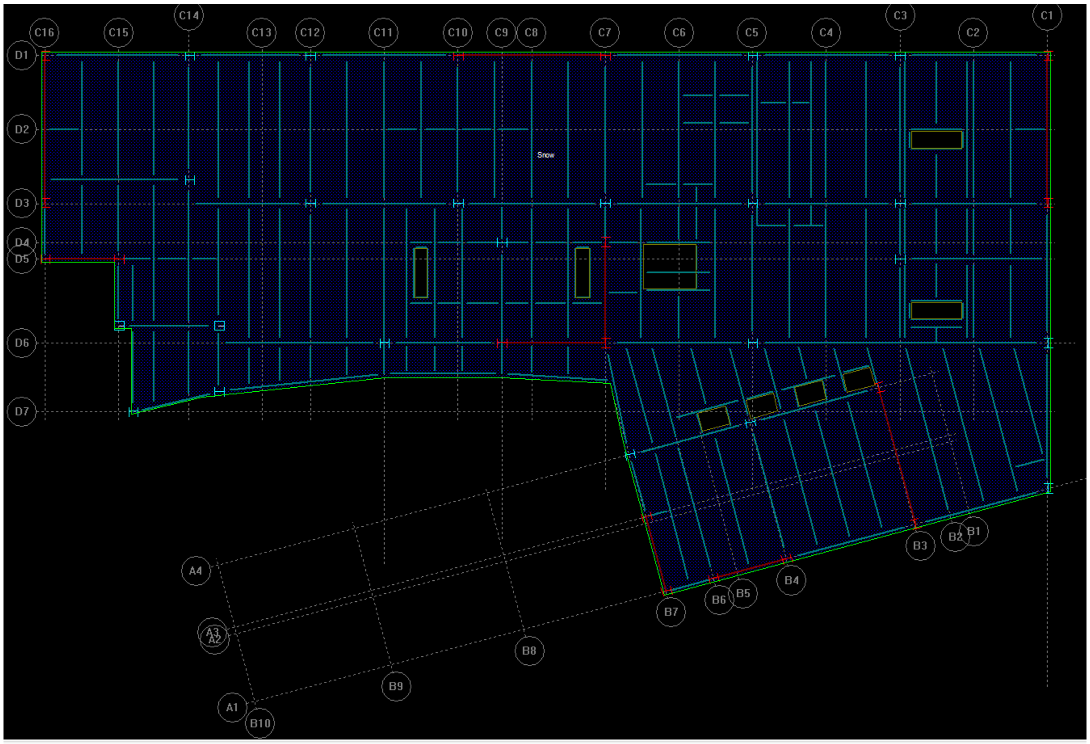
Label	Mag. 1 (psf)	Mag. 2 (psf)	Mag. 3 (psf)
Snow	30.0	----------	----------

Level 3 Snow Load



PRCNC20221036

Roof Snow Load



PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22 06/29/22 13:29:13
Building Code: IBC Steel Code: AISC 360-16 LRFD

Floor Type: Roof **Beam Number = 10**

SPAN INFORMATION (ft): I-End (41.92,176.50) J-End (71.25,176.50)

Beam Size (User Selected) = W18X50 Fy = 50.0 ksi
Total Beam Length (ft) = 29.33
Mp (kip-ft) = 420.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.500	3.19	0.00	0.0	0.00	0.00	0.0	2.84	Snow	0.00
15.000	3.11	0.00	0.0	0.00	0.00	0.0	2.78	Snow	0.00
22.167	3.04	0.00	0.0	0.00	0.00	0.0	2.71	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	29.333	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	29.333	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	29.333	0.000	0.019			0.000
4	0.000	0.050	0.000	---	NonR	0.000
	29.333	0.050	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 14.21 kips 1.00Vn = 191.70 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	133.4	15.0	7.5	1.10	0.90	378.75
Controlling		1.2DL+1.6LL	133.4	15.0	7.5	1.10	0.90	378.75

REACTIONS (kips):

	Left	**Right**
DL reaction	5.80	5.87
Max +LL reaction	4.41	4.48
Max +total reaction (factored)	14.03	14.21

DEFLECTIONS:

								Ratio
Dead load (in)	at 14.67 ft	=	-0.347	L/D	=	1015		
Live load (in)	at 14.67 ft	=	-0.272	L/D	=	1294	> 360	0.28
Net Total load (in)	at 14.67 ft	=	-0.619	L/D	=	569	> 240	0.42

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 11**

SPAN INFORMATION (ft): I-End (71.25,176.50) J-End (95.92,176.50)

Beam Size (User Selected) = W18X50 Fy = 50.0 ksi
Total Beam Length (ft) = 24.67
Mp (kip-ft) = 420.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.000	3.13	0.00	0.0	0.00	0.00	0.0	2.75	Snow	0.00
12.219	3.18	0.00	0.0	0.00	0.00	0.0	2.80	Snow	0.00
18.438	3.18	0.00	0.0	0.00	0.00	0.0	2.80	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	24.666	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	24.666	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	24.666	0.000	0.019			0.000
4	0.000	0.050	0.000	---	NonR	0.000
	24.666	0.050	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.99 kips 1.00Vn = 191.70 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	110.9	12.2	6.2	1.10	0.90	378.75
Controlling		1.2DL+1.6LL	110.9	12.2	6.2	1.10	0.90	378.75

REACTIONS (kips):

	Left	**Right**
DL reaction	5.75	5.69
Max +LL reaction	4.43	4.38
Max +total reaction (factored)	13.99	13.84

DEFLECTIONS:

					Ratio
Dead load (in)	at 12.33 ft = -0.203	L/D = 1460			
Live load (in)	at 12.33 ft = -0.160	L/D = 1847	>	360	0.19
Net Total load (in)	at 12.33 ft = -0.363	L/D = 816	>	240	0.29

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 12**

SPAN INFORMATION (ft): I-End (95.92,176.50) J-End (125.92,176.50)

Beam Size (User Selected) = W18X50 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 420.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.500	3.82	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
15.000	11.11	0.00	0.0	1.70	0.00	0.0	3.37	Snow	0.00
22.500	8.33	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	30.000	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	30.000	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	30.000	0.000	0.019			0.000
4	0.000	0.050	0.000	---	NonR	0.000
	30.000	0.050	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.65 kips 1.00Vn = 191.70 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	270.1	15.0	7.5	1.16	0.90	378.75
Controlling		1.2DL+1.6LL	270.1	15.0	7.5	1.16	0.90	378.75

REACTIONS (kips):

	Left	**Right**
DL reaction	11.69	13.94
Max +LL reaction	6.20	6.20
Max +total reaction (factored)	23.94	26.65

DEFLECTIONS:

						Ratio
Dead load (in)	at 15.30 ft	= -0.878	L/D = 410			
Live load (in)	at 15.15 ft	= -0.422	L/D = 853	>	360	0.42
Net Total load (in)	at 15.15 ft	= -1.300	L/D = 277	>	240	0.87

PRCNC20221036

Floor Type: Roof **Beam Number = 13**

SPAN INFORMATION (ft): I-End (155.92,176.50) J-End (185.92,176.50)

Beam Size (User Selected) = W18X50 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 420.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.500	4.06	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
15.000	5.48	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
22.500	6.57	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	30.000	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	30.000	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	30.000	0.000	0.019			0.000
4	0.000	0.050	0.000	---	NonR	0.000
	30.000	0.050	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.40 kips 1.00Vn = 191.70 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	192.3	15.0	7.5	1.09	0.90	378.75
Controlling		1.2DL+1.6LL	192.3	15.0	7.5	1.09	0.90	378.75

REACTIONS (kips):

	Left	**Right**
DL reaction	8.62	9.87
Max +LL reaction	5.35	5.35
Max +total reaction (factored)	18.90	20.40

DEFLECTIONS:							**Ratio**
Dead load (in)	at 15.15 ft	=	-0.598	L/D =	602		
Live load (in)	at 15.15 ft	=	-0.351	L/D =	1027	> 360	0.35
Net Total load (in)	at 15.15 ft	=	-0.949	L/D =	379	> 240	0.63

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 14**

SPAN INFORMATION (ft): I-End (185.92,176.50) J-End (215.92,176.50)

Beam Size (User Selected) = W18X50 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 420.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	5.33	0.00	0.0	0.00	0.00	0.0	1.69	Snow	0.00
7.500	4.25	0.00	0.0	0.00	0.00	0.0	2.47	Snow	0.00
12.000	5.08	0.00	0.0	0.00	0.00	0.0	1.69	Snow	0.00
15.000	2.93	0.00	0.0	0.00	0.00	0.0	2.52	Snow	0.00
23.188	4.01	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	30.000	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	30.000	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	30.000	0.000	0.019			0.000
4	0.000	0.050	0.000	---	NonR	0.000
	30.000	0.050	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 28.84 kips 1.00Vn = 191.70 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	196.8	15.0	8.2	1.15	0.90	378.75
Controlling		1.2DL+1.6LL	196.8	15.0	8.2	1.15	0.90	378.75

REACTIONS (kips):

	Left	**Right**
DL reaction	14.96	9.03
Max +LL reaction	6.81	5.50
Max +total reaction (factored)	28.84	19.64

DEFLECTIONS:

						Ratio
Dead load (in)	at 14.55 ft	= -0.638	L/D = 564			
Live load (in)	at 14.70 ft	= -0.355	L/D = 1014	>	360	0.36
Net Total load (in)	at 14.70 ft	= -0.993	L/D = 363	>	240	0.66

PRCNC20221036

Floor Type: Roof **Beam Number = 15**

SPAN INFORMATION (ft): I-End (215.92,176.50) J-End (245.92,176.50)

Beam Size (User Selected) = W18X50 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 420.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	4.75	0.00	0.0	0.00	0.00	0.0	2.16	Snow	0.00
7.500	1.57	0.00	0.0	0.00	0.00	0.0	1.43	Snow	0.00
13.750	4.78	0.00	0.0	0.00	0.00	0.0	2.19	Snow	0.00
15.000	2.23	0.00	0.0	0.00	0.00	0.0	1.97	Snow	0.00
22.500	3.84	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	30.000	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	30.000	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	30.000	0.000	0.019			0.000
4	0.000	0.050	0.000	---	NonR	0.000
	30.000	0.050	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 24.29 kips 1.00Vn = 191.70 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	179.2	13.8	6.3	1.15	0.90	378.75
Controlling		1.2DL+1.6LL	179.2	13.8	6.3	1.15	0.90	378.75

REACTIONS (kips):

	Left	**Right**
DL reaction	11.63	7.93
Max +LL reaction	6.46	5.23
Max +total reaction (factored)	24.29	17.89

DEFLECTIONS:

								Ratio
Dead load (in)	at 15.00 ft	=	-0.530	L/D	=	680		
Live load (in)	at 15.00 ft	=	-0.336	L/D	=	1072	> 360	0.34
Net Total load (in)	at 15.00 ft	=	-0.865	L/D	=	416	> 240	0.58

PRCNC20221036

Floor Type: Roof **Beam Number = 16**

SPAN INFORMATION (ft): I-End (41.92,151.25) J-End (71.25,151.25)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 29.33
Mp (kip-ft) = 326.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.500	3.20	0.00	0.0	0.00	0.00	0.0	2.84	Snow	0.00
7.500	1.97	0.00	0.0	0.00	0.00	0.0	1.81	Snow	0.00
15.000	3.11	0.00	0.0	0.00	0.00	0.0	2.78	Snow	0.00
15.000	2.01	0.00	0.0	0.00	0.00	0.0	1.77	Snow	0.00
22.167	3.04	0.00	0.0	0.00	0.00	0.0	2.71	Snow	0.00
22.167	3.65	0.00	0.0	0.00	0.00	0.0	3.19	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.040	0.000	---	NonR	0.000
	29.333	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 24.26 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	217.5	15.0	7.2	1.09	0.90	281.33
Controlling		1.2DL+1.6LL	217.5	15.0	7.2	1.09	0.90	281.33

REACTIONS (kips):

	Left	**Right**
DL reaction	8.57	9.58
Max +LL reaction	7.12	7.97
Max +total reaction (factored)	21.68	24.26

DEFLECTIONS:							**Ratio**
Dead load (in)	at 14.81 ft	=	-0.716	L/D =	492		
Live load (in)	at 14.81 ft	=	-0.603	L/D =	584	> 360	0.62
Net Total load (in)	at 14.81 ft	=	-1.319	L/D =	267	> 240	0.90

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 17**

SPAN INFORMATION (ft): I-End (71.25,151.25) J-End (71.25,176.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 25.25
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.204	0.000	---	Snow	0.000
	25.250	0.204	0.000			0.000
2	0.000	0.000	0.197	---	Snow	0.000
	25.250	0.000	0.197			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	25.250	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.37 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	46.5	12.6	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	46.5	12.6	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	2.82	2.82
Max +LL reaction	2.49	2.49
Max +total reaction (factored)	7.37	7.37

DEFLECTIONS:

								Ratio
Dead load (in)	at 12.62 ft	=	-0.541	L/D	=	560		
Live load (in)	at 12.62 ft	=	-0.479	L/D	=	632	> 360	0.57
Net Total load (in)	at 12.62 ft	=	-1.020	L/D	=	297	> 240	0.81

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 18**

SPAN INFORMATION (ft): I-End (56.92,121.58) J-End (77.25,121.58)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33
Mp (kip-ft) = 184.17

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
2.917	0.88	0.00	0.0	0.00	0.00	0.0	0.73	Snow	0.00
2.917	0.87	0.00	0.0	0.00	0.00	0.0	0.64	Snow	0.00
7.167	3.35	0.00	0.0	0.00	0.00	0.0	2.89	Snow	0.00
7.167	1.55	0.00	0.0	0.00	0.00	0.0	1.40	Snow	0.00
14.333	4.97	0.00	0.0	0.00	0.00	0.0	4.20	Snow	0.00
14.333	1.59	0.00	0.0	0.00	0.00	0.0	1.45	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	2.916	0.010	0.000			0.000
2	0.000	0.010	0.000	---	Snow	0.000
	2.575	0.010	0.000			0.000
3	2.584	0.010	0.000	---	Snow	0.000
	2.916	0.000	0.000			0.000
4	0.000	0.000	0.010	---	Snow	0.000
	2.575	0.000	0.010			0.000
5	2.575	0.000	0.010	---	Snow	0.000
	2.688	0.000	0.007			0.000
6	2.689	0.000	0.007	---	Snow	0.000
	2.802	0.000	0.000			0.000
7	0.000	0.026	0.000	---	NonR	0.000
	20.333	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.36 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	104.7	7.2	7.2	1.00	0.90	137.31
Controlling		1.2DL+1.6LL	104.7	7.2	7.2	1.00	0.90	137.31

REACTIONS (kips):

	Left	Right
DL reaction	6.93	6.87
Max +LL reaction	5.65	5.70
Max +total reaction (factored)	17.36	17.36

DEFLECTIONS: **Ratio**

Dead load (in) at 10.27 ft = -0.365 L/D = 668
Live load (in) at 10.27 ft = -0.305 L/D = 801 > PRCNC20221036

Net Total load (in)	at 10.27 ft	=	-0.670	L/D	=	364	> 240	0.66

Floor Type: Roof **Beam Number = 19**

SPAN INFORMATION (ft): I-End (71.25,121.58) J-End (71.25,151.25)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 29.67
Mp (kip-ft) = 184.17

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
13.583	0.04								
13.583	0.05								
24.917	9.40	0.00	0.0	0.00	0.00	0.0	7.93	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.204	0.000	---	Snow	0.000
	29.666	0.204	0.000			0.000
2	0.000	0.000	0.197	---	Snow	0.000
	29.666	0.000	0.197			0.000
3	0.000	0.026	0.000	---	NonR	0.000
	29.666	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 28.96 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	134.9	21.2	0.0	1.00	0.90	165.75
Controlling		1.2DL+1.6LL	134.9	21.2	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
DL reaction	4.97	11.35
Max +LL reaction	4.20	9.59
Max +total reaction (factored)	12.68	28.96

DEFLECTIONS: (Camber = 3/4)

					Ratio
Dead load (in)	at 15.87 ft	= -0.944	L/D = 377		
Live load (in)	at 15.87 ft	= -0.795	L/D = 448	> 360	0.80
Net Total load (in)	at 15.87 ft	= -0.989	L/D = 360	> 240	0.67

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 20**

SPAN INFORMATION (ft): I-End (71.25,146.50) J-End (95.92,146.50)

Beam Size (Optimum) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 24.67
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.000	3.13	0.00	0.0	0.00	0.00	0.0	2.75	Snow	0.00
6.000	2.58	0.00	0.0	0.00	0.00	0.0	2.28	Snow	0.00
12.219	3.18	0.00	0.0	0.00	0.00	0.0	2.80	Snow	0.00
12.219	2.96	0.00	0.0	0.00	0.00	0.0	2.64	Snow	0.00
18.438	3.18	0.00	0.0	0.00	0.00	0.0	2.80	Snow	0.00
18.438	2.96	0.00	0.0	0.00	0.00	0.0	2.65	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.035	0.000	---	NonR	0.000
	24.666	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 24.12 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	197.0	12.2	6.2	1.11	0.90	249.38
Controlling		1.2DL+1.6LL	197.0	12.2	6.2	1.11	0.90	249.38

REACTIONS (kips):

	Left	**Right**
DL reaction	9.40	9.45
Max +LL reaction	7.93	7.99
Max +total reaction (factored)	23.96	24.12

DEFLECTIONS:

						Ratio
Dead load (in)	at 12.33 ft	= -0.539	L/D = 549			
Live load (in)	at 12.33 ft	= -0.460	L/D = 643	>	360	0.56
Net Total load (in)	at 12.33 ft	= -1.000	L/D = 296	>	240	0.81

PRCNC20221036

Floor Type: Roof **Beam Number = 21**

SPAN INFORMATION (ft): I-End (95.92,146.50) J-End (125.92,146.50)

Beam Size (Optimum) = W24X68 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 737.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.500	3.82	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
7.500	3.56	0.00	0.0	0.00	0.00	0.0	3.19	Snow	0.00
15.000	16.20	0.00	0.0	1.70	0.00	0.0	3.37	Snow	0.00
15.000	1.80	0.00	0.0	0.00	0.00	0.0	2.59	Snow	0.00
		0.00	0.0	0.00	0.00	0.0	-0.81	Snow	0.00
19.667	4.80	0.00	0.0	0.00	0.00	0.0	2.01	Snow	0.00
22.500	14.91	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
25.333	3.94	0.00	0.0	0.00	0.00	0.0	2.23	Snow	0.00
15.000	8.00	0.00	0.0	3.40	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	15.000	0.240	0.000	---	NonR	0.000
	30.000	0.240	0.000			0.000
2	0.000	0.068	0.000	---	NonR	0.000
	30.000	0.068	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 64.11 kips 1.00Vn = 295.07 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	617.8	15.0	7.5	1.18	0.90	663.75
Controlling		1.2DL+1.6LL	617.8	15.0	7.5	1.18	0.90	663.75

REACTIONS (kips):

	Left	**Right**
DL reaction	26.45	36.22
Max +LL reaction	12.34	12.90
Max -LL reaction	-0.40	-0.40
Max +total reaction (factored)	51.48	64.11

DEFLECTIONS:

						Ratio
Dead load (in)	at 15.30 ft	= -0.931	L/D =	387		
Live load (in)	at 15.30 ft	= -0.378	L/D =	952	> 360	0.38
Net Total load (in)	at 15.30 ft	= -1.309	L/D =	275	> 240	0.87

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 22**

SPAN INFORMATION (ft): I-End (125.92,146.50) J-End (155.92,146.50)

Beam Size (Optimum) = W24X68 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 737.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	4.79	0.00	0.0	0.00	0.00	0.0	2.90	Snow	0.00
7.500	14.91	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
9.000	0.69	0.00	0.0	0.00	0.00	0.0	0.84	Snow	0.00
15.000	16.20	0.00	0.0	1.70	0.00	0.0	3.37	Snow	0.00
15.000	4.73	0.00	0.0	0.00	0.00	0.0	2.87	Snow	0.00
22.500	3.82	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
22.500	5.13	0.00	0.0	0.00	0.00	0.0	2.95	Snow	0.00
15.000	8.00	0.00	0.0	3.40	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.240	0.000	---	NonR	0.000
	15.000	0.240	0.000			0.000
2	0.000	0.068	0.000	---	NonR	0.000
	30.000	0.068	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 65.15 kips 1.00Vn = 295.07 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	602.5	15.0	7.5	1.17	0.90	663.75
Controlling		1.2DL+1.6LL	602.5	15.0	7.5	1.17	0.90	663.75

REACTIONS (kips):

	Left	**Right**
DL reaction	36.72	27.19
Max +LL reaction	13.18	11.61
Max +total reaction (factored)	65.15	51.21

DEFLECTIONS:

					Ratio
Dead load (in)	at 14.85 ft	= -0.914	L/D = 394		
Live load (in)	at 14.85 ft	= -0.347	L/D = 1037	> 360	0.35
Net Total load (in)	at 14.85 ft	= -1.261	L/D = 285	> 240	0.84

PRCNC20221036

Floor Type: Roof **Beam Number = 23**

SPAN INFORMATION (ft): I-End (155.92,146.50) J-End (185.92,146.50)

Beam Size (Optimum) = W21X48 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 445.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.333	9.55	0.00	0.0	0.00	0.00	0.0	3.35	Snow	0.00
7.500	6.21	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
15.000	6.85	0.00	0.0	0.00	0.00	0.0	3.27	Snow	0.00
15.000	0.75	0.00	0.0	0.00	0.00	0.0	0.68	Snow	0.00
18.667	0.88	0.00	0.0	0.00	0.00	0.0	0.21	Snow	0.00
18.667	1.91	0.00	0.0	0.00	0.00	0.0	0.45	Snow	0.00
22.500	5.83	0.00	0.0	0.00	0.00	0.0	3.27	Snow	0.00
22.500	6.69	0.00	0.0	0.00	0.00	0.0	3.55	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.048	0.000	---	NonR	0.000
	30.000	0.048	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 39.07 kips 1.00Vn = 216.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	354.3	15.0	7.5	1.08	0.90	397.95
Controlling		1.2DL+1.6LL	354.3	15.0	7.5	1.08	0.90	397.95

REACTIONS (kips):

	Left	**Right**
DL reaction	20.58	19.53
Max +LL reaction	8.99	9.16
Max +total reaction (factored)	39.07	38.10

DEFLECTIONS: (Camber = 3/4)

								Ratio
Dead load (in)	at 15.00 ft	=	-1.062	L/D	=	339		
Live load (in)	at 15.00 ft	=	-0.483	L/D	=	745	> 360	0.48
Net Total load (in)	at 15.00 ft	=	-0.795	L/D	=	453	> 240	0.53

Gravity Beam Design

Floor Type: Roof **Beam Number = 24**

SPAN INFORMATION (ft): I-End (185.92,146.50) J-End (215.92,146.50)

Beam Size (Optimum) = W21X48 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 445.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	7.17	0.00	0.0	0.00	0.00	0.0	1.69	Snow	0.00
1.000	1.12	0.00	0.0	0.00	0.00	0.0	0.26	Snow	0.00
7.500	3.52	0.00	0.0	0.00	0.00	0.0	2.47	Snow	0.00
7.500	5.87	0.00	0.0	0.00	0.00	0.0	3.05	Snow	0.00
12.000	7.06	0.00	0.0	0.00	0.00	0.0	1.69	Snow	0.00
12.000	1.12	0.00	0.0	0.00	0.00	0.0	0.26	Snow	0.00
15.000	2.93	0.00	0.0	0.00	0.00	0.0	2.51	Snow	0.00
15.000	4.40	0.00	0.0	0.00	0.00	0.0	3.17	Snow	0.00
23.167	4.01	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
23.167	3.73	0.00	0.0	0.00	0.00	0.0	3.19	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.048	0.000	---	NonR	0.000
	30.000	0.048	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 49.77 kips 1.00Vn = 216.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	367.7	15.0	8.2	1.16	0.90	397.95
Controlling		1.2DL+1.6LL	367.7	15.0	8.2	1.16	0.90	397.95

REACTIONS (kips):

	Left	**Right**
DL reaction	26.10	16.26
Max +LL reaction	11.53	10.14
Max +total reaction (factored)	49.77	35.73

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 14.55 ft	= -0.985	L/D =	366		
Live load (in)	at 14.70 ft	= -0.548	L/D =	657	> 360	0.55
Net Total load (in)	at 14.70 ft	= -0.783	L/D =	460	> 240	0.52

PRCNC20221036

Floor Type: Roof **Beam Number = 25**

SPAN INFORMATION (ft): I-End (215.92,146.50) J-End (245.92,146.50)

Beam Size (User Selected) = W21X48 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 445.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	7.05	0.00	0.0	0.00	0.00	0.0	2.28	Snow	0.00
1.000	2.37	0.00	0.0	0.00	0.00	0.0	0.64	Snow	0.00
7.500	0.87	0.00	0.0	0.00	0.00	0.0	1.05	Snow	0.00
7.500	0.90	0.00	0.0	0.00	0.00	0.0	1.08	Snow	0.00
13.750	7.08	0.00	0.0	0.00	0.00	0.0	2.31	Snow	0.00
13.750	2.37	0.00	0.0	0.00	0.00	0.0	0.64	Snow	0.00
15.000	2.19	0.00	0.0	0.00	0.00	0.0	1.97	Snow	0.00
15.000	0.81	0.00	0.0	0.00	0.00	0.0	0.74	Snow	0.00
22.500	3.84	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
22.500	1.39	0.00	0.0	0.00	0.00	0.0	1.27	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.048	0.000	---	NonR	0.000
	30.000	0.048	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 36.55 kips 1.00Vn = 216.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	258.9	13.8	6.3	1.16	0.90	397.95
Controlling		1.2DL+1.6LL	258.9	13.8	6.3	1.16	0.90	397.95

REACTIONS (kips):

	Left	**Right**
DL reaction	19.08	11.23
Max +LL reaction	8.53	6.83
Max +total reaction (factored)	36.55	24.40

DEFLECTIONS:

							Ratio
Dead load (in)	at 14.85 ft	=	-0.664	L/D =	542		
Live load (in)	at 15.00 ft	=	-0.370	L/D =	973	> 360	0.37
Net Total load (in)	at 15.00 ft	=	-1.034	L/D =	348	> 240	0.69

Floor Type: Roof **Beam Number = 26**

SPAN INFORMATION (ft): I-End (215.92,146.50) J-End (215.92,176.50)

Beam Size (Optimum) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.106	0.000	---	Snow	0.000
	30.000	0.106	0.000			0.000
2	0.000	0.000	0.117	---	Snow	0.000
	30.000	0.000	0.117			0.000
3	0.000	0.011	0.000	---	Snow	0.000
	15.000	0.011	0.000			0.000
4	15.000	0.015	0.000	---	Snow	0.000
	30.000	0.015	0.000			0.000
5	0.000	0.014	0.000	---	NonR	0.000
	30.000	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.23 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	39.1	15.1	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	39.1	15.1	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	1.99	2.02
Max +LL reaction	1.76	1.76
Max +total reaction (factored)	5.20	5.23

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 15.00 ft	= -0.946	L/D = 380			
Live load (in)	at 15.00 ft	= -0.832	L/D = 433	>	360	0.83
Net Total load (in)	at 15.00 ft	= -1.029	L/D = 350	>	240	0.69

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 27**

SPAN INFORMATION (ft): I-End (185.92,146.50) J-End (185.92,176.50)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
16.417	0.05								
21.833	0.05								
21.833	1.00								
16.417	1.00								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.132	0.000	---	Snow	0.000
	30.000	0.132	0.000			0.000
2	0.000	0.000	0.127	---	Snow	0.000
	30.000	0.000	0.127			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.43 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	58.3	16.4	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	58.3	16.4	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	3.07	3.64
Max +LL reaction	1.91	1.91
Max +total reaction (factored)	6.74	7.43

DEFLECTIONS:

								Ratio
Dead load (in)	at 15.30 ft	=	-0.790	L/D	=	456		
Live load (in)	at 15.30 ft	=	-0.402	L/D	=	895	> 360	0.40
Net Total load (in)	at 15.30 ft	=	-1.192	L/D	=	302	> 240	0.79

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 28**

SPAN INFORMATION (ft): I-End (155.92,146.50) J-End (155.92,176.50)

Beam Size (User Selected) = W18X55 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 466.67

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.233	0.000	---	Snow	0.000
	30.000	0.233	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
3	0.000	0.055	0.000	---	NonR	0.000
	30.000	0.055	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.58 kips 1.00Vn = 211.77 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	79.3	15.0	0.0	1.00	0.90	420.00
Controlling		1.2DL+1.6LL	79.3	15.0	0.0	1.00	0.90	420.00

REACTIONS (kips):

	Left	**Right**
DL reaction	4.31	4.31
Max +LL reaction	3.37	3.37
Max +total reaction (factored)	10.58	10.58

DEFLECTIONS:

								Ratio
Dead load (in)	at 15.00 ft	=	-0.203	L/D	=	1773		
Live load (in)	at 15.00 ft	=	-0.159	L/D	=	2266	> 360	0.16
Net Total load (in)	at 15.00 ft	=	-0.362	L/D	=	995	> 240	0.24

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 29**

SPAN INFORMATION (ft): I-End (125.92,146.50) J-End (125.92,176.50)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 326.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
15.000	0.95								
15.000	0.95								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	1.110	0.000	---	Snow	0.000
	15.000	1.110	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
3	15.000	0.233	0.000	---	Snow	0.000
	30.000	0.233	0.000			0.000
4	0.000	0.040	0.000	---	NonR	0.000
	30.000	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 23.29 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	155.8	13.4	0.0	1.00	0.90	294.00
Controlling		1.2DL+1.6LL	155.8	13.4	0.0	1.00	0.90	294.00

REACTIONS (kips):

	Left	**Right**
DL reaction	14.91	8.33
Max +LL reaction	3.37	3.37
Max +total reaction (factored)	23.29	15.39

DEFLECTIONS:

							Ratio
Dead load (in)	at 14.40 ft	=	-0.836	L/D =	431		
Live load (in)	at 14.55 ft	=	-0.231	L/D =	1560	> 360	0.23
Net Total load (in)	at 14.55 ft	=	-1.067	L/D =	338	> 240	0.71

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 30**

SPAN INFORMATION (ft): I-End (95.92,146.50) J-End (95.92,176.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.213	0.000	---	Snow	0.000
	30.000	0.213	0.000			0.000
2	0.000	0.000	0.206	---	Snow	0.000
	30.000	0.000	0.206			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	30.000	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.11 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	68.4	15.0	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	68.4	15.0	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.48	3.48
Max +LL reaction	3.09	3.09
Max +total reaction (factored)	9.11	9.11

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 15.00 ft	= -1.120	L/D = 321			
Live load (in)	at 15.00 ft	= -0.996	L/D = 362	>	360	1.00
Net Total load (in)	at 15.00 ft	= -1.366	L/D = 264	>	240	0.91

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 35**

SPAN INFORMATION (ft): I-End (245.92,118.17) J-End (245.92,146.50)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 326.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
17.000	7.84	0.00	0.0	0.00	0.00	0.0	4.69	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	28.333	0.010	0.000			0.000
2	0.000	0.116	0.000	---	Snow	0.000
	28.333	0.116	0.000			0.000
3	0.000	0.000	0.113	---	Snow	0.000
	28.333	0.000	0.113			0.000
4	0.000	0.019	0.000	---	Snow	0.000
	28.333	0.019	0.000			0.000
5	0.000	0.000	0.019	---	Snow	0.000
	28.333	0.000	0.019			0.000
6	0.000	0.040	0.000	---	NonR	0.000
	28.333	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.28 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	156.7	17.0	0.0	1.00	0.90	294.00
Controlling		1.2DL+1.6LL	156.7	17.0	0.0	1.00	0.90	294.00

REACTIONS (kips):

	Left	**Right**
DL reaction	5.77	7.33
Max +LL reaction	3.74	4.67
Max +total reaction (factored)	12.90	16.28

DEFLECTIONS:									**Ratio**
Dead load (in)	at 14.73 ft	=	-0.494	L/D	=	688			
Live load (in)	at 14.73 ft	=	-0.312	L/D	=	1089	>	360	0.33
Net Total load (in)	at 14.73 ft	=	-0.806	L/D	=	422	>	240	0.57

PRCNC20221036

Floor Type: Roof **Beam Number = 36**

SPAN INFORMATION (ft): I-End (215.92,135.17) J-End (215.92,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.106	0.000	---	Snow	0.000
	11.333	0.106	0.000			0.000
2	0.000	0.000	0.118	---	Snow	0.000
	11.333	0.000	0.117			0.000
3	0.000	0.011	0.000	---	Snow	0.000
	11.333	0.011	0.000			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	11.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.95 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	5.5	5.7	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	5.5	5.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.73	0.73
Max +LL reaction	0.67	0.67
Max +total reaction (factored)	1.95	1.95

DEFLECTIONS:

									Ratio
Dead load (in)	at	5.67 ft	=	-0.031	L/D	=	4413		
Live load (in)	at	5.67 ft	=	-0.028	L/D	=	4862	> 360	0.07
Net Total load (in)	at	5.67 ft	=	-0.059	L/D	=	2313	> 240	0.10

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 38**

SPAN INFORMATION (ft): I-End (215.92,135.17) J-End (245.92,135.17)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 326.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	2.37	0.00	0.0	0.00	0.00	0.0	0.64	Snow	0.00
1.000	4.14	0.00	0.0	0.00	0.00	0.0	1.16	Snow	0.00
7.500	0.90	0.00	0.0	0.00	0.00	0.0	1.08	Snow	0.00
7.500	0.67	0.00	0.0	0.00	0.00	0.0	0.81	Snow	0.00
13.750	2.37	0.00	0.0	0.00	0.00	0.0	0.64	Snow	0.00
13.750	4.16	0.00	0.0	0.00	0.00	0.0	1.18	Snow	0.00
15.000	0.81	0.00	0.0	0.00	0.00	0.0	0.74	Snow	0.00
15.000	1.23	0.00	0.0	0.00	0.00	0.0	1.12	Snow	0.00
22.500	1.39	0.00	0.0	0.00	0.00	0.0	1.27	Snow	0.00
22.500	2.10	0.00	0.0	0.00	0.00	0.0	1.91	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.040	0.000	---	NonR	0.000
	30.000	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 25.60 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	180.3	13.8	6.3	1.15	0.90	294.00
Controlling		1.2DL+1.6LL	178.5	15.0	7.5	1.13	0.90	287.81

REACTIONS (kips):

	Left	**Right**
DL reaction	13.50	7.84
Max +LL reaction	5.87	4.69
Max +total reaction (factored)	25.60	16.90

DEFLECTIONS:

						Ratio
Dead load (in)	at 14.85 ft	= -0.733	L/D = 491			
Live load (in)	at 14.85 ft	= -0.401	L/D = 897	>	360	0.40
Net Total load (in)	at 14.85 ft	= -1.134	L/D = 317	>	240	0.76

PRCNC20221036

Floor Type: Roof **Beam Number = 39**

SPAN INFORMATION (ft): I-End (245.92,88.57) J-End (245.92,118.17)

Beam Size (User Selected) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 29.60
Mp (kip-ft) = 225.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.212	1.85	0.00	0.0	0.00	0.00	0.0	1.59	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	29.596	0.010	0.000			0.000
2	0.000	0.089	0.000	---	Snow	0.000
	6.211	0.113	0.000			0.000
3	0.000	0.000	0.086	---	Snow	0.000
	6.211	0.000	0.109			0.000
4	6.212	0.012	0.000	---	Snow	0.000
	29.596	0.103	0.000			0.000
5	6.212	0.000	0.012	---	Snow	0.000
	29.596	0.000	0.099			0.000
6	0.000	0.019	0.000	---	Snow	0.000
	29.596	0.019	0.000			0.000
7	0.000	0.000	0.019	---	Snow	0.000
	29.596	0.000	0.019			0.000
8	0.000	0.031	0.000	---	NonR	0.000
	29.596	0.031	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.90 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	43.8	11.0	0.0	1.00	0.90	202.50
Controlling		1.2DL+1.6LL	43.8	11.0	0.0	1.00	0.90	202.50

REACTIONS (kips):

	Left	**Right**
DL reaction	3.31	2.30
Max +LL reaction	2.46	1.60
Max +total reaction (factored)	7.90	5.32

DEFLECTIONS:

								Ratio
Dead load (in)	at 14.21 ft	=	-0.279	L/D	=	1274		
Live load (in)	at 14.21 ft	=	-0.197	L/D	=	1803	> 360	0.20
Net Total load (in)	at 14.21 ft	=	-0.476	L/D	=	746	> 240	0.32

PRCNC20221036

Floor Type: Roof **Beam Number = 40**

SPAN INFORMATION (ft): I-End (218.93,81.34) J-End (245.92,88.57)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 27.94
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.333	4.58	0.00	0.0	0.00	0.00	0.0	3.98	Snow	0.00
14.666	4.33	0.00	0.0	0.00	0.00	0.0	3.76	Snow	0.00
21.999	4.09	0.00	0.0	0.00	0.00	0.0	3.55	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	27.938	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	27.938	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	27.938	0.000	0.019			0.000
4	0.000	0.035	0.000	---	NonR	0.000
	27.938	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.84 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	162.9	14.7	7.3	1.09	0.90	231.83
Controlling		1.2DL+1.6LL	162.9	14.7	7.3	1.09	0.90	231.83

REACTIONS (kips):

	Left	**Right**
DL reaction	7.20	7.59
Max +LL reaction	5.74	6.08
Max +total reaction (factored)	17.83	18.84

DEFLECTIONS:

							Ratio
Dead load (in)	at 13.97 ft	=	-0.593	L/D =	566		
Live load (in)	at 13.97 ft	=	-0.480	L/D =	698	> 360	0.52
Net Total load (in)	at 13.97 ft	=	-1.073	L/D =	312	> 240	0.77

PRCNC20221036

Floor Type: Roof **Beam Number = 41**

SPAN INFORMATION (ft): I-End (192.77,74.33) J-End (218.93,81.34)

Beam Size (User Selected) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08
Mp (kip-ft) = 225.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.771	3.32	0.00	0.0	0.00	0.00	0.0	2.91	Snow	0.00
13.542	3.32	0.00	0.0	0.00	0.00	0.0	2.91	Snow	0.00
20.313	3.32	0.00	0.0	0.00	0.00	0.0	2.91	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	27.083	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	27.083	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	27.083	0.000	0.019			0.000
4	0.000	0.031	0.000	---	NonR	0.000
	27.083	0.031	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 14.37 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	126.5	13.5	6.8	1.11	0.90	194.42
Controlling		1.2DL+1.6LL	126.5	13.5	6.8	1.11	0.90	194.42

REACTIONS (kips):

	Left	**Right**
DL reaction	5.81	5.81
Max +LL reaction	4.62	4.62
Max +total reaction (factored)	14.37	14.37

DEFLECTIONS:

						Ratio
Dead load (in)	at 13.54 ft =	-0.587	L/D =	554		
Live load (in)	at 13.54 ft =	-0.476	L/D =	683	> 360	0.53
Net Total load (in)	at 13.54 ft =	-1.062	L/D =	306	> 240	0.78

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 42**

SPAN INFORMATION (ft): I-End (168.30,67.77) J-End (177.96,70.36)

Beam Size (User Selected) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00
Mp (kip-ft) = 225.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
5.000	2.44	0.00	0.0	0.00	0.00	0.0	2.15	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	10.000	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	10.000	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	10.000	0.000	0.019			0.000
4	0.000	0.031	0.000	---	NonR	0.000
	10.000	0.031	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.70 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	17.2	5.0	5.0	1.63	0.90	202.50
Controlling		1.2DL+1.6LL	17.2	5.0	5.0	1.63	0.90	202.50

REACTIONS (kips):

	Left	**Right**
DL reaction	1.52	1.52
Max +LL reaction	1.17	1.17
Max +total reaction (factored)	3.70	3.70

DEFLECTIONS:

								Ratio
Dead load (in)	at	5.00 ft	=	-0.009	L/D	=	1287 3	
Live load (in)	at	5.00 ft	=	-0.008	L/D	=	1597 8 > 360	0.02
Net Total load (in)	at	5.00 ft	=	-0.017	L/D	=	7129 > 240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 43**

SPAN INFORMATION (ft): I-End (160.88,95.46) J-End (164.24,82.91)

Beam Size (User Selected) = W18X55 Fy = 50.0 ksi
Total Beam Length (ft) = 13.00
Mp (kip-ft) = 466.67

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	13.000	0.010	0.000			0.000
2	0.000	0.078	0.000	---	Snow	0.000
	13.000	0.078	0.000			0.000
3	0.000	0.000	0.075	---	Snow	0.000
	13.000	0.000	0.075			0.000
4	0.000	0.019	0.000	---	Snow	0.000
	13.000	0.019	0.000			0.000
5	0.000	0.000	0.019	---	Snow	0.000
	13.000	0.000	0.019			0.000
6	0.000	0.055	0.000	---	NonR	0.000
	13.000	0.055	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.24 kips 1.00Vn = 211.77 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	7.3	6.5	0.0	1.00	0.90	420.00
Controlling		1.2DL+1.6LL	7.3	6.5	0.0	1.00	0.90	420.00

REACTIONS (kips):

	Left	**Right**
DL reaction	1.05	1.05
Max +LL reaction	0.61	0.61
Max +total reaction (factored)	2.24	2.24

DEFLECTIONS:

										Ratio
Dead load (in)	at	6.50 ft	=	-0.004	L/D	=	3867 6			
Live load (in)	at	6.50 ft	=	-0.002	L/D	=	6665 4	>	360	0.01
Net Total load (in)	at	6.50 ft	=	-0.006	L/D	=	2447 5	>	240	0.01

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 44**

SPAN INFORMATION (ft): I-End (160.88,95.46) J-End (185.35,102.02)

Beam Size (Optimum) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 25.33
Mp (kip-ft) = 225.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
5.000	1.81	0.00	0.0	0.00	0.00	0.0	1.60	Snow	0.00
5.000	2.44	0.00	0.0	0.00	0.00	0.0	2.15	Snow	0.00
10.000	2.99	0.00	0.0	0.00	0.00	0.0	2.59	Snow	0.00
10.000	3.13	0.00	0.0	0.00	0.00	0.0	2.72	Snow	0.00
15.417	0.22	0.00	0.0	0.00	0.00	0.0	0.20	Snow	0.00
17.667	3.68	0.00	0.0	0.00	0.00	0.0	3.30	Snow	0.00
21.417	0.16	0.00	0.0	0.00	0.00	0.0	0.14	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	15.417	0.023	0.000	---	Snow	0.000
	21.416	0.023	0.000			0.000
2	15.417	0.000	0.022	---	Snow	0.000
	21.416	0.000	0.022			0.000
3	0.000	0.031	0.000	---	NonR	0.000
	25.333	0.031	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.30 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	165.6	10.0	5.4	1.07	0.90	202.50
Controlling		1.2DL+1.6LL	165.6	10.0	5.4	1.07	0.90	202.50

REACTIONS (kips):

	Left	**Right**
DL reaction	8.77	6.58
Max +LL reaction	7.36	5.47
Max +total reaction (factored)	22.30	16.65

DEFLECTIONS:

							Ratio
Dead load (in)	at 12.29 ft	=	-0.642	L/D =	473		
Live load (in)	at 12.29 ft	=	-0.542	L/D =	561	> 360	0.64
Net Total load (in)	at 12.29 ft	=	-1.184	L/D =	257	> 240	0.93

PRCNC20221036

Floor Type: Roof **Beam Number = 45**

SPAN INFORMATION (ft): I-End (185.35,102.02) J-End (211.51,109.03)

Beam Size (Optimum) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08
Mp (kip-ft) = 225.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.771	1.63	0.00	0.0	0.00	0.00	0.0	1.40	Snow	0.00
6.771	3.32	0.00	0.0	0.00	0.00	0.0	2.91	Snow	0.00
10.417	0.15	0.00	0.0	0.00	0.00	0.0	0.13	Snow	0.00
13.542	3.32	0.00	0.0	0.00	0.00	0.0	2.91	Snow	0.00
16.417	0.16	0.00	0.0	0.00	0.00	0.0	0.14	Snow	0.00
20.313	1.16	0.00	0.0	0.00	0.00	0.0	0.98	Snow	0.00
20.313	3.32	0.00	0.0	0.00	0.00	0.0	2.91	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.023	0.000	---	Snow	0.000
	6.770	0.023	0.000			0.000
2	0.000	0.000	0.022	---	Snow	0.000
	6.770	0.000	0.022			0.000
3	10.417	0.023	0.000	---	Snow	0.000
	16.416	0.023	0.000			0.000
4	10.417	0.000	0.022	---	Snow	0.000
	16.416	0.000	0.022			0.000
5	20.313	0.023	0.000	---	Snow	0.000
	27.083	0.023	0.000			0.000
6	20.313	0.000	0.022	---	Snow	0.000
	27.083	0.000	0.022			0.000
7	0.000	0.031	0.000	---	NonR	0.000
	27.083	0.031	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.38 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	152.7	13.5	3.1	1.03	0.90	202.50
Controlling		1.2DL+1.6LL	152.7	13.5	3.1	1.03	0.90	202.50

REACTIONS (kips):

	Left	**Right**
DL reaction	7.29	7.06
Max +LL reaction	6.02	5.81
Max +total reaction (factored)	18.38	17.76

DEFLECTIONS: **Ratio**

Dead load (in) at 13.54 ft = -0.715 L/D = 455

PRCNC20221036

Live load (in)	at 13.54 ft	=	-0.595	L/D	=	546	>	360	0.66
Net Total load (in)	at 13.54 ft	=	-1.309	L/D	=	248	>	240	0.97

Floor Type: Roof **Beam Number = 47**

SPAN INFORMATION (ft): I-End (155.92,138.50) J-End (155.92,146.50)

Beam Size (User Selected) = W18X55 Fy = 50.0 ksi
Total Beam Length (ft) = 8.00
Mp (kip-ft) = 466.67

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.086	0.000	---	Snow	0.000
	8.000	0.086	0.000			0.000
2	0.000	0.000	0.222	---	Snow	0.000
	8.000	0.000	0.222			0.000
3	0.000	0.114	0.000	---	Snow	0.000
	8.000	0.114	0.000			0.000
4	0.000	0.055	0.000	---	NonR	0.000
	8.000	0.055	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.65 kips 1.00Vn = 211.77 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	5.3	4.0	0.0	1.00	0.90	420.00
Controlling		1.2DL+1.6LL	5.3	4.0	0.0	1.00	0.90	420.00

REACTIONS (kips):

	Left	**Right**
DL reaction	1.02	1.02
Max +LL reaction	0.89	0.89
Max +total reaction (factored)	2.65	2.65

DEFLECTIONS:

						Ratio
Dead load (in)	at	4.00 ft	=	-0.001		
Live load (in)	at	4.00 ft	=	-0.001		
Net Total load (in)	at	4.00 ft	=	-0.002	L/D = 5630 0 > 240	0.00

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 52**

SPAN INFORMATION (ft): I-End (77.25,108.25) J-End (77.25,121.58)

Beam Size (Optimum) = W12X16 Fy = 50.0 ksi
Total Beam Length (ft) = 13.33
Mp (kip-ft) = 83.75

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
9.917	9.05	0.00	0.0	0.00	0.00	0.0	7.58	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.093	0.000	---	Snow	0.000
	13.333	0.093	0.000			0.000
2	0.000	0.000	0.090	---	Snow	0.000
	13.333	0.000	0.090			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	0.677	0.096	0.000			0.000
4	0.678	0.096	0.000	---	Snow	0.000
	13.333	0.096	0.000			0.000
5	0.000	0.000	0.000	---	Snow	0.000
	0.677	0.000	0.093			0.000
6	0.678	0.000	0.093	---	Snow	0.000
	13.333	0.000	0.093			0.000
7	0.000	0.016	0.000	---	NonR	0.000
	13.333	0.016	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.69 kips 1.00Vn = 79.20 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	67.5	9.9	0.0	1.00	0.90	75.38
Controlling		1.2DL+1.6LL	67.5	9.9	0.0	1.00	0.90	75.38

REACTIONS (kips):

	Left	**Right**
DL reaction	3.66	8.10
Max +LL reaction	3.13	6.86
Max +total reaction (factored)	9.40	20.69

DEFLECTIONS:

						Ratio
Dead load (in)	at 7.27 ft	= -0.233	L/D =	688		
Live load (in)	at 7.27 ft	= -0.197	L/D =	811	> 360	0.44
Net Total load (in)	at 7.27 ft	= -0.430	L/D =	372	> 240	0.64

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 53**

SPAN INFORMATION (ft): I-End (59.83,104.17) J-End (77.25,108.25)

Beam Size (User Selected) = W12X16 Fy = 50.0 ksi
Total Beam Length (ft) = 17.89
Mp (kip-ft) = 83.75

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
4.365	1.46	0.00	0.0	0.00	0.00	0.0	1.32	Snow	0.00
11.726	1.53	0.00	0.0	0.00	0.00	0.0	1.39	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	17.889	0.010	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	4.365	0.015	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	4.365	0.000	0.015			0.000
4	4.366	0.000	0.000	---	Snow	0.000
	11.726	0.025	0.000			0.000
5	4.366	0.000	0.000	---	Snow	0.000
	11.726	0.000	0.025			0.000
6	11.727	0.000	0.000	---	Snow	0.000
	17.889	0.021	0.000			0.000
7	11.727	0.000	0.000	---	Snow	0.000
	17.889	0.000	0.021			0.000
8	0.000	0.010	0.000	---	Snow	0.000
	14.438	0.010	0.000			0.000
9	14.440	0.010	0.000	---	Snow	0.000
	17.842	0.023	0.000			0.000
10	17.844	0.023	0.000	---	Snow	0.000
	17.889	0.000	0.000			0.000
11	0.000	0.000	0.010	---	Snow	0.000
	14.438	0.000	0.010			0.000
12	14.439	0.000	0.010	---	Snow	0.000
	17.842	0.000	0.023			0.000
13	0.000	0.016	0.000	---	NonR	0.000
	17.889	0.016	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.08 kips 1.00Vn = 79.20 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	25.6	11.7	0.0	1.00	0.90	75.38
Controlling		1.2DL+1.6LL	25.6	11.7	0.0	1.00	0.90	75.38

PRCNC20221036

REACTIONS (kips):

	Left	Right
DL reaction	2.04	1.82
Max +LL reaction	1.65	1.45
Max +total reaction (factored)	5.08	4.51

DEFLECTIONS:

										Ratio
Dead load (in)	at	8.94 ft	=	-0.197	L/D	=	1091			
Live load (in)	at	8.94 ft	=	-0.162	L/D	=	1329	>	360	0.27
Net Total load (in)	at	8.94 ft	=	-0.358	L/D	=	599	>	240	0.40

Gravity Beam Design

Floor Type: Roof **Beam Number = 54**

SPAN INFORMATION (ft): I-End (56.92,121.58) J-End (56.92,135.17)

Beam Size (User Selected) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 13.58
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	13.583	0.010	0.000			0.000
2	0.000	0.030	0.000	---	Snow	0.000
	12.616	0.030	0.000			0.000
3	12.625	0.030	0.000	---	Snow	0.000
	13.583	0.000	0.000			0.000
4	0.000	0.000	0.029	---	Snow	0.000
	12.616	0.000	0.029			0.000
5	12.617	0.000	0.029	---	Snow	0.000
	13.583	0.000	0.000			0.000
6	0.000	0.045	0.000	---	Snow	0.000
	13.583	0.045	0.000			0.000
7	0.000	0.000	0.044	---	Snow	0.000
	13.583	0.000	0.044			0.000
8	0.000	0.019	0.000	---	NonR	0.000
	13.583	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.64 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	5.6	6.8	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	5.6	6.8	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	0.71	0.69
Max +LL reaction	0.49	0.48
Max +total reaction (factored)	1.64	1.60

DEFLECTIONS:

										Ratio
Dead load (in)	at	6.79 ft	=	-0.021	L/D	=	7733			
Live load (in)	at	6.79 ft	=	-0.015	L/D	=	1104 6	>	360	0.03
Net Total load (in)	at	6.79 ft	=	-0.036	L/D	=	4549	>	240	0.05

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 72**

SPAN INFORMATION (ft): I-End (134.92,111.92) J-End (134.92,138.50)

Beam Size (User Selected) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 26.58
Cantilever on left (ft) = 6.25
Mp (kip-ft) = 225.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	1.45	0.00	0.0	0.00	0.00	0.0	1.02	Snow	0.00
0.000	1.60	0.00	0.0	0.00	0.00	0.0	1.09	Snow	0.00
14.333	1.00								
14.333	1.33								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.217	0.000	---	Snow	0.000
	6.250	0.217	0.000			0.000
2	0.000	0.000	0.210	---	Snow	0.000
	6.250	0.000	0.210			0.000
3	6.250	0.217	0.000	---	Snow	0.000
	10.750	0.217	0.000			0.000
4	10.750	0.161	0.000	---	Snow	0.000
	26.583	0.161	0.000			0.000
5	6.250	0.000	0.210	---	Snow	0.000
	26.583	0.000	0.210			0.000
6	0.000	0.031	0.000	---	NonR	0.000
	6.250	0.031	0.000			0.000
7	6.250	0.031	0.000	---	NonR	0.000
	26.583	0.031	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.99 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Left	Max -	1.2DL+1.6LL	-56.3	6.2	6.2	1.00	0.90	180.87
Center	Max +	1.2DL+1.6LL	26.6	16.9	0.0	1.00	0.90	202.50
	Max -	1.2DL+1.6LL	-56.3	6.3	8.1	1.58	0.90	202.50
Controlling		1.2DL+1.6LL	-56.3	6.2	6.2	1.00	0.90	180.87

REACTIONS (kips):

	Left	**Right**
DL reaction	9.35	1.73
Max +LL reaction	6.41	2.13
Max -LL reaction	0.00	-0.85
Max +total reaction (factored)	21.47	5.49

DEFLECTIONS:

PRCNC20221036

Left cantilever:

Dead load (in)	=	-0.077	L/D	=	1953			
Pos Live load (in)	=	-0.150	L/D	=	1000	>	360	0.36
Neg Live load (in)	=	0.073	L/D	=	2053	>	360	0.18
Pos Total load (in)	=	-0.227	L/D	=	661	>	240	0.36

Center span:

Dead load (in)	at 17.13 ft	=	-0.034	L/D	=	7123			
Live load (in)	at 17.13 ft	=	-0.074	L/D	=	3305	>	360	0.11
Net Total load (in)	at 17.13 ft	=	-0.108	L/D	=	2257	>	240	0.11

Gravity Beam Design

Floor Type: Roof **Beam Number = 74**

SPAN INFORMATION (ft): I-End (155.92,118.17) J-End (185.92,118.17)

Beam Size (User Selected) = W18X55 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 466.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
4.057	1.71	0.00	0.0	0.00	0.00	0.0	1.50	Snow	0.00
7.333	6.75	0.00	0.0	0.00	0.00	0.0	3.37	Snow	0.00
9.233	2.37	0.00	0.0	0.00	0.00	0.0	2.07	Snow	0.00
15.000	1.32	0.00	0.0	0.00	0.00	0.0	1.21	Snow	0.00
17.170	1.62	0.00	0.0	0.00	0.00	0.0	1.49	Snow	0.00
22.500	6.00	0.00	0.0	0.00	0.00	0.0	3.72	Snow	0.00
25.107	2.13	0.00	0.0	0.00	0.00	0.0	1.92	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	4.056	0.016	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	4.056	0.000	0.015			0.000
3	4.057	0.000	0.000	---	Snow	0.000
	9.233	0.020	0.000			0.000
4	4.057	0.000	0.000	---	Snow	0.000
	9.233	0.000	0.019			0.000
5	9.234	0.000	0.000	---	Snow	0.000
	17.170	0.031	0.000			0.000
6	9.234	0.000	0.000	---	Snow	0.000
	17.170	0.000	0.030			0.000
7	17.171	0.000	0.000	---	Snow	0.000
	25.107	0.031	0.000			0.000
8	17.171	0.000	0.000	---	Snow	0.000
	25.107	0.000	0.030			0.000
9	25.108	0.000	0.000	---	Snow	0.000
	30.000	0.019	0.000			0.000
10	25.108	0.000	0.000	---	Snow	0.000
	30.000	0.000	0.018			0.000
11	0.000	0.055	0.000	---	NonR	0.000
	30.000	0.055	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 27.57 kips 1.00Vn = 211.77 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	216.0	15.0	0.0	1.00	0.90	420.00
Controlling		1.2DL+1.6LL	216.0	15.0	0.0	1.00	0.90	420.00

PRCNC20221036

REACTIONS (kips):

	Left	Right
DL reaction	12.41	11.52
Max +LL reaction	7.92	7.72
Max +total reaction (factored)	27.57	26.18

DEFLECTIONS:

									Ratio
Dead load (in)	at 14.85 ft	=	-0.620	L/D	=	581			
Live load (in)	at 14.85 ft	=	-0.411	L/D	=	877	>	360	0.41
Net Total load (in)	at 14.85 ft	=	-1.030	L/D	=	349	>	240	0.69

Gravity Beam Design

Floor Type: Roof **Beam Number = 75**

SPAN INFORMATION (ft): I-End (185.35,102.02) J-End (192.77,74.33)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.224	0.000	---	Snow	0.000
	28.666	0.224	0.000			0.000
2	0.000	0.000	0.217	---	Snow	0.000
	28.666	0.000	0.217			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	28.666	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.14 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	65.5	14.3	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	65.5	14.3	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.48	3.48
Max +LL reaction	3.10	3.10
Max +total reaction (factored)	9.14	9.14

DEFLECTIONS: (Camber = 3/4)

								Ratio
Dead load (in)	at 14.33 ft	=	-0.978	L/D	=	352		
Live load (in)	at 14.33 ft	=	-0.873	L/D	=	394	> 360	0.91
Net Total load (in)	at 14.33 ft	=	-1.101	L/D	=	312	> 240	0.77

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 76**

SPAN INFORMATION (ft): I-End (155.92,118.17) J-End (160.88,95.46)

Beam Size (User Selected) = W18X55 Fy = 50.0 ksi
Total Beam Length (ft) = 23.24
Mp (kip-ft) = 466.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.723	1.42	0.00	0.0	0.00	0.00	0.0	0.93	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	7.724	0.010	0.000	---	NonR	0.000
	23.240	0.010	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	1.051	0.061	0.000			0.000
3	1.052	0.061	0.000	---	Snow	0.000
	23.240	0.077	0.000			0.000
4	0.000	0.000	0.000	---	Snow	0.000
	1.051	0.000	0.059			0.000
5	1.052	0.000	0.059	---	Snow	0.000
	23.240	0.000	0.075			0.000
6	7.724	0.000	0.000	---	Snow	0.000
	8.292	0.023	0.000			0.000
7	8.299	0.023	0.000	---	Snow	0.000
	23.240	0.019	0.000			0.000
8	7.724	0.000	0.000	---	Snow	0.000
	8.298	0.000	0.023			0.000
9	8.299	0.000	0.023	---	Snow	0.000
	20.571	0.000	0.023			0.000
10	20.572	0.000	0.023	---	Snow	0.000
	23.240	0.000	0.019			0.000
11	0.000	0.114	0.000	---	Snow	0.000
	7.187	0.137	0.000			0.000
12	7.188	0.137	0.000	---	Snow	0.000
	7.723	0.000	0.000			0.000
13	0.000	0.000	0.110	---	Snow	0.000
	7.187	0.000	0.132			0.000
14	7.188	0.000	0.132	---	Snow	0.000
	7.723	0.000	0.000			0.000
15	0.000	0.055	0.000	---	NonR	0.000
	23.240	0.055	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.46 kips 1.00Vn = 211.77 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	41.2	7.7	0.0	1.00	0.90	420.00
Controlling		1.2DL+1.6LL	41.2	7.7	0.0	1.00	0.90	420.00

REACTIONS (kips):

	Left	**Right**
DL reaction	3.27	2.42
Max +LL reaction	2.21	1.50
Max +total reaction (factored)	7.46	5.30

DEFLECTIONS:

								Ratio
Dead load (in)	at 11.16 ft	=	-0.066	L/D	=	4198		
Live load (in)	at 11.16 ft	=	-0.043	L/D	=	6553	> 360	0.05
Net Total load (in)	at 11.16 ft	=	-0.109	L/D	=	2559	> 240	0.09

PRCNC20221036

Floor Type: Roof **Beam Number = 77**

SPAN INFORMATION (ft): I-End (181.02,118.17) J-End (185.35,102.02)

Beam Size (Optimum) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 16.72
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
11.883	0.05	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00
11.883	1.19	0.00	0.0	0.00	0.00	0.0	1.01	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.814	0.105	0.000			0.000
2	1.815	0.105	0.000	---	Snow	0.000
	11.883	0.105	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.814	0.000	0.101			0.000
4	1.815	0.000	0.102	---	Snow	0.000
	11.883	0.000	0.102			0.000
5	11.884	0.013	0.000	---	Snow	0.000
	16.716	0.013	0.000			0.000
6	11.884	0.000	0.013	---	Snow	0.000
	16.716	0.000	0.012			0.000
7	0.000	0.119	0.000	---	Snow	0.000
	11.883	0.119	0.000			0.000
8	0.000	0.000	0.115	---	Snow	0.000
	11.883	0.000	0.115			0.000
9	11.884	0.061	0.000	---	Snow	0.000
	16.716	0.061	0.000			0.000
10	11.884	0.000	0.059	---	Snow	0.000
	16.716	0.000	0.059			0.000
11	0.000	0.012	0.000	---	NonR	0.000
	16.716	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.79 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	27.4	9.4	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	27.4	9.4	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	2.13	2.23
Max +LL reaction	1.92	1.95
Max +total reaction (factored)	5.63	5.79

PRCNC20221036

DEFLECTIONS:

											Ratio
Dead load (in)	at	8.53 ft	=	-0.336	L/D	=	597				
Live load (in)	at	8.53 ft	=	-0.298	L/D	=	672	>	360		0.54
Net Total load (in)	at	8.53 ft	=	-0.634	L/D	=	316	>	240		0.76

Gravity Beam Design

Floor Type: Roof **Beam Number = 80**

SPAN INFORMATION (ft): I-End (170.54,98.05) J-End (177.96,70.36)

Beam Size (User Selected) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67
Mp (kip-ft) = 122.08

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.196	0.000	---	Snow	0.000
	28.666	0.196	0.000			0.000
2	0.000	0.000	0.190	---	Snow	0.000
	28.666	0.000	0.190			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	28.666	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.11 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	58.1	14.3	0.0	1.00	0.90	109.88
Controlling		1.2DL+1.6LL	58.1	14.3	0.0	1.00	0.90	109.88

REACTIONS (kips):

	Left	**Right**
DL reaction	3.13	3.13
Max +LL reaction	2.72	2.72
Max +total reaction (factored)	8.11	8.11

DEFLECTIONS:

						Ratio
Dead load (in)	at 14.33 ft	= -0.733	L/D =	469		
Live load (in)	at 14.33 ft	= -0.638	L/D =	539	> 360	0.67
Net Total load (in)	at 14.33 ft	= -1.372	L/D =	251	> 240	0.96

PRCNC20221036

Floor Type: Roof **Beam Number = 81**

SPAN INFORMATION (ft): I-End (177.94,100.04) J-End (185.36,72.35)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.238	0.000	---	Snow	0.000
	28.666	0.238	0.000			0.000
2	0.000	0.000	0.230	---	Snow	0.000
	28.666	0.000	0.230			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	28.666	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.69 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	69.4	14.3	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	69.4	14.3	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.68	3.68
Max +LL reaction	3.30	3.30
Max +total reaction (factored)	9.69	9.69

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 14.33 ft	= -1.034	L/D =	333		
Live load (in)	at 14.33 ft	= -0.927	L/D =	371	> 360	0.97
Net Total load (in)	at 14.33 ft	= -1.211	L/D =	284	> 240	0.85

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 82**

SPAN INFORMATION (ft): I-End (165.15,118.17) J-End (170.54,98.05)

Beam Size (User Selected) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 20.83
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
15.992	1.17	0.00	0.0	0.00	0.00	0.0	0.99	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	2.054	0.119	0.000			0.000
2	2.055	0.119	0.000	---	Snow	0.000
	15.991	0.119	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	2.054	0.000	0.115			0.000
4	2.055	0.000	0.115	---	Snow	0.000
	15.991	0.000	0.115			0.000
5	15.992	0.084	0.000	---	Snow	0.000
	20.825	0.084	0.000			0.000
6	15.992	0.000	0.081	---	Snow	0.000
	20.825	0.000	0.081			0.000
7	0.000	0.078	0.000	---	Snow	0.000
	20.825	0.078	0.000			0.000
8	0.000	0.000	0.075	---	Snow	0.000
	20.825	0.000	0.075			0.000
9	0.000	0.019	0.000	---	NonR	0.000
	20.825	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.73 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	37.4	11.6	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	37.4	11.6	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	2.37	2.99
Max +LL reaction	2.07	2.59
Max +total reaction (factored)	6.17	7.73

DEFLECTIONS:

							Ratio
Dead load (in)	at 10.62 ft	=	-0.301	L/D =	830		
Live load (in)	at 10.62 ft	=	-0.263	L/D =	951	> 360	0.38
Net Total load (in)	at 10.62 ft	=	-0.564	L/D =	443	> PRCNC20221036	

Gravity Beam Design

Floor Type: Roof **Beam Number = 84**

SPAN INFORMATION (ft): I-End (59.83,104.17) J-End (59.83,121.58)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 17.42
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	17.416	0.010	0.000			0.000
2	0.000	0.010	0.000	---	Snow	0.000
	17.075	0.010	0.000			0.000
3	17.084	0.010	0.000	---	Snow	0.000
	17.416	0.000	0.000			0.000
4	0.000	0.000	0.010	---	Snow	0.000
	17.075	0.000	0.010			0.000
5	17.075	0.000	0.010	---	Snow	0.000
	17.188	0.000	0.007			0.000
6	17.189	0.000	0.007	---	Snow	0.000
	17.302	0.000	0.000			0.000
7	0.000	0.000	0.000	---	Snow	0.000
	0.996	0.066	0.000			0.000
8	0.997	0.066	0.000	---	Snow	0.000
	17.416	0.066	0.000			0.000
9	0.000	0.000	0.000	---	Snow	0.000
	0.996	0.000	0.064			0.000
10	0.997	0.000	0.064	---	Snow	0.000
	17.416	0.000	0.064			0.000
11	0.000	0.014	0.000	---	NonR	0.000
	17.416	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.07 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	9.0	8.7	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	9.0	8.7	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	0.84	0.87
Max +LL reaction	0.61	0.64
Max +total reaction (factored)	1.99	2.07

DEFLECTIONS: **Ratio**

Dead load (in)	at 8.71 ft =	-0.081	L/D =	2589		
Live load (in)	at 8.71 ft =	-0.059	L/D =	3513	> 360	0.10

PRCNC20221036

Net Total load (in)	at	8.71 ft	=	-0.140	L/D	=	1491	>	240	0.16

Floor Type: Roof **Beam Number = 85**

SPAN INFORMATION (ft): I-End (77.25,121.58) J-End (77.25,146.50)

Beam Size (Optimum) = W12X16 Fy = 50.0 ksi
Total Beam Length (ft) = 24.92
Mp (kip-ft) = 83.75

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
13.583	0.04								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.189	0.000	---	Snow	0.000
	24.916	0.189	0.000			0.000
2	0.000	0.000	0.183	---	Snow	0.000
	24.916	0.000	0.183			0.000
3	0.000	0.016	0.000	---	NonR	0.000
	24.916	0.016	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.75 kips 1.00Vn = 79.20 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	42.2	12.5	0.0	1.00	0.90	75.38
Controlling		1.2DL+1.6LL	42.2	12.5	0.0	1.00	0.90	75.38

REACTIONS (kips):

	Left	**Right**
DL reaction	2.58	2.58
Max +LL reaction	2.28	2.28
Max +total reaction (factored)	6.75	6.75

DEFLECTIONS:

						Ratio
Dead load (in)	at 12.46 ft	= -0.604	L/D = 495			
Live load (in)	at 12.46 ft	= -0.532	L/D = 562	>	360	0.64
Net Total load (in)	at 12.46 ft	= -1.136	L/D = 263	>	240	0.91

PRCNC20221036

Floor Type: Roof **Beam Number = 86**

SPAN INFORMATION (ft): I-End (77.25,146.50) J-End (77.25,176.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.189	0.000	---	Snow	0.000
	30.000	0.189	0.000			0.000
2	0.000	0.000	0.183	---	Snow	0.000
	30.000	0.000	0.183			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	30.000	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.15 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	61.1	15.0	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	61.1	15.0	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.13	3.13
Max +LL reaction	2.75	2.75
Max +total reaction (factored)	8.15	8.15

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 15.00 ft	= -1.007	L/D =	357		
Live load (in)	at 15.00 ft	= -0.886	L/D =	406	> 360	0.89
Net Total load (in)	at 15.00 ft	= -1.143	L/D =	315	> 240	0.76

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 104**

SPAN INFORMATION (ft): I-End (209.06,118.17) J-End (211.51,109.03)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 9.46
Mp (kip-ft) = 184.17

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
4.626	0.05	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.965	0.114	0.000			0.000
2	1.965	0.114	0.000	---	Snow	0.000
	9.459	0.114	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.965	0.000	0.110			0.000
4	1.965	0.000	0.110	---	Snow	0.000
	9.459	0.000	0.110			0.000
5	0.000	0.105	0.000	---	Snow	0.000
	4.597	0.105	0.000			0.000
6	4.598	0.105	0.000	---	Snow	0.000
	4.626	0.000	0.000			0.000
7	0.000	0.000	0.102	---	Snow	0.000
	4.597	0.000	0.102			0.000
8	4.627	0.019	0.000	---	Snow	0.000
	9.459	0.019	0.000			0.000
9	4.627	0.000	0.019	---	Snow	0.000
	9.459	0.000	0.019			0.000
10	0.000	0.026	0.000	---	NonR	0.000
	9.459	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.47 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	5.9	4.4	0.0	1.00	0.90	165.75
Controlling		1.2DL+1.6LL	5.9	4.4	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
DL reaction	0.97	0.87
Max +LL reaction	0.81	0.71
Max +total reaction (factored)	2.47	2.18

DEFLECTIONS: **Ratio**

PRCNC20221036

Dead load (in)	at	4.64 ft	=	-0.004	L/D	=	2678 1			
Live load (in)	at	4.64 ft	=	-0.004	L/D	=	3230 6	>	360	0.01
Net Total load (in)	at	4.64 ft	=	-0.008	L/D	=	1464 2	>	240	0.02

Gravity Beam Design

Floor Type: Roof **Beam Number = 122**

SPAN INFORMATION (ft): I-End (110.92,118.17) J-End (134.92,118.17)

Beam Size (User Selected) = W16X50 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00
Mp (kip-ft) = 383.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
4.667	4.94	0.00	0.0	0.00	0.00	0.0	2.02	Snow	0.00
4.667	0.54	0.00	0.0	0.00	0.00	0.0	0.48	Snow	0.00
10.333	4.10	0.00	0.0	0.00	0.00	0.0	2.23	Snow	0.00
10.333	0.59	0.00	0.0	0.00	0.00	0.0	0.53	Snow	0.00
16.000	4.98	0.00	0.0	0.00	0.00	0.0	2.90	Snow	0.00
16.000	0.70	0.00	0.0	0.00	0.00	0.0	0.64	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.050	0.000	---	NonR	0.000
	24.000	0.050	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 19.12 kips 1.00Vn = 185.82 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	134.4	10.3	5.7	1.04	0.90	345.00
Controlling		1.2DL+1.6LL	134.4	10.3	5.7	1.04	0.90	345.00

REACTIONS (kips):

	Left	**Right**
DL reaction	9.58	7.47
Max +LL reaction	4.77	4.04
Max +total reaction (factored)	19.12	15.43

DEFLECTIONS:

							Ratio
Dead load (in)	at 11.88 ft	=	-0.343	L/D =	839		
Live load (in)	at 11.88 ft	=	-0.185	L/D =	1561	> 360	0.23
Net Total load (in)	at 11.88 ft	=	-0.528	L/D =	546	> 240	0.44

PRCNC20221036

Floor Type: Roof **Beam Number = 123**

SPAN INFORMATION (ft): I-End (77.25,118.17) J-End (110.92,118.17)

Beam Size (Optimum) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 33.67
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.219	2.96	0.00	0.0	0.00	0.00	0.0	2.64	Snow	0.00
6.219	0.95	0.00	0.0	0.00	0.00	0.0	0.86	Snow	0.00
12.438	2.96	0.00	0.0	0.00	0.00	0.0	2.65	Snow	0.00
12.438	0.88	0.00	0.0	0.00	0.00	0.0	0.80	Snow	0.00
18.667	3.33	0.00	0.0	0.00	0.00	0.0	2.92	Snow	0.00
18.667	0.88	0.00	0.0	0.00	0.00	0.0	0.81	Snow	0.00
26.167	3.56	0.00	0.0	0.00	0.00	0.0	3.19	Snow	0.00
26.167	0.86	0.00	0.0	0.00	0.00	0.0	0.79	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.035	0.000	---	NonR	0.000
	33.666	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.99 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	230.6	18.7	6.2	1.02	0.90	230.65
Controlling		1.2DL+1.6LL	230.6	18.7	6.2	1.02	0.90	230.65

REACTIONS (kips):

	Left	**Right**
DL reaction	9.05	8.50
Max +LL reaction	7.58	7.08
Max +total reaction (factored)	22.99	21.53

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 16.83 ft	= -1.224	L/D = 330			
Live load (in)	at 16.83 ft	= -1.033	L/D = 391	>	360	0.92
Net Total load (in)	at 16.83 ft	= -1.507	L/D = 268	>	240	0.90

PRCNC20221036

Floor Type: Roof **Beam Number = 124**

SPAN INFORMATION (ft): I-End (95.92,118.17) J-End (95.92,146.50)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 138.33

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.213	0.000	---	Snow	0.000
	28.333	0.213	0.000			0.000
2	0.000	0.000	0.206	---	Snow	0.000
	28.333	0.000	0.206			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	28.333	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.66 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	61.3	14.2	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	61.3	14.2	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	3.33	3.33
Max +LL reaction	2.92	2.92
Max +total reaction (factored)	8.66	8.66

DEFLECTIONS:

						Ratio
Dead load (in)	at 14.17 ft	= -0.590	L/D = 576			
Live load (in)	at 14.17 ft	= -0.517	L/D = 657	>	360	0.55
Net Total load (in)	at 14.17 ft	= -1.108	L/D = 307	>	240	0.78

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 130**

SPAN INFORMATION (ft): I-End (56.92,135.17) J-End (56.92,151.25)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 16.08
Mp (kip-ft) = 138.33

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.227	0.000	---	Snow	0.000
	16.083	0.227	0.000			0.000
2	0.000	0.000	0.220	---	Snow	0.000
	16.083	0.000	0.220			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	16.083	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.24 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	21.1	8.0	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	21.1	8.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	2.01	2.01
Max +LL reaction	1.77	1.77
Max +total reaction (factored)	5.24	5.24

DEFLECTIONS:

										Ratio
Dead load (in)	at	8.04 ft	=	-0.065	L/D	=	2966			
Live load (in)	at	8.04 ft	=	-0.057	L/D	=	3363	>	360	0.11
Net Total load (in)	at	8.04 ft	=	-0.122	L/D	=	1576	>	240	0.15

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 131**

SPAN INFORMATION (ft): I-End (41.92,135.17) J-End (41.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33
Mp (kip-ft) = 184.17

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	11.333	0.010	0.000			0.000
2	0.000	0.019	0.000	---	Snow	0.000
	11.333	0.019	0.000			0.000
3	0.000	0.000	0.019	---	Snow	0.000
	11.333	0.000	0.019			0.000
4	0.000	0.116	0.000	---	Snow	0.000
	11.333	0.116	0.000			0.000
5	0.000	0.000	0.113	---	Snow	0.000
	11.333	0.000	0.113			0.000
6	0.000	0.026	0.000	---	NonR	0.000
	11.333	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.36 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	6.7	5.7	0.0	1.00	0.90	165.75
Controlling		1.2DL+1.6LL	6.7	5.7	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
DL reaction	0.97	0.97
Max +LL reaction	0.75	0.75
Max +total reaction (factored)	2.36	2.36

DEFLECTIONS:

									Ratio
Dead load (in)	at	5.67 ft	=	-0.007	L/D	=	1862 0		
Live load (in)	at	5.67 ft	=	-0.006	L/D	=	2432 0	> 360	0.01
Net Total load (in)	at	5.67 ft	=	-0.013	L/D	=	1054 6	> 240	0.02

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 132**

SPAN INFORMATION (ft): I-End (49.42,135.17) J-End (49.42,151.25)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 16.08
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.233	0.000	---	Snow	0.000
	16.083	0.233	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	16.083	0.000	0.225			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	16.083	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.25 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	21.1	8.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	21.1	8.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.97	1.97
Max +LL reaction	1.81	1.81
Max +total reaction (factored)	5.25	5.25

DEFLECTIONS:

										Ratio
Dead load (in)	at	8.04 ft	=	-0.236	L/D	=	818			
Live load (in)	at	8.04 ft	=	-0.217	L/D	=	889	>	360	0.40
Net Total load (in)	at	8.04 ft	=	-0.453	L/D	=	426	>	240	0.56

PRCNC20221036

Floor Type: Roof **Beam Number = 135**

SPAN INFORMATION (ft): I-End (77.25,108.25) J-End (110.92,111.92)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 33.87
Mp (kip-ft) = 184.17

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.256	0.91	0.00	0.0	0.00	0.00	0.0	0.83	Snow	0.00
12.511	0.85	0.00	0.0	0.00	0.00	0.0	0.77	Snow	0.00
18.777	0.84	0.00	0.0	0.00	0.00	0.0	0.77	Snow	0.00
26.321	0.82	0.00	0.0	0.00	0.00	0.0	0.75	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	33.865	0.010	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	6.255	0.010	0.000			0.000
3	2.086	0.000	0.000	---	Snow	0.000
	4.170	0.000	0.007			0.000
4	4.171	0.000	0.007	---	Snow	0.000
	6.255	0.000	0.010			0.000
5	6.256	0.000	0.000	---	Snow	0.000
	12.511	0.010	0.000			0.000
6	8.341	0.000	0.000	---	Snow	0.000
	10.425	0.000	0.007			0.000
7	10.426	0.000	0.007	---	Snow	0.000
	12.511	0.000	0.010			0.000
8	12.511	0.000	0.000	---	Snow	0.000
	18.777	0.010	0.000			0.000
9	14.600	0.000	0.000	---	Snow	0.000
	16.688	0.000	0.007			0.000
10	16.689	0.000	0.007	---	Snow	0.000
	18.777	0.000	0.010			0.000
11	18.777	0.000	0.000	---	Snow	0.000
	26.321	0.013	0.000			0.000
12	21.292	0.000	0.000	---	Snow	0.000
	23.806	0.000	0.008			0.000
13	23.807	0.000	0.008	---	Snow	0.000
	26.321	0.000	0.012			0.000
14	26.322	0.000	0.000	---	Snow	0.000
	33.865	0.013	0.000			0.000
15	28.837	0.000	0.000	---	Snow	0.000
	31.351	0.000	0.008			0.000
16	31.351	0.000	0.008	---	Snow	0.000
	33.865	0.000	0.012			0.000

PRCNC20221036

Load	Dist	DL	LL	Red%	Type	PartL
17	0.047	0.023	0.000	---	Snow	0.000
	33.824	0.023	0.000			0.000
18	33.825	0.023	0.000	---	Snow	0.000
	33.865	0.000	0.000			0.000
19	0.047	0.000	0.023	---	Snow	0.000
	33.824	0.000	0.023			0.000
20	0.000	0.000	0.000	---	Snow	0.000
	0.045	0.023	0.000			0.000
21	0.000	0.026	0.000	---	NonR	0.000
	33.865	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.90 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	64.2	18.6	6.3	1.01	0.90	146.18
Controlling		1.2DL+1.6LL	64.2	18.6	6.3	1.01	0.90	146.18

REACTIONS (kips):

	Left	**Right**
DL reaction	2.93	2.70
Max +LL reaction	2.12	1.91
Max +total reaction (factored)	6.90	6.30

DEFLECTIONS:

									Ratio
Dead load (in)	at 16.76 ft	=	-0.635	L/D	=	640			
Live load (in)	at 16.76 ft	=	-0.469	L/D	=	867	>	360	0.42
Net Total load (in)	at 16.76 ft	=	-1.103	L/D	=	368	>	240	0.65

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 136**

SPAN INFORMATION (ft): I-End (110.92,111.92) J-End (134.92,111.92)

Beam Size (User Selected) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
4.667	0.54	0.00	0.0	0.00	0.00	0.0	0.48	Snow	0.00
10.333	0.59	0.00	0.0	0.00	0.00	0.0	0.53	Snow	0.00
16.000	0.70	0.00	0.0	0.00	0.00	0.0	0.64	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	24.000	0.010	0.000			0.000
2	0.042	0.023	0.000	---	Snow	0.000
	23.978	0.023	0.000			0.000
3	23.979	0.023	0.000	---	Snow	0.000
	24.000	0.000	0.000			0.000
4	0.042	0.000	0.023	---	Snow	0.000
	23.978	0.000	0.023			0.000
5	0.000	0.000	0.000	---	Snow	0.000
	0.040	0.023	0.000			0.000
6	0.000	0.019	0.000	---	NonR	0.000
	24.000	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.84 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	26.3	10.3	5.7	1.03	0.90	76.99
Controlling		1.2DL+1.6LL	26.3	10.3	5.7	1.03	0.90	76.99

REACTIONS (kips):

	Left	**Right**
DL reaction	1.63	1.45
Max +LL reaction	1.18	1.02
Max +total reaction (factored)	3.84	3.38

DEFLECTIONS:

							Ratio
Dead load (in)	at 12.00 ft	=	-0.297	L/D =	971		
Live load (in)	at 12.00 ft	=	-0.221	L/D =	1305	> 360	0.28
Net Total load (in)	at 12.00 ft	=	-0.517	L/D =	557	> 240	0.43

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 139**

SPAN INFORMATION (ft): I-End (95.92,110.28) J-End (95.92,118.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.88
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.097	0.000	---	Snow	0.000
	7.883	0.097	0.000			0.000
2	0.000	0.000	0.093	---	Snow	0.000
	7.883	0.000	0.093			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	0.816	0.116	0.000			0.000
4	0.817	0.116	0.000	---	Snow	0.000
	7.883	0.116	0.000			0.000
5	0.000	0.000	0.000	---	Snow	0.000
	0.816	0.000	0.112			0.000
6	0.817	0.000	0.112	---	Snow	0.000
	7.883	0.000	0.112			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	7.883	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.36 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	4.6	4.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	4.6	4.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.84	0.88
Max +LL reaction	0.77	0.81
Max +total reaction (factored)	2.24	2.36

DEFLECTIONS:

										Ratio
Dead load (in)	at	3.94 ft	=	-0.012	L/D	=	7586			
Live load (in)	at	3.94 ft	=	-0.011	L/D	=	8285	>	360	0.04
Net Total load (in)	at	3.94 ft	=	-0.024	L/D	=	3960	>	240	0.06

PRCNC20221036

Floor Type: Roof **Beam Number = 141**

SPAN INFORMATION (ft): I-End (64.08,105.16) J-End (64.08,121.58)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 16.42
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.066	0.000	---	Snow	0.000
	16.420	0.066	0.000			0.000
2	0.000	0.000	0.064	---	Snow	0.000
	16.420	0.000	0.064			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.680	0.111	0.000			0.000
4	1.681	0.111	0.000	---	Snow	0.000
	16.420	0.111	0.000			0.000
5	0.000	0.000	0.000	---	Snow	0.000
	1.680	0.000	0.107			0.000
6	1.681	0.000	0.107	---	Snow	0.000
	16.420	0.000	0.107			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	16.420	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.10 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	16.8	8.2	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	16.8	8.2	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.46	1.55
Max +LL reaction	1.32	1.40
Max +total reaction (factored)	3.86	4.10

DEFLECTIONS:

										Ratio
Dead load (in)	at	8.21 ft	=	-0.197	L/D	=	999			
Live load (in)	at	8.21 ft	=	-0.179	L/D	=	1103	>	360	0.33
Net Total load (in)	at	8.21 ft	=	-0.376	L/D	=	524	>	240	0.46

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 142**

SPAN INFORMATION (ft): I-End (71.25,106.84) J-End (71.25,121.58)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 14.74
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.111	0.000	---	Snow	0.000
	14.740	0.111	0.000			0.000
2	0.000	0.000	0.107	---	Snow	0.000
	14.740	0.000	0.107			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.406	0.093	0.000			0.000
4	1.407	0.093	0.000	---	Snow	0.000
	14.740	0.093	0.000			0.000
5	0.000	0.000	0.000	---	Snow	0.000
	1.406	0.000	0.090			0.000
6	1.407	0.000	0.090	---	Snow	0.000
	14.740	0.000	0.090			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	14.740	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.23 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	15.6	7.4	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	15.6	7.4	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.53	1.59
Max +LL reaction	1.39	1.45
Max +total reaction (factored)	4.07	4.23

DEFLECTIONS:

											Ratio
Dead load (in)	at	7.37 ft	=	-0.147	L/D	=	1206				
Live load (in)	at	7.37 ft	=	-0.134	L/D	=	1320	>	360		0.27
Net Total load (in)	at	7.37 ft	=	-0.281	L/D	=	630	>	240		0.38

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 144**

SPAN INFORMATION (ft): I-End (134.92,111.92) J-End (157.56,110.62)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 22.69
Mp (kip-ft) = 184.17

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.010	0.71	0.00	0.0	0.00	0.00	0.0	0.65	Snow	0.00
13.522	0.89	0.00	0.0	0.00	0.00	0.0	0.82	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	22.686	0.010	0.000			0.000
2	0.000	0.005	0.000	---	Snow	0.000
	6.009	0.000	0.000			0.000
3	0.000	0.000	0.005	---	Snow	0.000
	2.003	0.000	0.000			0.000
4	6.010	0.007	0.000	---	Snow	0.000
	13.522	0.000	0.000			0.000
5	6.010	0.000	0.006	---	Snow	0.000
	8.513	0.000	0.000			0.000
6	13.522	0.008	0.000	---	Snow	0.000
	22.686	0.000	0.000			0.000
7	13.522	0.000	0.008	---	Snow	0.000
	16.576	0.000	0.005			0.000
8	16.577	0.000	0.005	---	Snow	0.000
	19.631	0.000	0.000			0.000
9	0.022	0.023	0.000	---	Snow	0.000
	22.111	0.023	0.000			0.000
10	22.118	0.023	0.000	---	Snow	0.000
	22.686	0.000	0.000			0.000
11	0.022	0.000	0.023	---	Snow	0.000
	22.111	0.000	0.023			0.000
12	22.111	0.000	0.023	---	Snow	0.000
	22.686	0.000	0.000			0.000
13	0.000	0.000	0.000	---	Snow	0.000
	0.021	0.023	0.000			0.000
14	0.000	0.026	0.000	---	NonR	0.000
	22.686	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.66 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	24.8	13.5	7.5	1.06	0.90	141.90

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
Controlling		1.2DL+1.6LL	24.8	13.5	7.5	1.06	0.90	141.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.60	1.42
Max +LL reaction	1.09	0.93
Max +total reaction (factored)	3.66	3.20

DEFLECTIONS:

										Ratio
Dead load (in)	at 11.34 ft	=	-0.108	L/D	=	2511				
Live load (in)	at 11.34 ft	=	-0.077	L/D	=	3537	>	360		0.10
Net Total load (in)	at 11.34 ft	=	-0.185	L/D	=	1468	>	240		0.16

Floor Type: Roof **Beam Number = 146**

SPAN INFORMATION (ft): I-End (110.92,111.92) J-End (110.92,146.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 34.58
Cantilever on left (ft) = 6.25
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	1.63	0.00	0.0	0.00	0.00	0.0	1.18	Snow	0.00
0.000	2.70	0.00	0.0	0.00	0.00	0.0	1.91	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.189	0.000	---	Snow	0.000
	6.250	0.189	0.000			0.000
2	0.000	0.000	0.183	---	Snow	0.000
	6.250	0.000	0.183			0.000
3	6.250	0.116	0.000	---	Snow	0.000
	34.583	0.116	0.000			0.000
4	6.250	0.000	0.183	---	Snow	0.000
	34.583	0.000	0.183			0.000
5	6.250	0.072	0.000	---	Snow	0.000
	10.750	0.072	0.000			0.000
6	10.750	0.054	0.000	---	Snow	0.000
	34.583	0.054	0.000			0.000
7	0.000	0.035	0.000	---	NonR	0.000
	6.250	0.035	0.000			0.000
8	6.250	0.035	0.000	---	NonR	0.000
	34.583	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.64 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Left	Max -	1.2DL+1.6LL	-74.3	6.2	6.2	1.00	0.90	225.73
Center	Max +	1.2DL+1.6LL	36.9	22.9	0.0	1.00	0.90	249.38
	Max -	1.2DL+1.6LL	-74.3	6.3	28.3	2.68	0.90	113.93
Controlling		1.2DL+1.6LL	-74.3	6.2	28.3	2.68	0.90	113.93

REACTIONS (kips):

	Left	**Right**
DL reaction	9.81	1.80
Max +LL reaction	7.63	2.59
Max -LL reaction	0.00	-0.81
Max +total reaction (factored)	23.97	6.30

DEFLECTIONS:

PRCNC20221036

Left cantilever:

Dead load (in)	=	-0.120	L/D	=	1255			
Pos Live load (in)	=	-0.191	L/D	=	784	>	360	0.46
Neg Live load (in)	=	0.126	L/D	=	1188	>	360	0.30
Pos Total load (in)	=	-0.311	L/D	=	483	>	240	0.50
Neg Total load (in)	=	0.007	L/D	=	22083	>	240	0.01

Center span:

Dead load (in)	at	21.97 ft	=	-0.024	L/D	=	1414 7			
Live load (in)	at	21.97 ft	=	-0.176	L/D	=	1928	>	360	0.19
Net Total load (in)	at	21.97 ft	=	-0.200	L/D	=	1697	>	240	0.14

Floor Type: Roof **Beam Number = 147**

SPAN INFORMATION (ft): I-End (134.92,138.50) J-End (134.92,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.161	0.000	---	Snow	0.000
	8.000	0.161	0.000			0.000
2	0.000	0.000	0.210	---	Snow	0.000
	8.000	0.000	0.210			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	8.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.17 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	4.3	4.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	4.3	4.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.69	0.69
Max +LL reaction	0.84	0.84
Max +total reaction (factored)	2.17	2.17

DEFLECTIONS:

					Ratio
Dead load (in)	at 4.00 ft	= -0.010	L/D = 9392		
Live load (in)	at 4.00 ft	= -0.012	L/D = 7739	> 360	0.05
Net Total load (in)	at 4.00 ft	= -0.023	L/D = 4243	> 240	0.06

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 148**

SPAN INFORMATION (ft): I-End (185.92,118.17) J-End (185.92,146.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
23.667	2.00	0.00	0.0	0.00	0.00	0.0	0.23	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.116	0.000	---	Snow	0.000
	28.333	0.116	0.000			0.000
2	0.000	0.000	0.112	---	Snow	0.000
	28.333	0.000	0.112			0.000
3	0.000	0.116	0.000	---	Snow	0.000
	23.667	0.116	0.000			0.000
4	0.000	0.000	0.113	---	Snow	0.000
	23.667	0.000	0.113			0.000
5	23.668	0.016	0.000	---	Snow	0.000
	28.333	0.016	0.000			0.000
6	23.668	0.000	0.015	---	Snow	0.000
	28.333	0.000	0.015			0.000
7	0.000	0.019	0.000	---	NonR	0.000
	28.333	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.50 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	71.4	14.7	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	71.4	14.7	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	Right
DL reaction	3.85	4.80
Max +LL reaction	3.19	2.96
Max +total reaction (factored)	9.72	10.50

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 14.45 ft	= -1.150	L/D = 296			
Live load (in)	at 14.31 ft	= -0.865	L/D = 393	>	360	0.92
Net Total load (in)	at 14.31 ft	= -1.264	L/D = 269	>	240	0.89

PRCNC20221036

Floor Type: Roof **Beam Number = 172**

SPAN INFORMATION (ft): I-End (169.29,102.72) J-End (184.10,106.69)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.33
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
5.417	0.22	0.00	0.0	0.00	0.00	0.0	0.20	Snow	0.00
7.667	1.73	0.00	0.0	0.00	0.00	0.0	1.60	Snow	0.00
11.417	0.16	0.00	0.0	0.00	0.00	0.0	0.14	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	5.417	0.010	0.000	---	Snow	0.000
	11.416	0.010	0.000			0.000
2	5.417	0.000	0.010	---	Snow	0.000
	11.416	0.000	0.010			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	15.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.04 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	21.1	7.7	3.7	1.21	0.90	46.90
Controlling		1.2DL+1.6LL	21.1	7.7	3.7	1.21	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.17	1.19
Max +LL reaction	0.99	1.01
Max +total reaction (factored)	2.98	3.04

DEFLECTIONS:

								Ratio
Dead load (in)	at	7.67 ft	=	-0.184	L/D =	1001		
Live load (in)	at	7.67 ft	=	-0.160	L/D =	1149	> 360	0.31
Net Total load (in)	at	7.67 ft	=	-0.344	L/D =	535	> 240	0.45

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 173**

SPAN INFORMATION (ft): I-End (173.09,118.17) J-End (176.69,104.70)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 13.94
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	2.054	0.119	0.000			0.000
2	2.055	0.119	0.000	---	Snow	0.000
	13.937	0.119	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	2.054	0.000	0.115			0.000
4	2.055	0.000	0.115	---	Snow	0.000
	13.937	0.000	0.115			0.000
5	0.000	0.119	0.000	---	Snow	0.000
	13.937	0.119	0.000			0.000
6	0.000	0.000	0.115	---	Snow	0.000
	13.937	0.000	0.115			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	13.937	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.64 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	16.1	7.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	16.1	7.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.62	1.73
Max +LL reaction	1.49	1.60
Max +total reaction (factored)	4.33	4.64

DEFLECTIONS:

						Ratio
Dead load (in)	at	6.97 ft	= -0.135	L/D = 1241		
Live load (in)	at	6.97 ft	= -0.124	L/D = 1348	> 360	0.27
Net Total load (in)	at	6.97 ft	= -0.259	L/D = 646	> 240	0.37

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 177**

SPAN INFORMATION (ft): I-End (180.31,105.67) J-End (181.57,101.01)

Beam Size (Optimum) = C4X5.4 Fy = 36.0 ksi
Total Beam Length (ft) = 4.83
Mp (kip-ft) = 6.87

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.061	0.000	---	Snow	0.000
	4.833	0.061	0.000			0.000
2	0.000	0.000	0.059	---	Snow	0.000
	4.833	0.000	0.059			0.000
3	0.000	0.005	0.000	---	NonR	0.000
	4.833	0.005	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.42 kips 0.90Vn = 14.31 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.5	2.4	0.0	1.00	0.90	6.18
Controlling		1.2DL+1.6LL	0.5	2.4	0.0	1.00	0.90	6.18

REACTIONS (kips):

	Left	**Right**
DL reaction	0.16	0.16
Max +LL reaction	0.14	0.14
Max +total reaction (factored)	0.42	0.42

DEFLECTIONS:									**Ratio**
Dead load (in)	at	2.42 ft	=	-0.007	L/D	=	7980		
Live load (in)	at	2.42 ft	=	-0.006	L/D	=	8977 >	360	0.04
Net Total load (in)	at	2.42 ft	=	-0.014	L/D	=	4225 >	240	0.06

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 178**

SPAN INFORMATION (ft): I-End (174.52,104.12) J-End (175.77,99.45)

Beam Size (Optimum) = C4X5.4 Fy = 36.0 ksi
Total Beam Length (ft) = 4.83
Mp (kip-ft) = 6.87

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.084	0.000	---	Snow	0.000
	4.833	0.084	0.000			0.000
2	0.000	0.000	0.081	---	Snow	0.000
	4.833	0.000	0.081			0.000
3	0.000	0.005	0.000	---	NonR	0.000
	4.833	0.005	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.57 kips 0.90Vn = 14.31 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.7	2.4	0.0	1.00	0.90	6.18
Controlling		1.2DL+1.6LL	0.7	2.4	0.0	1.00	0.90	6.18

REACTIONS (kips):

	Left	**Right**
DL reaction	0.22	0.22
Max +LL reaction	0.20	0.20
Max +total reaction (factored)	0.57	0.57

DEFLECTIONS:

										Ratio
Dead load (in)	at	2.42 ft	=	-0.010	L/D	=	5904			
Live load (in)	at	2.42 ft	=	-0.009	L/D	=	6491	>	360	0.06
Net Total load (in)	at	2.42 ft	=	-0.019	L/D	=	3092	>	240	0.08

PRCNC20221036

Floor Type: Roof **Beam Number = 184**

SPAN INFORMATION (ft): I-End (64.08,121.58) J-End (64.08,151.25)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 29.67
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
13.583	0.05								
13.583	0.41	0.00	0.0	0.00	0.00	0.0	0.30	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.177	0.000	---	Snow	0.000
	13.583	0.177	0.000			0.000
2	0.000	0.000	0.064	---	Snow	0.000
	13.583	0.000	0.064			0.000
3	13.584	0.222	0.000	---	Snow	0.000
	29.666	0.222	0.000			0.000
4	13.584	0.000	0.107	---	Snow	0.000
	29.666	0.000	0.107			0.000
5	0.000	0.000	0.107	---	Snow	0.000
	29.666	0.000	0.107			0.000
6	0.000	0.019	0.000	---	NonR	0.000
	29.666	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.48 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	70.9	14.7	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	70.9	14.7	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.35	3.65
Max +LL reaction	2.89	3.19
Max +total reaction (factored)	8.65	9.48

DEFLECTIONS: (Camber = 3/4)

								Ratio
Dead load (in)	at 14.83 ft	=	-1.138	L/D	=	313		
Live load (in)	at 14.98 ft	=	-0.980	L/D	=	363	> 360	0.99
Net Total load (in)	at 14.98 ft	=	-1.368	L/D	=	260	> 240	0.92

PRCNC20221036

Floor Type: Roof **Beam Number = 185**

SPAN INFORMATION (ft): I-End (56.92,135.17) J-End (64.08,135.17)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 7.17
Mp (kip-ft) = 72.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
2.917	0.88	0.00	0.0	0.00	0.00	0.0	0.73	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.014	0.000	---	NonR	0.000
	7.166	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.38 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	4.0	2.9	4.3	1.65	0.90	65.25
Controlling		1.2DL+1.6LL	4.0	2.9	4.3	1.65	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	0.57	0.41
Max +LL reaction	0.43	0.30
Max +total reaction (factored)	1.38	0.97

DEFLECTIONS:

										Ratio
Dead load (in)	at	3.40 ft	=	-0.005	L/D	=	1839 3			
Live load (in)	at	3.40 ft	=	-0.004	L/D	=	2391 6	>	360	0.02
Net Total load (in)	at	3.40 ft	=	-0.008	L/D	=	1039 7	>	240	0.02

Floor Type: Roof **Beam Number = 186**

SPAN INFORMATION (ft): I-End (64.08,135.17) J-End (71.25,135.17)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 7.17
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.014	0.000	---	NonR	0.000
	7.166	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.07 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.1	3.6	7.2	1.14	0.90	47.77
Controlling		1.4DL	0.1	3.6	7.2	1.14	0.90	47.77

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +total reaction (factored)	0.07	0.07

DEFLECTIONS: **Ratio**

Dead load (in) at 3.58 ft = -0.000
Live load (in) at 3.58 ft = -0.000
Net Total load (in) at 3.58 ft = -0.000

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 187**

SPAN INFORMATION (ft): I-End (71.25,135.17) J-End (77.25,135.17)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.014	0.000	---	NonR	0.000
	6.000	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.06 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	0.1	3.0	6.0	1.14	0.90	54.60
Controlling		1.4DL	0.1	3.0	6.0	1.14	0.90	54.60

REACTIONS (kips):

	Left	**Right**
DL reaction	0.04	0.04
Max +total reaction (factored)	0.06	0.06

DEFLECTIONS: **Ratio**

Dead load (in)	at	3.00 ft	=	-0.000	
Live load (in)	at	3.00 ft	=	-0.000	
Net Total load (in)	at	3.00 ft	=	-0.000	

PRCNC20221036

Floor Type: Roof **Beam Number = 192**

SPAN INFORMATION (ft): I-End (49.42,151.25) J-End (49.42,176.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 25.25
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
10.250	0.05								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.233	0.000	---	Snow	0.000
	25.250	0.233	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	25.250	0.000	0.225			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	25.250	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.39 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	53.0	12.6	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	53.0	12.6	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.20	3.19
Max +LL reaction	2.84	2.84
Max +total reaction (factored)	8.39	8.38

DEFLECTIONS:

						Ratio
Dead load (in)	at 12.62 ft	= -0.617	L/D = 491			
Live load (in)	at 12.62 ft	= -0.546	L/D = 555	>	360	0.65
Net Total load (in)	at 12.62 ft	= -1.162	L/D = 261	>	240	0.92

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 193**

SPAN INFORMATION (ft): I-End (56.92,151.25) J-End (56.92,176.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 25.25
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.227	0.000	---	Snow	0.000
	25.250	0.227	0.000			0.000
2	0.000	0.000	0.220	---	Snow	0.000
	25.250	0.000	0.220			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	25.250	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.17 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	51.6	12.6	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	51.6	12.6	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.11	3.11
Max +LL reaction	2.78	2.78
Max +total reaction (factored)	8.17	8.17

DEFLECTIONS:

						Ratio
Dead load (in)	at 12.62 ft	= -0.597	L/D = 507			
Live load (in)	at 12.62 ft	= -0.534	L/D = 568	>	360	0.63
Net Total load (in)	at 12.62 ft	= -1.131	L/D = 268	>	240	0.90

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 194**

SPAN INFORMATION (ft): I-End (64.08,151.25) J-End (64.08,176.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 25.25
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.222	0.000	---	Snow	0.000
	25.250	0.222	0.000			0.000
2	0.000	0.000	0.215	---	Snow	0.000
	25.250	0.000	0.215			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	25.250	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.00 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	50.5	12.6	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	50.5	12.6	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.04	3.04
Max +LL reaction	2.71	2.71
Max +total reaction (factored)	8.00	8.00

DEFLECTIONS:

							Ratio
Dead load (in)	at 12.62 ft	=	-0.585	L/D =	518		
Live load (in)	at 12.62 ft	=	-0.522	L/D =	581	> 360	0.62
Net Total load (in)	at 12.62 ft	=	-1.107	L/D =	274	> 240	0.88

PRCNC20221036

Floor Type: Roof **Beam Number = 195**

SPAN INFORMATION (ft): I-End (83.47,146.50) J-End (83.47,176.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.193	0.000	---	Snow	0.000
	30.000	0.193	0.000			0.000
2	0.000	0.000	0.187	---	Snow	0.000
	30.000	0.000	0.187			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	30.000	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.29 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	62.2	15.0	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	62.2	15.0	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.18	3.18
Max +LL reaction	2.80	2.80
Max +total reaction (factored)	8.29	8.29

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 15.00 ft	= -1.024	L/D =	352		
Live load (in)	at 15.00 ft	= -0.902	L/D =	399	> 360	0.90
Net Total load (in)	at 15.00 ft	= -1.175	L/D =	306	> 240	0.78

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 196**

SPAN INFORMATION (ft): I-End (89.69,146.50) J-End (89.69,176.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.193	0.000	---	Snow	0.000
	30.000	0.193	0.000			0.000
2	0.000	0.000	0.187	---	Snow	0.000
	30.000	0.000	0.187			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	30.000	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.30 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	62.2	15.0	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	62.2	15.0	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.18	3.18
Max +LL reaction	2.80	2.80
Max +total reaction (factored)	8.30	8.30

DEFLECTIONS: (Camber = 3/4)

							Ratio
Dead load (in)	at 15.00 ft	=	-1.024	L/D =	351		
Live load (in)	at 15.00 ft	=	-0.903	L/D =	399	> 360	0.90
Net Total load (in)	at 15.00 ft	=	-1.177	L/D =	306	> 240	0.78

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 197**

SPAN INFORMATION (ft): I-End (83.47,118.17) J-End (83.47,146.50)

Beam Size (Optimum) = W12X16 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 83.75

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.193	0.000	---	Snow	0.000
	28.333	0.193	0.000			0.000
2	0.000	0.000	0.187	---	Snow	0.000
	28.333	0.000	0.187			0.000
3	0.000	0.016	0.000	---	NonR	0.000
	28.333	0.016	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.78 kips 1.00Vn = 79.20 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	55.1	14.2	0.0	1.00	0.90	75.38
Controlling		1.2DL+1.6LL	55.1	14.2	0.0	1.00	0.90	75.38

REACTIONS (kips):

	Left	**Right**
DL reaction	2.96	2.96
Max +LL reaction	2.64	2.64
Max +total reaction (factored)	7.78	7.78

DEFLECTIONS: (Camber = 3/4)

							Ratio
Dead load (in)	at 14.17 ft	=	-1.014	L/D =	335		
Live load (in)	at 14.17 ft	=	-0.906	L/D =	375	> 360	0.96
Net Total load (in)	at 14.17 ft	=	-1.169	L/D =	291	> 240	0.83

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 198**

SPAN INFORMATION (ft): I-End (83.47,108.93) J-End (83.47,118.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.24
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.096	0.000	---	Snow	0.000
	9.239	0.096	0.000			0.000
2	0.000	0.000	0.093	---	Snow	0.000
	9.239	0.000	0.093			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	0.677	0.096	0.000			0.000
4	0.678	0.096	0.000	---	Snow	0.000
	9.239	0.096	0.000			0.000
5	0.000	0.000	0.000	---	Snow	0.000
	0.677	0.000	0.093			0.000
6	0.678	0.000	0.093	---	Snow	0.000
	9.239	0.000	0.093			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	9.239	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.51 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	5.8	4.6	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	5.8	4.6	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.91	0.95
Max +LL reaction	0.83	0.86
Max +total reaction (factored)	2.43	2.51

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.62 ft	=	-0.021	L/D	=	5161			
Live load (in)	at	4.62 ft	=	-0.020	L/D	=	5667	>	360	0.06
Net Total load (in)	at	4.62 ft	=	-0.041	L/D	=	2701	>	240	0.09

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 199**

SPAN INFORMATION (ft): I-End (89.69,118.17) J-End (89.69,146.50)

Beam Size (Optimum) = W12X16 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 83.75

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.193	0.000	---	Snow	0.000
	28.333	0.193	0.000			0.000
2	0.000	0.000	0.187	---	Snow	0.000
	28.333	0.000	0.187			0.000
3	0.000	0.016	0.000	---	NonR	0.000
	28.333	0.016	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.78 kips 1.00Vn = 79.20 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	55.1	14.2	0.0	1.00	0.90	75.38
Controlling		1.2DL+1.6LL	55.1	14.2	0.0	1.00	0.90	75.38

REACTIONS (kips):

	Left	**Right**
DL reaction	2.96	2.96
Max +LL reaction	2.65	2.65
Max +total reaction (factored)	7.78	7.78

DEFLECTIONS: (Camber = 3/4)

					Ratio
Dead load (in)	at 14.17 ft = -1.014	L/D = 335			
Live load (in)	at 14.17 ft = -0.906	L/D = 375	>	360	0.96
Net Total load (in)	at 14.17 ft = -1.171	L/D = 290	>	240	0.83

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 200**

SPAN INFORMATION (ft): I-End (89.69,109.60) J-End (89.69,118.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.56
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.096	0.000	---	Snow	0.000
	8.562	0.096	0.000			0.000
2	0.000	0.000	0.093	---	Snow	0.000
	8.562	0.000	0.093			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	0.678	0.097	0.000			0.000
4	0.679	0.097	0.000	---	Snow	0.000
	8.562	0.097	0.000			0.000
5	0.000	0.000	0.000	---	Snow	0.000
	0.678	0.000	0.093			0.000
6	0.679	0.000	0.093	---	Snow	0.000
	8.562	0.000	0.093			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	8.562	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.33 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	5.0	4.3	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	5.0	4.3	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.85	0.88
Max +LL reaction	0.77	0.80
Max +total reaction (factored)	2.24	2.33

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.28 ft	=	-0.016	L/D	=	6482			
Live load (in)	at	4.28 ft	=	-0.014	L/D	=	7118	>	360	0.05
Net Total load (in)	at	4.28 ft	=	-0.030	L/D	=	3393	>	240	0.07

PRCNC20221036

Floor Type: Roof **Beam Number = 201**

SPAN INFORMATION (ft): I-End (103.42,118.17) J-End (103.42,146.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.233	0.000	---	Snow	0.000
	28.333	0.233	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	28.333	0.000	0.225			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	28.333	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.37 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	66.4	14.2	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	66.4	14.2	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.56	3.56
Max +LL reaction	3.19	3.19
Max +total reaction (factored)	9.37	9.37

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 14.17 ft	= -0.967	L/D = 352			
Live load (in)	at 14.17 ft	= -0.865	L/D = 393	>	360	0.92
Net Total load (in)	at 14.17 ft	= -1.083	L/D = 314	>	240	0.76

PRCNC20221036

Floor Type: Roof **Beam Number = 202**

SPAN INFORMATION (ft): I-End (103.42,111.10) J-End (103.42,118.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.07
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.116	0.000	---	Snow	0.000
	7.066	0.116	0.000			0.000
2	0.000	0.000	0.112	---	Snow	0.000
	7.066	0.000	0.112			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	0.816	0.116	0.000			0.000
4	0.817	0.116	0.000	---	Snow	0.000
	7.066	0.116	0.000			0.000
5	0.000	0.000	0.000	---	Snow	0.000
	0.816	0.000	0.112			0.000
6	0.817	0.000	0.113	---	Snow	0.000
	7.066	0.000	0.113			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	7.066	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.30 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	4.1	3.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	4.1	3.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.82	0.86
Max +LL reaction	0.75	0.79
Max +total reaction (factored)	2.18	2.30

DEFLECTIONS:

										Ratio
Dead load (in)	at	3.53 ft	=	-0.009	L/D	=	9691			
Live load (in)	at	3.53 ft	=	-0.008	L/D	=	1053 6	>	360	0.03
Net Total load (in)	at	3.53 ft	=	-0.017	L/D	=	5048	>	240	0.05

Floor Type: Roof **Beam Number = 203**

SPAN INFORMATION (ft): I-End (103.42,146.50) J-End (103.42,176.50)

Beam Size (Optimum) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 122.08

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.233	0.000	---	Snow	0.000
	30.000	0.233	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.98 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	74.9	15.0	0.0	1.00	0.90	109.88
Controlling		1.2DL+1.6LL	74.9	15.0	0.0	1.00	0.90	109.88

REACTIONS (kips):

	Left	**Right**
DL reaction	3.82	3.82
Max +LL reaction	3.37	3.37
Max +total reaction (factored)	9.98	9.98

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 15.00 ft	= -1.025	L/D = 351			
Live load (in)	at 15.00 ft	= -0.906	L/D = 397	>	360	0.91
Net Total load (in)	at 15.00 ft	= -1.182	L/D = 305	>	240	0.79

Floor Type: Roof **Beam Number = 204**

SPAN INFORMATION (ft): I-End (110.92,146.50) J-End (110.92,176.50)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 326.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
15.000	0.95								
15.000	8.00	0.00	0.0	3.40	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.240	0.000	---	NonR	0.000
	15.000	0.240	0.000			0.000
2	0.000	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
3	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
4	0.000	0.555	0.000	---	Snow	0.000
	15.000	0.555	0.000			0.000
5	15.000	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
6	0.000	0.040	0.000	---	NonR	0.000
	30.000	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 27.56 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	244.4	15.0	0.0	1.00	0.90	294.00
Controlling		1.2DL+1.6LL	244.4	15.0	0.0	1.00	0.90	294.00

REACTIONS (kips):

	Left	**Right**
DL reaction	16.20	11.11
Max +LL reaction	5.07	5.07
Max +total reaction (factored)	27.56	21.45

DEFLECTIONS: (Camber = 3/4)

					Ratio
Dead load (in)	at 14.70 ft	= -1.119	L/D = 322		
Live load (in)	at 14.70 ft	= -0.417	L/D = 863	> 360	0.42
Net Total load (in)	at 14.70 ft	= -0.786	L/D = 458	> 240	0.52

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 205**

SPAN INFORMATION (ft): I-End (118.42,146.50) J-End (118.42,176.50)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 326.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
15.000	0.95								
15.000	0.95								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	1.110	0.000	---	Snow	0.000
	15.000	1.110	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
3	15.000	0.232	0.000	---	Snow	0.000
	30.000	0.232	0.000			0.000
4	0.000	0.040	0.000	---	NonR	0.000
	30.000	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 23.29 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	155.8	13.4	0.0	1.00	0.90	294.00
Controlling		1.2DL+1.6LL	155.8	13.4	0.0	1.00	0.90	294.00

REACTIONS (kips):

	Left	**Right**
DL reaction	14.91	8.33
Max +LL reaction	3.37	3.37
Max +total reaction (factored)	23.29	15.39

DEFLECTIONS:

								Ratio
Dead load (in)	at 14.40 ft	=	-0.836	L/D	=	431		
Live load (in)	at 14.55 ft	=	-0.231	L/D	=	1560	> 360	0.23
Net Total load (in)	at 14.55 ft	=	-1.067	L/D	=	338	> 240	0.71

PRCNC20221036

Floor Type: Roof **Beam Number = 206**

SPAN INFORMATION (ft): I-End (126.92,118.17) J-End (126.92,146.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
8.083	1.33								
8.083	0.94								
20.333	1.33								
20.333	0.94								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.212	0.000	---	Snow	0.000
	4.500	0.212	0.000			0.000
2	4.500	0.157	0.000	---	Snow	0.000
	28.333	0.157	0.000			0.000
3	0.000	0.000	0.205	---	Snow	0.000
	28.333	0.000	0.205			0.000
4	0.000	0.019	0.000	---	NonR	0.000
	28.333	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.63 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	76.3	14.1	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	76.3	14.1	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	4.98	4.79
Max +LL reaction	2.90	2.90
Max +total reaction (factored)	10.63	10.39

DEFLECTIONS: (Camber = 1)

						Ratio
Dead load (in)	at 14.17 ft	=	-1.439	L/D = 236		
Live load (in)	at 14.17 ft	=	-0.788	L/D = 431	> 360	0.83
Net Total load (in)	at 14.17 ft	=	-1.227	L/D = 277	> 240	0.87

PRCNC20221036

Floor Type: Roof **Beam Number = 207**

SPAN INFORMATION (ft): I-End (126.92,111.92) J-End (126.92,118.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.25
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.212	0.000	---	Snow	0.000
	6.250	0.212	0.000			0.000
2	0.000	0.000	0.205	---	Snow	0.000
	6.250	0.000	0.205			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	6.250	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.86 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	2.9	3.1	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	2.9	3.1	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.70	0.70
Max +LL reaction	0.64	0.64
Max +total reaction (factored)	1.86	1.86

DEFLECTIONS:

										Ratio
Dead load (in)	at	3.12 ft	=	-0.005	L/D	=	1522 4			
Live load (in)	at	3.12 ft	=	-0.005	L/D	=	1662 6	>	360	0.02
Net Total load (in)	at	3.12 ft	=	-0.009	L/D	=	7947	>	240	0.03

PRCNC20221036

Floor Type: Roof **Beam Number = 215**

SPAN INFORMATION (ft): I-End (133.42,146.50) J-End (133.42,176.50)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 326.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
15.000	0.95								
15.000	0.95								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	1.110	0.000	---	Snow	0.000
	15.000	1.110	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
3	15.000	0.233	0.000	---	Snow	0.000
	30.000	0.233	0.000			0.000
4	0.000	0.040	0.000	---	NonR	0.000
	30.000	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 23.29 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	155.8	13.4	0.0	1.00	0.90	294.00
Controlling		1.2DL+1.6LL	155.8	13.4	0.0	1.00	0.90	294.00

REACTIONS (kips):

	Left	**Right**
DL reaction	14.91	8.33
Max +LL reaction	3.37	3.37
Max +total reaction (factored)	23.29	15.39

DEFLECTIONS:

							Ratio
Dead load (in)	at 14.40 ft	=	-0.836	L/D =	431		
Live load (in)	at 14.55 ft	=	-0.231	L/D =	1560	> 360	0.23
Net Total load (in)	at 14.55 ft	=	-1.067	L/D =	338	> 240	0.71

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 216**

SPAN INFORMATION (ft): I-End (140.92,146.50) J-End (140.92,176.50)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 326.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
15.000	0.95								
15.000	8.00	0.00	0.0	3.40	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.240	0.000	---	NonR	0.000
	15.000	0.240	0.000			0.000
2	0.000	0.555	0.000	---	Snow	0.000
	15.000	0.555	0.000			0.000
3	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
4	15.000	0.233	0.000	---	Snow	0.000
	30.000	0.233	0.000			0.000
5	0.000	0.116	0.000	---	Snow	0.000
	15.000	0.116	0.000			0.000
6	0.000	0.040	0.000	---	NonR	0.000
	30.000	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 27.56 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	244.4	15.0	0.0	1.00	0.90	294.00
Controlling		1.2DL+1.6LL	244.4	15.0	0.0	1.00	0.90	294.00

REACTIONS (kips):

	Left	**Right**
DL reaction	16.20	11.11
Max +LL reaction	5.07	5.07
Max +total reaction (factored)	27.56	21.45

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 14.70 ft	= -1.119	L/D = 322			
Live load (in)	at 14.70 ft	= -0.417	L/D = 863	>	360	0.42
Net Total load (in)	at 14.70 ft	= -0.786	L/D = 458	>	240	0.52

PRCNC20221036

Floor Type: Roof **Beam Number = 217**

SPAN INFORMATION (ft): I-End (148.42,146.50) J-End (148.42,176.50)

Beam Size (Optimum) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 122.08

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.232	0.000	---	Snow	0.000
	30.000	0.232	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.98 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	74.9	15.0	0.0	1.00	0.90	109.88
Controlling		1.2DL+1.6LL	74.9	15.0	0.0	1.00	0.90	109.88

REACTIONS (kips):

	Left	**Right**
DL reaction	3.82	3.82
Max +LL reaction	3.37	3.37
Max +total reaction (factored)	9.98	9.98

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 15.00 ft	= -1.025	L/D = 351			
Live load (in)	at 15.00 ft	= -0.906	L/D = 397	>	360	0.91
Net Total load (in)	at 15.00 ft	= -1.182	L/D = 305	>	240	0.79

Gravity Beam Design

Floor Type: Roof **Beam Number = 218**

SPAN INFORMATION (ft): I-End (140.92,118.17) J-End (140.92,146.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
8.083	1.25								
8.083	1.00								
20.333	1.25								
20.333	1.00								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.209	0.000	---	Snow	0.000
	4.500	0.209	0.000			0.000
2	4.500	0.155	0.000	---	Snow	0.000
	28.333	0.155	0.000			0.000
3	0.000	0.000	0.202	---	Snow	0.000
	28.333	0.000	0.202			0.000
4	0.000	0.019	0.000	---	NonR	0.000
	28.333	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.50 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	75.4	14.1	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	75.4	14.1	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	4.93	4.73
Max +LL reaction	2.87	2.87
Max +total reaction (factored)	10.50	10.27

DEFLECTIONS: (Camber = 1)

						Ratio
Dead load (in)	at 14.17 ft	=	-1.422	L/D = 239		
Live load (in)	at 14.17 ft	=	-0.779	L/D = 437	> 360	0.82
Net Total load (in)	at 14.17 ft	=	-1.201	L/D = 283	> 240	0.85

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 219**

SPAN INFORMATION (ft): I-End (148.42,118.17) J-End (148.42,146.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
8.083	1.57	0.00	0.0	0.00	0.00	0.0	0.33	Snow	0.00
8.083	1.25								
20.333	1.57	0.00	0.0	0.00	0.00	0.0	0.33	Snow	0.00
20.333	1.25								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.232	0.000	---	Snow	0.000
	4.500	0.232	0.000			0.000
2	4.500	0.086	0.000	---	Snow	0.000
	28.333	0.086	0.000			0.000
3	0.000	0.000	0.112	---	Snow	0.000
	28.333	0.000	0.112			0.000
4	4.500	0.086	0.000	---	Snow	0.000
	8.083	0.086	0.000			0.000
5	0.000	0.000	0.113	---	Snow	0.000
	8.083	0.000	0.113			0.000
6	8.084	0.015	0.000	---	Snow	0.000
	20.333	0.015	0.000			0.000
7	8.084	0.000	0.020	---	Snow	0.000
	20.333	0.000	0.020			0.000
8	20.334	0.086	0.000	---	Snow	0.000
	28.333	0.086	0.000			0.000
9	20.334	0.000	0.113	---	Snow	0.000
	28.333	0.000	0.113			0.000
10	0.000	0.019	0.000	---	NonR	0.000
	28.333	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 11.13 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	75.2	14.0	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	75.2	14.0	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	5.34	5.13
Max +LL reaction	2.95	2.95
Max +total reaction (factored)	11.13	10.87

PRCNC20221036

DEFLECTIONS: (Camber = 1)

										Ratio
Dead load (in)	at	14.17 ft	=	-1.508	L/D	=	225			
Live load (in)	at	14.17 ft	=	-0.749	L/D	=	454	>	360	0.79
Net Total load (in)	at	14.17 ft	=	-1.257	L/D	=	270	>	240	0.89

Floor Type: Roof **Beam Number = 220**

SPAN INFORMATION (ft): I-End (140.92,111.57) J-End (140.92,118.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.59
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	0.343	0.093	0.000			0.000
2	0.343	0.093	0.000	---	Snow	0.000
	6.593	0.093	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	0.343	0.000	0.090			0.000
4	0.343	0.000	0.090	---	Snow	0.000
	6.593	0.000	0.090			0.000
5	0.000	0.116	0.000	---	Snow	0.000
	6.593	0.116	0.000			0.000
6	0.000	0.000	0.112	---	Snow	0.000
	6.593	0.000	0.112			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	6.593	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.94 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	3.2	3.3	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	3.2	3.3	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.71	0.73
Max +LL reaction	0.65	0.67
Max +total reaction (factored)	1.90	1.94

DEFLECTIONS:

								Ratio
Dead load (in)	at	3.30 ft	=	-0.006	L/D =	1313 3		
Live load (in)	at	3.30 ft	=	-0.006	L/D =	1435 2	> 360	0.03
Net Total load (in)	at	3.30 ft	=	-0.012	L/D =	6858	> 240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 221**

SPAN INFORMATION (ft): I-End (148.42,111.14) J-End (148.42,118.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.02
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	0.428	0.116	0.000			0.000
2	0.429	0.116	0.000	---	Snow	0.000
	7.021	0.116	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	0.428	0.000	0.112			0.000
4	0.429	0.000	0.112	---	Snow	0.000
	7.021	0.000	0.112			0.000
5	0.000	0.140	0.000	---	Snow	0.000
	7.021	0.116	0.000			0.000
6	0.000	0.000	0.136	---	Snow	0.000
	7.021	0.000	0.113			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	7.021	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.38 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	4.2	3.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	4.2	3.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.89	0.89
Max +LL reaction	0.82	0.82
Max +total reaction (factored)	2.38	2.37

DEFLECTIONS:

										Ratio
Dead load (in)	at	3.51 ft	=	-0.009	L/D	=	9385			
Live load (in)	at	3.51 ft	=	-0.008	L/D	=	1017 6	>	360	0.04
Net Total load (in)	at	3.51 ft	=	-0.017	L/D	=	4882	>	240	0.05

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 222**

SPAN INFORMATION (ft): I-End (134.92,138.50) J-End (140.92,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	6.000	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	6.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.39 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	2.1	3.0	6.0	1.14	0.90	40.74
Controlling		1.4DL	2.1	3.0	6.0	1.14	0.90	40.74

REACTIONS (kips):

	Left	**Right**
DL reaction	1.00	1.00
Max +total reaction (factored)	1.39	1.39

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.00 ft	=	-0.006	L/D	=	1160 2		
Live load (in)	at	3.00 ft	=	-0.000					
Net Total load (in)	at	3.00 ft	=	-0.006	L/D	=	1160 2	> 240	0.02

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Roof **Beam Number = 225**

SPAN INFORMATION (ft): I-End (163.42,146.50) J-End (163.42,176.50)

Beam Size (Optimum) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 122.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.666	1.36								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	3.666	0.350	0.000			0.000
2	0.000	0.233	0.000	---	Snow	0.000
	30.000	0.233	0.000			0.000
3	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
4	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 12.86 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	79.3	14.6	0.0	1.00	0.90	109.88
Controlling		1.2DL+1.6LL	79.3	14.6	0.0	1.00	0.90	109.88

REACTIONS (kips):

	Left	**Right**
DL reaction	6.21	4.06
Max +LL reaction	3.37	3.37
Max +total reaction (factored)	12.86	10.27

DEFLECTIONS: (Camber = 3/4)

								Ratio
Dead load (in)	at 14.70 ft	=	-1.181	L/D	=	305		
Live load (in)	at 14.85 ft	=	-0.906	L/D	=	397	> 360	0.91
Net Total load (in)	at 14.85 ft	=	-1.337	L/D	=	269	> 240	0.89

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 226**

SPAN INFORMATION (ft): I-End (170.92,146.50) J-End (170.92,176.50)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.666	1.46	0.00	0.0	0.00	0.00	0.0	0.11	Snow	0.00
3.666	1.36								
16.417	0.05								
21.833	0.05								
21.833	1.00								
16.417	1.00								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
2	0.000	0.000	0.112	---	Snow	0.000
	30.000	0.000	0.112			0.000
3	0.000	0.057	0.000	---	Snow	0.000
	3.666	0.057	0.000			0.000
4	0.000	0.000	0.055	---	Snow	0.000
	3.666	0.000	0.055			0.000
5	3.666	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
6	3.666	0.000	0.112	---	Snow	0.000
	30.000	0.000	0.112			0.000
7	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.45 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	94.7	15.8	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	94.7	15.8	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	6.85	5.48
Max +LL reaction	3.27	3.37
Max +total reaction (factored)	13.45	11.98

DEFLECTIONS: (Camber = 1) **Ratio**

Dead load (in)	at 15.00 ft = -1.271	L/D = 283		
Live load (in)	at 15.00 ft = -0.710	L/D = 507	>	PRCNC20221036

Net Total load (in)	at 15.00 ft	=	-0.982	L/D	=	367	> 240	0.65

Gravity Beam Design

Floor Type: Roof **Beam Number = 227**

SPAN INFORMATION (ft): I-End (178.42,146.50) J-End (178.42,176.50)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.666	0.79	0.00	0.0	0.00	0.00	0.0	0.10	Snow	0.00
16.417	0.05								
16.417	0.05								
21.833	0.05								
21.833	0.05								
21.833	2.00								
16.417	2.00								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.059	0.000	---	Snow	0.000
	3.666	0.059	0.000			0.000
2	0.000	0.000	0.058	---	Snow	0.000
	3.666	0.000	0.058			0.000
3	3.666	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
4	3.666	0.000	0.112	---	Snow	0.000
	30.000	0.000	0.112			0.000
5	0.000	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
6	0.000	0.000	0.112	---	Snow	0.000
	30.000	0.000	0.112			0.000
7	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.28 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	105.4	16.4	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	105.4	16.4	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	5.83	6.57
Max +LL reaction	3.27	3.37
Max +total reaction (factored)	12.23	13.28

DEFLECTIONS: (Camber = 1) **Ratio**

Dead load (in) at 15.30 ft = -1.453 L/D = 248

PRCNC20221036

Live load (in)	at	15.30 ft	=	-0.710	L/D	=	507	>	360	0.71
Net Total load (in)	at	15.30 ft	=	-1.163	L/D	=	310	>	240	0.78

Floor Type: Roof **Beam Number = 228**

SPAN INFORMATION (ft): I-End (193.42,146.50) J-End (193.42,176.50)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
20.500	0.81								
20.500	1.18								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.171	0.000	---	Snow	0.000
	30.000	0.171	0.000			0.000
2	0.000	0.000	0.165	---	Snow	0.000
	30.000	0.000	0.165			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.06 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	67.6	16.5	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	67.6	16.5	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	3.52	4.25
Max +LL reaction	2.47	2.47
Max +total reaction (factored)	8.18	9.06

DEFLECTIONS:

						Ratio
Dead load (in)	at 15.45 ft	= -0.885	L/D =	407		
Live load (in)	at 15.30 ft	= -0.521	L/D =	691	> 360	0.52
Net Total load (in)	at 15.30 ft	= -1.406	L/D =	256	> 240	0.94

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 229**

SPAN INFORMATION (ft): I-End (200.92,146.50) J-End (200.92,176.50)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 138.33

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.173	0.000	---	Snow	0.000
	30.000	0.173	0.000			0.000
2	0.000	0.000	0.168	---	Snow	0.000
	30.000	0.000	0.168			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.54 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	56.5	15.0	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	56.5	15.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	2.93	2.93
Max +LL reaction	2.51	2.52
Max +total reaction (factored)	7.54	7.54

DEFLECTIONS:					**Ratio**
Dead load (in)	at 15.00 ft	= -0.617	L/D = 584		
Live load (in)	at 15.00 ft	= -0.529	L/D = 680	> 360	0.53
Net Total load (in)	at 15.00 ft	= -1.146	L/D = 314	> 240	0.76

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 232**

SPAN INFORMATION (ft): I-End (230.92,146.50) J-End (230.92,176.50)

Beam Size (Optimum) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.014	0.000	---	Snow	0.000
	15.000	0.014	0.000			0.000
2	15.000	0.019	0.000	---	Snow	0.000
	30.000	0.019	0.000			0.000
3	0.000	0.000	0.131	---	Snow	0.000
	30.000	0.000	0.131			0.000
4	0.000	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
5	0.000	0.014	0.000	---	NonR	0.000
	30.000	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.82 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	43.5	15.1	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	43.5	15.1	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	2.19	2.23
Max +LL reaction	1.97	1.97
Max +total reaction (factored)	5.78	5.82

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 15.00 ft	=	-1.045	L/D = 345		
Live load (in)	at 15.00 ft	=	-0.931	L/D = 387	> 360	0.93
Net Total load (in)	at 15.00 ft	=	-1.226	L/D = 294	> 240	0.82

PRCNC20221036

Floor Type: Roof **Beam Number = 233**

SPAN INFORMATION (ft): I-End (238.42,146.50) J-End (238.42,176.50)

Beam Size (Optimum) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 122.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
15.000	0.05								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.233	0.000	---	Snow	0.000
	30.000	0.233	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.01 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	75.3	15.0	0.0	1.00	0.90	109.88
Controlling		1.2DL+1.6LL	75.3	15.0	0.0	1.00	0.90	109.88

REACTIONS (kips):

	Left	**Right**
DL reaction	3.84	3.84
Max +LL reaction	3.37	3.37
Max +total reaction (factored)	10.01	10.01

DEFLECTIONS: (Camber = 3/4)

							Ratio
Dead load (in)	at 15.00 ft	=	-1.035	L/D =	348		
Live load (in)	at 15.00 ft	=	-0.906	L/D =	397	> 360	0.91
Net Total load (in)	at 15.00 ft	=	-1.192	L/D =	302	> 240	0.79

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 235**

SPAN INFORMATION (ft): I-End (230.92,135.17) J-End (230.92,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.014	0.000	---	Snow	0.000
	11.333	0.014	0.000			0.000
2	0.000	0.000	0.131	---	Snow	0.000
	11.333	0.000	0.131			0.000
3	0.000	0.116	0.000	---	Snow	0.000
	11.333	0.116	0.000			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	11.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.16 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	6.1	5.7	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	6.1	5.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.81	0.81
Max +LL reaction	0.74	0.74
Max +total reaction (factored)	2.16	2.16

DEFLECTIONS:

							Ratio
Dead load (in)	at	5.67 ft	=	-0.034	L/D =	4007	
Live load (in)	at	5.67 ft	=	-0.031	L/D =	4355 > 360	0.08
Net Total load (in)	at	5.67 ft	=	-0.065	L/D =	2087 > 240	0.12

PRCNC20221036

Floor Type: Roof **Beam Number = 236**

SPAN INFORMATION (ft): I-End (238.42,135.17) J-End (238.42,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.233	0.000	---	Snow	0.000
	11.333	0.233	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	11.333	0.000	0.225			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	11.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.70 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	10.5	5.7	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	10.5	5.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.39	1.39
Max +LL reaction	1.27	1.27
Max +total reaction (factored)	3.70	3.70

DEFLECTIONS:

						Ratio
Dead load (in)	at 5.67 ft	=	-0.058	L/D = 2337		
Live load (in)	at 5.67 ft	=	-0.054	L/D = 2541	> 360	0.14
Net Total load (in)	at 5.67 ft	=	-0.112	L/D = 1217	> 240	0.20

PRCNC20221036

Floor Type: Roof **Beam Number = 238**

SPAN INFORMATION (ft): I-End (230.92,118.17) J-End (230.92,135.17)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 17.00
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.136	0.000	---	Snow	0.000
	4.500	0.136	0.000			0.000
2	4.500	0.014	0.000	---	Snow	0.000
	17.000	0.014	0.000			0.000
3	0.000	0.000	0.131	---	Snow	0.000
	17.000	0.000	0.131			0.000
4	4.500	0.116	0.000	---	Snow	0.000
	17.000	0.116	0.000			0.000
5	0.000	0.014	0.000	---	NonR	0.000
	17.000	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.28 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	13.9	8.5	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	13.9	8.5	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	1.25	1.23
Max +LL reaction	1.12	1.12
Max +total reaction (factored)	3.28	3.27

DEFLECTIONS:

										Ratio
Dead load (in)	at	8.50 ft	=	-0.106	L/D	=	1916			
Live load (in)	at	8.50 ft	=	-0.096	L/D	=	2125	>	360	0.17
Net Total load (in)	at	8.50 ft	=	-0.202	L/D	=	1008	>	240	0.24

PRCNC20221036

Floor Type: Roof **Beam Number = 239**

SPAN INFORMATION (ft): I-End (238.42,118.17) J-End (238.42,135.17)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 17.00
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.233	0.000	---	Snow	0.000
	17.000	0.233	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	17.000	0.000	0.225			0.000
3	0.000	0.014	0.000	---	NonR	0.000
	17.000	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.58 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	23.7	8.5	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	23.7	8.5	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	2.10	2.10
Max +LL reaction	1.91	1.91
Max +total reaction (factored)	5.58	5.58

DEFLECTIONS:

										Ratio
Dead load (in)	at	8.50 ft	=	-0.180	L/D	=	1131			
Live load (in)	at	8.50 ft	=	-0.165	L/D	=	1240	>	360	0.29
Net Total load (in)	at	8.50 ft	=	-0.345	L/D	=	591	>	240	0.41

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 240**

SPAN INFORMATION (ft): I-End (193.42,118.17) J-End (193.42,146.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
23.667	1.59	0.00	0.0	0.00	0.00	0.0	0.10	Snow	0.00
23.667	1.48	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.233	0.000	---	Snow	0.000
	23.667	0.233	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	23.667	0.000	0.225			0.000
3	23.668	0.171	0.000	---	Snow	0.000
	28.333	0.171	0.000			0.000
4	23.668	0.000	0.165	---	Snow	0.000
	28.333	0.000	0.165			0.000
5	0.000	0.019	0.000	---	NonR	0.000
	28.333	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 11.92 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	74.9	15.0	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	74.9	15.0	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	4.04	5.87
Max +LL reaction	3.19	3.05
Max +total reaction (factored)	9.95	11.92

DEFLECTIONS: (Camber = 1)

						Ratio
Dead load (in)	at 14.59 ft	= -1.272	L/D =	267		
Live load (in)	at 14.45 ft	= -0.865	L/D =	393	> 360	0.92
Net Total load (in)	at 14.45 ft	= -1.136	L/D =	299	> 240	0.80

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 241**

SPAN INFORMATION (ft): I-End (200.92,118.17) J-End (200.92,146.50)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
23.667	1.19	0.00	0.0	0.00	0.00	0.0	0.16	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.116	0.000	---	Snow	0.000
	23.667	0.116	0.000			0.000
2	0.000	0.000	0.113	---	Snow	0.000
	23.667	0.000	0.113			0.000
3	23.668	0.046	0.000	---	Snow	0.000
	28.333	0.046	0.000			0.000
4	23.668	0.000	0.045	---	Snow	0.000
	28.333	0.000	0.045			0.000
5	0.000	0.126	0.000	---	Snow	0.000
	28.333	0.127	0.000			0.000
6	0.000	0.000	0.122	---	Snow	0.000
	28.333	0.000	0.123			0.000
7	0.000	0.019	0.000	---	NonR	0.000
	28.333	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.35 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	72.1	14.5	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	72.1	14.5	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	3.87	4.40
Max +LL reaction	3.33	3.17
Max +total reaction (factored)	9.97	10.35

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 14.31 ft	= -1.112	L/D =	306		
Live load (in)	at 14.31 ft	= -0.903	L/D =	377	> 360	0.96
Net Total load (in)	at 14.31 ft	= -1.265	L/D =	269	> 240	0.89

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 243**

SPAN INFORMATION (ft): I-End (178.42,118.17) J-End (178.42,146.50)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
10.667	0.91	0.00	0.0	0.00	0.00	0.0	0.75	Snow	0.00
14.333	2.65	0.00	0.0	0.00	0.00	0.0	0.24	Snow	0.00
20.333	2.91	0.00	0.0	0.00	0.00	0.0	0.87	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.116	0.000	---	Snow	0.000
	10.666	0.116	0.000			0.000
2	0.000	0.000	0.112	---	Snow	0.000
	10.666	0.000	0.112			0.000
3	10.667	0.059	0.000	---	Snow	0.000
	28.333	0.059	0.000			0.000
4	10.667	0.000	0.058	---	Snow	0.000
	28.333	0.000	0.058			0.000
5	0.000	0.116	0.000	---	Snow	0.000
	28.333	0.116	0.000			0.000
6	0.000	0.000	0.112	---	Snow	0.000
	28.333	0.000	0.112			0.000
7	0.000	0.022	0.000	---	NonR	0.000
	28.333	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.71 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	112.7	14.3	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	112.7	14.3	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	6.00	6.69
Max +LL reaction	3.72	3.55
Max +total reaction (factored)	13.14	13.71

DEFLECTIONS: (Camber = 1)

						Ratio
Dead load (in)	at 14.31 ft	= -1.349	L/D =	252		
Live load (in)	at 14.31 ft	= -0.695	L/D =	489	> 360	0.74
Net Total load (in)	at 14.31 ft	= -1.044	L/D =	326	> 240	0.74

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 244**

SPAN INFORMATION (ft): I-End (165.71,96.76) J-End (173.13,69.07)

Beam Size (Optimum) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67
Mp (kip-ft) = 72.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
13.000	0.03								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.155	0.000	---	Snow	0.000
	28.666	0.155	0.000			0.000
2	0.000	0.000	0.150	---	Snow	0.000
	28.666	0.000	0.150			0.000
3	0.000	0.014	0.000	---	NonR	0.000
	28.666	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.37 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	45.7	14.3	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	45.7	14.3	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	2.44	2.44
Max +LL reaction	2.15	2.15
Max +total reaction (factored)	6.37	6.37

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 14.33 ft	= -1.010	L/D = 341			
Live load (in)	at 14.33 ft	= -0.887	L/D = 388	>	360	0.93
Net Total load (in)	at 14.33 ft	= -1.147	L/D = 300	>	240	0.80

PRCNC20221036

Floor Type: Roof **Beam Number = 247**

SPAN INFORMATION (ft): I-End (191.89,103.77) J-End (199.31,76.08)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67
Mp (kip-ft) = 138.33

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.210	0.000	---	Snow	0.000
	28.666	0.210	0.000			0.000
2	0.000	0.000	0.203	---	Snow	0.000
	28.666	0.000	0.203			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	28.666	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.65 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	62.0	14.3	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	62.0	14.3	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	3.32	3.32
Max +LL reaction	2.91	2.91
Max +total reaction (factored)	8.65	8.65

DEFLECTIONS:

					Ratio
Dead load (in)	at 14.33 ft	= -0.611	L/D = 563		
Live load (in)	at 14.33 ft	= -0.535	L/D = 643	> 360	0.56
Net Total load (in)	at 14.33 ft	= -1.146	L/D = 300	> 240	0.80

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 248**

SPAN INFORMATION (ft): I-End (198.43,105.52) J-End (205.85,77.83)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67
Mp (kip-ft) = 138.33

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.210	0.000	---	Snow	0.000
	28.666	0.210	0.000			0.000
2	0.000	0.000	0.203	---	Snow	0.000
	28.666	0.000	0.203			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	28.666	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.65 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	62.0	14.3	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	62.0	14.3	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	3.32	3.32
Max +LL reaction	2.91	2.91
Max +total reaction (factored)	8.65	8.65

DEFLECTIONS:

						Ratio
Dead load (in)	at 14.33 ft =	-0.611	L/D =	563		
Live load (in)	at 14.33 ft =	-0.535	L/D =	643	> 360	0.56
Net Total load (in)	at 14.33 ft =	-1.146	L/D =	300	> 240	0.80

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 249**

SPAN INFORMATION (ft): I-End (204.97,107.28) J-End (212.39,79.59)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67
Mp (kip-ft) = 138.33

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.210	0.000	---	Snow	0.000
	28.666	0.210	0.000			0.000
2	0.000	0.000	0.203	---	Snow	0.000
	28.666	0.000	0.203			0.000
3	0.000	0.022	0.000	---	NonR	0.000
	28.666	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.65 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	62.0	14.3	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	62.0	14.3	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	3.32	3.32
Max +LL reaction	2.91	2.91
Max +total reaction (factored)	8.65	8.65

DEFLECTIONS:

						Ratio
Dead load (in)	at 14.33 ft	= -0.611	L/D = 563			
Live load (in)	at 14.33 ft	= -0.535	L/D = 643	>	360	0.56
Net Total load (in)	at 14.33 ft	= -1.146	L/D = 300	>	240	0.80

PRCNC20221036

Floor Type: Roof **Beam Number = 265**

SPAN INFORMATION (ft): I-End (163.25,118.17) J-End (163.25,146.50)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
10.167	0.04								
10.667	0.85	0.00	0.0	0.00	0.00	0.0	0.70	Snow	0.00
14.333	2.94	0.00	0.0	0.00	0.00	0.0	0.08	Snow	0.00
20.333	1.35	0.00	0.0	0.00	0.00	0.0	0.57	Snow	0.00
20.333	0.04								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	14.334	0.350	0.000	---	Snow	0.000
	28.333	0.350	0.000			0.000
2	0.000	0.114	0.000	---	Snow	0.000
	28.333	0.114	0.000			0.000
3	0.000	0.000	0.110	---	Snow	0.000
	28.333	0.000	0.110			0.000
4	0.000	0.119	0.000	---	Snow	0.000
	10.666	0.119	0.000			0.000
5	0.000	0.000	0.115	---	Snow	0.000
	10.666	0.000	0.115			0.000
6	10.667	0.010	0.000	---	Snow	0.000
	20.333	0.010	0.000			0.000
7	10.667	0.000	0.010	---	Snow	0.000
	20.333	0.000	0.010			0.000
8	20.334	0.119	0.000	---	Snow	0.000
	28.333	0.119	0.000			0.000
9	20.334	0.000	0.115	---	Snow	0.000
	28.333	0.000	0.115			0.000
10	0.000	0.022	0.000	---	NonR	0.000
	28.333	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.81 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	118.9	14.3	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	118.9	14.3	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	6.75	9.55
Max +LL reaction	3.37	3.35

PRCNC20221036

	Left	Right
Max +total reaction (factored)	13.49	16.81

DEFLECTIONS: (Camber = 1-1/4)

										Ratio
Dead load (in)	at	14.59 ft	=	-1.616	L/D	=	210			
Live load (in)	at	14.45 ft	=	-0.595	L/D	=	572	>	360	0.63
Net Total load (in)	at	14.45 ft	=	-0.961	L/D	=	354	>	240	0.68

Floor Type: Roof **Beam Number = 266**

SPAN INFORMATION (ft): I-End (163.25,138.50) J-End (178.42,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.17
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.667	0.75	0.00	0.0	0.00	0.00	0.0	0.68	Snow	0.00
11.333	1.91	0.00	0.0	0.00	0.00	0.0	0.45	Snow	0.00
11.333	1.30	0.00	0.0	0.00	0.00	0.0	0.20	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	Snow	0.000
	11.333	0.010	0.000			0.000
2	0.000	0.000	0.010	---	Snow	0.000
	11.333	0.000	0.010			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	15.166	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.89 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	18.6	11.3	3.7	1.01	0.90	44.45
Controlling		1.2DL+1.6LL	18.6	11.3	3.7	1.01	0.90	44.45

REACTIONS (kips):

	Left	**Right**
DL reaction	1.35	2.91
Max +LL reaction	0.57	0.87
Max +total reaction (factored)	2.53	4.89

DEFLECTIONS:

									Ratio
Dead load (in)	at	8.19 ft	=	-0.257	L/D	=	707		
Live load (in)	at	8.11 ft	=	-0.098	L/D	=	1862	> 360	0.19
Net Total load (in)	at	8.11 ft	=	-0.355	L/D	=	512	> 240	0.47

PRCNC20221036

Floor Type: Roof **Beam Number = 267**

SPAN INFORMATION (ft): I-End (163.25,128.83) J-End (178.42,128.83)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.17
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.667	1.32	0.00	0.0	0.00	0.00	0.0	1.21	Snow	0.00
11.333	0.15	0.00	0.0	0.00	0.00	0.0	0.12	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	Snow	0.000
	11.333	0.010	0.000			0.000
2	0.000	0.000	0.010	---	Snow	0.000
	11.333	0.000	0.010			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	15.166	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.29 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	15.2	7.7	7.7	1.63	0.90	46.90
Controlling		1.2DL+1.6LL	15.2	7.7	7.7	1.63	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.85	0.91
Max +LL reaction	0.70	0.75
Max +total reaction (factored)	2.15	2.29

DEFLECTIONS:

									Ratio
Dead load (in)	at	7.66 ft	=	-0.130	L/D	=	1396		
Live load (in)	at	7.66 ft	=	-0.111	L/D	=	1638	> 360	0.22
Net Total load (in)	at	7.66 ft	=	-0.241	L/D	=	754	> 240	0.32

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 269**

SPAN INFORMATION (ft): I-End (170.92,138.50) J-End (170.92,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.176	0.000	---	Snow	0.000
	8.000	0.176	0.000			0.000
2	0.000	0.000	0.170	---	Snow	0.000
	8.000	0.000	0.170			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	8.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.99 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	4.0	4.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	4.0	4.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.75	0.75
Max +LL reaction	0.68	0.68
Max +total reaction (factored)	1.99	1.99

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.00 ft	=	-0.011	L/D	=	8658			
Live load (in)	at	4.00 ft	=	-0.010	L/D	=	9560	>	360	0.04
Net Total load (in)	at	4.00 ft	=	-0.021	L/D	=	4543	>	240	0.05

PRCNC20221036

Floor Type: Roof **Beam Number = 270**

SPAN INFORMATION (ft): I-End (170.92,118.17) J-End (170.92,128.83)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.67
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.235	0.000	---	Snow	0.000
	10.666	0.235	0.000			0.000
2	0.000	0.000	0.228	---	Snow	0.000
	10.666	0.000	0.228			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	10.666	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.52 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	9.4	5.3	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	9.4	5.3	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.32	1.32
Max +LL reaction	1.21	1.21
Max +total reaction (factored)	3.52	3.52

DEFLECTIONS:

										Ratio
Dead load (in)	at	5.33 ft	=	-0.046	L/D	=	2774			
Live load (in)	at	5.33 ft	=	-0.042	L/D	=	3014	>	360	0.12
Net Total load (in)	at	5.33 ft	=	-0.089	L/D	=	1445	>	240	0.17

PRCNC20221036

Floor Type: Roof **Beam Number = 271**

SPAN INFORMATION (ft): I-End (155.92,138.50) J-End (163.25,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	NonR	0.000
	7.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	0.1	3.7	7.3	1.14	0.90	35.39
Controlling		1.4DL	0.1	3.7	7.3	1.14	0.90	35.39

REACTIONS (kips):

	Left	**Right**
DL reaction	0.04	0.04
Max +total reaction (factored)	0.06	0.06

DEFLECTIONS: **Ratio**

Dead load (in)	at	3.67 ft	=	-0.001	
Live load (in)	at	3.67 ft	=	-0.000	
Net Total load (in)	at	3.67 ft	=	-0.001	

Gravity Beam Design

Floor Type: Roof **Beam Number = 272**

SPAN INFORMATION (ft): I-End (155.92,128.33) J-End (163.25,128.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	NonR	0.000
	7.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.1	3.7	7.3	1.14	0.90	35.39
Controlling		1.4DL	0.1	3.7	7.3	1.14	0.90	35.39

REACTIONS (kips):

	Left	**Right**
DL reaction	0.04	0.04
Max +total reaction (factored)	0.06	0.06

DEFLECTIONS: **Ratio**

Dead load (in)	at	3.67 ft	=	-0.001	
Live load (in)	at	3.67 ft	=	-0.000	
Net Total load (in)	at	3.67 ft	=	-0.001	

PRCNC20221036

Floor Type: Roof **Beam Number = 273**

SPAN INFORMATION (ft): I-End (159.97,118.17) J-End (165.71,96.76)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 22.16
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.339	0.078	0.000			0.000
2	1.340	0.078	0.000	---	Snow	0.000
	22.164	0.078	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.339	0.000	0.075			0.000
4	1.340	0.000	0.075	---	Snow	0.000
	22.164	0.000	0.075			0.000
5	0.000	0.061	0.000	---	Snow	0.000
	22.164	0.078	0.000			0.000
6	0.000	0.000	0.060	---	Snow	0.000
	22.164	0.000	0.075			0.000
7	0.000	0.014	0.000	---	NonR	0.000
	22.164	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.74 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	25.8	11.2	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	25.8	11.2	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	1.71	1.81
Max +LL reaction	1.50	1.60
Max +total reaction (factored)	4.44	4.74

DEFLECTIONS:

							Ratio
Dead load (in)	at 11.08 ft	=	-0.340	L/D =	782		
Live load (in)	at 11.08 ft	=	-0.300	L/D =	886	> 360	0.41
Net Total load (in)	at 11.08 ft	=	-0.640	L/D =	415	> 240	0.58

PRCNC20221036

Floor Type: Roof **Beam Number = 274**

SPAN INFORMATION (ft): I-End (188.03,118.17) J-End (191.89,103.77)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 14.90
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
10.069	0.71	0.00	0.0	0.00	0.00	0.0	0.58	Snow	0.00
10.069	0.05	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.814	0.105	0.000			0.000
2	1.815	0.105	0.000	---	Snow	0.000
	10.054	0.105	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.814	0.000	0.101			0.000
4	1.815	0.000	0.102	---	Snow	0.000
	10.054	0.000	0.102			0.000
5	10.069	0.057	0.000	---	Snow	0.000
	14.902	0.057	0.000			0.000
6	10.069	0.000	0.055	---	Snow	0.000
	14.902	0.000	0.055			0.000
7	0.000	0.105	0.000	---	Snow	0.000
	10.069	0.105	0.000			0.000
8	0.000	0.000	0.102	---	Snow	0.000
	10.069	0.000	0.102			0.000
9	10.069	0.021	0.000	---	Snow	0.000
	14.902	0.021	0.000			0.000
10	10.069	0.000	0.020	---	Snow	0.000
	14.902	0.000	0.020			0.000
11	0.000	0.012	0.000	---	NonR	0.000
	14.902	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.48 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	18.9	8.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	18.9	8.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.70	1.63
Max +LL reaction	1.52	1.40
Max +total reaction (factored)	4.48	4.20

PRCNC20221036

DEFLECTIONS:

											Ratio
Dead load (in)	at	7.53 ft	=	-0.183	L/D	=	975				
Live load (in)	at	7.53 ft	=	-0.161	L/D	=	1108	>	360		0.32
Net Total load (in)	at	7.53 ft	=	-0.345	L/D	=	519	>	240		0.46

PRCNC20221036

Floor Type: Roof **Beam Number = 275**

SPAN INFORMATION (ft): I-End (202.05,118.17) J-End (204.97,107.28)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.27
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.412	0.05	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00
6.412	0.71	0.00	0.0	0.00	0.00	0.0	0.58	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.814	0.105	0.000			0.000
2	1.815	0.105	0.000	---	Snow	0.000
	6.411	0.105	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.814	0.000	0.101			0.000
4	1.815	0.000	0.102	---	Snow	0.000
	6.411	0.000	0.102			0.000
5	6.412	0.013	0.000	---	Snow	0.000
	11.273	0.013	0.000			0.000
6	6.412	0.000	0.012	---	Snow	0.000
	11.273	0.000	0.013			0.000
7	0.000	0.105	0.000	---	Snow	0.000
	6.411	0.105	0.000			0.000
8	0.000	0.000	0.102	---	Snow	0.000
	6.411	0.000	0.102			0.000
9	6.420	0.060	0.000	---	Snow	0.000
	11.273	0.060	0.000			0.000
10	6.420	0.000	0.058	---	Snow	0.000
	11.273	0.000	0.058			0.000
11	0.000	0.012	0.000	---	NonR	0.000
	11.273	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.51 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	11.9	6.4	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	11.9	6.4	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.34	1.16
Max +LL reaction	1.18	0.98
Max +total reaction (factored)	3.51	2.96

PRCNC20221036

DEFLECTIONS:

											Ratio
Dead load (in)	at	5.64 ft	=	-0.063	L/D	=	2143				
Live load (in)	at	5.64 ft	=	-0.055	L/D	=	2482	>	360		0.15
Net Total load (in)	at	5.64 ft	=	-0.118	L/D	=	1150	>	240		0.21

Gravity Beam Design

Floor Type: Roof **Beam Number = 276**

SPAN INFORMATION (ft): I-End (184.10,106.69) J-End (190.64,108.44)

Beam Size (Optimum) = C4X5.4 Fy = 50.0 ksi
Total Beam Length (ft) = 6.77
Mp (kip-ft) = 9.54

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	Snow	0.000
	6.770	0.010	0.000			0.000
2	0.000	0.000	0.010	---	Snow	0.000
	6.770	0.000	0.010			0.000
3	0.000	0.005	0.000	---	NonR	0.000
	6.770	0.005	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.12 kips 0.90Vn = 19.87 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.2	3.4	6.8	1.14	0.90	6.53
Controlling		1.2DL+1.6LL	0.2	3.4	6.8	1.14	0.90	6.53

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.12	0.12

DEFLECTIONS:

								Ratio
Dead load (in)	at	3.39 ft	=	-0.007	L/D	=	1221 1	
Live load (in)	at	3.39 ft	=	-0.004	L/D	=	1918 > 360 3	0.02
Net Total load (in)	at	3.39 ft	=	-0.011	L/D	=	7462 > 240	0.03

PRCNC20221036

Floor Type: Roof **Beam Number = 277**

SPAN INFORMATION (ft): I-End (190.64,108.44) J-End (203.71,111.97)

Beam Size (Optimum) = W8X10 Fy = 50.0 ksi
Total Beam Length (ft) = 13.54
Mp (kip-ft) = 36.96

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.650	0.15	0.00	0.0	0.00	0.00	0.0	0.13	Snow	0.00
6.771	0.91	0.00	0.0	0.00	0.00	0.0	0.83	Snow	0.00
9.665	0.16	0.00	0.0	0.00	0.00	0.0	0.14	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	3.651	0.010	0.000	---	Snow	0.000
	9.664	0.010	0.000			0.000
2	3.651	0.000	0.010	---	Snow	0.000
	9.664	0.000	0.010			0.000
3	0.000	0.010	0.000	---	NonR	0.000
	13.541	0.010	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.78 kips 1.00Vn = 40.24 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	10.4	6.8	3.1	1.18	0.90	32.87
Controlling		1.2DL+1.6LL	10.4	6.8	3.1	1.18	0.90	32.87

REACTIONS (kips):

	Left	**Right**
DL reaction	0.71	0.71
Max +LL reaction	0.58	0.58
Max +total reaction (factored)	1.78	1.78

DEFLECTIONS:

								Ratio
Dead load (in)	at	6.77 ft	=	-0.128	L/D =	1270		
Live load (in)	at	6.77 ft	=	-0.109	L/D =	1492	> 360	0.24
Net Total load (in)	at	6.77 ft	=	-0.237	L/D =	686	> 240	0.35

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 278**

SPAN INFORMATION (ft): I-End (203.71,111.97) J-End (210.26,113.70)

Beam Size (Optimum) = C4X5.4 Fy = 50.0 ksi
Total Beam Length (ft) = 6.77
Mp (kip-ft) = 9.54

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	Snow	0.000
	6.770	0.010	0.000			0.000
2	0.000	0.000	0.010	---	Snow	0.000
	6.770	0.000	0.010			0.000
3	0.000	0.005	0.000	---	NonR	0.000
	6.770	0.005	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.12 kips 0.90Vn = 19.87 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.2	3.4	6.8	1.14	0.90	6.53
Controlling		1.2DL+1.6LL	0.2	3.4	6.8	1.14	0.90	6.53

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.12	0.12

DEFLECTIONS:

								Ratio
Dead load (in)	at	3.39 ft	=	-0.007	L/D =	1221 1		
Live load (in)	at	3.39 ft	=	-0.004	L/D =	1918 3	> 360	0.02
Net Total load (in)	at	3.39 ft	=	-0.011	L/D =	7461	> 240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 279**

SPAN INFORMATION (ft): I-End (195.04,118.17) J-End (197.17,110.21)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.24
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.814	0.105	0.000			0.000
2	1.815	0.105	0.000	---	Snow	0.000
	8.226	0.105	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.814	0.000	0.101			0.000
4	1.815	0.000	0.102	---	Snow	0.000
	8.226	0.000	0.102			0.000
5	0.000	0.105	0.000	---	Snow	0.000
	8.240	0.105	0.000			0.000
6	0.000	0.000	0.102	---	Snow	0.000
	8.240	0.000	0.102			0.000
7	0.000	0.012	0.000	---	NonR	0.000
	8.240	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.41 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	4.9	4.2	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	4.9	4.2	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.83	0.91
Max +LL reaction	0.75	0.83
Max +total reaction (factored)	2.19	2.41

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.12 ft	=	-0.014	L/D	=	6823			
Live load (in)	at	4.12 ft	=	-0.013	L/D	=	7464	>	360	0.05
Net Total load (in)	at	4.12 ft	=	-0.028	L/D	=	3565	>	240	0.07

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 281**

SPAN INFORMATION (ft): I-End (194.16,109.39) J-End (195.41,104.72)

Beam Size (Optimum) = C4X5.4 Fy = 36.0 ksi
Total Beam Length (ft) = 4.84
Mp (kip-ft) = 6.87

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.008	0.057	0.000	---	Snow	0.000
	4.841	0.057	0.000			0.000
2	0.008	0.000	0.055	---	Snow	0.000
	4.841	0.000	0.055			0.000
3	0.000	0.005	0.000	---	NonR	0.000
	4.841	0.005	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.39 kips 0.90Vn = 14.31 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	0.5	2.4	0.0	1.00	0.90	6.18
Controlling		1.2DL+1.6LL	0.5	2.4	0.0	1.00	0.90	6.18

REACTIONS (kips):

	Left	**Right**
DL reaction	0.15	0.15
Max +LL reaction	0.13	0.13
Max +total reaction (factored)	0.39	0.39

DEFLECTIONS:

											Ratio
Dead load (in)	at	2.42 ft	=	-0.007	L/D	=	8476				
Live load (in)	at	2.42 ft	=	-0.006	L/D	=	9591	>	360		0.04
Net Total load (in)	at	2.42 ft	=	-0.013	L/D	=	4500	>	240		0.05

PRCNC20221036

Floor Type: Roof **Beam Number = 282**

SPAN INFORMATION (ft): I-End (199.97,110.96) J-End (201.21,106.27)

Beam Size (Optimum) = C4X5.4 Fy = 36.0 ksi
Total Beam Length (ft) = 4.85
Mp (kip-ft) = 6.87

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.060	0.000	---	Snow	0.000
	4.853	0.060	0.000			0.000
2	0.000	0.000	0.058	---	Snow	0.000
	4.853	0.000	0.058			0.000
3	0.000	0.005	0.000	---	NonR	0.000
	4.853	0.005	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.42 kips 0.90Vn = 14.31 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.5	2.4	0.0	1.00	0.90	6.18
Controlling		1.2DL+1.6LL	0.5	2.4	0.0	1.00	0.90	6.18

REACTIONS (kips):

	Left	**Right**
DL reaction	0.16	0.16
Max +LL reaction	0.14	0.14
Max +total reaction (factored)	0.42	0.42

DEFLECTIONS:

							Ratio
Dead load (in)	at	2.43 ft	=	-0.007	L/D = 7935		
Live load (in)	at	2.43 ft	=	-0.007	L/D = 8932	> 360	0.04
Net Total load (in)	at	2.43 ft	=	-0.014	L/D = 4202	> 240	0.06

Gravity Beam Design

Floor Type: Roof **Beam Number = 283**

SPAN INFORMATION (ft): I-End (238.42,161.50) J-End (245.92,161.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.1	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	0.1	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +total reaction (factored)	0.06	0.06

DEFLECTIONS: **Ratio**

Dead load (in)	at	3.75 ft	=	-0.001
Live load (in)	at	3.75 ft	=	-0.000
Net Total load (in)	at	3.75 ft	=	-0.001

Gravity Beam Design

Floor Type: Roof **Beam Number = 284**

SPAN INFORMATION (ft): I-End (110.92,161.50) J-End (118.42,161.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.240	0.000	---	NonR	0.000
	7.500	0.240	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.32 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	2.5	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	2.5	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.95	0.95
Max +total reaction (factored)	1.32	1.32

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.75 ft	=	-0.012	L/D	=	7826		
Live load (in)	at	3.75 ft	=	-0.000					
Net Total load (in)	at	3.75 ft	=	-0.012	L/D	=	7826	> 240	0.03

Floor Type: Roof **Beam Number = 285**

SPAN INFORMATION (ft): I-End (118.42,161.50) J-End (125.92,161.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.240	0.000	---	NonR	0.000
	7.500	0.240	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.32 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	2.5	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	2.5	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.95	0.95
Max +total reaction (factored)	1.32	1.32

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.75 ft	=	-0.012	L/D	=	7825		
Live load (in)	at	3.75 ft	=	-0.000					
Net Total load (in)	at	3.75 ft	=	-0.012	L/D	=	7825	> 240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 286**

SPAN INFORMATION (ft): I-End (125.92,161.50) J-End (133.42,161.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.240	0.000	---	NonR	0.000
	7.500	0.240	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.32 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	2.5	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	2.5	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.95	0.95
Max +total reaction (factored)	1.32	1.32

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.75 ft	=	-0.012	L/D	=	7826		
Live load (in)	at	3.75 ft	=	-0.000					
Net Total load (in)	at	3.75 ft	=	-0.012	L/D	=	7826	> 240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 287**

SPAN INFORMATION (ft): I-End (133.42,161.50) J-End (140.92,161.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.240	0.000	---	NonR	0.000
	7.500	0.240	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.32 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	2.5	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	2.5	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.95	0.95
Max +total reaction (factored)	1.32	1.32

DEFLECTIONS:

									Ratio
Dead load (in)	at 3.75 ft	=	-0.012	L/D	=	7825			
Live load (in)	at 3.75 ft	=	-0.000						
Net Total load (in)	at 3.75 ft	=	-0.012	L/D	=	7825	>	240	0.03

PRCNC20221036

Floor Type: Roof **Beam Number = 288**

SPAN INFORMATION (ft): I-End (185.92,118.17) J-End (245.92,118.17)

Beam Size (User Selected) = W30X116 Fy = 50.0 ksi
Total Beam Length (ft) = 60.00
Mp (kip-ft) = 1575.0
0

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
2.117	1.70	0.00	0.0	0.00	0.00	0.0	1.52	Snow	0.00
7.500	4.04	0.00	0.0	0.00	0.00	0.0	3.19	Snow	0.00
9.127	0.83	0.00	0.0	0.00	0.00	0.0	0.75	Snow	0.00
15.000	3.87	0.00	0.0	0.00	0.00	0.0	3.33	Snow	0.00
16.137	1.34	0.00	0.0	0.00	0.00	0.0	1.18	Snow	0.00
23.146	3.73	0.00	0.0	0.00	0.00	0.0	3.19	Snow	0.00
23.146	0.97	0.00	0.0	0.00	0.00	0.0	0.81	Snow	0.00
30.000	1.14	0.00	0.0	0.00	0.00	0.0	1.00	Snow	0.00
30.738	4.47	0.00	0.0	0.00	0.00	0.0	3.87	Snow	0.00
31.000	4.93	0.00	0.0	0.00	0.00	0.0	1.30	Snow	0.00
37.500	0.33	0.00	0.0	0.00	0.00	0.0	0.30	Snow	0.00
38.330	4.22	0.00	0.0	0.00	0.00	0.0	3.66	Snow	0.00
43.750	4.95	0.00	0.0	0.00	0.00	0.0	1.33	Snow	0.00
45.000	1.25	0.00	0.0	0.00	0.00	0.0	1.12	Snow	0.00
45.922	3.83	0.00	0.0	0.00	0.00	0.0	3.35	Snow	0.00
52.500	2.10	0.00	0.0	0.00	0.00	0.0	1.91	Snow	0.00
52.910	2.33	0.00	0.0	0.00	0.00	0.0	2.08	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.019	0.000	---	Snow	0.000
	2.117	0.027	0.000			0.000
2	0.000	0.000	0.018	---	Snow	0.000
	2.117	0.000	0.026			0.000
3	2.118	0.000	0.000	---	Snow	0.000
	9.126	0.027	0.000			0.000
4	2.118	0.000	0.000	---	Snow	0.000
	9.126	0.000	0.026			0.000
5	9.127	0.000	0.000	---	Snow	0.000
	16.136	0.027	0.000			0.000
6	9.127	0.000	0.000	---	Snow	0.000
	16.136	0.000	0.026			0.000
7	16.137	0.000	0.000	---	Snow	0.000
	23.146	0.027	0.000			0.000
8	16.137	0.000	0.000	---	Snow	0.000
	23.146	0.000	0.026			0.000
9	23.147	0.000	0.000	---	Snow	0.000
	30.738	0.029	0.000			0.000

PRCNC20221036

Load	Dist	DL	LL	Red%	Type	PartL
10	23.147	0.000	0.000	---	Snow	0.000
	30.738	0.000	0.028			0.000
11	30.739	0.000	0.000	---	Snow	0.000
	38.329	0.029	0.000			0.000
12	30.739	0.000	0.000	---	Snow	0.000
	38.329	0.000	0.028			0.000
13	38.330	0.000	0.000	---	Snow	0.000
	45.921	0.029	0.000			0.000
14	38.330	0.000	0.000	---	Snow	0.000
	45.921	0.000	0.028			0.000
15	45.922	0.000	0.000	---	Snow	0.000
	52.909	0.027	0.000			0.000
16	45.922	0.000	0.000	---	Snow	0.000
	52.909	0.000	0.026			0.000
17	52.910	0.000	0.000	---	Snow	0.000
	60.000	0.027	0.000			0.000
18	52.910	0.000	0.000	---	Snow	0.000
	60.000	0.000	0.027			0.000
19	0.000	0.116	0.000	---	NonR	0.000
	60.000	0.116	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 60.53 kips 1.00Vn = 508.50 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	1042.6	30.7	0.0	1.00	0.90	1417.50
Controlling		1.2DL+1.6LL	1042.6	30.7	0.0	1.00	0.90	1417.50

REACTIONS (kips):

	Left	**Right**
DL reaction	26.45	27.45
Max +LL reaction	17.48	17.25
Max +total reaction (factored)	59.71	60.53

DEFLECTIONS: (Camber = 1-1/2)

								Ratio
Dead load (in)	at 30.30 ft	=	-2.074	L/D	=	347		
Live load (in)	at 30.30 ft	=	-1.311	L/D	=	549	> 360	0.66
Net Total load (in)	at 30.30 ft	=	-1.885	L/D	=	382	> 240	0.63

Floor Type: Roof **Beam Number = 289**

SPAN INFORMATION (ft): I-End (215.92,118.17) J-End (215.92,135.17)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 17.00
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.106	0.000	---	Snow	0.000
	17.000	0.106	0.000			0.000
2	0.000	0.000	0.118	---	Snow	0.000
	17.000	0.000	0.118			0.000
3	0.000	0.015	0.000	---	Snow	0.000
	4.500	0.015	0.000			0.000
4	4.500	0.011	0.000	---	Snow	0.000
	17.000	0.011	0.000			0.000
5	0.000	0.014	0.000	---	NonR	0.000
	17.000	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.96 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	12.5	8.5	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	12.5	8.5	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	1.14	1.12
Max +LL reaction	1.00	1.00
Max +total reaction (factored)	2.96	2.95

DEFLECTIONS:

										Ratio
Dead load (in)	at	8.50 ft	=	-0.097	L/D	=	2106			
Live load (in)	at	8.50 ft	=	-0.086	L/D	=	2370	>	360	0.15
Net Total load (in)	at	8.50 ft	=	-0.183	L/D	=	1115	>	240	0.22

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 290**

SPAN INFORMATION (ft): I-End (216.65,118.17) J-End (226.01,83.24)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 36.16
Mp (kip-ft) = 184.17

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.964	0.114	0.000			0.000
2	1.965	0.114	0.000	---	Snow	0.000
	36.161	0.114	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.964	0.000	0.110			0.000
4	1.965	0.000	0.110	---	Snow	0.000
	36.161	0.000	0.110			0.000
5	0.000	0.114	0.000	---	Snow	0.000
	36.161	0.114	0.000			0.000
6	0.000	0.000	0.110	---	Snow	0.000
	36.161	0.000	0.110			0.000
7	0.000	0.026	0.000	---	NonR	0.000
	36.161	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 11.86 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	107.1	18.1	0.0	1.00	0.90	165.75
Controlling		1.2DL+1.6LL	107.1	18.1	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
DL reaction	4.47	4.58
Max +LL reaction	3.87	3.98
Max +total reaction (factored)	11.56	11.86

DEFLECTIONS: (Camber = 3/4)

						Ratio
Dead load (in)	at 18.08 ft	= -1.116	L/D =	389		
Live load (in)	at 18.08 ft	= -0.968	L/D =	448	> 360	0.80
Net Total load (in)	at 18.08 ft	= -1.334	L/D =	325	> 240	0.74

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 291**

SPAN INFORMATION (ft): I-End (224.25,118.17) J-End (233.10,85.14)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 34.20
Mp (kip-ft) = 184.17

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.964	0.114	0.000			0.000
2	1.965	0.114	0.000	---	Snow	0.000
	34.196	0.114	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.964	0.000	0.110			0.000
4	1.965	0.000	0.110	---	Snow	0.000
	34.196	0.000	0.110			0.000
5	0.000	0.114	0.000	---	Snow	0.000
	34.196	0.114	0.000			0.000
6	0.000	0.000	0.110	---	Snow	0.000
	34.196	0.000	0.110			0.000
7	0.000	0.026	0.000	---	NonR	0.000
	34.196	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 11.21 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	95.8	17.1	0.0	1.00	0.90	165.75
Controlling		1.2DL+1.6LL	95.8	17.1	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
DL reaction	4.22	4.33
Max +LL reaction	3.66	3.76
Max +total reaction (factored)	10.92	11.21

DEFLECTIONS:

							Ratio
Dead load (in)	at 17.10 ft	=	-0.892	L/D =	460		
Live load (in)	at 17.10 ft	=	-0.774	L/D =	530	> 360	0.68
Net Total load (in)	at 17.10 ft	=	-1.667	L/D =	246	> 240	0.97

PRCNC20221036

Floor Type: Roof **Beam Number = 292**

SPAN INFORMATION (ft): I-End (231.84,118.17) J-End (240.18,87.03)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 32.23
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
26.232	0.27	0.00	0.0	0.00	0.00	0.0	0.19	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.808	0.105	0.000			0.000
2	1.809	0.105	0.000	---	Snow	0.000
	26.231	0.105	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.808	0.000	0.101			0.000
4	1.809	0.000	0.101	---	Snow	0.000
	26.231	0.000	0.101			0.000
5	26.232	0.117	0.000	---	Snow	0.000
	32.231	0.092	0.000			0.000
6	26.232	0.000	0.113	---	Snow	0.000
	32.231	0.000	0.089			0.000
7	0.000	0.114	0.000	---	Snow	0.000
	32.231	0.114	0.000			0.000
8	0.000	0.000	0.110	---	Snow	0.000
	32.231	0.000	0.110			0.000
9	0.000	0.022	0.000	---	NonR	0.000
	32.231	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.59 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	83.2	16.3	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	83.2	16.3	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	3.83	4.09
Max +LL reaction	3.35	3.55
Max +total reaction (factored)	9.96	10.59

DEFLECTIONS: (Camber = 3/4)

					Ratio
Dead load (in)	at 16.12 ft =	-1.041	L/D = 371		
Live load (in)	at 16.12 ft =	-0.910	L/D = 425	> 360	0.85
Net Total load (in)	at 16.12 ft =	-1.201	L/D = 322	> PRCNC20221036	

Gravity Beam Design

Floor Type: Roof **Beam Number = 293**

SPAN INFORMATION (ft): I-End (238.63,92.83) J-End (245.92,94.78)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 7.55
Mp (kip-ft) = 72.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.750	2.01	0.00	0.0	0.00	0.00	0.0	1.78	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.014	0.000	---	NonR	0.000
	7.546	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.77 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	3.8	6.8	6.8	1.62	0.90	65.25
Controlling		1.2DL+1.6LL	3.8	6.8	6.8	1.62	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	0.27	1.85
Max +LL reaction	0.19	1.59
Max +total reaction (factored)	0.62	4.77

DEFLECTIONS:

									Ratio
Dead load (in)	at	4.26 ft	=	-0.004	L/D	=	2124 6		
Live load (in)	at	4.30 ft	=	-0.003	L/D	=	2645 6	> 360	0.01
Net Total load (in)	at	4.30 ft	=	-0.008	L/D	=	1178 4	> 240	0.02

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 294**

SPAN INFORMATION (ft): I-End (238.82,118.17) J-End (245.15,94.58)

Beam Size (Optimum) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 24.42
Mp (kip-ft) = 72.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	1.835	0.106	0.000			0.000
2	1.836	0.106	0.000	---	Snow	0.000
	24.423	0.012	0.000			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	1.835	0.000	0.103			0.000
4	1.836	0.000	0.103	---	Snow	0.000
	24.423	0.000	0.012			0.000
5	0.000	0.105	0.000	---	Snow	0.000
	24.423	0.105	0.000			0.000
6	0.000	0.000	0.101	---	Snow	0.000
	24.423	0.000	0.101			0.000
7	0.000	0.014	0.000	---	NonR	0.000
	24.423	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.12 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	35.6	11.6	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	35.6	11.6	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	2.33	2.01
Max +LL reaction	2.08	1.78
Max +total reaction (factored)	6.12	5.26

DEFLECTIONS:

						Ratio
Dead load (in)	at 12.09 ft	=	-0.565	L/D = 519		
Live load (in)	at 12.09 ft	=	-0.504	L/D = 581	> 360	0.62
Net Total load (in)	at 12.09 ft	=	-1.069	L/D = 274	> 240	0.88

PRCNC20221036

Floor Type: Roof **Beam Number = 295**

SPAN INFORMATION (ft): I-End (209.06,118.17) J-End (209.08,146.50)

Beam Size (User Selected) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 225.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.232	0.000	---	Snow	0.000
	28.333	0.232	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	28.333	0.000	0.225			0.000
3	0.000	0.031	0.000	---	NonR	0.000
	28.333	0.031	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.58 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	67.9	14.2	0.0	1.00	0.90	202.50
Controlling		1.2DL+1.6LL	67.9	14.2	0.0	1.00	0.90	202.50

REACTIONS (kips):

	Left	**Right**
DL reaction	3.73	3.73
Max +LL reaction	3.19	3.19
Max +total reaction (factored)	9.58	9.58

DEFLECTIONS:

					Ratio
Dead load (in)	at 14.17 ft =	-0.351	L/D = 967		
Live load (in)	at 14.17 ft =	-0.300	L/D = 1133	> 360	0.32
Net Total load (in)	at 14.17 ft =	-0.651	L/D = 522	> 240	0.46

PRCNC20221036

Floor Type: Roof **Beam Number = 296**

SPAN INFORMATION (ft): I-End (209.08,146.50) J-End (209.10,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 277.08

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.232	0.000	---	Snow	0.000
	30.000	0.232	0.000			0.000
2	0.000	0.000	0.225	---	Snow	0.000
	30.000	0.000	0.225			0.000
3	0.000	0.035	0.000	---	NonR	0.000
	30.000	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.22 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	76.6	15.0	0.0	1.00	0.90	249.38
Controlling		1.2DL+1.6LL	76.6	15.0	0.0	1.00	0.90	249.38

REACTIONS (kips):

	Left	**Right**
DL reaction	4.01	4.01
Max +LL reaction	3.37	3.37
Max +total reaction (factored)	10.22	10.22

DEFLECTIONS:

				Ratio
Dead load (in)	at 15.00 ft = -0.330	L/D = 1092		
Live load (in)	at 15.00 ft = -0.277	L/D = 1298	> 360	0.28
Net Total load (in)	at 15.00 ft = -0.607	L/D = 593	> 240	0.40

PRCNC20221036

Floor Type: Roof **Beam Number = 297**

SPAN INFORMATION (ft): I-End (59.83,121.58) J-End (59.83,135.17)

Beam Size (User Selected) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 13.58
Mp (kip-ft) = 102.92

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.111	0.000	---	Snow	0.000
	13.583	0.111	0.000			0.000
2	0.000	0.000	0.107	---	Snow	0.000
	13.583	0.000	0.107			0.000
3	0.000	0.019	0.000	---	NonR	0.000
	13.583	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.23 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	7.6	6.8	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	7.6	6.8	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	0.88	0.88
Max +LL reaction	0.73	0.73
Max +total reaction (factored)	2.23	2.23

DEFLECTIONS:

										Ratio
Dead load (in)	at	6.79 ft	=	-0.026	L/D	=	6170			
Live load (in)	at	6.79 ft	=	-0.022	L/D	=	7463	>	360	0.05
Net Total load (in)	at	6.79 ft	=	-0.048	L/D	=	3378	>	240	0.07

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 298**

SPAN INFORMATION (ft): I-End (216.92,146.50) J-End (216.92,176.50)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
11.000	0.59	0.00	0.0	0.00	0.00	0.0	0.60	Snow	0.00
15.000	2.97	0.00	0.0	0.00	0.00	0.0	0.79	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	15.000	0.320	0.000			0.000
2	0.000	0.011	0.000	---	Snow	0.000
	15.000	0.011	0.000			0.000
3	15.000	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
4	0.000	0.000	0.015	---	Snow	0.000
	30.000	0.000	0.015			0.000
5	0.000	0.075	0.000	---	Snow	0.000
	11.000	0.075	0.000			0.000
6	0.000	0.000	0.097	---	Snow	0.000
	11.000	0.000	0.097			0.000
7	11.000	0.012	0.000	---	Snow	0.000
	15.000	0.012	0.000			0.000
8	11.000	0.000	0.015	---	Snow	0.000
	15.000	0.000	0.015			0.000
9	15.000	0.000	0.097	---	Snow	0.000
	30.000	0.000	0.097			0.000
10	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 12.10 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	98.4	15.0	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	98.4	15.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	7.05	4.75
Max +LL reaction	2.28	2.16
Max +total reaction (factored)	12.10	9.16

DEFLECTIONS: **(Camber = 1)**

PRCNC20221036

Dead load (in)	at	14.55 ft	=	-1.444	L/D	=	249			
Live load (in)	at	14.70 ft	=	-0.526	L/D	=	685	>	360	0.53
Net Total load (in)	at	14.70 ft	=	-0.970	L/D	=	371	>	240	0.65

Gravity Beam Design

Floor Type: Roof **Beam Number = 299**

SPAN INFORMATION (ft): I-End (216.92,135.17) J-End (216.92,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	11.333	0.320	0.000			0.000
2	0.000	0.086	0.000	---	Snow	0.000
	11.333	0.086	0.000			0.000
3	0.000	0.000	0.112	---	Snow	0.000
	11.333	0.000	0.112			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	11.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.86 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	10.9	5.7	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	10.9	5.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	2.37	2.37
Max +LL reaction	0.64	0.64
Max +total reaction (factored)	3.86	3.86

DEFLECTIONS:

									Ratio
Dead load (in)	at	5.67 ft	=	-0.100	L/D	=	1367		
Live load (in)	at	5.67 ft	=	-0.027	L/D	=	5081	> 360	0.07
Net Total load (in)	at	5.67 ft	=	-0.126	L/D	=	1077	> 240	0.22

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 300**

SPAN INFORMATION (ft): I-End (216.92,118.17) J-End (216.92,135.17)

Beam Size (Optimum) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 17.00
Mp (kip-ft) = 72.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.167	2.28	0.00	0.0	0.00	0.00	0.0	0.15	Snow	0.00
4.750	0.13	0.00	0.0	0.00	0.00	0.0	0.08	Snow	0.00
8.500	0.49	0.00	0.0	0.00	0.00	0.0	0.48	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	3.167	0.320	0.000	---	Snow	0.000
	17.000	0.320	0.000			0.000
2	0.000	0.015	0.000	---	Snow	0.000
	4.500	0.015	0.000			0.000
3	4.500	0.011	0.000	---	Snow	0.000
	17.000	0.011	0.000			0.000
4	0.000	0.000	0.015	---	Snow	0.000
	17.000	0.000	0.015			0.000
5	0.000	0.101	0.000	---	Snow	0.000
	3.167	0.101	0.000			0.000
6	0.000	0.000	0.098	---	Snow	0.000
	3.167	0.000	0.098			0.000
7	3.167	0.198	0.000	---	Snow	0.000
	4.500	0.198	0.000			0.000
8	4.500	0.147	0.000	---	Snow	0.000
	4.750	0.147	0.000			0.000
9	3.167	0.000	0.191	---	Snow	0.000
	4.750	0.000	0.191			0.000
10	4.750	0.011	0.000	---	Snow	0.000
	8.500	0.011	0.000			0.000
11	4.750	0.000	0.015	---	Snow	0.000
	8.500	0.000	0.015			0.000
12	8.500	0.075	0.000	---	Snow	0.000
	17.000	0.075	0.000			0.000
13	8.500	0.000	0.097	---	Snow	0.000
	17.000	0.000	0.097			0.000
14	0.000	0.014	0.000	---	NonR	0.000
	17.000	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.00 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	33.3	8.5	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	33.3	8.5	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	4.93	4.14
Max +LL reaction	1.30	1.16
Max +total reaction (factored)	8.00	6.83

DEFLECTIONS:

											Ratio
Dead load (in)	at	8.33 ft	=	-0.408	L/D	=	501				
Live load (in)	at	8.33 ft	=	-0.112	L/D	=	1818	>	360		0.20
Net Total load (in)	at	8.33 ft	=	-0.520	L/D	=	392	>	240		0.61

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 301**

SPAN INFORMATION (ft): I-End (229.67,146.50) J-End (229.67,176.50)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
11.000	0.60	0.00	0.0	0.00	0.00	0.0	0.62	Snow	0.00
15.000	3.00	0.00	0.0	0.00	0.00	0.0	0.82	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	15.000	0.320	0.000			0.000
2	0.000	0.072	0.000	---	Snow	0.000
	11.000	0.072	0.000			0.000
3	0.000	0.000	0.094	---	Snow	0.000
	11.000	0.000	0.094			0.000
4	11.000	0.012	0.000	---	Snow	0.000
	15.000	0.012	0.000			0.000
5	11.000	0.000	0.015	---	Snow	0.000
	15.000	0.000	0.015			0.000
6	15.000	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
7	15.000	0.000	0.094	---	Snow	0.000
	30.000	0.000	0.094			0.000
8	0.000	0.014	0.000	---	Snow	0.000
	15.000	0.014	0.000			0.000
9	0.000	0.000	0.019	---	Snow	0.000
	30.000	0.000	0.019			0.000
10	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 12.20 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	99.6	15.0	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	99.6	15.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	7.08	4.78
Max +LL reaction	2.31	2.19
Max +total reaction (factored)	12.20	9.23

DEFLECTIONS: (Camber = 1)

PRCNC20221036

Dead load (in)	at 14.55 ft	=	-1.454	L/D	=	248			
Live load (in)	at 14.70 ft	=	-0.536	L/D	=	672	>	360	0.54
Net Total load (in)	at 14.70 ft	=	-0.990	L/D	=	364	>	240	0.66

Gravity Beam Design

Floor Type: Roof **Beam Number = 302**

SPAN INFORMATION (ft): I-End (229.67,135.17) J-End (229.67,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	11.333	0.320	0.000			0.000
2	0.000	0.086	0.000	---	Snow	0.000
	11.333	0.086	0.000			0.000
3	0.000	0.000	0.113	---	Snow	0.000
	11.333	0.000	0.113			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	11.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.86 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	10.9	5.7	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	10.9	5.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	2.37	2.37
Max +LL reaction	0.64	0.64
Max +total reaction (factored)	3.86	3.86

DEFLECTIONS:

										Ratio
Dead load (in)	at	5.67 ft	=	-0.100	L/D	=	1367			
Live load (in)	at	5.67 ft	=	-0.027	L/D	=	5081	>	360	0.07
Net Total load (in)	at	5.67 ft	=	-0.126	L/D	=	1077	>	240	0.22

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 303**

SPAN INFORMATION (ft): I-End (229.67,118.17) J-End (229.67,135.17)

Beam Size (Optimum) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 17.00
Mp (kip-ft) = 72.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.167	2.29	0.00	0.0	0.00	0.00	0.0	0.15	Snow	0.00
4.750	0.13	0.00	0.0	0.00	0.00	0.0	0.08	Snow	0.00
8.500	0.50	0.00	0.0	0.00	0.00	0.0	0.50	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	3.167	0.320	0.000	---	Snow	0.000
	17.000	0.320	0.000			0.000
2	0.000	0.097	0.000	---	Snow	0.000
	3.167	0.097	0.000			0.000
3	0.000	0.000	0.094	---	Snow	0.000
	3.167	0.000	0.094			0.000
4	3.167	0.198	0.000	---	Snow	0.000
	4.500	0.198	0.000			0.000
5	4.500	0.147	0.000	---	Snow	0.000
	4.750	0.147	0.000			0.000
6	3.167	0.000	0.191	---	Snow	0.000
	4.750	0.000	0.191			0.000
7	4.750	0.012	0.000	---	Snow	0.000
	8.500	0.012	0.000			0.000
8	4.750	0.000	0.015	---	Snow	0.000
	8.500	0.000	0.015			0.000
9	8.500	0.072	0.000	---	Snow	0.000
	17.000	0.072	0.000			0.000
10	8.500	0.000	0.094	---	Snow	0.000
	17.000	0.000	0.094			0.000
11	0.000	0.019	0.000	---	Snow	0.000
	4.500	0.019	0.000			0.000
12	4.500	0.014	0.000	---	Snow	0.000
	17.000	0.014	0.000			0.000
13	0.000	0.000	0.019	---	Snow	0.000
	17.000	0.000	0.019			0.000
14	0.000	0.014	0.000	---	NonR	0.000
	17.000	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.07 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

PRCNC20221036

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	33.7	8.5	0.0	1.00	0.90	65.25
Controlling		1.2DL+1.6LL	33.7	8.5	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	**Right**
DL reaction	4.95	4.16
Max +LL reaction	1.33	1.18
Max +total reaction (factored)	8.07	6.87

DEFLECTIONS:

											Ratio
Dead load (in)	at	8.33 ft	=	-0.410	L/D	=	498				
Live load (in)	at	8.33 ft	=	-0.115	L/D	=	1779	>	360		0.20
Net Total load (in)	at	8.33 ft	=	-0.524	L/D	=	389	>	240		0.62

PRCNC20221036

Floor Type: Roof **Beam Number = 304**

SPAN INFORMATION (ft): I-End (216.92,161.50) J-End (229.67,161.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 12.75
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	0.05	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00
6.500	1.57	0.00	0.0	0.00	0.00	0.0	1.43	Snow	0.00
11.750	0.05	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	12.750	0.320	0.000			0.000
2	1.000	0.006	0.000	---	Snow	0.000
	11.750	0.006	0.000			0.000
3	1.000	0.000	0.007	---	Snow	0.000
	11.750	0.000	0.007			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	12.750	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.91 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	21.9	6.5	5.5	1.36	0.90	46.90
Controlling		1.2DL+1.6LL	21.9	6.5	5.5	1.36	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	2.97	3.00
Max +LL reaction	0.79	0.82
Max +total reaction (factored)	4.82	4.91

DEFLECTIONS:

										Ratio
Dead load (in)	at	6.38 ft	=	-0.205	L/D	=	746			
Live load (in)	at	6.38 ft	=	-0.072	L/D	=	2115	>	360	0.17
Net Total load (in)	at	6.38 ft	=	-0.277	L/D	=	552	>	240	0.43

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 305**

SPAN INFORMATION (ft): I-End (216.92,157.50) J-End (229.67,157.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 12.75
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	0.05	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00
6.500	0.87	0.00	0.0	0.00	0.00	0.0	1.05	Snow	0.00
11.750	0.05	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	1.000	0.006	0.000	---	Snow	0.000
	11.750	0.006	0.000			0.000
2	1.000	0.000	0.007	---	Snow	0.000
	11.750	0.000	0.007			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	12.750	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.72 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	9.5	6.5	5.5	1.47	0.90	46.90
Controlling		1.2DL+1.6LL	9.5	6.5	5.5	1.47	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.59	0.60
Max +LL reaction	0.60	0.62
Max +total reaction (factored)	1.66	1.72

DEFLECTIONS:

							Ratio
Dead load (in)	at	6.44 ft	=	-0.050	L/D =	3087	
Live load (in)	at	6.44 ft	=	-0.054	L/D =	2831 > 360	0.13
Net Total load (in)	at	6.44 ft	=	-0.104	L/D =	1477 > 240	0.16

PRCNC20221036

Floor Type: Roof **Beam Number = 306**

SPAN INFORMATION (ft): I-End (223.42,161.50) J-End (223.42,176.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.198	0.000	---	Snow	0.000
	15.000	0.198	0.000			0.000
2	0.000	0.000	0.191	---	Snow	0.000
	15.000	0.000	0.191			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	15.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.18 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	15.7	7.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	15.7	7.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.57	1.57
Max +LL reaction	1.43	1.43
Max +total reaction (factored)	4.18	4.18

DEFLECTIONS:

									Ratio
Dead load (in)	at 7.50 ft	=	-0.153	L/D	=	1176			
Live load (in)	at 7.50 ft	=	-0.140	L/D	=	1289	>	360	0.28
Net Total load (in)	at 7.50 ft	=	-0.293	L/D	=	615	>	240	0.39

Floor Type: Roof **Beam Number = 307**

SPAN INFORMATION (ft): I-End (223.42,146.50) J-End (223.42,157.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.147	0.000	---	Snow	0.000
	11.000	0.147	0.000			0.000
2	0.000	0.000	0.191	---	Snow	0.000
	11.000	0.000	0.191			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	11.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.73 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	7.5	5.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	7.5	5.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.87	0.87
Max +LL reaction	1.05	1.05
Max +total reaction (factored)	2.73	2.73

DEFLECTIONS:

										Ratio
Dead load (in)	at	5.50 ft	=	-0.034	L/D	=	3940			
Live load (in)	at	5.50 ft	=	-0.040	L/D	=	3269	>	360	0.11
Net Total load (in)	at	5.50 ft	=	-0.074	L/D	=	1787	>	240	0.13

Floor Type: Roof **Beam Number = 308**

SPAN INFORMATION (ft): I-End (217.92,157.50) J-End (217.92,161.50)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 4.00
Mp (kip-ft) = 15.48

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	Snow	0.000
	4.000	0.012	0.000			0.000
2	0.000	0.000	0.015	---	Snow	0.000
	4.000	0.000	0.015			0.000
3	0.000	0.006	0.000	---	Snow	0.000
	4.000	0.006	0.000			0.000
4	0.000	0.000	0.007	---	Snow	0.000
	4.000	0.000	0.007			0.000
5	0.000	0.008	0.000	---	NonR	0.000
	4.000	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.13 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	0.1	2.0	0.0	1.00	0.90	13.93
Controlling		1.2DL+1.6LL	0.1	2.0	0.0	1.00	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +LL reaction	0.04	0.04
Max +total reaction (factored)	0.13	0.13

DEFLECTIONS: **Ratio**

Dead load (in)	at	2.00 ft	=	-0.000	
Live load (in)	at	2.00 ft	=	-0.000	
Net Total load (in)	at	2.00 ft	=	-0.001	

PRCNC20221036

Floor Type: Roof **Beam Number = 309**

SPAN INFORMATION (ft): I-End (228.67,157.50) J-End (228.67,161.50)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 4.00
Mp (kip-ft) = 15.48

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.006	0.000	---	Snow	0.000
	4.000	0.006	0.000			0.000
2	0.000	0.000	0.007	---	Snow	0.000
	4.000	0.000	0.007			0.000
3	0.000	0.012	0.000	---	Snow	0.000
	4.000	0.012	0.000			0.000
4	0.000	0.000	0.015	---	Snow	0.000
	4.000	0.000	0.015			0.000
5	0.000	0.008	0.000	---	NonR	0.000
	4.000	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.13 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	0.1	2.0	0.0	1.00	0.90	13.93
Controlling		1.2DL+1.6LL	0.1	2.0	0.0	1.00	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +LL reaction	0.04	0.04
Max +total reaction (factored)	0.13	0.13

DEFLECTIONS: **Ratio**

Dead load (in) at 2.00 ft = -0.000
Live load (in) at 2.00 ft = -0.000
Net Total load (in) at 2.00 ft = -0.001

PRCNC20221036

Floor Type: Roof **Beam Number = 312**

SPAN INFORMATION (ft): I-End (223.42,135.17) J-End (223.42,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.147	0.000	---	Snow	0.000
	11.333	0.147	0.000			0.000
2	0.000	0.000	0.191	---	Snow	0.000
	11.333	0.000	0.191			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	11.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.81 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	8.0	5.7	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	8.0	5.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.90	0.90
Max +LL reaction	1.08	1.08
Max +total reaction (factored)	2.81	2.81

DEFLECTIONS:

								Ratio
Dead load (in)	at	5.67 ft	=	-0.038	L/D =	3603		
Live load (in)	at	5.67 ft	=	-0.046	L/D =	2989	> 360	0.12
Net Total load (in)	at	5.67 ft	=	-0.083	L/D =	1634	> 240	0.15

PRCNC20221036

Floor Type: Roof **Beam Number = 313**

SPAN INFORMATION (ft): I-End (216.92,126.67) J-End (229.67,126.67)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 12.75
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	0.05	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00
6.500	0.67	0.00	0.0	0.00	0.00	0.0	0.81	Snow	0.00
11.750	0.05	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	1.000	0.006	0.000	---	Snow	0.000
	11.750	0.006	0.000			0.000
2	1.000	0.000	0.007	---	Snow	0.000
	11.750	0.000	0.007			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	12.750	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.39 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	7.5	6.5	5.5	1.46	0.90	46.90
Controlling		1.2DL+1.6LL	7.5	6.5	5.5	1.46	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.49	0.50
Max +LL reaction	0.48	0.50
Max +total reaction (factored)	1.35	1.39

DEFLECTIONS:

									Ratio
Dead load (in)	at	6.44 ft	=	-0.040	L/D	=	3824		
Live load (in)	at	6.44 ft	=	-0.043	L/D	=	3595 > 360		0.10
Net Total load (in)	at	6.44 ft	=	-0.083	L/D	=	1853 > 240		0.13

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 314**

SPAN INFORMATION (ft): I-End (216.92,121.33) J-End (229.67,121.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 12.75
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.500	0.33	0.00	0.0	0.00	0.00	0.0	0.30	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	12.750	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	12.750	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 3.20 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	10.9	6.5	6.5	1.33	0.90	45.28
Controlling		1.4DL	10.9	6.5	6.5	1.33	0.90	45.28

REACTIONS (kips):

	Left	**Right**
DL reaction	2.28	2.29
Max +LL reaction	0.15	0.15
Max +total reaction (factored)	3.19	3.20

DEFLECTIONS:

									Ratio
Dead load (in)	at	6.38 ft	=	-0.142	L/D	=	1074		
Live load (in)	at	6.38 ft	=	-0.014	L/D	=	1057 3	> 360	0.03
Net Total load (in)	at	6.38 ft	=	-0.157	L/D	=	975	> 240	0.25

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 315**

SPAN INFORMATION (ft): I-End (223.42,126.67) J-End (223.42,135.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.147	0.000	---	Snow	0.000
	8.500	0.147	0.000			0.000
2	0.000	0.000	0.191	---	Snow	0.000
	8.500	0.000	0.191			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	8.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.11 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	4.5	4.3	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	4.5	4.3	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.67	0.67
Max +LL reaction	0.81	0.81
Max +total reaction (factored)	2.11	2.11

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.25 ft	=	-0.012	L/D	=	8539			
Live load (in)	at	4.25 ft	=	-0.014	L/D	=	7085	>	360	0.05
Net Total load (in)	at	4.25 ft	=	-0.026	L/D	=	3872	>	240	0.06

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 316**

SPAN INFORMATION (ft): I-End (223.42,118.17) J-End (223.42,121.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 3.17
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.198	0.000	---	Snow	0.000
	3.167	0.198	0.000			0.000
2	0.000	0.000	0.191	---	Snow	0.000
	3.167	0.000	0.191			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	3.167	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.88 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.7	1.6	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	0.7	1.6	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.33	0.33
Max +LL reaction	0.30	0.30
Max +total reaction (factored)	0.88	0.88

DEFLECTIONS: **Ratio**

Dead load (in)	at	1.58 ft	=	-0.000	
Live load (in)	at	1.58 ft	=	-0.000	
Net Total load (in)	at	1.58 ft	=	-0.001	

PRCNC20221036

Floor Type: Roof **Beam Number = 319**

SPAN INFORMATION (ft): I-End (216.92,122.92) J-End (229.67,122.92)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 12.75
Mp (kip-ft) = 15.48

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	0.05	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00
11.750	0.05	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	1.000	0.006	0.000	---	Snow	0.000
	11.750	0.006	0.000			0.000
2	1.000	0.000	0.007	---	Snow	0.000
	11.750	0.000	0.007			0.000
3	0.000	0.008	0.000	---	NonR	0.000
	12.750	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.29 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	0.7	6.4	10.8	1.08	0.90	8.34
Controlling		1.2DL+1.6LL	0.7	6.4	10.8	1.08	0.90	8.34

REACTIONS (kips):

	Left	**Right**
DL reaction	0.13	0.13
Max +LL reaction	0.08	0.08
Max +total reaction (factored)	0.29	0.29

DEFLECTIONS:

										Ratio
Dead load (in)	at	6.38 ft	=	-0.026	L/D	=	5924			
Live load (in)	at	6.38 ft	=	-0.015	L/D	=	1002 6	>	360	0.04
Net Total load (in)	at	6.38 ft	=	-0.041	L/D	=	3724	>	240	0.06

Floor Type: Roof **Beam Number = 320**

SPAN INFORMATION (ft): I-End (217.92,122.92) J-End (217.92,126.67)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 3.75
Mp (kip-ft) = 15.48

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	Snow	0.000
	3.750	0.012	0.000			0.000
2	0.000	0.000	0.015	---	Snow	0.000
	3.750	0.000	0.015			0.000
3	0.000	0.006	0.000	---	Snow	0.000
	3.750	0.006	0.000			0.000
4	0.000	0.000	0.007	---	Snow	0.000
	3.750	0.000	0.007			0.000
5	0.000	0.008	0.000	---	NonR	0.000
	3.750	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.12 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	0.1	1.9	0.0	1.00	0.90	13.93
Controlling		1.2DL+1.6LL	0.1	1.9	0.0	1.00	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +LL reaction	0.04	0.04
Max +total reaction (factored)	0.12	0.12

DEFLECTIONS: **Ratio**

Dead load (in)	at	1.88 ft	=	-0.000	
Live load (in)	at	1.88 ft	=	-0.000	
Net Total load (in)	at	1.88 ft	=	-0.001	

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 321**

SPAN INFORMATION (ft): I-End (228.67,122.92) J-End (228.67,126.67)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 3.75
Mp (kip-ft) = 15.48

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.006	0.000	---	Snow	0.000
	3.750	0.006	0.000			0.000
2	0.000	0.000	0.007	---	Snow	0.000
	3.750	0.000	0.007			0.000
3	0.000	0.011	0.000	---	Snow	0.000
	3.750	0.011	0.000			0.000
4	0.000	0.000	0.015	---	Snow	0.000
	3.750	0.000	0.015			0.000
5	0.000	0.008	0.000	---	NonR	0.000
	3.750	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.12 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.1	1.9	0.0	1.00	0.90	13.93
Controlling		1.2DL+1.6LL	0.1	1.9	0.0	1.00	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +LL reaction	0.04	0.04
Max +total reaction (factored)	0.12	0.12

DEFLECTIONS: **Ratio**

Dead load (in)	at	1.88 ft	=	-0.000	
Live load (in)	at	1.88 ft	=	-0.000	
Net Total load (in)	at	1.88 ft	=	-0.001	

PRCNC20221036

Floor Type: Roof **Beam Number = 323**

SPAN INFORMATION (ft): I-End (140.92,138.50) J-End (148.42,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	7.500	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.74 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	3.3	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	3.3	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	1.25	1.25
Max +total reaction (factored)	1.74	1.74

DEFLECTIONS:

						Ratio
Dead load (in)	at	3.75 ft	=	-0.015	L/D = 5940	
Live load (in)	at	3.75 ft	=	-0.000		
Net Total load (in)	at	3.75 ft	=	-0.015	L/D = 5940 > 240	0.04

PRCNC20221036

Floor Type: Roof **Beam Number = 324**

SPAN INFORMATION (ft): I-End (148.42,138.50) J-End (155.92,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.333	0.23	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00
4.500	0.35	0.00	0.0	0.00	0.00	0.0	0.37	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	7.500	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.42 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	4.9	4.5	3.2	1.10	0.90	46.90
Controlling		1.2DL+1.6LL	4.9	4.5	3.2	1.10	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.57	1.50
Max +LL reaction	0.33	0.26
Max +total reaction (factored)	2.42	2.22

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.75 ft	=	-0.020	L/D	=	4613		
Live load (in)	at	3.79 ft	=	-0.005	L/D	=	1987 8	> 360	0.02
Net Total load (in)	at	3.79 ft	=	-0.024	L/D	=	3744	> 240	0.06

Floor Type: Roof **Beam Number = 325**

SPAN INFORMATION (ft): I-End (126.92,138.50) J-End (134.92,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	8.000	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	8.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.86 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	3.7	4.0	8.0	1.14	0.90	32.72
Controlling		1.4DL	3.7	4.0	8.0	1.14	0.90	32.72

REACTIONS (kips):

	Left	**Right**
DL reaction	1.33	1.33
Max +total reaction (factored)	1.86	1.86

DEFLECTIONS:

									Ratio
Dead load (in)	at	4.00 ft	=	-0.020	L/D	=	4895		
Live load (in)	at	4.00 ft	=	-0.000					
Net Total load (in)	at	4.00 ft	=	-0.020	L/D	=	4895	> 240	0.05

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Roof **Beam Number = 326**

SPAN INFORMATION (ft): I-End (115.58,118.17) J-End (115.58,146.50)

Beam Size (User Selected) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
8.083	1.17	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00
20.333	1.17	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	8.084	0.320	0.000	---	Snow	0.000
	20.333	0.320	0.000			0.000
2	0.000	0.160	0.000	---	Snow	0.000
	4.500	0.160	0.000			0.000
3	4.500	0.054	0.000	---	Snow	0.000
	28.333	0.054	0.000			0.000
4	0.000	0.000	0.070	---	Snow	0.000
	28.333	0.000	0.070			0.000
5	4.500	0.065	0.000	---	Snow	0.000
	8.083	0.065	0.000			0.000
6	0.000	0.000	0.085	---	Snow	0.000
	8.083	0.000	0.085			0.000
7	8.084	0.015	0.000	---	Snow	0.000
	20.333	0.015	0.000			0.000
8	8.084	0.000	0.020	---	Snow	0.000
	20.333	0.000	0.020			0.000
9	20.334	0.065	0.000	---	Snow	0.000
	28.333	0.065	0.000			0.000
10	20.334	0.000	0.085	---	Snow	0.000
	28.333	0.000	0.085			0.000
11	0.000	0.019	0.000	---	NonR	0.000
	28.333	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.15 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	70.8	14.1	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	70.8	14.1	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	4.94	4.80
Max +LL reaction	2.02	2.01
Max +total reaction (factored)	9.15	8.98

PRCNC20221036

DEFLECTIONS: (Camber = 1-1/4)											**Ratio**
Dead load (in)	at	14.17 ft	=	-1.584	L/D	=	215				
Live load (in)	at	14.17 ft	=	-0.509	L/D	=	668	>	360		0.54
Net Total load (in)	at	14.17 ft	=	-0.844	L/D	=	403	>	240		0.60

Gravity Beam Design

Floor Type: Roof **Beam Number = 327**

SPAN INFORMATION (ft): I-End (115.58,111.92) J-End (115.58,118.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.25
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.160	0.000	---	Snow	0.000
	6.250	0.160	0.000			0.000
2	0.000	0.000	0.155	---	Snow	0.000
	6.250	0.000	0.155			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	6.250	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.42 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	2.2	3.1	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	2.2	3.1	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.54	0.54
Max +LL reaction	0.48	0.48
Max +total reaction (factored)	1.42	1.42

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.12 ft	=	-0.004	L/D	=	1979 1		
Live load (in)	at	3.12 ft	=	-0.003	L/D	=	2198 9	> 360	0.02
Net Total load (in)	at	3.12 ft	=	-0.007	L/D	=	1041 6	> 240	0.02

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Roof **Beam Number = 329**

SPAN INFORMATION (ft): I-End (121.25,118.17) J-End (121.25,146.50)

Beam Size (User Selected) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 28.33
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
8.083	0.94								
8.083	1.17	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00
20.333	0.94								
20.333	1.17	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.176	0.000	---	Snow	0.000
	4.500	0.176	0.000			0.000
2	4.500	0.130	0.000	---	Snow	0.000
	8.083	0.130	0.000			0.000
3	0.000	0.000	0.085	---	Snow	0.000
	28.333	0.000	0.085			0.000
4	8.084	0.081	0.000	---	Snow	0.000
	20.333	0.081	0.000			0.000
5	8.084	0.000	0.020	---	Snow	0.000
	20.333	0.000	0.020			0.000
6	20.334	0.130	0.000	---	Snow	0.000
	28.333	0.130	0.000			0.000
7	20.334	0.000	0.085	---	Snow	0.000
	28.333	0.000	0.085			0.000
8	0.000	0.000	0.085	---	Snow	0.000
	8.083	0.000	0.085			0.000
9	0.000	0.019	0.000	---	NonR	0.000
	28.333	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.49 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	57.6	14.1	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	57.6	14.1	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	4.10	3.94
Max +LL reaction	2.23	2.23
Max +total reaction (factored)	8.49	8.29

DEFLECTIONS: (Camber = 3/4)

PRCNC20221036

Dead load (in)	at	14.17 ft	=	-1.160	L/D	=	293			
Live load (in)	at	14.17 ft	=	-0.567	L/D	=	600	>	360	0.60
Net Total load (in)	at	14.17 ft	=	-0.976	L/D	=	348	>	240	0.69

Gravity Beam Design

Floor Type: Roof **Beam Number = 330**

SPAN INFORMATION (ft): I-End (121.25,138.50) J-End (126.92,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.67
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	5.666	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	5.666	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.32 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	1.9	2.8	5.7	1.14	0.90	42.08
Controlling		1.4DL	1.9	2.8	5.7	1.14	0.90	42.08

REACTIONS (kips):

	Left	**Right**
DL reaction	0.94	0.94
Max +total reaction (factored)	1.32	1.32

DEFLECTIONS:

									Ratio
Dead load (in)	at	2.83 ft	=	-0.005	L/D	=	1377 2		
Live load (in)	at	2.83 ft	=	-0.000					
Net Total load (in)	at	2.83 ft	=	-0.005	L/D	=	1377 2	> 240	0.02

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 331**

SPAN INFORMATION (ft): I-End (115.58,138.50) J-End (121.25,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.67
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.333	0.23	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00
4.333	0.23	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	5.666	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	5.666	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.75 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	2.4	2.8	3.0	1.02	0.90	46.90
Controlling		1.2DL+1.6LL	2.4	2.8	3.0	1.02	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.17	1.17
Max +LL reaction	0.22	0.22
Max +total reaction (factored)	1.75	1.75

DEFLECTIONS:

										Ratio
Dead load (in)	at	2.83 ft	=	-0.006	L/D	=	1098 2			
Live load (in)	at	2.83 ft	=	-0.001	L/D	=	5704 5	>	360	0.01
Net Total load (in)	at	2.83 ft	=	-0.007	L/D	=	9209	>	240	0.03

PRCNC20221036

Floor Type: Roof **Beam Number = 332**

SPAN INFORMATION (ft): I-End (115.58,126.25) J-End (121.25,126.25)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.67
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.333	0.23	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00
4.333	0.23	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	5.666	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	5.666	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.75 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	2.4	2.8	3.0	1.02	0.90	46.90
Controlling		1.2DL+1.6LL	2.4	2.8	3.0	1.02	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.17	1.17
Max +LL reaction	0.22	0.22
Max +total reaction (factored)	1.75	1.75

DEFLECTIONS:

									Ratio
Dead load (in)	at	2.83 ft	=	-0.006	L/D	=	1098 2		
Live load (in)	at	2.83 ft	=	-0.001	L/D	=	5704 5	> 360	0.01
Net Total load (in)	at	2.83 ft	=	-0.007	L/D	=	9209	> 240	0.03

Gravity Beam Design

Floor Type: Roof **Beam Number = 333**

SPAN INFORMATION (ft): I-End (121.25,126.25) J-End (126.92,126.25)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.67
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	5.666	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	5.666	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.32 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	1.9	2.8	5.7	1.14	0.90	42.08
Controlling		1.4DL	1.9	2.8	5.7	1.14	0.90	42.08

REACTIONS (kips):

	Left	**Right**
DL reaction	0.94	0.94
Max +total reaction (factored)	1.32	1.32

DEFLECTIONS:

										Ratio
Dead load (in)	at	2.83 ft	=	-0.005	L/D	=	1377 2			
Live load (in)	at	2.83 ft	=	-0.000						
Net Total load (in)	at	2.83 ft	=	-0.005	L/D	=	1377 2	>	240	0.02

PRCNC20221036

Floor Type: Roof **Beam Number = 334**

SPAN INFORMATION (ft): I-End (126.92,126.25) J-End (134.92,126.25)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	8.000	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	8.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.86 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	3.7	4.0	8.0	1.14	0.90	32.72
Controlling		1.4DL	3.7	4.0	8.0	1.14	0.90	32.72

REACTIONS (kips):

	Left	**Right**
DL reaction	1.33	1.33
Max +total reaction (factored)	1.86	1.86

DEFLECTIONS:

									Ratio
Dead load (in)	at	4.00 ft	=	-0.020	L/D	=	4894		
Live load (in)	at	4.00 ft	=	-0.000					
Net Total load (in)	at	4.00 ft	=	-0.020	L/D	=	4894	> 240	0.05

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 335**

SPAN INFORMATION (ft): I-End (134.92,126.25) J-End (140.92,126.25)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	6.000	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	6.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.39 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	2.1	3.0	6.0	1.14	0.90	40.74
Controlling		1.4DL	2.1	3.0	6.0	1.14	0.90	40.74

REACTIONS (kips):

	Left	**Right**
DL reaction	1.00	1.00
Max +total reaction (factored)	1.39	1.39

DEFLECTIONS:

								Ratio
Dead load (in)	at	3.00 ft	=	-0.006	L/D	=	1160 2	
Live load (in)	at	3.00 ft	=	-0.000				
Net Total load (in)	at	3.00 ft	=	-0.006	L/D	=	1160 2 > 240	0.02

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 336**

SPAN INFORMATION (ft): I-End (140.92,126.25) J-End (148.42,126.25)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	7.500	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.74 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	3.3	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	3.3	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	1.25	1.25
Max +total reaction (factored)	1.74	1.74

DEFLECTIONS:

								Ratio
Dead load (in)	at 3.75 ft	=	-0.015	L/D	=	5940		
Live load (in)	at 3.75 ft	=	-0.000					
Net Total load (in)	at 3.75 ft	=	-0.015	L/D	=	5940	> 240	0.04

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 337**

SPAN INFORMATION (ft): I-End (148.42,126.25) J-End (155.92,126.25)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.333	0.23	0.00	0.0	0.00	0.00	0.0	0.22	Snow	0.00
4.500	0.35	0.00	0.0	0.00	0.00	0.0	0.37	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.320	0.000	---	Snow	0.000
	7.500	0.320	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.42 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	4.9	4.5	3.2	1.10	0.90	46.90
Controlling		1.2DL+1.6LL	4.9	4.5	3.2	1.10	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.57	1.50
Max +LL reaction	0.33	0.26
Max +total reaction (factored)	2.42	2.22

DEFLECTIONS:

										Ratio
Dead load (in)	at	3.75 ft	=	-0.020	L/D	=	4613			
Live load (in)	at	3.79 ft	=	-0.005	L/D	=	1987 8	>	360	0.02
Net Total load (in)	at	3.79 ft	=	-0.024	L/D	=	3744	>	240	0.06

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 338**

SPAN INFORMATION (ft): I-End (121.25,111.92) J-End (121.25,118.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.25
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.176	0.000	---	Snow	0.000
	6.250	0.176	0.000			0.000
2	0.000	0.000	0.170	---	Snow	0.000
	6.250	0.000	0.170			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	6.250	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.55 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	2.4	3.1	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	2.4	3.1	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.59	0.59
Max +LL reaction	0.53	0.53
Max +total reaction (factored)	1.55	1.55

DEFLECTIONS:

								Ratio
Dead load (in)	at	3.12 ft	=	-0.004	L/D	=	1815 7	
Live load (in)	at	3.12 ft	=	-0.004	L/D	=	2004 9 > 360	0.02
Net Total load (in)	at	3.12 ft	=	-0.008	L/D	=	9528 > 240	0.03

PRCNC20221036

Floor Type: Roof **Beam Number = 339**

SPAN INFORMATION (ft): I-End (116.92,126.25) J-End (116.92,138.50)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 12.25
Mp (kip-ft) = 15.48

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	0.02	0.00	0.0	0.00	0.00	0.0	0.01	Snow	0.00
11.250	0.02	0.00	0.0	0.00	0.00	0.0	0.01	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.015	0.000	---	Snow	0.000
	12.250	0.015	0.000			0.000
2	0.000	0.000	0.020	---	Snow	0.000
	12.250	0.000	0.020			0.000
3	0.000	0.034	0.000	---	Snow	0.000
	1.000	0.034	0.000			0.000
4	0.000	0.000	0.045	---	Snow	0.000
	1.000	0.000	0.045			0.000
5	1.000	0.006	0.000	---	Snow	0.000
	11.250	0.006	0.000			0.000
6	1.000	0.000	0.007	---	Snow	0.000
	11.250	0.000	0.007			0.000
7	11.250	0.034	0.000	---	Snow	0.000
	12.250	0.034	0.000			0.000
8	11.250	0.000	0.045	---	Snow	0.000
	12.250	0.000	0.045			0.000
9	0.000	0.008	0.000	---	NonR	0.000
	12.250	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.62 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	1.6	6.1	0.0	1.00	0.90	13.93
Controlling		1.2DL+1.6LL	1.6	6.1	0.0	1.00	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.23	0.23
Max +LL reaction	0.22	0.22
Max +total reaction (factored)	0.62	0.62

DEFLECTIONS:

						Ratio
Dead load (in)	at	6.12 ft	=	-0.042	L/D =	3505
Live load (in)	at	6.12 ft	=	-0.039	L/D =	3748 > PRCNC20221036

Net Total load (in)	at	6.12 ft	=	-0.081	L/D	=	1811	>	240	0.13

Gravity Beam Design

Floor Type: Roof **Beam Number = 340**

SPAN INFORMATION (ft): I-End (119.92,126.25) J-End (119.92,138.50)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 12.25
Mp (kip-ft) = 15.48

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	0.02	0.00	0.0	0.00	0.00	0.0	0.01	Snow	0.00
11.250	0.02	0.00	0.0	0.00	0.00	0.0	0.01	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.034	0.000	---	Snow	0.000
	1.000	0.034	0.000			0.000
2	0.000	0.000	0.045	---	Snow	0.000
	1.000	0.000	0.045			0.000
3	1.000	0.006	0.000	---	Snow	0.000
	11.250	0.006	0.000			0.000
4	1.000	0.000	0.007	---	Snow	0.000
	11.250	0.000	0.007			0.000
5	11.250	0.034	0.000	---	Snow	0.000
	12.250	0.034	0.000			0.000
6	11.250	0.000	0.045	---	Snow	0.000
	12.250	0.000	0.045			0.000
7	0.000	0.015	0.000	---	Snow	0.000
	12.250	0.015	0.000			0.000
8	0.000	0.000	0.020	---	Snow	0.000
	12.250	0.000	0.020			0.000
9	0.000	0.008	0.000	---	NonR	0.000
	12.250	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.62 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	1.6	6.1	0.0	1.00	0.90	13.93
Controlling		1.2DL+1.6LL	1.6	6.1	0.0	1.00	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.23	0.23
Max +LL reaction	0.22	0.22
Max +total reaction (factored)	0.62	0.62

DEFLECTIONS:

						Ratio
Dead load (in)	at	6.12 ft	=	-0.042	L/D =	3505
Live load (in)	at	6.12 ft	=	-0.039	L/D =	3748 > PRCNC20221036

Net Total load (in)	at	6.12 ft	=	-0.081	L/D	=	1811	>	240	0.13

Floor Type: Roof **Beam Number = 341**

SPAN INFORMATION (ft): I-End (149.75,126.25) J-End (149.75,138.50)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 12.25
Mp (kip-ft) = 15.48

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	0.02	0.00	0.0	0.00	0.00	0.0	0.01	Snow	0.00
11.250	0.02	0.00	0.0	0.00	0.00	0.0	0.01	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.015	0.000	---	Snow	0.000
	12.250	0.015	0.000			0.000
2	0.000	0.000	0.020	---	Snow	0.000
	12.250	0.000	0.020			0.000
3	0.000	0.036	0.000	---	Snow	0.000
	1.000	0.036	0.000			0.000
4	0.000	0.000	0.047	---	Snow	0.000
	1.000	0.000	0.047			0.000
5	1.000	0.006	0.000	---	Snow	0.000
	11.250	0.006	0.000			0.000
6	1.000	0.000	0.007	---	Snow	0.000
	11.250	0.000	0.007			0.000
7	11.250	0.036	0.000	---	Snow	0.000
	12.250	0.036	0.000			0.000
8	11.250	0.000	0.047	---	Snow	0.000
	12.250	0.000	0.047			0.000
9	0.000	0.008	0.000	---	NonR	0.000
	12.250	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.63 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	1.6	6.1	0.0	1.00	0.90	13.93
Controlling		1.2DL+1.6LL	1.6	6.1	0.0	1.00	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.23	0.23
Max +LL reaction	0.22	0.22
Max +total reaction (factored)	0.63	0.63

DEFLECTIONS: **Ratio**

Dead load (in)	at	6.12 ft	=	-0.042	L/D =	3490
Live load (in)	at	6.12 ft	=	-0.039	L/D =	3733 >

PRCNC20221036

Net Total load (in)	at	6.12 ft	=	-0.082	L/D	=	1804	> 240	0.13

Gravity Beam Design

Floor Type: Roof **Beam Number = 342**

SPAN INFORMATION (ft): I-End (152.92,126.25) J-End (152.92,138.50)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 12.25
Mp (kip-ft) = 15.48

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	0.02	0.00	0.0	0.00	0.00	0.0	0.01	Snow	0.00
11.250	0.02	0.00	0.0	0.00	0.00	0.0	0.01	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.036	0.000	---	Snow	0.000
	1.000	0.036	0.000			0.000
2	0.000	0.000	0.047	---	Snow	0.000
	1.000	0.000	0.047			0.000
3	1.000	0.006	0.000	---	Snow	0.000
	11.250	0.006	0.000			0.000
4	1.000	0.000	0.007	---	Snow	0.000
	11.250	0.000	0.007			0.000
5	11.250	0.036	0.000	---	Snow	0.000
	12.250	0.036	0.000			0.000
6	11.250	0.000	0.047	---	Snow	0.000
	12.250	0.000	0.047			0.000
7	0.000	0.035	0.000	---	Snow	0.000
	12.250	0.035	0.000			0.000
8	0.000	0.000	0.045	---	Snow	0.000
	12.250	0.000	0.045			0.000
9	0.000	0.008	0.000	---	NonR	0.000
	12.250	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.02 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	2.8	6.1	0.0	1.00	0.90	13.93
Controlling		1.2DL+1.6LL	2.8	6.1	0.0	1.00	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.35	0.35
Max +LL reaction	0.37	0.37
Max +total reaction (factored)	1.02	1.02

DEFLECTIONS:

					Ratio
Dead load (in)	at	6.12 ft	=	-0.068	L/D = 2172
Live load (in)	at	6.12 ft	=	-0.073	L/D = 2021 >

PRCNC20221036

Net Total load (in)	at	6.12 ft	=	-0.140	L/D	=	1047	>	240	0.23

Gravity Beam Design

Floor Type: Roof **Beam Number = 343**

SPAN INFORMATION (ft): I-End (149.75,127.25) J-End (152.92,127.25)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 3.17
Mp (kip-ft) = 15.48

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.006	0.000	---	Snow	0.000
	3.166	0.006	0.000			0.000
2	0.000	0.000	0.007	---	Snow	0.000
	3.166	0.000	0.007			0.000
3	0.000	0.008	0.000	---	NonR	0.000
	3.166	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.05 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	0.0	1.6	3.2	1.14	0.90	13.93
Controlling		1.2DL+1.6LL	0.0	1.6	3.2	1.14	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.02	0.02
Max +LL reaction	0.01	0.01
Max +total reaction (factored)	0.05	0.05

DEFLECTIONS: **Ratio**

Dead load (in)	at	1.58 ft	=	-0.000	
Live load (in)	at	1.58 ft	=	-0.000	
Net Total load (in)	at	1.58 ft	=	-0.000	

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 344**

SPAN INFORMATION (ft): I-End (149.75,137.50) J-End (152.92,137.50)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 3.17
Mp (kip-ft) = 15.48

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.006	0.000	---	Snow	0.000
	3.166	0.006	0.000			0.000
2	0.000	0.000	0.007	---	Snow	0.000
	3.166	0.000	0.007			0.000
3	0.000	0.008	0.000	---	NonR	0.000
	3.166	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.05 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.0	1.6	3.2	1.14	0.90	13.93
Controlling		1.2DL+1.6LL	0.0	1.6	3.2	1.14	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.02	0.02
Max +LL reaction	0.01	0.01
Max +total reaction (factored)	0.05	0.05

DEFLECTIONS: **Ratio**

Dead load (in)	at	1.58 ft	=	-0.000	
Live load (in)	at	1.58 ft	=	-0.000	
Net Total load (in)	at	1.58 ft	=	-0.000	

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 345**

SPAN INFORMATION (ft): I-End (116.92,137.50) J-End (119.92,137.50)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 3.00
Mp (kip-ft) = 15.48

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.006	0.000	---	Snow	0.000
	3.000	0.006	0.000			0.000
2	0.000	0.000	0.007	---	Snow	0.000
	3.000	0.000	0.007			0.000
3	0.000	0.008	0.000	---	NonR	0.000
	3.000	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.04 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.0	1.5	3.0	1.14	0.90	13.93
Controlling		1.2DL+1.6LL	0.0	1.5	3.0	1.14	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.02	0.02
Max +LL reaction	0.01	0.01
Max +total reaction (factored)	0.04	0.04

DEFLECTIONS: **Ratio**

Dead load (in)	at	1.50 ft	=	-0.000	
Live load (in)	at	1.50 ft	=	-0.000	
Net Total load (in)	at	1.50 ft	=	-0.000	

PRCNC20221036

Floor Type: Roof **Beam Number = 346**

SPAN INFORMATION (ft): I-End (116.92,127.25) J-End (119.92,127.25)

Beam Size (User Selected) = C6X8.2 Fy = 36.0 ksi
Total Beam Length (ft) = 3.00
Mp (kip-ft) = 15.48

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.006	0.000	---	Snow	0.000
	3.000	0.006	0.000			0.000
2	0.000	0.000	0.007	---	Snow	0.000
	3.000	0.000	0.007			0.000
3	0.000	0.008	0.000	---	NonR	0.000
	3.000	0.008	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.04 kips 0.90Vn = 23.33 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	0.0	1.5	3.0	1.14	0.90	13.93
Controlling		1.2DL+1.6LL	0.0	1.5	3.0	1.14	0.90	13.93

REACTIONS (kips):

	Left	**Right**
DL reaction	0.02	0.02
Max +LL reaction	0.01	0.01
Max +total reaction (factored)	0.04	0.04

DEFLECTIONS: **Ratio**

Dead load (in)	at	1.50 ft	=	-0.000	
Live load (in)	at	1.50 ft	=	-0.000	
Net Total load (in)	at	1.50 ft	=	-0.000	

PRCNC20221036

Floor Type: Roof **Beam Number = 347**

SPAN INFORMATION (ft): I-End (164.24,82.91) J-End (169.07,84.20)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	NonR	0.000
	5.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.04 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	0.1	2.5	5.0	1.14	0.90	44.75
Controlling		1.4DL	0.1	2.5	5.0	1.14	0.90	44.75

REACTIONS (kips):

	Left	**Right**
DL reaction	0.03	0.03
Max +total reaction (factored)	0.04	0.04

DEFLECTIONS: **Ratio**

Dead load (in) at 2.50 ft = -0.000
Live load (in) at 2.50 ft = -0.000
Net Total load (in) at 2.50 ft = -0.000

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 348**

SPAN INFORMATION (ft): I-End (41.92,161.50) J-End (49.42,161.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	0.1	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	0.1	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +total reaction (factored)	0.06	0.06

DEFLECTIONS: **Ratio**

Dead load (in) at 3.75 ft = -0.001
Live load (in) at 3.75 ft = -0.000
Net Total load (in) at 3.75 ft = -0.001

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 349**

SPAN INFORMATION (ft): I-End (170.92,168.33) J-End (178.42,168.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	0.1	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	0.1	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +total reaction (factored)	0.06	0.06

DEFLECTIONS: **Ratio**

Dead load (in)	at	3.75 ft	=	-0.001	
Live load (in)	at	3.75 ft	=	-0.000	
Net Total load (in)	at	3.75 ft	=	-0.001	

PRCNC20221036

Floor Type: Roof **Beam Number = 350**

SPAN INFORMATION (ft): I-End (178.42,168.33) J-End (185.92,168.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	0.1	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	0.1	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +total reaction (factored)	0.06	0.06

DEFLECTIONS: **Ratio**

Dead load (in)	at	3.75 ft	=	-0.001	
Live load (in)	at	3.75 ft	=	-0.000	
Net Total load (in)	at	3.75 ft	=	-0.001	

Floor Type: Roof **Beam Number = 351**

SPAN INFORMATION (ft): I-End (170.92,162.92) J-End (178.42,162.92)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	0.1	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	0.1	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +total reaction (factored)	0.06	0.06

DEFLECTIONS: **Ratio**

Dead load (in)	at	3.75 ft	=	-0.001	
Live load (in)	at	3.75 ft	=	-0.000	
Net Total load (in)	at	3.75 ft	=	-0.001	

Gravity Beam Design

Floor Type: Roof **Beam Number = 352**

SPAN INFORMATION (ft): I-End (178.42,162.92) J-End (185.92,162.92)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	0.1	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	0.1	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	0.05	0.05
Max +total reaction (factored)	0.06	0.06

DEFLECTIONS: **Ratio**

Dead load (in)	at	3.75 ft	=	-0.001	
Live load (in)	at	3.75 ft	=	-0.000	
Net Total load (in)	at	3.75 ft	=	-0.001	

Gravity Beam Design

Floor Type: Roof **Beam Number = 353**

SPAN INFORMATION (ft): I-End (186.92,146.50) J-End (186.92,176.50)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
20.500	1.18								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	20.500	0.350	0.000			0.000
2	0.000	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
3	0.000	0.000	0.113	---	Snow	0.000
	30.000	0.000	0.113			0.000
4	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 11.30 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	83.4	14.8	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	83.4	14.8	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	7.17	5.33
Max +LL reaction	1.69	1.69
Max +total reaction (factored)	11.30	9.10

DEFLECTIONS: (Camber = 1)

							Ratio
Dead load (in)	at 14.85 ft	=	-1.457	L/D =	247		
Live load (in)	at 14.85 ft	=	-0.355	L/D =	1013	> 360	0.36
Net Total load (in)	at 14.85 ft	=	-0.812	L/D =	443	> 240	0.54

PRCNC20221036

Floor Type: Roof **Beam Number = 354**

SPAN INFORMATION (ft): I-End (197.92,146.50) J-End (197.92,176.50)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 138.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
20.500	0.81								

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	20.500	0.350	0.000			0.000
2	0.000	0.116	0.000	---	Snow	0.000
	30.000	0.116	0.000			0.000
3	0.000	0.000	0.113	---	Snow	0.000
	30.000	0.000	0.113			0.000
4	0.000	0.022	0.000	---	NonR	0.000
	30.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 11.17 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	81.4	14.6	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	81.4	14.6	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	7.06	5.08
Max +LL reaction	1.69	1.69
Max +total reaction (factored)	11.17	8.80

DEFLECTIONS: (Camber = 1)

					Ratio
Dead load (in)	at 14.85 ft	= -1.407	L/D = 256		
Live load (in)	at 14.85 ft	= -0.355	L/D = 1013	> 360	0.36
Net Total load (in)	at 14.85 ft	= -0.762	L/D = 472	> 240	0.51

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 355**

SPAN INFORMATION (ft): I-End (186.92,167.00) J-End (193.42,167.00)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	6.500	0.350	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	6.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.65 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	2.7	3.3	6.5	1.14	0.90	38.74
Controlling		1.4DL	2.7	3.3	6.5	1.14	0.90	38.74

REACTIONS (kips):

	Left	**Right**
DL reaction	1.18	1.18
Max +total reaction (factored)	1.65	1.65

DEFLECTIONS:

						Ratio
Dead load (in)	at	3.25 ft	=	-0.009	L/D = 8369	
Live load (in)	at	3.25 ft	=	-0.000		
Net Total load (in)	at	3.25 ft	=	-0.009	L/D = 8369 > 240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 356**

SPAN INFORMATION (ft): I-End (193.42,167.00) J-End (197.92,167.00)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 4.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	4.500	0.350	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	4.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.14 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	1.3	2.3	4.5	1.14	0.90	46.76
Controlling		1.4DL	1.3	2.3	4.5	1.14	0.90	46.76

REACTIONS (kips):

	Left	**Right**
DL reaction	0.81	0.81
Max +total reaction (factored)	1.14	1.14

DEFLECTIONS:

										Ratio
Dead load (in)	at	2.25 ft	=	-0.002	L/D	=	2522 2			
Live load (in)	at	2.25 ft	=	-0.000						
Net Total load (in)	at	2.25 ft	=	-0.002	L/D	=	2522 2	>	240	0.01

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 357**

SPAN INFORMATION (ft): I-End (193.42,141.83) J-End (200.92,141.83)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
4.500	1.12	0.00	0.0	0.00	0.00	0.0	0.26	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	4.500	0.350	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 2.23 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	5.0	4.5	4.5	1.33	0.90	46.90
Controlling		1.2DL+1.6LL	5.0	4.5	4.5	1.33	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.59	1.19
Max +LL reaction	0.10	0.16
Max +total reaction (factored)	2.23	1.68

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.75 ft	=	-0.021	L/D	=	4227		
Live load (in)	at	3.79 ft	=	-0.002	L/D	=	3727 1	> 360	0.01
Net Total load (in)	at	3.79 ft	=	-0.024	L/D	=	3796	> 240	0.06

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 358**

SPAN INFORMATION (ft): I-End (185.92,141.83) J-End (193.42,141.83)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.000	1.12	0.00	0.0	0.00	0.00	0.0	0.26	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	1.000	0.350	0.000	---	Snow	0.000
	7.500	0.350	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 2.80 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	4.3	3.4	6.5	1.12	0.90	38.29
Controlling		1.4DL	4.3	3.4	6.5	1.12	0.90	38.29

REACTIONS (kips):

	Left	**Right**
DL reaction	2.00	1.48
Max +LL reaction	0.23	0.03
Max +total reaction (factored)	2.80	2.08

DEFLECTIONS:

								Ratio
Dead load (in)	at 3.68 ft	=	-0.020	L/D	=	4477		
Live load (in)	at 3.64 ft	=	-0.001	L/D	=	8945 0	> 360	0.00
Net Total load (in)	at 3.64 ft	=	-0.021	L/D	=	4264	> 240	0.06

PRCNC20221036

Floor Type: Roof **Beam Number = 359**

SPAN INFORMATION (ft): I-End (186.92,141.83) J-End (186.92,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 4.67
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	4.666	0.350	0.000			0.000
2	0.000	0.116	0.000	---	Snow	0.000
	4.666	0.116	0.000			0.000
3	0.000	0.000	0.113	---	Snow	0.000
	4.666	0.000	0.113			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	4.666	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.76 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	2.1	2.3	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	2.1	2.3	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.12	1.12
Max +LL reaction	0.26	0.26
Max +total reaction (factored)	1.76	1.76

DEFLECTIONS:

							Ratio
Dead load (in)	at	2.33 ft	=	-0.003	L/D =	17126	
Live load (in)	at	2.33 ft	=	-0.001			
Net Total load (in)	at	2.33 ft	=	-0.004	L/D =	13865 > 240	0.02

PRCNC20221036

Floor Type: Roof **Beam Number = 360**

SPAN INFORMATION (ft): I-End (197.92,141.83) J-End (197.92,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 4.67
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	4.666	0.350	0.000			0.000
2	0.000	0.116	0.000	---	Snow	0.000
	4.666	0.116	0.000			0.000
3	0.000	0.000	0.113	---	Snow	0.000
	4.666	0.000	0.113			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	4.666	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.76 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	2.1	2.3	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	2.1	2.3	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.12	1.12
Max +LL reaction	0.26	0.26
Max +total reaction (factored)	1.76	1.76

DEFLECTIONS:

								Ratio
Dead load (in)	at	2.33 ft	=	-0.003	L/D	=	1712 6	
Live load (in)	at	2.33 ft	=	-0.001				
Net Total load (in)	at	2.33 ft	=	-0.004	L/D	=	1386 5 > 240	0.02

PRCNC20221036

Floor Type: Roof **Beam Number = 361**

SPAN INFORMATION (ft): I-End (170.92,150.17) J-End (178.42,150.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.667	0.88	0.00	0.0	0.00	0.00	0.0	0.21	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	3.666	0.350	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 2.05 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	4.1	3.7	3.8	1.65	0.90	46.90
Controlling		1.2DL+1.6LL	4.1	3.7	3.8	1.65	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.46	0.79
Max +LL reaction	0.11	0.10
Max +total reaction (factored)	2.05	1.11

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.60 ft	=	-0.017	L/D	=	5354		
Live load (in)	at	3.60 ft	=	-0.002	L/D	=	4494 7	> 360	0.01
Net Total load (in)	at	3.60 ft	=	-0.019	L/D	=	4784	> 240	0.05

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 362**

SPAN INFORMATION (ft): I-End (163.42,150.17) J-End (170.92,150.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.50
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	7.500	0.350	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	7.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 1.90 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	3.6	3.8	7.5	1.14	0.90	34.73
Controlling		1.4DL	3.6	3.8	7.5	1.14	0.90	34.73

REACTIONS (kips):

	Left	**Right**
DL reaction	1.36	1.36
Max +total reaction (factored)	1.90	1.90

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.75 ft	=	-0.017	L/D	=	5448		
Live load (in)	at	3.75 ft	=	-0.000					
Net Total load (in)	at	3.75 ft	=	-0.017	L/D	=	5448	> 240	0.04

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 363**

SPAN INFORMATION (ft): I-End (174.58,146.50) J-End (174.58,150.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 3.67
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	3.666	0.350	0.000			0.000
2	0.000	0.116	0.000	---	Snow	0.000
	3.666	0.116	0.000			0.000
3	0.000	0.000	0.112	---	Snow	0.000
	3.666	0.000	0.112			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	3.666	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.38 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	1.3	1.8	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	1.3	1.8	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.88	0.88
Max +LL reaction	0.21	0.21
Max +total reaction (factored)	1.38	1.38

DEFLECTIONS:

								Ratio
Dead load (in)	at	1.83 ft	=	-0.001	L/D	=	3531 1	
Live load (in)	at	1.83 ft	=	-0.000				
Net Total load (in)	at	1.83 ft	=	-0.002	L/D	=	2858 7 > 240	0.01

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 364**

SPAN INFORMATION (ft): I-End (174.58,138.50) J-End (174.58,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	8.000	0.350	0.000			0.000
2	0.000	0.116	0.000	---	Snow	0.000
	8.000	0.116	0.000			0.000
3	0.000	0.000	0.112	---	Snow	0.000
	8.000	0.000	0.112			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	8.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.02 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	6.0	4.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	6.0	4.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.91	1.91
Max +LL reaction	0.45	0.45
Max +total reaction (factored)	3.02	3.02

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.00 ft	=	-0.028	L/D	=	3398			
Live load (in)	at	4.00 ft	=	-0.007	L/D	=	1444 6	>	360	0.02
Net Total load (in)	at	4.00 ft	=	-0.035	L/D	=	2751	>	240	0.09

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 366**

SPAN INFORMATION (ft): I-End (163.25,132.50) J-End (178.42,132.50)

Beam Size (Optimum) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.17
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
11.333	1.30	0.00	0.0	0.00	0.00	0.0	0.20	Snow	0.00
11.333	0.15	0.00	0.0	0.00	0.00	0.0	0.12	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	11.333	0.350	0.000			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	15.166	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 4.12 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	16.7	8.1	11.3	1.15	0.90	18.76
Controlling		1.4DL	16.7	8.1	11.3	1.15	0.90	18.76

REACTIONS (kips):

	Left	**Right**
DL reaction	2.94	2.65
Max +LL reaction	0.08	0.24
Max +total reaction (factored)	4.12	3.71

DEFLECTIONS:

							Ratio
Dead load (in)	at	7.66 ft	=	-0.318	L/D = 573		
Live load (in)	at	7.74 ft	=	-0.018	L/D = 9942	> 360	0.04
Net Total load (in)	at	7.74 ft	=	-0.336	L/D = 541	> 240	0.44

PRCNC20221036

Gravity Beam Design

Floor Type: Roof **Beam Number = 369**

SPAN INFORMATION (ft): I-End (174.58,132.50) J-End (174.58,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.350	0.000	---	Snow	0.000
	6.000	0.350	0.000			0.000
2	0.000	0.010	0.000	---	Snow	0.000
	6.000	0.010	0.000			0.000
3	0.000	0.000	0.010	---	Snow	0.000
	6.000	0.000	0.010			0.000
4	0.000	0.059	0.000	---	Snow	0.000
	6.000	0.059	0.000			0.000
5	0.000	0.000	0.058	---	Snow	0.000
	6.000	0.000	0.058			0.000
6	0.000	0.012	0.000	---	NonR	0.000
	6.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.88 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	2.8	3.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	2.8	3.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.30	1.30
Max +LL reaction	0.20	0.20
Max +total reaction (factored)	1.88	1.88

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.00 ft	=	-0.008	L/D	=	8922		
Live load (in)	at	3.00 ft	=	-0.001	L/D	=	5707 1	> 360	0.01
Net Total load (in)	at	3.00 ft	=	-0.009	L/D	=	7716	> 240	0.03

PRCNC20221036

Floor Type: Roof **Beam Number = 370**

SPAN INFORMATION (ft): I-End (174.58,128.83) J-End (174.58,132.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 3.67
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	Snow	0.000
	3.666	0.010	0.000			0.000
2	0.000	0.000	0.010	---	Snow	0.000
	3.666	0.000	0.010			0.000
3	0.000	0.059	0.000	---	Snow	0.000
	3.666	0.059	0.000			0.000
4	0.000	0.000	0.058	---	Snow	0.000
	3.666	0.000	0.058			0.000
5	0.000	0.012	0.000	---	NonR	0.000
	3.666	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.38 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.3	1.8	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	0.3	1.8	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.15	0.15
Max +LL reaction	0.12	0.12
Max +total reaction (factored)	0.38	0.38

DEFLECTIONS: **Ratio**

Dead load (in)	at	1.83 ft	=	-0.000	
Live load (in)	at	1.83 ft	=	-0.000	
Net Total load (in)	at	1.83 ft	=	-0.000	

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 15**

SPAN INFORMATION (ft): I-End (41.92,176.50) J-End (71.25,176.50)

Beam Size (User Selected) = W27X84 Fy = 50.0 ksi
Total Beam Length (ft) = 29.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	58.00	Y bar(in)	=	21.51
Mnf (kip-ft)	=	1532.59	Mn (kip-ft)	=	1376.87
C (kips)	=	301.52	PNA (in)	=	19.90
Ieff (in4)	=	5294.63	Itr (in4)	=	6274.28
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 56 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 50.96

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.778	5.18	4.60	7.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.83
19.556	5.18	4.60	7.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	29.333	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	29.333	0.079	0.070	0.117			0.000	0.029
3	0.000	0.084	0.084	0.000	---	NonR	0.000	0.000
	29.333	0.084	0.084	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 44.86 kips 1.00Vn = 368.46 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	107.5	14.7	9.8	1.00	0.90	852.61
	Init DL	1.4DL	86.1	14.7	---	---		
	Max +	1.2DL+1.6LL	372.9	14.7	---	---	0.90	1239.18
Controlling		1.2DL+1.6LL	350.9	9.8	---	---	0.90	1144.11

REACTIONS (kips):

PRCNC20221036

	Left	Right
Initial reaction	9.12	9.12
DL reaction	25.32	25.32
Max +LL reaction	9.04	9.04
Max +total reaction (factored)	44.86	44.86

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.67 ft	=	-0.117	L/D	=	3005			
Live load (in)	at 14.67 ft	=	-0.087	L/D	=	4065	>	360	0.09
Post Comp load (in)	at 14.67 ft	=	-0.225	L/D	=	1566	>	240	0.15
Net Total load (in)	at 14.67 ft	=	-0.342	L/D	=	1029	>	240	0.23

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 16**

SPAN INFORMATION (ft): I-End (71.25,176.50) J-End (86.17,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 14.92

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	36.38	Y bar(in)	=	16.09
Mnf (kip-ft)	=	488.56	Mn (kip-ft)	=	392.22
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1044.08	Itr (in4)	=	1446.74
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 28 Partial = 14 Actual = 14
Number of Stud Rows = 1 Percent of Full Composite Action = 32.50

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	14.916	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	14.916	0.079	0.070	0.117			0.000	0.029
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	14.916	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	14.916	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.25 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	20.4	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	15.8	7.5	---	---		
	Max +	1.2DL+1.6LL	83.0	7.5	---	---	0.90	353.00
Controlling		1.2DL+1.6LL	83.0	7.5	---	---	0.90	353.00

REACTIONS (kips):

	Left	Right
Initial reaction	4.17	4.17
DL reaction	12.41	12.41
Max +LL reaction	4.60	4.60
Max +total reaction (factored)	22.25	22.25

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.46 ft	=	-0.031	L/D	=	5867			
Live load (in)	at	7.46 ft	=	-0.023	L/D	=	7890	>	360	0.05
Post Comp load (in)	at	7.46 ft	=	-0.069	L/D	=	2593	>	240	0.09
Net Total load (in)	at	7.46 ft	=	-0.100	L/D	=	1799	>	240	0.13

Floor Type: Level 3 **Beam Number = 17**

SPAN INFORMATION (ft): I-End (86.17,176.50) J-End (95.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 9.75

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	28.62	Y bar(in)	=	15.36
Mnf (kip-ft)	=	463.13	Mn (kip-ft)	=	359.46
C (kips)	=	80.98	PNA (in)	=	11.55
Ieff (in4)	=	952.69	Itr (in4)	=	1350.60
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 18 Partial = 10 Actual = 10
Number of Stud Rows = 2 Percent of Full Composite Action = 27.73

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	9.750	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	9.750	0.079	0.070	0.117			0.000	0.029
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	9.750	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	9.750	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 14.55 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	8.7	4.9	0.0	1.00	0.90	249.38
	Init DL	1.4DL	6.7	4.9	---	---		
	Max +	1.2DL+1.6LL	35.5	4.9	---	---	0.90	323.52
Controlling		1.2DL+1.6LL	35.5	4.9	---	---	0.90	323.52

REACTIONS (kips):

	Left	Right
Initial reaction	2.73	2.73
DL reaction	8.11	8.11

PRCNC20221036

	Left	Right
Max +LL reaction	3.01	3.01
Max +total reaction (factored)	14.55	14.55

DEFLECTIONS:

										Ratio
Initial load (in)	at	4.87 ft	=	-0.006	L/D	=	2101 1			
Live load (in)	at	4.87 ft	=	-0.005	L/D	=	2578 0	>	360	0.01
Post Comp load (in)	at	4.87 ft	=	-0.014	L/D	=	8474	>	240	0.03
Net Total load (in)	at	4.87 ft	=	-0.019	L/D	=	6039	>	240	0.04

Floor Type: Level 3 **Beam Number = 18**

SPAN INFORMATION (ft): I-End (95.92,176.50) J-End (110.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 36.50	Y bar(in)	= 16.10
Mnf (kip-ft)	= 488.96	Mn (kip-ft)	= 392.23
C (kips)	= 120.61	PNA (in)	= 12.87
Ieff (in4)	= 1043.94	Itr (in4)	= 1448.10
Stud length (in)	= 4.00	Stud diam (in)	= 0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 32.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	15.000	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	15.000	0.079	0.070	0.117			0.000	0.029
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.38 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	20.6	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	15.9	7.5	---	---		
	Max +	1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01
Controlling		1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01

REACTIONS (kips):

	Left	Right
Initial reaction	4.19	4.19
DL reaction	12.48	12.48
Max +LL reaction	4.62	4.62
Max +total reaction (factored)	22.38	22.38

PRCNC20221036

DEFLECTIONS:

											Ratio
Initial load (in)	at	7.50 ft	=	-0.031	L/D	=	5770				
Live load (in)	at	7.50 ft	=	-0.023	L/D	=	7758	>	360		0.05
Post Comp load (in)	at	7.50 ft	=	-0.071	L/D	=	2550	>	240		0.09
Net Total load (in)	at	7.50 ft	=	-0.102	L/D	=	1769	>	240		0.14

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 19**

SPAN INFORMATION (ft): I-End (110.92,176.50) J-End (125.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	36.50	Y bar(in)	=	16.10
Mnf (kip-ft)	=	488.96	Mn (kip-ft)	=	392.23
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1043.94	Itr (in4)	=	1448.10
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 32.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	15.000	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	15.000	0.079	0.070	0.117			0.000	0.029
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.38 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	20.6	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	15.9	7.5	---	---		
	Max +	1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01
Controlling		1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01

REACTIONS (kips):

	Left	Right
Initial reaction	4.19	4.19
DL reaction	12.48	12.48
Max +LL reaction	4.62	4.62
Max +total reaction (factored)	22.38	22.38

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.50 ft	=	-0.031	L/D	=	5770			
Live load (in)	at	7.50 ft	=	-0.023	L/D	=	7758	>	360	0.05
Post Comp load (in)	at	7.50 ft	=	-0.071	L/D	=	2550	>	240	0.09
Net Total load (in)	at	7.50 ft	=	-0.102	L/D	=	1769	>	240	0.14

Floor Type: Level 3 **Beam Number = 20**

SPAN INFORMATION (ft): I-End (155.92,176.50) J-End (170.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	36.50	Y bar(in)	=	16.10
Mnf (kip-ft)	=	488.96	Mn (kip-ft)	=	392.23
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1043.94	Itr (in4)	=	1448.10
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 32.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	15.000	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	15.000	0.079	0.070	0.117			0.000	0.029
3	0.000	0.309	0.273	0.455	0.0%	Red	0.000	0.114
	15.000	0.309	0.273	0.455			0.000	0.114
4	0.000	0.031	0.027	0.056	---	NonR	0.000	0.011
	15.000	0.031	0.027	0.056			0.000	0.011
5	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.51 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	20.6	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	15.9	7.5	---	---		
	Max +	1.2DL+1.6LL	84.4	7.5	---	---	0.90	353.01
Controlling		1.2DL+1.6LL	84.4	7.5	---	---	0.90	353.01

REACTIONS (kips):

	Left	Right
Initial reaction	4.19	4.19
DL reaction	12.48	12.48

PRCNC20221036

	Left	Right
Max +LL reaction	4.71	4.71
Max +total reaction (factored)	22.51	22.51

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.50 ft	=	-0.031	L/D	=	5770			
Live load (in)	at	7.50 ft	=	-0.024	L/D	=	7619	>	360	0.05
Post Comp load (in)	at	7.50 ft	=	-0.071	L/D	=	2535	>	240	0.09
Net Total load (in)	at	7.50 ft	=	-0.102	L/D	=	1761	>	240	0.14

Floor Type: Level 3 **Beam Number = 21**

SPAN INFORMATION (ft): I-End (170.92,176.50) J-End (185.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	36.50	Y bar(in)	=	16.10
Mnf (kip-ft)	=	488.96	Mn (kip-ft)	=	392.23
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1043.94	Itr (in4)	=	1448.10
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 32.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	15.000	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	15.000	0.079	0.070	0.117			0.000	0.029
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.38 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	20.6	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	15.9	7.5	---	---		
	Max +	1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01
Controlling		1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01

REACTIONS (kips):

	Left	Right
Initial reaction	4.19	4.19
DL reaction	12.48	12.48
Max +LL reaction	4.62	4.62
Max +total reaction (factored)	22.38	22.38

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.50 ft	=	-0.031	L/D	=	5770			
Live load (in)	at	7.50 ft	=	-0.023	L/D	=	7758	>	360	0.05
Post Comp load (in)	at	7.50 ft	=	-0.071	L/D	=	2550	>	240	0.09
Net Total load (in)	at	7.50 ft	=	-0.102	L/D	=	1769	>	240	0.14

Floor Type: Level 3 **Beam Number = 22**

SPAN INFORMATION (ft): I-End (185.92,176.50) J-End (200.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	36.50	Y bar(in)	=	16.10
Mnf (kip-ft)	=	488.96	Mn (kip-ft)	=	392.23
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1043.94	Itr (in4)	=	1448.10
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 32.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	15.000	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	15.000	0.079	0.070	0.117			0.000	0.029
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.38 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	20.6	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	15.9	7.5	---	---		
	Max +	1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01
Controlling		1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01

REACTIONS (kips):

	Left	Right
Initial reaction	4.19	4.19
DL reaction	12.48	12.48
Max +LL reaction	4.62	4.62
Max +total reaction (factored)	22.38	22.38

Gravity Beam Design

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.50 ft	=	-0.031	L/D	=	5770			
Live load (in)	at	7.50 ft	=	-0.023	L/D	=	7758	>	360	0.05
Post Comp load (in)	at	7.50 ft	=	-0.071	L/D	=	2550	>	240	0.09
Net Total load (in)	at	7.50 ft	=	-0.102	L/D	=	1769	>	240	0.14

Floor Type: Level 3 **Beam Number = 23**

SPAN INFORMATION (ft): I-End (200.92,176.50) J-End (215.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 36.50	Y bar(in)	=	16.10
Mnf (kip-ft)	= 488.96	Mn (kip-ft)	=	392.23
C (kips)	= 120.61	PNA (in)	=	12.87
Ieff (in4)	= 1043.94	Itr (in4)	=	1448.10
Stud length (in)	= 4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 32.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	15.000	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	15.000	0.079	0.070	0.117			0.000	0.029
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.38 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	20.6	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	15.9	7.5	---	---		
	Max +	1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01
Controlling		1.2DL+1.6LL	83.9	7.5	---	---	0.90	353.01

REACTIONS (kips):

	Left	Right
Initial reaction	4.19	4.19
DL reaction	12.48	12.48
Max +LL reaction	4.62	4.62
Max +total reaction (factored)	22.38	22.38

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.50 ft	=	-0.031	L/D	=	5770			
Live load (in)	at	7.50 ft	=	-0.023	L/D	=	7758	>	360	0.05
Post Comp load (in)	at	7.50 ft	=	-0.071	L/D	=	2550	>	240	0.09
Net Total load (in)	at	7.50 ft	=	-0.102	L/D	=	1769	>	240	0.14

Floor Type: Level 3 **Beam Number = 24**

SPAN INFORMATION (ft): I-End (215.92,176.50) J-End (245.92,176.50)

Beam Size (User Selected) = W27X84 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	59.00	Y bar(in)	=	21.58
Mnf (kip-ft)	=	1536.16	Mn (kip-ft)	=	1377.20
C (kips)	=	301.52	PNA (in)	=	19.90
Ieff (in4)	=	5295.39	Itr (in4)	=	6304.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 56 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 50.10

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	30.000	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	30.000	0.079	0.070	0.117			0.000	0.029
3	0.000	0.084	0.084	0.000	---	NonR	0.000	0.000
	30.000	0.084	0.084	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 45.87 kips 1.00Vn = 368.46 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	112.4	15.0	10.0	1.00	0.90	846.72
	Init DL	1.4DL	90.0	15.0	---	---		
	Max +	1.2DL+1.6LL	389.9	15.0	---	---	0.90	1239.48
Controlling		1.2DL+1.6LL	367.0	10.0	---	---	0.90	1144.23

REACTIONS (kips):

	Left	Right
Initial reaction	9.32	9.32
DL reaction	25.90	25.90
Max +LL reaction	9.25	9.25
Max +total reaction (factored)	45.87	45.87

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.128	L/D	=	2811			
Live load (in)	at 15.00 ft	=	-0.095	L/D	=	3801	>	360	0.09
Post Comp load (in)	at 15.00 ft	=	-0.246	L/D	=	1464	>	240	0.16
Net Total load (in)	at 15.00 ft	=	-0.374	L/D	=	963	>	240	0.25

Floor Type: Level 3 **Beam Number = 25**

SPAN INFORMATION (ft): I-End (41.92,161.50) J-End (71.25,161.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 29.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	88.00	Y bar(in)	=	21.40
Mnf (kip-ft)	=	1379.56	Mn (kip-ft)	=	1111.59
C (kips)	=	236.91	PNA (in)	=	17.33
Ieff (in4)	=	3800.22	Itr (in4)	=	5409.45
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.19

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.778	5.18	4.60	7.33	10.4	0.00	0.00	0.0	0.00	Snow	0.00	1.83
9.778	4.62	4.10	6.54	10.4	0.00	0.00	0.0	0.00	Snow	0.00	1.64
19.556	5.18	4.60	7.33	10.4	0.00	0.00	0.0	0.00	Snow	0.00	1.83
19.556	4.08	3.62	5.77	10.4	0.00	0.00	0.0	0.00	Snow	0.00	1.44

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	29.333	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 32.41 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	162.3	11.5	9.8	1.00	0.90	684.35
	Init DL	1.4DL	127.4	12.5	---	---		
	Max +	1.2DL+1.6LL	312.5	9.8	---	---	0.90	1000.43
Controlling		1.2DL+1.6LL	312.5	9.8	---	---	0.90	1000.43

REACTIONS (kips):

	Left	Right
Initial reaction	13.06	12.83
DL reaction	10.74	10.56

PRCNC20221036

	Left	Right
Max +LL reaction	12.20	11.97
Max +total reaction (factored)	32.41	31.82

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.67 ft	=	-0.236	L/D	=	1493			
Live load (in)	at 14.67 ft	=	-0.170	L/D	=	2074	>	360	0.17
Post Comp load (in)	at 14.67 ft	=	-0.185	L/D	=	1904	>	240	0.13
Net Total load (in)	at 14.67 ft	=	-0.421	L/D	=	837	>	240	0.29

Floor Type: Level 3 **Beam Number = 26**

SPAN INFORMATION (ft): I-End (71.25,161.50) J-End (71.25,176.50)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	18.40
Mnf (kip-ft)	=	694.64	Mn (kip-ft)	=	532.64
C (kips)	=	120.61	PNA (in)	=	13.80
Ieff (in4)	=	1596.15	Itr (in4)	=	2312.27
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 80 Partial = 21 Actual = 21
Number of Stud Rows = 1 Percent of Full Composite Action = 26.28

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.000	9.09	8.10	12.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	3.08

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	15.000	0.332	0.293	0.489			0.000	0.122
2	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	15.000	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.68 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	63.9	5.0	0.0	1.00	0.90	357.75
	Init DL	1.4DL	49.6	5.0	---	---		
	Max +	1.2DL+1.6LL	133.0	5.0	---	---	0.90	479.37
Controlling		1.2DL+1.6LL	133.0	5.0	---	---	0.90	479.37

REACTIONS (kips):

	Left	Right
Initial reaction	10.91	7.18
DL reaction	8.88	5.85
Max +LL reaction	11.89	7.78

PRCNC20221036

	Left	Right
Max +total reaction (factored)	29.68	19.47

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.05 ft	=	-0.050	L/D	=	3581			
Live load (in)	at	7.05 ft	=	-0.040	L/D	=	4523	>	360	0.08
Post Comp load (in)	at	7.05 ft	=	-0.043	L/D	=	4188	>	240	0.06
Net Total load (in)	at	7.05 ft	=	-0.093	L/D	=	1930	>	240	0.12

Floor Type: Level 3 **Beam Number = 27**

SPAN INFORMATION (ft): I-End (71.25,151.25) J-End (71.25,161.50)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 10.25

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.75	Y bar(in)	=	17.08
Mnf (kip-ft)	=	645.53	Mn (kip-ft)	=	497.86
C (kips)	=	86.15	PNA (in)	=	12.81
Ieff (in4)	=	1486.14	Itr (in4)	=	2070.17
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 39 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 26.16

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.250	9.07	8.08	12.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	3.08

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	10.250	0.332	0.293	0.489			0.000	0.122
2	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	10.250	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.00 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	45.3	5.2	0.0	1.00	0.90	357.75
	Init DL	1.4DL	35.2	5.2	---	---		
	Max +	1.2DL+1.6LL	94.6	5.2	---	---	0.90	448.08
Controlling		1.2DL+1.6LL	94.6	5.2	---	---	0.90	448.08

REACTIONS (kips):

	Left	Right
Initial reaction	7.80	8.07
DL reaction	6.35	6.57
Max +LL reaction	8.52	8.82

PRCNC20221036

	Left	Right
Max +total reaction (factored)	21.26	22.00

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.18 ft	=	-0.016	L/D	=	7578			
Live load (in)	at	5.18 ft	=	-0.014	L/D	=	8848	>	360	0.04
Post Comp load (in)	at	5.18 ft	=	-0.015	L/D	=	8192	>	240	0.03
Net Total load (in)	at	5.18 ft	=	-0.031	L/D	=	3937	>	240	0.06

Floor Type: Level 3 **Beam Number = 28**

SPAN INFORMATION (ft): I-End (71.25,135.17) J-End (71.25,151.25)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 16.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	48.25	Y bar(in)	=	18.63
Mnf (kip-ft)	=	705.19	Mn (kip-ft)	=	590.55
C (kips)	=	189.53	PNA (in)	=	15.77
Ieff (in4)	=	1781.77	Itr (in4)	=	2355.77
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 84 Partial = 25 Actual = 25
Number of Stud Rows = 1 Percent of Full Composite Action = 25.44

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
3.333	13.34	11.90	18.01	19.6	0.00	0.00	0.0	0.00	Snow	0.00	4.50
11.333	8.23	7.34	11.10	19.6	0.00	0.00	0.0	0.00	Snow	0.00	2.77

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	19.6%	Red	0.000	0.122
	14.500	0.332	0.293	0.489			0.000	0.122
2	14.500	0.332	0.293	0.489	19.6%	Red	0.000	0.122
	16.083	0.000	0.000	0.000			0.000	0.000
3	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	16.083	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 46.88 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	86.8	7.1	0.0	1.00	0.90	357.75
	Init DL	1.4DL	67.6	7.1	---	---		
	Max +	1.2DL+1.6LL	157.9	7.1	---	---	0.90	531.49
Controlling		1.2DL+1.6LL	150.3	3.3	---	---	0.90	449.04

REACTIONS (kips):

	Left	Right
Initial reaction	19.68	13.91
DL reaction	16.03	11.34
Max +LL reaction	17.28	12.16
Max +total reaction (factored)	46.88	33.06

DEFLECTIONS:

											Ratio
Initial load (in)	at	7.88 ft	=	-0.099	L/D	=	1957				
Live load (in)	at	7.88 ft	=	-0.056	L/D	=	3429	>	360		0.10
Post Comp load (in)	at	7.88 ft	=	-0.062	L/D	=	3119	>	240		0.08
Net Total load (in)	at	7.88 ft	=	-0.161	L/D	=	1202	>	240		0.20

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 29**

SPAN INFORMATION (ft): I-End (56.92,135.17) J-End (71.25,135.17)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 14.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 43.00	Y bar(in)	= 16.59
Mnf (kip-ft)	= 509.63	Mn (kip-ft)	= 399.36
C (kips)	= 129.22	PNA (in)	= 13.16
Ieff (in4)	= 1053.99	Itr (in4)	= 1512.21
Stud length (in)	= 4.00	Stud diam (in)	= 0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 65 Partial = 18 Actual = 18
Number of Stud Rows = 1 Percent of Full Composite Action = 27.45

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
2.917	1.74	1.54	2.43	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.61
4.556	5.00	4.43	7.07	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.77
7.167	2.72	2.41	3.88	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.97

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	14.333	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.61 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	42.0	4.6	2.6	1.02	0.90	249.38
	Init DL	1.4DL	32.4	4.6	---	---		
	Max +	1.2DL+1.6LL	88.2	4.6	---	---	0.90	359.42
Controlling		1.2DL+1.6LL	88.2	4.6	---	---	0.90	359.42

REACTIONS (kips):

	Left	Right
Initial reaction	7.88	4.35
DL reaction	6.40	3.55
Max +LL reaction	8.70	4.68

PRCNC20221036

	Left	Right
Max +total reaction (factored)	21.61	11.75

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.74 ft	=	-0.052	L/D	=	3286			
Live load (in)	at	6.74 ft	=	-0.039	L/D	=	4439	>	360	0.08
Post Comp load (in)	at	6.74 ft	=	-0.042	L/D	=	4110	>	240	0.06
Net Total load (in)	at	6.74 ft	=	-0.094	L/D	=	1826	>	240	0.13

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 30**

SPAN INFORMATION (ft): I-End (71.25,146.50) J-End (95.92,146.50)

Beam Size (User Selected) = W21X55 Fy = 50.0 ksi
Total Beam Length (ft) = 24.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	74.00	Y bar(in)	=	19.40
Mnf (kip-ft)	=	925.93	Mn (kip-ft)	=	735.70
C (kips)	=	206.76	PNA (in)	=	15.91
Ieff (in4)	=	2216.61	Itr (in4)	=	3197.04
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 48 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 27.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	3.8%	Red	0.000	0.225
	24.666	0.612	0.540	0.900			0.000	0.225
2	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	24.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.96 kips 1.00Vn = 234.00 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	81.7	12.3	0.0	1.00	0.90	472.50
	Init DL	1.4DL	63.4	12.3	---	---		
	Max +	1.2DL+1.6LL	166.2	12.3	---	---	0.90	662.13
Controlling		1.2DL+1.6LL	166.2	12.3	---	---	0.90	662.13

REACTIONS (kips):

	Left	Right
Initial reaction	10.11	10.11
DL reaction	8.23	8.23
Max +LL reaction	10.68	10.68
Max +total reaction (factored)	26.96	26.96

DEFLECTIONS:

						Ratio
Initial load (in)	at 12.33 ft	=	-0.150	L/D	=	1974
Live load (in)	at 12.33 ft	=	-0.112	L/D	=	2639 >

PRCNC20221036

Post Comp load (in)	at	12.33 ft	=	-0.122	L/D	=	2436	>	240	0.10
Net Total load (in)	at	12.33 ft	=	-0.271	L/D	=	1090	>	240	0.22

Floor Type: Level 3 **Beam Number = 31**

SPAN INFORMATION (ft): I-End (41.92,146.50) J-End (71.25,151.25)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 29.72

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 89.15	Y bar(in)	= 21.45
Mnf (kip-ft)	= 1383.26	Mn (kip-ft)	= 1181.51
C (kips)	= 323.06	PNA (in)	= 19.29
Ieff (in4)	= 4082.71	Itr (in4)	= 5426.37
Stud length (in)	= 4.00	Stud diam (in)	= 0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 118 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 25.58

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.905	4.38	3.89	6.19	9.9	0.00	0.00	0.0	0.00	Snow	0.00	1.55
9.905	4.21	3.73	5.94	9.9	0.00	0.00	0.0	0.00	Snow	0.00	1.49
19.810	3.84	3.40	5.41	9.9	0.00	0.00	0.0	0.00	Snow	0.00	1.35
19.810	4.76	4.22	6.72	9.9	0.00	0.00	0.0	0.00	Snow	0.00	1.68

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.053	0.047	0.078	9.9%	Red	0.000	0.020
	29.715	0.053	0.047	0.078			0.000	0.020
2	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	29.715	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.77 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	158.4	14.9	9.9	1.00	0.90	680.41
	Init DL	1.4DL	124.7	14.9	---	---		
	Max +	1.2DL+1.6LL	304.8	14.9	---	---	0.90	1063.36
Controlling		1.2DL+1.6LL	301.5	19.8	---	---	0.90	982.55

REACTIONS (kips):

PRCNC20221036

	Left	Right
Initial reaction	12.77	12.77
DL reaction	10.51	10.51
Max +LL reaction	11.97	11.97
Max +total reaction (factored)	31.77	31.77

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.86 ft	=	-0.237	L/D	=	1505			
Live load (in)	at 14.86 ft	=	-0.159	L/D	=	2244	>	360	0.16
Post Comp load (in)	at 14.86 ft	=	-0.173	L/D	=	2061	>	240	0.12
Net Total load (in)	at 14.86 ft	=	-0.410	L/D	=	870	>	240	0.28

Floor Type: Level 3 **Beam Number = 32**

SPAN INFORMATION (ft): I-End (41.92,135.17) J-End (41.92,146.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	31.00	Y bar(in)	=	15.60
Mnf (kip-ft)	=	471.02	Mn (kip-ft)	=	364.13
C (kips)	=	86.15	PNA (in)	=	11.72
Ieff (in4)	=	965.56	Itr (in4)	=	1382.78
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 22 Partial = 11 Actual = 11
Number of Stud Rows = 1 Percent of Full Composite Action = 27.24

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	11.333	1.210	0.000	0.000			0.000	0.000
2	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	11.333	0.079	0.070	0.117			0.000	0.029
3	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	11.333	0.332	0.293	0.489			0.000	0.122
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	11.333	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.76 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	11.6	5.7	0.0	1.00	0.90	249.38
	Init DL	1.4DL	9.0	5.7	---	---		
	Max +	1.2DL+1.6LL	47.5	5.7	---	---	0.90	327.72
Controlling		1.2DL+1.6LL	47.5	5.7	---	---	0.90	327.72

REACTIONS (kips):

	Left	Right
Initial reaction	3.12	3.12
DL reaction	9.39	9.39
Max +LL reaction	3.43	3.43
Max +total reaction (factored)	16.76	16.76

PRCNC20221036

DEFLECTIONS:											
											Ratio
Initial load (in)	at	5.67 ft	=	-0.010	L/D	=	13602				
Live load (in)	at	5.67 ft	=	-0.008	L/D	=	16941	>	360		0.02
Post Comp load (in)	at	5.67 ft	=	-0.025	L/D	=	5504	>	240		0.04
Net Total load (in)	at	5.67 ft	=	-0.035	L/D	=	3918	>	240		0.06

PRCNC20221036

Floor Type: Level 3 **Beam Number = 33**

SPAN INFORMATION (ft): I-End (95.92,146.50) J-End (95.92,176.50)

Beam Size (User Selected) = W24X94 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.00
Mnf (kip-ft)	=	1664.96	Mn (kip-ft)	=	1439.89
C (kips)	=	344.59	PNA (in)	=	18.84
Ieff (in4)	=	5075.64	Itr (in4)	=	6577.48
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 127 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.21

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	21.7	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	9.07	8.08	12.33	21.7	0.00	0.00	0.0	0.00	Snow	0.00	3.08
20.000	5.30	4.70	7.50	21.7	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	9.10	8.12	12.33	21.7	0.00	0.00	0.0	0.00	Snow	0.00	3.08

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.094	0.094	0.000	---	NonR	0.000	0.000
	30.000	0.094	0.094	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 43.79 kips 1.00Vn = 375.43 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	245.6	15.2	10.0	1.00	0.90	875.19
	Init DL	1.4DL	194.0	15.2	---	---		
	Max +	1.2DL+1.6LL	433.6	15.2	---	---	0.90	1295.90
Controlling		1.2DL+1.6LL	432.3	20.0	---	---	0.90	1210.16

REACTIONS (kips):

	Left	Right
Initial reaction	19.16	19.17
DL reaction	15.79	15.80

PRCNC20221036

	Left	Right
Max +LL reaction	15.52	15.52
Max +total reaction (factored)	43.78	43.79

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.293	L/D	=	1231			
Live load (in)	at 15.00 ft	=	-0.175	L/D	=	2062	>	360	0.17
Post Comp load (in)	at 15.00 ft	=	-0.192	L/D	=	1871	>	240	0.13
Net Total load (in)	at 15.00 ft	=	-0.485	L/D	=	742	>	240	0.32

Floor Type: Level 3 **Beam Number = 34**

SPAN INFORMATION (ft): I-End (95.92,146.50) J-End (110.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS:

							Ratio
Initial load (in)	at	7.50 ft	=	-0.074	L/D	=	2437
Live load (in)	at	7.50 ft	=	-0.050	L/D	=	3567 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 35**

SPAN INFORMATION (ft): I-End (110.92,146.50) J-End (125.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

Initial load (in)	at 7.50 ft	=	-0.074	L/D =	2437
Live load (in)	at 7.50 ft	=	-0.050	L/D =	3567 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 36**

SPAN INFORMATION (ft): I-End (125.92,146.50) J-End (140.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

						Ratio
Initial load (in)	at	7.50 ft	=	-0.074	L/D =	2437
Live load (in)	at	7.50 ft	=	-0.050	L/D =	3567 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Floor Type: Level 3 **Beam Number = 37**

SPAN INFORMATION (ft): I-End (140.92,146.50) J-End (155.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	0.625	---	NonR	0.000	0.125
	15.000	0.340	0.300	0.625			0.000	0.125
2	0.000	0.272	0.240	0.400	0.0%	Red	0.000	0.100
	15.000	0.272	0.240	0.400			0.000	0.100
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.04 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	67.7	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	67.7	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	7.69	7.69
Max +total reaction (factored)	18.04	18.04

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	7.50 ft	=	-0.074	L/D	=	2437			
Live load (in)	at	7.50 ft	=	-0.057	L/D	=	3132	>	360	0.11
Post Comp load (in)	at	7.50 ft	=	-0.062	L/D	=	2926	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.135	L/D	=	1329	>	240	0.18

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 38**

SPAN INFORMATION (ft): I-End (155.92,146.50) J-End (170.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	0.625	---	NonR	0.000	0.125
	15.000	0.340	0.300	0.625			0.000	0.125
2	0.000	0.272	0.240	0.400	0.0%	Red	0.000	0.100
	15.000	0.272	0.240	0.400			0.000	0.100
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.04 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	67.7	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	67.7	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	7.69	7.69
Max +total reaction (factored)	18.04	18.04

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	7.50 ft	=	-0.074	L/D	=	2437			
Live load (in)	at	7.50 ft	=	-0.057	L/D	=	3132	>	360	0.11
Post Comp load (in)	at	7.50 ft	=	-0.062	L/D	=	2926	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.135	L/D	=	1329	>	240	0.18

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 39**

SPAN INFORMATION (ft): I-End (170.92,146.50) J-End (185.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

Initial load (in) at 7.50 ft = -0.074 L/D = 2437
Live load (in) at 7.50 ft = -0.050 L/D = 3567 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 40**

SPAN INFORMATION (ft): I-End (185.92,146.50) J-End (200.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.074	L/D	=	2437
Live load (in)	at	7.50 ft	=	-0.050	L/D	=	3567 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Floor Type: Level 3 **Beam Number = 41**

SPAN INFORMATION (ft): I-End (200.92,146.50) J-End (215.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.074	L/D	=	2437
Live load (in)	at	7.50 ft	=	-0.050	L/D	=	3567 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 42**

SPAN INFORMATION (ft): I-End (215.92,146.50) J-End (215.92,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	274.83
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	670.82	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Full = 68 Partial = 18 Actual = 18
Number of Stud Rows = 1 Percent of Full Composite Action = 26.92

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.53 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	43.6	10.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	33.3	10.0	---	---		
	Max +	1.2DL+1.6LL	92.2	10.0	---	---	0.90	247.35
Controlling		1.2DL+1.6LL	92.2	10.0	---	---	0.90	247.35

REACTIONS (kips):

	Left	Right
Initial reaction	5.57	7.76
DL reaction	4.51	6.28
Max +LL reaction	6.25	8.75

PRCNC20221036

	Left	Right
Max +total reaction (factored)	15.41	21.53

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.88 ft	=	-0.099	L/D	=	1827			
Live load (in)	at	7.88 ft	=	-0.069	L/D	=	2594	>	360	0.14
Post Comp load (in)	at	7.88 ft	=	-0.075	L/D	=	2401	>	240	0.10
Net Total load (in)	at	7.88 ft	=	-0.174	L/D	=	1037	>	240	0.23

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 43**

SPAN INFORMATION (ft): I-End (215.92,161.50) J-End (215.92,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	274.83
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	670.82	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Full = 68 Partial = 18 Actual = 18
Number of Stud Rows = 1 Percent of Full Composite Action = 26.92

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.53 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	43.6	5.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	33.3	5.0	---	---		
	Max +	1.2DL+1.6LL	92.2	5.0	---	---	0.90	247.35
Controlling		1.2DL+1.6LL	92.2	5.0	---	---	0.90	247.35

REACTIONS (kips):

	Left	Right
Initial reaction	7.76	5.57
DL reaction	6.28	4.51
Max +LL reaction	8.75	6.25

PRCNC20221036

	Left	Right
Max +total reaction (factored)	21.53	15.41

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.13 ft	=	-0.099	L/D	=	1827			
Live load (in)	at	7.13 ft	=	-0.069	L/D	=	2594	>	360	0.14
Post Comp load (in)	at	7.13 ft	=	-0.075	L/D	=	2401	>	240	0.10
Net Total load (in)	at	7.13 ft	=	-0.174	L/D	=	1037	>	240	0.23

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 44**

SPAN INFORMATION (ft): I-End (215.92,146.50) J-End (245.92,146.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.57

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	9.6	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	4.00	3.55	5.67	9.6	0.00	0.00	0.0	0.00	Snow	0.00	1.42
20.000	5.30	4.70	7.50	9.6	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	4.00	3.55	5.67	9.6	0.00	0.00	0.0	0.00	Snow	0.00	1.42

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.56 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	161.9	15.0	10.0	1.00	0.90	677.70
	Init DL	1.4DL	127.4	15.0	---	---		
	Max +	1.2DL+1.6LL	312.2	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	311.1	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	12.68	12.68
DL reaction	10.44	10.44

PRCNC20221036

	Left	Right
Max +LL reaction	11.90	11.90
Max +total reaction (factored)	31.56	31.56

DEFLECTIONS:

										Ratio
Initial load (in)	at	15.00 ft	=	-0.247	L/D	=	1458			
Live load (in)	at	15.00 ft	=	-0.164	L/D	=	2197	>	360	0.16
Post Comp load (in)	at	15.00 ft	=	-0.178	L/D	=	2018	>	240	0.12
Net Total load (in)	at	15.00 ft	=	-0.425	L/D	=	846	>	240	0.28

Floor Type: Level 3 **Beam Number = 45**

SPAN INFORMATION (ft): I-End (215.92,161.50) J-End (245.92,161.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

										Ratio
Initial load (in)	at	15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at	15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at	15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at	15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Floor Type: Level 3 **Beam Number = 46**

SPAN INFORMATION (ft): I-End (245.92,135.17) J-End (245.92,146.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	31.00	Y bar(in)	=	15.60
Mnf (kip-ft)	=	471.02	Mn (kip-ft)	=	364.13
C (kips)	=	86.15	PNA (in)	=	11.72
Ieff (in4)	=	965.56	Itr (in4)	=	1382.78
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 22 Partial = 11 Actual = 11
Number of Stud Rows = 1 Percent of Full Composite Action = 27.24

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	11.333	1.210	0.000	0.000			0.000	0.000
2	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	11.333	0.340	0.300	0.500			0.000	0.125
3	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	11.333	0.079	0.070	0.117			0.000	0.029
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	11.333	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.91 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	11.8	5.7	0.0	1.00	0.90	249.38
	Init DL	1.4DL	9.1	5.7	---	---		
	Max +	1.2DL+1.6LL	47.9	5.7	---	---	0.90	327.72
Controlling		1.2DL+1.6LL	47.9	5.7	---	---	0.90	327.72

REACTIONS (kips):

	Left	Right
Initial reaction	3.17	3.17
DL reaction	9.43	9.43
Max +LL reaction	3.49	3.49
Max +total reaction (factored)	16.91	16.91

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.67 ft	=	-0.010	L/D	=	1337 8			
Live load (in)	at	5.67 ft	=	-0.008	L/D	=	1663 6	>	360	0.02
Post Comp load (in)	at	5.67 ft	=	-0.025	L/D	=	5469	>	240	0.04
Net Total load (in)	at	5.67 ft	=	-0.035	L/D	=	3882	>	240	0.06

Floor Type: Level 3 **Beam Number = 47**

SPAN INFORMATION (ft): I-End (215.92,135.17) J-End (245.92,135.17)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1111.77
C (kips)	=	236.91	PNA (in)	=	17.33
Ieff (in4)	=	3796.14	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 129 Partial = 33 Actual = 33
Number of Stud Rows = 1 Percent of Full Composite Action = 25.81

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	4.00	3.55	5.67	15.2	0.00	0.00	0.0	0.00	Snow	0.00	1.42
10.000	7.85	6.96	10.52	15.2	1.51	0.00	0.0	0.00	Snow	0.00	2.78
20.000	4.00	3.55	5.67	15.2	0.00	0.00	0.0	0.00	Snow	0.00	1.42
20.000	6.92	6.13	9.65	15.2	0.37	0.00	0.0	0.00	Snow	0.00	2.45

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 38.59 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	197.4	10.0	10.0	1.01	0.90	681.48
	Init DL	1.4DL	154.1	11.4	---	---		
	Max +	1.2DL+1.6LL	381.3	10.0	---	---	0.90	1000.59
Controlling		1.2DL+1.6LL	381.3	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	15.47	15.08
DL reaction	12.69	12.37

PRCNC20221036

	Left	Right
Max +LL reaction	14.60	13.98
Max +total reaction (factored)	38.59	37.21

DEFLECTIONS:

							Ratio
Initial load (in)	at 15.00 ft	= -0.297	L/D	=	1211		
Live load (in)	at 15.00 ft	= -0.215	L/D	=	1675	> 360	0.21
Post Comp load (in)	at 15.00 ft	= -0.234	L/D	=	1536	> 240	0.16
Net Total load (in)	at 15.00 ft	= -0.532	L/D	=	677	> 240	0.35

Floor Type: Level 3 **Beam Number = 48**

SPAN INFORMATION (ft): I-End (215.92,135.17) J-End (215.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	34.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	354.05	Mn (kip-ft)	=	273.89
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	654.49	Itr (in4)	=	948.45
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 60 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 26.91

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
3.333	9.79	8.70	13.62	0.0	0.00	0.00	0.0	0.00	Snow	0.00	3.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	11.333	0.340	0.300	0.500			0.000	0.125
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 30.70 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	45.3	3.3	0.0	1.00	0.90	165.75
	Init DL	1.4DL	34.7	3.3	---	---		
	Max +	1.2DL+1.6LL	95.5	3.3	---	---	0.90	246.50
Controlling		1.2DL+1.6LL	95.5	3.3	---	---	0.90	246.50

REACTIONS (kips):

	Left	Right
Initial reaction	11.10	6.12
DL reaction	8.99	4.95
Max +LL reaction	12.45	6.84

	Left	Right
Max +total reaction (factored)	30.70	16.89

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.21 ft	=	-0.055	L/D	=	2471			
Live load (in)	at	5.21 ft	=	-0.039	L/D	=	3449	>	360	0.10
Post Comp load (in)	at	5.21 ft	=	-0.043	L/D	=	3194	>	240	0.08
Net Total load (in)	at	5.21 ft	=	-0.098	L/D	=	1393	>	240	0.17

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 49**

SPAN INFORMATION (ft): I-End (185.92,138.50) J-End (215.92,138.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	18.48
Mnf (kip-ft)	=	560.96	Mn (kip-ft)	=	475.30
C (kips)	=	258.45	PNA (in)	=	17.27
Ieff (in4)	=	1401.42	Itr (in4)	=	1768.35
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 60 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 50.18

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.618	0.545	0.908	10.7%	Red	0.000	0.227
	30.000	0.618	0.545	0.908			0.000	0.227
2	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	30.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.21 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	119.2	15.0	0.0	1.00	0.90	249.38
	Init DL	1.4DL	91.4	15.0	---	---		
	Max +	1.2DL+1.6LL	234.0	15.0	---	---	0.90	427.77
Controlling		1.2DL+1.6LL	234.0	15.0	---	---	0.90	427.77

REACTIONS (kips):

	Left	Right
Initial reaction	12.11	12.11
DL reaction	9.79	9.79
Max +LL reaction	12.16	12.16
Max +total reaction (factored)	31.21	31.21

DEFLECTIONS: **Ratio**

Initial load (in)	at 15.00 ft	=	-0.715	L/D	=	504	
Live load (in)	at 15.00 ft	=	-0.364	L/D	=	990	> PRCNC20221036

Post Comp load (in)	at 15.00 ft	=	-0.396	L/D	=	909	>	240	0.26
Net Total load (in)	at 15.00 ft	=	-1.111	L/D	=	324	>	240	0.74

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 50**

SPAN INFORMATION (ft): I-End (155.92,138.50) J-End (185.92,138.50)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	49.00	Y bar(in)	=	16.03
Mnf (kip-ft)	=	376.32	Mn (kip-ft)	=	319.40
C (kips)	=	189.53	PNA (in)	=	15.35
Ieff (in4)	=	814.94	Itr (in4)	=	1032.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 60 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 45.10

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
7.333	1.94	1.75	2.41	11.6	0.00	0.00	0.0	0.00	Snow	0.00	0.60
19.167	3.02	2.71	3.96	11.6	0.00	0.00	0.0	0.00	Snow	0.00	0.99

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.272	0.240	0.400	11.6%	Red	0.000	0.100
	30.000	0.272	0.240	0.400			0.000	0.100
2	0.000	0.346	0.305	0.508	11.6%	Red	0.000	0.127
	7.333	0.346	0.305	0.508			0.000	0.127
3	7.333	0.023	0.020	0.033	11.6%	Red	0.000	0.008
	19.166	0.023	0.020	0.033			0.000	0.008
4	19.167	0.346	0.305	0.508	11.6%	Red	0.000	0.127
	30.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	30.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 32.62 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	120.7	18.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	93.4	18.0	---	---		
	Max +	1.2DL+1.6LL	233.3	18.1	---	---	(	

PRCNC20221036

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
Controlling		1.2DL+1.6LL	232.7	19.2	---	---	0.90	281.53

REACTIONS (kips):

	Left	**Right**
Initial reaction	12.42	12.80
DL reaction	10.08	10.38
Max +LL reaction	12.14	12.60
Max +total reaction (factored)	31.53	32.62

DEFLECTIONS: (Camber = 1)

								Ratio
Initial load (in)	at 15.15 ft	=	-1.251	L/D	=	288		
Live load (in)	at 15.15 ft	=	-0.621	L/D	=	580	> 360	0.62
Post Comp load (in)	at 15.15 ft	=	-0.677	L/D	=	532	> 240	0.45
Net Total load (in)	at 15.15 ft	=	-0.928	L/D	=	388	> 240	0.62

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 51**

SPAN INFORMATION (ft): I-End (134.92,138.50) J-End (155.92,138.50)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 21.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	63.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	301.65	Mn (kip-ft)	=	250.30
C (kips)	=	172.30	PNA (in)	=	13.40
Ieff (in4)	=	619.67	Itr (in4)	=	776.32
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 21 Partial = 21 Actual = 21
Number of Stud Rows = 1 Percent of Full Composite Action = 53.09

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.618	0.545	0.908	0.0%	Red	0.000	0.227
	21.000	0.618	0.545	0.908			0.000	0.227
2	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	21.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 23.32 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	57.5	10.5	0.0	1.00	0.90	124.50
	Init DL	1.4DL	43.8	10.5	---	---		
	Max +	1.2DL+1.6LL	122.4	10.5	---	---	0.90	225.27
Controlling		1.2DL+1.6LL	122.4	10.5	---	---	0.90	225.27

REACTIONS (kips):

	Left	Right
Initial reaction	8.34	8.34
DL reaction	6.72	6.72
Max +LL reaction	9.54	9.54
Max +total reaction (factored)	23.32	23.32

DEFLECTIONS:

					Ratio
Initial load (in)	at 10.50 ft	=	-0.430	L/D	= 586
Live load (in)	at 10.50 ft	=	-0.221	L/D	= 1139 >

PRCNC20221036

Post Comp load (in)	at 10.50 ft	=	-0.239	L/D	=	1055	> 240	0.23
Net Total load (in)	at 10.50 ft	=	-0.669	L/D	=	377	> 240	0.64

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 52**

SPAN INFORMATION (ft): I-End (110.92,138.50) J-End (134.92,138.50)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 40.00		Y bar(in)	=	14.24
Mnf (kip-ft)	= 289.87		Mn (kip-ft)	=	246.98
C (kips)	= 172.30		PNA (in)	=	13.40
Ieff (in4)	= 571.55		Itr (in4)	=	710.27
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 24 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 51.28

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
2.167	0.18	0.16	0.17	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.04
13.500	0.18	0.16	0.17	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.04

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.272	0.240	0.400	0.0%	Red	0.000	0.100
	24.000	0.272	0.240	0.400			0.000	0.100
2	0.000	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	2.166	0.346	0.305	0.508			0.000	0.127
3	2.167	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	13.500	0.023	0.020	0.033			0.000	0.008
4	13.500	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	24.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	24.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.72 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	55.1	13.7	0.0	1.00	0.90	124.50
	Init DL	1.4DL	42.3	13.7	---	---		
	Max +	1.2DL+1.6LL	116.2	13.8	---	---	(	

PRCNC20221036

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
Controlling		1.2DL+1.6LL	116.2	13.8	---	---	0.90	222.28

REACTIONS (kips):

	Left	**Right**
Initial reaction	6.72	8.17
DL reaction	5.45	6.60
Max +LL reaction	7.50	9.25
Max +total reaction (factored)	18.54	22.72

DEFLECTIONS:

								Ratio
Initial load (in)	at 12.36 ft	=	-0.538	L/D	=	536		
Live load (in)	at 12.36 ft	=	-0.292	L/D	=	988	> 360	0.36
Post Comp load (in)	at 12.36 ft	=	-0.315	L/D	=	914	> 240	0.26
Net Total load (in)	at 12.36 ft	=	-0.853	L/D	=	338	> 240	0.71

Floor Type: Level 3 **Beam Number = 53**

SPAN INFORMATION (ft): I-End (71.25,138.50) J-End (110.92,138.50)

Beam Size (User Selected) = W24X55 Fy = 50.0 ksi
Total Beam Length (ft) = 39.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	107.50	Y bar(in)	=	22.93
Mnf (kip-ft)	=	1063.42	Mn (kip-ft)	=	940.55
C (kips)	=	411.79	PNA (in)	=	22.23
Ieff (in4)	=	3348.30	Itr (in4)	=	4152.63
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
\# of studs: Max = 78 Partial = 52 Actual = 52
Number of Stud Rows = 2 Percent of Full Composite Action = 50.84

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.618	0.545	0.908	19.1%	Red	0.000	0.227
	39.666	0.618	0.545	0.908			0.000	0.227
2	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	39.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 39.32 kips 0.90Vn = 251.69 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	213.1	19.8	0.0	1.00	0.90	502.50
	Init DL	1.4DL	165.2	19.8	---	---		
	Max +	1.2DL+1.6LL	390.0	19.8	---	---	0.90	846.49
Controlling		1.2DL+1.6LL	390.0	19.8	---	---	0.90	846.49

REACTIONS (kips):

	Left	Right
Initial reaction	16.41	16.41
DL reaction	13.34	13.34
Max +LL reaction	14.57	14.57
Max +total reaction (factored)	39.32	39.32

DEFLECTIONS:

Initial load (in)	at	19.83 ft	=	-0.854	L/D	=	557			
Live load (in)	at	19.83 ft	=	-0.421	L/D	=	1129	>	360	0.32
Post Comp load (in)	at	19.83 ft	=	-0.463	L/D	=	1028	>	240	0.23
Net Total load (in)	at	19.83 ft	=	-1.317	L/D	=	361	>	240	0.66

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 54**

SPAN INFORMATION (ft): I-End (50.50,121.58) J-End (77.25,121.58)

Beam Size (Optimum) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 26.75
Cantilever on left (ft) = 6.42
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	0.54	0.00	0.0	0.00	0.00	0.0	0.77	Snow	0.00
9.333	1.74	2.43	1.6	0.00	0.00	0.0	0.00	Snow	0.00
9.333	3.91	0.00	0.0	0.00	0.00	0.0	0.66	Snow	0.00
13.583	2.72	3.88	1.6	0.00	0.00	0.0	0.00	Snow	0.00
20.750	9.05	12.10	1.6	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	6.417	0.400	0.000	---	NonR	0.000
	9.333	0.400	0.000			0.000
2	0.000	0.003	0.000	---	Snow	0.000
	4.833	0.003	0.000			0.000
3	4.834	0.003	0.000	---	Snow	0.000
	5.458	0.002	0.000			0.000
4	4.834	0.091	0.133	0.0%	Red	0.000
	6.416	0.000	0.000			0.000
5	0.000	0.000	0.007	---	Snow	0.000
	5.458	0.000	0.007			0.000
6	5.459	0.000	0.007	---	Snow	0.000
	5.777	0.000	0.005			0.000
7	5.778	0.000	0.005	---	Snow	0.000
	6.097	0.000	0.000			0.000
8	20.750	0.229	0.337	1.6%	Red	0.000
	26.750	0.229	0.337			0.000
9	0.000	0.065	0.000	---	Snow	0.000
	6.416	0.065	0.000			0.000
10	6.417	0.065	0.000	---	Snow	0.000
	9.333	0.065	0.000			0.000
11	0.000	0.000	0.150	---	Snow	0.000
	6.416	0.000	0.150			0.000
12	6.417	0.000	0.150	---	Snow	0.000
	9.333	0.000	0.143			0.000
13	9.334	0.000	0.000	1.6%	Red	0.000
	9.583	0.017	0.025			0.000
14	9.584	0.017	0.025	1.6%	Red	0.000
	26.750	0.017	0.025			0.000
15	0.000	0.035	0.000	---	NonR	0.000
	6.416	0.035	0.000			0.000

Load	Dist	DL	LL	Red%	Type	PartL
16	6.417	0.035	0.000	---	NonR	0.000
	26.750	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.04 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Left	Max -	1.2DL+1.6LL	-20.1	6.4	6.4	1.00	0.90	223.70
Center	Max +	1.2DL+1.6LL	169.9	20.8	7.2	1.08	0.90	232.36
	Max -	1.2DL+1.6LL	-20.1	6.4	2.9	2.27	0.90	249.38
Controlling		1.2DL+1.6LL	169.9	20.8	7.2	1.08	0.90	232.36

REACTIONS (kips):

	Left	**Right**
DL reaction	12.76	9.67
Max +LL reaction	11.77	12.15
Max -LL reaction	0.00	-0.41
Max +total reaction (factored)	34.14	31.04

DEFLECTIONS:

					Ratio
Left cantilever:					
Dead load (in)		= 0.240	L/D = 640		
Pos Live load (in)		= -0.054	L/D = 2841	> 360	0.13
Neg Live load (in)		= 0.299	L/D = 515	> 360	0.70
Neg Total load (in)		= 0.540	L/D = 285	> 240	0.84
Center span:					
Dead load (in)	at 16.99 ft	= -0.256	L/D = 951		
Live load (in)	at 16.99 ft	= -0.311	L/D = 784	> 360	0.46
Net Total load (in)	at 16.99 ft	= -0.568	L/D = 430	> 240	0.56

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 55**

SPAN INFORMATION (ft): I-End (56.92,121.58) J-End (56.92,135.17)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 13.58

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	36.50	Y bar(in)	=	14.04
Mnf (kip-ft)	=	286.78	Mn (kip-ft)	=	217.61
C (kips)	=	103.38	PNA (in)	=	11.34
Ieff (in4)	=	479.35	Itr (in4)	=	695.71
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 13 Partial = 13 Actual = 13
Number of Stud Rows = 1 Percent of Full Composite Action = 31.85

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.400	0.000	0.000	---	NonR	0.000	0.000
	13.583	0.400	0.000	0.000			0.000	0.000
2	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	1.583	0.108	0.095	0.158			0.000	0.040
3	1.592	0.108	0.095	0.158	0.0%	Red	0.000	0.040
	11.991	0.108	0.095	0.158			0.000	0.040
4	12.000	0.108	0.095	0.158	0.0%	Red	0.000	0.040
	13.583	0.000	0.000	0.000			0.000	0.000
5	0.000	0.099	0.087	0.146	0.0%	Red	0.000	0.036
	13.583	0.099	0.087	0.146			0.000	0.036
6	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	13.583	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.12 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	8.4	6.8	0.0	1.00	0.90	124.50
	Init DL	1.4DL	6.5	6.8	---	---		
	Max +	1.2DL+1.6LL	28.5	6.8	---	---	0.90	195.85
Controlling		1.2DL+1.6LL	28.5	6.8	---	---	0.90	195.85

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	1.80	1.80
DL reaction	4.18	4.18
Max +LL reaction	1.94	1.94
Max +total reaction (factored)	8.12	8.12

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.79 ft	=	-0.027	L/D	=	6066			
Live load (in)	at	6.79 ft	=	-0.017	L/D	=	9841	>	360	0.04
Post Comp load (in)	at	6.79 ft	=	-0.040	L/D	=	4082	>	240	0.06
Net Total load (in)	at	6.79 ft	=	-0.067	L/D	=	2440	>	240	0.10

Floor Type: Level 3 **Beam Number = 56**

SPAN INFORMATION (ft): I-End (71.25,121.58) J-End (71.25,135.17)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 13.58

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	40.75	Y bar(in)	=	16.18
Mnf (kip-ft)	=	561.39	Mn (kip-ft)	=	445.39
C (kips)	=	120.61	PNA (in)	=	12.78
Ieff (in4)	=	1193.75	Itr (in4)	=	1691.97
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Full = 50 Partial = 14 Actual = 14
Number of Stud Rows = 1 Percent of Full Composite Action = 28.66

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
6.750	14.16	12.62	19.22	6.7	0.00	0.00	0.0	0.00	Snow	0.00	4.80

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.244	0.215	0.358	6.7%	Red	0.000	0.090
	13.583	0.244	0.215	0.358			0.000	0.090
2	0.000	0.040	0.040	0.000	---	NonR	0.000	0.000
	13.583	0.040	0.040	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 28.93 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	87.9	6.7	0.0	1.00	0.90	294.00
	Init DL	1.4DL	68.2	6.7	---	---		
	Max +	1.2DL+1.6LL	175.4	6.7	---	---	0.90	400.85
Controlling		1.2DL+1.6LL	175.4	6.7	---	---	0.90	400.85

REACTIONS (kips):

	Left	Right
Initial reaction	11.11	11.00
DL reaction	9.05	8.96
Max +LL reaction	11.30	11.19

PRCNC20221036

	Left	Right
Max +total reaction (factored)	28.93	28.65

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.79 ft	=	-0.075	L/D	=	2168			
Live load (in)	at	6.79 ft	=	-0.054	L/D	=	3010	>	360	0.12
Post Comp load (in)	at	6.79 ft	=	-0.059	L/D	=	2773	>	240	0.09
Net Total load (in)	at	6.79 ft	=	-0.134	L/D	=	1217	>	240	0.20

Floor Type: Level 3 **Beam Number = 57**

SPAN INFORMATION (ft): I-End (110.92,146.50) J-End (110.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

										Ratio
Initial load (in)	at 15.00 ft	=	-0.278	L/D	=	1294				
Live load (in)	at 15.00 ft	=	-0.178	L/D	=	2020	>	360		0.18
Post Comp load (in)	at 15.00 ft	=	-0.195	L/D	=	1849	>	240		0.13
Net Total load (in)	at 15.00 ft	=	-0.473	L/D	=	761	>	240		0.32

Floor Type: Level 3 **Beam Number = 58**

SPAN INFORMATION (ft): I-End (125.92,146.50) J-End (125.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

										Ratio
Initial load (in)	at	15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at	15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at	15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at	15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Floor Type: Level 3 **Beam Number = 59**

SPAN INFORMATION (ft): I-End (140.92,146.50) J-End (140.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1165.69
C (kips)	=	301.52	PNA (in)	=	18.80
Ieff (in4)	=	4013.50	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 129 Partial = 33 Actual = 33
Number of Stud Rows = 1 Percent of Full Composite Action = 25.26

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	0.00	0.0	9.37	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	1.84	0.0	7.08	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 40.84 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	404.0	12.3	---	---	0.90	1049.12
Controlling		1.2DL+1.6LL	403.8	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	16.72	16.57
Max +total reaction (factored)	40.84	40.59

DEFLECTIONS:

										Ratio
Initial load (in)	at	15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at	15.00 ft	=	-0.237	L/D	=	1520	>	360	0.24
Post Comp load (in)	at	15.00 ft	=	-0.254	L/D	=	1418	>	240	0.17
Net Total load (in)	at	15.00 ft	=	-0.532	L/D	=	677	>	240	0.35

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 60**

SPAN INFORMATION (ft): I-End (155.92,146.50) J-End (155.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1111.77
C (kips)	=	236.91	PNA (in)	=	17.33
Ieff (in4)	=	3796.14	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 129 Partial = 33 Actual = 33
Number of Stud Rows = 1 Percent of Full Composite Action = 25.81

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	0.00	0.0	9.37	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	0.00	0.0	9.37	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	1.84	0.0	7.08	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	1.84	0.0	7.08	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 43.59 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	431.3	10.0	---	---	0.90	1000.59
Controlling		1.2DL+1.6LL	431.3	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	18.44	18.14
Max +total reaction (factored)	43.59	43.10

DEFLECTIONS:

										Ratio
Initial load (in)	at	15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at	15.00 ft	=	-0.275	L/D	=	1309	>	360	0.28
Post Comp load (in)	at	15.00 ft	=	-0.293	L/D	=	1228	>	240	0.20
Net Total load (in)	at	15.00 ft	=	-0.571	L/D	=	630	>	240	0.38

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 61**

SPAN INFORMATION (ft): I-End (170.92,146.50) J-End (170.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1165.69
C (kips)	=	301.52	PNA (in)	=	18.80
Ieff (in4)	=	4013.50	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 129 Partial = 33 Actual = 33
Number of Stud Rows = 1 Percent of Full Composite Action = 25.26

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	0.00	0.0	9.37	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	1.84	0.0	7.08	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 40.84 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	404.0	12.3	---	---	0.90	1049.12
Controlling		1.2DL+1.6LL	403.8	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	16.72	16.57
Max +total reaction (factored)	40.84	40.59

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at 15.00 ft	=	-0.237	L/D	=	1520	>	360	0.24
Post Comp load (in)	at 15.00 ft	=	-0.254	L/D	=	1418	>	240	0.17
Net Total load (in)	at 15.00 ft	=	-0.532	L/D	=	677	>	240	0.35

PRCNC20221036

Floor Type: Level 3 **Beam Number = 62**

SPAN INFORMATION (ft): I-End (185.92,146.50) J-End (185.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at 15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at 15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at 15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Floor Type: Level 3 **Beam Number = 63**

SPAN INFORMATION (ft): I-End (200.92,146.50) J-End (200.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

Gravity Beam Design

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

										Ratio
Initial load (in)	at	15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at	15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at	15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at	15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 64**

SPAN INFORMATION (ft): I-End (110.92,118.17) J-End (110.92,138.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	43.50	Y bar(in)	=	16.62
Mnf (kip-ft)	=	511.19	Mn (kip-ft)	=	439.45
C (kips)	=	193.83	PNA (in)	=	15.31
Ieff (in4)	=	1175.35	Itr (in4)	=	1516.65
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 42 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 43.69

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.167	6.59	5.86	9.18	13.0	0.00	0.00	0.0	0.00	Snow	0.00	2.30
10.167	14.75	13.14	20.09	13.0	0.00	0.00	0.0	0.00	Snow	0.00	5.02

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	20.333	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 33.60 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	177.6	10.2	10.2	1.66	0.90	249.38
	Init DL	1.4DL	137.8	10.2	---	---		
	Max +	1.2DL+1.6LL	339.5	10.2	---	---	0.90	395.50
Controlling		1.2DL+1.6LL	339.5	10.2	---	---	0.90	395.50

REACTIONS (kips):

	Left	Right
Initial reaction	13.52	13.52
DL reaction	11.03	11.03
Max +LL reaction	12.73	12.73
Max +total reaction (factored)	33.60	33.60

Gravity Beam Design

DEFLECTIONS:

								Ratio
Initial load (in)	at 10.17 ft	=	-0.398	L/D	=	613		
Live load (in)	at 10.17 ft	=	-0.226	L/D	=	1079	> 360	0.33
Post Comp load (in)	at 10.17 ft	=	-0.247	L/D	=	988	> 240	0.24
Net Total load (in)	at 10.17 ft	=	-0.645	L/D	=	378	> 240	0.63

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 65**

SPAN INFORMATION (ft): I-End (134.92,118.17) J-End (134.92,138.50)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	61.00	Y bar(in)	=	16.51
Mnf (kip-ft)	=	383.58	Mn (kip-ft)	=	322.78
C (kips)	=	193.83	PNA (in)	=	15.35
Ieff (in4)	=	853.34	Itr (in4)	=	1078.42
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 36 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 50.48

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.167	7.52	6.67	10.67	2.5	0.00	0.00	0.0	0.00	Snow	0.00	2.67
10.167	7.61	6.75	10.74	2.5	0.00	0.00	0.0	0.00	Snow	0.00	2.68

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	20.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.09 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	127.0	10.2	10.2	1.66	0.90	165.75
	Init DL	1.4DL	97.4	10.2	---	---		
	Max +	1.2DL+1.6LL	263.7	10.2	---	---	0.90	290.50
Controlling		1.2DL+1.6LL	263.7	10.2	---	---	0.90	290.50

REACTIONS (kips):

	Left	Right
Initial reaction	9.65	9.65
DL reaction	7.83	7.83
Max +LL reaction	10.44	10.44
Max +total reaction (factored)	26.09	26.09

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	10.17 ft	=	-0.477	L/D	=	512			
Live load (in)	at	10.17 ft	=	-0.255	L/D	=	956	>	360	0.38
Post Comp load (in)	at	10.17 ft	=	-0.276	L/D	=	883	>	240	0.27
Net Total load (in)	at	10.17 ft	=	-0.753	L/D	=	324	>	240	0.74

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 66**

SPAN INFORMATION (ft): I-End (185.92,118.17) J-End (185.92,138.50)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	61.00	Y bar(in)	=	17.36
Mnf (kip-ft)	=	619.01	Mn (kip-ft)	=	497.26
C (kips)	=	193.83	PNA (in)	=	15.10
Ieff (in4)	=	1334.18	Itr (in4)	=	1871.96
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 56 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 32.85

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.167	10.90	9.68	15.25	1.4	0.00	0.00	0.0	0.00	Snow	0.00	3.81
10.167	3.81	3.37	5.51	1.4	0.00	0.00	0.0	0.00	Snow	0.00	1.38

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.040	0.040	0.000	---	NonR	0.000	0.000
	20.333	0.040	0.040	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 25.69 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	124.3	10.2	10.2	1.66	0.90	294.00
	Init DL	1.4DL	95.7	10.2	---	---		
	Max +	1.2DL+1.6LL	258.7	10.2	---	---	0.90	447.54
Controlling		1.2DL+1.6LL	258.7	10.2	---	---	0.90	447.54

REACTIONS (kips):

	Left	Right
Initial reaction	9.52	9.52
DL reaction	7.76	7.76
Max +LL reaction	10.23	10.23
Max +total reaction (factored)	25.69	25.69

PRCNC20221036

DEFLECTIONS:

								Ratio
Initial load (in)	at 10.17 ft	=	-0.231	L/D	=	1056		
Live load (in)	at 10.17 ft	=	-0.160	L/D	=	1524	> 360	0.24
Post Comp load (in)	at 10.17 ft	=	-0.173	L/D	=	1410	> 240	0.17
Net Total load (in)	at 10.17 ft	=	-0.404	L/D	=	604	> 240	0.40

Floor Type: Level 3 **Beam Number = 67**

SPAN INFORMATION (ft): I-End (211.51,109.03) J-End (218.59,110.93)

Beam Size (User Selected) = W27X84 Fy = 50.0 ksi
Total Beam Length (ft) = 7.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	22.00	Y bar(in)	=	17.77
Mnf (kip-ft)	=	1286.44	Mn (kip-ft)	=	1100.65
C (kips)	=	58.58	PNA (in)	=	14.62
Ieff (in4)	=	3795.71	Itr (in4)	=	4700.93
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 21 Partial = 11 Actual = 11
Number of Stud Rows = 2 Percent of Full Composite Action = 25.20

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
4.561	14.63	13.09	16.54	0.0	6.75	0.00	0.0	0.00	Snow	0.00	4.81

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.300	0.265	0.441	0.0%	Red	0.000	0.110
	4.560	0.261	0.231	0.384			0.000	0.096
2	4.561	0.000	0.000	0.000	---	NonR	0.000	0.000
	7.333	0.024	0.021	0.087			0.000	0.009
3	0.000	0.221	0.195	0.813	---	NonR	0.000	0.081
	7.333	0.221	0.195	0.813			0.000	0.081
4	0.000	0.084	0.084	0.000	---	NonR	0.000	0.000
	7.333	0.084	0.084	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 41.79 kips 1.00Vn = 368.46 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	45.1	4.6	0.0	1.00	0.90	915.00
	Init DL	1.4DL	35.4	4.6	---	---		
	Max +	1.2DL+1.6LL	109.0	4.6	---	---	0.90	990.59
Controlling		1.2DL+1.6LL	109.0	4.6	---	---	(	

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	9.21	12.98
DL reaction	7.55	10.64
Max +LL reaction	13.11	18.14
Max +total reaction (factored)	30.03	41.79

DEFLECTIONS:

										Ratio
Initial load (in)	at	3.89 ft	=	-0.002	L/D	=	3623 8			
Live load (in)	at	3.89 ft	=	-0.003	L/D	=	2571 9	>	360	0.01
Post Comp load (in)	at	3.89 ft	=	-0.004	L/D	=	2421 9	>	240	0.01
Net Total load (in)	at	3.89 ft	=	-0.006	L/D	=	1451 7	>	240	0.02

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 68**

SPAN INFORMATION (ft): I-End (245.92,118.17) J-End (245.92,135.17)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 17.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	39.50	Y bar(in)	=	16.34
Mnf (kip-ft)	=	498.57	Mn (kip-ft)	=	405.01
C (kips)	=	137.84	PNA (in)	=	13.44
Ieff (in4)	=	1076.90	Itr (in4)	=	1479.22
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 34 Partial = 17 Actual = 17
Number of Stud Rows = 1 Percent of Full Composite Action = 34.21

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.370	0.000	0.000	---	NonR	0.000	0.000
	17.000	1.370	0.000	0.000			0.000	0.000
2	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	17.000	0.340	0.300	0.500			0.000	0.125
3	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	17.000	0.079	0.070	0.117			0.000	0.029
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	17.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.99 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	26.5	8.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	20.5	8.5	---	---		
	Max +	1.2DL+1.6LL	114.7	8.5	---	---	0.90	364.51
Controlling		1.2DL+1.6LL	114.7	8.5	---	---	0.90	364.51

REACTIONS (kips):

	Left	Right
Initial reaction	4.75	4.75
DL reaction	15.51	15.51
Max +LL reaction	5.24	5.24
Max +total reaction (factored)	26.99	26.99

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

											Ratio
Initial load (in)	at	8.50 ft	=	-0.051	L/D	=	3964				
Live load (in)	at	8.50 ft	=	-0.037	L/D	=	5498	>	360		0.07
Post Comp load (in)	at	8.50 ft	=	-0.123	L/D	=	1665	>	240		0.14
Net Total load (in)	at	8.50 ft	=	-0.174	L/D	=	1173	>	240		0.20

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 69**

SPAN INFORMATION (ft): I-End (245.92,103.42) J-End (245.92,118.17)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 14.75
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
4.939	8.11	0.00	0.0	27.93	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	1.370	0.000	---	NonR	0.000
	14.750	1.370	0.000			0.000
2	0.000	0.042	0.154	---	NonR	0.000
	4.939	0.000	0.000			0.000
3	4.939	0.083	0.307	---	NonR	0.000
	14.750	0.000	0.000			0.000
4	0.000	0.079	0.292	---	NonR	0.000
	14.750	0.079	0.292			0.000
5	0.000	0.035	0.000	---	NonR	0.000
	14.750	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 54.71 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	240.4	4.9	0.0	1.00	0.90	249.38
Controlling		1.2DL+1.6LL	240.4	4.9	0.0	1.00	0.90	249.38

REACTIONS (kips):

	Left	**Right**
DL reaction	16.61	13.90
Max +LL reaction	21.73	12.38
Max +total reaction (factored)	54.71	36.49

DEFLECTIONS:

										Ratio
Dead load (in)	at	7.15 ft	=	-0.164	L/D	=	1078			
Live load (in)	at	6.93 ft	=	-0.220	L/D	=	805	>	360	0.45
Net Total load (in)	at	6.93 ft	=	-0.384	L/D	=	461	>	240	0.52

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 70**

SPAN INFORMATION (ft): I-End (245.92,88.57) J-End (245.92,103.42)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 14.85
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
9.893	7.23	0.00	0.0	25.24	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	1.370	0.000	---	NonR	0.000
	14.846	1.370	0.000			0.000
2	0.000	0.084	0.309	---	NonR	0.000
	9.892	0.000	0.000			0.000
3	9.893	0.045	0.166	---	NonR	0.000
	14.846	0.000	0.000			0.000
4	0.000	0.079	0.292	---	NonR	0.000
	14.846	0.079	0.292			0.000
5	0.000	0.035	0.000	---	NonR	0.000
	14.846	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 50.65 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	222.0	9.9	0.0	1.00	0.90	249.38
Controlling		1.2DL+1.6LL	222.0	9.9	0.0	1.00	0.90	249.38

REACTIONS (kips):

	Left	**Right**
DL reaction	13.78	16.02
Max +LL reaction	11.87	19.64
Max +total reaction (factored)	35.52	50.65

DEFLECTIONS:

										Ratio
Dead load (in)	at	7.65 ft	=	-0.161	L/D	=	1104			
Live load (in)	at	7.79 ft	=	-0.203	L/D	=	878	>	360	0.41
Net Total load (in)	at	7.79 ft	=	-0.364	L/D	=	489	>	240	0.49

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 71**

SPAN INFORMATION (ft): I-End (229.80,84.25) J-End (245.92,88.57)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 16.69
Mp (kip-ft) = 277.08

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	1.370	0.000	---	NonR	0.000
	16.688	1.370	0.000			0.000
2	0.000	0.325	1.194	---	NonR	0.000
	16.688	0.325	1.194			0.000
3	0.000	0.079	0.292	---	NonR	0.000
	16.688	0.079	0.292			0.000
4	0.000	0.035	0.000	---	NonR	0.000
	16.688	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 37.95 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	158.4	8.3	0.0	1.00	0.90	249.38
Controlling		1.2DL+1.6LL	158.4	8.3	0.0	1.00	0.90	249.38

REACTIONS (kips):

	Left	**Right**
DL reaction	15.10	15.10
Max +LL reaction	12.40	12.40
Max +total reaction (factored)	37.95	37.95

DEFLECTIONS:

									Ratio
Dead load (in)	at	8.34 ft	=	-0.213	L/D	=	938		
Live load (in)	at	8.34 ft	=	-0.175	L/D	=	1142	> 360	0.32
Net Total load (in)	at	8.34 ft	=	-0.389	L/D	=	515	> 240	0.47

PRCNC20221036

Floor Type: Level 3 **Beam Number = 72**

SPAN INFORMATION (ft): I-End (218.93,81.34) J-End (229.80,84.25)

Beam Size (Optimum) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 11.25
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.333	10.75	0.00	0.0	33.55	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.400	0.000	---	NonR	0.000
	11.250	0.400	0.000			0.000
2	0.000	0.224	0.823	---	NonR	0.000
	7.333	0.224	0.823			0.000
3	7.334	0.325	1.194	---	NonR	0.000
	11.250	0.325	1.194			0.000
4	0.000	0.079	0.292	---	NonR	0.000
	11.250	0.079	0.292			0.000
5	0.000	0.035	0.000	---	NonR	0.000
	11.250	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 60.73 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	211.9	7.3	0.0	1.00	0.90	249.38
Controlling		1.2DL+1.6LL	211.9	7.3	0.0	1.00	0.90	249.38

REACTIONS (kips):

	Left	**Right**
DL reaction	7.96	11.49
Max +LL reaction	18.20	29.34
Max +total reaction (factored)	38.68	60.73

DEFLECTIONS:										**Ratio**
Dead load (in)	at	5.96 ft	=	-0.051	L/D	=	2623			
Live load (in)	at	5.96 ft	=	-0.132	L/D	=	1022	>	360	0.35
Net Total load (in)	at	5.96 ft	=	-0.184	L/D	=	735	>	240	0.33

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 73**

SPAN INFORMATION (ft): I-End (192.77,74.33) J-End (218.93,81.34)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	54.63	Y bar(in)	=	19.05
Mnf (kip-ft)	=	725.50	Mn (kip-ft)	=	615.71
C (kips)	=	223.99	PNA (in)	=	16.75
Ieff (in4)	=	1850.43	Itr (in4)	=	2431.91
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 54 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 40.20

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	27.083	1.210	0.000	0.000			0.000	0.000
2	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	27.083	0.325	0.287	0.478			0.000	0.119
3	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	27.083	0.079	0.070	0.117			0.000	0.029
4	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	27.083	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 39.83 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	65.9	13.5	0.0	1.00	0.90	357.75
	Init DL	1.4DL	51.5	13.5	---	---		
	Max +	1.2DL+1.6LL	269.7	13.5	---	---	0.90	554.14
Controlling		1.2DL+1.6LL	269.7	13.5	---	---	0.90	554.14

REACTIONS (kips):

	Left	Right
Initial reaction	7.44	7.44
DL reaction	22.46	22.46
Max +LL reaction	8.05	8.05
Max +total reaction (factored)	39.83	39.83

PRCNC20221036

DEFLECTIONS:

									Ratio
Initial load (in)	at 13.54 ft	=	-0.199	L/D	=	1637			
Live load (in)	at 13.54 ft	=	-0.134	L/D	=	2424	>	360	0.15
Post Comp load (in)	at 13.54 ft	=	-0.418	L/D	=	778	>	240	0.31
Net Total load (in)	at 13.54 ft	=	-0.616	L/D	=	527	>	240	0.46

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 74**

SPAN INFORMATION (ft): I-End (168.30,67.77) J-End (177.96,70.36)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	29.00	Y bar(in)	=	14.69
Mnf (kip-ft)	=	338.45	Mn (kip-ft)	=	261.50
C (kips)	=	86.15	PNA (in)	=	11.30
Ieff (in4)	=	629.35	Itr (in4)	=	909.44
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 20 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 29.12

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	10.000	1.210	0.000	0.000			0.000	0.000
2	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	10.000	0.325	0.287	0.478			0.000	0.119
3	0.000	0.079	0.070	0.117	0.0%	Red	0.000	0.029
	10.000	0.079	0.070	0.117			0.000	0.029
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	10.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 14.60 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	8.7	5.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	6.7	5.0	---	---		
	Max +	1.2DL+1.6LL	36.5	5.0	---	---	0.90	235.35
Controlling		1.2DL+1.6LL	36.5	5.0	---	---	0.90	235.35

REACTIONS (kips):

	Left	Right
Initial reaction	2.66	2.66
DL reaction	8.20	8.20
Max +LL reaction	2.97	2.97
Max +total reaction (factored)	14.60	14.60

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.00 ft	=	-0.010	L/D	=	1216 2			
Live load (in)	at	5.00 ft	=	-0.007	L/D	=	1637 5	>	360	0.02
Post Comp load (in)	at	5.00 ft	=	-0.023	L/D	=	5256	>	240	0.05
Net Total load (in)	at	5.00 ft	=	-0.033	L/D	=	3670	>	240	0.07

PRCNC20221036

Floor Type: Level 3 **Beam Number = 75**

SPAN INFORMATION (ft): I-End (139.32,60.01) J-End (168.30,67.77)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	52.50	Y bar(in)	=	14.79
Mnf (kip-ft)	=	297.55	Mn (kip-ft)	=	272.86
C (kips)	=	241.22	PNA (in)	=	13.53
Ieff (in4)	=	674.98	Itr (in4)	=	751.07
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 74.33

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL
28.167	5.84	0.06								

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	30.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.401	0.287	0.000	---	Snow	0.000	0.119
	30.000	0.401	0.287	0.000			0.000	0.119
3	0.000	0.000	0.000	0.143	---	Snow	0.000	0.000
	30.000	0.000	0.000	0.143			0.000	0.000
4	0.000	0.053	0.038	0.000	---	Snow	0.000	0.016
	30.000	0.053	0.038	0.000			0.000	0.016
5	0.000	0.000	0.000	0.019	---	Snow	0.000	0.000
	30.000	0.000	0.000	0.019			0.000	0.000
6	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	30.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 19.21 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	71.1	15.0	0.0	1.00	0.90	124.50
	Init DL	1.4DL	54.6	15.0	---	---		

PRCNC20221036

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
	Max +	1.2DL+1.6LL	101.3	15.5	---	---	0.90	245.58
Controlling		1.2DL+1.6LL	71.1	15.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
Initial reaction	7.22	7.27
DL reaction	7.65	12.77
Max +LL reaction	2.43	2.43
Max +total reaction (factored)	13.06	19.21

DEFLECTIONS: (Camber = 3/4)

					Ratio
Initial load (in)	at 15.15 ft	= -1.095	L/D = 329		
Live load (in)	at 15.15 ft	= -0.151	L/D = 2386	> 360	0.15
Post Comp load (in)	at 15.15 ft	= -0.333	L/D = 1080	> 240	0.22
Net Total load (in)	at 15.15 ft	= -0.679	L/D = 531	> 240	0.45

Floor Type: Level 3 **Beam Number = 76**

SPAN INFORMATION (ft): I-End (112.27,52.76) J-End (139.32,60.01)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.00
Mp (kip-ft) = 138.33

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	28.000	0.010	0.000			0.000
2	0.000	0.401	0.000	---	Snow	0.000
	28.000	0.401	0.000			0.000
3	0.000	0.000	0.143	---	Snow	0.000
	28.000	0.000	0.143			0.000
4	0.000	0.053	0.000	---	Snow	0.000
	28.000	0.053	0.000			0.000
5	0.000	0.000	0.019	---	Snow	0.000
	28.000	0.000	0.019			0.000
6	0.000	0.022	0.000	---	NonR	0.000
	28.000	0.022	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 11.79 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	82.6	14.0	0.0	1.00	0.90	124.50
Controlling		1.2DL+1.6LL	82.6	14.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
DL reaction	6.80	6.80
Max +LL reaction	2.27	2.27
Max +total reaction (factored)	11.79	11.79

DEFLECTIONS: (Camber = 3/4)

										Ratio
Dead load (in)	at	14.00 ft	=	-1.164	L/D	=	289			
Live load (in)	at	14.00 ft	=	-0.388	L/D	=	865	>	360	0.42
Net Total load (in)	at	14.00 ft	=	-0.803	L/D	=	418	>	240	0.57

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 77**

SPAN INFORMATION (ft): I-End (84.58,45.34) J-End (112.27,52.76)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	50.50	Y bar(in)	=	14.71
Mnf (kip-ft)	=	296.58	Mn (kip-ft)	=	272.32
C (kips)	=	241.22	PNA (in)	=	13.53
Ieff (in4)	=	670.16	Itr (in4)	=	745.48
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 28 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 74.33

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	28.666	0.010	0.000	0.000			0.000	0.000
2	0.000	0.401	0.287	0.000	---	Snow	0.000	0.119
	28.666	0.401	0.287	0.000			0.000	0.119
3	0.000	0.000	0.000	0.143	---	Snow	0.000	0.000
	28.666	0.000	0.000	0.143			0.000	0.000
4	0.000	0.052	0.037	0.000	---	Snow	0.000	0.016
	28.666	0.053	0.038	0.000			0.000	0.016
5	0.000	0.000	0.000	0.019	---	Snow	0.000	0.000
	28.666	0.000	0.000	0.019			0.000	0.000
6	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	28.666	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 12.07 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	64.9	14.3	0.0	1.00	0.90	124.50
	Init DL	1.4DL	49.8	14.3	---	---		
	Max +	1.2DL+1.6LL	86.5	14.3	---	---	0.90	245.09
Controlling		1.2DL+1.6LL	64.9	14.3	0.0	1.00	0.90	124.50

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	6.90	6.90
DL reaction	6.96	6.96
Max +LL reaction	2.32	2.32
Max +total reaction (factored)	12.07	12.07

DEFLECTIONS:

										Ratio
Initial load (in)	at	14.33 ft	=	-0.912	L/D	=	377			
Live load (in)	at	14.33 ft	=	-0.127	L/D	=	2715	>	360	0.13
Post Comp load (in)	at	14.33 ft	=	-0.236	L/D	=	1458	>	240	0.16
Net Total load (in)	at	14.33 ft	=	-1.148	L/D	=	300	>	240	0.80

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 78**

SPAN INFORMATION (ft): I-End (77.17,73.03) J-End (104.86,80.45)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	48.60	Y bar(in)	=	14.64
Mnf (kip-ft)	=	295.58	Mn (kip-ft)	=	260.57
C (kips)	=	206.76	PNA (in)	=	13.46
Ieff (in4)	=	630.74	Itr (in4)	=	739.88
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 28 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 56.05

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
18.250	0.59	0.46	0.00	0.0	0.00	0.00	0.0	0.16	Snow	0.00	0.13
23.667	0.63	0.48	0.00	0.0	0.00	0.00	0.0	0.16	Snow	0.00	0.16

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	18.250	0.010	0.000	0.000			0.000	0.000
2	0.000	0.052	0.037	0.000	---	Snow	0.000	0.016
	17.616	0.052	0.037	0.000			0.000	0.016
3	17.626	0.052	0.037	0.000	---	Snow	0.000	0.016
	18.250	0.000	0.000	0.000			0.000	0.000
4	0.000	0.000	0.000	0.019	---	Snow	0.000	0.000
	17.625	0.000	0.000	0.019			0.000	0.000
5	17.626	0.000	0.000	0.019	---	Snow	0.000	0.000
	18.250	0.000	0.000	0.000			0.000	0.000
6	18.251	0.357	0.255	0.000	---	Snow	0.000	0.106
	21.389	0.357	0.255	0.000			0.000	0.106
7	21.390	0.357	0.255	0.000	---	Snow	0.000	0.106
	23.666	0.000	0.000	0.000			0.000	0.000
8	18.251	0.000	0.000	0.128	---	Snow	0.000	0.000
	21.389	0.000	0.000	0.128			0.000	0.000
9	21.390	0.000	0.000	0.127	---	Snow	0.000	0.000

PRCNC20221036

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
	23.666	0.000	0.000	0.000			0.000	0.000
10	23.667	0.028	0.020	0.000	---	Snow	0.000	0.008
	28.666	0.028	0.020	0.000			0.000	0.008
11	23.667	0.000	0.000	0.010	---	Snow	0.000	0.000
	28.666	0.000	0.000	0.010			0.000	0.000
12	0.000	0.401	0.287	0.000	---	Snow	0.000	0.119
	28.666	0.401	0.287	0.000			0.000	0.119
13	0.000	0.000	0.000	0.143	---	Snow	0.000	0.000
	28.666	0.000	0.000	0.143			0.000	0.000
14	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	28.666	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 14.76 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	78.1	15.7	0.0	1.00	0.90	124.50
	Init DL	1.4DL	60.3	15.8	---	---		
	Max +	1.2DL+1.6LL	103.2	15.7	---	---	0.90	234.52
Controlling		1.2DL+1.6LL	78.1	15.7	---	---	0.90	124.50

REACTIONS (kips):

	Left	**Right**
Initial reaction	7.57	8.57
DL reaction	7.61	8.54
Max +LL reaction	2.53	2.83
Max +total reaction (factored)	13.19	14.76

DEFLECTIONS: (Camber = 3/4)

							Ratio
Initial load (in)	at 14.62 ft	=	-1.104	L/D	=	312	
Live load (in)	at 14.62 ft	=	-0.160	L/D	=	2150 > 360	0.17
Post Comp load (in)	at 14.62 ft	=	-0.294	L/D	=	1168 > 240	0.21
Net Total load (in)	at 14.62 ft	=	-0.648	L/D	=	531 > 240	0.45

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 79**

SPAN INFORMATION (ft): I-End (104.86,80.45) J-End (131.90,87.70)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 28.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	46.00	Y bar(in)	=	18.47
Mnf (kip-ft)	=	697.90	Mn (kip-ft)	=	539.08
C (kips)	=	127.50	PNA (in)	=	13.99
Ieff (in4)	=	1616.08	Itr (in4)	=	2326.03
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 56 Partial = 36 Actual = 36
Number of Stud Rows = 2 Percent of Full Composite Action = 26.72

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
1.000	0.73	0.55	0.00	0.0	0.00	0.00	0.0	0.19	Snow	0.00	0.19
6.274	29.88	20.40	2.73	0.0	0.00	0.00	0.0	8.24	Snow	0.00	7.57
10.000	0.64	0.48	0.00	0.0	0.00	0.00	0.0	0.16	Snow	0.00	0.16
16.000	0.73	0.55	0.00	0.0	0.00	0.00	0.0	0.19	Snow	0.00	0.19
25.000	0.63	0.48	0.00	0.0	0.00	0.00	0.0	0.16	Snow	0.00	0.16

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.028	0.020	0.000	---	Snow	0.000	0.008
	0.821	0.028	0.020	0.000			0.000	0.008
2	0.822	0.028	0.020	0.000	---	Snow	0.000	0.008
	1.000	0.000	0.000	0.000			0.000	0.000
3	0.000	0.000	0.000	0.010	---	Snow	0.000	0.000
	0.821	0.000	0.000	0.010			0.000	0.000
4	0.822	0.000	0.000	0.010	---	Snow	0.000	0.000
	0.881	0.000	0.000	0.007			0.000	0.000
5	0.881	0.000	0.000	0.007	---	Snow	0.000	0.000
	0.940	0.000	0.000	0.000			0.000	0.000
6	1.000	0.357	0.255	0.000	---	Snow	0.000	0.106
	7.722	0.357	0.255	0.000			0.000	0.106

PRCNC20221036

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
7	1.000	0.000	0.000	0.128	---	Snow	0.000	0.000
	7.722	0.000	0.000	0.128			0.000	0.000
8	7.723	0.357	0.255	0.000	---	Snow	0.000	0.106
	10.000	0.000	0.000	0.000			0.000	0.000
9	7.723	0.000	0.000	0.127	---	Snow	0.000	0.000
	10.000	0.000	0.000	0.000			0.000	0.000
10	10.000	0.028	0.020	0.000	---	Snow	0.000	0.008
	15.821	0.028	0.020	0.000			0.000	0.008
11	15.822	0.028	0.020	0.000	---	Snow	0.000	0.008
	16.000	0.000	0.000	0.000			0.000	0.000
12	10.000	0.000	0.000	0.010	---	Snow	0.000	0.000
	15.821	0.000	0.000	0.010			0.000	0.000
13	15.822	0.000	0.000	0.010	---	Snow	0.000	0.000
	15.881	0.000	0.000	0.007			0.000	0.000
14	15.881	0.000	0.000	0.007	---	Snow	0.000	0.000
	15.940	0.000	0.000	0.000			0.000	0.000
15	16.000	0.357	0.255	0.000	---	Snow	0.000	0.106
	22.722	0.357	0.255	0.000			0.000	0.106
16	22.723	0.357	0.255	0.000	---	Snow	0.000	0.106
	25.000	0.000	0.000	0.000			0.000	0.000
17	16.000	0.000	0.000	0.128	---	Snow	0.000	0.000
	22.722	0.000	0.000	0.128			0.000	0.000
18	22.723	0.000	0.000	0.127	---	Snow	0.000	0.000
	25.000	0.000	0.000	0.000			0.000	0.000
19	25.000	0.028	0.020	0.000	---	Snow	0.000	0.008
	28.000	0.028	0.020	0.000			0.000	0.008
20	25.000	0.000	0.000	0.010	---	Snow	0.000	0.000
	28.000	0.000	0.000	0.010			0.000	0.000
21	0.000	0.401	0.287	0.000	---	Snow	0.000	0.119
	28.000	0.401	0.287	0.000			0.000	0.119
22	0.000	0.000	0.000	0.143	---	Snow	0.000	0.000
	28.000	0.000	0.000	0.143			0.000	0.000
23	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	28.000	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 60.29 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	245.7	6.3	0.0	1.00	0.90	357.75
	Init DL	1.4DL	191.6	6.3	---	---		
	Max +	1.2DL+1.6LL	347.9	6.3	---	---	0.90	485.17
Controlling		1.2DL+1.6LL	347.9	6.3	---	---	0.90	485.17

REACTIONS (kips):

PRCNC20221036

	Left	Right
Initial reaction	32.79	16.50
DL reaction	34.15	16.82
Max +LL reaction	12.07	5.73
Max +total reaction (factored)	60.29	29.36

DEFLECTIONS:

									Ratio
Initial load (in)	at 13.02 ft	=	-0.727	L/D	=	462			
Live load (in)	at 13.02 ft	=	-0.188	L/D	=	1784	>	360	0.20
Post Comp load (in)	at 13.02 ft	=	-0.348	L/D	=	967	>	240	0.25
Net Total load (in)	at 13.02 ft	=	-1.075	L/D	=	313	>	240	0.77

Floor Type: Level 3 **Beam Number = 80**

SPAN INFORMATION (ft): I-End (131.90,87.70) J-End (160.88,95.46)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	58.33	Y bar(in)	=	19.26
Mnf (kip-ft)	=	737.07	Mn (kip-ft)	=	604.69
C (kips)	=	206.76	PNA (in)	=	16.26
Ieff (in4)	=	1802.93	Itr (in4)	=	2471.41
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 60 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 29.91

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
3.000	0.73	0.55	0.00	0.0	0.00	0.00	0.0	0.19	Snow	0.00	0.19
3.120	23.19	15.47	2.59	0.0	0.00	0.00	0.0	6.23	Snow	0.00	5.86
24.861	18.90	11.69	8.79	0.0	0.00	0.00	0.0	2.55	Snow	0.00	4.32
28.167	5.84	0.06									

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.028	0.020	0.000	---	Snow	0.000	0.008
	2.821	0.028	0.020	0.000			0.000	0.008
2	2.822	0.028	0.020	0.000	---	Snow	0.000	0.008
	3.000	0.000	0.000	0.000			0.000	0.000
3	0.000	0.000	0.000	0.010	---	Snow	0.000	0.000
	2.821	0.000	0.000	0.010			0.000	0.000
4	2.822	0.000	0.000	0.010	---	Snow	0.000	0.000
	2.881	0.000	0.000	0.007			0.000	0.000
5	2.881	0.000	0.000	0.007	---	Snow	0.000	0.000
	2.940	0.000	0.000	0.000			0.000	0.000
6	3.000	0.357	0.255	0.000	---	Snow	0.000	0.106
	27.722	0.357	0.255	0.000			0.000	0.106
7	3.000	0.000	0.000	0.128	---	Snow	0.000	0.000
	27.722	0.000	0.000	0.128			0.000	0.000
8	27.723	0.357	0.255	0.000	---	Snow	0.000	0.106

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
	30.000	0.000	0.000	0.000			0.000	0.000
9	27.723	0.000	0.000	0.127	---	Snow	0.000	0.000
	30.000	0.000	0.000	0.000			0.000	0.000
10	0.000	0.401	0.287	0.000	---	Snow	0.000	0.119
	30.000	0.401	0.287	0.000			0.000	0.119
11	0.000	0.000	0.000	0.143	---	Snow	0.000	0.000
	30.000	0.000	0.000	0.143			0.000	0.000
12	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	30.000	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 65.34 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	217.6	15.6	0.0	1.00	0.90	357.75
	Init DL	1.4DL	168.6	15.6	---	---		
	Max +	1.2DL+1.6LL	337.3	17.2	---	---	0.90	544.22
Controlling		1.2DL+1.6LL	295.9	24.9	---	---	0.90	449.34

REACTIONS (kips):

	Left	**Right**
Initial reaction	33.72	27.34
DL reaction	36.12	35.22
Max +LL reaction	13.75	14.24
Max +total reaction (factored)	65.34	65.05

DEFLECTIONS:

								Ratio
Initial load (in)	at 15.15 ft	=	-0.857	L/D	=	420		
Live load (in)	at 15.15 ft	=	-0.249	L/D	=	1446	> 360	0.25
Post Comp load (in)	at 15.15 ft	=	-0.455	L/D	=	792	> 240	0.30
Net Total load (in)	at 15.15 ft	=	-1.312	L/D	=	274	> 240	0.87

Floor Type: Level 3 **Beam Number = 81**

SPAN INFORMATION (ft): I-End (104.86,80.45) J-End (112.27,52.76)

Beam Size (Optimum) = W21X50 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 86.00		Y bar(in)	=	20.16
Mnf (kip-ft)	= 870.10		Mn (kip-ft)	=	721.82
C (kips)	= 279.98		PNA (in)	=	17.77
Ieff (in4)	= 2235.86		Itr (in4)	=	3012.32
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 102 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 25.50

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.556	11.55	8.34	0.00	0.0	0.00	0.00	0.0	4.01	Snow	0.00	3.34
9.556	11.83	8.55	0.00	0.0	0.00	0.00	0.0	4.11	Snow	0.00	3.42
19.111	11.55	8.34	0.00	0.0	0.00	0.00	0.0	4.01	Snow	0.00	3.34
19.111	11.83	8.55	0.00	0.0	0.00	0.00	0.0	4.11	Snow	0.00	3.42

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.050	0.050	0.000	---	NonR	0.000	0.000
	28.666	0.050	0.050	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 41.91 kips 1.00Vn = 237.12 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	303.2	14.3	9.6	1.00	0.90	321.62
	Init DL	1.4DL	233.0	14.3	---	---		
	Max +	1.2DL+1.6LL	398.4	14.3	---	---	0.90	649.63
Controlling		1.2DL+1.6LL	303.2	14.3	9.6	1.00	0.90	321.62

REACTIONS (kips):

	Left	Right
Initial reaction	24.37	24.37
DL reaction	24.10	24.10

PRCNC20221036

	Left	Right
Max +LL reaction	8.12	8.12
Max +total reaction (factored)	41.91	41.91

DEFLECTIONS:

										Ratio
Initial load (in)	at	14.33 ft	=	-0.881	L/D	=	390			
Live load (in)	at	14.33 ft	=	-0.181	L/D	=	1901	>	360	0.19
Post Comp load (in)	at	14.33 ft	=	-0.326	L/D	=	1056	>	240	0.23
Net Total load (in)	at	14.33 ft	=	-1.207	L/D	=	285	>	240	0.84

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 82**

SPAN INFORMATION (ft): I-End (131.90,87.70) J-End (139.32,60.01)

Beam Size (Optimum) = W21X50 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	86.00	Y bar(in)	=	20.16
Mnf (kip-ft)	=	870.10	Mn (kip-ft)	=	721.82
C (kips)	=	279.98	PNA (in)	=	17.77
Ieff (in4)	=	2235.86	Itr (in4)	=	3012.32
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 102 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 25.50

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.556	13.08	8.94	0.00	0.0	0.00	0.00	0.0	4.30	Snow	0.00	3.58
9.556	11.55	8.34	0.00	0.0	0.00	0.00	0.0	4.01	Snow	0.00	3.34
19.111	13.08	8.94	0.00	0.0	0.00	0.00	0.0	4.30	Snow	0.00	3.58
19.111	11.55	8.34	0.00	0.0	0.00	0.00	0.0	4.01	Snow	0.00	3.34

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.050	0.050	0.000	---	NonR	0.000	0.000
	28.666	0.050	0.050	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 43.72 kips 1.00Vn = 237.12 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	310.2	14.3	9.6	1.00	0.90	321.62
	Init DL	1.4DL	238.3	14.3	---	---		
	Max +	1.2DL+1.6LL	415.7	14.3	---	---	0.90	649.63
Controlling		1.2DL+1.6LL	310.2	14.3	9.6	1.00	0.90	321.62

REACTIONS (kips):

	Left	Right
Initial reaction	24.92	24.92
DL reaction	25.35	25.35

PRCNC20221036

	Left	Right
Max +LL reaction	8.31	8.31
Max +total reaction (factored)	43.72	43.72

DEFLECTIONS:

										Ratio
Initial load (in)	at	14.33 ft	=	-0.901	L/D	=	382			
Live load (in)	at	14.33 ft	=	-0.185	L/D	=	1857	>	360	0.19
Post Comp load (in)	at	14.33 ft	=	-0.349	L/D	=	985	>	240	0.24
Net Total load (in)	at	14.33 ft	=	-1.250	L/D	=	275	>	240	0.87

Floor Type: Level 3 **Beam Number = 83**

SPAN INFORMATION (ft): I-End (160.88,95.46) J-End (164.24,82.91)

Beam Size (User Selected) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 13.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	15.50	Y bar(in)	=	10.88
Mnf (kip-ft)	=	210.20	Mn (kip-ft)	=	172.55
C (kips)	=	64.61	PNA (in)	=	8.64
Ieff (in4)	=	349.20	Itr (in4)	=	458.21
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 29 Partial = 12 Actual = 12
Number of Stud Rows = 1 Percent of Full Composite Action = 40.87

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
0.500	1.60	1.42	2.31	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.58
9.556	2.19	1.94	3.12	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.78
9.556	23.33	9.04	0.00	0.0	0.00	0.00	0.0	4.30	Snow	0.00	3.58

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.025	0.022	0.037	0.0%	Red	0.000	0.009
	0.500	0.025	0.022	0.037			0.000	0.009
2	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	13.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.63 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	51.8	9.6	9.1	1.58	0.90	106.27
	Init DL	1.4DL	39.7	9.6	---	---		
	Max +	1.2DL+1.6LL	108.8	9.6	---	---	0.90	155.30
Controlling		1.2DL+1.6LL	108.8	9.6	---	---	0.90	155.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.14	11.49
DL reaction	8.46	18.96
Max +LL reaction	4.20	5.55
Max +total reaction (factored)	16.87	31.63

DEFLECTIONS:

											Ratio
Initial load (in)	at	7.21 ft	=	-0.146	L/D	=	1067				
Live load (in)	at	7.21 ft	=	-0.044	L/D	=	3514	>	360		0.10
Post Comp load (in)	at	7.21 ft	=	-0.128	L/D	=	1222	>	240		0.20
Net Total load (in)	at	7.21 ft	=	-0.274	L/D	=	570	>	240		0.42

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 84**

SPAN INFORMATION (ft): I-End (169.96,100.22) J-End (177.96,70.36)

Beam Size (User Selected) = W21X48 Fy = 50.0 ksi
Total Beam Length (ft) = 30.92
Mp (kip-ft) = 445.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
2.250	4.79	6.91	17.1	0.00	0.00	0.0	0.00	Snow	0.00
2.750	1.60	2.31	17.1	0.00	0.00	0.0	0.00	Snow	0.00
11.806	5.07	7.33	17.1	0.00	0.00	0.0	0.00	Snow	0.00
11.806	2.19	3.12	17.1	0.00	0.00	0.0	0.00	Snow	0.00
15.250	1.68	2.39	17.1	0.00	0.00	0.0	0.00	Snow	0.00
21.361	5.07	7.33	17.1	0.00	0.00	0.0	0.00	Snow	0.00
21.361	2.72	3.92	17.1	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.057	0.084	17.1%	Red	0.000
	2.250	0.077	0.114			0.000
2	0.000	0.020	0.029	17.1%	Red	0.000
	2.750	0.020	0.029			0.000
3	0.000	0.048	0.000	---	NonR	0.000
	30.916	0.048	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 43.96 kips 1.00Vn = 216.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	320.7	14.7	6.1	1.04	0.90	397.95
Controlling		1.2DL+1.6LL	320.7	14.7	3.4	1.00	0.90	397.95

REACTIONS (kips):

	Left	**Right**
DL reaction	14.59	10.23
Max +LL reaction	16.53	11.32
Max +total reaction (factored)	43.96	30.38

DEFLECTIONS:

								Ratio
Dead load (in)	at 15.46 ft	=	-0.654	L/D	=	567		
Live load (in)	at 15.46 ft	=	-0.738	L/D	=	503	> 360	0.72
Net Total load (in)	at 15.46 ft	=	-1.392	L/D	=	267	> 240	0.90

PRCNC20221036

Floor Type: Level 3 **Beam Number = 85**

SPAN INFORMATION (ft): I-End (185.35,102.02) J-End (192.77,74.33)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	86.00	Y bar(in)	=	20.42
Mnf (kip-ft)	=	774.64	Mn (kip-ft)	=	654.12
C (kips)	=	279.98	PNA (in)	=	18.35
Ieff (in4)	=	2055.53	Itr (in4)	=	2690.50
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 92 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 28.79

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.556	9.17	8.13	12.94	22.3	0.00	0.00	0.0	0.00	Snow	0.00	3.23
9.556	5.07	4.49	7.33	22.3	0.00	0.00	0.0	0.00	Snow	0.00	1.83
19.111	9.17	8.13	12.94	22.3	0.00	0.00	0.0	0.00	Snow	0.00	3.23
19.111	5.07	4.49	7.33	22.3	0.00	0.00	0.0	0.00	Snow	0.00	1.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	28.666	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 43.04 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	227.6	14.3	9.6	1.00	0.90	272.14
	Init DL	1.4DL	175.2	14.3	---	---		
	Max +	1.2DL+1.6LL	409.4	14.3	---	---	0.90	588.71
Controlling		1.2DL+1.6LL	227.6	14.3	9.6	1.00	0.90	272.14

REACTIONS (kips):

	Left	Right
Initial reaction	18.32	18.32
DL reaction	14.87	14.87

PRCNC20221036

	Left	Right
Max +LL reaction	15.74	15.74
Max +total reaction (factored)	43.04	43.04

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.33 ft	=	-0.773	L/D	=	445			
Live load (in)	at 14.33 ft	=	-0.382	L/D	=	902	>	360	0.40
Post Comp load (in)	at 14.33 ft	=	-0.421	L/D	=	817	>	240	0.29
Net Total load (in)	at 14.33 ft	=	-1.194	L/D	=	288	>	240	0.83

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 86**

SPAN INFORMATION (ft): I-End (185.35,102.02) J-End (211.51,109.03)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	60.39	Y bar(in)	=	16.49
Mnf (kip-ft)	=	383.28	Mn (kip-ft)	=	327.45
C (kips)	=	206.76	PNA (in)	=	15.38
Ieff (in4)	=	869.97	Itr (in4)	=	1076.41
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 54 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 53.84

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
0.586	9.09	8.01	12.03	14.4	0.00	0.00	0.0	0.01	Snow	0.00	3.02

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.258	0.228	0.379	14.4%	Red	0.000	0.095
	26.848	0.030	0.026	0.044			0.000	0.011
2	26.849	0.030	0.026	0.044	14.4%	Red	0.000	0.011
	27.083	0.000	0.000	0.000			0.000	0.000
3	0.000	0.325	0.287	0.478	14.4%	Red	0.000	0.119
	27.083	0.325	0.287	0.478			0.000	0.119
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	27.083	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 49.26 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	78.1	12.6	0.0	1.00	0.90	165.75
	Init DL	1.4DL	59.9	12.6	---	---		
	Max +	1.2DL+1.6LL	149.4	12.6	---	---	0.90	294.71
Controlling		1.2DL+1.6LL	149.4	12.6	---	---	0.90	294.71

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	19.71	7.86
DL reaction	16.10	6.36
Max +LL reaction	18.71	7.54
Max +total reaction (factored)	49.26	19.69

DEFLECTIONS:

									Ratio
Initial load (in)	at 13.27 ft	=	-0.651	L/D	=	499			
Live load (in)	at 13.27 ft	=	-0.302	L/D	=	1078	>	360	0.33
Post Comp load (in)	at 13.27 ft	=	-0.330	L/D	=	985	>	240	0.24
Net Total load (in)	at 13.27 ft	=	-0.981	L/D	=	331	>	240	0.72

PRCNC20221036

Floor Type: Level 3 **Beam Number = 87**

SPAN INFORMATION (ft): I-End (170.54,98.05) J-End (185.35,102.02)

Beam Size (Optimum) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	46.00	Y bar(in)	=	12.05
Mnf (kip-ft)	=	139.12	Mn (kip-ft)	=	119.48
C (kips)	=	120.61	PNA (in)	=	9.73
Ieff (in4)	=	241.81	Itr (in4)	=	281.56
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 15 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 68.01

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.289	0.255	0.425	0.0%	Red	0.000	0.106
	11.684	0.289	0.255	0.425			0.000	0.106
2	11.684	0.289	0.255	0.425	0.0%	Red	0.000	0.106
	15.333	0.258	0.228	0.379			0.000	0.095
3	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	15.333	0.325	0.287	0.478			0.000	0.119
4	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	15.333	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.82 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	30.1	7.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	22.7	7.7	---	---		
	Max +	1.2DL+1.6LL	64.4	7.7	---	---	0.90	107.53
Controlling		1.2DL+1.6LL	30.1	7.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	5.97	5.91
DL reaction	4.79	4.75
Max +LL reaction	6.91	6.84
Max +total reaction (factored)	16.82	16.65

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.67 ft	=	-0.440	L/D	=	418			
Live load (in)	at	7.67 ft	=	-0.160	L/D	=	1152	>	360	0.31
Post Comp load (in)	at	7.67 ft	=	-0.173	L/D	=	1066	>	240	0.23
Net Total load (in)	at	7.67 ft	=	-0.613	L/D	=	300	>	240	0.80

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 88**

SPAN INFORMATION (ft): I-End (164.24,82.91) J-End (173.90,85.49)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	11.48
Mnf (kip-ft)	=	134.67	Mn (kip-ft)	=	105.25
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	197.47	Itr (in4)	=	259.73
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 10 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	10.000	0.325	0.287	0.478			0.000	0.119
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.84 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	6.9	5.0	0.0	1.00	0.90	46.90
	Init DL	1.4DL	5.2	5.0	---	---		
	Max +	1.2DL+1.6LL	14.6	5.0	---	---	0.90	94.72
Controlling		1.2DL+1.6LL	14.6	5.0	---	---	0.90	94.72

REACTIONS (kips):

	Left	Right
Initial reaction	2.09	2.09
DL reaction	1.68	1.68
Max +LL reaction	2.39	2.39
Max +total reaction (factored)	5.84	5.84

DEFLECTIONS:

					Ratio
Initial load (in)	at	5.00 ft	=	-0.043	L/D = 2786
Live load (in)	at	5.00 ft	=	-0.019	L/D = 6392 > PRCNC20221036

Post Comp load (in)	at	5.00 ft	=	-0.020	L/D	=	5919	>	240	0.04
Net Total load (in)	at	5.00 ft	=	-0.063	L/D	=	1894	>	240	0.13

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 89**

SPAN INFORMATION (ft): I-End (110.92,118.17) J-End (134.92,118.17)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	72.00	Y bar(in)	=	16.84
Mnf (kip-ft)	=	388.10	Mn (kip-ft)	=	328.85
C (kips)	=	206.76	PNA (in)	=	15.38
Ieff (in4)	=	895.15	Itr (in4)	=	1110.71
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 48 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 53.84

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.628	0.554	0.923	3.7%	Red	0.000	0.231
	24.000	0.628	0.554	0.923			0.000	0.231
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	24.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.47 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	76.7	12.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	58.5	12.0	---	---		
	Max +	1.2DL+1.6LL	158.8	12.0	---	---	0.90	295.96
Controlling		1.2DL+1.6LL	158.8	12.0	---	---	0.90	295.96

REACTIONS (kips):

	Left	Right
Initial reaction	9.73	9.73
DL reaction	7.84	7.84
Max +LL reaction	10.66	10.66
Max +total reaction (factored)	26.47	26.47

DEFLECTIONS: **Ratio**

Initial load (in)	at 12.00 ft	=	-0.496	L/D = 581
Live load (in)	at 12.00 ft	=	-0.255	L/D = 1127 >

PRCNC20221036

Post Comp load (in)	at 12.00 ft	=	-0.277	L/D	=	1041	>	240	0.23
Net Total load (in)	at 12.00 ft	=	-0.773	L/D	=	373	>	240	0.64

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 90**

SPAN INFORMATION (ft): I-End (155.92,118.17) J-End (185.92,118.17)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	54.00	Y bar(in)	=	16.25
Mnf (kip-ft)	=	379.74	Mn (kip-ft)	=	332.43
C (kips)	=	223.99	PNA (in)	=	15.41
Ieff (in4)	=	875.59	Itr (in4)	=	1053.35
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 60 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 49.86

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
7.333	2.20	1.98	2.74	14.8	0.00	0.00	0.0	0.00	Snow	0.00	0.68
15.833	0.79	0.71	0.99	14.8	0.00	0.00	0.0	0.00	Snow	0.00	0.25
19.167	3.13	2.80	4.11	14.8	0.00	0.00	0.0	0.00	Snow	0.00	1.03

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	14.8%	Red	0.000	0.127
	7.333	0.346	0.305	0.508			0.000	0.127
2	7.333	0.051	0.045	0.075	14.8%	Red	0.000	0.019
	15.833	0.051	0.045	0.075			0.000	0.019
3	15.834	0.186	0.164	0.273	14.8%	Red	0.000	0.068
	19.166	0.186	0.164	0.273			0.000	0.068
4	19.167	0.346	0.305	0.508	14.8%	Red	0.000	0.127
	30.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.282	0.249	0.415	14.8%	Red	0.000	0.104
	30.000	0.282	0.249	0.415			0.000	0.104
6	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	30.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 35.29 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

PRCNC20221036

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	141.3	16.6	0.0	1.00	0.90	165.75
	Init DL	1.4DL	109.4	16.6	---	---		
	Max +	1.2DL+1.6LL	267.1	16.7	---	---	0.90	299.19
Controlling		1.2DL+1.6LL	262.4	19.2	---	---	0.90	282.15

REACTIONS (kips):

	Left	**Right**
Initial reaction	13.81	14.16
DL reaction	11.21	11.48
Max +LL reaction	13.01	13.44
Max +total reaction (factored)	34.27	35.29

DEFLECTIONS: (Camber = 1)

					Ratio
Initial load (in)	at 15.15 ft	= -1.447	L/D = 249		
Live load (in)	at 15.15 ft	= -0.644	L/D = 559	> 360	0.64
Post Comp load (in)	at 15.15 ft	= -0.705	L/D = 511	> 240	0.47
Net Total load (in)	at 15.15 ft	= -1.152	L/D = 313	> 240	0.77

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 91**

SPAN INFORMATION (ft): I-End (155.92,94.13) J-End (155.92,118.17)

Beam Size (Optimum) = W21X48 Fy = 50.0 ksi
Total Beam Length (ft) = 24.03
Mp (kip-ft) = 445.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
8.800	8.27	5.85	1.1	0.00	0.00	0.0	0.43	Snow	0.00
8.800	8.42	0.00	0.0	0.00	0.00	0.0	2.90	Snow	0.00
15.742	7.56	10.39	1.1	0.00	0.00	0.0	0.00	Snow	0.00
15.742	10.95	4.34	1.1	0.00	0.00	0.0	1.26	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	8.800	0.400	0.000	---	NonR	0.000
	15.742	0.400	0.000			0.000
2	0.000	0.048	0.000	---	NonR	0.000
	24.033	0.048	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 46.23 kips 1.00Vn = 216.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	381.3	15.7	6.9	1.02	0.90	393.51
Controlling		1.2DL+1.6LL	381.3	15.7	6.9	1.02	0.90	393.51

REACTIONS (kips):

	Left	**Right**
DL reaction	18.90	20.23
Max +LL reaction	11.25	13.72
Max +total reaction (factored)	40.68	46.23

DEFLECTIONS:

							Ratio
Dead load (in)	at 12.14 ft	= -0.621	L/D	= 464			
Live load (in)	at 12.14 ft	= -0.396	L/D	= 728	>	360	0.49
Net Total load (in)	at 12.14 ft	= -1.017	L/D	= 284	>	240	0.85

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 92**

SPAN INFORMATION (ft): I-End (134.92,88.51) J-End (134.92,118.17)

Beam Size (Optimum) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 29.66

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	61.29	Y bar(in)	=	19.41
Mnf (kip-ft)	=	746.18	Mn (kip-ft)	=	638.08
C (kips)	=	258.45	PNA (in)	=	17.73
Ieff (in4)	=	1908.88	Itr (in4)	=	2500.74
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 77 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 35.62

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
8.800	6.16	4.47	0.00	0.0	0.00	0.00	0.0	2.12	Snow	0.00	1.77
8.800	7.36	5.37	0.00	0.0	0.00	0.00	0.0	2.47	Snow	0.00	2.08
13.077	3.85	2.78	0.00	0.0	0.00	0.00	0.0	1.33	Snow	0.00	1.11
13.077	7.58	5.47	0.00	0.0	0.00	0.00	0.0	2.65	Snow	0.00	2.21
21.369	11.07	5.48	4.34	0.0	0.00	0.00	0.0	1.30	Snow	0.00	2.17
21.369	12.65	6.26	4.93	0.0	0.00	0.00	0.0	1.49	Snow	0.00	2.48

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	29.660	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 51.05 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	284.0	13.1	8.3	1.08	0.90	315.60
	Init DL	1.4DL	219.0	13.1	---	---		
	Max +	1.2DL+1.6LL	443.2	13.1	---	---	0.90	574.27
Controlling		1.2DL+1.6LL	284.0	13.1	8.3	1.08	0.90	315.60

REACTIONS (kips):

PRCNC20221036

	Left	Right
Initial reaction	21.32	21.62
DL reaction	23.19	26.80
Max +LL reaction	8.83	11.81
Max +total reaction (factored)	41.95	51.05

DEFLECTIONS: (Camber = 3/4)

										Ratio
Initial load (in)	at	14.83 ft	=	-0.978	L/D	=	364			
Live load (in)	at	14.98 ft	=	-0.281	L/D	=	1265	>	360	0.28
Post Comp load (in)	at	14.98 ft	=	-0.536	L/D	=	664	>	240	0.36
Net Total load (in)	at	14.98 ft	=	-0.764	L/D	=	466	>	240	0.52

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 93**

SPAN INFORMATION (ft): I-End (110.92,82.08) J-End (110.92,118.17)

Beam Size (User Selected) = W24X68 Fy = 50.0 ksi
Total Beam Length (ft) = 36.09

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in) =	65.15	Y bar(in) =	20.52
Mnf (kip-ft) =	1184.46	Mn (kip-ft) =	1081.22
C (kips) =	344.59	PNA (in) =	20.15
Ieff (in4) =	3777.94	Itr (in4) =	4535.02
Stud length (in) =	4.00	Stud diam (in) =	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 68 Partial = 35 Actual = 35
Number of Stud Rows = 1 Percent of Full Composite Action = 51.86

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
8.800	8.70	6.33	0.00	0.0	0.00	0.00	0.0	2.94	Snow	0.00	2.48
8.800	4.17	3.05	0.00	0.0	0.00	0.00	0.0	1.39	Snow	0.00	1.17
9.508	5.33	3.85	0.00	0.0	0.00	0.00	0.0	1.85	Snow	0.00	1.54
19.508	8.67	6.24	0.00	0.0	0.00	0.00	0.0	3.03	Snow	0.00	2.53
19.508	8.80	6.34	0.00	0.0	0.00	0.00	0.0	3.08	Snow	0.00	2.57
27.800	12.64	6.25	4.92	0.0	0.00	0.00	0.0	1.49	Snow	0.00	2.47
27.800	17.66	8.84	6.98	0.0	0.00	0.00	0.0	1.94	Snow	0.00	3.33

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.068	0.068	0.000	---	NonR	0.000	0.000
	36.091	0.068	0.068	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 72.93 kips 1.00Vn = 295.07 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	444.5	19.5	10.0	1.11	0.90	657.34
	Init DL	1.4DL	344.6	19.5	---	---		
	Max +	1.2DL+1.6LL	693.2	19.5	---	---	0.90	973.09
Controlling		1.2DL+1.6LL	693.2	19.5	---	---	0.90	973.09

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	27.97	31.48
DL reaction	29.88	38.56
Max +LL reaction	10.97	16.66
Max +total reaction (factored)	53.42	72.93

DEFLECTIONS: **(Camber = 3/4)**

									Ratio
Initial load (in)	at 18.41 ft	=	-1.044	L/D	=	415			
Live load (in)	at 18.59 ft	=	-0.312	L/D	=	1390	>	360	0.26
Post Comp load (in)	at 18.59 ft	=	-0.590	L/D	=	734	>	240	0.33
Net Total load (in)	at 18.59 ft	=	-0.885	L/D	=	490	>	240	0.49

Floor Type: Level 3 **Beam Number = 94**

SPAN INFORMATION (ft): I-End (185.92,102.17) J-End (185.92,118.17)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 16.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 47.99	Y bar(in)	=	15.98
Mnf (kip-ft)	= 375.54	Mn (kip-ft)	=	302.85
C (kips)	= 150.76	PNA (in)	=	13.88
Ieff (in4)	= 756.51	Itr (in4)	=	1027.98
Stud length (in)	= 4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 38 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 39.26

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
7.704	6.25	5.56	8.71	5.4	0.00	0.00	0.0	0.00	Snow	0.00	2.18
7.704	10.88	9.49	14.51	5.4	0.00	0.00	0.0	0.03	Snow	0.00	3.65

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.995	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.15 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	110.3	7.7	8.3	1.66	0.90	165.75
	Init DL	1.4DL	85.3	7.7	---	---		
	Max +	1.2DL+1.6LL	223.6	7.7	---	---	0.90	272.56
Controlling		1.2DL+1.6LL	223.6	7.7	---	---	0.90	272.56

REACTIONS (kips):

	Left	Right
Initial reaction	11.03	10.26
DL reaction	9.09	8.46
Max +LL reaction	11.40	10.59
Max +total reaction (factored)	29.15	27.10

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.92 ft	=	-0.258	L/D	=	744			
Live load (in)	at	7.92 ft	=	-0.147	L/D	=	1302	>	360	0.28
Post Comp load (in)	at	7.92 ft	=	-0.161	L/D	=	1189	>	240	0.20
Net Total load (in)	at	7.92 ft	=	-0.419	L/D	=	458	>	240	0.52

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 95**

SPAN INFORMATION (ft): I-End (77.25,108.25) J-End (77.25,121.58)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 13.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	28.00	Y bar(in)	=	15.29
Mnf (kip-ft)	=	461.05	Mn (kip-ft)	=	410.76
C (kips)	=	150.76	PNA (in)	=	13.88
Ieff (in4)	=	1114.25	Itr (in4)	=	1341.67
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 51 Partial = 14 Actual = 14
Number of Stud Rows = 1 Percent of Full Composite Action = 28.71

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
1.625	15.61	7.44	7.57	6.5	0.00	0.00	0.0	1.23	Snow	0.00	2.75
9.917	11.41	10.16	15.54	6.5	0.00	0.00	0.0	0.00	Snow	0.00	3.88
12.667	4.00	4.00	0.00	0.0	4.00	0.00	0.0	0.00	Snow	0.00	2.00
0.667	4.00	4.00	0.00	0.0	4.00	0.00	0.0	0.00	Snow	0.00	2.00
6.583	4.00	4.00	0.00	0.0	4.00	0.00	0.0	0.00	Snow	0.00	2.00

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.000	0.000	0.000	6.5%	Red	0.000	0.000
	0.100	0.045	0.040	0.067			0.000	0.017
2	0.101	0.045	0.040	0.067	6.5%	Red	0.000	0.017
	13.333	0.045	0.040	0.067			0.000	0.017
3	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	13.333	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 55.74 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	76.6	6.6	8.3	1.10	0.90	221.81
	Init DL	1.4DL	57.3	6.6	---	---		
	Max +	1.2DL+1.6LL	137.8	6.8	---	---	0.90	369.69
Controlling		1.2DL+1.6LL	136.8	9.9	---	---	(	

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	22.20	21.26
DL reaction	23.19	16.90
Max +LL reaction	17.45	18.20
Max +total reaction (factored)	55.74	49.40

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.80 ft	=	-0.090	L/D	=	1774			
Live load (in)	at	6.80 ft	=	-0.050	L/D	=	3205	>	360	0.11
Post Comp load (in)	at	6.80 ft	=	-0.060	L/D	=	2666	>	240	0.09
Net Total load (in)	at	6.80 ft	=	-0.150	L/D	=	1065	>	240	0.23

Floor Type: Level 3 **Beam Number = 98**

SPAN INFORMATION (ft): I-End (92.59,85.97) J-End (94.79,77.76)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 277.08

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	8.500	0.096	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	8.500	0.000	0.034			0.000
3	0.000	0.000	0.000	---	Snow	0.000
	0.500	0.042	0.000			0.000
4	0.500	0.042	0.000	---	Snow	0.000
	7.875	0.042	0.000			0.000
5	7.875	0.052	0.000	---	Snow	0.000
	8.500	0.000	0.000			0.000
6	0.000	0.000	0.000	---	Snow	0.000
	0.500	0.000	0.015			0.000
7	0.500	0.000	0.015	---	Snow	0.000
	7.875	0.000	0.015			0.000
8	7.875	0.000	0.019	---	Snow	0.000
	8.500	0.000	0.000			0.000
9	0.000	0.035	0.000	---	NonR	0.000
	8.500	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.96 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	1.8	4.5	0.0	1.00	0.90	249.38
Controlling		1.2DL+1.6LL	1.8	4.5	0.0	1.00	0.90	249.38

REACTIONS (kips):

	Left	**Right**
DL reaction	0.45	0.59
Max +LL reaction	0.11	0.16
Max +total reaction (factored)	0.72	0.96

DEFLECTIONS:

					Ratio
Dead load (in)	at 4.29 ft	=	-0.001		
Live load (in)	at 4.33 ft	=	-0.000		
Net Total load (in)	at 4.33 ft	=	-0.001	L/D = 8195 8 > 240	0.00

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 99**

SPAN INFORMATION (ft): I-End (92.59,85.97) J-End (110.92,90.87)

Beam Size (User Selected) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 18.97

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	75.0 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	37.57	Y bar(in)	=	13.13
Mnf (kip-ft)	=	233.76	Mn (kip-ft)	=	191.51
C (kips)	=	137.84	PNA (in)	=	11.85
Ieff (in4)	=	404.16	Itr (in4)	=	519.71
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 18 Partial = 18 Actual = 18
Number of Stud Rows = 1 Percent of Full Composite Action = 43.64

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.417	0.71	0.52	0.00	0.0	0.00	0.00	0.0	0.21	Snow	0.00	0.19
11.417	0.54	0.41	0.00	0.0	0.00	0.00	0.0	0.16	Snow	0.00	0.14

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.228	0.163	0.000	---	Snow	0.000	0.068
	18.967	0.029	0.021	0.000			0.000	0.009
2	0.000	0.000	0.000	0.081	---	Snow	0.000	0.000
	18.967	0.000	0.000	0.010			0.000	0.000
3	0.000	0.000	0.000	0.000	---	Snow	0.000	0.000
	2.277	0.357	0.255	0.000			0.000	0.106
4	2.278	0.357	0.255	0.000	---	Snow	0.000	0.106
	5.416	0.357	0.255	0.000			0.000	0.106
5	0.000	0.000	0.000	0.000	---	Snow	0.000	0.000
	2.277	0.000	0.000	0.127			0.000	0.000
6	2.278	0.000	0.000	0.128	---	Snow	0.000	0.000
	5.416	0.000	0.000	0.128			0.000	0.000
7	5.417	0.000	0.000	0.000	---	Snow	0.000	0.000
	6.443	0.161	0.115	0.000			0.000	0.048
8	6.444	0.161	0.115	0.000	---	Snow	0.000	0.048
	11.416	0.161	0.115	0.000			0.000	0.048
9	5.417	0.000	0.000	0.000	---	Snow	0.000	0.000

Gravity Beam Design

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
	6.443	0.000	0.000	0.057			0.000	0.000
10	6.444	0.000	0.000	0.058	---	Snow	0.000	0.000
	11.416	0.000	0.000	0.058			0.000	0.000
11	11.417	0.000	0.000	0.000	---	Snow	0.000	0.000
	13.694	0.357	0.255	0.000			0.000	0.106
12	13.695	0.357	0.255	0.000	---	Snow	0.000	0.106
	18.967	0.357	0.255	0.000			0.000	0.106
13	11.417	0.000	0.000	0.000	---	Snow	0.000	0.000
	13.694	0.000	0.000	0.127			0.000	0.000
14	13.695	0.000	0.000	0.128	---	Snow	0.000	0.000
	18.967	0.000	0.000	0.128			0.000	0.000
15	0.000	0.019	0.019	0.000	---	NonR	0.000	0.000
	18.967	0.019	0.019	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.92 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	26.9	9.1	0.0	1.00	0.90	92.62
	Init DL	1.4DL	20.8	9.2	---	---		
	Max +	1.2DL+1.6LL	35.1	9.1	---	---	0.90	172.36
Controlling		1.2DL+1.6LL	26.9	9.1	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
Initial reaction	4.62	4.22
DL reaction	4.57	4.17
Max +LL reaction	1.52	1.39
Max +total reaction (factored)	7.92	7.23

DEFLECTIONS:

										Ratio
Initial load (in)	at	9.39 ft	=	-0.260	L/D	=	875			
Live load (in)	at	9.39 ft	=	-0.038	L/D	=	6033	>	360	0.06
Post Comp load (in)	at	9.39 ft	=	-0.068	L/D	=	3332	>	240	0.07
Net Total load (in)	at	9.39 ft	=	-0.328	L/D	=	693	>	240	0.35

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 100**

SPAN INFORMATION (ft): I-End (50.50,74.69) J-End (92.59,85.97)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 43.58
Cantilever on left (ft) = 9.66
Mp (kip-ft) = 833.33

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	0.03	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00
26.648	0.53	0.00	0.0	0.00	0.00	0.0	1.41	Snow	0.00
		0.00	0.0	0.00	0.00	0.0	-0.68	Snow	0.00
27.694	2.48	0.00	0.0	0.00	0.00	0.0	3.71	Snow	0.00
		0.00	0.0	0.00	0.00	0.0	-0.80	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.043	0.000	---	Snow	0.000
	9.662	0.028	0.000			0.000
2	0.000	0.000	0.100	---	Snow	0.000
	9.662	0.000	0.064			0.000
3	9.663	0.028	0.000	---	Snow	0.000
	26.647	0.000	0.000			0.000
4	9.663	0.000	0.064	---	Snow	0.000
	26.647	0.000	0.000			0.000
5	26.648	0.063	0.000	---	Snow	0.000
	42.022	0.038	0.000			0.000
6	26.648	0.000	0.145	---	Snow	0.000
	42.022	0.000	0.087			0.000
7	42.022	0.038	0.000	---	Snow	0.000
	43.580	0.000	0.000			0.000
8	42.022	0.000	0.087	---	Snow	0.000
	43.580	0.000	0.000			0.000
9	9.663	0.006	0.000	---	Snow	0.000
	43.080	0.006	0.000			0.000
10	43.081	0.006	0.000	---	Snow	0.000
	43.580	0.000	0.000			0.000
11	9.663	0.000	0.015	---	Snow	0.000
	43.080	0.000	0.015			0.000
12	43.081	0.000	0.015	---	Snow	0.000
	43.580	0.000	0.000			0.000
13	0.000	0.006	0.000	---	Snow	0.000
	9.662	0.006	0.000			0.000
14	0.000	0.000	0.015	---	Snow	0.000
	9.662	0.000	0.015			0.000
15	0.000	0.076	0.000	---	NonR	0.000
	9.662	0.076	0.000			0.000

PRCNC20221036

Load	Dist	DL	LL	Red%	Type	PartL
16	9.663	0.076	0.000	---	NonR	0.000
	43.580	0.076	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 11.07 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Left	Max -	1.2DL+1.6LL	-15.2	9.7	9.7	1.00	0.90	684.76
Center	Max +	1.2DL+1.6LL	135.5	27.7	0.0	1.00	0.90	750.00
	Max -	1.2DL+1.6LL	-15.2	9.7	17.0	1.95	0.90	750.00
Controlling		1.2DL+1.6LL	135.5	27.7	0.0	1.00	0.90	750.00

REACTIONS (kips):

	Left	**Right**
DL reaction	4.60	3.43
Max +LL reaction	4.78	4.35
Max -LL reaction	-0.71	-0.91
Max +total reaction (factored)	13.16	11.07

DEFLECTIONS:

						Ratio
Left cantilever:						
Dead load (in)		= 0.086	L/D =	2705		
Pos Live load (in)		= -0.048	L/D =	4853	> 360	0.07
Neg Live load (in)		= 0.136	L/D =	1708	> 360	0.21
Neg Total load (in)		= 0.222	L/D =	1047	> 240	0.23
Center span:						
Dead load (in)	at 26.96 ft	= -0.113	L/D =	3602		
Live load (in)	at 26.96 ft	= -0.160	L/D =	2539	> 360	0.14
Net Total load (in)	at 26.96 ft	= -0.273	L/D =	1489	> 240	0.16

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 101**

SPAN INFORMATION (ft): I-End (110.92,90.87) J-End (134.92,97.31)

Beam Size (User Selected) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 24.85
Mp (kip-ft) = 102.92

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.449	0.71	0.00	0.0	0.00	0.00	0.0	0.21	Snow	0.00
7.449	0.54	0.00	0.0	0.00	0.00	0.0	0.16	Snow	0.00
16.449	0.71	0.00	0.0	0.00	0.00	0.0	0.21	Snow	0.00
22.449	0.54	0.00	0.0	0.00	0.00	0.0	0.16	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.434	0.000	---	Snow	0.000
	24.846	0.174	0.000			0.000
2	0.000	0.000	0.155	---	Snow	0.000
	24.846	0.000	0.062			0.000
3	0.000	0.357	0.000	---	Snow	0.000
	1.448	0.357	0.000			0.000
4	0.000	0.000	0.128	---	Snow	0.000
	1.448	0.000	0.128			0.000
5	1.449	0.000	0.000	---	Snow	0.000
	2.486	0.163	0.000			0.000
6	2.487	0.163	0.000	---	Snow	0.000
	7.448	0.161	0.000			0.000
7	1.449	0.000	0.000	---	Snow	0.000
	2.486	0.000	0.058			0.000
8	2.487	0.000	0.058	---	Snow	0.000
	7.448	0.000	0.058			0.000
9	7.449	0.000	0.000	---	Snow	0.000
	9.726	0.357	0.000			0.000
10	9.727	0.357	0.000	---	Snow	0.000
	16.448	0.357	0.000			0.000
11	7.449	0.000	0.000	---	Snow	0.000
	9.726	0.000	0.127			0.000
12	9.727	0.000	0.128	---	Snow	0.000
	16.448	0.000	0.128			0.000
13	16.449	0.000	0.000	---	Snow	0.000
	17.476	0.161	0.000			0.000
14	17.476	0.161	0.000	---	Snow	0.000
	22.448	0.161	0.000			0.000
15	16.449	0.000	0.000	---	Snow	0.000
	17.476	0.000	0.057			0.000
16	17.476	0.000	0.058	---	Snow	0.000
	22.448	0.000	0.058			0.000

PRCNC20221036

Load	Dist	DL	LL	Red%	Type	PartL
17	22.449	0.000	0.000	---	Snow	0.000
	24.726	0.357	0.000			0.000
18	24.727	0.357	0.000	---	Snow	0.000
	24.846	0.357	0.000			0.000
19	22.449	0.000	0.000	---	Snow	0.000
	24.726	0.000	0.127			0.000
20	24.727	0.000	0.128	---	Snow	0.000
	24.846	0.000	0.128			0.000
21	0.000	0.019	0.000	---	NonR	0.000
	24.846	0.019	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 15.15 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	87.9	12.2	0.0	1.00	0.90	92.62
Controlling		1.2DL+1.6LL	87.9	12.2	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	**Right**
DL reaction	8.70	7.36
Max +LL reaction	2.94	2.47
Max +total reaction (factored)	15.15	12.79

DEFLECTIONS: (Camber = 1)

							Ratio
Dead load (in)	at 12.30 ft	=	-1.475	L/D =	202		
Live load (in)	at 12.30 ft	=	-0.499	L/D =	597	> 360	0.60
Net Total load (in)	at 12.30 ft	=	-0.975	L/D =	306	> 240	0.78

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 102**

SPAN INFORMATION (ft): I-End (134.92,97.31) J-End (155.92,102.93)

Beam Size (User Selected) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 21.74

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	75.0 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	47.07	Y bar(in)	=	13.54
Mnf (kip-ft)	=	238.87	Mn (kip-ft)	=	192.76
C (kips)	=	137.84	PNA (in)	=	11.85
Ieff (in4)	=	421.64	Itr (in4)	=	544.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 21 Partial = 21 Actual = 21
Number of Stud Rows = 1 Percent of Full Composite Action = 36.59

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
16.527	3.37	2.44	0.00	0.0	0.00	0.00	0.0	1.16	Snow	0.00	0.97

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.174	0.124	0.000	---	Snow	0.000	0.052
	16.527	0.000	0.000	0.000			0.000	0.000
2	0.000	0.000	0.000	0.062	---	Snow	0.000	0.000
	16.527	0.000	0.000	0.000			0.000	0.000
3	16.528	0.336	0.240	0.000	---	Snow	0.000	0.100
	21.740	0.282	0.201	0.000			0.000	0.084
4	16.528	0.000	0.000	0.120	---	Snow	0.000	0.000
	21.740	0.000	0.000	0.101			0.000	0.000
5	0.000	0.357	0.255	0.000	---	Snow	0.000	0.106
	21.740	0.357	0.255	0.000			0.000	0.106
6	0.000	0.000	0.000	0.128	---	Snow	0.000	0.000
	21.740	0.000	0.000	0.128			0.000	0.000
7	0.000	0.019	0.019	0.000	---	NonR	0.000	0.000
	21.740	0.019	0.019	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 14.76 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	49.9	12.8	0.0	1.00	0.90	92.62
	Init DL	1.4DL	38.1	12.8	---	---		
	Max +	1.2DL+1.6LL	65.7	12.8	---	---	0.90	173.49
Controlling		1.2DL+1.6LL	49.9	12.8	---	---	0.90	92.62

REACTIONS (kips):

	Left	**Right**
Initial reaction	6.23	8.52
DL reaction	6.16	8.42
Max +LL reaction	2.12	2.90
Max +total reaction (factored)	10.79	14.76

DEFLECTIONS:

										Ratio
Initial load (in)	at	11.20 ft	=	-0.624	L/D	=	418			
Live load (in)	at	11.20 ft	=	-0.091	L/D	=	2861	>	360	0.13
Post Comp load (in)	at	11.20 ft	=	-0.164	L/D	=	1590	>	240	0.15
Net Total load (in)	at	11.20 ft	=	-0.788	L/D	=	331	>	240	0.73

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 103**

SPAN INFORMATION (ft): I-End (77.25,118.17) J-End (110.92,118.17)

Beam Size (User Selected) = W21X50 Fy = 50.0 ksi
Total Beam Length (ft) = 33.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	100.25	Y bar(in)	=	20.59
Mnf (kip-ft)	=	881.04	Mn (kip-ft)	=	768.92
C (kips)	=	372.16	PNA (in)	=	20.19
Ieff (in4)	=	2494.05	Itr (in4)	=	3106.12
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 66 Partial = 48 Actual = 48
Number of Stud Rows = 2 Percent of Full Composite Action = 50.63

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.628	0.554	0.923	14.8%	Red	0.000	0.231
	33.666	0.628	0.554	0.923			0.000	0.231
2	0.000	0.050	0.050	0.000	---	NonR	0.000	0.000
	33.666	0.050	0.050	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.86 kips 1.00Vn = 237.12 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	155.0	16.8	0.0	1.00	0.90	412.50
	Init DL	1.4DL	119.8	16.8	---	---		
	Max +	1.2DL+1.6LL	293.4	16.8	---	---	0.90	692.03
Controlling		1.2DL+1.6LL	293.4	16.8	---	---	0.90	692.03

REACTIONS (kips):

	Left	Right
Initial reaction	14.05	14.05
DL reaction	11.41	11.41
Max +LL reaction	13.23	13.23
Max +total reaction (factored)	34.86	34.86

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	16.83 ft	=	-0.612	L/D	=	661			
Live load (in)	at	16.83 ft	=	-0.314	L/D	=	1286	>	360	0.28
Post Comp load (in)	at	16.83 ft	=	-0.344	L/D	=	1176	>	240	0.20
Net Total load (in)	at	16.83 ft	=	-0.955	L/D	=	423	>	240	0.57

Floor Type: Level 3 **Beam Number = 104**

SPAN INFORMATION (ft): I-End (71.25,128.33) J-End (110.92,128.33)

Beam Size (User Selected) = W24X55 Fy = 50.0 ksi
Total Beam Length (ft) = 39.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	119.00	Y bar(in)	=	23.24
Mnf (kip-ft)	=	1070.65	Mn (kip-ft)	=	942.41
C (kips)	=	411.79	PNA (in)	=	22.23
Ieff (in4)	=	3404.74	Itr (in4)	=	4231.79
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 78 Partial = 53 Actual = 53
Number of Stud Rows = 2 Percent of Full Composite Action = 50.46

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	21.5%	Red	0.000	0.127
	39.666	0.346	0.305	0.508			0.000	0.127
2	0.000	0.229	0.202	0.337	21.5%	Red	0.000	0.084
	6.000	0.229	0.202	0.337			0.000	0.084
3	6.000	0.346	0.305	0.508	21.5%	Red	0.000	0.127
	39.666	0.346	0.305	0.508			0.000	0.127
4	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	39.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 42.93 kips 0.90Vn = 251.69 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	235.2	19.9	0.0	1.00	0.90	502.50
	Init DL	1.4DL	181.9	19.9	---	---		
	Max +	1.2DL+1.6LL	424.1	19.9	---	---	0.90	848.17
Controlling		1.2DL+1.6LL	424.1	19.9	---	---	0.90	848.17

REACTIONS (kips):

	Left	Right
Initial reaction	17.43	18.17
DL reaction	14.16	14.75

PRCNC20221036

	Left	Right
Max +LL reaction	15.08	15.77
Max +total reaction (factored)	41.13	42.93

DEFLECTIONS: (Camber = 3/4)

									Ratio
Initial load (in)	at 19.83 ft	=	-0.938	L/D	=	507			
Live load (in)	at 19.83 ft	=	-0.446	L/D	=	1067	>	360	0.34
Post Comp load (in)	at 19.83 ft	=	-0.492	L/D	=	968	>	240	0.25
Net Total load (in)	at 19.83 ft	=	-0.680	L/D	=	700	>	240	0.34

Floor Type: Level 3 **Beam Number = 106**

SPAN INFORMATION (ft): I-End (110.92,128.33) J-End (134.92,128.33)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	46.00	Y bar(in)	=	14.53
Mnf (kip-ft)	=	294.08	Mn (kip-ft)	=	248.16
C (kips)	=	172.30	PNA (in)	=	13.40
Ieff (in4)	=	587.17	Itr (in4)	=	731.71
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 24 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 53.10

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
2.167	0.18	0.16	0.17	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.04
13.500	0.18	0.16	0.17	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.04

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	2.166	0.346	0.305	0.508			0.000	0.127
2	2.167	0.057	0.050	0.083	0.0%	Red	0.000	0.021
	13.500	0.057	0.050	0.083			0.000	0.021
3	13.500	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	24.000	0.346	0.305	0.508			0.000	0.127
4	0.000	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	24.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	24.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.31 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	65.9	13.5	0.0	1.00	0.90	124.50
	Init DL	1.4DL	50.4	13.5	---	---		
	Max +	1.2DL+1.6LL	139.4	13.5	---	---	(	

PRCNC20221036

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
Controlling		1.2DL+1.6LL	139.4	13.5	---	---	0.90	223.35

REACTIONS (kips):

	Left	Right
Initial reaction	8.15	9.43
DL reaction	6.59	7.61
Max +LL reaction	9.18	10.74
Max +total reaction (factored)	22.60	26.31

DEFLECTIONS:

									Ratio
Initial load (in)	at 12.24 ft	=	-0.644	L/D	=	447			
Live load (in)	at 12.24 ft	=	-0.344	L/D	=	837	>	360	0.43
Post Comp load (in)	at 12.24 ft	=	-0.372	L/D	=	775	>	240	0.31
Net Total load (in)	at 12.24 ft	=	-1.016	L/D	=	284	>	240	0.85

Floor Type: Level 3 **Beam Number = 107**

SPAN INFORMATION (ft): I-End (134.92,128.33) J-End (155.92,128.33)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 21.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	63.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	301.65	Mn (kip-ft)	=	250.30
C (kips)	=	172.30	PNA (in)	=	13.40
Ieff (in4)	=	619.67	Itr (in4)	=	776.32
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 21 Partial = 21 Actual = 21
Number of Stud Rows = 1 Percent of Full Composite Action = 53.10

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
10.500	0.06	0.06								

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.691	0.610	1.017	2.4%	Red	0.000	0.254
	21.000	0.691	0.610	1.017			0.000	0.254
2	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	21.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 25.69 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	64.6	10.5	0.0	1.00	0.90	124.50
	Init DL	1.4DL	49.2	10.5	---	---		
	Max +	1.2DL+1.6LL	135.1	10.5	---	---	0.90	225.27
Controlling		1.2DL+1.6LL	135.1	10.5	---	---	0.90	225.27

REACTIONS (kips):

	Left	Right
Initial reaction	9.34	9.34
DL reaction	7.52	7.52
Max +LL reaction	10.42	10.42

PRCNC20221036

	Left	Right
Max +total reaction (factored)	25.69	25.69

DEFLECTIONS:

									Ratio
Initial load (in)	at 10.50 ft	=	-0.483	L/D	=	522			
Live load (in)	at 10.50 ft	=	-0.242	L/D	=	1043	>	360	0.35
Post Comp load (in)	at 10.50 ft	=	-0.261	L/D	=	964	>	240	0.25
Net Total load (in)	at 10.50 ft	=	-0.744	L/D	=	339	>	240	0.71

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 108**

SPAN INFORMATION (ft): I-End (215.92,110.21) J-End (215.92,135.17)

Beam Size (User Selected) = W27X84 Fy = 50.0 ksi
Total Beam Length (ft) = 24.96

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	74.87	Y bar(in)	=	22.58
Mnf (kip-ft)	=	1591.54	Mn (kip-ft)	=	1323.67
C (kips)	=	241.22	PNA (in)	=	18.59
Ieff (in4)	=	5030.21	Itr (in4)	=	6729.28
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 127 Partial = 33 Actual = 33
Number of Stud Rows = 1 Percent of Full Composite Action = 26.31

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
7.957	9.97	8.86	13.90	20.3	0.00	0.00	0.0	0.00	Snow	0.00	3.47
18.123	10.90	9.68	15.25	20.3	0.00	0.00	0.0	0.00	Snow	0.00	3.81

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.000	0.000	0.000	---	NonR	0.000	0.000
	0.717	0.091	0.080	0.335			0.000	0.033
2	0.718	0.091	0.080	0.335	---	NonR	0.000	0.033
	2.657	0.340	0.300	1.250			0.000	0.125
3	2.658	0.340	0.300	1.250	---	NonR	0.000	0.125
	7.956	0.340	0.300	1.250			0.000	0.125
4	7.957	0.340	0.300	0.500	20.3%	Red	0.000	0.125
	24.956	0.340	0.300	0.500			0.000	0.125
5	0.000	0.084	0.084	0.000	---	NonR	0.000	0.000
	24.956	0.084	0.084	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 49.44 kips 1.00Vn = 368.46 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	176.1	12.0	0.0	1.00	0.90	915.00
	Init DL	1.4DL	137.3	12.0	---	---		
	Max +	1.2DL+1.6LL	340.6	10.6	---	---	(	

PRCNC20221036

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
Controlling		1.2DL+1.6LL	336.7	8.0	---	---	0.90	1141.36

REACTIONS (kips):

	Left	**Right**
Initial reaction	17.90	20.06
DL reaction	14.63	16.37
Max +LL reaction	19.93	18.34
Max +total reaction (factored)	49.44	48.99

DEFLECTIONS:

									Ratio
Initial load (in)	at 12.48 ft	=	-0.138	L/D	=	2165			
Live load (in)	at 12.48 ft	=	-0.104	L/D	=	2871	>	360	0.13
Post Comp load (in)	at 12.48 ft	=	-0.114	L/D	=	2635	>	240	0.09
Net Total load (in)	at 12.48 ft	=	-0.252	L/D	=	1188	>	240	0.20

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 110**

SPAN INFORMATION (ft): I-End (218.59,110.93) J-End (245.92,118.17)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 28.26

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	165.2 deg	90.2 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	84.79	Y bar(in)	=	21.26
Mnf (kip-ft)	=	1369.15	Mn (kip-ft)	=	1110.52
C (kips)	=	236.05	PNA (in)	=	17.31
Ieff (in4)	=	3803.43	Itr (in4)	=	5360.68
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 84 Partial = 29 Actual = 29
Number of Stud Rows = 2 Percent of Full Composite Action = 26.20

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
7.575	7.44	6.60	6.48	0.0	10.08	0.00	0.0	0.00	Snow	0.00	2.63
17.920	6.51	5.77	7.35	0.0	4.59	0.00	0.0	0.00	Snow	0.00	2.30

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.023	0.021	0.086	---	NonR	0.000	0.009
	7.574	0.087	0.077	0.320			0.000	0.032
2	7.575	0.000	0.000	0.000	---	NonR	0.000	0.000
	17.919	0.087	0.077	0.320			0.000	0.032
3	17.920	0.000	0.000	0.000	---	NonR	0.000	0.000
	28.264	0.087	0.077	0.320			0.000	0.032
4	0.000	0.325	0.287	1.194	---	NonR	0.000	0.119
	25.725	0.322	0.285	1.185			0.000	0.119
5	25.726	0.322	0.285	1.185	---	NonR	0.000	0.119
	28.264	0.000	0.000	0.000			0.000	0.000
6	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	28.264	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 73.85 kips 1.00Vn = 315.48 kips

PRCNC20221036

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	170.4	15.0	0.0	1.00	0.90	750.00
	Init DL	1.4DL	132.8	15.0	---	---		
	Max +	1.2DL+1.6LL	541.6	14.3	---	---	0.90	999.47
Controlling		1.2DL+1.6LL	522.8	17.9	---	---	0.90	943.70

REACTIONS (kips):

	Left	**Right**
Initial reaction	17.28	14.74
DL reaction	14.10	12.06
Max +LL reaction	35.59	29.89
Max +total reaction (factored)	73.85	62.29

DEFLECTIONS:

									Ratio
Initial load (in)	at 13.99 ft	=	-0.228	L/D	=	1491			
Live load (in)	at 13.99 ft	=	-0.343	L/D	=	988	>	360	0.36
Post Comp load (in)	at 13.99 ft	=	-0.358	L/D	=	947	>	240	0.25
Net Total load (in)	at 13.99 ft	=	-0.586	L/D	=	579	>	240	0.41

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 111**

SPAN INFORMATION (ft): I-End (113.08,128.33) J-End (113.08,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.17

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	17.00	Y bar(in)	=	10.51
Mnf (kip-ft)	=	124.27	Mn (kip-ft)	=	109.38
C (kips)	=	107.69	PNA (in)	=	9.69
Ieff (in4)	=	189.88	Itr (in4)	=	226.47
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 62.10

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	10.166	0.023	0.020	0.033			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.166	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.48 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.7	5.1	10.2	1.14	0.90	22.00
	Init DL	1.4DL	0.6	5.1	---	---		
	Max +	1.2DL+1.6LL	1.2	5.1	---	---	0.90	98.44
Controlling		1.2DL+1.6LL	0.7	5.1	10.2	1.14	0.90	22.00

REACTIONS (kips):

	Left	Right
Initial reaction	0.21	0.21
DL reaction	0.18	0.18
Max +LL reaction	0.17	0.17
Max +total reaction (factored)	0.48	0.48

DEFLECTIONS: **Ratio**

Initial load (in) at 5.08 ft = -0.005 L/D = 2471
0

PRCNC20221036

Gravity Beam Design

Live load (in)	at	5.08 ft	=	-0.001	L/D	=	83842	>	360	0.00
Post Comp load (in)	at	5.08 ft	=	-0.002	L/D	=	77631	>	240	0.00
Net Total load (in)	at	5.08 ft	=	-0.007	L/D	=	18744	>	240	0.01

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 112**

SPAN INFORMATION (ft): I-End (124.42,128.33) J-End (124.42,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.17

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	19.25	Y bar(in)	=	10.74
Mnf (kip-ft)	=	127.52	Mn (kip-ft)	=	110.36
C (kips)	=	107.69	PNA (in)	=	9.69
Ieff (in4)	=	194.49	Itr (in4)	=	234.17
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 60.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	10.166	0.023	0.020	0.033			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.166	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.48 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.7	5.1	10.2	1.14	0.90	22.00
	Init DL	1.4DL	0.6	5.1	---	---		
	Max +	1.2DL+1.6LL	1.2	5.1	---	---	0.90	99.32
Controlling		1.2DL+1.6LL	0.7	5.1	10.2	1.14	0.90	22.00

REACTIONS (kips):

	Left	Right
Initial reaction	0.21	0.21
DL reaction	0.18	0.18
Max +LL reaction	0.17	0.17
Max +total reaction (factored)	0.48	0.48

DEFLECTIONS: **Ratio**

Initial load (in) at 5.08 ft = -0.005 L/D = 2471
0

PRCNC20221036

Live load (in)	at	5.08 ft	=	-0.001	L/D	=	85878	>	360	0.00
Post Comp load (in)	at	5.08 ft	=	-0.002	L/D	=	79517	>	240	0.00
Net Total load (in)	at	5.08 ft	=	-0.006	L/D	=	18852	>	240	0.01

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 113**

SPAN INFORMATION (ft): I-End (163.25,118.17) J-End (163.25,138.50)

Beam Size (User Selected) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	34.50	Y bar(in)	=	12.74
Mnf (kip-ft)	=	265.45	Mn (kip-ft)	=	232.76
C (kips)	=	193.83	PNA (in)	=	11.98
Ieff (in4)	=	484.80	Itr (in4)	=	581.10
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 32 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 59.83

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
1.500	0.36	0.33	0.46	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.12
10.167	2.58	2.28	3.73	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.93
10.917	0.32	0.30	0.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.08

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	1.500	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	20.333	0.023	0.020	0.033			0.000	0.008
2	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	20.333	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.01 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	27.5	10.2	8.7	1.45	0.90	101.67
	Init DL	1.4DL	21.5	10.2	---	---		
	Max +	1.2DL+1.6LL	56.7	10.2	---	---	0.90	209.49
Controlling		1.2DL+1.6LL	56.7	10.2	---	---	0.90	209.49

REACTIONS (kips):

	Left	Right
Initial reaction	2.66	2.35
DL reaction	2.20	1.94
Max +LL reaction	2.74	2.41
Max +total reaction (factored)	7.01	6.19

DEFLECTIONS:

											Ratio
Initial load (in)	at	10.17 ft	=	-0.212	L/D	=	1148				
Live load (in)	at	10.17 ft	=	-0.099	L/D	=	2476	>	360		0.15
Post Comp load (in)	at	10.17 ft	=	-0.106	L/D	=	2293	>	240		0.10
Net Total load (in)	at	10.17 ft	=	-0.319	L/D	=	765	>	240		0.31

Floor Type: Level 3 **Beam Number = 114**

SPAN INFORMATION (ft): I-End (175.08,118.17) J-End (175.08,138.50)

Beam Size (User Selected) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 34.50		Y bar(in)	=	12.74
Mnf (kip-ft)	= 265.45		Mn (kip-ft)	=	232.76
C (kips)	= 193.83		PNA (in)	=	11.98
Ieff (in4)	= 484.80		Itr (in4)	=	581.10
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 32 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 59.83

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.458	0.64	0.57	0.91	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.23
10.167	3.81	3.37	5.51	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.38
10.917	1.04	0.94	1.34	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.34

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	10.917	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	20.333	0.023	0.020	0.033			0.000	0.008
2	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	20.333	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.33 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	44.6	10.2	4.7	1.19	0.90	109.88
	Init DL	1.4DL	34.5	10.2	---	---		
	Max +	1.2DL+1.6LL	93.2	10.2	---	---	0.90	209.49
Controlling		1.2DL+1.6LL	93.2	10.2	---	---	0.90	209.49

REACTIONS (kips):

	Left	Right
Initial reaction	3.83	3.70
DL reaction	3.13	3.02
Max +LL reaction	4.11	3.96
Max +total reaction (factored)	10.33	9.96

DEFLECTIONS:

											Ratio
Initial load (in)	at	10.17 ft	=	-0.341	L/D	=	715				
Live load (in)	at	10.17 ft	=	-0.165	L/D	=	1475	>	360		0.24
Post Comp load (in)	at	10.17 ft	=	-0.179	L/D	=	1366	>	240		0.18
Net Total load (in)	at	10.17 ft	=	-0.520	L/D	=	469	>	240		0.51

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 115**

SPAN INFORMATION (ft): I-End (155.92,128.33) J-End (163.25,128.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 22.00	Y bar(in)	=	10.98
Mnf (kip-ft)	= 130.01	Mn (kip-ft)	=	88.50
C (kips)	= 51.69	PNA (in)	=	7.66
Ieff (in4)	= 155.60	Itr (in4)	=	242.19
Stud length (in)	= 4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 7 Partial = 7 Actual = 7
Number of Stud Rows = 1 Percent of Full Composite Action = 29.20

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.691	0.610	1.017	0.0%	Red	0.000	0.254
	7.333	0.691	0.610	1.017			0.000	0.254
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	7.333	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	7.8	3.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	5.9	3.7	---	---		
	Max +	1.2DL+1.6LL	16.6	3.7	---	---	0.90	79.65
Controlling		1.2DL+1.6LL	16.6	3.7	---	---	0.90	79.65

REACTIONS (kips):

	Left	Right
Initial reaction	3.21	3.21
DL reaction	2.58	2.58
Max +LL reaction	3.73	3.73
Max +total reaction (factored)	9.06	9.06

DEFLECTIONS: **Ratio**

Initial load (in)	at 3.67 ft	= -0.026	L/D = 3392		
Live load (in)	at 3.67 ft	= -0.015	L/D = 6003	>	PRCNC20221036

Gravity Beam Design

Post Comp load (in)	at	3.67 ft	=	-0.016	L/D	=	5559	>	240	0.04
Net Total load (in)	at	3.67 ft	=	-0.042	L/D	=	2107	>	240	0.11

Floor Type: Level 3 **Beam Number = 116**

SPAN INFORMATION (ft): I-End (175.08,128.33) J-End (185.92,128.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.83

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	32.50	Y bar(in)	=	11.60
Mnf (kip-ft)	=	135.65	Mn (kip-ft)	=	105.48
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	200.45	Itr (in4)	=	264.01
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 10 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.691	0.610	1.017	0.0%	Red	0.000	0.254
	10.833	0.691	0.610	1.017			0.000	0.254
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.833	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.38 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	16.9	5.4	0.0	1.00	0.90	46.90
	Init DL	1.4DL	12.8	5.4	---	---		
	Max +	1.2DL+1.6LL	36.2	5.4	---	---	0.90	94.93
Controlling		1.2DL+1.6LL	36.2	5.4	---	---	0.90	94.93

REACTIONS (kips):

	Left	Right
Initial reaction	4.75	4.75
DL reaction	3.81	3.81
Max +LL reaction	5.51	5.51
Max +total reaction (factored)	13.38	13.38

DEFLECTIONS: **Ratio**

Initial load (in)	at 5.42 ft	=	-0.124	L/D	=	1052
Live load (in)	at 5.42 ft	=	-0.054	L/D	=	2399 >

PRCNC20221036

Post Comp load (in)	at	5.42 ft	=	-0.059	L/D	=	2221	>	240	0.11
Net Total load (in)	at	5.42 ft	=	-0.182	L/D	=	714	>	240	0.34

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 117**

SPAN INFORMATION (ft): I-End (185.92,128.33) J-End (215.92,128.33)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 90.00	Y bar(in)	= 18.48
Mnf (kip-ft)	= 560.96	Mn (kip-ft)	= 475.30
C (kips)	= 258.45	PNA (in)	= 17.27
Ieff (in4)	= 1401.42	Itr (in4)	= 1768.35
Stud length (in)	= 4.00	Stud diam (in)	= 0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 60 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 50.18

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.691	0.610	1.017	14.3%	Red	0.000	0.254
	30.000	0.691	0.610	1.017			0.000	0.254
2	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	30.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 33.99 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	132.8	15.0	0.0	1.00	0.90	249.38
	Init DL	1.4DL	101.6	15.0	---	---		
	Max +	1.2DL+1.6LL	255.0	15.0	---	---	0.90	427.77
Controlling		1.2DL+1.6LL	255.0	15.0	---	---	0.90	427.77

REACTIONS (kips):

	Left	Right
Initial reaction	13.49	13.49
DL reaction	10.90	10.90
Max +LL reaction	13.07	13.07
Max +total reaction (factored)	33.99	33.99

DEFLECTIONS: **Ratio**

Initial load (in)	at 15.00 ft = -0.795	L/D = 453		
Live load (in)	at 15.00 ft = -0.391	L/D = 921	>	PRCNC20221036

Post Comp load (in)	at 15.00 ft	=	-0.427	L/D	=	842	>	240	0.28
Net Total load (in)	at 15.00 ft	=	-1.222	L/D	=	295	>	240	0.81

Floor Type: Level 3 **Beam Number = 118**

SPAN INFORMATION (ft): I-End (185.92,118.17) J-End (215.92,118.17)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	18.48
Mnf (kip-ft)	=	560.96	Mn (kip-ft)	=	468.42
C (kips)	=	241.22	PNA (in)	=	16.89
Ieff (in4)	=	1371.19	Itr (in4)	=	1768.35
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 60 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 46.84

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	11.3%	Red	0.000	0.127
	30.000	0.346	0.305	0.508			0.000	0.127
2	0.000	0.282	0.249	0.415	11.3%	Red	0.000	0.104
	25.368	0.282	0.249	0.415			0.000	0.104
3	25.368	0.282	0.249	0.415	11.3%	Red	0.000	0.104
	25.594	0.311	0.274	0.457			0.000	0.114
4	25.595	0.311	0.274	0.457	11.3%	Red	0.000	0.114
	30.000	0.271	0.239	0.398			0.000	0.099
5	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	30.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.68 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	121.2	15.0	0.0	1.00	0.90	249.38
	Init DL	1.4DL	92.8	15.0	---	---		
	Max +	1.2DL+1.6LL	237.0	15.0	---	---	0.90	421.57
Controlling		1.2DL+1.6LL	237.0	15.0	---	---	0.90	421.57

REACTIONS (kips):

	Left	Right
Initial reaction	12.30	12.34
DL reaction	9.94	9.97

PRCNC20221036

	Left	Right
Max +LL reaction	12.28	12.32
Max +total reaction (factored)	31.59	31.68

DEFLECTIONS:

										Ratio
Initial load (in)	at	15.00 ft	=	-0.726	L/D	=	496			
Live load (in)	at	15.00 ft	=	-0.376	L/D	=	958	>	360	0.38
Post Comp load (in)	at	15.00 ft	=	-0.409	L/D	=	879	>	240	0.27
Net Total load (in)	at	15.00 ft	=	-1.136	L/D	=	317	>	240	0.76

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 119**

SPAN INFORMATION (ft): I-End (163.25,129.08) J-End (175.08,129.08)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.83
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
8.500	0.56	0.70	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	8.501	0.014	0.021	0.0%	Red	0.000
	11.833	0.014	0.021			0.000
2	8.501	0.186	0.273	0.0%	Red	0.000
	11.833	0.186	0.273			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	11.833	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.40 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	7.3	8.5	8.5	1.63	0.90	42.55
Controlling		1.2DL+1.6LL	7.3	8.5	8.5	1.63	0.90	42.55

REACTIONS (kips):

	Left	**Right**
DL reaction	0.32	1.04
Max +LL reaction	0.33	1.34
Max +total reaction (factored)	0.92	3.40

DEFLECTIONS:

										Ratio
Dead load (in)	at	6.51 ft	=	-0.030	L/D	=	4727			
Live load (in)	at	6.57 ft	=	-0.036	L/D	=	3980	>	360	0.09
Net Total load (in)	at	6.57 ft	=	-0.066	L/D	=	2161	>	240	0.11

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 120**

SPAN INFORMATION (ft): I-End (171.75,118.17) J-End (171.75,129.08)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.92

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	20.37	Y bar(in)	=	10.84
Mnf (kip-ft)	=	128.62	Mn (kip-ft)	=	110.76
C (kips)	=	107.69	PNA (in)	=	9.69
Ieff (in4)	=	197.17	Itr (in4)	=	237.61
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 18 Partial = 11 Actual = 11
Number of Stud Rows = 1 Percent of Full Composite Action = 60.84

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
1.500	0.36	0.33	0.46	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.12
5.458	0.64	0.57	0.91	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.23

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	1.500	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	10.916	0.023	0.020	0.033			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.916	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.53 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	4.0	5.5	5.5	1.58	0.90	46.90
	Init DL	1.4DL	3.2	5.5	---	---		
	Max +	1.2DL+1.6LL	8.3	5.5	---	---	0.90	99.69
Controlling		1.2DL+1.6LL	4.0	5.5	5.5	1.58	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	0.96	0.67
DL reaction	0.79	0.56

PRCNC20221036

	Left	Right
Max +LL reaction	0.99	0.70
Max +total reaction (factored)	2.53	1.78

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.35 ft	=	-0.027	L/D	=	4795			
Live load (in)	at	5.35 ft	=	-0.011	L/D	=	1218 9	>	360	0.03
Post Comp load (in)	at	5.35 ft	=	-0.012	L/D	=	1128 6	>	240	0.02
Net Total load (in)	at	5.35 ft	=	-0.039	L/D	=	3365	>	240	0.07

Floor Type: Level 3 **Beam Number = 121**

SPAN INFORMATION (ft): I-End (171.75,123.62) J-End (175.08,123.62)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 3.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.371	0.546	0.0%	Red	0.000
	3.333	0.371	0.546			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	3.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.22 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	1.9	1.7	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	1.9	1.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.64	0.64
Max +LL reaction	0.91	0.91
Max +total reaction (factored)	2.22	2.22

DEFLECTIONS:

						Ratio
Dead load (in)	at	1.67 ft	=	-0.001		
Live load (in)	at	1.67 ft	=	-0.001		
Net Total load (in)	at	1.67 ft	=	-0.002	L/D = 2418 > 240 1	0.01

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285 | Page 434/963
DataBase: Pierce College - 6.14.22 | 06/29/22 13:29:13
Building Code: IBC | Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 122**

SPAN INFORMATION (ft): I-End (163.25,119.67) J-End (171.75,119.67)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.50

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	13.00	Y bar(in)	=	9.97
Mnf (kip-ft)	=	111.96	Mn (kip-ft)	=	95.31
C (kips)	=	68.92	PNA (in)	=	8.56
Ieff (in4)	=	165.86	Itr (in4)	=	209.23
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 8 Partial = 8 Actual = 8
Number of Stud Rows = 1 Percent of Full Composite Action = 51.97

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	8.500	0.023	0.020	0.033			0.000	0.008
2	0.000	0.051	0.045	0.075	0.0%	Red	0.000	0.019
	8.500	0.051	0.045	0.075			0.000	0.019
3	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	8.500	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.17 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	1.2	4.3	0.0	1.00	0.90	46.90
	Init DL	1.4DL	1.0	4.3	---	---		
	Max +	1.2DL+1.6LL	2.5	4.3	---	---	0.90	85.78
Controlling		1.2DL+1.6LL	2.5	4.3	---	---	0.90	85.78

REACTIONS (kips):

	Left	Right
Initial reaction	0.44	0.44
DL reaction	0.36	0.36
Max +LL reaction	0.46	0.46
Max +total reaction (factored)	1.17	1.17

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	4.25 ft	=	-0.006	L/D	=	1758 4		
Live load (in)	at	4.25 ft	=	-0.003	L/D	=	3855 3	> 360	0.01
Post Comp load (in)	at	4.25 ft	=	-0.003	L/D	=	3569 7	> 240	0.01
Net Total load (in)	at	4.25 ft	=	-0.009	L/D	=	1178 1	> 240	0.02

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 123**

SPAN INFORMATION (ft): I-End (51.69,161.50) J-End (51.69,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.665	0.587	0.978	0.0%	Red	0.000	0.244
	15.000	0.665	0.587	0.978			0.000	0.244
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.95 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	31.7	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.1	7.5	---	---		
	Max +	1.2DL+1.6LL	67.3	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	67.3	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.43	6.43
DL reaction	5.18	5.18
Max +LL reaction	7.33	7.33
Max +total reaction (factored)	17.95	17.95

DEFLECTIONS:

							Ratio
Initial load (in)	at	7.50 ft	=	-0.080	L/D	=	2251
Live load (in)	at	7.50 ft	=	-0.055	L/D	=	3283 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.059	L/D	=	3040	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.139	L/D	=	1293	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 124**

SPAN INFORMATION (ft): I-End (61.47,161.50) J-End (61.47,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.665	0.587	0.978	0.0%	Red	0.000	0.244
	15.000	0.665	0.587	0.978			0.000	0.244
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.95 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	31.7	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.1	7.5	---	---		
	Max +	1.2DL+1.6LL	67.3	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	67.3	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.43	6.43
DL reaction	5.18	5.18
Max +LL reaction	7.33	7.33
Max +total reaction (factored)	17.95	17.95

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.080	L/D = 2251
Live load (in)	at	7.50 ft	=	-0.055	L/D = 3283 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.059	L/D	=	3040	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.139	L/D	=	1293	>	240	0.19

Floor Type: Level 3 **Beam Number = 125**

SPAN INFORMATION (ft): I-End (51.69,148.08) J-End (51.69,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 13.42

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	40.25	Y bar(in)	=	15.56
Mnf (kip-ft)	=	368.30	Mn (kip-ft)	=	274.48
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	657.64	Itr (in4)	=	988.36
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 26 Partial = 13 Actual = 13
Number of Stud Rows = 1 Percent of Full Composite Action = 26.80

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	13.416	0.332	0.293	0.489			0.000	0.122
2	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	1.583	0.332	0.293	0.489			0.000	0.122
3	1.584	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	13.416	0.332	0.293	0.489			0.000	0.122
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	13.416	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.02 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	25.2	6.7	0.0	1.00	0.90	165.75
	Init DL	1.4DL	19.2	6.7	---	---		
	Max +	1.2DL+1.6LL	53.6	6.7	---	---	0.90	247.04
Controlling		1.2DL+1.6LL	53.6	6.7	---	---	0.90	247.04

REACTIONS (kips):

	Left	Right
Initial reaction	5.43	5.74
DL reaction	4.38	4.62
Max +LL reaction	6.19	6.54
Max +total reaction (factored)	15.16	16.02

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.71 ft	=	-0.051	L/D	=	3162			
Live load (in)	at	6.71 ft	=	-0.037	L/D	=	4331	>	360	0.08
Post Comp load (in)	at	6.71 ft	=	-0.040	L/D	=	4011	>	240	0.06
Net Total load (in)	at	6.71 ft	=	-0.091	L/D	=	1768	>	240	0.14

Floor Type: Level 3 **Beam Number = 126**

SPAN INFORMATION (ft): I-End (61.47,149.67) J-End (61.47,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.83

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 35.50		Y bar(in)	=	15.23
Mnf (kip-ft)	= 358.66		Mn (kip-ft)	=	270.58
C (kips)	= 98.21		PNA (in)	=	11.78
Ieff (in4)	= 643.58		Itr (in4)	=	958.82
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
\# of studs: Max = 22 Partial = 13 Actual = 13
Number of Stud Rows = 2 Percent of Full Composite Action = 26.98

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	11.833	0.332	0.293	0.489			0.000	0.122
2	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	1.583	0.332	0.293	0.489			0.000	0.122
3	1.584	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	11.833	0.332	0.293	0.489			0.000	0.122
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.833	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 14.12 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	19.6	5.9	0.0	1.00	0.90	165.75
	Init DL	1.4DL	14.9	5.9	---	---		
	Max +	1.2DL+1.6LL	41.7	5.9	---	---	0.90	243.53
Controlling		1.2DL+1.6LL	41.7	5.9	---	---	0.90	243.53

REACTIONS (kips):

	Left	Right
Initial reaction	4.76	5.06
DL reaction	3.84	4.08

PRCNC20221036

Gravity Beam Design

	Left	Right
Max +LL reaction	5.41	5.77
Max +total reaction (factored)	13.27	14.12

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.92 ft	=	-0.031	L/D	=	4616			
Live load (in)	at	5.92 ft	=	-0.023	L/D	=	6188	>	360	0.06
Post Comp load (in)	at	5.92 ft	=	-0.025	L/D	=	5730	>	240	0.04
Net Total load (in)	at	5.92 ft	=	-0.056	L/D	=	2557	>	240	0.09

PRCNC20221036

Floor Type: Level 3 **Beam Number = 127**

SPAN INFORMATION (ft): I-End (71.25,156.50) J-End (95.92,156.50)

Beam Size (User Selected) = W21X55 Fy = 50.0 ksi
Total Beam Length (ft) = 24.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	74.00	Y bar(in)	=	19.40
Mnf (kip-ft)	=	925.93	Mn (kip-ft)	=	735.70
C (kips)	=	206.76	PNA (in)	=	15.91
Ieff (in4)	=	2216.61	Itr (in4)	=	3197.04
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 48 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 27.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	7.5%	Red	0.000	0.250
	24.666	0.680	0.600	1.000			0.000	0.250
2	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	24.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.14 kips 1.00Vn = 234.00 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	90.2	12.3	0.0	1.00	0.90	472.50
	Init DL	1.4DL	69.8	12.3	---	---		
	Max +	1.2DL+1.6LL	179.7	12.3	---	---	0.90	662.13
Controlling		1.2DL+1.6LL	179.7	12.3	---	---	0.90	662.13

REACTIONS (kips):

	Left	Right
Initial reaction	11.16	11.16
DL reaction	9.07	9.07
Max +LL reaction	11.41	11.41
Max +total reaction (factored)	29.14	29.14

DEFLECTIONS: **Ratio**

Initial load (in)	at 12.33 ft	=	-0.165	L/D	=	1793
Live load (in)	at 12.33 ft	=	-0.120	L/D	=	2469 >

PRCNC20221036

Post Comp load (in)	at 12.33 ft	=	-0.130	L/D	=	2272	>	240	0.11
Net Total load (in)	at 12.33 ft	=	-0.295	L/D	=	1002	>	240	0.24

Floor Type: Level 3 **Beam Number = 128**

SPAN INFORMATION (ft): I-End (71.25,166.50) J-End (95.92,166.50)

Beam Size (User Selected) = W21X55 Fy = 50.0 ksi
Total Beam Length (ft) = 24.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	74.00	Y bar(in)	=	19.40
Mnf (kip-ft)	=	925.93	Mn (kip-ft)	=	722.22
C (kips)	=	189.53	PNA (in)	=	15.45
Ieff (in4)	=	2170.77	Itr (in4)	=	3197.04
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 48 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 25.11

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
14.917	0.06	0.06								

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	7.5%	Red	0.000	0.250
	24.666	0.680	0.600	1.000			0.000	0.250
2	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	24.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.18 kips 1.00Vn = 234.00 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	90.6	12.4	0.0	1.00	0.90	472.50
	Init DL	1.4DL	70.2	12.4	---	---		
	Max +	1.2DL+1.6LL	180.0	12.3	---	---	0.90	650.00
Controlling		1.2DL+1.6LL	180.0	12.3	---	---	0.90	650.00

REACTIONS (kips):

	Left	Right
Initial reaction	11.19	11.20
DL reaction	9.09	9.10
Max +LL reaction	11.41	11.41

PRCNC20221036

	Left	Right
Max +total reaction (factored)	29.17	29.18

DEFLECTIONS:

									Ratio
Initial load (in)	at 12.33 ft	=	-0.166	L/D	=	1783			
Live load (in)	at 12.33 ft	=	-0.122	L/D	=	2418	>	360	0.15
Post Comp load (in)	at 12.33 ft	=	-0.133	L/D	=	2225	>	240	0.11
Net Total load (in)	at 12.33 ft	=	-0.299	L/D	=	990	>	240	0.24

Floor Type: Level 3 **Beam Number = 129**

SPAN INFORMATION (ft): I-End (95.92,156.50) J-End (110.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in) at 7.50 ft = -0.082 L/D = 2203
Live load (in) at 7.50 ft = -0.056 L/D = 3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 3 **Beam Number = 130**

SPAN INFORMATION (ft): I-End (95.92,166.50) J-End (110.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

						Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203	
Live load (in)	at	7.50 ft	=	-0.056	L/D = 3210	>

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 131**

SPAN INFORMATION (ft): I-End (110.92,156.50) J-End (125.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 45.00		Y bar(in)	=	15.83
Mnf (kip-ft)	= 373.04		Mn (kip-ft)	=	285.88
C (kips)	= 120.61		PNA (in)	=	12.67
Ieff (in4)	= 700.45		Itr (in4)	=	1013.75
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at 7.50 ft	= -0.082	L/D = 2203		
Live load (in)	at 7.50 ft	= -0.056	L/D = 3210	>	PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 132**

SPAN INFORMATION (ft): I-End (110.92,166.50) J-End (125.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at 7.50 ft	=	-0.082	L/D =	2203
Live load (in)	at 7.50 ft	=	-0.056	L/D =	3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 133**

SPAN INFORMATION (ft): I-End (125.92,156.50) J-End (140.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D	=	3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 134**

SPAN INFORMATION (ft): I-End (125.92,166.50) J-End (140.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

							Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D	=	3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 135**

SPAN INFORMATION (ft): I-End (140.92,156.50) J-End (155.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.250	---	NonR	0.000	0.250
	15.000	0.680	0.600	1.250			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	80.1	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	80.1	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	9.37	9.37
Max +total reaction (factored)	21.35	21.35

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203
Live load (in)	at	7.50 ft	=	-0.070	L/D = 2568 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.075	L/D	=	2413	>	240	0.10
Net Total load (in)	at	7.50 ft	=	-0.156	L/D	=	1152	>	240	0.21

Floor Type: Level 3 **Beam Number = 136**

SPAN INFORMATION (ft): I-End (140.92,166.50) J-End (155.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.513	0.453	0.944	---	NonR	0.000	0.189
	15.000	0.513	0.453	0.944			0.000	0.189
2	0.000	0.167	0.147	0.245	0.0%	Red	0.000	0.061
	15.000	0.167	0.147	0.245			0.000	0.061
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.62 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	77.3	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	77.3	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	8.92	8.92
Max +total reaction (factored)	20.62	20.62

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203			
Live load (in)	at	7.50 ft	=	-0.067	L/D	=	2700	>	360	0.13
Post Comp load (in)	at	7.50 ft	=	-0.071	L/D	=	2530	>	240	0.09
Net Total load (in)	at	7.50 ft	=	-0.153	L/D	=	1178	>	240	0.20

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 137**

SPAN INFORMATION (ft): I-End (155.92,156.50) J-End (170.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	= 373.04	Mn (kip-ft)	=	285.88
C (kips)	= 120.61	PNA (in)	=	12.67
Ieff (in4)	= 700.45	Itr (in4)	=	1013.75
Stud length (in)	= 4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.250	---	NonR	0.000	0.250
	15.000	0.680	0.600	1.250			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	80.1	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	80.1	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	9.37	9.37
Max +total reaction (factored)	21.35	21.35

DEFLECTIONS:

				Ratio
Initial load (in)	at 7.50 ft	= -0.082	L/D = 2203	
Live load (in)	at 7.50 ft	= -0.070	L/D = 2568 >	PRCNC20221036

Gravity Beam Design

Post Comp load (in)	at	7.50 ft	=	-0.075	L/D	=	2414	>	240	0.10
Net Total load (in)	at	7.50 ft	=	-0.156	L/D	=	1152	>	240	0.21

PRCNC20221036

Floor Type: Level 3 **Beam Number = 138**

SPAN INFORMATION (ft): I-End (155.92,166.50) J-End (170.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.513	0.453	0.944	---	NonR	0.000	0.189
	15.000	0.513	0.453	0.944			0.000	0.189
2	0.000	0.167	0.147	0.245	0.0%	Red	0.000	0.061
	15.000	0.167	0.147	0.245			0.000	0.061
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.62 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	77.3	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	77.3	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	8.92	8.92
Max +total reaction (factored)	20.62	20.62

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203			
Live load (in)	at	7.50 ft	=	-0.067	L/D	=	2700	>	360	0.13
Post Comp load (in)	at	7.50 ft	=	-0.071	L/D	=	2530	>	240	0.09
Net Total load (in)	at	7.50 ft	=	-0.153	L/D	=	1178	>	240	0.20

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 139**

SPAN INFORMATION (ft): I-End (170.92,156.50) J-End (185.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D = 3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 140**

SPAN INFORMATION (ft): I-End (170.92,166.50) J-End (185.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

						Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D	= 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D	= 3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 3 **Beam Number = 141**

SPAN INFORMATION (ft): I-End (185.92,156.50) J-End (200.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in) at 7.50 ft = -0.082 L/D = 2203
Live load (in) at 7.50 ft = -0.056 L/D = 3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	> 240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	> 240	0.19

Floor Type: Level 3 **Beam Number = 142**

SPAN INFORMATION (ft): I-End (185.92,166.50) J-End (200.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D	=	3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 143**

SPAN INFORMATION (ft): I-End (200.92,156.50) J-End (215.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D = 3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

RAM Steel 17.03.00.285 | Page 478/963
DataBase: Pierce College - 6.14.22 | 06/29/22 13:29:13
Building Code: IBC | Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 144**

SPAN INFORMATION (ft): I-End (200.92,166.50) J-End (215.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D	=	3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 145**

SPAN INFORMATION (ft): I-End (225.92,161.50) J-End (225.92,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.082	L/D =	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D =	3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 146**

SPAN INFORMATION (ft): I-End (235.92,161.50) J-End (235.92,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.082	L/D =	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D =	3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 3 **Beam Number = 147**

SPAN INFORMATION (ft): I-End (225.92,146.50) J-End (225.92,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in) at 7.50 ft = -0.082 L/D = 2203
Live load (in) at 7.50 ft = -0.056 L/D = 3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 3 **Beam Number = 148**

SPAN INFORMATION (ft): I-End (235.92,146.50) J-End (235.92,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.082	L/D =	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D =	3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 3 **Beam Number = 149**

SPAN INFORMATION (ft): I-End (225.92,135.17) J-End (225.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	34.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	354.05	Mn (kip-ft)	=	270.44
C (kips)	=	98.21	PNA (in)	=	11.78
Ieff (in4)	=	645.54	Itr (in4)	=	948.45
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 22 Partial = 12 Actual = 12
Number of Stud Rows = 2 Percent of Full Composite Action = 28.32

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	11.333	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.87 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.5	5.7	0.0	1.00	0.90	165.75
	Init DL	1.4DL	14.1	5.7	---	---		
	Max +	1.2DL+1.6LL	39.3	5.7	---	---	0.90	243.39
Controlling		1.2DL+1.6LL	39.3	5.7	---	---	0.90	243.39

REACTIONS (kips):

	Left	Right
Initial reaction	4.96	4.96
DL reaction	4.00	4.00
Max +LL reaction	5.67	5.67
Max +total reaction (factored)	13.87	13.87

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	5.67 ft	=	-0.027	L/D	=	5108			
Live load (in)	at	5.67 ft	=	-0.020	L/D	=	6859	>	360	0.05
Post Comp load (in)	at	5.67 ft	=	-0.021	L/D	=	6351	>	240	0.04
Net Total load (in)	at	5.67 ft	=	-0.048	L/D	=	2831	>	240	0.08

Floor Type: Level 3 **Beam Number = 150**

SPAN INFORMATION (ft): I-End (235.92,135.17) J-End (235.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	34.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	354.05	Mn (kip-ft)	=	270.44
C (kips)	=	98.21	PNA (in)	=	11.78
Ieff (in4)	=	645.54	Itr (in4)	=	948.45
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 22 Partial = 12 Actual = 12
Number of Stud Rows = 2 Percent of Full Composite Action = 28.32

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	11.333	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.87 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.5	5.7	0.0	1.00	0.90	165.75
	Init DL	1.4DL	14.1	5.7	---	---		
	Max +	1.2DL+1.6LL	39.3	5.7	---	---	0.90	243.39
Controlling		1.2DL+1.6LL	39.3	5.7	---	---	0.90	243.39

REACTIONS (kips):

	Left	Right
Initial reaction	4.96	4.96
DL reaction	4.00	4.00
Max +LL reaction	5.67	5.67
Max +total reaction (factored)	13.87	13.87

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	5.67 ft	=	-0.027	L/D	=	5108			
Live load (in)	at	5.67 ft	=	-0.020	L/D	=	6859	>	360	0.05
Post Comp load (in)	at	5.67 ft	=	-0.021	L/D	=	6351	>	240	0.04
Net Total load (in)	at	5.67 ft	=	-0.048	L/D	=	2831	>	240	0.08

Floor Type: Level 3 **Beam Number = 151**

SPAN INFORMATION (ft): I-End (225.92,112.87) J-End (225.92,135.17)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 22.30

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	66.90	Y bar(in)	=	16.70
Mnf (kip-ft)	=	386.19	Mn (kip-ft)	=	314.79
C (kips)	=	172.30	PNA (in)	=	14.74
Ieff (in4)	=	833.96	Itr (in4)	=	1096.66
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 44 Partial = 22 Actual = 22
Number of Stud Rows = 1 Percent of Full Composite Action = 44.59

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	1.250	---	NonR	0.000	0.125
	5.299	0.340	0.300	1.250			0.000	0.125
2	5.300	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	22.299	0.680	0.600	1.000			0.000	0.250
3	0.000	0.000	0.000	0.000	---	NonR	0.000	0.000
	2.649	0.340	0.300	1.250			0.000	0.125
4	2.650	0.340	0.300	1.250	---	NonR	0.000	0.125
	5.299	0.340	0.300	1.250			0.000	0.125
5	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	22.299	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 35.43 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	71.2	11.2	0.0	1.00	0.90	165.75
	Init DL	1.4DL	54.2	11.2	---	---		
	Max +	1.2DL+1.6LL	167.9	10.6	---	---	0.90	283.31
Controlling		1.2DL+1.6LL	167.9	10.6	---	---	0.90	283.31

REACTIONS (kips):

	Left	Right
Initial reaction	9.23	9.75
DL reaction	7.44	7.85

PRCNC20221036

	Left	Right
Max +LL reaction	16.56	12.03
Max +total reaction (factored)	35.43	28.67

DEFLECTIONS:

									Ratio
Initial load (in)	at 11.15 ft	=	-0.397	L/D	=	674			
Live load (in)	at 11.04 ft	=	-0.272	L/D	=	984	>	360	0.37
Post Comp load (in)	at 11.04 ft	=	-0.290	L/D	=	922	>	240	0.26
Net Total load (in)	at 11.04 ft	=	-0.687	L/D	=	389	>	240	0.62

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 152**

SPAN INFORMATION (ft): I-End (235.92,115.52) J-End (235.92,135.17)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 19.65

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	58.95	Y bar(in)	=	16.44
Mnf (kip-ft)	=	382.55	Mn (kip-ft)	=	306.09
C (kips)	=	155.07	PNA (in)	=	14.05
Ieff (in4)	=	790.63	Itr (in4)	=	1071.50
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 38 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 39.45

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	1.250	---	NonR	0.000	0.125
	2.649	0.680	0.600	2.500			0.000	0.250
2	2.650	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	19.649	0.680	0.600	1.000			0.000	0.250
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	19.649	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.92 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	55.2	9.9	0.0	1.00	0.90	165.75
	Init DL	1.4DL	42.1	9.9	---	---		
	Max +	1.2DL+1.6LL	120.9	9.7	---	---	0.90	275.48
Controlling		1.2DL+1.6LL	120.9	9.7	---	---	0.90	275.48

REACTIONS (kips):

	Left	Right
Initial reaction	8.07	8.58
DL reaction	6.51	6.92
Max +LL reaction	11.95	10.02
Max +total reaction (factored)	26.92	24.33

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	9.82 ft	=	-0.239	L/D	=	987			
Live load (in)	at	9.82 ft	=	-0.153	L/D	=	1540	>	360	0.23
Post Comp load (in)	at	9.82 ft	=	-0.165	L/D	=	1431	>	240	0.17
Net Total load (in)	at	9.82 ft	=	-0.404	L/D	=	584	>	240	0.41

Floor Type: Level 3 **Beam Number = 153**

SPAN INFORMATION (ft): I-End (79.64,63.80) J-End (107.33,71.22)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	86.00	Y bar(in)	=	15.60
Mnf (kip-ft)	=	307.13	Mn (kip-ft)	=	271.77
C (kips)	=	223.99	PNA (in)	=	13.50
Ieff (in4)	=	711.41	Itr (in4)	=	815.76
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 28 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 69.02

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.000	0.57	0.43	0.00	0.0	0.00	0.00	0.0	0.18	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.401	0.287	0.000	---	Snow	0.000	0.119
	28.666	0.401	0.287	0.000			0.000	0.119
2	0.000	0.000	0.000	0.143	---	Snow	0.000	0.000
	28.666	0.000	0.000	0.143			0.000	0.000
3	0.000	0.201	0.143	0.000	---	Snow	0.000	0.060
	5.000	0.201	0.143	0.000			0.000	0.060
4	0.000	0.000	0.000	0.072	---	Snow	0.000	0.000
	5.000	0.000	0.000	0.072			0.000	0.000
5	5.000	0.401	0.287	0.000	---	Snow	0.000	0.119
	28.666	0.401	0.287	0.000			0.000	0.119
6	5.000	0.000	0.000	0.143	---	Snow	0.000	0.000
	28.666	0.000	0.000	0.143			0.000	0.000
7	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	28.666	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.77 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	112.9	14.3	0.0	1.00	0.90	124.50
	Init DL	1.4DL	85.9	14.3	---	---		
	Max +	1.2DL+1.6LL	149.0	14.3	---	---	0.90	244.60
Controlling		1.2DL+1.6LL	112.9	14.3	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	**Right**
Initial reaction	11.51	11.97
DL reaction	11.38	11.83
Max +LL reaction	3.93	4.11
Max +total reaction (factored)	19.94	20.77

DEFLECTIONS: (Camber = 1-1/4)

									Ratio
Initial load (in)	at 14.33 ft	=	-1.572	L/D	=	219			
Live load (in)	at 14.33 ft	=	-0.211	L/D	=	1630	>	360	0.22
Post Comp load (in)	at 14.33 ft	=	-0.380	L/D	=	906	>	240	0.27
Net Total load (in)	at 14.33 ft	=	-0.702	L/D	=	490	>	240	0.49

Floor Type: Level 3 **Beam Number = 154**

SPAN INFORMATION (ft): I-End (82.11,54.57) J-End (109.80,61.99)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	86.00	Y bar(in)	=	15.60
Mnf (kip-ft)	=	307.13	Mn (kip-ft)	=	271.77
C (kips)	=	223.99	PNA (in)	=	13.50
Ieff (in4)	=	711.41	Itr (in4)	=	815.76
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 28 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 69.02

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.000	0.57	0.43	0.00	0.0	0.00	0.00	0.0	0.18	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.201	0.143	0.000	---	Snow	0.000	0.060
	5.000	0.201	0.143	0.000			0.000	0.060
2	0.000	0.000	0.000	0.072	---	Snow	0.000	0.000
	5.000	0.000	0.000	0.072			0.000	0.000
3	5.000	0.401	0.287	0.000	---	Snow	0.000	0.119
	28.666	0.401	0.287	0.000			0.000	0.119
4	5.000	0.000	0.000	0.143	---	Snow	0.000	0.000
	28.666	0.000	0.000	0.143			0.000	0.000
5	0.000	0.401	0.287	0.000	---	Snow	0.000	0.119
	28.666	0.401	0.287	0.000			0.000	0.119
6	0.000	0.000	0.000	0.143	---	Snow	0.000	0.000
	28.666	0.000	0.000	0.143			0.000	0.000
7	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	28.666	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.77 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

PRCNC20221036

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	112.9	14.3	0.0	1.00	0.90	124.50
	Init DL	1.4DL	85.9	14.3	---	---		
	Max +	1.2DL+1.6LL	149.0	14.3	---	---	0.90	244.60
Controlling		1.2DL+1.6LL	112.9	14.3	---	---	0.90	124.50

REACTIONS (kips):

	Left	**Right**
Initial reaction	11.51	11.97
DL reaction	11.38	11.83
Max +LL reaction	3.93	4.11
Max +total reaction (factored)	19.94	20.77

DEFLECTIONS: (Camber = 1-1/4)

							Ratio
Initial load (in)	at 14.33 ft	=	-1.572	L/D =	219		
Live load (in)	at 14.33 ft	=	-0.211	L/D =	1630	> 360	0.22
Post Comp load (in)	at 14.33 ft	=	-0.380	L/D =	906	> 240	0.27
Net Total load (in)	at 14.33 ft	=	-0.702	L/D =	490	> 240	0.49

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 155**

SPAN INFORMATION (ft): I-End (107.33,71.22) J-End (134.37,78.47)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	84.00	Y bar(in)	=	15.56
Mnf (kip-ft)	=	306.77	Mn (kip-ft)	=	277.96
C (kips)	=	241.22	PNA (in)	=	13.53
Ieff (in4)	=	728.31	Itr (in4)	=	812.92
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 28 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 74.33

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.803	0.573	0.000	---	Snow	0.000	0.239
	28.000	0.803	0.573	0.000			0.000	0.239
2	0.000	0.000	0.000	0.287	---	Snow	0.000	0.000
	28.000	0.000	0.000	0.287			0.000	0.000
3	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	28.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.28 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	107.5	14.0	0.0	1.00	0.90	124.50
	Init DL	1.4DL	81.7	14.0	---	---		
	Max +	1.2DL+1.6LL	141.9	14.0	---	---	0.90	250.16
Controlling		1.2DL+1.6LL	107.5	14.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	Right
Initial reaction	11.68	11.68
DL reaction	11.55	11.55
Max +LL reaction	4.01	4.01
Max +total reaction (factored)	20.28	20.28

DEFLECTIONS: (Camber = 1)

PRCNC20221036

Initial load (in)	at 14.00 ft	=	-1.427	L/D	=	235			
Live load (in)	at 14.00 ft	=	-0.188	L/D	=	1790	>	360	0.20
Post Comp load (in)	at 14.00 ft	=	-0.338	L/D	=	994	>	240	0.24
Net Total load (in)	at 14.00 ft	=	-0.765	L/D	=	439	>	240	0.55

Floor Type: Level 3 **Beam Number = 156**

SPAN INFORMATION (ft): I-End (109.80,61.99) J-End (136.85,69.24)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 28.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	84.00	Y bar(in)	=	15.56
Mnf (kip-ft)	=	306.77	Mn (kip-ft)	=	277.96
C (kips)	=	241.22	PNA (in)	=	13.53
Ieff (in4)	=	728.31	Itr (in4)	=	812.92
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 28 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 74.33

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.803	0.573	0.000	---	Snow	0.000	0.239
	28.000	0.803	0.573	0.000			0.000	0.239
2	0.000	0.000	0.000	0.287	---	Snow	0.000	0.000
	28.000	0.000	0.000	0.287			0.000	0.000
3	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	28.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.28 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	107.5	14.0	0.0	1.00	0.90	124.50
	Init DL	1.4DL	81.7	14.0	---	---		
	Max +	1.2DL+1.6LL	141.9	14.0	---	---	0.90	250.16
Controlling		1.2DL+1.6LL	107.5	14.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	Right
Initial reaction	11.68	11.68
DL reaction	11.55	11.55
Max +LL reaction	4.01	4.01
Max +total reaction (factored)	20.28	20.28

DEFLECTIONS: (Camber = 1)

PRCNC20221036

Initial load (in)	at	14.00 ft	=	-1.427	L/D	=	235			
Live load (in)	at	14.00 ft	=	-0.188	L/D	=	1790	>	360	0.20
Post Comp load (in)	at	14.00 ft	=	-0.338	L/D	=	994	>	240	0.24
Net Total load (in)	at	14.00 ft	=	-0.765	L/D	=	439	>	240	0.55

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 157**

SPAN INFORMATION (ft): I-End (134.37,78.47) J-End (163.35,86.23)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	15.66
Mnf (kip-ft)	=	307.80	Mn (kip-ft)	=	278.52
C (kips)	=	241.22	PNA (in)	=	13.53
Ieff (in4)	=	735.42	Itr (in4)	=	821.18
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 73.62

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL
28.167	5.84	0.06								
28.167	5.84	0.06								

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.803	0.573	0.000	---	Snow	0.000	0.239
	30.000	0.803	0.573	0.000			0.000	0.239
2	0.000	0.000	0.000	0.287	---	Snow	0.000	0.000
	30.000	0.000	0.000	0.287			0.000	0.000
3	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	30.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.88 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	123.5	15.0	0.0	1.00	0.90	124.50
	Init DL	1.4DL	93.9	15.0	---	---		
	Max +	1.2DL+1.6LL	176.0	15.6	---	---	0.90	250.67
Controlling		1.2DL+1.6LL	123.5	15.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	Right
Initial reaction	12.52	12.62
DL reaction	13.08	23.33
Max +LL reaction	4.30	4.30
Max +total reaction (factored)	22.58	34.88

DEFLECTIONS: (Camber = 1-1/2)

									Ratio
Initial load (in)	at 15.15 ft	=	-1.884	L/D	=	191			
Live load (in)	at 15.15 ft	=	-0.245	L/D	=	1470	>	360	0.24
Post Comp load (in)	at 15.15 ft	=	-0.537	L/D	=	670	>	240	0.36
Net Total load (in)	at 15.15 ft	=	-0.921	L/D	=	391	>	240	0.61

PRCNC20221036

Floor Type: Level 3 **Beam Number = 158**

SPAN INFORMATION (ft): I-End (136.85,69.24) J-End (165.83,77.00)

Beam Size (Optimum) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	15.66
Mnf (kip-ft)	=	307.80	Mn (kip-ft)	=	278.52
C (kips)	=	241.22	PNA (in)	=	13.53
Ieff (in4)	=	735.42	Itr (in4)	=	821.18
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 73.62

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL
28.167	5.84	0.06								
28.167	5.84	0.06								

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.803	0.573	0.000	---	Snow	0.000	0.239
	30.000	0.803	0.573	0.000			0.000	0.239
2	0.000	0.000	0.000	0.287	---	Snow	0.000	0.000
	30.000	0.000	0.000	0.287			0.000	0.000
3	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	30.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.88 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	123.5	15.0	0.0	1.00	0.90	124.50
	Init DL	1.4DL	93.9	15.0	---	---		
	Max +	1.2DL+1.6LL	176.0	15.6	---	---	0.90	250.67
Controlling		1.2DL+1.6LL	123.5	15.0	0.0	1.00	0.90	124.50

REACTIONS (kips):

	Left	Right
Initial reaction	12.52	12.62
DL reaction	13.08	23.33
Max +LL reaction	4.30	4.30
Max +total reaction (factored)	22.58	34.88

DEFLECTIONS: (Camber = 1-1/2)

										Ratio
Initial load (in)	at	15.15 ft	=	-1.884	L/D	=	191			
Live load (in)	at	15.15 ft	=	-0.245	L/D	=	1470	>	360	0.24
Post Comp load (in)	at	15.15 ft	=	-0.537	L/D	=	670	>	240	0.36
Net Total load (in)	at	15.15 ft	=	-0.921	L/D	=	391	>	240	0.61

Floor Type: Level 3 **Beam Number = 159**

SPAN INFORMATION (ft): I-End (187.82,92.79) J-End (213.98,99.80)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 81.25	Y bar(in)	= 17.07
Mnf (kip-ft)	= 390.96	Mn (kip-ft)	= 336.25
C (kips)	= 223.99	PNA (in)	= 15.41
Ieff (in4)	= 936.40	Itr (in4)	= 1132.95
Stud length (in)	= 4.00	Stud diam (in)	= 0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 54 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 58.27

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
22.083	0.48	0.43	0.60	8.3	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	0.478	8.3%	Red	0.000	0.119
	27.083	0.325	0.287	0.478			0.000	0.119
2	0.000	0.325	0.287	0.478	8.3%	Red	0.000	0.119
	22.083	0.325	0.287	0.478			0.000	0.119
3	22.084	0.162	0.143	0.239	8.3%	Red	0.000	0.060
	27.083	0.162	0.143	0.239			0.000	0.060
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	27.083	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.99 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	101.2	13.6	0.0	1.00	0.90	165.75
	Init DL	1.4DL	77.2	13.6	---	---		
	Max +	1.2DL+1.6LL	203.1	13.5	---	---	0.90	302.63
Controlling		1.2DL+1.6LL	203.1	13.5	---	---	0.90	302.63

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	11.37	10.90
DL reaction	9.17	8.81
Max +LL reaction	11.87	11.32
Max +total reaction (factored)	29.99	28.68

DEFLECTIONS:

									Ratio
Initial load (in)	at 13.54 ft	=	-0.834	L/D	=	390			
Live load (in)	at 13.54 ft	=	-0.390	L/D	=	832	>	360	0.43
Post Comp load (in)	at 13.54 ft	=	-0.425	L/D	=	766	>	240	0.31
Net Total load (in)	at 13.54 ft	=	-1.259	L/D	=	258	>	240	0.93

Floor Type: Level 3 **Beam Number = 160**

SPAN INFORMATION (ft): I-End (190.30,83.56) J-End (216.46,90.57)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	81.25	Y bar(in)	=	17.07
Mnf (kip-ft)	=	390.96	Mn (kip-ft)	=	336.25
C (kips)	=	223.99	PNA (in)	=	15.41
Ieff (in4)	=	936.40	Itr (in4)	=	1132.95
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 54 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 58.27

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
22.083	0.48	0.43	0.60	8.3	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	0.478	8.3%	Red	0.000	0.119
	22.083	0.325	0.287	0.478			0.000	0.119
2	22.084	0.162	0.143	0.239	8.3%	Red	0.000	0.060
	27.083	0.162	0.143	0.239			0.000	0.060
3	0.000	0.325	0.287	0.478	8.3%	Red	0.000	0.119
	27.083	0.325	0.287	0.478			0.000	0.119
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	27.083	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.99 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	101.2	13.6	0.0	1.00	0.90	165.75
	Init DL	1.4DL	77.2	13.6	---	---		
	Max +	1.2DL+1.6LL	203.1	13.5	---	---	0.90	302.63
Controlling		1.2DL+1.6LL	203.1	13.5	---	---	0.90	302.63

REACTIONS (kips):

	Left	Right
Initial reaction	11.37	10.90
DL reaction	9.17	8.81
Max +LL reaction	11.87	11.32
Max +total reaction (factored)	29.99	28.68

DEFLECTIONS:

										Ratio
Initial load (in)	at	13.54 ft	=	-0.834	L/D	=	390			
Live load (in)	at	13.54 ft	=	-0.390	L/D	=	832	>	360	0.43
Post Comp load (in)	at	13.54 ft	=	-0.425	L/D	=	766	>	240	0.31
Net Total load (in)	at	13.54 ft	=	-1.259	L/D	=	258	>	240	0.93

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 161**

SPAN INFORMATION (ft): I-End (173.01,88.82) J-End (187.82,92.79)

Beam Size (Optimum) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	46.00	Y bar(in)	=	12.05
Mnf (kip-ft)	=	139.12	Mn (kip-ft)	=	119.48
C (kips)	=	120.61	PNA (in)	=	9.73
Ieff (in4)	=	241.81	Itr (in4)	=	281.56
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 15 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 68.13

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.650	0.573	0.956	0.0%	Red	0.000	0.239
	15.333	0.650	0.573	0.956			0.000	0.239
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	15.333	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.81 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	31.9	7.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	24.1	7.7	---	---		
	Max +	1.2DL+1.6LL	68.3	7.7	---	---	0.90	107.53
Controlling		1.2DL+1.6LL	31.9	7.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	6.32	6.32
DL reaction	5.07	5.07
Max +LL reaction	7.33	7.33
Max +total reaction (factored)	17.81	17.81

DEFLECTIONS:

						Ratio
Initial load (in)	at	7.67 ft	=	-0.467	L/D =	394
Live load (in)	at	7.67 ft	=	-0.169	L/D =	1086 >

PRCNC20221036

Post Comp load (in)	at	7.67 ft	=	-0.183	L/D	=	1005	>	240	0.24
Net Total load (in)	at	7.67 ft	=	-0.650	L/D	=	283	>	240	0.85

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 162**

SPAN INFORMATION (ft): I-End (175.48,79.59) J-End (190.30,83.56)

Beam Size (Optimum) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	46.00	Y bar(in)	=	12.05
Mnf (kip-ft)	=	139.12	Mn (kip-ft)	=	119.48
C (kips)	=	120.61	PNA (in)	=	9.73
Ieff (in4)	=	241.81	Itr (in4)	=	281.56
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 15 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 68.13

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.650	0.573	0.956	0.0%	Red	0.000	0.239
	15.333	0.650	0.573	0.956			0.000	0.239
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	15.333	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.81 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	31.9	7.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	24.1	7.7	---	---		
	Max +	1.2DL+1.6LL	68.3	7.7	---	---	0.90	107.53
Controlling		1.2DL+1.6LL	31.9	7.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	6.32	6.32
DL reaction	5.07	5.07
Max +LL reaction	7.33	7.33
Max +total reaction (factored)	17.81	17.81

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.67 ft	=	-0.467	L/D	=	394	
Live load (in)	at	7.67 ft	=	-0.169	L/D	=	1086	> PRCNC20221036

Post Comp load (in)	at	7.67 ft	=	-0.183	L/D	=	1005	>	240	0.24
Net Total load (in)	at	7.67 ft	=	-0.650	L/D	=	283	>	240	0.85

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 163**

SPAN INFORMATION (ft): I-End (165.83,77.00) J-End (175.48,79.59)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	11.48
Mnf (kip-ft)	=	134.67	Mn (kip-ft)	=	105.25
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	197.47	Itr (in4)	=	259.73
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 10 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.533	0.470	0.783	0.0%	Red	0.000	0.196
	10.000	0.533	0.470	0.783			0.000	0.196
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.53 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	11.1	5.0	0.0	1.00	0.90	46.90
	Init DL	1.4DL	8.4	5.0	---	---		
	Max +	1.2DL+1.6LL	23.8	5.0	---	---	0.90	94.72
Controlling		1.2DL+1.6LL	23.8	5.0	---	---	0.90	94.72

REACTIONS (kips):

	Left	Right
Initial reaction	3.39	3.39
DL reaction	2.72	2.72
Max +LL reaction	3.92	3.92
Max +total reaction (factored)	9.53	9.53

DEFLECTIONS:

					Ratio
Initial load (in)	at	5.00 ft	=	-0.070	L/D = 1726
Live load (in)	at	5.00 ft	=	-0.031	L/D = 3899 > PRCNC20221036

Post Comp load (in)	at	5.00 ft	=	-0.033	L/D	=	3610	>	240	0.07
Net Total load (in)	at	5.00 ft	=	-0.103	L/D	=	1168	>	240	0.21

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 171**

SPAN INFORMATION (ft): I-End (240.00,106.77) J-End (242.47,97.54)

Beam Size (User Selected) = W10x12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.56

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	28.67	Y bar(in)	=	11.42
Mnf (kip-ft)	=	134.07	Mn (kip-ft)	=	95.67
C (kips)	=	64.61	PNA (in)	=	8.34
Ieff (in4)	=	176.72	Itr (in4)	=	257.26
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 24 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 36.50

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
3.467	0.81	0.72	0.00	0.0	2.86	0.00	0.0	0.00	Snow	0.00	0.29

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	9.555	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.60 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	3.1	3.5	6.1	1.63	0.90	46.90
	Init DL	1.4DL	2.4	3.5	---	---		
	Max +	1.2DL+1.6LL	12.4	3.5	---	---	0.90	86.11
Controlling		1.2DL+1.6LL	12.4	3.5	---	---	0.90	86.11

REACTIONS (kips):

	Left	Right
Initial reaction	0.70	0.42
DL reaction	0.57	0.35
Max +LL reaction	1.82	1.04
Max +total reaction (factored)	3.60	2.08

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	4.44 ft	=	-0.014	L/D	=	7920			
Live load (in)	at	4.44 ft	=	-0.016	L/D	=	7239	>	360	0.05
Post Comp load (in)	at	4.44 ft	=	-0.016	L/D	=	7014	>	240	0.03
Net Total load (in)	at	4.44 ft	=	-0.031	L/D	=	3720	>	240	0.06

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 172**

SPAN INFORMATION (ft): I-End (240.90,103.42) J-End (245.92,103.42)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.02
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.114	0.419	---	NonR	0.000
	5.020	0.157	0.576			0.000
2	0.003	0.200	0.735	---	NonR	0.000
	3.692	0.168	0.619			0.000
3	3.693	0.168	0.619	---	NonR	0.000
	5.020	0.000	0.000			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	5.020	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.54 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	6.9	2.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	6.9	2.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.81	0.72
Max +LL reaction	2.86	2.55
Max +total reaction (factored)	5.54	4.94

DEFLECTIONS:

										Ratio
Dead load (in)	at	2.51 ft	=	-0.003	L/D	=	2073 4			
Live load (in)	at	2.51 ft	=	-0.010	L/D	=	5862	>	360	0.06
Net Total load (in)	at	2.51 ft	=	-0.013	L/D	=	4570	>	240	0.05

PRCNC20221036

Floor Type: Level 3 **Beam Number = 173**

SPAN INFORMATION (ft): I-End (59.83,77.19) J-End (59.83,104.17)

Beam Size (User Selected) = W18X60 Fy = 50.0 ksi
Total Beam Length (ft) = 26.98
Mp (kip-ft) = 512.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
4.396	2.90	0.00	0.0	0.00	0.00	0.0	4.52	Snow	0.00
14.396	3.68	0.00	0.0	0.00	0.00	0.0	6.28	Snow	0.00
24.396	4.10	0.00	0.0	0.00	0.00	0.0	6.62	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.060	0.000	---	NonR	0.000
	26.979	0.060	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 24.46 kips 1.00Vn = 226.59 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	147.0	14.4	10.0	1.22	0.90	461.25
Controlling		1.2DL+1.6LL	147.0	14.4	10.0	1.22	0.90	461.25

REACTIONS (kips):

	Left	**Right**
DL reaction	5.34	6.95
Max +LL reaction	7.35	10.07
Max +total reaction (factored)	18.16	24.46

DEFLECTIONS:

					Ratio
Dead load (in)	at 13.62 ft = -0.178	L/D = 1815			
Live load (in)	at 13.62 ft = -0.254	L/D = 1275	>	360	0.28
Net Total load (in)	at 13.62 ft = -0.432	L/D = 749	>	240	0.32

PRCNC20221036

Floor Type: Level 3 **Beam Number = 174**

SPAN INFORMATION (ft): I-End (77.25,81.85) J-End (77.25,108.25)

Beam Size (User Selected) = W18X60 Fy = 50.0 ksi
Total Beam Length (ft) = 26.40
Mp (kip-ft) = 512.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
9.729	1.12	0.00	0.0	0.00	0.00	0.0	1.91	Snow	0.00
9.729	1.03	0.00	0.0	0.00	0.00	0.0	2.61	Snow	0.00
		0.00	0.0	0.00	0.00	0.0	-0.79	Snow	0.00
19.729	0.84	0.00	0.0	0.00	0.00	0.0	1.39	Snow	0.00
19.729	0.50	0.00	0.0	0.00	0.00	0.0	2.00	Snow	0.00
		0.00	0.0	0.00	0.00	0.0	-1.19	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.060	0.000	---	NonR	0.000
	26.395	0.060	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.81 kips 1.00Vn = 226.59 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	83.3	9.7	10.0	1.09	0.90	440.56
Controlling		1.2DL+1.6LL	83.3	9.7	10.0	1.09	0.90	440.56

REACTIONS (kips):

	Left	**Right**
DL reaction	2.48	2.58
Max +LL reaction	3.71	4.20
Max -LL reaction	-0.80	-1.18
Max +total reaction (factored)	8.91	9.81

DEFLECTIONS:

				Ratio
Dead load (in)	at 13.07 ft =	-0.090	L/D = 3536	
Live load (in)	at 13.07 ft =	-0.149	L/D = 2120 > 360	0.17
Net Total load (in)	at 13.07 ft =	-0.239	L/D = 1326 > 240	0.18

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 175**

SPAN INFORMATION (ft): I-End (59.83,104.17) J-End (77.25,108.25)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 17.89
Mp (kip-ft) = 184.17

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.400	0.000	---	NonR	0.000
	17.889	0.400	0.000			0.000
2	0.000	0.003	0.000	---	Snow	0.000
	17.262	0.003	0.000			0.000
3	17.263	0.003	0.000	---	Snow	0.000
	17.889	0.000	0.000			0.000
4	0.000	0.000	0.007	---	Snow	0.000
	17.262	0.000	0.007			0.000
5	17.263	0.000	0.007	---	Snow	0.000
	17.471	0.000	0.005			0.000
6	17.472	0.000	0.005	---	Snow	0.000
	17.680	0.000	0.000			0.000
7	0.000	0.016	0.000	---	Snow	0.000
	17.889	0.042	0.000			0.000
8	0.000	0.000	0.038	---	Snow	0.000
	17.889	0.000	0.097			0.000
9	0.000	0.026	0.000	---	NonR	0.000
	17.889	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.18 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	26.8	9.1	0.0	1.00	0.90	165.75
Controlling		1.2DL+1.6LL	26.8	9.1	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
DL reaction	4.06	4.14
Max +LL reaction	0.58	0.76
Max +total reaction (factored)	5.81	6.18

DEFLECTIONS:

							Ratio
Dead load (in)	at	8.94 ft	=	-0.121	L/D =	1773	
Live load (in)	at	8.94 ft	=	-0.020	L/D =	1083 8 > 360	0.03
Net Total load (in)	at	8.94 ft	=	-0.141	L/D =	1524 > 240	0.16

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 176**

SPAN INFORMATION (ft): I-End (59.83,104.17) J-End (59.83,121.58)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 17.42
Mp (kip-ft) = 72.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.417	0.65	0.00	0.0	0.00	0.00	0.0	1.40	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.400	0.000	---	NonR	0.000
	17.416	0.400	0.000			0.000
2	0.000	0.003	0.000	---	Snow	0.000
	17.166	0.003	0.000			0.000
3	17.167	0.003	0.000	---	Snow	0.000
	17.416	0.000	0.000			0.000
4	0.000	0.000	0.007	---	Snow	0.000
	17.166	0.000	0.007			0.000
5	0.000	0.014	0.000	---	NonR	0.000
	17.416	0.014	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.20 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	31.9	7.4	10.0	1.36	0.90	34.04
Controlling		1.2DL+1.6LL	31.9	7.4	10.0	1.36	0.90	34.04

REACTIONS (kips):

	Left	**Right**
DL reaction	4.01	3.91
Max +LL reaction	0.87	0.66
Max +total reaction (factored)	6.20	5.75

DEFLECTIONS:

									Ratio
Dead load (in)	at	8.62 ft	=	-0.383	L/D	=	545		
Live load (in)	at	8.62 ft	=	-0.107	L/D	=	1962	> 360	0.18
Net Total load (in)	at	8.62 ft	=	-0.490	L/D	=	427	> 240	0.56

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 177**

SPAN INFORMATION (ft): I-End (51.69,135.17) J-End (51.69,148.08)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 12.92

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	38.75	Y bar(in)	=	15.46
Mnf (kip-ft)	=	366.57	Mn (kip-ft)	=	274.36
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	653.06	Itr (in4)	=	979.53
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 24 Partial = 13 Actual = 13
Number of Stud Rows = 2 Percent of Full Composite Action = 26.78

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	11.333	0.332	0.293	0.489			0.000	0.122
2	11.334	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	12.916	0.000	0.000	0.000			0.000	0.000
3	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	12.916	0.332	0.293	0.489			0.000	0.122
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	12.916	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 15.42 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	23.4	6.4	0.0	1.00	0.90	165.75
	Init DL	1.4DL	17.8	6.4	---	---		
	Max +	1.2DL+1.6LL	49.7	6.4	---	---	0.90	246.92
Controlling		1.2DL+1.6LL	49.7	6.4	---	---	0.90	246.92

REACTIONS (kips):

	Left	Right
Initial reaction	5.52	5.22
DL reaction	4.45	4.21

PRCNC20221036

	Left	Right
Max +LL reaction	6.30	5.94
Max +total reaction (factored)	15.42	14.56

DEFLECTIONS:

											Ratio
Initial load (in)	at	6.46 ft	=	-0.044	L/D	=	3546				
Live load (in)	at	6.46 ft	=	-0.032	L/D	=	4822	>	360		0.07
Post Comp load (in)	at	6.46 ft	=	-0.035	L/D	=	4465	>	240		0.05
Net Total load (in)	at	6.46 ft	=	-0.078	L/D	=	1976	>	240		0.12

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 178**

SPAN INFORMATION (ft): I-End (61.47,135.17) J-End (61.47,149.67)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 14.50

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	43.50	Y bar(in)	=	15.75
Mnf (kip-ft)	=	371.66	Mn (kip-ft)	=	274.73
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	666.86	Itr (in4)	=	1006.12
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 28 Partial = 14 Actual = 14
Number of Stud Rows = 1 Percent of Full Composite Action = 26.92

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	12.916	0.332	0.293	0.489			0.000	0.122
2	12.917	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	14.500	0.000	0.000	0.000			0.000	0.000
3	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	14.500	0.332	0.293	0.489			0.000	0.122
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	14.500	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.32 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.5	7.2	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.5	7.2	---	---		
	Max +	1.2DL+1.6LL	62.7	7.2	---	---	0.90	247.25
Controlling		1.2DL+1.6LL	62.7	7.2	---	---	0.90	247.25

REACTIONS (kips):

	Left	Right
Initial reaction	6.20	5.90
DL reaction	5.00	4.76
Max +LL reaction	7.07	6.72
Max +total reaction (factored)	17.32	16.45

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

											Ratio
Initial load (in)	at	7.25 ft	=	-0.070	L/D	=	2503				
Live load (in)	at	7.25 ft	=	-0.050	L/D	=	3477	>	360		0.10
Post Comp load (in)	at	7.25 ft	=	-0.054	L/D	=	3219	>	240		0.07
Net Total load (in)	at	7.25 ft	=	-0.124	L/D	=	1408	>	240		0.17

PRCNC20221036

Floor Type: Level 3 **Beam Number = 179**

SPAN INFORMATION (ft): I-End (86.64,108.18) J-End (92.59,85.97)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 23.00
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.832	8.28	0.00	0.0	0.00	0.00	0.0	2.89	Snow	0.00
6.832	0.81	0.00	0.0	0.00	0.00	0.0	1.31	Snow	0.00
17.184	5.89	0.00	0.0	0.00	0.00	0.0	2.05	Snow	0.00
17.184	0.99	0.00	0.0	0.00	0.00	0.0	1.60	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.018	0.000	---	Snow	0.000
	6.831	0.090	0.000			0.000
2	0.000	0.000	0.032	---	Snow	0.000
	6.831	0.000	0.032			0.000
3	6.832	0.000	0.000	---	Snow	0.000
	17.184	0.109	0.000			0.000
4	6.832	0.000	0.039	---	Snow	0.000
	17.184	0.000	0.039			0.000
5	17.185	0.000	0.000	---	Snow	0.000
	23.000	0.061	0.000			0.000
6	17.185	0.000	0.023	---	Snow	0.000
	23.000	0.000	0.022			0.000
7	0.000	0.011	0.000	---	Snow	0.000
	6.831	0.000	0.000			0.000
8	6.832	0.017	0.000	---	Snow	0.000
	17.184	0.000	0.000			0.000
9	17.185	0.010	0.000	---	Snow	0.000
	23.000	0.000	0.000			0.000
10	0.000	0.035	0.000	---	NonR	0.000
	23.000	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.84 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	118.3	6.8	0.0	1.00	0.90	249.38
Controlling		1.2DL+1.6LL	118.3	6.8	0.0	1.00	0.90	249.38

REACTIONS (kips):

	Left	**Right**
DL reaction	9.17	8.88
Max +LL reaction	4.27	4.34
Max +total reaction (factored)	17.84	17.59

PRCNC20221036

DEFLECTIONS:

									Ratio
Dead load (in)	at 11.39 ft	=	-0.393	L/D	=	702			
Live load (in)	at 11.39 ft	=	-0.188	L/D	=	1469	>	360	0.25
Net Total load (in)	at 11.39 ft	=	-0.581	L/D	=	475	>	240	0.51

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22 06/29/22 13:29:13
Building Code: IBC Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 180**

SPAN INFORMATION (ft): I-End (77.25,108.25) J-End (86.64,108.18)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.39

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	---
Concrete thickness (in)	3.00	0.00
Unit weight concrete (pcf)	150.00	0.00
f'c (ksi)	4.00	0.00
Decking Orientation	89.6 deg	89.6 deg
Decking type	VERCO W2 Formlok	Noncomposite

beff (in)	=	9.89	Y bar(in)	=	9.40
Mnf (kip-ft)	=	102.15	Mn (kip-ft)	=	93.90
C (kips)	=	68.92	PNA (in)	=	8.56
Ieff (in4)	=	167.29	Itr (in4)	=	191.08
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 9 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 68.34

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.400	0.000	0.000	---	NonR	0.000	0.000
	9.392	0.400	0.000	0.000			0.000	0.000
2	0.000	0.055	0.049	0.081	0.0%	Red	0.000	0.020
	8.939	0.057	0.051	0.084			0.000	0.021
3	8.939	0.058	0.051	0.085	0.0%	Red	0.000	0.021
	9.392	0.000	0.000	0.000			0.000	0.000
4	8.939	0.000	0.000	0.000	---	Snow	0.000	0.000
	9.392	0.071	0.051	0.000			0.000	0.021
5	0.000	0.000	0.000	0.124	---	Snow	0.000	0.000
	9.392	0.000	0.000	0.124			0.000	0.000
6	0.000	0.043	0.043	0.000	---	Snow	0.000	0.083
	9.392	0.043	0.043	0.000			0.000	0.082
7	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	9.392	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.43 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	3.2	4.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	1.6	4.7	---	---		
	Max +	1.2DL+1.6LL	10.4	4.7	---	---	0.90	84.51
Controlling		1.2DL+1.6LL	10.4	4.7	---	---	0.90	84.51

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	0.98	0.98
DL reaction	2.40	2.41
Max +LL reaction	0.97	0.96
Max +total reaction (factored)	4.43	4.42

DEFLECTIONS:

										Ratio
Initial load (in)	at	4.70 ft	=	-0.012	L/D	=	9570			
Live load (in)	at	4.70 ft	=	-0.007	L/D	=	1507 3	>	360	0.02
Post Comp load (in)	at	4.70 ft	=	-0.022	L/D	=	5087	>	240	0.05
Net Total load (in)	at	4.70 ft	=	-0.034	L/D	=	3321	>	240	0.07

Floor Type: Level 3 **Beam Number = 181**

SPAN INFORMATION (ft): I-End (50.50,101.58) J-End (77.25,101.58)

Beam Size (User Selected) = W14X43 Fy = 50.0 ksi
Total Beam Length (ft) = 26.75
Cantilever on left (ft) = 9.33
Mp (kip-ft) = 290.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	0.54	0.00	0.0	0.00	0.00	0.0	0.77	Snow	0.00
0.000	0.04	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.130	0.000	---	Snow	0.000
	9.333	0.130	0.000			0.000
2	0.000	0.000	0.300	---	Snow	0.000
	9.333	0.000	0.300			0.000
3	9.334	0.082	0.000	---	Snow	0.000
	26.750	0.108	0.000			0.000
4	9.334	0.000	0.189	---	Snow	0.000
	26.750	0.000	0.250			0.000
5	0.000	0.043	0.000	---	NonR	0.000
	9.333	0.043	0.000			0.000
6	9.334	0.043	0.000	---	NonR	0.000
	26.750	0.043	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.41 kips 1.00Vn = 125.36 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Left	Max -	1.2DL+1.6LL	-48.6	9.3	9.3	1.00	0.90	241.83
Center	Max +	1.2DL+1.6LL	12.7	19.9	0.0	1.00	0.90	261.00
	Max -	1.2DL+1.6LL	-48.6	9.3	17.4	1.95	0.90	261.00
Controlling		1.2DL+1.6LL	-48.6	9.3	9.3	1.00	0.90	241.83

REACTIONS (kips):

	Left	**Right**
DL reaction	4.10	0.50
Max +LL reaction	6.62	2.00
Max -LL reaction	0.00	-1.19
Max +total reaction (factored)	15.51	3.79
Max -total reaction	5.74	-1.30

DEFLECTIONS: **Ratio**

Left cantilever:

Dead load (in) = -0.103 L/D = 2169
Pos Live load (in) = -0.226 L/D = 991 > 360

PRCNC20221036

Left cantilever:

Neg Live load (in)	=	0.062	L/D	=	3603	> 360	0.10
Pos Total load (in)	=	-0.329	L/D	=	680	> 240	0.35

Center span:

Dead load (in)	at 16.21 ft	=	0.013	L/D	=	1581 4		
Live load (in)	at 16.21 ft	=	0.056	L/D	=	3749	> 360	0.10
Net Total load (in)	at 16.21 ft	=	0.069	L/D	=	3031	> 240	0.08

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 182**

SPAN INFORMATION (ft): I-End (50.50,91.58) J-End (77.25,91.58)

Beam Size (User Selected) = W14X43 Fy = 50.0 ksi
Total Beam Length (ft) = 26.75
Cantilever on left (ft) = 9.33
Mp (kip-ft) = 290.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	0.04	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00
0.000	0.04	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.130	0.000	---	Snow	0.000
	9.333	0.130	0.000			0.000
2	0.000	0.000	0.300	---	Snow	0.000
	9.333	0.000	0.300			0.000
3	9.334	0.065	0.000	---	Snow	0.000
	26.750	0.065	0.000			0.000
4	9.334	0.000	0.150	---	Snow	0.000
	26.750	0.000	0.150			0.000
5	9.334	0.065	0.000	---	Snow	0.000
	25.739	0.065	0.000			0.000
6	25.740	0.065	0.000	---	Snow	0.000
	26.750	0.063	0.000			0.000
7	9.334	0.000	0.150	---	Snow	0.000
	25.739	0.000	0.150			0.000
8	25.740	0.000	0.150	---	Snow	0.000
	26.750	0.000	0.146			0.000
9	0.000	0.043	0.000	---	NonR	0.000
	9.333	0.043	0.000			0.000
10	9.334	0.043	0.000	---	NonR	0.000
	26.750	0.043	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.82 kips 1.00Vn = 125.36 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Left	Max -	1.2DL+1.6LL	-32.0	9.3	9.3	1.00	0.90	241.83
Center	Max +	1.2DL+1.6LL	21.3	18.9	0.0	1.00	0.90	261.00
	Max -	1.2DL+1.6LL	-32.0	9.3	17.4	2.31	0.90	261.00
Controlling		1.2DL+1.6LL	-32.0	9.3	9.3	1.00	0.90	241.83

REACTIONS (kips):

	Left	**Right**
DL reaction	3.68	1.03
Max +LL reaction	6.28	2.61

PRCNC20221036

	Left	Right
Max -LL reaction	0.00	-0.79
Max +total reaction (factored)	14.46	5.41

DEFLECTIONS:

Left cantilever:

								Ratio
Dead load (in)	=	-0.040	L/D	=	5671			
Pos Live load (in)	=	-0.146	L/D	=	1531	>	360	0.24
Neg Live load (in)	=	0.086	L/D	=	2610	>	360	0.14
Pos Total load (in)	=	-0.186	L/D	=	1206	>	240	0.20
Neg Total load (in)	=	0.046	L/D	=	4837	>	240	0.05

Center span:

Dead load (in)	at 18.48 ft	=	-0.007	L/D	=	2914 0			
Live load (in)	at 18.48 ft	=	-0.050	L/D	=	4189	>	360	0.09
Net Total load (in)	at 18.48 ft	=	-0.057	L/D	=	3663	>	240	0.07

Floor Type: Level 3 **Beam Number = 183**

SPAN INFORMATION (ft): I-End (50.50,81.58) J-End (76.24,81.58)

Beam Size (User Selected) = W14X43 Fy = 50.0 ksi
Total Beam Length (ft) = 25.74
Cantilever on left (ft) = 9.33
Mp (kip-ft) = 290.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	0.04	0.00	0.0	0.00	0.00	0.0	0.04	Snow	0.00
0.000	0.03	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.110	0.000	---	Snow	0.000
	9.333	0.094	0.000			0.000
2	0.000	0.000	0.253	---	Snow	0.000
	9.333	0.000	0.216			0.000
3	9.334	0.094	0.000	---	Snow	0.000
	25.739	0.065	0.000			0.000
4	9.334	0.000	0.216	---	Snow	0.000
	25.739	0.000	0.150			0.000
5	0.000	0.043	0.000	---	NonR	0.000
	9.333	0.043	0.000			0.000
6	9.334	0.043	0.000	---	NonR	0.000
	25.739	0.043	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.39 kips 1.00Vn = 125.36 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Left	Max -	1.2DL+1.6LL	-26.2	9.3	9.3	1.00	0.90	241.83
Center	Max +	1.2DL+1.6LL	10.7	18.5	0.0	1.00	0.90	261.00
	Max -	1.2DL+1.6LL	-26.2	9.3	16.4	2.12	0.90	261.00
Controlling		1.2DL+1.6LL	-26.2	9.3	9.3	1.00	0.90	241.83

REACTIONS (kips):

	Left	**Right**
DL reaction	2.90	0.53
Max +LL reaction	4.52	1.41
Max -LL reaction	0.00	-0.68
Max +total reaction (factored)	10.71	2.89
Max -total reaction	4.05	0.74

DEFLECTIONS: **Ratio**

Left cantilever:

					Ratio
Dead load (in)	=	-0.043	L/D	=	5171
Pos Live load (in)	=	-0.113	L/D	=	1977 > 360

PRCNC20221036

Left cantilever:

Neg Live load (in)	= 0.044		L/D =	5060 > 360	0.07
Pos Total load (in)	= -0.157		L/D =	1430 > 240	0.17

Center span:

Dead load (in)	at 15.57 ft =	0.002	L/D =	1021 63	
Live load (in)	at 15.57 ft =	0.026	L/D =	7451 > 360	0.05
Net Total load (in)	at 15.57 ft =	0.028	L/D =	6944 > 240	0.03

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 184**

SPAN INFORMATION (ft): I-End (50.50,101.58) J-End (50.50,121.58)

Beam Size (User Selected) = W8X18 Fy = 50.0 ksi
Total Beam Length (ft) = 20.00
Mp (kip-ft) = 70.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
10.000	0.65	0.00	0.0	0.00	0.00	0.0	1.40	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.003	0.000	---	Snow	0.000
	20.000	0.003	0.000			0.000
2	0.000	0.000	0.008	---	Snow	0.000
	20.000	0.000	0.008			0.000
3	0.000	0.018	0.000	---	NonR	0.000
	20.000	0.018	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.89 kips 1.00Vn = 56.17 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	17.0	10.0	10.0	1.62	0.90	63.75
Controlling		1.2DL+1.6LL	17.0	10.0	10.0	1.62	0.90	63.75

REACTIONS (kips):

	Left	**Right**
DL reaction	0.54	0.54
Max +LL reaction	0.77	0.77
Max +total reaction (factored)	1.89	1.89

DEFLECTIONS:

						Ratio
Dead load (in)	at 10.00 ft	= -0.147	L/D = 1630			
Live load (in)	at 10.00 ft	= -0.240	L/D = 1002	>	360	0.36
Net Total load (in)	at 10.00 ft	= -0.387	L/D = 620	>	240	0.39

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 185**

SPAN INFORMATION (ft): I-End (50.50,111.58) J-End (59.83,111.58)

Beam Size (Optimum) = W8X10 Fy = 50.0 ksi
Total Beam Length (ft) = 9.33
Mp (kip-ft) = 36.96

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.130	0.000	---	Snow	0.000
	9.333	0.130	0.000			0.000
2	0.000	0.000	0.300	---	Snow	0.000
	9.333	0.000	0.300			0.000
3	0.000	0.010	0.000	---	NonR	0.000
	9.333	0.010	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.02 kips 1.00Vn = 40.24 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	7.1	4.7	0.0	1.00	0.90	32.87
Controlling		1.2DL+1.6LL	7.1	4.7	0.0	1.00	0.90	32.87

REACTIONS (kips):

	Left	**Right**
DL reaction	0.65	0.65
Max +LL reaction	1.40	1.40
Max +total reaction (factored)	3.02	3.02

DEFLECTIONS:

									Ratio
Dead load (in)	at	4.67 ft	=	-0.027	L/D	=	4183		
Live load (in)	at	4.67 ft	=	-0.057	L/D	=	1953	> 360	0.18
Net Total load (in)	at	4.67 ft	=	-0.084	L/D	=	1332	> 240	0.18

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 186**

SPAN INFORMATION (ft): I-End (77.25,101.58) J-End (88.41,101.58)

Beam Size (User Selected) = W14X43 Fy = 50.0 ksi
Total Beam Length (ft) = 11.16
Mp (kip-ft) = 290.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.043	0.000	---	Snow	0.000
	9.392	0.043	0.000			0.000
2	9.393	0.043	0.000	---	Snow	0.000
	11.160	0.000	0.000			0.000
3	0.000	0.000	0.100	---	Snow	0.000
	9.392	0.000	0.099			0.000
4	9.393	0.000	0.099	---	Snow	0.000
	11.160	0.000	0.000			0.000
5	0.000	0.065	0.000	---	Snow	0.000
	11.160	0.065	0.000			0.000
6	0.000	0.000	0.150	---	Snow	0.000
	11.160	0.000	0.150			0.000
7	0.000	0.043	0.000	---	NonR	0.000
	11.160	0.043	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.23 kips 1.00Vn = 125.36 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	9.0	5.6	0.0	1.00	0.90	261.00
Controlling		1.2DL+1.6LL	9.0	5.6	0.0	1.00	0.90	261.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.84	0.81
Max +LL reaction	1.39	1.31
Max +total reaction (factored)	3.23	3.06

DEFLECTIONS:

										Ratio
Dead load (in)	at	5.58 ft	=	-0.004	L/D	=	31727			
Live load (in)	at	5.58 ft	=	-0.007	L/D	=	19246	>	360	0.02
Net Total load (in)	at	5.58 ft	=	-0.011	L/D	=	11979	>	240	0.02

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 187**

SPAN INFORMATION (ft): I-End (88.41,101.58) J-End (110.92,101.58)

Beam Size (Optimum) = W12X16 Fy = 50.0 ksi
Total Beam Length (ft) = 22.51

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	67.52	Y bar(in)	=	14.13
Mnf (kip-ft)	=	207.04	Mn (kip-ft)	=	184.65
C (kips)	=	172.30	PNA (in)	=	11.84
Ieff (in4)	=	433.47	Itr (in4)	=	489.36
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 22 Partial = 22 Actual = 22
Number of Stud Rows = 1 Percent of Full Composite Action = 73.16

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.348	0.249	0.000	---	Snow	0.000	0.104
	22.506	0.348	0.249	0.000			0.000	0.104
2	0.000	0.000	0.000	0.124	---	Snow	0.000	0.000
	22.506	0.000	0.000	0.124			0.000	0.000
3	0.000	0.000	0.000	0.000	---	Snow	0.000	0.000
	2.679	0.420	0.300	0.000			0.000	0.125
4	2.680	0.420	0.300	0.000	---	Snow	0.000	0.125
	22.506	0.420	0.300	0.000			0.000	0.125
5	0.000	0.000	0.000	0.000	---	Snow	0.000	0.000
	2.679	0.000	0.000	0.150			0.000	0.000
6	2.680	0.000	0.000	0.150	---	Snow	0.000	0.000
	22.506	0.000	0.000	0.150			0.000	0.000
7	0.000	0.016	0.016	0.000	---	NonR	0.000	0.000
	22.506	0.016	0.016	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 15.49 kips 1.00Vn = 79.20 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	65.7	11.3	0.0	1.00	0.90	75.38
	Init DL	1.4DL	49.8	11.3	---	---		
	Max +	1.2DL+1.6LL	86.9	11.3	---	---	0.90	166.18
Controlling		1.2DL+1.6LL	65.7	11.3	---	---	0.90	75.38

PRCNC20221036

Gravity Beam Design

REACTIONS (kips):

	Left	**Right**
Initial reaction	8.38	8.91
DL reaction	8.28	8.80
Max +LL reaction	2.89	3.08
Max +total reaction (factored)	14.57	15.49

DEFLECTIONS: (Camber = 3/4)

										Ratio
Initial load (in)	at	11.25 ft	=	-1.085	L/D	=	249			
Live load (in)	at	11.25 ft	=	-0.125	L/D	=	2157	>	360	0.17
Post Comp load (in)	at	11.25 ft	=	-0.225	L/D	=	1198	>	240	0.20
Net Total load (in)	at	11.25 ft	=	-0.560	L/D	=	482	>	240	0.50

Floor Type: Level 3 **Beam Number = 188**

SPAN INFORMATION (ft): I-End (110.92,101.58) J-End (134.92,101.58)

Beam Size (Optimum) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	72.00	Y bar(in)	=	14.25
Mnf (kip-ft)	=	183.52	Mn (kip-ft)	=	176.94
C (kips)	=	189.53	PNA (in)	=	11.85
Ieff (in4)	=	422.68	Itr (in4)	=	438.59
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 24 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 91.12

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.798	0.570	0.000	---	Snow	0.000	0.238
	24.000	0.528	0.377	0.000			0.000	0.157
2	0.000	0.000	0.000	0.285	---	Snow	0.000	0.000
	24.000	0.000	0.000	0.189			0.000	0.000
3	0.000	0.014	0.014	0.000	---	NonR	0.000	0.000
	24.000	0.014	0.014	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 15.25 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	64.9	11.6	0.0	1.00	0.90	65.25
	Init DL	1.4DL	49.2	11.6	---	---		
	Max +	1.2DL+1.6LL	85.9	11.6	---	---	0.90	159.25
Controlling		1.2DL+1.6LL	64.9	11.6	0.0	1.00	0.90	65.25

REACTIONS (kips):

	Left	Right
Initial reaction	8.77	7.67
DL reaction	8.67	7.58
Max +LL reaction	3.03	2.65
Max +total reaction (factored)	15.25	13.34

DEFLECTIONS: (Camber = 1)

PRCNC20221036

Initial load (in)	at	11.88 ft	=	-1.417	L/D	=	203			
Live load (in)	at	11.88 ft	=	-0.144	L/D	=	1997	>	360	0.18
Post Comp load (in)	at	11.88 ft	=	-0.260	L/D	=	1110	>	240	0.22
Net Total load (in)	at	11.88 ft	=	-0.677	L/D	=	426	>	240	0.56

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 189**

SPAN INFORMATION (ft): I-End (77.25,91.58) J-End (91.09,91.58)

Beam Size (User Selected) = W14X43 Fy = 50.0 ksi
Total Beam Length (ft) = 13.84
Mp (kip-ft) = 290.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.065	0.000	---	Snow	0.000
	11.160	0.065	0.000			0.000
2	11.161	0.065	0.000	---	Snow	0.000
	13.840	0.000	0.000			0.000
3	0.000	0.000	0.150	---	Snow	0.000
	11.160	0.000	0.150			0.000
4	11.161	0.000	0.150	---	Snow	0.000
	13.840	0.000	0.000			0.000
5	0.000	0.063	0.000	---	Snow	0.000
	13.840	0.039	0.000			0.000
6	0.000	0.000	0.146	---	Snow	0.000
	13.840	0.000	0.090			0.000
7	0.000	0.043	0.000	---	NonR	0.000
	13.840	0.043	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.40 kips 1.00Vn = 125.36 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	14.7	6.8	0.0	1.00	0.90	261.00
Controlling		1.2DL+1.6LL	14.7	6.8	0.0	1.00	0.90	261.00

REACTIONS (kips):

	Left	**Right**
DL reaction	1.12	0.99
Max +LL reaction	1.91	1.60
Max +total reaction (factored)	4.40	3.75

DEFLECTIONS:

								Ratio
Dead load (in)	at	6.92 ft	=	-0.010	L/D =	1589 1		
Live load (in)	at	6.85 ft	=	-0.018	L/D =	9470	> 360	0.04
Net Total load (in)	at	6.85 ft	=	-0.028	L/D =	5934	> 240	0.04

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 190**

SPAN INFORMATION (ft): I-End (91.09,91.58) J-End (110.92,91.58)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 19.83

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	44.62	Y bar(in)	=	13.65
Mnf (kip-ft)	=	179.00	Mn (kip-ft)	=	161.67
C (kips)	=	155.07	PNA (in)	=	11.77
Ieff (in4)	=	363.22	Itr (in4)	=	406.65
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 19 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 70.00

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.420	0.300	0.000	---	Snow	0.000	0.125
	19.826	0.420	0.300	0.000			0.000	0.125
2	0.000	0.000	0.000	0.150	---	Snow	0.000	0.000
	19.826	0.000	0.000	0.150			0.000	0.000
3	0.000	0.000	0.000	0.000	---	Snow	0.000	0.000
	1.505	0.236	0.169	0.000			0.000	0.070
4	1.506	0.236	0.169	0.000	---	Snow	0.000	0.070
	19.826	0.030	0.021	0.000			0.000	0.009
5	0.000	0.000	0.000	0.000	---	Snow	0.000	0.000
	1.505	0.000	0.000	0.084			0.000	0.000
6	1.506	0.000	0.000	0.084	---	Snow	0.000	0.000
	19.826	0.000	0.000	0.011			0.000	0.000
7	0.000	0.014	0.014	0.000	---	NonR	0.000	0.000
	19.826	0.014	0.014	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.35 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	37.6	9.6	0.0	1.00	0.90	65.25
	Init DL	1.4DL	28.5	9.6	---	---		
	Max +	1.2DL+1.6LL	49.7	9.6	---	---	0.90	145.50
Controlling		1.2DL+1.6LL	37.6	9.6	0.0	1.00	0.90	65.25

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	5.96	5.39
DL reaction	5.89	5.33
Max +LL reaction	2.05	1.85
Max +total reaction (factored)	10.35	9.36

DEFLECTIONS:

										Ratio
Initial load (in)	at	9.81 ft	=	-0.561	L/D	=	424			
Live load (in)	at	9.81 ft	=	-0.066	L/D	=	3603	>	360	0.10
Post Comp load (in)	at	9.81 ft	=	-0.119	L/D	=	2002	>	240	0.12
Net Total load (in)	at	9.81 ft	=	-0.679	L/D	=	350	>	240	0.69

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 191**

SPAN INFORMATION (ft): I-End (134.92,101.58) J-End (150.88,101.58)

Beam Size (User Selected) = W12X14 Fy = 50.0 ksi
Total Beam Length (ft) = 15.96

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	32.50	Y bar(in)	=	13.14
Mnf (kip-ft)	=	174.57	Mn (kip-ft)	=	147.76
C (kips)	=	120.61	PNA (in)	=	11.68
Ieff (in4)	=	312.67	Itr (in4)	=	382.86
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 15 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 54.26

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.528	0.377	0.000	---	Snow	0.000	0.157
	15.964	0.348	0.249	0.000			0.000	0.104
2	0.000	0.000	0.000	0.189	---	Snow	0.000	0.000
	15.964	0.000	0.000	0.124			0.000	0.000
3	0.000	0.014	0.014	0.000	---	NonR	0.000	0.000
	15.964	0.014	0.014	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.75 kips 0.90Vn = 64.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	19.2	7.7	0.0	1.00	0.90	65.25
	Init DL	1.4DL	14.6	7.7	---	---		
	Max +	1.2DL+1.6LL	25.3	7.7	---	---	0.90	132.99
Controlling		1.2DL+1.6LL	19.2	7.7	---	---	0.90	65.25

REACTIONS (kips):

	Left	Right
Initial reaction	3.89	3.41
DL reaction	3.85	3.37
Max +LL reaction	1.33	1.16
Max +total reaction (factored)	6.75	5.91

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	7.90 ft	=	-0.186	L/D	=	1030			
Live load (in)	at	7.90 ft	=	-0.025	L/D	=	7597	>	360	0.05
Post Comp load (in)	at	7.90 ft	=	-0.045	L/D	=	4221	>	240	0.06
Net Total load (in)	at	7.90 ft	=	-0.231	L/D	=	828	>	240	0.29

PRCNC20221036

Floor Type: Level 3 **Beam Number = 193**

SPAN INFORMATION (ft): I-End (77.25,109.87) J-End (110.92,109.87)

Beam Size (User Selected) = W21X50 Fy = 50.0 ksi
Total Beam Length (ft) = 33.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	61.89	Y bar(in)	=	19.13
Mnf (kip-ft)	=	823.73	Mn (kip-ft)	=	739.73
C (kips)	=	323.92	PNA (in)	=	18.92
Ieff (in4)	=	2281.16	Itr (in4)	=	2794.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
\# of studs: Max = 66 Partial = 41 Actual = 41
Number of Stud Rows = 2 Percent of Full Composite Action = 50.37

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.400	0.000	0.000	---	NonR	0.000	0.000
	33.666	0.400	0.000	0.000			0.000	0.000
2	0.000	0.282	0.249	0.415	0.0%	Red	0.000	0.104
	8.916	0.282	0.249	0.415			0.000	0.104
3	8.917	0.282	0.249	0.415	0.0%	Red	0.000	0.104
	8.938	0.276	0.244	0.406			0.000	0.102
4	8.939	0.276	0.244	0.406	0.0%	Red	0.000	0.102
	33.666	0.278	0.246	0.409			0.000	0.102
5	0.000	0.055	0.049	0.081	0.0%	Red	0.000	0.020
	8.938	0.057	0.051	0.084			0.000	0.021
6	8.939	0.000	0.000	0.000	---	Snow	0.000	0.000
	11.160	0.348	0.249	0.000			0.000	0.104
7	8.939	0.057	0.051	0.084	0.0%	Red	0.000	0.021
	9.392	0.000	0.000	0.000			0.000	0.000
8	11.161	0.348	0.249	0.000	---	Snow	0.000	0.104
	33.666	0.348	0.249	0.000			0.000	0.104
9	0.000	0.000	0.000	0.024	---	Snow	0.000	0.000
	9.392	0.000	0.000	0.025			0.000	0.000
10	9.393	0.000	0.000	0.025	---	Snow	0.000	0.000
	11.160	0.000	0.000	0.124			0.000	0.000
11	11.161	0.000	0.000	0.124	---	Snow	0.000	

PRCNC20221036

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
	33.666	0.000	0.000	0.124			0.000	0.000
12	0.000	0.050	0.050	0.000	---	NonR	0.000	0.000
	33.666	0.050	0.050	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 35.46 kips 1.00Vn = 237.12 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	129.5	17.4	0.0	1.00	0.90	412.50
	Init DL	1.4DL	100.6	17.4	---	---		
	Max +	1.2DL+1.6LL	293.3	17.1	---	---	0.90	665.76
Controlling		1.2DL+1.6LL	293.3	17.1	---	---	0.90	665.76

REACTIONS (kips):

	Left	**Right**
Initial reaction	10.20	12.18
DL reaction	15.61	17.66
Max +LL reaction	8.80	8.92
Max +total reaction (factored)	32.80	35.46

DEFLECTIONS:

									Ratio
Initial load (in)	at 17.00 ft	=	-0.509	L/D	=	794			
Live load (in)	at 17.00 ft	=	-0.230	L/D	=	1757	>	360	0.20
Post Comp load (in)	at 17.00 ft	=	-0.454	L/D	=	889	>	240	0.27
Net Total load (in)	at 17.00 ft	=	-0.963	L/D	=	420	>	240	0.57

PRCNC20221036

Floor Type: Level 3 **Beam Number = 194**

SPAN INFORMATION (ft): I-End (110.92,109.87) J-End (134.92,109.87)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	72.00	Y bar(in)	=	16.84
Mnf (kip-ft)	=	388.10	Mn (kip-ft)	=	328.85
C (kips)	=	206.76	PNA (in)	=	15.38
Ieff (in4)	=	895.15	Itr (in4)	=	1110.71
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 48 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 53.81

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.400	0.000	0.000	---	NonR	0.000	0.000
	24.000	0.400	0.000	0.000			0.000	0.000
2	0.000	0.278	0.246	0.409	0.0%	Red	0.000	0.102
	24.000	0.280	0.247	0.412			0.000	0.103
3	0.000	0.348	0.249	0.000	---	Snow	0.000	0.104
	24.000	0.348	0.249	0.000			0.000	0.104
4	0.000	0.000	0.000	0.124	---	Snow	0.000	0.000
	24.000	0.000	0.000	0.124			0.000	0.000
5	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	24.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 25.46 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	68.8	12.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	52.5	12.0	---	---		
	Max +	1.2DL+1.6LL	152.7	12.0	---	---	0.90	295.96
Controlling		1.2DL+1.6LL	152.7	12.0	---	---	0.90	295.96

REACTIONS (kips):

	Left	Right
Initial reaction	8.73	8.74
DL reaction	12.64	12.65

PRCNC20221036

	Left	Right
Max +LL reaction	6.41	6.43
Max +total reaction (factored)	25.43	25.46

DEFLECTIONS:

										Ratio
Initial load (in)	at	12.00 ft	=	-0.446	L/D	=	646			
Live load (in)	at	12.00 ft	=	-0.154	L/D	=	1872	>	360	0.19
Post Comp load (in)	at	12.00 ft	=	-0.307	L/D	=	938	>	240	0.26
Net Total load (in)	at	12.00 ft	=	-0.753	L/D	=	383	>	240	0.63

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 195**

SPAN INFORMATION (ft): I-End (134.92,109.87) J-End (155.92,109.87)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 21.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	63.00	Y bar(in)	=	16.58
Mnf (kip-ft)	=	384.52	Mn (kip-ft)	=	314.46
C (kips)	=	172.30	PNA (in)	=	14.74
Ieff (in4)	=	826.07	Itr (in4)	=	1084.87
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 42 Partial = 21 Actual = 21
Number of Stud Rows = 1 Percent of Full Composite Action = 44.80

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.400	0.000	0.000	---	NonR	0.000	0.000
	21.000	0.400	0.000	0.000			0.000	0.000
2	0.000	0.280	0.247	0.412	0.0%	Red	0.000	0.103
	21.000	0.282	0.249	0.415			0.000	0.104
3	0.000	0.348	0.249	0.000	---	Snow	0.000	0.104
	15.964	0.348	0.249	0.000			0.000	0.104
4	15.964	0.348	0.249	0.000	---	Snow	0.000	0.104
	21.000	0.292	0.208	0.000			0.000	0.087
5	0.000	0.000	0.000	0.124	---	Snow	0.000	0.000
	15.964	0.000	0.000	0.124			0.000	0.000
6	15.964	0.000	0.000	0.124	---	Snow	0.000	0.000
	21.000	0.000	0.000	0.104			0.000	0.000
7	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	21.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.30 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	52.7	10.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	40.2	10.5	---	---		
	Max +	1.2DL+1.6LL	117.0	10.5	---	---	0.90	283.01
Controlling		1.2DL+1.6LL	117.0	10.5	---	---	0.90	283.01

PRCNC20221036

REACTIONS (kips):

	Left	**Right**
Initial reaction	7.65	7.53
DL reaction	11.07	10.95
Max +LL reaction	5.64	5.60
Max +total reaction (factored)	22.30	22.11

DEFLECTIONS:

										Ratio
Initial load (in)	at	10.50 ft	=	-0.261	L/D	=	965			
Live load (in)	at	10.50 ft	=	-0.098	L/D	=	2570	>	360	0.14
Post Comp load (in)	at	10.50 ft	=	-0.195	L/D	=	1291	>	240	0.19
Net Total load (in)	at	10.50 ft	=	-0.456	L/D	=	552	>	240	0.43

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 196**

SPAN INFORMATION (ft): I-End (155.92,109.87) J-End (185.92,109.87)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	66.68	Y bar(in)	=	16.69
Mnf (kip-ft)	=	386.10	Mn (kip-ft)	=	340.78
C (kips)	=	241.22	PNA (in)	=	15.44
Ieff (in4)	=	931.11	Itr (in4)	=	1096.03
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 57 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 59.41

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
25.909	5.00	4.23	6.28	7.8	0.00	0.00	0.0	0.03	Snow	0.00	1.60

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.282	0.249	0.415	7.8%	Red	0.000	0.104
	30.000	0.282	0.249	0.415			0.000	0.104
2	0.000	0.236	0.208	0.347	7.8%	Red	0.000	0.087
	25.909	0.000	0.000	0.000			0.000	0.000
3	25.909	0.299	0.264	0.440	7.8%	Red	0.000	0.110
	30.000	0.262	0.231	0.385			0.000	0.096
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	30.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.50 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	92.1	15.9	0.0	1.00	0.90	165.75
	Init DL	1.4DL	71.0	16.0	---	---		
	Max +	1.2DL+1.6LL	184.2	15.9	---	---	0.90	306.70
Controlling		1.2DL+1.6LL	184.2	15.9	---	---	0.90	306.70

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	9.29	13.14
DL reaction	7.56	10.88
Max +LL reaction	9.59	13.40
Max +total reaction (factored)	24.41	34.50

DEFLECTIONS: (Camber = 3/4)

									Ratio
Initial load (in)	at 15.30 ft	=	-0.969	L/D	=	371			
Live load (in)	at 15.30 ft	=	-0.445	L/D	=	809	>	360	0.44
Post Comp load (in)	at 15.30 ft	=	-0.487	L/D	=	739	>	240	0.32
Net Total load (in)	at 15.30 ft	=	-0.707	L/D	=	509	>	240	0.47

Floor Type: Level 3 **Beam Number = 199**

SPAN INFORMATION (ft): I-End (155.92,102.93) J-End (181.82,109.87)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 26.82

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	75.0 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	26.37	Y bar(in)	=	14.43
Mnf (kip-ft)	=	330.10	Mn (kip-ft)	=	316.26
C (kips)	=	206.76	PNA (in)	=	15.38
Ieff (in4)	=	813.56	Itr (in4)	=	885.67
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 37 Partial = 25 Actual = 25
Number of Stud Rows = 1 Percent of Full Composite Action = 73.02

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
2.861	2.49	0.67	0.63	0.0	0.00	0.00	0.0	0.10	Snow	0.00	0.24
12.861	0.48	0.43	0.59	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.400	0.000	0.000	---	NonR	0.000	0.000
	2.861	0.400	0.000	0.000			0.000	0.000
2	0.000	0.228	0.201	0.335	0.0%	Red	0.000	0.084
	26.823	0.000	0.000	0.000			0.000	0.000
3	0.000	0.357	0.255	0.000	---	Snow	0.000	0.106
	2.861	0.357	0.255	0.000			0.000	0.106
4	0.000	0.000	0.000	0.128	---	Snow	0.000	0.000
	2.861	0.000	0.000	0.128			0.000	0.000
5	2.862	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	3.397	0.068	0.060	0.100			0.000	0.025
6	3.398	0.068	0.060	0.100	0.0%	Red	0.000	0.025
	12.861	0.068	0.060	0.100			0.000	0.025
7	12.862	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	15.139	0.289	0.255	0.425			0.000	0.106
8	15.139	0.289	0.255	0.425	0.0%	Red	0.000	0.106
	26.823	0.289	0.255	0.425			0.000	0.106
9	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
	26.823	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 19.97 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	51.2	13.8	0.0	1.00	0.90	165.75
	Init DL	1.4DL	39.9	13.6	---	---		
	Max +	1.2DL+1.6LL	108.9	13.6	---	---	0.90	284.64
Controlling		1.2DL+1.6LL	108.7	12.9	---	---	0.90	280.53

REACTIONS (kips):

	Left	**Right**
Initial reaction	6.68	5.82
DL reaction	8.27	5.00
Max +LL reaction	6.28	6.31
Max +total reaction (factored)	19.97	16.09

DEFLECTIONS:

						Ratio
Initial load (in)	at 13.41 ft	=	-0.422	L/D = 762		
Live load (in)	at 13.41 ft	=	-0.227	L/D = 1415	> 360	0.25
Post Comp load (in)	at 13.41 ft	=	-0.269	L/D = 1198	> 240	0.20
Net Total load (in)	at 13.41 ft	=	-0.691	L/D = 466	> 240	0.52

Floor Type: Level 3 **Beam Number = 200**

SPAN INFORMATION (ft): I-End (168.34,106.26) J-End (169.96,100.22)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.25
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
2.000	0.50	0.64	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	0.0%	Red	0.000
	6.250	0.057	0.084			0.000
2	0.000	0.018	0.027	0.0%	Red	0.000
	2.000	0.000	0.000			0.000
3	2.000	0.020	0.029	0.0%	Red	0.000
	6.250	0.020	0.029			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	6.250	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.52 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	2.9	2.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	2.9	2.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.48	0.37
Max +LL reaction	0.59	0.46
Max +total reaction (factored)	1.52	1.19

DEFLECTIONS:

									Ratio
Dead load (in)	at	2.97 ft	=	-0.004	L/D	=	2091 7		
Live load (in)	at	2.97 ft	=	-0.004	L/D	=	1678 9	> 360	0.02
Net Total load (in)	at	2.97 ft	=	-0.008	L/D	=	9313	> 240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 201**

SPAN INFORMATION (ft): I-End (158.68,103.67) J-End (160.88,95.46)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
2.000	0.51	0.67	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.400	0.000	---	NonR	0.000
	8.500	0.400	0.000			0.000
2	0.000	0.000	0.000	0.0%	Red	0.000
	2.000	0.018	0.027			0.000
3	2.000	0.025	0.037	0.0%	Red	0.000
	8.500	0.025	0.037			0.000
4	0.000	0.096	0.000	---	Snow	0.000
	8.500	0.000	0.000			0.000
5	0.000	0.000	0.034	---	Snow	0.000
	8.500	0.000	0.000			0.000
6	0.000	0.012	0.000	---	NonR	0.000
	8.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.15 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	7.8	3.6	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	7.8	3.6	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	2.49	2.11
Max +LL reaction	0.72	0.36
Max +total reaction (factored)	4.15	3.11

DEFLECTIONS:

							Ratio
Dead load (in)	at	4.16 ft	= -0.041	L/D =	2477		
Live load (in)	at	4.12 ft	= -0.010	L/D =	1006 7	> 360	0.04
Net Total load (in)	at	4.12 ft	= -0.051	L/D =	1988	> 240	0.12

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 203**

SPAN INFORMATION (ft): I-End (161.01,94.98) J-End (170.67,97.57)

Beam Size (Optimum) = MC10X6.5 Fy = 36.0 ksi
Total Beam Length (ft) = 10.00
Mp (kip-ft) = 17.70

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.006	0.008	0.0%	Red	0.000
	10.000	0.006	0.008			0.000
2	0.000	0.308	0.453	0.0%	Red	0.000
	10.000	0.308	0.453			0.000
3	0.000	0.007	0.000	---	NonR	0.000
	10.000	0.007	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.61 kips 0.90Vn = 29.55 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	14.0	5.0	0.0	1.00	0.90	15.93
Controlling		1.2DL+1.6LL	14.0	5.0	0.0	1.00	0.90	15.93

REACTIONS (kips):

	Left	**Right**
DL reaction	1.60	1.60
Max +LL reaction	2.31	2.31
Max +total reaction (factored)	5.61	5.61

DEFLECTIONS:

										Ratio
Dead load (in)	at	5.00 ft	=	-0.108	L/D	=	1106			
Live load (in)	at	5.00 ft	=	-0.156	L/D	=	768	>	360	0.47
Net Total load (in)	at	5.00 ft	=	-0.265	L/D	=	453	>	240	0.53

Floor Type: Level 3 **Beam Number = 204**

SPAN INFORMATION (ft): I-End (159.20,101.74) J-End (168.86,104.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	75.0 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 16.00	Y bar(in)	=	10.39
Mnf (kip-ft)	= 121.22	Mn (kip-ft)	=	96.15
C (kips)	= 68.92	PNA (in)	=	8.56
Ieff (in4)	= 163.52	Itr (in4)	=	222.65
Stud length (in)	= 4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 9 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 42.08

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.068	0.060	0.100	0.0%	Red	0.000	0.025
	9.464	0.068	0.060	0.100			0.000	0.025
2	9.465	0.068	0.060	0.100	0.0%	Red	0.000	0.025
	10.000	0.000	0.000	0.000			0.000	0.000
3	0.000	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	10.000	0.023	0.020	0.033			0.000	0.008
4	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.68 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	2.0	5.0	0.0	1.00	0.90	46.90
	Init DL	1.4DL	1.6	5.0	---	---		
	Max +	1.2DL+1.6LL	4.2	5.0	---	---	0.90	86.53
Controlling		1.2DL+1.6LL	4.2	5.0	---	---	0.90	86.53

REACTIONS (kips):

	Left	Right
Initial reaction	0.63	0.60
DL reaction	0.51	0.50
Max +LL reaction	0.67	0.64
Max +total reaction (factored)	1.68	1.62

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.00 ft	=	-0.013	L/D	=	9054			
Live load (in)	at	5.00 ft	=	-0.006	L/D	=	1900 2	>	360	0.02
Post Comp load (in)	at	5.00 ft	=	-0.007	L/D	=	1759 4	>	240	0.01
Net Total load (in)	at	5.00 ft	=	-0.020	L/D	=	5978	>	240	0.04

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 205**

SPAN INFORMATION (ft): I-End (211.28,109.87) J-End (211.51,109.03)

Beam Size (Optimum) = W8X10 Fy = 50.0 ksi
Total Beam Length (ft) = 0.88
Cantilever on left (ft) = 0.88
Mp (kip-ft) = 36.96

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	5.28	7.27	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.081	0.119	0.0%	Red	0.000
	0.875	0.080	0.118			0.000
2	0.000	0.010	0.000	---	NonR	0.000
	0.875	0.010	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.22 kips 1.00Vn = 40.24 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Left	Max -	1.2DL+1.6LL	-15.8	0.9	0.9	1.00	0.90	32.87
Controlling		1.2DL+1.6LL	-15.8	0.9	0.9	1.00	0.90	32.87

REACTIONS (kips):

	Left	**Right**
DL reaction	---	5.35
Max +LL reaction	---	7.37
Max +total reaction (factored)	---	18.22

DEFLECTIONS:

Left cantilever:

							Ratio
Dead load (in)	=	-0.002	L/D	=	9153		
Pos Live load (in)	=	-0.003	L/D	=	6643 >	360	0.05
Pos Total load (in)	=	-0.005	L/D	=	3849 >	240	0.06

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 206**

SPAN INFORMATION (ft): I-End (185.92,109.87) J-End (211.28,109.87)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 25.37

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	57.08	Y bar(in)	=	16.37
Mnf (kip-ft)	=	381.54	Mn (kip-ft)	=	320.68
C (kips)	=	189.53	PNA (in)	=	15.35
Ieff (in4)	=	837.68	Itr (in4)	=	1064.92
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 50 Partial = 25 Actual = 25
Number of Stud Rows = 1 Percent of Full Composite Action = 49.36

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.544	0.480	0.800	0.0%	Red	0.000	0.200
	25.367	0.313	0.276	0.460			0.000	0.115
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	25.367	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.43 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	59.4	12.1	0.0	1.00	0.90	165.75
	Init DL	1.4DL	45.6	12.2	---	---		
	Max +	1.2DL+1.6LL	125.2	12.1	---	---	0.90	288.61
Controlling		1.2DL+1.6LL	125.2	12.1	---	---	0.90	288.61

REACTIONS (kips):

	Left	Right
Initial reaction	7.73	6.51
DL reaction	6.25	5.28
Max +LL reaction	8.71	7.27
Max +total reaction (factored)	21.43	17.96

DEFLECTIONS: **Ratio**

Initial load (in) at 12.56 ft = -0.431 L/D = 706
Live load (in) at 12.56 ft = -0.242 L/D = 1260 >

PRCNC20221036

Gravity Beam Design

Post Comp load (in)	at 12.56 ft	=	-0.261	L/D	=	1167	> 240	0.21
Net Total load (in)	at 12.56 ft	=	-0.692	L/D	=	440	> 240	0.55

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 207**

SPAN INFORMATION (ft): I-End (50.50,91.58) J-End (50.50,101.58)

Beam Size (Optimum) = C4X5.4 Fy = 36.0 ksi
Total Beam Length (ft) = 10.00
Mp (kip-ft) = 6.87

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.003	0.000	---	Snow	0.000
	10.000	0.003	0.000			0.000
2	0.000	0.000	0.008	---	Snow	0.000
	10.000	0.000	0.008			0.000
3	0.000	0.005	0.000	---	NonR	0.000
	10.000	0.005	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.11 kips 0.90Vn = 14.31 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.3	5.0	10.0	1.14	0.90	4.45
Controlling		1.2DL+1.6LL	0.3	5.0	10.0	1.14	0.90	4.45

REACTIONS (kips):

	Left	**Right**
DL reaction	0.04	0.04
Max +LL reaction	0.04	0.04
Max +total reaction (factored)	0.11	0.11

DEFLECTIONS:											**Ratio**
Dead load (in)	at	5.00 ft	=	-0.017	L/D	=	6902				
Live load (in)	at	5.00 ft	=	-0.015	L/D	=	7938	>	360		0.05
Net Total load (in)	at	5.00 ft	=	-0.033	L/D	=	3692	>	240		0.07

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 208**

SPAN INFORMATION (ft): I-End (50.50,81.58) J-End (50.50,91.58)

Beam Size (Optimum) = C4X5.4 Fy = 36.0 ksi
Total Beam Length (ft) = 10.00
Mp (kip-ft) = 6.87

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.003	0.000	---	Snow	0.000
	10.000	0.003	0.000			0.000
2	0.000	0.000	0.008	---	Snow	0.000
	10.000	0.000	0.008			0.000
3	0.000	0.005	0.000	---	NonR	0.000
	10.000	0.005	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.11 kips 0.90Vn = 14.31 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	0.3	5.0	10.0	1.14	0.90	4.45
Controlling		1.2DL+1.6LL	0.3	5.0	10.0	1.14	0.90	4.45

REACTIONS (kips):

	Left	**Right**
DL reaction	0.04	0.04
Max +LL reaction	0.04	0.04
Max +total reaction (factored)	0.11	0.11

DEFLECTIONS:

											Ratio
Dead load (in)	at	5.00 ft	=	-0.017	L/D	=	6902				
Live load (in)	at	5.00 ft	=	-0.015	L/D	=	7938	>	360		0.05
Net Total load (in)	at	5.00 ft	=	-0.033	L/D	=	3692	>	240		0.07

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 209**

SPAN INFORMATION (ft): I-End (50.50,74.69) J-End (50.50,81.58)

Beam Size (Optimum) = C4X5.4 Fy = 36.0 ksi
Total Beam Length (ft) = 6.90
Mp (kip-ft) = 6.87

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.003	0.000	---	Snow	0.000
	6.897	0.003	0.000			0.000
2	0.000	0.000	0.008	---	Snow	0.000
	6.897	0.000	0.008			0.000
3	0.000	0.005	0.000	---	NonR	0.000
	6.897	0.005	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.08 kips 0.90Vn = 14.31 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	0.1	3.4	6.9	1.14	0.90	5.43
Controlling		1.2DL+1.6LL	0.1	3.4	6.9	1.14	0.90	5.43

REACTIONS (kips):

	Left	**Right**
DL reaction	0.03	0.03
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.08	0.08

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.45 ft	=	-0.004	L/D	=	2104 0		
Live load (in)	at	3.45 ft	=	-0.003	L/D	=	2419 9	> 360	0.01
Net Total load (in)	at	3.45 ft	=	-0.007	L/D	=	1125 5	> 240	0.02

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 210**

SPAN INFORMATION (ft): I-End (64.08,121.58) J-End (64.08,135.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 13.58
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.388	0.571	0.0%	Red	0.000
	13.583	0.388	0.571			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	13.583	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.46 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	32.1	6.8	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	32.1	6.8	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	2.72	2.72
Max +LL reaction	3.88	3.88
Max +total reaction (factored)	9.46	9.46

DEFLECTIONS:

								Ratio
Dead load (in)	at	6.79 ft	=	-0.196	L/D =	830		
Live load (in)	at	6.79 ft	=	-0.280	L/D =	582	>	360	0.62
Net Total load (in)	at	6.79 ft	=	-0.477	L/D =	342	>	240	0.70

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 211**

SPAN INFORMATION (ft): I-End (97.83,87.37) J-End (100.03,79.16)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 28.89

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.833	0.55	0.00	0.0	0.00	0.00	0.0	0.17	Snow	0.00
7.833	0.15	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	3.833	0.043	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	3.833	0.000	0.015			0.000
3	3.834	0.012	0.000	---	Snow	0.000
	7.833	0.012	0.000			0.000
4	7.834	0.000	0.000	---	Snow	0.000
	8.500	0.008	0.000			0.000
5	0.000	0.096	0.000	---	Snow	0.000
	8.500	0.000	0.000			0.000
6	0.000	0.000	0.034	---	Snow	0.000
	8.500	0.000	0.000			0.000
7	0.000	0.011	0.000	---	NonR	0.000
	8.500	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.19 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	3.2	3.8	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	3.2	3.8	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.71	0.63
Max +LL reaction	0.21	0.16
Max +total reaction (factored)	1.19	1.02

DEFLECTIONS:

									Ratio
Dead load (in)	at	4.12 ft	=	-0.023	L/D	=	4382		
Live load (in)	at	4.12 ft	=	-0.007	L/D	=	1507 6	> 360	0.02
Net Total load (in)	at	4.12 ft	=	-0.030	L/D	=	3395	> 240	0.07

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 212**

SPAN INFORMATION (ft): I-End (103.62,88.92) J-End (105.82,80.71)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 28.89

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.833	0.48	0.00	0.0	0.00	0.00	0.0	0.14	Snow	0.00
7.833	0.16	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	8.500	0.096	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	8.500	0.000	0.034			0.000
3	0.000	0.043	0.000	---	Snow	0.000
	3.833	0.000	0.000			0.000
4	0.000	0.000	0.015	---	Snow	0.000
	3.833	0.000	0.000			0.000
5	3.834	0.012	0.000	---	Snow	0.000
	7.833	0.012	0.000			0.000
6	7.834	0.008	0.000	---	Snow	0.000
	8.500	0.000	0.000			0.000
7	0.000	0.011	0.000	---	NonR	0.000
	8.500	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.18 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	2.8	3.8	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	2.8	3.8	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.54	0.73
Max +LL reaction	0.16	0.19
Max +total reaction (factored)	0.90	1.18

DEFLECTIONS:

								Ratio
Dead load (in)	at	4.25 ft	=	-0.021	L/D	=	4875	
Live load (in)	at	4.25 ft	=	-0.006	L/D	=	1722 > 360 1	0.02
Net Total load (in)	at	4.25 ft	=	-0.027	L/D	=	3800 > 240	0.06

PRCNC20221036

Floor Type: Level 3 **Beam Number = 213**

SPAN INFORMATION (ft): I-End (98.82,83.66) J-End (104.61,85.22)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 28.89

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.161	0.000	---	Snow	0.000
	4.972	0.161	0.000			0.000
2	4.973	0.161	0.000	---	Snow	0.000
	6.000	0.000	0.000			0.000
3	0.000	0.000	0.058	---	Snow	0.000
	4.972	0.000	0.058			0.000
4	4.973	0.000	0.057	---	Snow	0.000
	6.000	0.000	0.000			0.000
5	0.000	0.012	0.000	---	Snow	0.000
	6.000	0.012	0.000			0.000
6	0.000	0.011	0.000	---	NonR	0.000
	6.000	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.93 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	1.4	3.0	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	1.4	3.0	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.55	0.48
Max +LL reaction	0.17	0.14
Max +total reaction (factored)	0.93	0.80

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.00 ft	=	-0.006	L/D	=	1285 9		
Live load (in)	at	3.00 ft	=	-0.002	L/D	=	4143 9	> 360	0.01
Net Total load (in)	at	3.00 ft	=	-0.007	L/D	=	9814	> 240	0.02

PRCNC20221036

Floor Type: Level 3 **Beam Number = 214**

SPAN INFORMATION (ft): I-End (99.85,79.80) J-End (105.65,81.35)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 28.89

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	Snow	0.000
	6.000	0.012	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	0.178	0.028	0.000			0.000
3	0.179	0.028	0.000	---	Snow	0.000
	6.000	0.028	0.000			0.000
4	0.060	0.000	0.000	---	Snow	0.000
	0.119	0.000	0.007			0.000
5	0.119	0.000	0.007	---	Snow	0.000
	0.178	0.000	0.010			0.000
6	0.179	0.000	0.010	---	Snow	0.000
	6.000	0.000	0.010			0.000
7	0.000	0.011	0.000	---	NonR	0.000
	6.000	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.23 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	0.4	3.0	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	0.4	3.0	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.15	0.16
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.23	0.23

DEFLECTIONS:

							Ratio
Dead load (in)	at	3.00 ft	=	-0.002	L/D =	4501 8	
Live load (in)	at	3.00 ft	=	-0.000			
Net Total load (in)	at	3.00 ft	=	-0.002	L/D =	3772 7 > 240	0.01

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 215**

SPAN INFORMATION (ft): I-End (112.31,91.25) J-End (114.51,83.04)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 28.89

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.872	0.55	0.00	0.0	0.00	0.00	0.0	0.17	Snow	0.00
7.833	0.15	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	3.871	0.044	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	3.871	0.000	0.016			0.000
3	3.872	0.012	0.000	---	Snow	0.000
	7.833	0.012	0.000			0.000
4	7.834	0.000	0.000	---	Snow	0.000
	8.500	0.008	0.000			0.000
5	0.000	0.096	0.000	---	Snow	0.000
	8.500	0.000	0.000			0.000
6	0.000	0.000	0.034	---	Snow	0.000
	8.500	0.000	0.000			0.000
7	0.000	0.011	0.000	---	NonR	0.000
	8.500	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.19 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	3.2	3.9	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	3.2	3.9	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.71	0.64
Max +LL reaction	0.21	0.16
Max +total reaction (factored)	1.19	1.02

DEFLECTIONS:

								Ratio
Dead load (in)	at	4.16 ft	=	-0.023	L/D =	4361		
Live load (in)	at	4.12 ft	=	-0.007	L/D =	1498 3	> 360	0.02
Net Total load (in)	at	4.12 ft	=	-0.030	L/D =	3378	> 240	0.07

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 216**

SPAN INFORMATION (ft): I-End (118.11,92.80) J-End (120.31,84.59)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 28.89

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.833	0.48	0.00	0.0	0.00	0.00	0.0	0.14	Snow	0.00
7.833	0.16	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	8.500	0.096	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	8.500	0.000	0.034			0.000
3	0.000	0.043	0.000	---	Snow	0.000
	3.833	0.000	0.000			0.000
4	0.000	0.000	0.015	---	Snow	0.000
	3.833	0.000	0.000			0.000
5	3.834	0.012	0.000	---	Snow	0.000
	7.833	0.012	0.000			0.000
6	7.834	0.008	0.000	---	Snow	0.000
	8.500	0.000	0.000			0.000
7	0.000	0.011	0.000	---	NonR	0.000
	8.500	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.18 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	2.8	3.8	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	2.8	3.8	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.54	0.73
Max +LL reaction	0.16	0.19
Max +total reaction (factored)	0.90	1.18

DEFLECTIONS:

									Ratio
Dead load (in)	at	4.25 ft	=	-0.021	L/D	=	4871		
Live load (in)	at	4.25 ft	=	-0.006	L/D	=	1720 0	> 360	0.02
Net Total load (in)	at	4.25 ft	=	-0.027	L/D	=	3796	> 240	0.06

PRCNC20221036

Floor Type: Level 3 **Beam Number = 217**

SPAN INFORMATION (ft): I-End (113.32,87.51) J-End (119.10,89.10)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 28.89

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.162	0.000	---	Snow	0.000
	4.971	0.161	0.000			0.000
2	4.972	0.161	0.000	---	Snow	0.000
	6.000	0.000	0.000			0.000
3	0.000	0.000	0.058	---	Snow	0.000
	4.971	0.000	0.057			0.000
4	4.972	0.000	0.057	---	Snow	0.000
	6.000	0.000	0.000			0.000
5	0.000	0.012	0.000	---	Snow	0.000
	6.000	0.012	0.000			0.000
6	0.000	0.011	0.000	---	NonR	0.000
	6.000	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.94 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	1.4	3.0	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	1.4	3.0	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.55	0.48
Max +LL reaction	0.17	0.14
Max +total reaction (factored)	0.94	0.80

DEFLECTIONS:

								Ratio
Dead load (in)	at	3.00 ft	=	-0.006	L/D	=	1282 2	
Live load (in)	at	3.00 ft	=	-0.002	L/D	=	4130 > 360 1	0.01
Net Total load (in)	at	3.00 ft	=	-0.007	L/D	=	9784 > 240	0.02

PRCNC20221036

Floor Type: Level 3 **Beam Number = 218**

SPAN INFORMATION (ft): I-End (114.34,83.68) J-End (120.14,85.24)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 28.89

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	Snow	0.000
	6.000	0.012	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	0.178	0.028	0.000			0.000
3	0.179	0.028	0.000	---	Snow	0.000
	6.000	0.028	0.000			0.000
4	0.060	0.000	0.000	---	Snow	0.000
	0.119	0.000	0.007			0.000
5	0.119	0.000	0.007	---	Snow	0.000
	0.178	0.000	0.010			0.000
6	0.179	0.000	0.010	---	Snow	0.000
	6.000	0.000	0.010			0.000
7	0.000	0.011	0.000	---	NonR	0.000
	6.000	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.23 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	0.4	3.0	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	0.4	3.0	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.15	0.16
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.23	0.23

DEFLECTIONS:

								Ratio
Dead load (in)	at	3.00 ft	=	-0.002	L/D	=	4501 8	
Live load (in)	at	3.00 ft	=	-0.000				
Net Total load (in)	at	3.00 ft	=	-0.002	L/D	=	3772 7 > 240	0.01

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 219**

SPAN INFORMATION (ft): I-End (132.60,96.69) J-End (134.80,88.47)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 28.89

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.833	0.48	0.00	0.0	0.00	0.00	0.0	0.14	Snow	0.00
7.833	0.16	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	8.500	0.096	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	8.500	0.000	0.034			0.000
3	0.000	0.043	0.000	---	Snow	0.000
	3.833	0.000	0.000			0.000
4	0.000	0.000	0.015	---	Snow	0.000
	3.833	0.000	0.000			0.000
5	3.834	0.012	0.000	---	Snow	0.000
	7.833	0.012	0.000			0.000
6	7.834	0.008	0.000	---	Snow	0.000
	8.500	0.000	0.000			0.000
7	0.000	0.011	0.000	---	NonR	0.000
	8.500	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.18 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	2.8	3.8	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	2.8	3.8	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.54	0.73
Max +LL reaction	0.16	0.19
Max +total reaction (factored)	0.90	1.18

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.25 ft	=	-0.021	L/D	=	4875			
Live load (in)	at	4.25 ft	=	-0.006	L/D	=	1722 1	>	360	0.02
Net Total load (in)	at	4.25 ft	=	-0.027	L/D	=	3800	>	240	0.06

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 3 **Beam Number = 220**

SPAN INFORMATION (ft): I-End (126.80,95.13) J-End (129.00,86.92)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 28.89

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.833	0.55	0.00	0.0	0.00	0.00	0.0	0.17	Snow	0.00
7.833	0.15	0.00	0.0	0.00	0.00	0.0	0.03	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	---	Snow	0.000
	3.833	0.043	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	3.833	0.000	0.015			0.000
3	3.834	0.012	0.000	---	Snow	0.000
	7.833	0.012	0.000			0.000
4	7.834	0.000	0.000	---	Snow	0.000
	8.500	0.008	0.000			0.000
5	0.000	0.096	0.000	---	Snow	0.000
	8.500	0.000	0.000			0.000
6	0.000	0.000	0.034	---	Snow	0.000
	8.500	0.000	0.000			0.000
7	0.000	0.011	0.000	---	NonR	0.000
	8.500	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.19 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	3.2	3.8	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	3.2	3.8	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.71	0.63
Max +LL reaction	0.21	0.16
Max +total reaction (factored)	1.19	1.02

DEFLECTIONS:

									Ratio
Dead load (in)	at	4.12 ft	=	-0.023	L/D	=	4382		
Live load (in)	at	4.12 ft	=	-0.007	L/D	=	1507 6	> 360	0.02
Net Total load (in)	at	4.12 ft	=	-0.030	L/D	=	3395	> 240	0.07

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 226**

SPAN INFORMATION (ft): I-End (128.83,87.57) J-End (134.63,89.12)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 28.89

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.012	0.000	---	Snow	0.000
	6.000	0.012	0.000			0.000
2	0.000	0.000	0.000	---	Snow	0.000
	0.178	0.028	0.000			0.000
3	0.179	0.028	0.000	---	Snow	0.000
	6.000	0.028	0.000			0.000
4	0.060	0.000	0.000	---	Snow	0.000
	0.119	0.000	0.007			0.000
5	0.119	0.000	0.007	---	Snow	0.000
	0.178	0.000	0.010			0.000
6	0.179	0.000	0.010	---	Snow	0.000
	6.000	0.000	0.010			0.000
7	0.000	0.011	0.000	---	NonR	0.000
	6.000	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.23 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	0.4	3.0	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	0.4	3.0	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.15	0.16
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.23	0.23

DEFLECTIONS:

								Ratio
Dead load (in)	at	3.00 ft	=	-0.002	L/D	=	4501 8	
Live load (in)	at	3.00 ft	=	-0.000				
Net Total load (in)	at	3.00 ft	=	-0.002	L/D	=	3772 7 > 240	0.01

PRCNC20221036

Floor Type: Level 3 **Beam Number = 230**

SPAN INFORMATION (ft): I-End (127.80,91.43) J-End (133.59,92.98)

Beam Size (User Selected) = C8X11.5 Fy = 36.0 ksi
Total Beam Length (ft) = 6.00
Mp (kip-ft) = 28.89

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.161	0.000	---	Snow	0.000
	4.972	0.161	0.000			0.000
2	4.973	0.161	0.000	---	Snow	0.000
	6.000	0.000	0.000			0.000
3	0.000	0.000	0.058	---	Snow	0.000
	4.972	0.000	0.058			0.000
4	4.973	0.000	0.057	---	Snow	0.000
	6.000	0.000	0.000			0.000
5	0.000	0.012	0.000	---	Snow	0.000
	6.000	0.012	0.000			0.000
6	0.000	0.011	0.000	---	NonR	0.000
	6.000	0.011	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.93 kips 0.90Vn = 34.21 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	1.4	3.0	0.0	1.00	0.90	26.00
Controlling		1.2DL+1.6LL	1.4	3.0	0.0	1.00	0.90	26.00

REACTIONS (kips):

	Left	**Right**
DL reaction	0.55	0.48
Max +LL reaction	0.17	0.14
Max +total reaction (factored)	0.93	0.80

DEFLECTIONS:

									Ratio
Dead load (in)	at	3.00 ft	=	-0.006	L/D	=	1285 9		
Live load (in)	at	3.00 ft	=	-0.002	L/D	=	4143 9	> 360	0.01
Net Total load (in)	at	3.00 ft	=	-0.007	L/D	=	9814	> 240	0.02

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 234**

SPAN INFORMATION (ft): I-End (209.15,98.51) J-End (211.63,89.28)

Beam Size (User Selected) = W10x12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.56

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	28.67	Y bar(in)	=	11.42
Mnf (kip-ft)	=	134.07	Mn (kip-ft)	=	105.11
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	195.74	Itr (in4)	=	257.26
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
4.778	0.84	0.75	1.19	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.30

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	9.555	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.53 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	3.4	4.8	4.8	1.64	0.90	46.90
	Init DL	1.4DL	2.7	4.8	---	---		
	Max +	1.2DL+1.6LL	7.1	4.8	---	---	0.90	94.60
Controlling		1.2DL+1.6LL	7.1	4.8	---	---	0.90	94.60

REACTIONS (kips):

	Left	Right
Initial reaction	0.58	0.58
DL reaction	0.48	0.48
Max +LL reaction	0.60	0.60
Max +total reaction (factored)	1.53	1.53

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	4.78 ft	=	-0.016	L/D	=	6958			
Live load (in)	at	4.78 ft	=	-0.007	L/D	=	1735 2	>	360	0.02
Post Comp load (in)	at	4.78 ft	=	-0.007	L/D	=	1606 7	>	240	0.01
Net Total load (in)	at	4.78 ft	=	-0.024	L/D	=	4855	>	240	0.05

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 235**

SPAN INFORMATION (ft): I-End (210.39,93.89) J-End (215.22,95.18)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.325	0.478	0.0%	Red	0.000
	5.000	0.325	0.478			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	5.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.92 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	3.7	2.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	3.7	2.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.84	0.84
Max +LL reaction	1.19	1.19
Max +total reaction (factored)	2.92	2.92

DEFLECTIONS:

									Ratio
Dead load (in)	at	2.50 ft	=	-0.003	L/D	=	1975 7		
Live load (in)	at	2.50 ft	=	-0.004	L/D	=	1393 3	> 360	0.03
Net Total load (in)	at	2.50 ft	=	-0.007	L/D	=	8171	> 240	0.03

PRCNC20221036

Floor Type: Level 3 **Beam Number = 236**

SPAN INFORMATION (ft): I-End (163.35,86.23) J-End (173.01,88.82)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	11.48
Mnf (kip-ft)	=	134.67	Mn (kip-ft)	=	105.25
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	197.47	Itr (in4)	=	259.73
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 10 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.425	0.375	0.625	0.0%	Red	0.000	0.156
	10.000	0.425	0.375	0.625			0.000	0.156
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.62 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	8.9	5.0	0.0	1.00	0.90	46.90
	Init DL	1.4DL	6.8	5.0	---	---		
	Max +	1.2DL+1.6LL	19.1	5.0	---	---	0.90	94.72
Controlling		1.2DL+1.6LL	19.1	5.0	---	---	0.90	94.72

REACTIONS (kips):

	Left	Right
Initial reaction	2.72	2.72
DL reaction	2.19	2.19
Max +LL reaction	3.12	3.12
Max +total reaction (factored)	7.62	7.62

DEFLECTIONS: **Ratio**

Initial load (in)	at	5.00 ft	=	-0.056	L/D	=	2150
Live load (in)	at	5.00 ft	=	-0.025	L/D	=	4887 > PRCNC20221036

Post Comp load (in)	at	5.00 ft	=	-0.027	L/D	=	4525	>	240	0.05
Net Total load (in)	at	5.00 ft	=	-0.082	L/D	=	1457	>	240	0.16

Floor Type: Level 3 **Beam Number = 237**

SPAN INFORMATION (ft): I-End (86.17,166.50) J-End (86.17,176.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 30.00		Y bar(in)	=	11.48
Mnf (kip-ft)	= 134.67		Mn (kip-ft)	=	113.00
C (kips)	= 107.69		PNA (in)	=	9.69
Ieff (in4)	= 214.43		Itr (in4)	=	259.73
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 60.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.08 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.4DL	0.2	5.0	10.0	1.14	0.90	22.60
	Init DL	1.4DL	0.2	5.0	---	---		
	Max +	1.4DL	0.2	5.0	---	---	0.90	101.70
Controlling		1.4DL	0.2	5.0	10.0	1.14	0.90	22.60

REACTIONS (kips):

	Left	Right
Initial reaction	0.06	0.06
DL reaction	0.06	0.06
Max +total reaction (factored)	0.08	0.08

DEFLECTIONS:

					Ratio
Initial load (in)	at	5.00 ft	=	-0.002	L/D = 6907 8
Live load (in)	at	5.00 ft	=	-0.000	
Post Comp load (in)	at	5.00 ft	=	-0.000	

PRCNC20221036

Net Total load (in)	at	5.00 ft	=	-0.002	L/D	=	6907 8	>	240	0.00

Floor Type: Level 3 **Beam Number = 242**

SPAN INFORMATION (ft): I-End (145.42,118.17) J-End (145.42,128.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.17

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.50	Y bar(in)	=	11.51
Mnf (kip-ft)	=	134.88	Mn (kip-ft)	=	113.08
C (kips)	=	107.69	PNA (in)	=	9.69
Ieff (in4)	=	215.12	Itr (in4)	=	260.62
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 60.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.166	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.09 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.4DL	0.2	5.1	10.2	1.14	0.90	22.00
	Init DL	1.4DL	0.2	5.1	---	---		
	Max +	1.4DL	0.2	5.1	---	---	0.90	101.77
Controlling		1.4DL	0.2	5.1	10.2	1.14	0.90	22.00

REACTIONS (kips):

	Left	Right
Initial reaction	0.06	0.06
DL reaction	0.06	0.06
Max +total reaction (factored)	0.09	0.09

DEFLECTIONS:

					Ratio
Initial load (in)	at	5.08 ft	=	-0.002	L/D = 6573 7
Live load (in)	at	5.08 ft	=	-0.000	
Post Comp load (in)	at	5.08 ft	=	-0.000	

PRCNC20221036

Net Total load (in)	at	5.08 ft	=	-0.002	L/D	=	6573 7	>	240	0.00

Floor Type: Level 3 **Beam Number = 243**

SPAN INFORMATION (ft): I-End (159.11,94.99) J-End (161.58,85.76)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.56

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	25.33	Y bar(in)	=	11.22
Mnf (kip-ft)	=	132.31	Mn (kip-ft)	=	104.69
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	190.93	Itr (in4)	=	250.36
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 18 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	9.555	1.210	0.000	0.000			0.000	0.000
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	9.555	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 8.17 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.4DL	0.2	4.8	9.6	1.14	0.90	24.34
	Init DL	1.4DL	0.2	4.8	---	---		
	Max +	1.4DL	19.5	4.8	---	---	0.90	94.22
Controlling		1.4DL	19.5	4.8	---	---	0.90	94.22

REACTIONS (kips):

	Left	Right
Initial reaction	0.06	0.06
DL reaction	5.84	5.84
Max +total reaction (factored)	8.17	8.17

DEFLECTIONS: **Ratio**

Initial load (in) at 4.78 ft = -0.001 L/D = 7917
2

Live load (in) at 4.78 ft = -0.000

PRCNC20221036

Post Comp load (in)	at	4.78 ft	=	-0.041	L/D	=	2797	>	240	0.09
Net Total load (in)	at	4.78 ft	=	-0.042	L/D	=	2702	>	240	0.09

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 244**

SPAN INFORMATION (ft): I-End (161.58,85.76) J-End (164.05,76.53)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.56

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	25.33	Y bar(in)	=	11.22
Mnf (kip-ft)	=	132.31	Mn (kip-ft)	=	104.69
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	190.93	Itr (in4)	=	250.36
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	9.555	1.210	0.000	0.000			0.000	0.000
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	9.555	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 8.17 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.4DL	0.2	4.8	9.6	1.14	0.90	24.34
	Init DL	1.4DL	0.2	4.8	---	---		
	Max +	1.4DL	19.5	4.8	---	---	0.90	94.22
Controlling		1.4DL	19.5	4.8	---	---	0.90	94.22

REACTIONS (kips):

	Left	Right
Initial reaction	0.06	0.06
DL reaction	5.84	5.84
Max +total reaction (factored)	8.17	8.17

DEFLECTIONS: **Ratio**

Initial load (in) at 4.78 ft = -0.001 L/D = 7917
2

Live load (in) at 4.78 ft = -0.000

PRCNC20221036

Post Comp load (in)	at	4.78 ft	=	-0.041	L/D	=	2797	>	240	0.09
Net Total load (in)	at	4.78 ft	=	-0.042	L/D	=	2702	>	240	0.09

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 245**

SPAN INFORMATION (ft): I-End (164.05,76.53) J-End (166.53,67.30)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.56

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	25.33	Y bar(in)	=	11.22
Mnf (kip-ft)	=	132.31	Mn (kip-ft)	=	104.69
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	190.93	Itr (in4)	=	250.36
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 18 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	1.210	0.000	0.000	---	NonR	0.000	0.000
	9.555	1.210	0.000	0.000			0.000	0.000
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	9.555	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 8.17 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.4DL	0.2	4.8	9.6	1.14	0.90	24.34
	Init DL	1.4DL	0.2	4.8	---	---		
	Max +	1.4DL	19.5	4.8	---	---	0.90	94.22
Controlling		1.4DL	19.5	4.8	---	---	0.90	94.22

REACTIONS (kips):

	Left	Right
Initial reaction	0.06	0.06
DL reaction	5.84	5.84
Max +total reaction (factored)	8.17	8.17

DEFLECTIONS: **Ratio**

Initial load (in) at 4.78 ft = -0.001 L/D = 7917
2

Live load (in) at 4.78 ft = -0.000

PRCNC20221036

Post Comp load (in)	at	4.78 ft	=	-0.041	L/D	=	2797	>	240	0.09
Net Total load (in)	at	4.78 ft	=	-0.042	L/D	=	2702	>	240	0.09

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 246**

SPAN INFORMATION (ft): I-End (59.83,121.58) J-End (59.83,135.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 13.58

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	37.87	Y bar(in)	=	11.81
Mnf (kip-ft)	=	137.33	Mn (kip-ft)	=	112.40
C (kips)	=	103.38	PNA (in)	=	9.68
Ieff (in4)	=	220.51	Itr (in4)	=	271.93
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 13 Partial = 13 Actual = 13
Number of Stud Rows = 1 Percent of Full Composite Action = 58.40

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.244	0.215	0.358	0.0%	Red	0.000	0.090
	13.583	0.244	0.215	0.358			0.000	0.090
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	13.583	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 5.98 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	9.6	6.8	0.0	1.00	0.90	46.90
	Init DL	1.4DL	7.3	6.8	---	---		
	Max +	1.2DL+1.6LL	20.3	6.8	---	---	0.90	101.16
Controlling		1.2DL+1.6LL	9.6	6.8	---	---	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	2.15	2.15
DL reaction	1.74	1.74
Max +LL reaction	2.43	2.43
Max +total reaction (factored)	5.98	5.98

DEFLECTIONS: **Ratio**

Initial load (in)	at 6.79 ft	=	-0.111	L/D	=	1462	
Live load (in)	at 6.79 ft	=	-0.043	L/D	=	3798	> PRCNC20221036

Gravity Beam Design

Post Comp load (in)	at	6.79 ft	=	-0.046	L/D	=	3516	>	240	0.07
Net Total load (in)	at	6.79 ft	=	-0.158	L/D	=	1033	>	240	0.23

Floor Type: Level 3 **Beam Number = 247**

SPAN INFORMATION (ft): I-End (218.59,110.93) J-End (226.01,83.24)

Beam Size (Optimum) = W21X50 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	34.00	Y bar(in)	=	17.08
Mnf (kip-ft)	=	729.81	Mn (kip-ft)	=	729.81
C (kips)	=	346.80	PNA (in)	=	19.53
Ieff (in4)	=	2365.28	Itr (in4)	=	2365.28
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 49 Partial = 47 Actual = 47
Number of Stud Rows = 1 Percent of Full Composite Action = 96.96

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
6.500	4.10	3.95	0.00	0.0	7.23	0.00	0.0	0.00	Snow	0.00	2.31
9.556	8.21	7.30	0.00	0.0	28.45	0.00	0.0	0.00	Snow	0.00	2.84
14.333	0.66	0.58	0.00	0.0	2.34	0.00	0.0	0.00	Snow	0.00	0.23
19.111	7.27	6.46	0.00	0.0	25.50	0.00	0.0	0.00	Snow	0.00	2.55
22.084	0.95	0.84	0.00	0.0	3.32	0.00	0.0	0.00	Snow	0.00	0.33

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	6.500	0.060	0.053	0.219	---	NonR	0.000	0.022
	22.083	0.060	0.053	0.219			0.000	0.022
2	0.000	0.050	0.050	0.000	---	NonR	0.000	0.000
	28.666	0.050	0.050	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 74.06 kips 1.00Vn = 237.12 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	179.9	9.6	4.8	1.01	0.90	412.50
	Init DL	1.4DL	135.9	9.6	---	---		
	Max +	1.2DL+1.6LL	652.8	10.3	---	---	0.90	656.83
Controlling		1.2DL+1.6LL	652.6	9.6	---	---	0.90	656.27

Gravity Beam Design

REACTIONS (kips):

	Left	Right
Initial reaction	16.58	13.41
DL reaction	12.79	10.75
Max +LL reaction	36.69	33.55
Max +total reaction (factored)	74.06	66.58

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.05 ft	=	-0.504	L/D	=	682			
Live load (in)	at 14.19 ft	=	-0.717	L/D	=	480	>	360	0.75
Post Comp load (in)	at 14.19 ft	=	-0.739	L/D	=	465	>	240	0.52
Net Total load (in)	at 14.19 ft	=	-1.243	L/D	=	277	>	240	0.87

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 248**

SPAN INFORMATION (ft): I-End (223.54,92.47) J-End (245.92,98.46)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 23.17

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	69.50	Y bar(in)	=	16.78
Mnf (kip-ft)	=	387.20	Mn (kip-ft)	=	344.27
C (kips)	=	249.83	PNA (in)	=	15.46
Ieff (in4)	=	948.69	Itr (in4)	=	1103.99
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 46 Partial = 33 Actual = 33
Number of Stud Rows = 2 Percent of Full Composite Action = 64.26

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
3.917	0.03	0.03									
19.602	0.35	0.32	0.00	0.0	1.04	0.00	0.0	0.00	Snow	0.00	0.10

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.162	0.143	0.597	---	NonR	0.000	0.060
	3.916	0.162	0.143	0.597			0.000	0.060
2	3.917	0.325	0.287	1.194	---	NonR	0.000	0.119
	19.597	0.325	0.287	1.194			0.000	0.119
3	19.602	0.207	0.183	0.761	---	NonR	0.000	0.076
	23.165	0.174	0.154	0.641			0.000	0.064
4	0.000	0.325	0.287	1.194	---	NonR	0.000	0.119
	20.604	0.325	0.287	1.194			0.000	0.119
5	20.605	0.325	0.287	1.194	---	NonR	0.000	0.119
	23.165	0.000	0.000	0.000			0.000	0.000
6	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	23.165	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 49.53 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	72.9	11.7	0.0	1.00	0.90	165.75
	Init DL	1.4DL	55.7	11.7	---	---		
	Max +	1.2DL+1.6LL	306.0	11.7	---	---	0.90	309.85
Controlling		1.2DL+1.6LL	306.0	11.7	---	---	0.90	309.85

REACTIONS (kips):

	Left	**Right**
Initial reaction	9.01	8.95
DL reaction	7.27	7.23
Max +LL reaction	25.50	25.24
Max +total reaction (factored)	49.53	49.07

DEFLECTIONS:

									Ratio
Initial load (in)	at 11.58 ft	=	-0.439	L/D	=	633			
Live load (in)	at 11.58 ft	=	-0.552	L/D	=	504	>	360	0.71
Post Comp load (in)	at 11.58 ft	=	-0.569	L/D	=	488	>	240	0.49
Net Total load (in)	at 11.58 ft	=	-1.008	L/D	=	276	>	240	0.87

Floor Type: Level 3 **Beam Number = 249**

SPAN INFORMATION (ft): I-End (221.07,101.70) J-End (245.92,108.36)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 25.73

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	67.71	Y bar(in)	=	17.82
Mnf (kip-ft)	=	549.07	Mn (kip-ft)	=	450.09
C (kips)	=	206.76	PNA (in)	=	15.74
Ieff (in4)	=	1249.53	Itr (in4)	=	1677.16
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 50 Partial = 25 Actual = 25
Number of Stud Rows = 1 Percent of Full Composite Action = 39.89

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
19.598	0.57	0.51	0.00	0.0	1.82	0.00	0.0	0.00	Snow	0.00	0.18

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	1.194	---	NonR	0.000	0.119
	25.725	0.322	0.285	1.185			0.000	0.119
2	0.000	0.162	0.143	0.597	---	NonR	0.000	0.060
	3.916	0.162	0.143	0.597			0.000	0.060
3	3.917	0.325	0.287	1.194	---	NonR	0.000	0.119
	19.597	0.325	0.287	1.194			0.000	0.119
4	19.600	0.118	0.104	0.433	---	NonR	0.000	0.043
	24.447	0.162	0.143	0.596			0.000	0.060
5	24.448	0.162	0.143	0.596	---	NonR	0.000	0.060
	25.725	0.000	0.000	0.000			0.000	0.000
6	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	25.725	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 55.37 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	90.7	12.9	0.0	1.00	0.90	249.38
	Init DL	1.4DL	69.6	12.9	---	---		

PRCNC20221036

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
	Max +	1.2DL+1.6LL	377.4	12.9	---	---	0.90	405.08
Controlling		1.2DL+1.6LL	377.4	12.9	---	---	0.90	405.08

REACTIONS (kips):

	Left	**Right**
Initial reaction	10.14	10.01
DL reaction	8.21	8.11
Max +LL reaction	28.45	27.93
Max +total reaction (factored)	55.37	54.41

DEFLECTIONS:

								Ratio
Initial load (in)	at 12.86 ft	=	-0.399	L/D	=	774		
Live load (in)	at 12.86 ft	=	-0.635	L/D	=	486	> 360	0.74
Post Comp load (in)	at 12.86 ft	=	-0.655	L/D	=	471	> 240	0.51
Net Total load (in)	at 12.86 ft	=	-1.054	L/D	=	293	> 240	0.82

Floor Type: Level 3 **Beam Number = 250**

SPAN INFORMATION (ft): I-End (222.30,97.08) J-End (226.09,98.10)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 3.92
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.325	1.194	---	NonR	0.000
	3.916	0.325	1.194			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	3.916	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.53 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	4.4	2.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	4.4	2.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.66	0.66
Max +LL reaction	2.34	2.34
Max +total reaction (factored)	4.53	4.53

DEFLECTIONS:

	at		=							**Ratio**
Dead load (in)	at	1.96 ft	=	-0.001	L/D	=	4110 5			
Live load (in)	at	1.96 ft	=	-0.004	L/D	=	1159 5	>	360	0.03
Net Total load (in)	at	1.96 ft	=	-0.005	L/D	=	9044	>	240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 251**

SPAN INFORMATION (ft): I-End (226.09,98.10) J-End (227.32,93.48)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 4.78

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	14.33	Y bar(in)	=	10.17
Mnf (kip-ft)	=	116.10	Mn (kip-ft)	=	83.01
C (kips)	=	43.07	PNA (in)	=	7.20
Ieff (in4)	=	141.62	Itr (in4)	=	215.59
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Max = 12 Partial = 5 Actual = 5
Number of Stud Rows = 1 Percent of Full Composite Action = 29.45

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	4.777	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.04 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.4DL	0.0	2.4	4.8	1.14	0.90	45.65
	Init DL	1.4DL	0.0	0.0	---	---		
	Max +	1.4DL	0.0	2.4	---	---	0.90	74.71
Controlling		1.4DL	0.0	2.4	4.8	1.14	0.90	45.65

REACTIONS (kips):

	Left	Right
Initial reaction	0.03	0.03
DL reaction	0.03	0.03
Max +total reaction (factored)	0.04	0.04

DEFLECTIONS: **Ratio**

Initial load (in)	at	2.39 ft	=	-0.000	
Live load (in)	at	2.39 ft	=	-0.000	
Post Comp load (in)	at	2.39 ft	=	-0.000	
Net Total load (in)	at	2.39 ft	=	-0.000	

PRCNC20221036

Floor Type: Level 3 **Beam Number = 252**

SPAN INFORMATION (ft): I-End (217.23,87.70) J-End (224.31,89.60)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	15.00	Y bar(in)	=	10.26
Mnf (kip-ft)	=	118.16	Mn (kip-ft)	=	87.80
C (kips)	=	51.69	PNA (in)	=	7.66
Ieff (in4)	=	149.54	Itr (in4)	=	218.52
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 7 Partial = 7 Actual = 7
Number of Stud Rows = 1 Percent of Full Composite Action = 33.78

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.023	0.020	0.083	---	NonR	0.000	0.008
	7.333	0.023	0.020	0.083			0.000	0.008
2	0.000	0.224	0.197	0.823	---	NonR	0.000	0.082
	7.333	0.224	0.197	0.823			0.000	0.082
3	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	7.333	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.45 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	2.8	3.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	2.2	3.7	---	---		
	Max +	1.2DL+1.6LL	11.8	3.7	---	---	0.90	79.02
Controlling		1.2DL+1.6LL	11.8	3.7	---	---	0.90	79.02

REACTIONS (kips):

	Left	Right
Initial reaction	1.17	1.17
DL reaction	0.95	0.95
Max +LL reaction	3.32	3.32
Max +total reaction (factored)	6.45	6.45

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	3.67 ft	=	-0.010	L/D	=	9192			
Live load (in)	at	3.67 ft	=	-0.014	L/D	=	6472	>	360	0.06
Post Comp load (in)	at	3.67 ft	=	-0.014	L/D	=	6271	>	240	0.04
Net Total load (in)	at	3.67 ft	=	-0.024	L/D	=	3728	>	240	0.06

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 253**

SPAN INFORMATION (ft): I-End (213.19,102.75) J-End (220.28,104.65)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 7.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	22.00	Y bar(in)	=	13.92
Mnf (kip-ft)	=	315.95	Mn (kip-ft)	=	243.87
C (kips)	=	63.75	PNA (in)	=	10.40
Ieff (in4)	=	588.06	Itr (in4)	=	839.58
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
\# of studs: Max = 14 Partial = 10 Actual = 10
Number of Stud Rows = 2 Percent of Full Composite Action = 27.90

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
1.250	3.00	3.00	0.00	0.0	3.00	0.00	0.0	0.00	Snow	0.00	2.00
5.583	3.00	3.00	0.00	0.0	3.00	0.00	0.0	0.00	Snow	0.00	2.00

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.221	0.195	0.812	---	NonR	0.000	0.081
	7.333	0.221	0.195	0.812			0.000	0.081
2	0.000	0.108	0.095	0.396	---	NonR	0.000	0.040
	7.333	0.108	0.095	0.396			0.000	0.040
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	7.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.62 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	14.2	4.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	9.4	4.3	---	---		
	Max +	1.2DL+1.6LL	28.5	3.9	---	---	0.90	219.48
Controlling		1.2DL+1.6LL	25.2	5.6	---	---	0.90	192.53

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	6.94	6.26
DL reaction	4.51	4.10
Max +LL reaction	7.63	7.23
Max +total reaction (factored)	17.62	16.48

DEFLECTIONS:

										Ratio
Initial load (in)	at	3.70 ft	=	-0.008	L/D	=	1102 2			
Live load (in)	at	3.70 ft	=	-0.007	L/D	=	1174 8	>	360	0.03
Post Comp load (in)	at	3.70 ft	=	-0.008	L/D	=	1152 1	>	240	0.02
Net Total load (in)	at	3.70 ft	=	-0.016	L/D	=	5633	>	240	0.04

PRCNC20221036

Gravity Beam Design

Floor Type: Level 3 **Beam Number = 255**

SPAN INFORMATION (ft): I-End (84.47,65.10) J-End (86.94,55.87)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.56

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	28.67	Y bar(in)	=	11.42
Mnf (kip-ft)	=	134.07	Mn (kip-ft)	=	105.11
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	195.74	Itr (in4)	=	257.26
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
4.778	1.03	0.75	0.00	0.0	0.00	0.00	0.0	0.36	Snow	0.00	0.30

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	9.555	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.98 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	3.4	4.8	4.8	1.64	0.90	46.90
	Init DL	1.4DL	2.7	4.8	---	---		
	Max +	1.2DL+1.6LL	4.5	4.8	---	---	0.90	94.60
Controlling		1.2DL+1.6LL	3.4	4.8	---	---	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	0.58	0.58
DL reaction	0.57	0.57
Max +LL reaction	0.18	0.18
Max +total reaction (factored)	0.98	0.98

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

											Ratio
Initial load (in)	at	4.78 ft	=	-0.016	L/D	=	6958				
Live load (in)	at	4.78 ft	=	-0.002	L/D	=	5784 0	>	360		0.01
Post Comp load (in)	at	4.78 ft	=	-0.004	L/D	=	3213 3	>	240		0.01
Net Total load (in)	at	4.78 ft	=	-0.020	L/D	=	5719	>	240		0.04

PRCNC20221036

Floor Type: Level 3 **Beam Number = 256**

SPAN INFORMATION (ft): I-End (80.88,59.19) J-End (85.70,60.48)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.401	0.000	---	Snow	0.000
	5.000	0.401	0.000			0.000
2	0.000	0.000	0.143	---	Snow	0.000
	5.000	0.000	0.143			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	5.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.81 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	2.3	2.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	2.3	2.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.03	1.03
Max +LL reaction	0.36	0.36
Max +total reaction (factored)	1.81	1.81

DEFLECTIONS:

									Ratio
Dead load (in)	at	2.50 ft	=	-0.004	L/D	=	1610 3		
Live load (in)	at	2.50 ft	=	-0.001	L/D	=	4644 3	> 360	0.01
Net Total load (in)	at	2.50 ft	=	-0.005	L/D	=	1195 7	> 240	0.02

PRCNC20221036

Floor Type: Level 2 **Beam Number = 17**

SPAN INFORMATION (ft): I-End (41.92,176.50) J-End (71.25,176.50)

Beam Size (User Selected) = W27X84 Fy = 50.0 ksi
Total Beam Length (ft) = 29.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	51.50	Y bar(in)	=	21.01
Mnf (kip-ft)	=	1506.19	Mn (kip-ft)	=	1374.45
C (kips)	=	301.52	PNA (in)	=	19.90
Ieff (in4)	=	5284.52	Itr (in4)	=	6063.36
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 66 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 42.77

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.778	5.18	4.60	7.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.83
19.556	5.18	4.60	7.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	29.333	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	29.333	0.042	0.038	0.063			0.000	0.016
3	0.000	0.084	0.084	0.000	---	NonR	0.000	0.000
	29.333	0.084	0.084	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.82 kips 1.00Vn = 368.46 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	101.0	14.7	9.8	1.00	0.90	852.05
	Init DL	1.4DL	81.2	14.7	---	---		
	Max +	1.2DL+1.6LL	203.9	14.7	---	---	0.90	1237.00
Controlling		1.2DL+1.6LL	200.8	9.8	---	---	0.90	1143.21

REACTIONS (kips):

PRCNC20221036

	Left	Right
Initial reaction	8.44	8.44
DL reaction	7.19	7.19
Max +LL reaction	8.25	8.25
Max +total reaction (factored)	21.82	21.82

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.67 ft	=	-0.111	L/D	=	3183			
Live load (in)	at 14.67 ft	=	-0.081	L/D	=	4353	>	360	0.08
Post Comp load (in)	at 14.67 ft	=	-0.088	L/D	=	3981	>	240	0.06
Net Total load (in)	at 14.67 ft	=	-0.199	L/D	=	1769	>	240	0.14

Floor Type: Level 2 **Beam Number = 18**

SPAN INFORMATION (ft): I-End (71.25,176.50) J-End (86.17,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 14.92

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	29.88	Y bar(in)	=	15.49
Mnf (kip-ft)	=	467.29	Mn (kip-ft)	=	391.15
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1049.70	Itr (in4)	=	1367.87
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 28 Partial = 14 Actual = 14
Number of Stud Rows = 1 Percent of Full Composite Action = 39.58

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	14.916	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	14.916	0.042	0.038	0.063			0.000	0.016
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	14.916	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	14.916	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.54 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.7	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	14.5	7.5	---	---		
	Max +	1.2DL+1.6LL	39.3	7.5	---	---	0.90	352.04
Controlling		1.2DL+1.6LL	39.3	7.5	---	---	0.90	352.04

REACTIONS (kips):

	Left	Right
Initial reaction	3.83	3.83
DL reaction	3.19	3.19
Max +LL reaction	4.20	4.20
Max +total reaction (factored)	10.54	10.54

Gravity Beam Design

DEFLECTIONS:										
										Ratio
Initial load (in)	at	7.46 ft	=	-0.028	L/D	=	6379			
Live load (in)	at	7.46 ft	=	-0.021	L/D	=	8696	>	360	0.04
Post Comp load (in)	at	7.46 ft	=	-0.023	L/D	=	7922	>	240	0.03
Net Total load (in)	at	7.46 ft	=	-0.051	L/D	=	3534	>	240	0.07

Floor Type: Level 2 **Beam Number = 19**

SPAN INFORMATION (ft): I-End (86.17,176.50) J-End (95.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 9.75

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	22.12	Y bar(in)	=	14.56
Mnf (kip-ft)	=	440.19	Mn (kip-ft)	=	348.17
C (kips)	=	68.92	PNA (in)	=	11.15
Ieff (in4)	=	917.08	Itr (in4)	=	1246.64
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 18 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 30.53

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	9.750	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	9.750	0.042	0.038	0.063			0.000	0.016
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	9.750	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	9.750	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.89 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	8.0	4.9	0.0	1.00	0.90	249.38
	Init DL	1.4DL	6.2	4.9	---	---		
	Max +	1.2DL+1.6LL	16.8	4.9	---	---	0.90	313.35
Controlling		1.2DL+1.6LL	16.8	4.9	---	---	0.90	313.35

REACTIONS (kips):

	Left	Right
Initial reaction	2.50	2.50
DL reaction	2.08	2.08
Max +LL reaction	2.74	2.74
Max +total reaction (factored)	6.89	6.89

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	4.87 ft	=	-0.005	L/D	=	2284 4			
Live load (in)	at	4.87 ft	=	-0.004	L/D	=	2720 6	>	360	0.01
Post Comp load (in)	at	4.87 ft	=	-0.005	L/D	=	2478 3	>	240	0.01
Net Total load (in)	at	4.87 ft	=	-0.010	L/D	=	1188 7	>	240	0.02

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 20**

SPAN INFORMATION (ft): I-End (95.92,176.50) J-End (110.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	15.50
Mnf (kip-ft)	=	467.71	Mn (kip-ft)	=	391.18
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1049.63	Itr (in4)	=	1369.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 39.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	15.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	15.000	0.042	0.038	0.063			0.000	0.016
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.60 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.9	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	14.7	7.5	---	---		
	Max +	1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06
Controlling		1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06

REACTIONS (kips):

	Left	Right
Initial reaction	3.85	3.85
DL reaction	3.21	3.21
Max +LL reaction	4.22	4.22
Max +total reaction (factored)	10.60	10.60

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

											Ratio
Initial load (in)	at	7.50 ft	=	-0.029	L/D	=	6274				
Live load (in)	at	7.50 ft	=	-0.021	L/D	=	8551	>	360		0.04
Post Comp load (in)	at	7.50 ft	=	-0.023	L/D	=	7790	>	240		0.03
Net Total load (in)	at	7.50 ft	=	-0.052	L/D	=	3475	>	240		0.07

Floor Type: Level 2 **Beam Number = 21**

SPAN INFORMATION (ft): I-End (110.92,176.50) J-End (125.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	15.50
Mnf (kip-ft)	=	467.71	Mn (kip-ft)	=	391.18
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1049.63	Itr (in4)	=	1369.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 39.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	15.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	15.000	0.042	0.038	0.063			0.000	0.016
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.60 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.9	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	14.7	7.5	---	---		
	Max +	1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06
Controlling		1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06

REACTIONS (kips):

	Left	Right
Initial reaction	3.85	3.85
DL reaction	3.21	3.21
Max +LL reaction	4.22	4.22
Max +total reaction (factored)	10.60	10.60

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.50 ft	=	-0.029	L/D	=	6274			
Live load (in)	at	7.50 ft	=	-0.021	L/D	=	8551	>	360	0.04
Post Comp load (in)	at	7.50 ft	=	-0.023	L/D	=	7790	>	240	0.03
Net Total load (in)	at	7.50 ft	=	-0.052	L/D	=	3475	>	240	0.07

Floor Type: Level 2 **Beam Number = 22**

SPAN INFORMATION (ft): I-End (155.92,176.50) J-End (170.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	15.50
Mnf (kip-ft)	=	467.71	Mn (kip-ft)	=	391.18
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1049.63	Itr (in4)	=	1369.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 39.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	15.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	15.000	0.042	0.038	0.063			0.000	0.016
3	0.000	0.326	0.288	0.480	0.0%	Red	0.000	0.120
	15.000	0.326	0.288	0.480			0.000	0.120
4	0.000	0.014	0.012	0.025	---	NonR	0.000	0.005
	15.000	0.014	0.012	0.025			0.000	0.005
5	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.66 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.9	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	14.7	7.5	---	---		
	Max +	1.2DL+1.6LL	40.0	7.5	---	---	0.90	352.06
Controlling		1.2DL+1.6LL	40.0	7.5	---	---	0.90	352.06

REACTIONS (kips):

	Left	Right
Initial reaction	3.85	3.85
DL reaction	3.21	3.21

PRCNC20221036

Gravity Beam Design

	Left	Right
Max +LL reaction	4.26	4.26
Max +total reaction (factored)	10.66	10.66

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.50 ft	=	-0.029	L/D	=	6273			
Live load (in)	at	7.50 ft	=	-0.021	L/D	=	8476	>	360	0.04
Post Comp load (in)	at	7.50 ft	=	-0.023	L/D	=	7727	>	240	0.03
Net Total load (in)	at	7.50 ft	=	-0.052	L/D	=	3462	>	240	0.07

PRCNC20221036

Floor Type: Level 2 **Beam Number = 23**

SPAN INFORMATION (ft): I-End (170.92,176.50) J-End (185.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	15.50
Mnf (kip-ft)	=	467.71	Mn (kip-ft)	=	391.18
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1049.63	Itr (in4)	=	1369.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 39.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	15.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	15.000	0.042	0.038	0.063			0.000	0.016
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.60 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.9	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	14.7	7.5	---	---		
	Max +	1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06
Controlling		1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06

REACTIONS (kips):

	Left	Right
Initial reaction	3.85	3.85
DL reaction	3.21	3.21
Max +LL reaction	4.22	4.22
Max +total reaction (factored)	10.60	10.60

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.50 ft	=	-0.029	L/D	=	6274			
Live load (in)	at	7.50 ft	=	-0.021	L/D	=	8551	>	360	0.04
Post Comp load (in)	at	7.50 ft	=	-0.023	L/D	=	7790	>	240	0.03
Net Total load (in)	at	7.50 ft	=	-0.052	L/D	=	3475	>	240	0.07

Floor Type: Level 2 **Beam Number = 24**

SPAN INFORMATION (ft): I-End (185.92,176.50) J-End (200.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	15.50
Mnf (kip-ft)	=	467.71	Mn (kip-ft)	=	391.18
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1049.63	Itr (in4)	=	1369.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 39.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	15.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	15.000	0.042	0.038	0.063			0.000	0.016
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.60 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.9	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	14.7	7.5	---	---		
	Max +	1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06
Controlling		1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06

REACTIONS (kips):

	Left	Right
Initial reaction	3.85	3.85
DL reaction	3.21	3.21
Max +LL reaction	4.22	4.22
Max +total reaction (factored)	10.60	10.60

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

											Ratio
Initial load (in)	at	7.50 ft	=	-0.029	L/D	=	6274				
Live load (in)	at	7.50 ft	=	-0.021	L/D	=	8551	>	360		0.04
Post Comp load (in)	at	7.50 ft	=	-0.023	L/D	=	7790	>	240		0.03
Net Total load (in)	at	7.50 ft	=	-0.052	L/D	=	3475	>	240		0.07

Floor Type: Level 2 **Beam Number = 25**

SPAN INFORMATION (ft): I-End (200.92,176.50) J-End (215.92,176.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	15.50
Mnf (kip-ft)	=	467.71	Mn (kip-ft)	=	391.18
C (kips)	=	120.61	PNA (in)	=	12.87
Ieff (in4)	=	1049.63	Itr (in4)	=	1369.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 39.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	15.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	15.000	0.042	0.038	0.063			0.000	0.016
3	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	15.000	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.60 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.9	7.5	0.0	1.00	0.90	249.38
	Init DL	1.4DL	14.7	7.5	---	---		
	Max +	1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06
Controlling		1.2DL+1.6LL	39.7	7.5	---	---	0.90	352.06

REACTIONS (kips):

	Left	Right
Initial reaction	3.85	3.85
DL reaction	3.21	3.21
Max +LL reaction	4.22	4.22
Max +total reaction (factored)	10.60	10.60

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.50 ft	=	-0.029	L/D	=	6274			
Live load (in)	at	7.50 ft	=	-0.021	L/D	=	8551	>	360	0.04
Post Comp load (in)	at	7.50 ft	=	-0.023	L/D	=	7790	>	240	0.03
Net Total load (in)	at	7.50 ft	=	-0.052	L/D	=	3475	>	240	0.07

PRCNC20221036

Floor Type: Level 2 **Beam Number = 26**

SPAN INFORMATION (ft): I-End (215.92,176.50) J-End (245.92,176.50)

Beam Size (User Selected) = W27X84 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 52.50	Y bar(in)	= 21.09
Mnf (kip-ft)	= 1510.76	Mn (kip-ft)	= 1374.86
C (kips)	= 301.52	PNA (in)	= 19.90
Ieff (in4)	= 5286.73	Itr (in4)	= 6097.36
Stud length (in)	= 4.00	Stud diam (in)	= 0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 68 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 42.10

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	30.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	30.000	0.042	0.038	0.063			0.000	0.016
3	0.000	0.084	0.084	0.000	---	NonR	0.000	0.000
	30.000	0.084	0.084	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.31 kips 1.00Vn = 368.46 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	105.6	15.0	10.0	1.00	0.90	846.16
	Init DL	1.4DL	84.9	15.0	---	---		
	Max +	1.2DL+1.6LL	213.2	15.0	---	---	0.90	1237.37
Controlling		1.2DL+1.6LL	209.9	10.0	---	---	0.90	1143.36

REACTIONS (kips):

PRCNC20221036

	Left	Right
Initial reaction	8.63	8.63
DL reaction	7.34	7.34
Max +LL reaction	8.44	8.44
Max +total reaction (factored)	22.31	22.31

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.121	L/D	=	2978			
Live load (in)	at 15.00 ft	=	-0.088	L/D	=	4071	>	360	0.09
Post Comp load (in)	at 15.00 ft	=	-0.097	L/D	=	3723	>	240	0.06
Net Total load (in)	at 15.00 ft	=	-0.218	L/D	=	1655	>	240	0.15

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 27**

SPAN INFORMATION (ft): I-End (41.92,161.50) J-End (71.25,161.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 29.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	88.00	Y bar(in)	=	21.40
Mnf (kip-ft)	=	1379.56	Mn (kip-ft)	=	1111.59
C (kips)	=	236.91	PNA (in)	=	17.33
Ieff (in4)	=	3800.22	Itr (in4)	=	5409.45
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.19

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.778	5.18	4.60	7.33	10.4	0.00	0.00	0.0	0.00	Snow	0.00	1.83
9.778	4.62	4.10	6.54	10.4	0.00	0.00	0.0	0.00	Snow	0.00	1.64
19.556	5.18	4.60	7.33	10.4	0.00	0.00	0.0	0.00	Snow	0.00	1.83
19.556	4.08	3.62	5.77	10.4	0.00	0.00	0.0	0.00	Snow	0.00	1.44

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	29.333	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 32.41 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	162.3	11.5	9.8	1.00	0.90	684.35
	Init DL	1.4DL	127.4	12.5	---	---		
	Max +	1.2DL+1.6LL	312.5	9.8	---	---	0.90	1000.43
Controlling		1.2DL+1.6LL	312.5	9.8	---	---	0.90	1000.43

REACTIONS (kips):

	Left	Right
Initial reaction	13.06	12.83
DL reaction	10.74	10.56

PRCNC20221036

Gravity Beam Design

	Left	Right
Max +LL reaction	12.20	11.97
Max +total reaction (factored)	32.41	31.82

DEFLECTIONS:

										Ratio
Initial load (in)	at 14.67 ft	=	-0.236	L/D	=	1493				
Live load (in)	at 14.67 ft	=	-0.170	L/D	=	2074	>	360		0.17
Post Comp load (in)	at 14.67 ft	=	-0.185	L/D	=	1904	>	240		0.13
Net Total load (in)	at 14.67 ft	=	-0.421	L/D	=	837	>	240		0.29

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 28**

SPAN INFORMATION (ft): I-End (71.25,161.50) J-End (71.25,176.50)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	18.40
Mnf (kip-ft)	=	694.64	Mn (kip-ft)	=	532.64
C (kips)	=	120.61	PNA (in)	=	13.80
Ieff (in4)	=	1596.15	Itr (in4)	=	2312.27
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 80 Partial = 21 Actual = 21
Number of Stud Rows = 1 Percent of Full Composite Action = 26.28

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.000	9.09	8.10	12.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	3.08

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	15.000	0.332	0.293	0.489			0.000	0.122
2	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	15.000	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.68 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	63.9	5.0	0.0	1.00	0.90	357.75
	Init DL	1.4DL	49.6	5.0	---	---		
	Max +	1.2DL+1.6LL	133.0	5.0	---	---	0.90	479.37
Controlling		1.2DL+1.6LL	133.0	5.0	---	---	0.90	479.37

REACTIONS (kips):

	Left	Right
Initial reaction	10.90	7.18
DL reaction	8.88	5.85
Max +LL reaction	11.89	7.78

	Left	Right
Max +total reaction (factored)	29.68	19.47

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.05 ft	=	-0.050	L/D	=	3582			
Live load (in)	at	7.05 ft	=	-0.040	L/D	=	4523	>	360	0.08
Post Comp load (in)	at	7.05 ft	=	-0.043	L/D	=	4188	>	240	0.06
Net Total load (in)	at	7.05 ft	=	-0.093	L/D	=	1931	>	240	0.12

Floor Type: Level 2 **Beam Number = 29**

SPAN INFORMATION (ft): I-End (71.25,151.25) J-End (71.25,161.50)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 10.25

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.75	Y bar(in)	=	17.08
Mnf (kip-ft)	=	645.53	Mn (kip-ft)	=	497.86
C (kips)	=	86.15	PNA (in)	=	12.81
Ieff (in4)	=	1486.14	Itr (in4)	=	2070.17
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 39 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 26.16

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.250	9.07	8.08	12.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	3.08

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	10.250	0.332	0.293	0.489			0.000	0.122
2	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	10.250	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.00 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	45.3	5.2	0.0	1.00	0.90	357.75
	Init DL	1.4DL	35.2	5.2	---	---		
	Max +	1.2DL+1.6LL	94.6	5.2	---	---	0.90	448.08
Controlling		1.2DL+1.6LL	94.6	5.2	---	---	0.90	448.08

REACTIONS (kips):

	Left	Right
Initial reaction	7.80	8.07
DL reaction	6.35	6.57
Max +LL reaction	8.52	8.82

PRCNC20221036

	Left	Right
Max +total reaction (factored)	21.26	22.00

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.18 ft	=	-0.016	L/D	=	7578			
Live load (in)	at	5.18 ft	=	-0.014	L/D	=	8848	>	360	0.04
Post Comp load (in)	at	5.18 ft	=	-0.015	L/D	=	8192	>	240	0.03
Net Total load (in)	at	5.18 ft	=	-0.031	L/D	=	3937	>	240	0.06

Floor Type: Level 2 **Beam Number = 30**

SPAN INFORMATION (ft): I-End (71.25,135.17) J-End (71.25,151.25)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 16.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	48.25	Y bar(in)	=	18.63
Mnf (kip-ft)	=	705.19	Mn (kip-ft)	=	590.55
C (kips)	=	189.53	PNA (in)	=	15.77
Ieff (in4)	=	1781.77	Itr (in4)	=	2355.77
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 84 Partial = 25 Actual = 25
Number of Stud Rows = 1 Percent of Full Composite Action = 25.44

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
3.333	13.34	11.90	18.01	19.6	0.00	0.00	0.0	0.00	Snow	0.00	4.50
11.333	8.23	7.34	11.10	19.6	0.00	0.00	0.0	0.00	Snow	0.00	2.77

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	19.6%	Red	0.000	0.122
	14.500	0.332	0.293	0.489			0.000	0.122
2	14.500	0.332	0.293	0.489	19.6%	Red	0.000	0.122
	16.083	0.000	0.000	0.000			0.000	0.000
3	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	16.083	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 46.88 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	86.8	7.1	0.0	1.00	0.90	357.75
	Init DL	1.4DL	67.6	7.1	---	---		
	Max +	1.2DL+1.6LL	157.9	7.1	---	---	0.90	531.49
Controlling		1.2DL+1.6LL	150.3	3.3	---	---	0.90	449.04

REACTIONS (kips):

	Left	Right
Initial reaction	19.68	13.91
DL reaction	16.03	11.34
Max +LL reaction	17.28	12.16
Max +total reaction (factored)	46.88	33.06

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.88 ft	=	-0.099	L/D	=	1957			
Live load (in)	at	7.88 ft	=	-0.056	L/D	=	3429	>	360	0.10
Post Comp load (in)	at	7.88 ft	=	-0.062	L/D	=	3119	>	240	0.08
Net Total load (in)	at	7.88 ft	=	-0.161	L/D	=	1202	>	240	0.20

Floor Type: Level 2 **Beam Number = 31**

SPAN INFORMATION (ft): I-End (95.92,146.50) J-End (95.92,176.50)

Beam Size (User Selected) = W24X94 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.00
Mnf (kip-ft)	=	1664.96	Mn (kip-ft)	=	1439.89
C (kips)	=	344.59	PNA (in)	=	18.84
Ieff (in4)	=	5075.64	Itr (in4)	=	6577.48
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 127 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.37

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	21.7	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	9.07	8.08	12.33	21.7	0.00	0.00	0.0	0.00	Snow	0.00	3.08
20.000	5.30	4.70	7.50	21.7	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	9.10	8.11	12.33	21.7	0.00	0.00	0.0	0.00	Snow	0.00	3.08

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.094	0.094	0.000	---	NonR	0.000	0.000
	30.000	0.094	0.094	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 43.79 kips 1.00Vn = 375.43 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	245.5	15.1	10.0	1.00	0.90	875.19
	Init DL	1.4DL	193.9	15.2	---	---		
	Max +	1.2DL+1.6LL	433.6	15.1	---	---	0.90	1295.90
Controlling		1.2DL+1.6LL	432.2	20.0	---	---	0.90	1210.16

REACTIONS (kips):

	Left	Right
Initial reaction	19.16	19.17
DL reaction	15.79	15.80

PRCNC20221036

	Left	Right
Max +LL reaction	15.52	15.52
Max +total reaction (factored)	43.78	43.79

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.292	L/D	=	1231			
Live load (in)	at 15.00 ft	=	-0.175	L/D	=	2062	>	360	0.17
Post Comp load (in)	at 15.00 ft	=	-0.192	L/D	=	1871	>	240	0.13
Net Total load (in)	at 15.00 ft	=	-0.485	L/D	=	742	>	240	0.32

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 32**

SPAN INFORMATION (ft): I-End (110.92,146.50) J-End (110.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

										Ratio
Initial load (in)	at	15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at	15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at	15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at	15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Floor Type: Level 2 **Beam Number = 33**

SPAN INFORMATION (ft): I-End (125.92,146.50) J-End (125.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at 15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at 15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at 15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 34**

SPAN INFORMATION (ft): I-End (140.92,146.50) J-End (140.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at 15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at 15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at 15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Floor Type: Level 2 **Beam Number = 35**

SPAN INFORMATION (ft): I-End (155.92,146.50) J-End (155.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 90.00		Y bar(in)	=	21.48
Mnf (kip-ft)	= 1386.01		Mn (kip-ft)	=	1148.72
C (kips)	= 279.98		PNA (in)	=	18.31
Ieff (in4)	= 3943.89		Itr (in4)	=	5438.81
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 128 Partial = 33 Actual = 33
Number of Stud Rows = 1 Percent of Full Composite Action = 25.35

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	0.00	0.0	9.37	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	2.40	0.0	6.37	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 40.76 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	403.1	11.5	---	---	0.90	1033.85
Controlling		1.2DL+1.6LL	403.0	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	16.67	16.47
Max +total reaction (factored)	40.76	40.44

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at 15.00 ft	=	-0.240	L/D	=	1500	>	360	0.24
Post Comp load (in)	at 15.00 ft	=	-0.257	L/D	=	1399	>	240	0.17
Net Total load (in)	at 15.00 ft	=	-0.536	L/D	=	672	>	240	0.36

Floor Type: Level 2 **Beam Number = 36**

SPAN INFORMATION (ft): I-End (170.92,146.50) J-End (170.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1148.72
C (kips)	=	279.98	PNA (in)	=	18.31
Ieff (in4)	=	3943.89	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 128 Partial = 33 Actual = 33
Number of Stud Rows = 1 Percent of Full Composite Action = 25.35

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	0.00	0.0	9.37	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	2.40	0.0	6.37	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 40.76 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	403.1	11.5	---	---	0.90	1033.85
Controlling		1.2DL+1.6LL	403.0	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	16.67	16.47
Max +total reaction (factored)	40.76	40.44

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at 15.00 ft	=	-0.240	L/D	=	1500	>	360	0.24
Post Comp load (in)	at 15.00 ft	=	-0.257	L/D	=	1399	>	240	0.17
Net Total load (in)	at 15.00 ft	=	-0.536	L/D	=	672	>	240	0.36

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 37**

SPAN INFORMATION (ft): I-End (185.92,146.50) J-End (185.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at 15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at 15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at 15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Floor Type: Level 2 **Beam Number = 38**

SPAN INFORMATION (ft): I-End (200.92,146.50) J-End (200.92,176.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 90.00	Y bar(in)	= 21.48
Mnf (kip-ft)	= 1386.01	Mn (kip-ft)	= 1196.61
C (kips)	= 344.59	PNA (in)	= 19.78
Ieff (in4)	= 4145.62	Itr (in4)	= 5438.81
Stud length (in)	= 4.00	Stud diam (in)	= 0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

										Ratio
Initial load (in)	at	15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at	15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at	15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at	15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Floor Type: Level 2 **Beam Number = 39**

SPAN INFORMATION (ft): I-End (215.92,161.50) J-End (245.92,161.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	= 1386.01	Mn (kip-ft)	=	1196.61
C (kips)	= 344.59	PNA (in)	=	19.78
Ieff (in4)	= 4145.62	Itr (in4)	=	5438.81
Stud length (in)	= 4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	5.30	4.70	7.50	13.8	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 34.78 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	183.0	15.0	10.0	1.00	0.90	677.64
	Init DL	1.4DL	143.5	15.0	---	---		
	Max +	1.2DL+1.6LL	344.3	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	343.2	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	14.28	14.28
DL reaction	11.73	11.73

PRCNC20221036

	Left	Right
Max +LL reaction	12.94	12.94
Max +total reaction (factored)	34.78	34.78

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.278	L/D	=	1294			
Live load (in)	at 15.00 ft	=	-0.178	L/D	=	2020	>	360	0.18
Post Comp load (in)	at 15.00 ft	=	-0.195	L/D	=	1849	>	240	0.13
Net Total load (in)	at 15.00 ft	=	-0.473	L/D	=	761	>	240	0.32

Floor Type: Level 2 **Beam Number = 40**

SPAN INFORMATION (ft): I-End (215.92,146.50) J-End (245.92,146.50)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	21.48
Mnf (kip-ft)	=	1386.01	Mn (kip-ft)	=	1196.61
C (kips)	=	344.59	PNA (in)	=	19.78
Ieff (in4)	=	4145.62	Itr (in4)	=	5438.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 126 Partial = 32 Actual = 32
Number of Stud Rows = 1 Percent of Full Composite Action = 25.57

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	9.6	0.00	0.00	0.0	0.00	Snow	0.00	1.87
10.000	4.00	3.55	5.67	9.6	0.00	0.00	0.0	0.00	Snow	0.00	1.42
20.000	5.30	4.70	7.50	9.6	0.00	0.00	0.0	0.00	Snow	0.00	1.87
20.000	4.00	3.55	5.67	9.6	0.00	0.00	0.0	0.00	Snow	0.00	1.42

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	30.000	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.56 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	161.9	15.0	10.0	1.00	0.90	677.70
	Init DL	1.4DL	127.4	15.0	---	---		
	Max +	1.2DL+1.6LL	312.2	15.0	---	---	0.90	1076.95
Controlling		1.2DL+1.6LL	311.1	10.0	---	---	0.90	1000.59

REACTIONS (kips):

	Left	Right
Initial reaction	12.68	12.68
DL reaction	10.44	10.44

PRCNC20221036

	Left	Right
Max +LL reaction	11.90	11.90
Max +total reaction (factored)	31.56	31.56

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.00 ft	=	-0.247	L/D	=	1458			
Live load (in)	at 15.00 ft	=	-0.164	L/D	=	2197	>	360	0.16
Post Comp load (in)	at 15.00 ft	=	-0.178	L/D	=	2018	>	240	0.12
Net Total load (in)	at 15.00 ft	=	-0.425	L/D	=	846	>	240	0.28

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 41**

SPAN INFORMATION (ft): I-End (215.92,135.17) J-End (245.92,135.17)

Beam Size (User Selected) = W27X84 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	52.50	Y bar(in)	=	21.09
Mnf (kip-ft)	=	1510.76	Mn (kip-ft)	=	1246.34
C (kips)	=	172.30	PNA (in)	=	17.10
Ieff (in4)	=	4692.00	Itr (in4)	=	6097.36
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 94 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 29.16

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
1.667	12.46	11.13	16.64	14.1	0.00	0.00	0.0	0.00	Snow	0.00	4.16
10.000	4.00	3.55	5.67	14.1	0.00	0.00	0.0	0.00	Snow	0.00	1.42
20.000	4.00	3.55	5.67	14.1	0.00	0.00	0.0	0.00	Snow	0.00	1.42

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	1.667	0.250	0.000	0.000	---	NonR	0.000	0.000
	30.000	0.250	0.000	0.000			0.000	0.000
2	2.300	0.042	0.038	0.063	14.1%	Red	0.000	0.016
	30.000	0.042	0.038	0.063			0.000	0.016
3	1.667	0.000	0.000	0.000	14.1%	Red	0.000	0.000
	2.291	0.043	0.038	0.063			0.000	0.016
4	0.000	0.232	0.205	0.342	14.1%	Red	0.000	0.085
	1.666	0.232	0.205	0.342			0.000	0.085
5	0.000	0.084	0.084	0.000	---	NonR	0.000	0.000
	30.000	0.084	0.084	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 56.85 kips 1.00Vn = 368.46 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	104.8	10.0	10.0	1.03	0.90	869.37
	Init DL	1.4DL	84.2	10.0	---	---		

PRCNC20221036

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
	Max +	1.2DL+1.6LL	222.3	11.1	---	---	0.90	1121.70
Controlling		1.2DL+1.6LL	222.0	10.0	---	---	0.90	1103.69

REACTIONS (kips):

	Left	**Right**
Initial reaction	21.83	7.88
DL reaction	21.31	10.34
Max +LL reaction	19.55	6.48
Max +total reaction (factored)	56.85	22.77

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.70 ft	=	-0.120	L/D	=	3001			
Live load (in)	at 14.70 ft	=	-0.084	L/D	=	4301	>	360	0.08
Post Comp load (in)	at 14.70 ft	=	-0.125	L/D	=	2887	>	240	0.08
Net Total load (in)	at 14.70 ft	=	-0.245	L/D	=	1471	>	240	0.16

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 42**

SPAN INFORMATION (ft): I-End (245.92,135.17) J-End (245.92,146.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	24.50	Y bar(in)	=	14.88
Mnf (kip-ft)	=	449.25	Mn (kip-ft)	=	363.35
C (kips)	=	86.15	PNA (in)	=	11.72
Ieff (in4)	=	966.60	Itr (in4)	=	1287.67
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 22 Partial = 11 Actual = 11
Number of Stud Rows = 1 Percent of Full Composite Action = 34.47

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	11.333	0.010	0.000	0.000			0.000	0.000
2	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	11.333	0.340	0.300	0.500			0.000	0.125
3	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	11.333	0.042	0.038	0.063			0.000	0.016
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	11.333	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.01 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	10.8	5.7	0.0	1.00	0.90	249.38
	Init DL	1.4DL	8.4	5.7	---	---		
	Max +	1.2DL+1.6LL	22.7	5.7	---	---	0.90	327.01
Controlling		1.2DL+1.6LL	22.7	5.7	---	---	0.90	327.01

REACTIONS (kips):

	Left	Right
Initial reaction	2.91	2.91
DL reaction	2.42	2.42
Max +LL reaction	3.19	3.19
Max +total reaction (factored)	8.01	8.01

PRCNC20221036

DEFLECTIONS:										Ratio
Initial load (in)	at	5.67 ft	=	-0.009	L/D	=	1454 5			
Live load (in)	at	5.67 ft	=	-0.007	L/D	=	1825 8	>	360	0.02
Post Comp load (in)	at	5.67 ft	=	-0.008	L/D	=	1663 2	>	240	0.01
Net Total load (in)	at	5.67 ft	=	-0.018	L/D	=	7759	>	240	0.03

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 43**

SPAN INFORMATION (ft): I-End (215.92,135.17) J-End (215.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	34.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	354.05	Mn (kip-ft)	=	273.89
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	654.49	Itr (in4)	=	948.45
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 60 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 26.91

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
3.333	9.66	8.57	13.62	0.0	0.00	0.00	0.0	0.00	Snow	0.00	3.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	11.333	0.340	0.300	0.500			0.000	0.125
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 30.59 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	44.9	3.3	0.0	1.00	0.90	165.75
	Init DL	1.4DL	34.3	3.3	---	---		
	Max +	1.2DL+1.6LL	95.1	3.3	---	---	0.90	246.50
Controlling		1.2DL+1.6LL	95.1	3.3	---	---	0.90	246.50

REACTIONS (kips):

	Left	Right
Initial reaction	11.01	6.08
DL reaction	8.89	4.91
Max +LL reaction	12.45	6.84

PRCNC20221036

	Left	Right
Max +total reaction (factored)	30.59	16.84

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.21 ft	=	-0.054	L/D	=	2500			
Live load (in)	at	5.21 ft	=	-0.039	L/D	=	3449	>	360	0.10
Post Comp load (in)	at	5.21 ft	=	-0.043	L/D	=	3194	>	240	0.08
Net Total load (in)	at	5.21 ft	=	-0.097	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 44**

SPAN INFORMATION (ft): I-End (215.92,146.50) J-End (215.92,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	274.83
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	670.82	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 68 Partial = 18 Actual = 18
Number of Stud Rows = 1 Percent of Full Composite Action = 26.92

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.53 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	43.6	10.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	33.3	10.0	---	---		
	Max +	1.2DL+1.6LL	92.2	10.0	---	---	0.90	247.35
Controlling		1.2DL+1.6LL	92.2	10.0	---	---	0.90	247.35

REACTIONS (kips):

	Left	Right
Initial reaction	5.57	7.76
DL reaction	4.51	6.28
Max +LL reaction	6.25	8.75

PRCNC20221036

	Left	Right
Max +total reaction (factored)	15.41	21.53

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.88 ft	=	-0.099	L/D	=	1827			
Live load (in)	at	7.88 ft	=	-0.069	L/D	=	2594	>	360	0.14
Post Comp load (in)	at	7.88 ft	=	-0.075	L/D	=	2401	>	240	0.10
Net Total load (in)	at	7.88 ft	=	-0.174	L/D	=	1037	>	240	0.23

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 45**

SPAN INFORMATION (ft): I-End (215.92,161.50) J-End (215.92,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	274.83
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	670.82	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Full = 68 Partial = 18 Actual = 18
Number of Stud Rows = 1 Percent of Full Composite Action = 26.92

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.000	5.30	4.70	7.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.87

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	0.500	0.0%	Red	0.000	0.125
	15.000	0.340	0.300	0.500			0.000	0.125
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.53 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	43.6	5.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	33.3	5.0	---	---		
	Max +	1.2DL+1.6LL	92.2	5.0	---	---	0.90	247.35
Controlling		1.2DL+1.6LL	92.2	5.0	---	---	0.90	247.35

REACTIONS (kips):

	Left	Right
Initial reaction	7.76	5.57
DL reaction	6.28	4.51
Max +LL reaction	8.75	6.25

PRCNC20221036

	Left	Right
Max +total reaction (factored)	21.53	15.41

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.13 ft	=	-0.099	L/D	=	1827			
Live load (in)	at	7.13 ft	=	-0.069	L/D	=	2594	>	360	0.14
Post Comp load (in)	at	7.13 ft	=	-0.075	L/D	=	2401	>	240	0.10
Net Total load (in)	at	7.13 ft	=	-0.174	L/D	=	1037	>	240	0.23

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 46**

SPAN INFORMATION (ft): I-End (71.25,146.50) J-End (95.92,146.50)

Beam Size (User Selected) = W21X55 Fy = 50.0 ksi
Total Beam Length (ft) = 24.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	74.00	Y bar(in)	=	19.40
Mnf (kip-ft)	=	925.93	Mn (kip-ft)	=	735.70
C (kips)	=	206.76	PNA (in)	=	15.91
Ieff (in4)	=	2216.61	Itr (in4)	=	3197.04
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 48 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 27.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	3.8%	Red	0.000	0.225
	24.666	0.612	0.540	0.900			0.000	0.225
2	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	24.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.96 kips 1.00Vn = 234.00 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	81.7	12.3	0.0	1.00	0.90	472.50
	Init DL	1.4DL	63.4	12.3	---	---		
	Max +	1.2DL+1.6LL	166.2	12.3	---	---	0.90	662.13
Controlling		1.2DL+1.6LL	166.2	12.3	---	---	0.90	662.13

REACTIONS (kips):

	Left	Right
Initial reaction	10.11	10.11
DL reaction	8.23	8.23
Max +LL reaction	10.68	10.68
Max +total reaction (factored)	26.96	26.96

DEFLECTIONS: **Ratio**

Initial load (in)	at 12.33 ft	=	-0.150	L/D	=	1974
Live load (in)	at 12.33 ft	=	-0.112	L/D	=	2639 >

PRCNC20221036

Gravity Beam Design

Post Comp load (in)	at 12.33 ft	=	-0.122	L/D	=	2436	>	240	0.10
Net Total load (in)	at 12.33 ft	=	-0.271	L/D	=	1090	>	240	0.22

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 47**

SPAN INFORMATION (ft): I-End (41.92,146.50) J-End (71.25,151.25)

Beam Size (User Selected) = W24X76 Fy = 50.0 ksi
Total Beam Length (ft) = 29.72

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 89.15	Y bar(in)	= 21.45
Mnf (kip-ft)	= 1383.26	Mn (kip-ft)	= 1181.51
C (kips)	= 323.06	PNA (in)	= 19.29
Ieff (in4)	= 4082.71	Itr (in4)	= 5426.37
Stud length (in)	= 4.00	Stud diam (in)	= 0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 118 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 25.58

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.905	4.38	3.89	6.19	9.9	0.00	0.00	0.0	0.00	Snow	0.00	1.55
9.905	4.21	3.73	5.94	9.9	0.00	0.00	0.0	0.00	Snow	0.00	1.49
19.810	3.84	3.40	5.41	9.9	0.00	0.00	0.0	0.00	Snow	0.00	1.35
19.810	4.76	4.22	6.72	9.9	0.00	0.00	0.0	0.00	Snow	0.00	1.68

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.053	0.047	0.078	9.9%	Red	0.000	0.020
	29.715	0.053	0.047	0.078			0.000	0.020
2	0.000	0.076	0.076	0.000	---	NonR	0.000	0.000
	29.715	0.076	0.076	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.77 kips 1.00Vn = 315.48 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	158.4	14.9	9.9	1.00	0.90	680.41
	Init DL	1.4DL	124.7	14.9	---	---		
	Max +	1.2DL+1.6LL	304.8	14.9	---	---	0.90	1063.36
Controlling		1.2DL+1.6LL	301.5	19.8	---	---	0.90	982.55

REACTIONS (kips):

	Left	Right
Initial reaction	12.77	12.77
DL reaction	10.51	10.51
Max +LL reaction	11.97	11.97
Max +total reaction (factored)	31.77	31.77

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.86 ft	=	-0.237	L/D	=	1505			
Live load (in)	at 14.86 ft	=	-0.159	L/D	=	2244	>	360	0.16
Post Comp load (in)	at 14.86 ft	=	-0.173	L/D	=	2061	>	240	0.12
Net Total load (in)	at 14.86 ft	=	-0.410	L/D	=	870	>	240	0.28

Floor Type: Level 2 **Beam Number = 48**

SPAN INFORMATION (ft): I-End (41.92,135.17) J-End (41.92,146.50)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	24.50	Y bar(in)	=	14.88
Mnf (kip-ft)	=	449.25	Mn (kip-ft)	=	363.35
C (kips)	=	86.15	PNA (in)	=	11.72
Ieff (in4)	=	966.60	Itr (in4)	=	1287.67
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 22 Partial = 11 Actual = 11
Number of Stud Rows = 1 Percent of Full Composite Action = 34.47

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	11.333	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	11.333	0.042	0.038	0.063			0.000	0.016
3	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	11.333	0.332	0.293	0.489			0.000	0.122
4	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	11.333	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.85 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	10.6	5.7	0.0	1.00	0.90	249.38
	Init DL	1.4DL	8.2	5.7	---	---		
	Max +	1.2DL+1.6LL	22.3	5.7	---	---	0.90	327.01
Controlling		1.2DL+1.6LL	22.3	5.7	---	---	0.90	327.01

REACTIONS (kips):

	Left	Right
Initial reaction	2.85	2.85
DL reaction	2.38	2.38
Max +LL reaction	3.12	3.12
Max +total reaction (factored)	7.85	7.85

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.67 ft	=	-0.009	L/D	=	1481 0			
Live load (in)	at	5.67 ft	=	-0.007	L/D	=	1862 6	>	360	0.02
Post Comp load (in)	at	5.67 ft	=	-0.008	L/D	=	1696 1	>	240	0.01
Net Total load (in)	at	5.67 ft	=	-0.017	L/D	=	7906	>	240	0.03

Floor Type: Level 2 **Beam Number = 49**

SPAN INFORMATION (ft): I-End (95.92,146.50) J-End (110.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.074	L/D	=	2437
Live load (in)	at	7.50 ft	=	-0.050	L/D	=	3567 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 50**

SPAN INFORMATION (ft): I-End (110.92,146.50) J-End (125.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS:

						Ratio
Initial load (in)	at 7.50 ft	=	-0.074	L/D	=	2437
Live load (in)	at 7.50 ft	=	-0.050	L/D	=	3567 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 51**

SPAN INFORMATION (ft): I-End (125.92,146.50) J-End (140.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 45.00		Y bar(in)	=	15.83
Mnf (kip-ft)	= 373.04		Mn (kip-ft)	=	285.88
C (kips)	= 120.61		PNA (in)	=	12.67
Ieff (in4)	= 700.45		Itr (in4)	=	1013.75
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	= -0.074	L/D =	2437
Live load (in)	at	7.50 ft	= -0.050	L/D =	3567 >

PRCNC20221036

Gravity Beam Design

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Floor Type: Level 2 **Beam Number = 52**

SPAN INFORMATION (ft): I-End (140.92,146.50) J-End (155.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.074	L/D	=	2437	
Live load (in)	at	7.50 ft	=	-0.050	L/D	=	3567	> PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 53**

SPAN INFORMATION (ft): I-End (155.92,146.50) J-End (170.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.340	0.300	0.625	---	NonR	0.000	0.125
	15.000	0.340	0.300	0.625			0.000	0.125
2	0.000	0.272	0.240	0.400	0.0%	Red	0.000	0.100
	15.000	0.272	0.240	0.400			0.000	0.100
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.04 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	67.7	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	67.7	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	7.69	7.69
Max +total reaction (factored)	18.04	18.04

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	7.50 ft	=	-0.074	L/D	=	2437			
Live load (in)	at	7.50 ft	=	-0.057	L/D	=	3132	>	360	0.11
Post Comp load (in)	at	7.50 ft	=	-0.062	L/D	=	2926	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.135	L/D	=	1329	>	240	0.18

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 54**

SPAN INFORMATION (ft): I-End (170.92,146.50) J-End (185.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

Initial load (in)	at 7.50 ft	=	-0.074	L/D =	2437
Live load (in)	at 7.50 ft	=	-0.050	L/D =	3567 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 55**

SPAN INFORMATION (ft): I-End (185.92,146.50) J-End (200.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

Initial load (in) at 7.50 ft = -0.074 L/D = 2437
Live load (in) at 7.50 ft = -0.050 L/D = 3567 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 56**

SPAN INFORMATION (ft): I-End (200.92,146.50) J-End (215.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.612	0.540	0.900	0.0%	Red	0.000	0.225
	15.000	0.612	0.540	0.900			0.000	0.225
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.54 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.2	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.3	7.5	---	---		
	Max +	1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	62.0	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	5.93	5.93
DL reaction	4.79	4.79
Max +LL reaction	6.75	6.75
Max +total reaction (factored)	16.54	16.54

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.074	L/D	=	2437
Live load (in)	at	7.50 ft	=	-0.050	L/D	=	3567 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.055	L/D	=	3302	>	240	0.07
Net Total load (in)	at	7.50 ft	=	-0.128	L/D	=	1402	>	240	0.17

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 57**

SPAN INFORMATION (ft): I-End (185.92,138.50) J-End (215.92,138.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	17.24
Mnf (kip-ft)	=	393.12	Mn (kip-ft)	=	349.98
C (kips)	=	258.45	PNA (in)	=	15.47
Ieff (in4)	=	998.29	Itr (in4)	=	1150.96
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 52 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 67.30

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.618	0.545	0.908	10.7%	Red	0.000	0.227
	30.000	0.618	0.545	0.908			0.000	0.227
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	30.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.04 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	118.0	15.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	90.0	15.0	---	---		
	Max +	1.2DL+1.6LL	232.8	15.0	---	---	0.90	314.98
Controlling		1.2DL+1.6LL	232.8	15.0	---	---	0.90	314.98

REACTIONS (kips):

	Left	Right
Initial reaction	11.97	11.97
DL reaction	9.66	9.66
Max +LL reaction	12.16	12.16
Max +total reaction (factored)	31.04	31.04

DEFLECTIONS: (Camber = 3/4) **Ratio**

Initial load (in)	at 15.00 ft =	-1.192	L/D =	302	
Live load (in)	at 15.00 ft =	-0.510	L/D =	705	> PRCNC20221036

Post Comp load (in)	at	15.00 ft	=	-0.556	L/D	=	647	>	240	0.37
Net Total load (in)	at	15.00 ft	=	-0.999	L/D	=	361	>	240	0.67

Floor Type: Level 2 **Beam Number = 58**

SPAN INFORMATION (ft): I-End (155.92,138.50) J-End (185.92,138.50)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	49.00	Y bar(in)	=	16.03
Mnf (kip-ft)	=	376.32	Mn (kip-ft)	=	319.40
C (kips)	=	189.53	PNA (in)	=	15.35
Ieff (in4)	=	814.94	Itr (in4)	=	1032.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 60 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 45.10

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
7.333	1.94	1.75	2.41	11.6	0.00	0.00	0.0	0.00	Snow	0.00	0.60
19.167	3.02	2.71	3.96	11.6	0.00	0.00	0.0	0.00	Snow	0.00	0.99

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.272	0.240	0.400	11.6%	Red	0.000	0.100
	30.000	0.272	0.240	0.400			0.000	0.100
2	0.000	0.346	0.305	0.508	11.6%	Red	0.000	0.127
	7.333	0.346	0.305	0.508			0.000	0.127
3	7.334	0.023	0.020	0.033	11.6%	Red	0.000	0.008
	19.166	0.023	0.020	0.033			0.000	0.008
4	19.167	0.346	0.305	0.508	11.6%	Red	0.000	0.127
	30.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	30.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 32.62 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	120.7	18.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	93.4	18.0	---	---		
	Max +	1.2DL+1.6LL	233.3	18.1	---	---	(	

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
Controlling		1.2DL+1.6LL	232.7	19.2	---	---	0.90	281.53

REACTIONS (kips):

	Left	**Right**
Initial reaction	12.42	12.80
DL reaction	10.08	10.38
Max +LL reaction	12.14	12.60
Max +total reaction (factored)	31.53	32.62

DEFLECTIONS: (Camber = 1)

										Ratio
Initial load (in)	at	15.15 ft	=	-1.251	L/D	=	288			
Live load (in)	at	15.15 ft	=	-0.621	L/D	=	580	>	360	0.62
Post Comp load (in)	at	15.15 ft	=	-0.677	L/D	=	532	>	240	0.45
Net Total load (in)	at	15.15 ft	=	-0.928	L/D	=	388	>	240	0.62

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 59**

SPAN INFORMATION (ft): I-End (134.92,138.50) J-End (155.92,138.50)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 21.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	63.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	301.65	Mn (kip-ft)	=	250.30
C (kips)	=	172.30	PNA (in)	=	13.40
Ieff (in4)	=	619.67	Itr (in4)	=	776.32
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 21 Partial = 21 Actual = 21
Number of Stud Rows = 1 Percent of Full Composite Action = 51.28

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.272	0.240	0.400	0.0%	Red	0.000	0.100
	21.000	0.272	0.240	0.400			0.000	0.100
2	0.000	0.239	0.211	0.351	0.0%	Red	0.000	0.088
	6.000	0.239	0.211	0.351			0.000	0.088
3	0.000	0.630	0.094	0.063	0.0%	Red	0.000	0.039
	6.000	0.630	0.094	0.063			0.000	0.039
4	6.000	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	21.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	21.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 25.77 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	57.5	10.5	0.0	1.00	0.90	124.50
	Init DL	1.4DL	43.8	10.5	---	---		
	Max +	1.2DL+1.6LL	126.8	10.3	---	---	0.90	225.27
Controlling		1.2DL+1.6LL	126.8	10.3	---	---	0.90	225.27

REACTIONS (kips):

	Left	Right
Initial reaction	8.34	8.34
DL reaction	9.40	7.16

	Left	Right
Max +LL reaction	9.05	9.46
Max +total reaction (factored)	25.77	23.73

DEFLECTIONS:

										Ratio
Initial load (in)	at	10.50 ft	=	-0.430	L/D	=	586			
Live load (in)	at	10.50 ft	=	-0.217	L/D	=	1162	>	360	0.31
Post Comp load (in)	at	10.50 ft	=	-0.258	L/D	=	976	>	240	0.25
Net Total load (in)	at	10.50 ft	=	-0.688	L/D	=	366	>	240	0.66

Floor Type: Level 2 **Beam Number = 60**

SPAN INFORMATION (ft): I-End (110.92,138.50) J-End (134.92,138.50)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	40.00	Y bar(in)	=	14.24
Mnf (kip-ft)	=	289.87	Mn (kip-ft)	=	246.98
C (kips)	=	172.30	PNA (in)	=	13.40
Ieff (in4)	=	571.55	Itr (in4)	=	710.27
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 24 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 51.28

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
2.167	0.18	0.16	0.17	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.04
13.500	0.18	0.16	0.17	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.04

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.272	0.240	0.400	0.0%	Red	0.000	0.100
	24.000	0.272	0.240	0.400			0.000	0.100
2	0.000	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	2.166	0.346	0.305	0.508			0.000	0.127
3	2.167	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	13.500	0.023	0.020	0.033			0.000	0.008
4	13.500	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	24.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	24.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 22.72 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	55.1	13.7	0.0	1.00	0.90	124.50
	Init DL	1.4DL	42.3	13.7	---	---		
	Max +	1.2DL+1.6LL	116.2	13.8	---	---		

PRCNC20221036

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
Controlling		1.2DL+1.6LL	116.2	13.8	---	---	0.90	222.28

REACTIONS (kips):

	Left	**Right**
Initial reaction	6.72	8.17
DL reaction	5.45	6.60
Max +LL reaction	7.50	9.25
Max +total reaction (factored)	18.54	22.72

DEFLECTIONS:

									Ratio
Initial load (in)	at 12.36 ft	=	-0.538	L/D	=	536			
Live load (in)	at 12.36 ft	=	-0.292	L/D	=	988	>	360	0.36
Post Comp load (in)	at 12.36 ft	=	-0.315	L/D	=	914	>	240	0.26
Net Total load (in)	at 12.36 ft	=	-0.853	L/D	=	338	>	240	0.71

PRCNC20221036

Floor Type: Level 2 **Beam Number = 61**

SPAN INFORMATION (ft): I-End (71.25,138.50) J-End (110.92,138.50)

Beam Size (User Selected) = W24X55 Fy = 50.0 ksi
Total Beam Length (ft) = 39.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	107.50	Y bar(in)	=	22.93
Mnf (kip-ft)	=	1063.42	Mn (kip-ft)	=	940.55
C (kips)	=	411.79	PNA (in)	=	22.23
Ieff (in4)	=	3348.30	Itr (in4)	=	4152.63
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 78 Partial = 52 Actual = 52
Number of Stud Rows = 2 Percent of Full Composite Action = 50.84

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.618	0.545	0.908	19.1%	Red	0.000	0.227
	39.666	0.618	0.545	0.908			0.000	0.227
2	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	39.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 39.32 kips 0.90Vn = 251.69 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	213.1	19.8	0.0	1.00	0.90	502.50
	Init DL	1.4DL	165.2	19.8	---	---		
	Max +	1.2DL+1.6LL	390.0	19.8	---	---	0.90	846.49
Controlling		1.2DL+1.6LL	390.0	19.8	---	---	0.90	846.49

REACTIONS (kips):

	Left	Right
Initial reaction	16.41	16.41
DL reaction	13.34	13.34
Max +LL reaction	14.57	14.57
Max +total reaction (factored)	39.32	39.32

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at 19.83 ft	=	-0.854	L/D	=	557			
Live load (in)	at 19.83 ft	=	-0.421	L/D	=	1129	>	360	0.32
Post Comp load (in)	at 19.83 ft	=	-0.463	L/D	=	1028	>	240	0.23
Net Total load (in)	at 19.83 ft	=	-1.317	L/D	=	361	>	240	0.66

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 62**

SPAN INFORMATION (ft): I-End (56.92,135.17) J-End (71.25,135.17)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 14.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	43.00	Y bar(in)	=	16.59
Mnf (kip-ft)	=	509.63	Mn (kip-ft)	=	427.56
C (kips)	=	172.30	PNA (in)	=	14.59
Ieff (in4)	=	1138.15	Itr (in4)	=	1512.21
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 60 Partial = 16 Actual = 16
Number of Stud Rows = 1 Percent of Full Composite Action = 27.28

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
4.556	5.00	4.43	7.07	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.77
7.167	3.39	3.00	4.87	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.22

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	14.333	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.04 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	39.5	7.2	7.2	1.65	0.90	249.38
	Init DL	1.4DL	30.5	7.2	---	---		
	Max +	1.2DL+1.6LL	83.0	7.2	---	---	0.90	384.80
Controlling		1.2DL+1.6LL	81.8	4.6	---	---	0.90	344.64

REACTIONS (kips):

	Left	Right
Initial reaction	6.59	4.33
DL reaction	5.36	3.54
Max +LL reaction	7.26	4.68
Max +total reaction (factored)	18.04	11.73

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.81 ft	=	-0.050	L/D	=	3431			
Live load (in)	at	6.81 ft	=	-0.034	L/D	=	4988	>	360	0.07
Post Comp load (in)	at	6.81 ft	=	-0.037	L/D	=	4619	>	240	0.05
Net Total load (in)	at	6.81 ft	=	-0.087	L/D	=	1969	>	240	0.12

Floor Type: Level 2 **Beam Number = 63**

SPAN INFORMATION (ft): I-End (56.92,121.58) J-End (56.92,135.17)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 13.58

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	31.87	Y bar(in)	=	13.73
Mnf (kip-ft)	=	281.65	Mn (kip-ft)	=	217.09
C (kips)	=	103.38	PNA (in)	=	11.34
Ieff (in4)	=	466.79	Itr (in4)	=	673.45
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 13 Partial = 13 Actual = 13
Number of Stud Rows = 1 Percent of Full Composite Action = 31.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	13.583	0.010	0.000	0.000			0.000	0.000
2	0.000	0.065	0.058	0.096	0.0%	Red	0.000	0.024
	12.616	0.065	0.057	0.096			0.000	0.024
3	12.625	0.065	0.057	0.096	0.0%	Red	0.000	0.024
	13.583	0.000	0.000	0.000			0.000	0.000
4	0.000	0.244	0.215	0.358	0.0%	Red	0.000	0.090
	13.583	0.244	0.215	0.358			0.000	0.090
5	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	13.583	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.71 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	12.3	6.8	0.0	1.00	0.90	124.50
	Init DL	1.4DL	9.5	6.8	---	---		
	Max +	1.2DL+1.6LL	26.2	6.8	---	---	0.90	195.38
Controlling		1.2DL+1.6LL	26.2	6.8	---	---	0.90	195.38

REACTIONS (kips):

	Left	Right
Initial reaction	2.77	2.73
DL reaction	2.31	2.28

PRCNC20221036

	Left	Right
Max +LL reaction	3.08	3.04
Max +total reaction (factored)	7.71	7.60

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.79 ft	=	-0.039	L/D	=	4172			
Live load (in)	at	6.79 ft	=	-0.026	L/D	=	6349	>	360	0.06
Post Comp load (in)	at	6.79 ft	=	-0.028	L/D	=	5761	>	240	0.04
Net Total load (in)	at	6.79 ft	=	-0.067	L/D	=	2420	>	240	0.10

Floor Type: Level 2 **Beam Number = 64**

SPAN INFORMATION (ft): I-End (56.92,121.58) J-End (77.25,121.58)

Beam Size (User Selected) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	33.50	Y bar(in)	=	14.77
Mnf (kip-ft)	=	402.91	Mn (kip-ft)	=	305.11
C (kips)	=	86.15	PNA (in)	=	11.08
Ieff (in4)	=	740.14	Itr (in4)	=	1102.21
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 40 Partial = 20 Actual = 20
Number of Stud Rows = 1 Percent of Full Composite Action = 25.21

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
7.167	3.39	3.00	4.87	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.22
14.333	9.05	8.08	12.10	0.0	0.00	0.00	0.0	0.00	Snow	0.00	3.03
2.917	9.00	9.00	0.00	0.0	8.00	0.00	0.0	0.00	Snow	0.00	3.00

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	14.334	0.229	0.202	0.337	0.0%	Red	0.000	0.084
	20.333	0.229	0.202	0.337			0.000	0.084
2	0.000	0.017	0.015	0.025	0.0%	Red	0.000	0.006
	19.666	0.017	0.015	0.025			0.000	0.006
3	19.667	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	20.333	0.000	0.000	0.000			0.000	0.000
4	0.000	0.031	0.031	0.000	---	NonR	0.000	0.000
	20.333	0.031	0.031	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 38.53 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	94.3	14.3	7.2	1.01	0.90	173.13
	Init DL	1.4DL	74.0	14.3	---	---		
	Max +	1.2DL+1.6LL	187.8	14.3	---	---	0.90	274.60
Controlling		1.2DL+1.6LL	187.8	14.3	---	---	(	

PRCNC20221036

Gravity Beam Design

REACTIONS (kips):

	Left	Right
Initial reaction	17.07	13.04
DL reaction	13.27	10.53
Max +LL reaction	14.13	13.38
Max +total reaction (factored)	38.53	34.04

DEFLECTIONS:

									Ratio
Initial load (in)	at 10.17 ft	=	-0.385	L/D	=	634			
Live load (in)	at 10.27 ft	=	-0.258	L/D	=	947	>	360	0.38
Post Comp load (in)	at 10.27 ft	=	-0.275	L/D	=	889	>	240	0.27
Net Total load (in)	at 10.27 ft	=	-0.659	L/D	=	370	>	240	0.65

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 2 **Beam Number = 65**

SPAN INFORMATION (ft): I-End (95.92,156.50) J-End (110.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in) at 7.50 ft = -0.082 L/D = 2203
Live load (in) at 7.50 ft = -0.056 L/D = 3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 66**

SPAN INFORMATION (ft): I-End (95.92,166.50) J-End (110.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.082	L/D =	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D =	3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 67**

SPAN INFORMATION (ft): I-End (110.92,156.50) J-End (125.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in) at 7.50 ft = -0.082 L/D = 2203
Live load (in) at 7.50 ft = -0.056 L/D = 3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 2 **Beam Number = 68**

SPAN INFORMATION (ft): I-End (110.92,166.50) J-End (125.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at 7.50 ft	=	-0.082	L/D =	2203
Live load (in)	at 7.50 ft	=	-0.056	L/D =	3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 69**

SPAN INFORMATION (ft): I-End (125.92,156.50) J-End (140.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at 7.50 ft	= -0.082	L/D = 2203		
Live load (in)	at 7.50 ft	= -0.056	L/D = 3210	>	PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 2 **Beam Number = 70**

SPAN INFORMATION (ft): I-End (125.92,166.50) J-End (140.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

						Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D	= 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D	= 3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 71**

SPAN INFORMATION (ft): I-End (140.92,156.50) J-End (155.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

						Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D =	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D =	3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 72**

SPAN INFORMATION (ft): I-End (140.92,166.50) J-End (155.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

							Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D	=	3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 73**

SPAN INFORMATION (ft): I-End (155.92,156.50) J-End (170.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.250	---	NonR	0.000	0.250
	15.000	0.680	0.600	1.250			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	80.1	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	80.1	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	9.37	9.37
Max +total reaction (factored)	21.35	21.35

DEFLECTIONS:

							Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203
Live load (in)	at	7.50 ft	=	-0.070	L/D	=	2568 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.075	L/D	=	2413	>	240	0.10
Net Total load (in)	at	7.50 ft	=	-0.156	L/D	=	1152	>	240	0.21

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 74**

SPAN INFORMATION (ft): I-End (155.92,166.50) J-End (170.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.462	0.408	0.850	---	NonR	0.000	0.170
	15.000	0.462	0.408	0.850			0.000	0.170
2	0.000	0.218	0.192	0.320	0.0%	Red	0.000	0.080
	15.000	0.218	0.192	0.320			0.000	0.080
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.39 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	76.5	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	76.5	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	8.77	8.77
Max +total reaction (factored)	20.39	20.39

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203			
Live load (in)	at	7.50 ft	=	-0.066	L/D	=	2744	>	360	0.13
Post Comp load (in)	at	7.50 ft	=	-0.070	L/D	=	2568	>	240	0.09
Net Total load (in)	at	7.50 ft	=	-0.152	L/D	=	1186	>	240	0.20

Floor Type: Level 2 **Beam Number = 75**

SPAN INFORMATION (ft): I-End (170.92,156.50) J-End (185.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

							Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D	=	3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 76**

SPAN INFORMATION (ft): I-End (170.92,166.50) J-End (185.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D = 3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 77**

SPAN INFORMATION (ft): I-End (185.92,156.50) J-End (200.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D = 3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 78**

SPAN INFORMATION (ft): I-End (185.92,166.50) J-End (200.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D = 3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 79**

SPAN INFORMATION (ft): I-End (200.92,156.50) J-End (215.92,156.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

							Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D	=	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D	=	3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 2 **Beam Number = 80**

SPAN INFORMATION (ft): I-End (200.92,166.50) J-End (215.92,166.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D = 3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 81**

SPAN INFORMATION (ft): I-End (225.92,161.50) J-End (225.92,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D = 3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 2 **Beam Number = 82**

SPAN INFORMATION (ft): I-End (235.92,161.50) J-End (235.92,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.50 ft	=	-0.082	L/D =	2203
Live load (in)	at	7.50 ft	=	-0.056	L/D =	3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 83**

SPAN INFORMATION (ft): I-End (225.92,146.50) J-End (225.92,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS: **Ratio**

Initial load (in)	at 7.50 ft	=	-0.082	L/D =	2203
Live load (in)	at 7.50 ft	=	-0.056	L/D =	3210 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Floor Type: Level 2 **Beam Number = 84**

SPAN INFORMATION (ft): I-End (235.92,146.50) J-End (235.92,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	15.000	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.35 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.7	7.5	---	---		
	Max +	1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	68.8	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.30	5.30
Max +LL reaction	7.50	7.50
Max +total reaction (factored)	18.35	18.35

DEFLECTIONS:

					Ratio
Initial load (in)	at	7.50 ft	=	-0.082	L/D = 2203
Live load (in)	at	7.50 ft	=	-0.056	L/D = 3210 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.061	L/D	=	2972	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.142	L/D	=	1265	>	240	0.19

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 85**

SPAN INFORMATION (ft): I-End (225.92,135.17) J-End (225.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	34.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	354.05	Mn (kip-ft)	=	270.44
C (kips)	=	98.21	PNA (in)	=	11.78
Ieff (in4)	=	645.54	Itr (in4)	=	948.45
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 22 Partial = 12 Actual = 12
Number of Stud Rows = 2 Percent of Full Composite Action = 28.32

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	11.333	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.87 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.5	5.7	0.0	1.00	0.90	165.75
	Init DL	1.4DL	14.1	5.7	---	---		
	Max +	1.2DL+1.6LL	39.3	5.7	---	---	0.90	243.39
Controlling		1.2DL+1.6LL	39.3	5.7	---	---	0.90	243.39

REACTIONS (kips):

	Left	Right
Initial reaction	4.96	4.96
DL reaction	4.00	4.00
Max +LL reaction	5.67	5.67
Max +total reaction (factored)	13.87	13.87

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	5.67 ft	=	-0.027	L/D	=	5108			
Live load (in)	at	5.67 ft	=	-0.020	L/D	=	6859	>	360	0.05
Post Comp load (in)	at	5.67 ft	=	-0.021	L/D	=	6351	>	240	0.04
Net Total load (in)	at	5.67 ft	=	-0.048	L/D	=	2831	>	240	0.08

Floor Type: Level 2 **Beam Number = 86**

SPAN INFORMATION (ft): I-End (235.92,135.17) J-End (235.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	34.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	354.05	Mn (kip-ft)	=	270.44
C (kips)	=	98.21	PNA (in)	=	11.78
Ieff (in4)	=	645.54	Itr (in4)	=	948.45
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 22 Partial = 12 Actual = 12
Number of Stud Rows = 2 Percent of Full Composite Action = 28.32

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	0.0%	Red	0.000	0.250
	11.333	0.680	0.600	1.000			0.000	0.250
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.87 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.5	5.7	0.0	1.00	0.90	165.75
	Init DL	1.4DL	14.1	5.7	---	---		
	Max +	1.2DL+1.6LL	39.3	5.7	---	---	0.90	243.39
Controlling		1.2DL+1.6LL	39.3	5.7	---	---	0.90	243.39

REACTIONS (kips):

	Left	Right
Initial reaction	4.96	4.96
DL reaction	4.00	4.00
Max +LL reaction	5.67	5.67
Max +total reaction (factored)	13.87	13.87

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	5.67 ft	=	-0.027	L/D	=	5108			
Live load (in)	at	5.67 ft	=	-0.020	L/D	=	6859	>	360	0.05
Post Comp load (in)	at	5.67 ft	=	-0.021	L/D	=	6351	>	240	0.04
Net Total load (in)	at	5.67 ft	=	-0.048	L/D	=	2831	>	240	0.08

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 87**

SPAN INFORMATION (ft): I-End (71.25,156.50) J-End (95.92,156.50)

Beam Size (User Selected) = W21X55 Fy = 50.0 ksi
Total Beam Length (ft) = 24.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	74.00	Y bar(in)	=	19.40
Mnf (kip-ft)	=	925.93	Mn (kip-ft)	=	735.70
C (kips)	=	206.76	PNA (in)	=	15.91
Ieff (in4)	=	2216.61	Itr (in4)	=	3197.04
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 48 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 27.39

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	7.5%	Red	0.000	0.250
	24.666	0.680	0.600	1.000			0.000	0.250
2	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	24.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.14 kips 1.00Vn = 234.00 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	90.2	12.3	0.0	1.00	0.90	472.50
	Init DL	1.4DL	69.8	12.3	---	---		
	Max +	1.2DL+1.6LL	179.7	12.3	---	---	0.90	662.13
Controlling		1.2DL+1.6LL	179.7	12.3	---	---	0.90	662.13

REACTIONS (kips):

	Left	Right
Initial reaction	11.16	11.16
DL reaction	9.07	9.07
Max +LL reaction	11.41	11.41
Max +total reaction (factored)	29.14	29.14

DEFLECTIONS:

				Ratio
Initial load (in)	at 12.33 ft	=	-0.165	L/D = 1793
Live load (in)	at 12.33 ft	=	-0.120	L/D = 2469 > PRCNC20221036

Post Comp load (in)	at 12.33 ft	=	-0.130	L/D	=	2272	>	240	0.11
Net Total load (in)	at 12.33 ft	=	-0.295	L/D	=	1002	>	240	0.24

Floor Type: Level 2 **Beam Number = 88**

SPAN INFORMATION (ft): I-End (71.25,166.50) J-End (95.92,166.50)

Beam Size (User Selected) = W21X55 Fy = 50.0 ksi
Total Beam Length (ft) = 24.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	74.00	Y bar(in)	=	19.40
Mnf (kip-ft)	=	925.93	Mn (kip-ft)	=	722.22
C (kips)	=	189.53	PNA (in)	=	15.45
Ieff (in4)	=	2170.77	Itr (in4)	=	3197.04
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 48 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 25.11

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL
14.917	0.05	0.05								

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.680	0.600	1.000	7.5%	Red	0.000	0.250
	24.666	0.680	0.600	1.000			0.000	0.250
2	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	24.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.18 kips 1.00Vn = 234.00 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	90.5	12.4	0.0	1.00	0.90	472.50
	Init DL	1.4DL	70.1	12.4	---	---		
	Max +	1.2DL+1.6LL	180.0	12.3	---	---	0.90	650.00
Controlling		1.2DL+1.6LL	180.0	12.3	---	---	0.90	650.00

REACTIONS (kips):

	Left	Right
Initial reaction	11.18	11.19
DL reaction	9.09	9.10
Max +LL reaction	11.41	11.41

	Left	Right
Max +total reaction (factored)	29.16	29.18

DEFLECTIONS:

										Ratio
Initial load (in)	at 12.33 ft	=	-0.166	L/D	=	1785				
Live load (in)	at 12.33 ft	=	-0.122	L/D	=	2418	>	360		0.15
Post Comp load (in)	at 12.33 ft	=	-0.133	L/D	=	2225	>	240		0.11
Net Total load (in)	at 12.33 ft	=	-0.299	L/D	=	990	>	240		0.24

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 89**

SPAN INFORMATION (ft): I-End (51.69,161.50) J-End (51.69,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.665	0.587	0.978	0.0%	Red	0.000	0.244
	15.000	0.665	0.587	0.978			0.000	0.244
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.95 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	31.7	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.1	7.5	---	---		
	Max +	1.2DL+1.6LL	67.3	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	67.3	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.43	6.43
DL reaction	5.18	5.18
Max +LL reaction	7.33	7.33
Max +total reaction (factored)	17.95	17.95

DEFLECTIONS:

						Ratio
Initial load (in)	at	7.50 ft	=	-0.080	L/D =	2251
Live load (in)	at	7.50 ft	=	-0.055	L/D =	3283 >

PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.059	L/D	=	3040	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.139	L/D	=	1293	>	240	0.19

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 2 **Beam Number = 90**

SPAN INFORMATION (ft): I-End (61.47,161.50) J-End (61.47,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	45.00	Y bar(in)	=	15.83
Mnf (kip-ft)	=	373.04	Mn (kip-ft)	=	285.88
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	700.45	Itr (in4)	=	1013.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 31.41

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.665	0.587	0.978	0.0%	Red	0.000	0.244
	15.000	0.665	0.587	0.978			0.000	0.244
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.95 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	31.7	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	24.1	7.5	---	---		
	Max +	1.2DL+1.6LL	67.3	7.5	---	---	0.90	257.30
Controlling		1.2DL+1.6LL	67.3	7.5	---	---	0.90	257.30

REACTIONS (kips):

	Left	Right
Initial reaction	6.43	6.43
DL reaction	5.18	5.18
Max +LL reaction	7.33	7.33
Max +total reaction (factored)	17.95	17.95

DEFLECTIONS:

						Ratio
Initial load (in)	at	7.50 ft	=	-0.080	L/D =	2251
Live load (in)	at	7.50 ft	=	-0.055	L/D =	3283 > PRCNC20221036

Post Comp load (in)	at	7.50 ft	=	-0.059	L/D	=	3040	>	240	0.08
Net Total load (in)	at	7.50 ft	=	-0.139	L/D	=	1293	>	240	0.19

Floor Type: Level 2 **Beam Number = 91**

SPAN INFORMATION (ft): I-End (51.69,148.08) J-End (51.69,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 13.42

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	40.25	Y bar(in)	=	15.56
Mnf (kip-ft)	=	368.30	Mn (kip-ft)	=	274.48
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	657.64	Itr (in4)	=	988.36
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 26 Partial = 13 Actual = 13
Number of Stud Rows = 1 Percent of Full Composite Action = 26.80

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	13.416	0.332	0.293	0.489			0.000	0.122
2	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	1.583	0.332	0.293	0.489			0.000	0.122
3	1.584	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	13.416	0.332	0.293	0.489			0.000	0.122
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	13.416	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.02 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	25.2	6.7	0.0	1.00	0.90	165.75
	Init DL	1.4DL	19.2	6.7	---	---		
	Max +	1.2DL+1.6LL	53.6	6.7	---	---	0.90	247.04
Controlling		1.2DL+1.6LL	53.6	6.7	---	---	0.90	247.04

REACTIONS (kips):

	Left	Right
Initial reaction	5.43	5.74
DL reaction	4.38	4.62
Max +LL reaction	6.19	6.54
Max +total reaction (factored)	15.16	16.02

PRCNC20221036

DEFLECTIONS:

											Ratio
Initial load (in)	at	6.71 ft	=	-0.051	L/D	=	3162				
Live load (in)	at	6.71 ft	=	-0.037	L/D	=	4331	>	360		0.08
Post Comp load (in)	at	6.71 ft	=	-0.040	L/D	=	4011	>	240		0.06
Net Total load (in)	at	6.71 ft	=	-0.091	L/D	=	1768	>	240		0.14

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 92**

SPAN INFORMATION (ft): I-End (61.47,149.67) J-End (61.47,161.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.83

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	35.50	Y bar(in)	=	15.23
Mnf (kip-ft)	=	358.66	Mn (kip-ft)	=	270.58
C (kips)	=	98.21	PNA (in)	=	11.78
Ieff (in4)	=	643.58	Itr (in4)	=	958.82
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 22 Partial = 13 Actual = 13
Number of Stud Rows = 2 Percent of Full Composite Action = 26.98

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	11.833	0.332	0.293	0.489			0.000	0.122
2	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	1.583	0.332	0.293	0.489			0.000	0.122
3	1.584	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	11.833	0.332	0.293	0.489			0.000	0.122
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.833	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 14.12 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	19.6	5.9	0.0	1.00	0.90	165.75
	Init DL	1.4DL	14.9	5.9	---	---		
	Max +	1.2DL+1.6LL	41.7	5.9	---	---	0.90	243.53
Controlling		1.2DL+1.6LL	41.7	5.9	---	---	0.90	243.53

REACTIONS (kips):

	Left	Right
Initial reaction	4.76	5.06
DL reaction	3.84	4.08

PRCNC20221036

	Left	Right
Max +LL reaction	5.41	5.77
Max +total reaction (factored)	13.27	14.12

DEFLECTIONS:

											Ratio
Initial load (in)	at	5.92 ft	=	-0.031	L/D	=	4616				
Live load (in)	at	5.92 ft	=	-0.023	L/D	=	6188	>	360		0.06
Post Comp load (in)	at	5.92 ft	=	-0.025	L/D	=	5730	>	240		0.04
Net Total load (in)	at	5.92 ft	=	-0.056	L/D	=	2557	>	240		0.09

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 93**

SPAN INFORMATION (ft): I-End (51.69,135.17) J-End (51.69,148.08)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 12.92

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	38.75	Y bar(in)	=	15.46
Mnf (kip-ft)	=	366.57	Mn (kip-ft)	=	274.36
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	653.06	Itr (in4)	=	979.53
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 24 Partial = 13 Actual = 13
Number of Stud Rows = 2 Percent of Full Composite Action = 26.78

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	11.333	0.332	0.293	0.489			0.000	0.122
2	11.334	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	12.916	0.000	0.000	0.000			0.000	0.000
3	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	12.916	0.332	0.293	0.489			0.000	0.122
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	12.916	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 15.42 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	23.4	6.4	0.0	1.00	0.90	165.75
	Init DL	1.4DL	17.8	6.4	---	---		
	Max +	1.2DL+1.6LL	49.7	6.4	---	---	0.90	246.92
Controlling		1.2DL+1.6LL	49.7	6.4	---	---	0.90	246.92

REACTIONS (kips):

	Left	Right
Initial reaction	5.52	5.22
DL reaction	4.45	4.21

PRCNC20221036

	Left	Right
Max +LL reaction	6.30	5.94
Max +total reaction (factored)	15.42	14.56

DEFLECTIONS:

											Ratio
Initial load (in)	at	6.46 ft	=	-0.044	L/D	=	3546				
Live load (in)	at	6.46 ft	=	-0.032	L/D	=	4822	>	360		0.07
Post Comp load (in)	at	6.46 ft	=	-0.035	L/D	=	4465	>	240		0.05
Net Total load (in)	at	6.46 ft	=	-0.078	L/D	=	1976	>	240		0.12

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 94**

SPAN INFORMATION (ft): I-End (61.47,135.17) J-End (61.47,149.67)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 14.50

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	43.50	Y bar(in)	=	15.75
Mnf (kip-ft)	=	371.66	Mn (kip-ft)	=	274.73
C (kips)	=	103.38	PNA (in)	=	11.99
Ieff (in4)	=	666.86	Itr (in4)	=	1006.12
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 28 Partial = 14 Actual = 14
Number of Stud Rows = 1 Percent of Full Composite Action = 26.92

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	12.916	0.332	0.293	0.489			0.000	0.122
2	12.917	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	14.500	0.000	0.000	0.000			0.000	0.000
3	0.000	0.332	0.293	0.489	0.0%	Red	0.000	0.122
	14.500	0.332	0.293	0.489			0.000	0.122
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	14.500	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.32 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	29.5	7.2	0.0	1.00	0.90	165.75
	Init DL	1.4DL	22.5	7.2	---	---		
	Max +	1.2DL+1.6LL	62.7	7.2	---	---	0.90	247.25
Controlling		1.2DL+1.6LL	62.7	7.2	---	---	0.90	247.25

REACTIONS (kips):

	Left	Right
Initial reaction	6.20	5.90
DL reaction	5.00	4.76
Max +LL reaction	7.07	6.72
Max +total reaction (factored)	17.32	16.45

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.25 ft	=	-0.070	L/D	=	2503			
Live load (in)	at	7.25 ft	=	-0.050	L/D	=	3477	>	360	0.10
Post Comp load (in)	at	7.25 ft	=	-0.054	L/D	=	3219	>	240	0.07
Net Total load (in)	at	7.25 ft	=	-0.124	L/D	=	1408	>	240	0.17

PRCNC20221036

Floor Type: Level 2 **Beam Number = 95**

SPAN INFORMATION (ft): I-End (71.25,121.58) J-End (71.25,135.17)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 13.58

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	40.75	Y bar(in)	=	16.18
Mnf (kip-ft)	=	561.39	Mn (kip-ft)	=	445.39
C (kips)	=	120.61	PNA (in)	=	12.78
Ieff (in4)	=	1193.75	Itr (in4)	=	1691.97
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 50 Partial = 14 Actual = 14
Number of Stud Rows = 1 Percent of Full Composite Action = 28.66

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
6.750	14.16	12.62	19.22	6.7	0.00	0.00	0.0	0.00	Snow	0.00	4.80

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.244	0.215	0.358	6.7%	Red	0.000	0.090
	13.583	0.244	0.215	0.358			0.000	0.090
2	0.000	0.040	0.040	0.000	---	NonR	0.000	0.000
	13.583	0.040	0.040	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 28.93 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	87.9	6.7	0.0	1.00	0.90	294.00
	Init DL	1.4DL	68.2	6.7	---	---		
	Max +	1.2DL+1.6LL	175.4	6.7	---	---	0.90	400.85
Controlling		1.2DL+1.6LL	175.4	6.7	---	---	0.90	400.85

REACTIONS (kips):

	Left	Right
Initial reaction	11.11	11.00
DL reaction	9.05	8.96
Max +LL reaction	11.30	11.19

	Left	Right
Max +total reaction (factored)	28.93	28.65

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.79 ft	=	-0.075	L/D	=	2168			
Live load (in)	at	6.79 ft	=	-0.054	L/D	=	3010	>	360	0.12
Post Comp load (in)	at	6.79 ft	=	-0.059	L/D	=	2773	>	240	0.09
Net Total load (in)	at	6.79 ft	=	-0.134	L/D	=	1217	>	240	0.20

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 97**

SPAN INFORMATION (ft): I-End (77.25,108.25) J-End (77.25,121.58)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 13.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	28.00	Y bar(in)	=	15.29
Mnf (kip-ft)	=	461.05	Mn (kip-ft)	=	363.81
C (kips)	=	86.15	PNA (in)	=	11.72
Ieff (in4)	=	966.77	Itr (in4)	=	1341.67
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 53 Partial = 14 Actual = 14
Number of Stud Rows = 1 Percent of Full Composite Action = 25.98

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.917	12.10	10.78	16.56	0.0	0.00	0.00	0.0	0.00	Snow	0.00	4.14
12.667	4.00	4.00	0.00	0.0	4.00	0.00	0.0	0.00	Snow	0.00	2.00
0.667	4.00	4.00	0.00	0.0	4.00	0.00	0.0	0.00	Snow	0.00	2.00
6.583	4.00	4.00	0.00	0.0	4.00	0.00	0.0	0.00	Snow	0.00	2.00

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	12.666	0.045	0.040	0.067			0.000	0.017
2	12.667	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	13.333	0.000	0.000	0.000			0.000	0.000
3	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	13.333	0.035	0.035	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 48.54 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	70.5	9.9	9.9	1.30	0.90	234.61
	Init DL	1.4DL	53.3	9.9	---	---		
	Max +	1.2DL+1.6LL	134.0	9.9	---	---	0.90	327.43
Controlling		1.2DL+1.6LL	134.0	9.9	---	---	0.90	327.43

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	13.47	20.65
DL reaction	9.66	15.50
Max +LL reaction	10.71	18.71
Max +total reaction (factored)	28.73	48.54

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.07 ft	=	-0.078	L/D	=	2063			
Live load (in)	at	7.13 ft	=	-0.053	L/D	=	3008	>	360	0.12
Post Comp load (in)	at	7.13 ft	=	-0.056	L/D	=	2847	>	240	0.08
Net Total load (in)	at	7.13 ft	=	-0.134	L/D	=	1196	>	240	0.20

Floor Type: Level 2 **Beam Number = 98**

SPAN INFORMATION (ft): I-End (77.25,118.17) J-End (110.92,118.17)

Beam Size (User Selected) = W21X50 Fy = 50.0 ksi
Total Beam Length (ft) = 33.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	101.00	Y bar(in)	=	20.61
Mnf (kip-ft)	=	881.53	Mn (kip-ft)	=	769.04
C (kips)	=	372.16	PNA (in)	=	20.19
Ieff (in4)	=	2497.20	Itr (in4)	=	3110.55
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 66 Partial = 50 Actual = 50
Number of Stud Rows = 2 Percent of Full Composite Action = 50.63

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	16.0%	Red	0.000	0.127
	33.666	0.346	0.305	0.508			0.000	0.127
2	0.000	0.337	0.298	0.496	16.0%	Red	0.000	0.124
	9.392	0.339	0.300	0.499			0.000	0.125
3	9.393	0.339	0.300	0.499	16.0%	Red	0.000	0.125
	33.666	0.249	0.220	0.367			0.000	0.092
4	0.000	0.050	0.050	0.000	---	NonR	0.000	0.000
	33.666	0.050	0.050	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 36.78 kips 1.00Vn = 237.12 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	161.5	16.6	0.0	1.00	0.90	412.50
	Init DL	1.4DL	124.7	16.6	---	---		
	Max +	1.2DL+1.6LL	303.6	16.6	---	---	0.90	692.14
Controlling		1.2DL+1.6LL	303.6	16.6	---	---	0.90	692.14

REACTIONS (kips):

	Left	Right
Initial reaction	14.92	14.22
DL reaction	12.10	11.54

PRCNC20221036

	Left	Right
Max +LL reaction	13.91	13.22
Max +total reaction (factored)	36.78	35.01

DEFLECTIONS:

									Ratio
Initial load (in)	at 16.83 ft	=	-0.636	L/D	=	635			
Live load (in)	at 16.83 ft	=	-0.323	L/D	=	1250	>	360	0.29
Post Comp load (in)	at 16.83 ft	=	-0.354	L/D	=	1141	>	240	0.21
Net Total load (in)	at 16.83 ft	=	-0.990	L/D	=	408	>	240	0.59

Floor Type: Level 2 **Beam Number = 99**

SPAN INFORMATION (ft): I-End (110.92,118.17) J-End (134.92,118.17)

Beam Size (User Selected) = W24X55 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	72.00	Y bar(in)	=	21.60
Mnf (kip-ft)	=	1014.19	Mn (kip-ft)	=	784.03
C (kips)	=	191.25	PNA (in)	=	16.64
Ieff (in4)	=	2605.83	Itr (in4)	=	3810.91
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 48 Partial = 32 Actual = 32
Number of Stud Rows = 2 Percent of Full Composite Action = 26.04

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
15.000	16.54	14.85	21.11	23.3	0.00	0.00	0.0	0.00	Snow	0.00	5.28

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	23.3%	Red	0.000	0.127
	24.000	0.346	0.305	0.508			0.000	0.127
2	0.000	0.249	0.220	0.367	23.3%	Red	0.000	0.092
	15.000	0.247	0.218	0.363			0.000	0.091
3	15.000	0.000	0.000	0.000	23.3%	Red	0.000	0.000
	16.629	0.282	0.249	0.415			0.000	0.104
4	16.629	0.282	0.249	0.415	23.3%	Red	0.000	0.104
	24.000	0.282	0.249	0.415			0.000	0.104
5	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	24.000	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 51.07 kips 0.90Vn = 251.69 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	217.6	15.0	0.0	1.00	0.90	502.50
	Init DL	1.4DL	171.2	15.0	---	---		

PRCNC20221036

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
	Max +	1.2DL+1.6LL	381.0	15.0	---	---	0.90	705.63
Controlling		1.2DL+1.6LL	381.0	15.0	---	---	0.90	705.63

REACTIONS (kips):

	Left	**Right**
Initial reaction	17.09	22.27
DL reaction	13.97	18.22
Max +LL reaction	14.07	18.25
Max +total reaction (factored)	39.28	51.07

DEFLECTIONS:

										Ratio
Initial load (in)	at	12.48 ft	=	-0.283	L/D	=	1017			
Live load (in)	at	12.48 ft	=	-0.163	L/D	=	1761	>	360	0.20
Post Comp load (in)	at	12.48 ft	=	-0.181	L/D	=	1595	>	240	0.15
Net Total load (in)	at	12.48 ft	=	-0.464	L/D	=	621	>	240	0.39

Floor Type: Level 2 **Beam Number = 100**

SPAN INFORMATION (ft): I-End (134.92,118.17) J-End (134.92,138.50)

Beam Size (Optimum) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	61.00	Y bar(in)	=	16.51
Mnf (kip-ft)	=	383.58	Mn (kip-ft)	=	322.78
C (kips)	=	193.83	PNA (in)	=	15.35
Ieff (in4)	=	853.34	Itr (in4)	=	1078.42
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 36 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 50.48

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.167	9.96	6.67	10.23	2.5	0.00	0.00	0.0	0.00	Snow	0.00	2.67
10.167	7.61	6.75	10.74	2.5	0.00	0.00	0.0	0.00	Snow	0.00	2.68

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	20.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 27.21 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	127.0	10.2	10.2	1.66	0.90	165.75
	Init DL	1.4DL	97.4	10.2	---	---		
	Max +	1.2DL+1.6LL	275.0	10.2	---	---	0.90	290.50
Controlling		1.2DL+1.6LL	275.0	10.2	---	---	0.90	290.50

REACTIONS (kips):

	Left	Right
Initial reaction	9.65	9.65
DL reaction	9.05	9.05
Max +LL reaction	10.22	10.22
Max +total reaction (factored)	27.21	27.21

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

									Ratio
Initial load (in)	at 10.17 ft	=	-0.477	L/D	=	512			
Live load (in)	at 10.17 ft	=	-0.250	L/D	=	976	>	360	0.37
Post Comp load (in)	at 10.17 ft	=	-0.301	L/D	=	811	>	240	0.30
Net Total load (in)	at 10.17 ft	=	-0.777	L/D	=	314	>	240	0.76

Floor Type: Level 2 **Beam Number = 101**

SPAN INFORMATION (ft): I-End (155.92,118.17) J-End (185.92,118.17)

Beam Size (User Selected) = W16X57 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	54.00	Y bar(in)	=	14.79
Mnf (kip-ft)	=	732.71	Mn (kip-ft)	=	626.56
C (kips)	=	223.99	PNA (in)	=	13.41
Ieff (in4)	=	1598.94	Itr (in4)	=	2076.71
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 60 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 36.40

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
7.333	2.20	1.98	2.74	14.8	0.00	0.00	0.0	0.00	Snow	0.00	0.68
15.833	0.79	0.71	0.99	14.8	0.00	0.00	0.0	0.00	Snow	0.00	0.25
19.167	3.13	2.80	4.11	14.8	0.00	0.00	0.0	0.00	Snow	0.00	1.03

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	14.8%	Red	0.000	0.127
	7.333	0.346	0.305	0.508			0.000	0.127
2	7.334	0.051	0.045	0.075	14.8%	Red	0.000	0.019
	15.833	0.051	0.045	0.075			0.000	0.019
3	15.834	0.186	0.164	0.273	14.8%	Red	0.000	0.068
	19.166	0.186	0.164	0.273			0.000	0.068
4	19.167	0.346	0.305	0.508	14.8%	Red	0.000	0.127
	30.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.282	0.249	0.415	14.8%	Red	0.000	0.104
	30.000	0.282	0.249	0.415			0.000	0.104
6	0.000	0.057	0.057	0.000	---	NonR	0.000	0.000
	30.000	0.057	0.057	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 35.84 kips 1.00Vn = 211.56 kips

MOMENTS (Ultimate):

PRCNC20221036

Gravity Beam Design

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	145.4	16.6	0.0	1.00	0.90	393.75
	Init DL	1.4DL	114.2	16.5	---	---		
	Max +	1.2DL+1.6LL	271.3	16.6	---	---	0.90	563.90
Controlling		1.2DL+1.6LL	266.3	19.2	---	---	0.90	534.54

REACTIONS (kips):

	Left	**Right**
Initial reaction	14.27	14.63
DL reaction	11.67	11.95
Max +LL reaction	13.01	13.44
Max +total reaction (factored)	34.83	35.84

DEFLECTIONS:

							Ratio
Initial load (in)	at 15.15 ft	=	-0.600	L/D =	600		
Live load (in)	at 15.15 ft	=	-0.353	L/D =	1020	> 360	0.35
Post Comp load (in)	at 15.15 ft	=	-0.386	L/D =	932	> 240	0.26
Net Total load (in)	at 15.15 ft	=	-0.986	L/D =	365	> 240	0.66

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 2 **Beam Number = 102**

SPAN INFORMATION (ft): I-End (185.92,118.17) J-End (185.92,138.50)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	61.00	Y bar(in)	=	17.36
Mnf (kip-ft)	=	619.01	Mn (kip-ft)	=	497.26
C (kips)	=	193.83	PNA (in)	=	15.10
Ieff (in4)	=	1334.18	Itr (in4)	=	1871.96
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 56 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 32.85

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
10.167	11.58	10.29	16.09	2.8	0.00	0.00	0.0	0.00	Snow	0.00	4.02
10.167	3.81	3.37	5.51	2.8	0.00	0.00	0.0	0.00	Snow	0.00	1.38

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.040	0.040	0.000	---	NonR	0.000	0.000
	20.333	0.040	0.040	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.51 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	129.7	10.2	10.2	1.66	0.90	294.00
	Init DL	1.4DL	100.1	10.2	---	---		
	Max +	1.2DL+1.6LL	267.0	10.2	---	---	0.90	447.54
Controlling		1.2DL+1.6LL	267.0	10.2	---	---	0.90	447.54

REACTIONS (kips):

	Left	Right
Initial reaction	9.94	9.94
DL reaction	8.10	8.10
Max +LL reaction	10.49	10.49
Max +total reaction (factored)	26.51	26.51

PRCNC20221036

DEFLECTIONS:

						Ratio
Initial load (in)	at 10.17 ft	=	-0.242	L/D = 1010		
Live load (in)	at 10.17 ft	=	-0.164	L/D = 1486	> 360	0.24
Post Comp load (in)	at 10.17 ft	=	-0.178	L/D = 1373	> 240	0.17
Net Total load (in)	at 10.17 ft	=	-0.419	L/D = 582	> 240	0.41

Floor Type: Level 2 **Beam Number = 104**

SPAN INFORMATION (ft): I-End (215.22,95.18) J-End (226.09,98.10)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.25

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	33.75	Y bar(in)	=	15.10
Mnf (kip-ft)	=	353.28	Mn (kip-ft)	=	261.95
C (kips)	=	86.15	PNA (in)	=	11.30
Ieff (in4)	=	623.99	Itr (in4)	=	946.66
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 22 Partial = 12 Actual = 12
Number of Stud Rows = 2 Percent of Full Composite Action = 25.03

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
1.250	2.50	2.50	0.00	0.0	2.50	0.00	0.0	0.00	Snow	0.00	2.00
5.583	2.50	2.50	0.00	0.0	2.50	0.00	0.0	0.00	Snow	0.00	2.00
10.333	2.50	2.50	0.00	0.0	2.50	0.00	0.0	0.00	Snow	0.00	2.00

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.162	0.143	0.239	0.0%	Red	0.000	0.060
	11.250	0.162	0.143	0.239			0.000	0.060
2	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	2.000	0.136	0.120	0.200			0.000	0.050
3	2.000	0.136	0.120	0.200	0.0%	Red	0.000	0.050
	10.916	0.136	0.120	0.200			0.000	0.050
4	10.917	0.017	0.015	0.025	0.0%	Red	0.000	0.006
	11.250	0.017	0.015	0.025			0.000	0.006
5	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.250	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 16.65 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Gravity Beam Design

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	32.4	5.6	0.0	1.00	0.90	165.75
	Init DL	1.4DL	20.0	5.6	---	---		
	Max +	1.2DL+1.6LL	44.4	5.6	---	---	0.90	235.75
Controlling		1.2DL+1.6LL	32.4	5.6	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
Initial reaction	8.72	9.05
DL reaction	5.38	5.59
Max +LL reaction	5.96	6.21
Max +total reaction (factored)	16.00	16.65

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.57 ft	=	-0.035	L/D	=	3872			
Live load (in)	at	5.62 ft	=	-0.020	L/D	=	6835	>	360	0.05
Post Comp load (in)	at	5.62 ft	=	-0.020	L/D	=	6604	>	240	0.04
Net Total load (in)	at	5.62 ft	=	-0.055	L/D	=	2441	>	240	0.10

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 105**

SPAN INFORMATION (ft): I-End (211.51,109.03) J-End (218.59,110.93)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 7.33
Mp (kip-ft) = 184.17

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
6.286	11.52	15.30	2.4	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.300	0.441	2.4%	Red	0.000
	6.286	0.247	0.363			0.000
2	6.287	0.009	0.013	2.4%	Red	0.000
	7.333	0.000	0.000			0.000
3	0.000	0.325	0.478	2.4%	Red	0.000
	7.333	0.325	0.478			0.000
4	0.000	0.026	0.000	---	NonR	0.000
	7.333	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 39.11 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	40.3	6.2	0.0	1.00	0.90	165.75
Controlling		1.2DL+1.6LL	40.3	6.2	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
DL reaction	3.94	11.88
Max +LL reaction	5.29	15.54
Max +total reaction (factored)	13.18	39.11

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.00 ft	=	-0.012	L/D	=	7070			
Live load (in)	at	4.00 ft	=	-0.016	L/D	=	5338	>	360	0.07
Net Total load (in)	at	4.00 ft	=	-0.029	L/D	=	3042	>	240	0.08

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 107**

SPAN INFORMATION (ft): I-End (185.35,102.02) J-End (211.51,109.03)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	60.39	Y bar(in)	=	16.49
Mnf (kip-ft)	=	383.28	Mn (kip-ft)	=	327.45
C (kips)	=	206.76	PNA (in)	=	15.38
Ieff (in4)	=	869.97	Itr (in4)	=	1076.41
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 54 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 53.84

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
0.586	11.22	9.99	15.39	17.4	0.00	0.00	0.0	0.00	Snow	0.00	3.85

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.102	0.090	0.150	17.4%	Red	0.000	0.037
	0.586	0.097	0.086	0.143			0.000	0.036
2	0.586	0.253	0.223	0.372	17.4%	Red	0.000	0.093
	26.848	0.030	0.026	0.044			0.000	0.011
3	26.849	0.030	0.026	0.044	17.4%	Red	0.000	0.011
	27.083	0.000	0.000	0.000			0.000	0.000
4	0.000	0.325	0.287	0.478	17.4%	Red	0.000	0.119
	27.083	0.325	0.287	0.478			0.000	0.119
5	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	27.083	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 54.77 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	79.2	12.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	60.7	12.5	---	---		
	Max +	1.2DL+1.6LL	148.4	12.5	---	---	0.90	294.71
Controlling		1.2DL+1.6LL	148.4	12.5	---	---		

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	22.35	7.92
DL reaction	18.10	6.41
Max +LL reaction	20.66	7.34
Max +total reaction (factored)	54.77	19.42

DEFLECTIONS:

									Ratio
Initial load (in)	at 13.27 ft	=	-0.662	L/D	=	491			
Live load (in)	at 13.27 ft	=	-0.296	L/D	=	1097	>	360	0.33
Post Comp load (in)	at 13.27 ft	=	-0.325	L/D	=	1001	>	240	0.24
Net Total load (in)	at 13.27 ft	=	-0.987	L/D	=	329	>	240	0.73

Floor Type: Level 2 **Beam Number = 108**

SPAN INFORMATION (ft): I-End (169.96,100.22) J-End (177.96,70.36)

Beam Size (User Selected) = W21X48 Fy = 50.0 ksi
Total Beam Length (ft) = 30.92
Mp (kip-ft) = 445.83

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.250	1.85	2.67	17.2	0.00	0.00	0.0	0.00	Snow	0.00
2.250	4.14	5.79	17.2	0.00	0.00	0.0	0.00	Snow	0.00
10.250	2.61	3.75	17.2	0.00	0.00	0.0	0.00	Snow	0.00
11.806	5.07	7.33	17.2	0.00	0.00	0.0	0.00	Snow	0.00
15.250	1.95	2.78	17.2	0.00	0.00	0.0	0.00	Snow	0.00
21.361	5.07	7.33	17.2	0.00	0.00	0.0	0.00	Snow	0.00
21.361	2.72	3.92	17.2	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.043	0.063	17.2%	Red	0.000
	2.250	0.062	0.092			0.000
2	0.000	0.048	0.000	---	NonR	0.000
	30.916	0.048	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 44.38 kips 1.00Vn = 216.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	319.5	15.2	6.1	1.04	0.90	397.95
Controlling		1.2DL+1.6LL	319.5	15.2	6.1	1.04	0.90	397.95

REACTIONS (kips):

	Left	**Right**
DL reaction	14.80	10.21
Max +LL reaction	16.63	11.28
Max +total reaction (factored)	44.38	30.30

DEFLECTIONS:							**Ratio**
Dead load (in)	at 15.46 ft	=	-0.652	L/D =	569		
Live load (in)	at 15.46 ft	=	-0.733	L/D =	506	> 360	0.71
Net Total load (in)	at 15.46 ft	=	-1.385	L/D =	268	> 240	0.90

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 109**

SPAN INFORMATION (ft): I-End (168.30,67.77) J-End (177.96,70.36)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	22.50	Y bar(in)	=	13.98
Mnf (kip-ft)	=	317.59	Mn (kip-ft)	=	260.60
C (kips)	=	86.15	PNA (in)	=	11.30
Ieff (in4)	=	634.49	Itr (in4)	=	845.32
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 20 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 37.53

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	10.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	10.000	0.325	0.287	0.478			0.000	0.119
3	0.000	0.042	0.037	0.062	0.0%	Red	0.000	0.016
	10.000	0.043	0.038	0.063			0.000	0.016
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	10.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.74 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	8.0	5.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	6.1	5.0	---	---		
	Max +	1.2DL+1.6LL	16.9	5.0	---	---	0.90	234.54
Controlling		1.2DL+1.6LL	16.9	5.0	---	---	0.90	234.54

REACTIONS (kips):

	Left	Right
Initial reaction	2.43	2.43
DL reaction	2.02	2.02
Max +LL reaction	2.70	2.70
Max +total reaction (factored)	6.74	6.74

PRCNC20221036

DEFLECTIONS:											**Ratio**
Initial load (in)	at	5.00 ft	=	-0.009	L/D	=	1329 0				
Live load (in)	at	5.00 ft	=	-0.007	L/D	=	1816 4	>	360		0.02
Post Comp load (in)	at	5.00 ft	=	-0.007	L/D	=	1653 5	>	240		0.01
Net Total load (in)	at	5.00 ft	=	-0.016	L/D	=	7368	>	240		0.03

Floor Type: Level 2 **Beam Number = 110**

SPAN INFORMATION (ft): I-End (192.77,74.33) J-End (218.93,81.34)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 48.13	Y bar(in)	=	15.99
Mnf (kip-ft)	= 375.65	Mn (kip-ft)	=	331.04
C (kips)	= 223.99	PNA (in)	=	15.41
Ieff (in4)	= 856.71	Itr (in4)	=	1028.62
Stud length (in)	= 4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 54 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 58.33

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	27.083	0.010	0.000	0.000			0.000	0.000
2	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	27.083	0.325	0.287	0.478			0.000	0.119
3	0.000	0.042	0.037	0.062	0.0%	Red	0.000	0.016
	27.083	0.042	0.037	0.062			0.000	0.016
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	27.083	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.26 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	58.4	13.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	45.0	13.5	---	---		
	Max +	1.2DL+1.6LL	123.7	13.5	---	---	0.90	297.94
Controlling		1.2DL+1.6LL	123.7	13.5	---	---	0.90	297.94

REACTIONS (kips):

	Left	Right
Initial reaction	6.57	6.57
DL reaction	5.46	5.46
Max +LL reaction	7.32	7.32
Max +total reaction (factored)	18.26	18.26

PRCNC20221036

DEFLECTIONS:

								Ratio
Initial load (in)	at 13.54 ft	=	-0.486	L/D	=	669		
Live load (in)	at 13.54 ft	=	-0.263	L/D	=	1235	> 360	0.29
Post Comp load (in)	at 13.54 ft	=	-0.289	L/D	=	1124	> 240	0.21
Net Total load (in)	at 13.54 ft	=	-0.775	L/D	=	419	> 240	0.57

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 2 **Beam Number = 111**

SPAN INFORMATION (ft): I-End (170.54,98.05) J-End (185.35,102.02)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 15.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	46.00	Y bar(in)	=	15.88
Mnf (kip-ft)	=	373.92	Mn (kip-ft)	=	285.97
C (kips)	=	120.61	PNA (in)	=	12.67
Ieff (in4)	=	703.19	Itr (in4)	=	1018.65
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 30.09

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.557	0.492	0.819	0.0%	Red	0.000	0.205
	15.333	0.427	0.377	0.628			0.000	0.157
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 14.23 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	24.7	7.5	0.0	1.00	0.90	165.75
	Init DL	1.4DL	18.9	7.5	---	---		
	Max +	1.2DL+1.6LL	52.3	7.5	---	---	0.90	257.37
Controlling		1.2DL+1.6LL	52.3	7.5	---	---	0.90	257.37

REACTIONS (kips):

	Left	Right
Initial reaction	5.12	4.71
DL reaction	4.14	3.81
Max +LL reaction	5.79	5.30
Max +total reaction (factored)	14.23	13.05

DEFLECTIONS: **Ratio**

Initial load (in) at 7.67 ft = -0.066 L/D = 2806
Live load (in) at 7.67 ft = -0.044 L/D = 4169 > PRCNC20221036

Post Comp load (in)	at	7.67 ft	=	-0.048	L/D	=	3861	>	240	0.06
Net Total load (in)	at	7.67 ft	=	-0.113	L/D	=	1625	>	240	0.15

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 112**

SPAN INFORMATION (ft): I-End (185.35,102.02) J-End (192.77,74.33)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	86.00	Y bar(in)	=	20.42
Mnf (kip-ft)	=	774.64	Mn (kip-ft)	=	654.12
C (kips)	=	279.98	PNA (in)	=	18.35
Ieff (in4)	=	2055.53	Itr (in4)	=	2690.50
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 92 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 28.79

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.556	9.17	8.13	12.94	22.3	0.00	0.00	0.0	0.00	Snow	0.00	3.23
9.556	5.07	4.49	7.33	22.3	0.00	0.00	0.0	0.00	Snow	0.00	1.83
19.111	9.17	8.13	12.94	22.3	0.00	0.00	0.0	0.00	Snow	0.00	3.23
19.111	5.07	4.49	7.33	22.3	0.00	0.00	0.0	0.00	Snow	0.00	1.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	28.666	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 43.04 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	227.6	14.3	9.6	1.00	0.90	272.14
	Init DL	1.4DL	175.2	14.3	---	---		
	Max +	1.2DL+1.6LL	409.4	14.3	---	---	0.90	588.71
Controlling		1.2DL+1.6LL	227.6	14.3	9.6	1.00	0.90	272.14

REACTIONS (kips):

	Left	Right
Initial reaction	18.32	18.32
DL reaction	14.87	14.87

PRCNC20221036

	Left	Right
Max +LL reaction	15.74	15.74
Max +total reaction (factored)	43.04	43.04

DEFLECTIONS:

										Ratio
Initial load (in)	at	14.33 ft	=	-0.773	L/D	=	445			
Live load (in)	at	14.33 ft	=	-0.382	L/D	=	902	>	360	0.40
Post Comp load (in)	at	14.33 ft	=	-0.421	L/D	=	817	>	240	0.29
Net Total load (in)	at	14.33 ft	=	-1.194	L/D	=	288	>	240	0.83

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 113**

SPAN INFORMATION (ft): I-End (139.32,60.01) J-End (168.30,67.77)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	52.50	Y bar(in)	=	16.19
Mnf (kip-ft)	=	378.78	Mn (kip-ft)	=	343.49
C (kips)	=	258.45	PNA (in)	=	15.47
Ieff (in4)	=	913.33	Itr (in4)	=	1047.39
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 52 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 67.30

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	30.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	30.000	0.325	0.287	0.478			0.000	0.119
3	0.000	0.043	0.038	0.063	0.0%	Red	0.000	0.016
	30.000	0.042	0.037	0.062			0.000	0.016
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	30.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 20.23 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	71.6	15.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	55.2	15.0	---	---		
	Max +	1.2DL+1.6LL	151.7	15.0	---	---	0.90	309.14
Controlling		1.2DL+1.6LL	151.7	15.0	---	---	0.90	309.14

REACTIONS (kips):

	Left	Right
Initial reaction	7.28	7.28
DL reaction	6.05	6.05
Max +LL reaction	8.10	8.10
Max +total reaction (factored)	20.23	20.23

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at 15.00 ft	=	-0.731	L/D	=	492				
Live load (in)	at 15.00 ft	=	-0.372	L/D	=	968	>	360		0.37
Post Comp load (in)	at 15.00 ft	=	-0.408	L/D	=	882	>	240		0.27
Net Total load (in)	at 15.00 ft	=	-1.140	L/D	=	316	>	240		0.76

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 114**

SPAN INFORMATION (ft): I-End (112.27,52.76) J-End (139.32,60.01)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	49.50	Y bar(in)	=	16.05
Mnf (kip-ft)	=	376.69	Mn (kip-ft)	=	337.07
C (kips)	=	241.22	PNA (in)	=	15.44
Ieff (in4)	=	882.55	Itr (in4)	=	1034.75
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 52 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 62.81

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	28.000	0.010	0.000	0.000			0.000	0.000
2	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	28.000	0.325	0.287	0.478			0.000	0.119
3	0.000	0.042	0.038	0.063	0.0%	Red	0.000	0.016
	28.000	0.042	0.038	0.063			0.000	0.016
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.88 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	62.4	14.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	48.1	14.0	---	---		
	Max +	1.2DL+1.6LL	132.2	14.0	---	---	0.90	303.36
Controlling		1.2DL+1.6LL	132.2	14.0	---	---	0.90	303.36

REACTIONS (kips):

	Left	Right
Initial reaction	6.79	6.79
DL reaction	5.65	5.65
Max +LL reaction	7.56	7.56
Max +total reaction (factored)	18.88	18.88

PRCNC20221036

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.00 ft	=	-0.555	L/D	=	605			
Live load (in)	at 14.00 ft	=	-0.292	L/D	=	1151	>	360	0.31
Post Comp load (in)	at 14.00 ft	=	-0.321	L/D	=	1048	>	240	0.23
Net Total load (in)	at 14.00 ft	=	-0.876	L/D	=	384	>	240	0.63

PRCNC20221036

Floor Type: Level 2 **Beam Number = 115**

SPAN INFORMATION (ft): I-End (84.58,45.34) J-End (112.27,52.76)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	50.50	Y bar(in)	=	16.10
Mnf (kip-ft)	=	377.42	Mn (kip-ft)	=	337.35
C (kips)	=	241.22	PNA (in)	=	15.44
Ieff (in4)	=	885.98	Itr (in4)	=	1039.08
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Full = 52 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 62.81

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	28.666	0.010	0.000	0.000			0.000	0.000
2	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	28.666	0.325	0.287	0.478			0.000	0.119
3	0.000	0.042	0.037	0.062	0.0%	Red	0.000	0.016
	28.666	0.043	0.038	0.063			0.000	0.016
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.666	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 19.33 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	65.4	14.3	0.0	1.00	0.90	165.75
	Init DL	1.4DL	50.4	14.3	---	---		
	Max +	1.2DL+1.6LL	138.5	14.3	---	---	0.90	303.62
Controlling		1.2DL+1.6LL	138.5	14.3	---	---	0.90	303.62

REACTIONS (kips):

	Left	Right
Initial reaction	6.96	6.96
DL reaction	5.78	5.78
Max +LL reaction	7.74	7.74
Max +total reaction (factored)	19.33	19.33

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

										Ratio
Initial load (in)	at	14.33 ft	=	-0.610	L/D	=	564			
Live load (in)	at	14.33 ft	=	-0.320	L/D	=	1077	>	360	0.33
Post Comp load (in)	at	14.33 ft	=	-0.351	L/D	=	980	>	240	0.24
Net Total load (in)	at	14.33 ft	=	-0.961	L/D	=	358	>	240	0.67

Floor Type: Level 2 **Beam Number = 116**

SPAN INFORMATION (ft): I-End (77.17,73.03) J-End (104.86,80.45)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	48.60	Y bar(in)	=	16.01
Mnf (kip-ft)	=	376.02	Mn (kip-ft)	=	325.35
C (kips)	=	206.76	PNA (in)	=	15.38
Ieff (in4)	=	836.48	Itr (in4)	=	1030.76
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 56 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 48.49

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
18.250	0.66	0.59	0.82	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.20

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	18.250	0.010	0.000	0.000			0.000	0.000
2	0.000	0.042	0.037	0.062	0.0%	Red	0.000	0.016
	17.616	0.043	0.038	0.063			0.000	0.016
3	17.626	0.043	0.038	0.063	0.0%	Red	0.000	0.016
	18.250	0.000	0.000	0.000			0.000	0.000
4	18.251	0.178	0.158	0.262	0.0%	Red	0.000	0.066
	27.260	0.178	0.157	0.262			0.000	0.066
5	27.260	0.178	0.157	0.262	0.0%	Red	0.000	0.066
	28.666	0.000	0.000	0.000			0.000	0.000
6	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	28.666	0.325	0.287	0.478			0.000	0.119
7	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.666	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 24.21 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Gravity Beam Design

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	77.2	15.6	0.0	1.00	0.90	165.75
	Init DL	1.4DL	59.5	15.6	---	---		
	Max +	1.2DL+1.6LL	162.9	15.5	---	---	0.90	292.81
Controlling		1.2DL+1.6LL	157.9	18.3	---	---	0.90	281.47

REACTIONS (kips):

	Left	**Right**
Initial reaction	7.56	8.75
DL reaction	6.25	7.14
Max +LL reaction	8.41	9.77
Max +total reaction (factored)	20.96	24.21

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.48 ft	=	-0.720	L/D	=	477			
Live load (in)	at 14.48 ft	=	-0.399	L/D	=	861	>	360	0.42
Post Comp load (in)	at 14.48 ft	=	-0.436	L/D	=	789	>	240	0.30
Net Total load (in)	at 14.48 ft	=	-1.156	L/D	=	298	>	240	0.81

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 117**

SPAN INFORMATION (ft): I-End (104.86,80.45) J-End (131.90,87.70)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	73.50	Y bar(in)	=	16.88
Mnf (kip-ft)	=	388.61	Mn (kip-ft)	=	341.77
C (kips)	=	241.22	PNA (in)	=	15.44
Ieff (in4)	=	945.82	Itr (in4)	=	1114.58
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 52 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 62.80

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.178	0.157	0.262	1.1%	Red	0.000	0.066
	26.949	0.179	0.158	0.262			0.000	0.066
2	26.950	0.178	0.158	0.262	1.1%	Red	0.000	0.066
	28.000	0.000	0.000	0.000			0.000	0.000
3	0.000	0.325	0.287	0.478	1.1%	Red	0.000	0.119
	28.000	0.325	0.287	0.478			0.000	0.119
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 25.29 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	84.3	14.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	64.5	14.0	---	---		
	Max +	1.2DL+1.6LL	177.0	14.0	---	---	0.90	307.59
Controlling		1.2DL+1.6LL	177.0	14.0	---	---	0.90	307.59

REACTIONS (kips):

	Left	Right
Initial reaction	9.17	9.06
DL reaction	7.41	7.32
Max +LL reaction	10.25	10.12
Max +total reaction (factored)	25.29	24.97

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

									Ratio
Initial load (in)	at 14.00 ft	=	-0.745	L/D	=	451			
Live load (in)	at 14.00 ft	=	-0.369	L/D	=	910	>	360	0.40
Post Comp load (in)	at 14.00 ft	=	-0.399	L/D	=	842	>	240	0.28
Net Total load (in)	at 14.00 ft	=	-1.144	L/D	=	294	>	240	0.82

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 118**

SPAN INFORMATION (ft): I-End (131.90,87.70) J-End (160.88,95.46)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	56.26	Y bar(in)	=	17.34
Mnf (kip-ft)	=	539.30	Mn (kip-ft)	=	444.13
C (kips)	=	198.14	PNA (in)	=	15.45
Ieff (in4)	=	1193.85	Itr (in4)	=	1612.50
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 60 Partial = 47 Actual = 47
Number of Stud Rows = 2 Percent of Full Composite Action = 25.21

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
24.861	18.48	16.49	24.93	25.7	0.00	0.00	0.0	0.00	Snow	0.00	6.23
24.861	0.61	0.56	0.61	25.7	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.243	0.214	0.357	25.7%	Red	0.000	0.089
	24.861	0.031	0.028	0.046			0.000	0.011
2	24.861	0.361	0.319	0.531	25.7%	Red	0.000	0.133
	27.319	0.340	0.300	0.500			0.000	0.125
3	27.320	0.340	0.300	0.500	25.7%	Red	0.000	0.125
	30.000	0.000	0.000	0.000			0.000	0.000
4	0.000	0.325	0.287	0.478	25.7%	Red	0.000	0.119
	22.300	0.325	0.287	0.478			0.000	0.119
5	22.301	0.325	0.287	0.478	25.7%	Red	0.000	0.119
	24.861	0.000	0.000	0.000			0.000	0.000
6	24.861	0.325	0.287	0.478	25.7%	Red	0.000	0.119
	30.000	0.325	0.287	0.478			0.000	0.119
7	0.000	0.035	0.035	0.000	---	NonR	0.000	0.000
	30.000	0.035	0.035	0.000			0.000	0.000

Gravity Beam Design

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 64.75 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	182.0	21.7	0.0	1.00	0.90	249.38
	Init DL	1.4DL	141.3	21.7	---	---		
	Max +	1.2DL+1.6LL	316.9	21.6	---	---	0.90	399.72
Controlling		1.2DL+1.6LL	311.9	24.9	---	---	0.90	355.75

REACTIONS (kips):

	Left	**Right**
Initial reaction	13.65	28.40
DL reaction	11.08	23.11
Max +LL reaction	11.22	23.13
Max +total reaction (factored)	31.25	64.75

DEFLECTIONS: (Camber = 3/4)

								Ratio
Initial load (in)	at 16.05 ft	=	-1.089	L/D	=	331		
Live load (in)	at 15.90 ft	=	-0.524	L/D	=	688	> 360	0.52
Post Comp load (in)	at 15.90 ft	=	-0.580	L/D	=	621	> 240	0.39
Net Total load (in)	at 15.90 ft	=	-0.919	L/D	=	392	> 240	0.61

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 119**

SPAN INFORMATION (ft): I-End (160.88,95.46) J-End (164.24,82.91)

Beam Size (User Selected) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 13.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	39.00	Y bar(in)	=	13.00
Mnf (kip-ft)	=	269.75	Mn (kip-ft)	=	188.44
C (kips)	=	86.15	PNA (in)	=	9.46
Ieff (in4)	=	384.13	Itr (in4)	=	598.41
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Max = 34 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 26.36

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
8.000	2.61	2.31	3.75	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.94
9.556	10.43	9.28	14.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	3.58

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	13.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.85 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	52.2	9.6	3.4	1.67	0.90	109.88
	Init DL	1.4DL	40.3	9.6	---	---		
	Max +	1.2DL+1.6LL	109.5	9.6	---	---	0.90	169.60
Controlling		1.2DL+1.6LL	109.5	9.6	---	---	0.90	169.60

REACTIONS (kips):

	Left	Right
Initial reaction	4.80	11.60
DL reaction	3.91	9.42
Max +LL reaction	5.24	12.84
Max +total reaction (factored)	13.08	31.85

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.15 ft	=	-0.159	L/D	=	979			
Live load (in)	at	7.15 ft	=	-0.099	L/D	=	1573	>	360	0.23
Post Comp load (in)	at	7.15 ft	=	-0.107	L/D	=	1456	>	240	0.16
Net Total load (in)	at	7.15 ft	=	-0.266	L/D	=	585	>	240	0.41

Floor Type: Level 2 **Beam Number = 120**

SPAN INFORMATION (ft): I-End (103.50,85.52) J-End (112.27,52.76)

Beam Size (User Selected) = W24X55 Fy = 50.0 ksi
Total Beam Length (ft) = 33.92
Cantilever on left (ft) = 5.25

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	86.00	Y bar(in)	=	22.22
Mnf (kip-ft)	=	1044.73	Mn (kip-ft)	=	807.20
C (kips)	=	215.37	PNA (in)	=	17.25
Ieff (in4)	=	2699.86	Itr (in4)	=	3967.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 114 Partial = 29 Actual = 29
Number of Stud Rows = 1 Percent of Full Composite Action = 26.33

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
0.000	5.38	4.82	6.98	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.74
0.000	1.30	1.16	1.71	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.43
14.806	9.46	8.39	13.38	29.4	0.00	0.00	0.0	0.00	Snow	0.00	3.34
14.806	9.70	8.60	13.70	29.4	0.00	0.00	0.0	0.00	Snow	0.00	3.42
24.361	9.46	8.39	13.38	29.4	0.00	0.00	0.0	0.00	Snow	0.00	3.34
24.361	9.70	8.60	13.70	29.4	0.00	0.00	0.0	0.00	Snow	0.00	3.42

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.048	0.042	0.070	0.0%	Red	0.000	0.018
	5.250	0.048	0.042	0.070			0.000	0.018
2	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	5.250	0.055	0.055	0.000			0.000	0.000
3	5.250	0.055	0.055	0.000	---	NonR	0.000	0.000
	33.916	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 58.64 kips 0.90Vn = 251.69 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Left	PreCmp-	1.2DL+1.6LL	-57.9	5.2	5.2	1.00	0.90	491.05
	Max -	1.2DL+1.6LL	-118.2	5.2	5.2	1.00	(	

PRCNC20221036

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
Center	PreCmp+	1.2DL+1.6LL	291.3	24.4	9.6	1.02	0.90	402.05
	PreCmp-	1.2DL+1.6LL	-57.9	5.3	9.6	2.14	0.90	502.50
	Init DL	1.4DL	219.2	24.4	---	---		
	Max +	1.2DL+1.6LL	503.3	24.4	---	---	0.90	726.48
	Max -	1.2DL+1.6LL	-118.2	5.3	9.6	2.22	0.90	502.50
Controlling		1.2DL+1.6LL	291.3	24.4	9.6	1.02	0.90	402.05

REACTIONS (kips):

	Left	**Right**
Initial reaction	34.85	23.01
DL reaction	28.44	18.68
Max +LL reaction	29.79	19.11
Max -LL reaction	0.00	-1.62
Max +total reaction (factored)	81.78	52.99

DEFLECTIONS:

Left cantilever:

							Ratio
Init load (in)	= 0.287	L/D	=	440			
Pos Live load (in)	= -0.070	L/D	=	1792	>	360	0.20
Neg Live load (in)	= 0.202	L/D	=	623	>	360	0.58
Pos Post Comp load (in)	= -0.053	L/D	=	2376	>	240	0.10
Neg Post Comp load (in)	= 0.219	L/D	=	574	>	240	0.42
Neg Total load (in)	= 0.506	L/D	=	249	>	240	0.96

Center span:

Initial load (in)	at 19.73 ft	=	-0.575	L/D	=	599			
Live load (in)	at 19.73 ft	=	-0.353	L/D	=	976	>	360	0.37
Post Comp load (in)	at 19.73 ft	=	-0.388	L/D	=	886	>	240	0.27
Net Total load (in)	at 19.73 ft	=	-0.963	L/D	=	357	>	240	0.67

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 121**

SPAN INFORMATION (ft): I-End (131.90,87.70) J-End (139.32,60.01)

Beam Size (User Selected) = W24X55 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	86.00	Y bar(in)	=	22.22
Mnf (kip-ft)	=	1044.73	Mn (kip-ft)	=	889.10
C (kips)	=	323.06	PNA (in)	=	19.98
Ieff (in4)	=	3003.24	Itr (in4)	=	3967.81
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 114 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 26.69

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
9.556	10.24	9.09	14.33	30.0	0.00	0.00	0.0	0.00	Snow	0.00	3.58
9.556	9.46	8.39	13.38	30.0	0.00	0.00	0.0	0.00	Snow	0.00	3.34
19.111	10.22	9.07	14.35	30.0	0.00	0.00	0.0	0.00	Snow	0.00	3.59
19.111	9.46	8.39	13.38	30.0	0.00	0.00	0.0	0.00	Snow	0.00	3.34

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	28.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 55.64 kips 0.90Vn = 251.69 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	313.1	14.2	9.6	1.00	0.90	395.64
	Init DL	1.4DL	241.7	14.2	---	---		
	Max +	1.2DL+1.6LL	529.4	14.3	---	---	0.90	800.19
Controlling		1.2DL+1.6LL	313.1	14.2	9.6	1.00	0.90	395.64

REACTIONS (kips):

	Left	Right
Initial reaction	25.20	25.19
DL reaction	20.48	20.48

PRCNC20221036

	Left	Right
Max +LL reaction	19.41	19.42
Max +total reaction (factored)	55.64	55.64

DEFLECTIONS:

										Ratio
Initial load (in)	at	14.33 ft	=	-0.666	L/D	=	516			
Live load (in)	at	14.33 ft	=	-0.322	L/D	=	1068	>	360	0.34
Post Comp load (in)	at	14.33 ft	=	-0.359	L/D	=	958	>	240	0.25
Net Total load (in)	at	14.33 ft	=	-1.025	L/D	=	336	>	240	0.72

PRCNC20221036

Floor Type: Level 2 **Beam Number = 122**

SPAN INFORMATION (ft): I-End (79.64,63.80) J-End (107.33,71.22)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 86.00	Y bar(in)	=	17.17
Mnf (kip-ft)	= 392.19	Mn (kip-ft)	=	336.67
C (kips)	= 223.99	PNA (in)	=	15.41
Ieff (in4)	= 944.10	Itr (in4)	=	1143.05
Stud length (in)	= 4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Full = 53 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 58.33

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.000	0.48	0.43	0.60	10.2	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	0.478	10.2%	Red	0.000	0.119
	28.666	0.325	0.287	0.478			0.000	0.119
2	0.000	0.162	0.143	0.239	10.2%	Red	0.000	0.060
	5.000	0.162	0.143	0.239			0.000	0.060
3	5.000	0.325	0.287	0.478	10.2%	Red	0.000	0.119
	28.666	0.325	0.287	0.478			0.000	0.119
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.666	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.32 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	113.4	14.3	0.0	1.00	0.90	165.75
	Init DL	1.4DL	86.5	14.3	---	---		
	Max +	1.2DL+1.6LL	224.6	14.3	---	---	0.90	303.00
Controlling		1.2DL+1.6LL	224.6	14.3	---	---	0.90	303.00

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	11.57	12.03
DL reaction	9.34	9.70
Max +LL reaction	11.76	12.30
Max +total reaction (factored)	30.03	31.32

DEFLECTIONS: (Camber = 3/4)

									Ratio
Initial load (in)	at 14.33 ft	=	-1.047	L/D	=	329			
Live load (in)	at 14.33 ft	=	-0.476	L/D	=	723	>	360	0.50
Post Comp load (in)	at 14.33 ft	=	-0.518	L/D	=	664	>	240	0.36
Net Total load (in)	at 14.33 ft	=	-0.815	L/D	=	422	>	240	0.57

Floor Type: Level 2 **Beam Number = 123**

SPAN INFORMATION (ft): I-End (82.11,54.57) J-End (109.80,61.99)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	86.00	Y bar(in)	=	17.17
Mnf (kip-ft)	=	392.19	Mn (kip-ft)	=	336.67
C (kips)	=	223.99	PNA (in)	=	15.41
Ieff (in4)	=	944.10	Itr (in4)	=	1143.05
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 53 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 58.33

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.000	0.48	0.43	0.60	10.2	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.162	0.143	0.239	10.2%	Red	0.000	0.060
	5.000	0.162	0.143	0.239			0.000	0.060
2	5.000	0.325	0.287	0.478	10.2%	Red	0.000	0.119
	28.666	0.325	0.287	0.478			0.000	0.119
3	0.000	0.325	0.287	0.478	10.2%	Red	0.000	0.119
	28.666	0.325	0.287	0.478			0.000	0.119
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.666	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 31.32 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	113.4	14.3	0.0	1.00	0.90	165.75
	Init DL	1.4DL	86.5	14.3	---	---		
	Max +	1.2DL+1.6LL	224.6	14.3	---	---	0.90	303.00
Controlling		1.2DL+1.6LL	224.6	14.3	---	---	0.90	303.00

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	11.57	12.03
DL reaction	9.34	9.70
Max +LL reaction	11.76	12.30
Max +total reaction (factored)	30.03	31.32

DEFLECTIONS: (Camber = 3/4)

									Ratio
Initial load (in)	at 14.33 ft	=	-1.047	L/D	=	329			
Live load (in)	at 14.33 ft	=	-0.476	L/D	=	723	>	360	0.50
Post Comp load (in)	at 14.33 ft	=	-0.518	L/D	=	664	>	240	0.36
Net Total load (in)	at 14.33 ft	=	-0.815	L/D	=	422	>	240	0.57

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 124**

SPAN INFORMATION (ft): I-End (107.33,71.22) J-End (134.37,78.47)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	84.00	Y bar(in)	=	17.12
Mnf (kip-ft)	=	391.69	Mn (kip-ft)	=	342.98
C (kips)	=	241.22	PNA (in)	=	15.44
Ieff (in4)	=	965.09	Itr (in4)	=	1138.89
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 52 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 62.81

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.650	0.573	0.956	10.2%	Red	0.000	0.239
	28.000	0.650	0.573	0.956			0.000	0.239
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 30.59 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	108.0	14.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	82.2	14.0	---	---		
	Max +	1.2DL+1.6LL	214.1	14.0	---	---	0.90	308.68
Controlling		1.2DL+1.6LL	214.1	14.0	---	---	0.90	308.68

REACTIONS (kips):

	Left	Right
Initial reaction	11.74	11.74
DL reaction	9.46	9.46
Max +LL reaction	12.02	12.02
Max +total reaction (factored)	30.59	30.59

DEFLECTIONS: (Camber = 3/4) **Ratio**

Initial load (in) at 14.00 ft = -0.950 L/D = 354
Live load (in) at 14.00 ft = -0.424 L/D = 792 > PRCNC20221036

Post Comp load (in)	at	14.00 ft	=	-0.462	L/D	=	727	>	240	0.33
Net Total load (in)	at	14.00 ft	=	-0.662	L/D	=	508	>	240	0.47

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 125**

SPAN INFORMATION (ft): I-End (109.80,61.99) J-End (136.85,69.24)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	84.00	Y bar(in)	=	17.12
Mnf (kip-ft)	=	391.69	Mn (kip-ft)	=	342.98
C (kips)	=	241.22	PNA (in)	=	15.44
Ieff (in4)	=	965.09	Itr (in4)	=	1138.89
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 52 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 62.81

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.650	0.573	0.956	10.2%	Red	0.000	0.239
	28.000	0.650	0.573	0.956			0.000	0.239
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 30.59 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	108.0	14.0	0.0	1.00	0.90	165.75
	Init DL	1.4DL	82.2	14.0	---	---		
	Max +	1.2DL+1.6LL	214.1	14.0	---	---	0.90	308.68
Controlling		1.2DL+1.6LL	214.1	14.0	---	---	0.90	308.68

REACTIONS (kips):

	Left	Right
Initial reaction	11.74	11.74
DL reaction	9.46	9.46
Max +LL reaction	12.02	12.02
Max +total reaction (factored)	30.59	30.59

DEFLECTIONS: (Camber = 3/4) **Ratio**

Initial load (in)	at 14.00 ft	=	-0.950	L/D	=	354	
Live load (in)	at 14.00 ft	=	-0.424	L/D	=	792	> PRCNC20221036

Post Comp load (in)	at 14.00 ft	=	-0.462	L/D	=	727	>	240	0.33
Net Total load (in)	at 14.00 ft	=	-0.662	L/D	=	508	>	240	0.47

PRCNC20221036

Floor Type: Level 2 **Beam Number = 126**

SPAN INFORMATION (ft): I-End (134.37,78.47) J-End (163.35,86.23)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	17.24
Mnf (kip-ft)	=	393.12	Mn (kip-ft)	=	343.55
C (kips)	=	241.22	PNA (in)	=	15.44
Ieff (in4)	=	974.65	Itr (in4)	=	1150.96
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Full = 53 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 62.82

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
22.301	0.61	0.56	0.61	12.4	0.00	0.00	0.0	0.00	Snow	0.00	0.15
22.301	0.61	0.56	0.61	12.4	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	0.478	12.4%	Red	0.000	0.119
	30.000	0.325	0.287	0.478			0.000	0.119
2	22.301	0.000	0.000	0.000	12.4%	Red	0.000	0.000
	24.861	0.325	0.287	0.478			0.000	0.119
3	24.861	0.325	0.287	0.478	12.4%	Red	0.000	0.119
	30.000	0.325	0.287	0.478			0.000	0.119
4	0.000	0.325	0.287	0.478	12.4%	Red	0.000	0.119
	19.740	0.325	0.287	0.478			0.000	0.119
5	19.741	0.325	0.287	0.478	12.4%	Red	0.000	0.119
	22.300	0.000	0.000	0.000			0.000	0.000
6	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	30.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 32.62 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	125.8	15.1	0.0	1.00	(	PRCNC20221036

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
	Init DL	1.4DL	96.5	15.2	---	---		
	Max +	1.2DL+1.6LL	243.8	15.1	---	---	0.90	309.19
Controlling		1.2DL+1.6LL	243.8	15.1	---	---	0.90	309.19

REACTIONS (kips):

	Left	**Right**
Initial reaction	12.68	12.87
DL reaction	10.24	10.43
Max +LL reaction	12.56	12.56
Max +total reaction (factored)	32.39	32.62

DEFLECTIONS: **(Camber = 1)**

									Ratio
Initial load (in)	at 15.00 ft	=	-1.283	L/D	=	281			
Live load (in)	at 15.00 ft	=	-0.540	L/D	=	666	>	360	0.54
Post Comp load (in)	at 15.00 ft	=	-0.589	L/D	=	611	>	240	0.39
Net Total load (in)	at 15.00 ft	=	-0.872	L/D	=	413	>	240	0.58

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 127**

SPAN INFORMATION (ft): I-End (136.85,69.24) J-End (165.83,77.00)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	90.00	Y bar(in)	=	17.24
Mnf (kip-ft)	=	393.12	Mn (kip-ft)	=	343.55
C (kips)	=	241.22	PNA (in)	=	15.44
Ieff (in4)	=	974.65	Itr (in4)	=	1150.96
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 55 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 60.63

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
19.740	0.61	0.56	0.61	12.4	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	0.478	12.4%	Red	0.000	0.119
	19.740	0.325	0.287	0.478			0.000	0.119
2	19.741	0.000	0.000	0.000	12.4%	Red	0.000	0.000
	22.300	0.325	0.287	0.478			0.000	0.119
3	22.301	0.325	0.287	0.478	12.4%	Red	0.000	0.119
	30.000	0.325	0.287	0.478			0.000	0.119
4	0.000	0.325	0.287	0.478	12.4%	Red	0.000	0.119
	30.000	0.325	0.287	0.478			0.000	0.119
5	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	30.000	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 32.38 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	125.4	15.1	0.0	1.00	0.90	165.75
	Init DL	1.4DL	96.1	15.1	---	---		
	Max +	1.2DL+1.6LL	243.8	15.1	---	---	0.90	309.19
Controlling		1.2DL+1.6LL	243.8	15.1	---	---	(	

PRCNC20221036

REACTIONS (kips):

	Left	**Right**
Initial reaction	12.66	12.69
DL reaction	10.22	10.26
Max +LL reaction	12.58	12.55
Max +total reaction (factored)	32.38	32.38

DEFLECTIONS: (Camber = 1)

								Ratio
Initial load (in)	at 15.00 ft	=	-1.273	L/D	=	283		
Live load (in)	at 15.00 ft	=	-0.541	L/D	=	666	> 360	0.54
Post Comp load (in)	at 15.00 ft	=	-0.590	L/D	=	610	> 240	0.39
Net Total load (in)	at 15.00 ft	=	-0.863	L/D	=	417	> 240	0.58

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 128**

SPAN INFORMATION (ft): I-End (173.01,88.82) J-End (187.82,92.79)

Beam Size (Optimum) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	46.00	Y bar(in)	=	12.05
Mnf (kip-ft)	=	139.12	Mn (kip-ft)	=	119.48
C (kips)	=	120.61	PNA (in)	=	9.73
Ieff (in4)	=	241.81	Itr (in4)	=	281.56
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 15 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 68.13

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.650	0.573	0.956	0.0%	Red	0.000	0.239
	15.333	0.650	0.573	0.956			0.000	0.239
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	15.333	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.81 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	31.9	7.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	24.1	7.7	---	---		
	Max +	1.2DL+1.6LL	68.3	7.7	---	---	0.90	107.53
Controlling		1.2DL+1.6LL	31.9	7.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	6.32	6.32
DL reaction	5.07	5.07
Max +LL reaction	7.33	7.33
Max +total reaction (factored)	17.81	17.81

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.67 ft	=	-0.467	L/D	=	394
Live load (in)	at	7.67 ft	=	-0.169	L/D	=	1086 > PRCNC20221036

Post Comp load (in)	at	7.67 ft	=	-0.183	L/D	=	1005	>	240	0.24
Net Total load (in)	at	7.67 ft	=	-0.650	L/D	=	283	>	240	0.85

Floor Type: Level 2 **Beam Number = 129**

SPAN INFORMATION (ft): I-End (175.48,79.59) J-End (190.30,83.56)

Beam Size (Optimum) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 15.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	46.00	Y bar(in)	=	12.05
Mnf (kip-ft)	=	139.12	Mn (kip-ft)	=	119.48
C (kips)	=	120.61	PNA (in)	=	9.73
Ieff (in4)	=	241.81	Itr (in4)	=	281.56
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 15 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 68.13

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.650	0.573	0.956	0.0%	Red	0.000	0.239
	15.333	0.650	0.573	0.956			0.000	0.239
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	15.333	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.81 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	31.9	7.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	24.1	7.7	---	---		
	Max +	1.2DL+1.6LL	68.3	7.7	---	---	0.90	107.53
Controlling		1.2DL+1.6LL	31.9	7.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	6.32	6.32
DL reaction	5.07	5.07
Max +LL reaction	7.33	7.33
Max +total reaction (factored)	17.81	17.81

DEFLECTIONS: **Ratio**

Initial load (in)	at	7.67 ft	=	-0.467	L/D	=	394
Live load (in)	at	7.67 ft	=	-0.169	L/D	=	1086 > PRCNC20221036

Post Comp load (in)	at	7.67 ft	=	-0.183	L/D	=	1005	>	240	0.24
Net Total load (in)	at	7.67 ft	=	-0.650	L/D	=	283	>	240	0.85

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 130**

SPAN INFORMATION (ft): I-End (187.82,92.79) J-End (213.98,99.80)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	81.25	Y bar(in)	=	17.07
Mnf (kip-ft)	=	390.96	Mn (kip-ft)	=	336.25
C (kips)	=	223.99	PNA (in)	=	15.41
Ieff (in4)	=	936.40	Itr (in4)	=	1132.95
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 54 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 58.27

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
22.083	0.48	0.43	0.60	8.3	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	0.478	8.3%	Red	0.000	0.119
	27.083	0.325	0.287	0.478			0.000	0.119
2	0.000	0.325	0.287	0.478	8.3%	Red	0.000	0.119
	22.083	0.325	0.287	0.478			0.000	0.119
3	22.084	0.162	0.143	0.239	8.3%	Red	0.000	0.060
	27.083	0.162	0.143	0.239			0.000	0.060
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	27.083	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.99 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	101.2	13.6	0.0	1.00	0.90	165.75
	Init DL	1.4DL	77.2	13.6	---	---		
	Max +	1.2DL+1.6LL	203.1	13.5	---	---	0.90	302.63
Controlling		1.2DL+1.6LL	203.1	13.5	---	---	0.90	302.63

REACTIONS (kips):

	Left	Right
Initial reaction	11.37	10.90
DL reaction	9.17	8.81
Max +LL reaction	11.87	11.32
Max +total reaction (factored)	29.99	28.68

DEFLECTIONS:

									Ratio
Initial load (in)	at 13.54 ft	=	-0.834	L/D	=	390			
Live load (in)	at 13.54 ft	=	-0.390	L/D	=	832	>	360	0.43
Post Comp load (in)	at 13.54 ft	=	-0.425	L/D	=	766	>	240	0.31
Net Total load (in)	at 13.54 ft	=	-1.259	L/D	=	258	>	240	0.93

Floor Type: Level 2 **Beam Number = 131**

SPAN INFORMATION (ft): I-End (190.30,83.56) J-End (216.46,90.57)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 27.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	81.25	Y bar(in)	=	17.07
Mnf (kip-ft)	=	390.96	Mn (kip-ft)	=	336.25
C (kips)	=	223.99	PNA (in)	=	15.41
Ieff (in4)	=	936.40	Itr (in4)	=	1132.95
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 54 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 58.27

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
22.083	0.48	0.43	0.60	8.3	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	0.478	8.3%	Red	0.000	0.119
	22.083	0.325	0.287	0.478			0.000	0.119
2	22.084	0.162	0.143	0.239	8.3%	Red	0.000	0.060
	27.083	0.162	0.143	0.239			0.000	0.060
3	0.000	0.325	0.287	0.478	8.3%	Red	0.000	0.119
	27.083	0.325	0.287	0.478			0.000	0.119
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	27.083	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.99 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	101.2	13.6	0.0	1.00	0.90	165.75
	Init DL	1.4DL	77.2	13.6	---	---		
	Max +	1.2DL+1.6LL	203.1	13.5	---	---	0.90	302.63
Controlling		1.2DL+1.6LL	203.1	13.5	---	---	0.90	302.63

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	11.37	10.90
DL reaction	9.17	8.81
Max +LL reaction	11.87	11.32
Max +total reaction (factored)	29.99	28.68

DEFLECTIONS:

										Ratio
Initial load (in)	at	13.54 ft	=	-0.834	L/D	=	390			
Live load (in)	at	13.54 ft	=	-0.390	L/D	=	832	>	360	0.43
Post Comp load (in)	at	13.54 ft	=	-0.425	L/D	=	766	>	240	0.31
Net Total load (in)	at	13.54 ft	=	-1.259	L/D	=	258	>	240	0.93

Floor Type: Level 2 **Beam Number = 132**

SPAN INFORMATION (ft): I-End (164.24,82.91) J-End (173.90,85.49)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	11.48
Mnf (kip-ft)	=	134.67	Mn (kip-ft)	=	105.25
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	197.47	Itr (in4)	=	259.73
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 10 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.378	0.333	0.556	0.0%	Red	0.000	0.139
	10.000	0.378	0.333	0.556			0.000	0.139
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.78 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	8.0	5.0	0.0	1.00	0.90	46.90
	Init DL	1.4DL	6.0	5.0	---	---		
	Max +	1.2DL+1.6LL	17.0	5.0	---	---	0.90	94.72
Controlling		1.2DL+1.6LL	17.0	5.0	---	---	0.90	94.72

REACTIONS (kips):

	Left	Right
Initial reaction	2.42	2.42
DL reaction	1.95	1.95
Max +LL reaction	2.78	2.78
Max +total reaction (factored)	6.78	6.78

DEFLECTIONS: **Ratio**

Initial load (in)	at	5.00 ft	=	-0.050	L/D	=	2409	
Live load (in)	at	5.00 ft	=	-0.022	L/D	=	5497	> PRCNC20221036

Post Comp load (in)	at	5.00 ft	=	-0.024	L/D	=	5090	>	240	0.05
Net Total load (in)	at	5.00 ft	=	-0.073	L/D	=	1635	>	240	0.15

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 133**

SPAN INFORMATION (ft): I-End (165.83,77.00) J-End (175.48,79.59)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	11.48
Mnf (kip-ft)	=	134.67	Mn (kip-ft)	=	105.25
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	197.47	Itr (in4)	=	259.73
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 10 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.533	0.470	0.783	0.0%	Red	0.000	0.196
	10.000	0.533	0.470	0.783			0.000	0.196
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.53 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	11.1	5.0	0.0	1.00	0.90	46.90
	Init DL	1.4DL	8.4	5.0	---	---		
	Max +	1.2DL+1.6LL	23.8	5.0	---	---	0.90	94.72
Controlling		1.2DL+1.6LL	23.8	5.0	---	---	0.90	94.72

REACTIONS (kips):

	Left	Right
Initial reaction	3.39	3.39
DL reaction	2.72	2.72
Max +LL reaction	3.92	3.92
Max +total reaction (factored)	9.53	9.53

DEFLECTIONS: **Ratio**

Initial load (in)	at	5.00 ft	=	-0.070	L/D	=	1726
Live load (in)	at	5.00 ft	=	-0.031	L/D	=	3899 > PRCNC20221036

Post Comp load (in)	at	5.00 ft	=	-0.033	L/D	=	3610	>	240	0.07
Net Total load (in)	at	5.00 ft	=	-0.103	L/D	=	1168	>	240	0.21

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 134**

SPAN INFORMATION (ft): I-End (92.59,85.97) J-End (94.79,77.76)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.50
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.250	1.18	1.54	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	3.250	0.000	0.000	0.0%	Red	0.000
	8.500	0.048	0.070			0.000
2	3.250	0.014	0.021	0.0%	Red	0.000
	7.875	0.014	0.021			0.000
3	7.875	0.043	0.063	0.0%	Red	0.000
	8.500	0.000	0.000			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	8.500	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.63 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	8.5	3.2	3.2	1.66	0.90	46.90
Controlling		1.2DL+1.6LL	8.5	3.2	3.2	1.66	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.83	0.66
Max +LL reaction	1.02	0.82
Max +total reaction (factored)	2.63	2.10

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.04 ft	=	-0.018	L/D	=	5633			
Live load (in)	at	4.04 ft	=	-0.023	L/D	=	4500	>	360	0.08
Net Total load (in)	at	4.04 ft	=	-0.041	L/D	=	2502	>	240	0.10

PRCNC20221036

Gravity Beam Design

Bentley

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Level 2 **Beam Number = 135**

SPAN INFORMATION (ft): I-End (125.92,118.17) J-End (131.90,87.70)

Beam Size (User Selected) = W27X84 Fy = 50.0 ksi
Total Beam Length (ft) = 31.05
Mp (kip-ft) = 1016.6
7

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
7.389	2.44	3.27	25.2	0.00	0.00	0.0	0.00	Snow	0.00
8.450	8.14	11.43	25.2	0.00	0.00	0.0	0.00	Snow	0.00
16.900	6.93	9.68	25.2	0.00	0.00	0.0	0.00	Snow	0.00
17.854	2.79	3.63	25.2	0.00	0.00	0.0	0.00	Snow	0.00
23.524	5.34	7.36	25.2	0.00	0.00	0.0	0.00	Snow	0.00
25.789	5.47	7.41	25.2	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	25.2%	Red	0.000
	8.450	0.054	0.080			0.000
2	8.451	0.000	0.000	25.2%	Red	0.000
	16.900	0.054	0.080			0.000
3	16.901	0.000	0.000	25.2%	Red	0.000
	23.524	0.043	0.063			0.000
4	23.525	0.000	0.000	25.2%	Red	0.000
	31.050	0.048	0.071			0.000
5	7.940	0.045	0.067	25.2%	Red	0.000
	17.408	0.045	0.067			0.000
6	17.409	0.045	0.067	25.2%	Red	0.000
	17.853	0.000	0.000			0.000
7	7.389	0.000	0.000	25.2%	Red	0.000
	7.939	0.045	0.067			0.000
8	0.000	0.048	0.070	25.2%	Red	0.000
	7.388	0.000	0.000			0.000
9	17.854	0.054	0.079	25.2%	Red	0.000
	25.788	0.000	0.000			0.000
10	25.789	0.036	0.052	25.2%	Red	0.000
	31.050	0.000	0.000			0.000
11	0.000	0.084	0.000	---	NonR	0.000
	31.050	0.084	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 51.66 kips 1.00Vn = 368.46 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	462.1	16.9	0.0	1.00	0.90	915.00
Controlling		1.2DL+1.6LL	462.1	16.9	0.0	1.00	0.90	915.00

PRCNC20221036

Gravity Beam Design

REACTIONS (kips):

	Left	Right
DL reaction	16.54	18.90
Max +LL reaction	15.79	18.11
Max +total reaction (factored)	45.12	51.66

DEFLECTIONS:

									Ratio
Dead load (in)	at 15.68 ft	=	-0.342	L/D	=	1090			
Live load (in)	at 15.68 ft	=	-0.331	L/D	=	1126	>	360	0.32
Net Total load (in)	at 15.68 ft	=	-0.673	L/D	=	554	>	240	0.43

Floor Type: Level 2 **Beam Number = 136**

SPAN INFORMATION (ft): I-End (110.92,110.83) J-End (110.92,138.50)

Beam Size (User Selected) = W24X55 Fy = 50.0 ksi
Total Beam Length (ft) = 27.67
Cantilever on left (ft) = 7.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	43.50	Y bar(in)	=	19.72
Mnf (kip-ft)	=	920.46	Mn (kip-ft)	=	762.53
C (kips)	=	172.30	PNA (in)	=	16.16
Ieff (in4)	=	2586.85	Itr (in4)	=	3334.82
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 50 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 36.42

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
0.000	2.62	2.34	3.54	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.88
0.000	4.26	3.80	5.80	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.45
17.500	6.59	5.86	9.18	13.0	0.00	0.00	0.0	0.00	Snow	0.00	2.30
17.500	14.75	13.14	20.09	13.0	0.00	0.00	0.0	0.00	Snow	0.00	5.02

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	7.333	0.055	0.055	0.000			0.000	0.000
2	7.334	0.055	0.055	0.000	---	NonR	0.000	0.000
	27.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 42.30 kips 0.90Vn = 251.69 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Left	PreCmp-	1.2DL+1.6LL	-83.1	7.3	7.3	1.00	0.90	444.83
	Max -	1.2DL+1.6LL	-171.9	7.3	7.3	1.00	0.90	444.83
Center	PreCmp+	1.2DL+1.6LL	151.0	17.5	10.2	2.14	0.90	502.50
	PreCmp-	1.2DL+1.6LL	-83.1	7.3	10.2	2.28	0.90	502.50
	Init DL	1.4DL	106.7	17.5	---	---		
	Max +	1.2DL+1.6LL	309.5	17.5	---	---	(	

Gravity Beam Design

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
	Max -	1.2DL+1.6LL	-171.9	7.3	10.2	2.06	0.90	502.50
Controlling		1.2DL+1.6LL	309.5	17.5	---	---	0.90	686.28

REACTIONS (kips):

	Left	**Right**
Initial reaction	25.72	10.59
DL reaction	21.07	8.68
Max +LL reaction	25.44	12.73
Max -LL reaction	0.00	-3.37
Max +total reaction (factored)	65.98	30.78

DEFLECTIONS:

Left cantilever:

					Ratio
Init load (in)	= 0.027	L/D =	6576		
Pos Live load (in)	= -0.133	L/D =	1328	> 360	0.27
Neg Live load (in)	= 0.111	L/D =	1584	> 360	0.23
Pos Post Comp load (in)	= -0.133	L/D =	1324	> 240	0.18
Neg Post Comp load (in)	= 0.111	L/D =	1589	> 240	0.15
Pos Total load (in)	= -0.106	L/D =	1657	> 240	0.14
Neg Total load (in)	= 0.138	L/D =	1280	> 240	0.19

Center span:

						Ratio
Initial load (in)	at 17.80 ft	= -0.100	L/D =	2448		
Live load (in)	at 17.80 ft	= -0.103	L/D =	2379	> 360	0.15
Post Comp load (in)	at 17.80 ft	= -0.109	L/D =	2243	> 240	0.11
Net Total load (in)	at 17.80 ft	= -0.208	L/D =	1170	> 240	0.21

Floor Type: Level 2 **Beam Number = 137**

SPAN INFORMATION (ft): I-End (71.25,128.33) J-End (110.92,128.33)

Beam Size (User Selected) = W24X55 Fy = 50.0 ksi
Total Beam Length (ft) = 39.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 119.00		Y bar(in)	=	23.24
Mnf (kip-ft)	= 1070.65		Mn (kip-ft)	=	942.41
C (kips)	= 411.79		PNA (in)	=	22.23
Ieff (in4)	= 3404.74		Itr (in4)	=	4231.79
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
\# of studs: Max = 78 Partial = 53 Actual = 53
Number of Stud Rows = 2 Percent of Full Composite Action = 50.46

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	21.5%	Red	0.000	0.127
	39.666	0.346	0.305	0.508			0.000	0.127
2	0.000	0.229	0.202	0.337	21.5%	Red	0.000	0.084
	6.000	0.229	0.202	0.337			0.000	0.084
3	6.000	0.346	0.305	0.508	21.5%	Red	0.000	0.127
	39.666	0.346	0.305	0.508			0.000	0.127
4	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	39.666	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 42.93 kips 0.90Vn = 251.69 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	235.2	19.9	0.0	1.00	0.90	502.50
	Init DL	1.4DL	181.9	19.9	---	---		
	Max +	1.2DL+1.6LL	424.1	19.9	---	---	0.90	848.17
Controlling		1.2DL+1.6LL	424.1	19.9	---	---	0.90	848.17

REACTIONS (kips):

	Left	Right
Initial reaction	17.43	18.17
DL reaction	14.16	14.75

PRCNC20221036

	Left	Right
Max +LL reaction	15.08	15.77
Max +total reaction (factored)	41.13	42.93

DEFLECTIONS: (Camber = 3/4)

										Ratio
Initial load (in)	at	19.83 ft	=	-0.938	L/D	=	507			
Live load (in)	at	19.83 ft	=	-0.446	L/D	=	1067	>	360	0.34
Post Comp load (in)	at	19.83 ft	=	-0.492	L/D	=	968	>	240	0.25
Net Total load (in)	at	19.83 ft	=	-0.680	L/D	=	700	>	240	0.34

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 138**

SPAN INFORMATION (ft): I-End (110.92,128.33) J-End (134.92,128.33)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	46.00	Y bar(in)	=	14.53
Mnf (kip-ft)	=	294.08	Mn (kip-ft)	=	248.16
C (kips)	=	172.30	PNA (in)	=	13.40
Ieff (in4)	=	587.17	Itr (in4)	=	731.71
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 24 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 53.10

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
2.167	0.18	0.16	0.17	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.04
13.500	0.18	0.16	0.17	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.04

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	2.166	0.346	0.305	0.508			0.000	0.127
2	2.167	0.057	0.050	0.083	0.0%	Red	0.000	0.021
	13.500	0.057	0.050	0.083			0.000	0.021
3	13.500	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	24.000	0.346	0.305	0.508			0.000	0.127
4	0.000	0.346	0.305	0.508	0.0%	Red	0.000	0.127
	24.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	24.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 26.31 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	65.9	13.5	0.0	1.00	0.90	124.50
	Init DL	1.4DL	50.4	13.5	---	---		
	Max +	1.2DL+1.6LL	139.4	13.5	---	---	(	

PRCNC20221036

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
Controlling		1.2DL+1.6LL	139.4	13.5	---	---	0.90	223.35

REACTIONS (kips):

	Left	**Right**
Initial reaction	8.15	9.43
DL reaction	6.59	7.61
Max +LL reaction	9.18	10.74
Max +total reaction (factored)	22.60	26.31

DEFLECTIONS:

										Ratio
Initial load (in)	at	12.24 ft	=	-0.644	L/D	=	447			
Live load (in)	at	12.24 ft	=	-0.344	L/D	=	837	>	360	0.43
Post Comp load (in)	at	12.24 ft	=	-0.372	L/D	=	775	>	240	0.31
Net Total load (in)	at	12.24 ft	=	-1.016	L/D	=	284	>	240	0.85

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 139**

SPAN INFORMATION (ft): I-End (134.92,128.33) J-End (155.92,128.33)

Beam Size (User Selected) = W14X22 Fy = 50.0 ksi
Total Beam Length (ft) = 21.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	63.00	Y bar(in)	=	15.12
Mnf (kip-ft)	=	301.65	Mn (kip-ft)	=	250.30
C (kips)	=	172.30	PNA (in)	=	13.40
Ieff (in4)	=	619.67	Itr (in4)	=	776.32
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 21 Partial = 21 Actual = 21
Number of Stud Rows = 1 Percent of Full Composite Action = 51.74

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL
10.500	0.06	0.06								

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.249	0.219	0.366	2.4%	Red	0.000	0.091
	6.000	0.249	0.219	0.366			0.000	0.091
2	0.000	0.570	0.086	0.057	2.4%	Red	0.000	0.036
	6.000	0.570	0.086	0.057			0.000	0.036
3	6.000	0.346	0.305	0.508	2.4%	Red	0.000	0.127
	21.000	0.346	0.305	0.508			0.000	0.127
4	0.000	0.346	0.305	0.508	2.4%	Red	0.000	0.127
	21.000	0.346	0.305	0.508			0.000	0.127
5	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	21.000	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 27.93 kips 1.00Vn = 94.53 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	64.6	10.5	0.0	1.00	0.90	124.50
	Init DL	1.4DL	49.2	10.5	---	---		
	Max +	1.2DL+1.6LL	139.0	10.4	---	---	0.90	225.27
Controlling		1.2DL+1.6LL	139.0	10.4	---	---	[illegible]	

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	9.34	9.34
DL reaction	9.96	7.93
Max +LL reaction	9.99	10.35
Max +total reaction (factored)	27.93	26.07

DEFLECTIONS:

										Ratio
Initial load (in)	at	10.50 ft	=	-0.483	L/D	=	522			
Live load (in)	at	10.50 ft	=	-0.238	L/D	=	1060	>	360	0.34
Post Comp load (in)	at	10.50 ft	=	-0.279	L/D	=	903	>	240	0.27
Net Total load (in)	at	10.50 ft	=	-0.762	L/D	=	331	>	240	0.73

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 140**

SPAN INFORMATION (ft): I-End (217.58,110.66) J-End (217.58,135.17)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 24.51

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	44.27	Y bar(in)	=	16.43
Mnf (kip-ft)	=	572.79	Mn (kip-ft)	=	515.03
C (kips)	=	236.91	PNA (in)	=	16.47
Ieff (in4)	=	1421.88	Itr (in4)	=	1730.05
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 69 Partial = 23 Actual = 23
Number of Stud Rows = 1 Percent of Full Composite Action = 32.47

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL	CLL
0.271	0.02	0.02	0.02	15.6	0.00	0.00	0.0	0.00	Snow	0.00	0.00
7.510	10.58	9.41	14.62	15.6	0.00	0.00	0.0	0.00	Snow	0.00	3.65
17.677	11.40	10.13	15.82	15.6	0.00	0.00	0.0	0.00	Snow	0.00	3.96

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.896	0.042	0.038	0.063	15.6%	Red	0.000	0.016
	23.885	0.042	0.038	0.063			0.000	0.016
2	23.886	0.043	0.038	0.063	15.6%	Red	0.000	0.016
	24.510	0.000	0.000	0.000			0.000	0.000
3	0.271	0.000	0.000	0.000	15.6%	Red	0.000	0.000
	0.896	0.043	0.038	0.063			0.000	0.016
4	0.000	0.040	0.040	0.000	---	NonR	0.000	0.000
	24.510	0.040	0.040	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 37.41 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	136.4	11.5	10.2	1.00	0.90	218.78
	Init DL	1.4DL	106.1	11.5	---	---		
	Max +	1.2DL+1.6LL	255.3	11.4	---	---	0.90	463.53
Controlling		1.2DL+1.6LL	136.4	11.5	10.2	1.00		

PRCNC20221036

REACTIONS (kips):

	Left	Right
Initial reaction	14.12	15.29
DL reaction	11.52	12.46
Max +LL reaction	12.90	14.03
Max +total reaction (factored)	34.47	37.41

DEFLECTIONS:

										Ratio
Initial load (in)	at	12.26 ft	=	-0.488	L/D	=	602			
Live load (in)	at	12.26 ft	=	-0.266	L/D	=	1104	>	360	0.33
Post Comp load (in)	at	12.26 ft	=	-0.292	L/D	=	1008	>	240	0.24
Net Total load (in)	at	12.26 ft	=	-0.780	L/D	=	377	>	240	0.64

Floor Type: Level 2 **Beam Number = 141**

SPAN INFORMATION (ft): I-End (185.92,118.17) J-End (217.58,118.17)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 31.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	95.00	Y bar(in)	=	18.48
Mnf (kip-ft)	=	644.04	Mn (kip-ft)	=	551.88
C (kips)	=	306.69	PNA (in)	=	17.43
Ieff (in4)	=	1646.70	Itr (in4)	=	2047.13
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 62 Partial = 39 Actual = 39
Number of Stud Rows = 2 Percent of Full Composite Action = 51.92

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	13.0%	Red	0.000	0.127
	31.666	0.346	0.305	0.508			0.000	0.127
2	0.000	0.282	0.249	0.415	13.0%	Red	0.000	0.104
	25.368	0.282	0.249	0.415			0.000	0.104
3	25.368	0.282	0.249	0.415	13.0%	Red	0.000	0.104
	25.594	0.311	0.274	0.457			0.000	0.114
4	25.595	0.311	0.274	0.457	13.0%	Red	0.000	0.114
	31.666	0.255	0.225	0.376			0.000	0.094
5	0.000	0.040	0.040	0.000	---	NonR	0.000	0.000
	31.666	0.040	0.040	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 33.06 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	135.8	15.8	0.0	1.00	0.90	294.00
	Init DL	1.4DL	104.3	15.8	---	---		
	Max +	1.2DL+1.6LL	261.9	15.8	---	---	0.90	496.70
Controlling		1.2DL+1.6LL	261.9	15.8	---	---	0.90	496.70

REACTIONS (kips):

	Left	Right
Initial reaction	13.06	13.06
DL reaction	10.58	10.58
Max +LL reaction	12.73	12.72
Max +total reaction (factored)	33.06	33.04

DEFLECTIONS:

									Ratio
Initial load (in)	at 15.83 ft	=	-0.758	L/D	=	501			
Live load (in)	at 15.83 ft	=	-0.381	L/D	=	997	>	360	0.36
Post Comp load (in)	at 15.83 ft	=	-0.416	L/D	=	913	>	240	0.26
Net Total load (in)	at 15.83 ft	=	-1.174	L/D	=	324	>	240	0.74

Floor Type: Level 2 **Beam Number = 142**

SPAN INFORMATION (ft): I-End (185.92,128.33) J-End (217.58,128.33)

Beam Size (User Selected) = W18X40 Fy = 50.0 ksi
Total Beam Length (ft) = 31.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	95.00	Y bar(in)	=	18.48
Mnf (kip-ft)	=	644.04	Mn (kip-ft)	=	551.88
C (kips)	=	306.69	PNA (in)	=	17.43
Ieff (in4)	=	1646.70	Itr (in4)	=	2047.13
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 62 Partial = 39 Actual = 39
Number of Stud Rows = 2 Percent of Full Composite Action = 51.94

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	15.6%	Red	0.000	0.127
	30.000	0.346	0.305	0.508			0.000	0.127
2	30.000	0.232	0.205	0.342	15.6%	Red	0.000	0.085
	31.666	0.231	0.204	0.340			0.000	0.085
3	0.000	0.346	0.305	0.508	15.6%	Red	0.000	0.127
	31.666	0.346	0.305	0.508			0.000	0.127
4	0.000	0.040	0.040	0.000	---	NonR	0.000	0.000
	31.666	0.040	0.040	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 35.61 kips 1.00Vn = 169.15 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	148.6	15.8	0.0	1.00	0.90	294.00
	Init DL	1.4DL	114.0	15.8	---	---		
	Max +	1.2DL+1.6LL	281.8	15.8	---	---	0.90	496.70
Controlling		1.2DL+1.6LL	281.8	15.8	---	---	0.90	496.70

REACTIONS (kips):

	Left	Right
Initial reaction	14.31	14.09
DL reaction	11.58	11.40

PRCNC20221036

	Left	Right
Max +LL reaction	13.57	13.35
Max +total reaction (factored)	35.61	35.04

DEFLECTIONS:

										Ratio
Initial load (in)	at 15.83 ft	=	-0.828	L/D	=	459				
Live load (in)	at 15.83 ft	=	-0.406	L/D	=	936	>	360		0.38
Post Comp load (in)	at 15.83 ft	=	-0.444	L/D	=	855	>	240		0.28
Net Total load (in)	at 15.83 ft	=	-1.272	L/D	=	299	>	240		0.80

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 143**

SPAN INFORMATION (ft): I-End (155.92,94.13) J-End (155.92,118.17)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 24.03

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	50.30	Y bar(in)	=	18.77
Mnf (kip-ft)	=	711.78	Mn (kip-ft)	=	577.73
C (kips)	=	172.30	PNA (in)	=	15.27
Ieff (in4)	=	1734.56	Itr (in4)	=	2381.50
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 70 Partial = 23 Actual = 23
Number of Stud Rows = 1 Percent of Full Composite Action = 32.17

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
0.951	4.54	4.04	6.19	25.7	0.00	0.00	0.0	0.00	Snow	0.00	1.55
7.451	7.07	6.28	9.89	25.7	0.00	0.00	0.0	0.00	Snow	0.00	2.47
10.992	6.33	5.63	8.74	25.7	0.00	0.00	0.0	0.00	Snow	0.00	2.18
15.742	6.94	6.15	9.78	25.7	0.00	0.00	0.0	0.00	Snow	0.00	2.45
15.742	8.36	7.42	11.76	25.7	0.00	0.00	0.0	0.00	Snow	0.00	2.94

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	24.033	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 51.80 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	209.7	13.1	4.8	1.00	0.90	352.86
	Init DL	1.4DL	162.0	12.2	---	---		
	Max +	1.2DL+1.6LL	366.5	15.1	---	---	0.90	519.96
Controlling		1.2DL+1.6LL	366.5	15.1	---	---	0.90	519.96

REACTIONS (kips):

Gravity Beam Design

	Left	Right
Initial reaction	22.72	19.46
DL reaction	18.48	15.82
Max +LL reaction	18.52	15.90
Max +total reaction (factored)	51.80	44.42

DEFLECTIONS:

										Ratio
Initial load (in)	at	12.14 ft	=	-0.483	L/D	=	597			
Live load (in)	at	12.14 ft	=	-0.267	L/D	=	1081	>	360	0.33
Post Comp load (in)	at	12.14 ft	=	-0.295	L/D	=	976	>	240	0.25
Net Total load (in)	at	12.14 ft	=	-0.779	L/D	=	370	>	240	0.65

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 144**

SPAN INFORMATION (ft): I-End (185.92,102.17) J-End (185.92,118.17)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 16.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	47.99	Y bar(in)	=	15.98
Mnf (kip-ft)	=	375.54	Mn (kip-ft)	=	302.85
C (kips)	=	150.76	PNA (in)	=	13.88
Ieff (in4)	=	756.51	Itr (in4)	=	1027.98
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 38 Partial = 15 Actual = 15
Number of Stud Rows = 1 Percent of Full Composite Action = 39.26

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
2.954	5.12	4.55	7.12	8.7	0.00	0.00	0.0	0.00	Snow	0.00	1.78
7.704	6.25	5.56	8.71	8.7	0.00	0.00	0.0	0.00	Snow	0.00	2.18
7.704	6.94	6.15	9.78	8.7	0.00	0.00	0.0	0.00	Snow	0.00	2.45

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	15.995	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 35.94 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	99.4	7.7	8.3	1.66	0.90	165.75
	Init DL	1.4DL	76.4	7.7	---	---		
	Max +	1.2DL+1.6LL	197.4	7.7	---	---	0.90	272.56
Controlling		1.2DL+1.6LL	197.4	7.7	---	---	0.90	272.56

REACTIONS (kips):

	Left	Right
Initial reaction	13.84	9.24
DL reaction	11.22	7.51
Max +LL reaction	14.05	9.33

PRCNC20221036

	Left	Right
Max +total reaction (factored)	35.94	23.93

DEFLECTIONS:

										Ratio
Initial load (in)	at	7.76 ft	=	-0.243	L/D	=	791			
Live load (in)	at	7.76 ft	=	-0.136	L/D	=	1408	>	360	0.26
Post Comp load (in)	at	7.76 ft	=	-0.148	L/D	=	1294	>	240	0.19
Net Total load (in)	at	7.76 ft	=	-0.391	L/D	=	491	>	240	0.49

Floor Type: Level 2 **Beam Number = 145**

SPAN INFORMATION (ft): I-End (163.25,118.17) J-End (163.25,138.50)

Beam Size (User Selected) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 34.50		Y bar(in)	=	12.74
Mnf (kip-ft)	= 265.45		Mn (kip-ft)	=	232.76
C (kips)	= 193.83		PNA (in)	=	11.98
Ieff (in4)	= 484.80		Itr (in4)	=	581.10
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 32 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 59.83

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
1.500	0.36	0.33	0.46	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.12
10.167	2.58	2.28	3.73	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.93
10.917	0.32	0.30	0.33	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.08

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	1.500	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	20.333	0.023	0.020	0.033			0.000	0.008
2	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	20.333	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 7.01 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	27.5	10.2	8.7	1.45	0.90	101.67
	Init DL	1.4DL	21.5	10.2	---	---		
	Max +	1.2DL+1.6LL	56.7	10.2	---	---	0.90	209.49
Controlling		1.2DL+1.6LL	56.7	10.2	---	---	0.90	209.49

REACTIONS (kips):

	Left	Right
Initial reaction	2.66	2.35
DL reaction	2.20	1.94
Max +LL reaction	2.74	2.41
Max +total reaction (factored)	7.01	6.19

DEFLECTIONS:

										Ratio
Initial load (in)	at	10.17 ft	=	-0.212	L/D	=	1148			
Live load (in)	at	10.17 ft	=	-0.099	L/D	=	2476	>	360	0.15
Post Comp load (in)	at	10.17 ft	=	-0.106	L/D	=	2293	>	240	0.10
Net Total load (in)	at	10.17 ft	=	-0.319	L/D	=	765	>	240	0.31

Floor Type: Level 2 **Beam Number = 146**

SPAN INFORMATION (ft): I-End (175.08,118.17) J-End (175.08,138.50)

Beam Size (User Selected) = W12X22 Fy = 50.0 ksi
Total Beam Length (ft) = 20.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	34.50	Y bar(in)	=	12.74
Mnf (kip-ft)	=	265.45	Mn (kip-ft)	=	232.76
C (kips)	=	193.83	PNA (in)	=	11.98
Ieff (in4)	=	484.80	Itr (in4)	=	581.10
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 32 Partial = 19 Actual = 19
Number of Stud Rows = 1 Percent of Full Composite Action = 59.83

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.458	0.64	0.57	0.91	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.23
10.167	3.81	3.37	5.51	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.38
10.917	1.04	0.94	1.34	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.34

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	10.917	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	20.333	0.023	0.020	0.033			0.000	0.008
2	0.000	0.022	0.022	0.000	---	NonR	0.000	0.000
	20.333	0.022	0.022	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.33 kips 1.00Vn = 95.94 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	44.6	10.2	4.7	1.19	0.90	109.88
	Init DL	1.4DL	34.5	10.2	---	---		
	Max +	1.2DL+1.6LL	93.2	10.2	---	---	0.90	209.49
Controlling		1.2DL+1.6LL	93.2	10.2	---	---	0.90	209.49

REACTIONS (kips):

	Left	Right
Initial reaction	3.83	3.70
DL reaction	3.13	3.02
Max +LL reaction	4.11	3.96
Max +total reaction (factored)	10.33	9.96

DEFLECTIONS:

										Ratio
Initial load (in)	at	10.17 ft	=	-0.341	L/D	=	715			
Live load (in)	at	10.17 ft	=	-0.165	L/D	=	1475	>	360	0.24
Post Comp load (in)	at	10.17 ft	=	-0.179	L/D	=	1366	>	240	0.18
Net Total load (in)	at	10.17 ft	=	-0.520	L/D	=	469	>	240	0.51

Floor Type: Level 2 **Beam Number = 147**

SPAN INFORMATION (ft): I-End (155.92,128.33) J-End (163.25,128.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 7.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	22.00	Y bar(in)	=	10.98
Mnf (kip-ft)	=	130.01	Mn (kip-ft)	=	88.50
C (kips)	=	51.69	PNA (in)	=	7.66
Ieff (in4)	=	155.60	Itr (in4)	=	242.19
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 7 Partial = 7 Actual = 7
Number of Stud Rows = 1 Percent of Full Composite Action = 29.20

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.691	0.610	1.017	0.0%	Red	0.000	0.254
	7.333	0.691	0.610	1.017			0.000	0.254
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	7.333	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.06 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	7.8	3.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	5.9	3.7	---	---		
	Max +	1.2DL+1.6LL	16.6	3.7	---	---	0.90	79.65
Controlling		1.2DL+1.6LL	16.6	3.7	---	---	0.90	79.65

REACTIONS (kips):

	Left	Right
Initial reaction	3.21	3.21
DL reaction	2.58	2.58
Max +LL reaction	3.73	3.73
Max +total reaction (factored)	9.06	9.06

DEFLECTIONS: **Ratio**

Initial load (in)	at	3.67 ft	=	-0.026	L/D =	3392
Live load (in)	at	3.67 ft	=	-0.015	L/D =	6003 >

PRCNC20221036

Post Comp load (in)	at	3.67 ft	=	-0.016	L/D	=	5558	>	240	0.04
Net Total load (in)	at	3.67 ft	=	-0.042	L/D	=	2106	>	240	0.11

Floor Type: Level 2 **Beam Number = 148**

SPAN INFORMATION (ft): I-End (175.08,128.33) J-End (185.92,128.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.83

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	32.50	Y bar(in)	=	11.60
Mnf (kip-ft)	=	135.65	Mn (kip-ft)	=	105.48
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	200.45	Itr (in4)	=	264.01
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 10 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.691	0.610	1.017	0.0%	Red	0.000	0.254
	10.833	0.691	0.610	1.017			0.000	0.254
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.833	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 13.38 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	16.9	5.4	0.0	1.00	0.90	46.90
	Init DL	1.4DL	12.8	5.4	---	---		
	Max +	1.2DL+1.6LL	36.2	5.4	---	---	0.90	94.93
Controlling		1.2DL+1.6LL	36.2	5.4	---	---	0.90	94.93

REACTIONS (kips):

	Left	Right
Initial reaction	4.75	4.75
DL reaction	3.81	3.81
Max +LL reaction	5.51	5.51
Max +total reaction (factored)	13.38	13.38

DEFLECTIONS:

						Ratio
Initial load (in)	at	5.42 ft	=	-0.124	L/D =	1052
Live load (in)	at	5.42 ft	=	-0.054	L/D =	2399 >

PRCNC20221036

Post Comp load (in)	at	5.42 ft	=	-0.059	L/D	=	2221	>	240	0.11
Net Total load (in)	at	5.42 ft	=	-0.182	L/D	=	714	>	240	0.34

Floor Type: Level 2 **Beam Number = 149**

SPAN INFORMATION (ft): I-End (163.25,129.08) J-End (175.08,129.08)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 11.83
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
8.500	0.56	0.70	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	8.500	0.014	0.021	0.0%	Red	0.000
	11.833	0.014	0.021			0.000
2	8.500	0.186	0.273	0.0%	Red	0.000
	11.833	0.186	0.273			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	11.833	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.40 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	7.3	8.5	8.5	1.63	0.90	42.55
Controlling		1.2DL+1.6LL	7.3	8.5	8.5	1.63	0.90	42.55

REACTIONS (kips):

	Left	**Right**
DL reaction	0.32	1.04
Max +LL reaction	0.33	1.34
Max +total reaction (factored)	0.92	3.40

DEFLECTIONS:

										Ratio
Dead load (in)	at	6.51 ft	=	-0.030	L/D	=	4727			
Live load (in)	at	6.57 ft	=	-0.036	L/D	=	3981	>	360	0.09
Net Total load (in)	at	6.57 ft	=	-0.066	L/D	=	2161	>	240	0.11

PRCNC20221036

Floor Type: Level 2 **Beam Number = 150**

SPAN INFORMATION (ft): I-End (171.75,118.17) J-End (171.75,129.08)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.92

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	20.38	Y bar(in)	=	10.84
Mnf (kip-ft)	=	128.62	Mn (kip-ft)	=	110.76
C (kips)	=	107.69	PNA (in)	=	9.69
Ieff (in4)	=	197.17	Itr (in4)	=	237.61
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 18 Partial = 11 Actual = 11
Number of Stud Rows = 1 Percent of Full Composite Action = 60.84

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
1.500	0.36	0.33	0.46	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.12
5.458	0.64	0.57	0.91	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.23

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	1.500	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	10.916	0.023	0.020	0.033			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.916	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.53 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	4.0	5.5	5.5	1.58	0.90	46.90
	Init DL	1.4DL	3.2	5.5	---	---		
	Max +	1.2DL+1.6LL	8.3	5.5	---	---	0.90	99.69
Controlling		1.2DL+1.6LL	4.0	5.5	---	---	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	0.96	0.67
DL reaction	0.79	0.56

PRCNC20221036

	Left	Right
Max +LL reaction	0.99	0.70
Max +total reaction (factored)	2.53	1.78

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.35 ft	=	-0.027	L/D	=	4795			
Live load (in)	at	5.35 ft	=	-0.011	L/D	=	1218 9	>	360	0.03
Post Comp load (in)	at	5.35 ft	=	-0.012	L/D	=	1128 6	>	240	0.02
Net Total load (in)	at	5.35 ft	=	-0.039	L/D	=	3365	>	240	0.07

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 151**

SPAN INFORMATION (ft): I-End (171.75,123.62) J-End (175.08,123.62)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 3.33
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.371	0.546	0.0%	Red	0.000
	3.333	0.371	0.546			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	3.333	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.22 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	1.9	1.7	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	1.9	1.7	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.64	0.64
Max +LL reaction	0.91	0.91
Max +total reaction (factored)	2.22	2.22

DEFLECTIONS:

					Ratio
Dead load (in)	at	1.67 ft	=	-0.001	
Live load (in)	at	1.67 ft	=	-0.001	
Net Total load (in)	at	1.67 ft	=	-0.002	L/D = 2418 > 240 1	0.01

PRCNC20221036

Floor Type: Level 2 **Beam Number = 152**

SPAN INFORMATION (ft): I-End (113.08,128.33) J-End (113.08,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.17

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	17.00	Y bar(in)	=	10.51
Mnf (kip-ft)	=	124.27	Mn (kip-ft)	=	109.38
C (kips)	=	107.69	PNA (in)	=	9.69
Ieff (in4)	=	189.88	Itr (in4)	=	226.47
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 62.10

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	10.166	0.023	0.020	0.033			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.166	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.48 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.7	5.1	10.2	1.14	0.90	22.00
	Init DL	1.4DL	0.6	5.1	---	---		
	Max +	1.2DL+1.6LL	1.2	5.1	---	---	0.90	98.44
Controlling		1.2DL+1.6LL	0.7	5.1	10.2	1.14	0.90	22.00

REACTIONS (kips):

	Left	Right
Initial reaction	0.21	0.21
DL reaction	0.18	0.18
Max +LL reaction	0.17	0.17
Max +total reaction (factored)	0.48	0.48

DEFLECTIONS: **Ratio**

Initial load (in) at 5.08 ft = -0.005 L/D = 2471
0

PRCNC20221036

Live load (in)	at	5.08 ft	=	-0.001	L/D	=	83842	>	360	0.00
Post Comp load (in)	at	5.08 ft	=	-0.002	L/D	=	77631	>	240	0.00
Net Total load (in)	at	5.08 ft	=	-0.007	L/D	=	18744	>	240	0.01

Floor Type: Level 2 **Beam Number = 153**

SPAN INFORMATION (ft): I-End (124.42,128.33) J-End (124.42,138.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.17

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 19.25		Y bar(in)	=	10.74
Mnf (kip-ft)	= 127.52		Mn (kip-ft)	=	110.36
C (kips)	= 107.69		PNA (in)	=	9.69
Ieff (in4)	= 194.49		Itr (in4)	=	234.17
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 60.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	10.166	0.023	0.020	0.033			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.166	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.48 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.7	5.1	10.2	1.14	0.90	22.00
	Init DL	1.4DL	0.6	5.1	---	---		
	Max +	1.2DL+1.6LL	1.2	5.1	---	---	0.90	99.32
Controlling		1.2DL+1.6LL	0.7	5.1	10.2	1.14	0.90	22.00

REACTIONS (kips):

	Left	Right
Initial reaction	0.21	0.21
DL reaction	0.18	0.18
Max +LL reaction	0.17	0.17
Max +total reaction (factored)	0.48	0.48

DEFLECTIONS: **Ratio**

Initial load (in) at 5.08 ft = -0.005 L/D = 2471
0

PRCNC20221036

Live load (in)	at	5.08 ft	=	-0.001	L/D	=	85878	>	360	0.00
Post Comp load (in)	at	5.08 ft	=	-0.002	L/D	=	79517	>	240	0.00
Net Total load (in)	at	5.08 ft	=	-0.006	L/D	=	18852	>	240	0.01

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 154**

SPAN INFORMATION (ft): I-End (163.25,119.67) J-End (171.75,119.67)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 8.50

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	13.00	Y bar(in)	=	9.97
Mnf (kip-ft)	=	111.96	Mn (kip-ft)	=	95.31
C (kips)	=	68.92	PNA (in)	=	8.56
Ieff (in4)	=	165.86	Itr (in4)	=	209.23
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
# of studs: Max = 8 Partial = 8 Actual = 8
Number of Stud Rows = 1 Percent of Full Composite Action = 51.97

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	8.500	0.023	0.020	0.033			0.000	0.008
2	0.000	0.051	0.045	0.075	0.0%	Red	0.000	0.019
	8.500	0.051	0.045	0.075			0.000	0.019
3	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	8.500	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.17 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	1.2	4.3	0.0	1.00	0.90	46.90
	Init DL	1.4DL	1.0	4.3	---	---		
	Max +	1.2DL+1.6LL	2.5	4.3	---	---	0.90	85.78
Controlling		1.2DL+1.6LL	2.5	4.3	---	---	0.90	85.78

REACTIONS (kips):

	Left	Right
Initial reaction	0.44	0.44
DL reaction	0.36	0.36
Max +LL reaction	0.46	0.46
Max +total reaction (factored)	1.17	1.17

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	4.25 ft	=	-0.006	L/D	=	1758 6			
Live load (in)	at	4.25 ft	=	-0.003	L/D	=	3855 7	>	360	0.01
Post Comp load (in)	at	4.25 ft	=	-0.003	L/D	=	3570 1	>	240	0.01
Net Total load (in)	at	4.25 ft	=	-0.009	L/D	=	1178 2	>	240	0.02

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 155**

SPAN INFORMATION (ft): I-End (77.25,108.25) J-End (86.64,108.18)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 9.39

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	89.6 deg	89.6 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	20.09	Y bar(in)	=	13.66
Mnf (kip-ft)	=	309.68	Mn (kip-ft)	=	247.66
C (kips)	=	68.92	PNA (in)	=	10.61
Ieff (in4)	=	599.86	Itr (in4)	=	816.33
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 18 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 33.63

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	9.392	0.010	0.000	0.000			0.000	0.000
2	0.000	0.337	0.297	0.496	0.0%	Red	0.000	0.124
	9.392	0.339	0.300	0.499			0.000	0.125
3	0.000	0.034	0.030	0.050	0.0%	Red	0.000	0.012
	9.392	0.034	0.030	0.050			0.000	0.013
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	9.392	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.42 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	7.1	4.7	0.0	1.00	0.90	165.75
	Init DL	1.4DL	5.5	4.7	---	---		
	Max +	1.2DL+1.6LL	15.1	4.7	---	---	0.90	222.89
Controlling		1.2DL+1.6LL	15.1	4.7	---	---	0.90	222.89

REACTIONS (kips):

	Left	Right
Initial reaction	2.31	2.31
DL reaction	1.92	1.92
Max +LL reaction	2.57	2.57
Max +total reaction (factored)	6.41	6.42

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	4.70 ft	=	-0.007	L/D	=	1584 2			
Live load (in)	at	4.70 ft	=	-0.006	L/D	=	2045 0	>	360	0.02
Post Comp load (in)	at	4.70 ft	=	-0.006	L/D	=	1862 0	>	240	0.01
Net Total load (in)	at	4.70 ft	=	-0.013	L/D	=	8559	>	240	0.03

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 156**

SPAN INFORMATION (ft): I-End (86.64,108.18) J-End (110.92,110.83)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 24.42

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	83.8 deg	83.8 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	44.63	Y bar(in)	=	15.81
Mnf (kip-ft)	=	372.71	Mn (kip-ft)	=	318.52
C (kips)	=	189.53	PNA (in)	=	15.35
Ieff (in4)	=	800.43	Itr (in4)	=	1011.89
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 48 Partial = 24 Actual = 24
Number of Stud Rows = 1 Percent of Full Composite Action = 49.36

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.337	0.298	0.496	0.0%	Red	0.000	0.124
	24.418	0.248	0.219	0.364			0.000	0.091
2	0.000	0.034	0.030	0.050	0.0%	Red	0.000	0.013
	1.401	0.045	0.040	0.067			0.000	0.017
3	1.402	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	24.384	0.045	0.040	0.067			0.000	0.017
4	24.384	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	24.418	0.000	0.000	0.000			0.000	0.000
5	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	24.418	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 15.66 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	43.8	11.9	0.0	1.00	0.90	165.75
	Init DL	1.4DL	33.9	11.9	---	---		
	Max +	1.2DL+1.6LL	91.9	11.9	---	---	0.90	286.67
Controlling		1.2DL+1.6LL	91.9	11.9	---	---	0.90	286.67

REACTIONS (kips):

	Left	Right
Initial reaction	5.70	5.25
DL reaction	4.62	4.26

PRCNC20221036

	Left	Right
Max +LL reaction	6.33	5.80
Max +total reaction (factored)	15.66	14.39

DEFLECTIONS:

										Ratio
Initial load (in)	at	12.21 ft	=	-0.297	L/D	=	986			
Live load (in)	at	12.21 ft	=	-0.171	L/D	=	1711	>	360	0.21
Post Comp load (in)	at	12.21 ft	=	-0.185	L/D	=	1584	>	240	0.15
Net Total load (in)	at	12.21 ft	=	-0.482	L/D	=	608	>	240	0.39

Floor Type: Level 2 **Beam Number = 157**

SPAN INFORMATION (ft): I-End (110.92,110.83) J-End (127.34,110.92)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 16.42

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	89.7 deg	89.7 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 32.64		Y bar(in)	=	15.01
Mnf (kip-ft)	= 349.84		Mn (kip-ft)	=	284.38
C (kips)	= 120.61		PNA (in)	=	12.67
Ieff (in4)	= 684.74		Itr (in4)	=	938.53
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 32 Partial = 16 Actual = 16
Number of Stud Rows = 1 Percent of Full Composite Action = 36.23

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.249	0.220	0.367	0.0%	Red	0.000	0.092
	15.000	0.247	0.218	0.363			0.000	0.091
2	15.001	0.247	0.218	0.363	0.0%	Red	0.000	0.091
	16.424	0.000	0.000	0.000			0.000	0.000
3	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	0.034	0.045	0.040	0.067			0.000	0.017
4	0.035	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	15.873	0.045	0.040	0.067			0.000	0.017
5	15.874	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	16.424	0.000	0.000	0.000			0.000	0.000
6	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	16.424	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.81 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	17.3	8.2	0.0	1.00	0.90	165.75
	Init DL	1.4DL	13.4	8.2	---	---		
	Max +	1.2DL+1.6LL	36.0	8.2	---	---	0.90	255.95
Controlling		1.2DL+1.6LL	36.0	8.2	---	---	0.90	255.95

REACTIONS (kips):

	Left	Right
Initial reaction	3.22	2.99
DL reaction	2.62	2.44
Max +LL reaction	3.54	3.27
Max +total reaction (factored)	8.81	8.15

DEFLECTIONS:

											Ratio
Initial load (in)	at	8.21 ft	=	-0.053	L/D	=	3706				
Live load (in)	at	8.21 ft	=	-0.035	L/D	=	5572	>	360		0.06
Post Comp load (in)	at	8.21 ft	=	-0.038	L/D	=	5159	>	240		0.05
Net Total load (in)	at	8.21 ft	=	-0.091	L/D	=	2157	>	240		0.11

Floor Type: Level 2 **Beam Number = 158**

SPAN INFORMATION (ft): I-End (93.43,82.83) J-End (103.50,85.52)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 10.42

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	75.0 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	23.62	Y bar(in)	=	14.12
Mnf (kip-ft)	=	321.24	Mn (kip-ft)	=	248.09
C (kips)	=	68.92	PNA (in)	=	10.61
Ieff (in4)	=	598.75	Itr (in4)	=	857.76
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 20 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 28.60

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	10.416	0.045	0.040	0.067			0.000	0.017
2	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	1.406	0.179	0.158	0.263			0.000	0.066
3	1.407	0.179	0.158	0.262	0.0%	Red	0.000	0.066
	10.416	0.178	0.157	0.262			0.000	0.066
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	10.416	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 4.28 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	5.4	5.2	0.0	1.00	0.90	165.75
	Init DL	1.4DL	4.2	5.2	---	---		
	Max +	1.2DL+1.6LL	11.1	5.2	---	---	0.90	223.28
Controlling		1.2DL+1.6LL	11.1	5.2	---	---	0.90	223.28

REACTIONS (kips):

	Left	Right
Initial reaction	1.44	1.59
DL reaction	1.18	1.30
Max +LL reaction	1.54	1.71
Max +total reaction (factored)	3.88	4.28

DEFLECTIONS:										**Ratio**
Initial load (in)	at	5.21 ft	=	-0.007	L/D	=	1860 9			
Live load (in)	at	5.21 ft	=	-0.005	L/D	=	2518 3	>	360	0.01
Post Comp load (in)	at	5.21 ft	=	-0.005	L/D	=	2331 8	>	240	0.01
Net Total load (in)	at	5.21 ft	=	-0.012	L/D	=	1034 9	>	240	0.02

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 159**

SPAN INFORMATION (ft): I-End (103.50,85.52) J-End (130.89,92.86)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.36

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	75.0 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 45.07		Y bar(in)	=	15.83
Mnf (kip-ft)	= 373.10		Mn (kip-ft)	=	330.18
C (kips)	= 223.99		PNA (in)	=	15.41
Ieff (in4)	= 845.61		Itr (in4)	=	1014.09
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 54 Partial = 27 Actual = 27
Number of Stud Rows = 1 Percent of Full Composite Action = 56.32

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.417	1.84	1.66	2.23	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.56

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	5.307	0.045	0.040	0.067			0.000	0.017
2	5.308	0.045	0.040	0.067	0.0%	Red	0.000	0.017
	5.416	0.000	0.000	0.000			0.000	0.000
3	5.417	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	26.772	0.269	0.238	0.396			0.000	0.099
4	26.773	0.269	0.238	0.396	0.0%	Red	0.000	0.099
	28.356	0.000	0.000	0.000			0.000	0.000
5	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	1.406	0.178	0.157	0.262			0.000	0.066
6	1.407	0.178	0.157	0.262	0.0%	Red	0.000	0.066
	28.356	0.179	0.158	0.262			0.000	0.066
7	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.356	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.42 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	59.5	14.3	0.0	1.00	0.90	165.75
	Init DL	1.4DL	46.4	14.3	---	---		
	Max +	1.2DL+1.6LL	123.4	14.4	---	---	0.90	297.16
Controlling		1.2DL+1.6LL	123.4	14.4	---	---	0.90	297.16

REACTIONS (kips):

	Left	**Right**
Initial reaction	6.56	6.73
DL reaction	5.38	5.47
Max +LL reaction	6.98	7.41
Max +total reaction (factored)	17.62	18.42

DEFLECTIONS:

										Ratio
Initial load (in)	at	14.18 ft	=	-0.561	L/D	=	607			
Live load (in)	at	14.18 ft	=	-0.297	L/D	=	1146	>	360	0.31
Post Comp load (in)	at	14.18 ft	=	-0.321	L/D	=	1061	>	240	0.23
Net Total load (in)	at	14.18 ft	=	-0.881	L/D	=	386	>	240	0.62

Floor Type: Level 2 **Beam Number = 160**

SPAN INFORMATION (ft): I-End (108.73,86.92) J-End (129.36,100.65)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 24.78
Mp (kip-ft) = 184.17

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	0.0%	Red	0.000
	0.109	0.045	0.067			0.000
2	0.110	0.045	0.067	0.0%	Red	0.000
	24.331	0.045	0.067			0.000
3	24.331	0.045	0.067	0.0%	Red	0.000
	24.776	0.000	0.000			0.000
4	0.000	0.000	0.000	0.0%	Red	0.000
	24.776	0.232	0.341			0.000
5	0.000	0.026	0.000	---	NonR	0.000
	24.776	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.16 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	47.0	13.7	0.0	1.00	0.90	165.75
Controlling		1.2DL+1.6LL	47.0	13.7	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
DL reaction	1.84	2.79
Max +LL reaction	2.23	3.63
Max +total reaction (factored)	5.78	9.16

DEFLECTIONS:

					Ratio
Dead load (in)	at 12.64 ft	= -0.182	L/D = 1632		
Live load (in)	at 12.76 ft	= -0.231	L/D = 1289	> 360	0.28
Net Total load (in)	at 12.76 ft	= -0.413	L/D = 720	> 240	0.33

PRCNC20221036

Floor Type: Level 2 **Beam Number = 165**

SPAN INFORMATION (ft): I-End (127.54,109.87) J-End (155.92,109.87)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 28.37

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	85.11	Y bar(in)	=	17.15
Mnf (kip-ft)	=	391.97	Mn (kip-ft)	=	336.60
C (kips)	=	223.99	PNA (in)	=	15.41
Ieff (in4)	=	942.71	Itr (in4)	=	1141.22
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 53 Partial = 28 Actual = 28
Number of Stud Rows = 1 Percent of Full Composite Action = 58.33

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.282	0.249	0.415	5.3%	Red	0.000	0.104
	28.371	0.282	0.249	0.415			0.000	0.104
2	0.000	0.000	0.000	0.000	5.3%	Red	0.000	0.000
	1.629	0.282	0.249	0.415			0.000	0.104
3	1.629	0.282	0.249	0.415	5.3%	Red	0.000	0.104
	28.371	0.282	0.249	0.415			0.000	0.104
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	28.371	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 27.84 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	96.5	14.2	0.0	1.00	0.90	165.75
	Init DL	1.4DL	73.7	14.2	---	---		
	Max +	1.2DL+1.6LL	197.4	14.2	---	---	0.90	302.94
Controlling		1.2DL+1.6LL	197.4	14.2	---	---	0.90	302.94

REACTIONS (kips):

	Left	Right
Initial reaction	10.09	10.36
DL reaction	8.14	8.36
Max +LL reaction	10.82	11.13
Max +total reaction (factored)	27.08	27.84

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

										Ratio
Initial load (in)	at	14.19 ft	=	-0.873	L/D	=	390			
Live load (in)	at	14.19 ft	=	-0.418	L/D	=	815	>	360	0.44
Post Comp load (in)	at	14.19 ft	=	-0.453	L/D	=	751	>	240	0.32
Net Total load (in)	at	14.19 ft	=	-1.327	L/D	=	257	>	240	0.94

Floor Type: Level 2 **Beam Number = 166**

SPAN INFORMATION (ft): I-End (129.17,101.58) J-End (155.92,101.58)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 26.74

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	79.11	Y bar(in)	=	17.02
Mnf (kip-ft)	=	390.36	Mn (kip-ft)	=	336.05
C (kips)	=	223.99	PNA (in)	=	15.41
Ieff (in4)	=	932.72	Itr (in4)	=	1128.14
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 52 Partial = 26 Actual = 26
Number of Stud Rows = 1 Percent of Full Composite Action = 58.29

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.282	0.249	0.415	0.0%	Red	0.000	0.104
	26.741	0.282	0.249	0.415			0.000	0.104
2	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	1.277	0.221	0.195	0.325			0.000	0.081
3	1.277	0.221	0.195	0.325	0.0%	Red	0.000	0.081
	26.741	0.221	0.195	0.325			0.000	0.081
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	26.741	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 24.30 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	76.8	13.4	0.0	1.00	0.90	165.75
	Init DL	1.4DL	58.8	13.4	---	---		
	Max +	1.2DL+1.6LL	162.4	13.4	---	---	0.90	302.44
Controlling		1.2DL+1.6LL	162.4	13.4	---	---	0.90	302.44

REACTIONS (kips):

	Left	Right
Initial reaction	8.58	8.75
DL reaction	6.93	7.07
Max +LL reaction	9.68	9.89
Max +total reaction (factored)	23.82	24.30

PRCNC20221036

DEFLECTIONS:

									Ratio
Initial load (in)	at 13.37 ft	=	-0.619	L/D	=	518			
Live load (in)	at 13.37 ft	=	-0.314	L/D	=	1021	>	360	0.35
Post Comp load (in)	at 13.37 ft	=	-0.340	L/D	=	945	>	240	0.25
Net Total load (in)	at 13.37 ft	=	-0.958	L/D	=	335	>	240	0.72

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 167**

SPAN INFORMATION (ft): I-End (155.92,109.87) J-End (185.92,109.87)

Beam Size (Optimum) = W12X19 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	73.50	Y bar(in)	=	14.21
Mnf (kip-ft)	=	246.13	Mn (kip-ft)	=	239.42
C (kips)	=	258.45	PNA (in)	=	12.15
Ieff (in4)	=	571.67	Itr (in4)	=	588.48
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 30 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 92.80

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.443	0.391	0.652	0.0%	Red	0.000	0.163
	30.000	0.443	0.391	0.652			0.000	0.163
2	0.000	0.019	0.019	0.000	---	NonR	0.000	0.000
	30.000	0.019	0.019	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 23.97 kips 1.00Vn = 86.01 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	84.7	15.0	0.0	1.00	0.90	92.62
	Init DL	1.4DL	64.6	15.0	---	---		
	Max +	1.2DL+1.6LL	179.8	15.0	---	---	0.90	215.48
Controlling		1.2DL+1.6LL	84.7	15.0	0.0	1.00	0.90	92.62

REACTIONS (kips):

	Left	Right
Initial reaction	8.60	8.60
DL reaction	6.94	6.94
Max +LL reaction	9.78	9.78
Max +total reaction (factored)	23.97	23.97

DEFLECTIONS: (Camber = 1-1/2) **Ratio**

Initial load (in)	at 15.00 ft	= -1.983	L/D = 182		
Live load (in)	at 15.00 ft	= -0.717	L/D = 502	>	PRCNC20221036

Post Comp load (in)	at 15.00 ft	=	-0.774	L/D	=	465	>	240	0.52
Net Total load (in)	at 15.00 ft	=	-1.257	L/D	=	286	>	240	0.84

Floor Type: Level 2 **Beam Number = 169**

SPAN INFORMATION (ft): I-End (130.45,95.08) J-End (155.92,95.08)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 25.46

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	57.55	Y bar(in)	=	16.39
Mnf (kip-ft)	=	381.80	Mn (kip-ft)	=	320.74
C (kips)	=	189.53	PNA (in)	=	15.35
Ieff (in4)	=	838.85	Itr (in4)	=	1066.58
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 50 Partial = 25 Actual = 25
Number of Stud Rows = 1 Percent of Full Composite Action = 49.36

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.221	0.195	0.325	0.0%	Red	0.000	0.081
	25.464	0.221	0.195	0.325			0.000	0.081
2	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	1.451	0.251	0.222	0.369			0.000	0.092
3	1.451	0.251	0.222	0.369	0.0%	Red	0.000	0.092
	25.464	0.032	0.029	0.048			0.000	0.012
4	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	25.464	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.19 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	51.9	12.1	0.0	1.00	0.90	165.75
	Init DL	1.4DL	40.0	12.1	---	---		
	Max +	1.2DL+1.6LL	109.0	12.1	---	---	0.90	288.66
Controlling		1.2DL+1.6LL	109.0	12.1	---	---	0.90	288.66

REACTIONS (kips):

	Left	Right
Initial reaction	6.59	5.59
DL reaction	5.34	4.54
Max +LL reaction	7.36	6.19
Max +total reaction (factored)	18.19	15.34

DEFLECTIONS:

									Ratio
Initial load (in)	at 12.61 ft	=	-0.381	L/D	=	802			
Live load (in)	at 12.61 ft	=	-0.211	L/D	=	1449	>	360	0.25
Post Comp load (in)	at 12.61 ft	=	-0.228	L/D	=	1342	>	240	0.18
Net Total load (in)	at 12.61 ft	=	-0.609	L/D	=	502	>	240	0.48

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 170**

SPAN INFORMATION (ft): I-End (162.95,87.74) J-End (172.61,90.32)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	11.48
Mnf (kip-ft)	=	134.67	Mn (kip-ft)	=	105.25
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	197.47	Itr (in4)	=	259.73
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 10 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.510	0.450	0.750	0.0%	Red	0.000	0.188
	10.000	0.510	0.450	0.750			0.000	0.188
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.13 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	10.7	5.0	0.0	1.00	0.90	46.90
	Init DL	1.4DL	8.1	5.0	---	---		
	Max +	1.2DL+1.6LL	22.8	5.0	---	---	0.90	94.72
Controlling		1.2DL+1.6LL	22.8	5.0	---	---	0.90	94.72

REACTIONS (kips):

	Left	Right
Initial reaction	3.25	3.25
DL reaction	2.61	2.61
Max +LL reaction	3.75	3.75
Max +total reaction (factored)	9.13	9.13

DEFLECTIONS:

							Ratio
Initial load (in)	at	5.00 ft	=	-0.067	L/D	=	1801
Live load (in)	at	5.00 ft	=	-0.029	L/D	=	4072 > PRCNC20221036

Post Comp load (in)	at	5.00 ft	=	-0.032	L/D	=	3771	>	240	0.06
Net Total load (in)	at	5.00 ft	=	-0.098	L/D	=	1219	>	240	0.20

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 171**

SPAN INFORMATION (ft): I-End (155.92,105.12) J-End (185.92,105.12)

Beam Size (Optimum) = W12X16 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	33.27	Y bar(in)	=	13.05
Mnf (kip-ft)	=	196.67	Mn (kip-ft)	=	196.67
C (kips)	=	235.50	PNA (in)	=	14.98
Ieff (in4)	=	430.31	Itr (in4)	=	430.31
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Full = 30 Partial = 30 Actual = 30
Number of Stud Rows = 1 Percent of Full Composite Action = 97.37

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
2.375	1.20	1.07	1.61	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.40
12.728	0.48	0.43	0.58	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.15

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.161	0.142	0.237	0.0%	Red	0.000	0.059
	30.000	0.161	0.142	0.237			0.000	0.059
2	0.000	0.374	0.330	0.550	0.0%	Red	0.000	0.137
	2.375	0.352	0.311	0.518			0.000	0.129
3	2.375	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	3.281	0.115	0.102	0.169			0.000	0.042
4	3.282	0.115	0.102	0.169	0.0%	Red	0.000	0.042
	12.727	0.029	0.026	0.043			0.000	0.011
5	12.728	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	14.623	0.241	0.212	0.354			0.000	0.088
6	14.624	0.241	0.212	0.354	0.0%	Red	0.000	0.088
	30.000	0.100	0.089	0.148			0.000	0.037
7	0.000	0.016	0.016	0.000	---	NonR	0.000	0.000
	30.000	0.016	0.016	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.57 kips 1.00Vn = 79.20 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	65.5	15.2	0.0	1.00	0.90	75.38
	Init DL	1.4DL	50.4	15.2	---	---		
	Max +	1.2DL+1.6LL	138.0	15.2	---	---	0.90	177.01
Controlling		1.2DL+1.6LL	133.9	12.7	---	---	0.90	139.26

REACTIONS (kips):

	Left	Right
Initial reaction	7.81	6.33
DL reaction	6.33	5.12
Max +LL reaction	8.74	7.12
Max +total reaction (factored)	21.57	17.54

DEFLECTIONS: **(Camber = 1-1/2)**

									Ratio
Initial load (in)	at 15.00 ft	=	-1.938	L/D	=	186			
Live load (in)	at 15.00 ft	=	-0.721	L/D	=	499	>	360	0.72
Post Comp load (in)	at 15.00 ft	=	-0.778	L/D	=	462	>	240	0.52
Net Total load (in)	at 15.00 ft	=	-1.217	L/D	=	296	>	240	0.81

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 172**

SPAN INFORMATION (ft): I-End (158.29,105.12) J-End (160.88,95.46)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
3.503	0.59	0.78	0.0	0.00	0.00	0.0	0.00	Snow	0.00
8.003	1.85	2.67	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	0.0%	Red	0.000
	3.503	0.030	0.044			0.000
2	3.503	0.025	0.037	0.0%	Red	0.000
	8.003	0.026	0.038			0.000
3	0.000	0.091	0.134	0.0%	Red	0.000
	10.003	0.000	0.000			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	10.003	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.76 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	13.5	7.0	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	13.5	7.0	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.20	1.97
Max +LL reaction	1.61	2.74
Max +total reaction (factored)	4.03	6.76

DEFLECTIONS:

										Ratio
Dead load (in)	at	5.20 ft	=	-0.048	L/D	=	2520			
Live load (in)	at	5.20 ft	=	-0.065	L/D	=	1845	>	360	0.20
Net Total load (in)	at	5.20 ft	=	-0.113	L/D	=	1065	>	240	0.23

PRCNC20221036

Floor Type: Level 2 **Beam Number = 173**

SPAN INFORMATION (ft): I-End (168.64,105.12) J-End (169.96,100.22)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.07
Mp (kip-ft) = 52.50

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.823	0.44	0.56	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	0.0%	Red	0.000
	5.073	0.043	0.063			0.000
2	0.000	0.008	0.011	0.0%	Red	0.000
	0.823	0.000	0.000			0.000
3	0.824	0.020	0.029	0.0%	Red	0.000
	5.073	0.020	0.029			0.000
4	0.000	0.012	0.000	---	NonR	0.000
	5.073	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.50 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	1.2	1.2	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	1.2	1.2	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.48	0.22
Max +LL reaction	0.58	0.27
Max +total reaction (factored)	1.50	0.70

DEFLECTIONS:

									Ratio
Dead load (in)	at	2.36 ft	=	-0.001	L/D	=	5372 8		
Live load (in)	at	2.36 ft	=	-0.001	L/D	=	4441 6	> 360	0.01
Net Total load (in)	at	2.36 ft	=	-0.003	L/D	=	2431 5	> 240	0.01

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 174**

SPAN INFORMATION (ft): I-End (160.36,97.39) J-End (170.02,99.98)

Beam Size (Optimum) = MC10X6.5 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00
Mp (kip-ft) = 24.58

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.023	0.033	0.0%	Red	0.000
	10.000	0.023	0.033			0.000
2	0.000	0.340	0.500	0.0%	Red	0.000
	10.000	0.340	0.500			0.000
3	0.000	0.007	0.000	---	NonR	0.000
	10.000	0.007	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 6.48 kips 0.90Vn = 41.04 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	16.2	5.0	0.0	1.00	0.90	22.12
Controlling		1.2DL+1.6LL	16.2	5.0	0.0	1.00	0.90	22.12

REACTIONS (kips):

	Left	**Right**
DL reaction	1.85	1.85
Max +LL reaction	2.67	2.67
Max +total reaction (factored)	6.48	6.48

DEFLECTIONS:

								Ratio
Dead load (in)	at	5.00 ft	=	-0.125	L/D =	959		
Live load (in)	at	5.00 ft	=	-0.181	L/D =	664	> 360	0.54
Net Total load (in)	at	5.00 ft	=	-0.306	L/D =	392	> 240	0.61

PRCNC20221036

Floor Type: Level 2 **Beam Number = 175**

SPAN INFORMATION (ft): I-End (159.20,101.74) J-End (168.86,104.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	75.0 deg	75.0 deg
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	14.30	Y bar(in)	=	10.17
Mnf (kip-ft)	=	116.00	Mn (kip-ft)	=	95.71
C (kips)	=	68.92	PNA (in)	=	8.56
Ieff (in4)	=	164.91	Itr (in4)	=	215.44
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 9 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 40.62

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.111	0.098	0.163	0.0%	Red	0.000	0.041
	9.779	0.028	0.025	0.041			0.000	0.010
2	9.780	0.028	0.025	0.041	0.0%	Red	0.000	0.010
	10.000	0.000	0.000	0.000			0.000	0.000
3	0.000	0.023	0.020	0.033	0.0%	Red	0.000	0.008
	10.000	0.023	0.020	0.033			0.000	0.008
4	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.95 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	2.1	4.7	0.0	1.00	0.90	46.90
	Init DL	1.4DL	1.6	4.7	---	---		
	Max +	1.2DL+1.6LL	4.3	4.6	---	---	0.90	86.14
Controlling		1.2DL+1.6LL	4.3	4.6	---	---	0.90	86.14

REACTIONS (kips):

	Left	Right
Initial reaction	0.72	0.54
DL reaction	0.59	0.44
Max +LL reaction	0.78	0.56
Max +total reaction (factored)	1.95	1.43

PRCNC20221036

Gravity Beam Design

DEFLECTIONS:

										Ratio
Initial load (in)	at	4.90 ft	=	-0.013	L/D	=	8985			
Live load (in)	at	4.90 ft	=	-0.006	L/D	=	1899 4	>	360	0.02
Post Comp load (in)	at	4.90 ft	=	-0.007	L/D	=	1758 7	>	240	0.01
Net Total load (in)	at	4.90 ft	=	-0.020	L/D	=	5947	>	240	0.04

Floor Type: Level 2 **Beam Number = 176**

SPAN INFORMATION (ft): I-End (211.28,109.87) J-End (211.51,109.03)

Beam Size (Optimum) = W8X10 Fy = 50.0 ksi
Total Beam Length (ft) = 0.88
Cantilever on left (ft) = 0.88
Mp (kip-ft) = 36.96

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	5.28	7.27	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.081	0.119	0.0%	Red	0.000
	0.875	0.080	0.118			0.000
2	0.000	0.010	0.000	---	NonR	0.000
	0.875	0.010	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 18.22 kips 1.00Vn = 40.24 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Left	Max -	1.2DL+1.6LL	-15.8	0.9	0.9	1.00	0.90	32.87
Controlling		1.2DL+1.6LL	-15.8	0.9	0.9	1.00	0.90	32.87

REACTIONS (kips):

	Left	**Right**
DL reaction	---	5.35
Max +LL reaction	---	7.37
Max +total reaction (factored)	---	18.22

DEFLECTIONS:

Left cantilever:

					Ratio
Dead load (in)	= -0.002	L/D	=	9153	
Pos Live load (in)	= -0.003	L/D	=	6643 > 360	0.05
Pos Total load (in)	= -0.005	L/D	=	3849 > 240	0.06

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 177**

SPAN INFORMATION (ft): I-End (185.92,109.87) J-End (211.28,109.87)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 25.37

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	57.08	Y bar(in)	=	16.37
Mnf (kip-ft)	=	381.54	Mn (kip-ft)	=	320.68
C (kips)	=	189.53	PNA (in)	=	15.35
Ieff (in4)	=	837.68	Itr (in4)	=	1064.92
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 50 Partial = 25 Actual = 25
Number of Stud Rows = 1 Percent of Full Composite Action = 49.36

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.544	0.480	0.800	0.0%	Red	0.000	0.200
	25.367	0.313	0.276	0.460			0.000	0.115
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	25.367	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 21.43 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	59.4	12.1	0.0	1.00	0.90	165.75
	Init DL	1.4DL	45.6	12.2	---	---		
	Max +	1.2DL+1.6LL	125.2	12.1	---	---	0.90	288.61
Controlling		1.2DL+1.6LL	125.2	12.1	---	---	0.90	288.61

REACTIONS (kips):

	Left	Right
Initial reaction	7.73	6.51
DL reaction	6.25	5.28
Max +LL reaction	8.71	7.27
Max +total reaction (factored)	21.43	17.96

DEFLECTIONS: **Ratio**

Initial load (in)	at 12.56 ft	=	-0.431	L/D =	706
Live load (in)	at 12.56 ft	=	-0.242	L/D =	1260 >

PRCNC20221036

Post Comp load (in)	at	12.56 ft	=	-0.261	L/D	=	1167	>	240	0.21
Net Total load (in)	at	12.56 ft	=	-0.692	L/D	=	440	>	240	0.55

Floor Type: Level 2 **Beam Number = 178**

SPAN INFORMATION (ft): I-End (64.08,121.58) J-End (64.08,135.17)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 13.58

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	40.75	Y bar(in)	=	11.91
Mnf (kip-ft)	=	138.04	Mn (kip-ft)	=	112.65
C (kips)	=	103.38	PNA (in)	=	9.68
Ieff (in4)	=	223.32	Itr (in4)	=	275.61
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 13 Partial = 13 Actual = 13
Number of Stud Rows = 1 Percent of Full Composite Action = 58.40

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.487	0.430	0.717	0.0%	Red	0.000	0.179
	13.583	0.487	0.430	0.717			0.000	0.179
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	13.583	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 11.86 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	18.8	6.8	0.0	1.00	0.90	46.90
	Init DL	1.4DL	14.3	6.8	---	---		
	Max +	1.2DL+1.6LL	40.3	6.8	---	---	0.90	101.38
Controlling		1.2DL+1.6LL	18.8	6.8	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	Right
Initial reaction	4.22	4.22
DL reaction	3.39	3.39
Max +LL reaction	4.87	4.87
Max +total reaction (factored)	11.86	11.86

DEFLECTIONS:

							Ratio
Initial load (in)	at	6.79 ft	=	-0.217	L/D	=	751
Live load (in)	at	6.79 ft	=	-0.085	L/D	=	1923 > PRCNC20221036

Post Comp load (in)	at	6.79 ft	=	-0.092	L/D	=	1781	>	240	0.13
Net Total load (in)	at	6.79 ft	=	-0.309	L/D	=	528	>	240	0.45

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 180**

SPAN INFORMATION (ft): I-End (209.15,98.51) J-End (211.63,89.28)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.56

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	28.67	Y bar(in)	=	11.42
Mnf (kip-ft)	=	134.07	Mn (kip-ft)	=	105.11
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	195.74	Itr (in4)	=	257.26
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 18 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
4.778	0.84	0.75	1.19	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.30

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	9.555	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.53 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	3.4	4.8	4.8	1.64	0.90	46.90
	Init DL	1.4DL	2.7	4.8	---	---		
	Max +	1.2DL+1.6LL	7.1	4.8	---	---	0.90	94.60
Controlling		1.2DL+1.6LL	7.1	4.8	---	---	0.90	94.60

REACTIONS (kips):

	Left	Right
Initial reaction	0.58	0.58
DL reaction	0.48	0.48
Max +LL reaction	0.60	0.60
Max +total reaction (factored)	1.53	1.53

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	4.78 ft	=	-0.016	L/D	=	6958			
Live load (in)	at	4.78 ft	=	-0.007	L/D	=	1735 2	>	360	0.02
Post Comp load (in)	at	4.78 ft	=	-0.007	L/D	=	1606 7	>	240	0.01
Net Total load (in)	at	4.78 ft	=	-0.024	L/D	=	4855	>	240	0.05

Floor Type: Level 2 **Beam Number = 181**

SPAN INFORMATION (ft): I-End (210.39,93.89) J-End (215.22,95.18)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.325	0.478	0.0%	Red	0.000
	5.000	0.325	0.478			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	5.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.92 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	3.7	2.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	3.7	2.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.84	0.84
Max +LL reaction	1.19	1.19
Max +total reaction (factored)	2.92	2.92

DEFLECTIONS:										**Ratio**
Dead load (in)	at	2.50 ft	=	-0.003	L/D	=	1975 7			
Live load (in)	at	2.50 ft	=	-0.004	L/D	=	1393 3	>	360	0.03
Net Total load (in)	at	2.50 ft	=	-0.007	L/D	=	8171	>	240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 182**

SPAN INFORMATION (ft): I-End (86.17,166.50) J-End (86.17,176.50)

Beam Size (Optimum) = W8X10 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	9.96
Mnf (kip-ft)	=	102.14	Mn (kip-ft)	=	89.18
C (kips)	=	107.69	PNA (in)	=	7.79
Ieff (in4)	=	152.37	Itr (in4)	=	173.32
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 14 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 72.75

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.010	0.000	---	NonR	0.000	0.000
	10.000	0.010	0.010	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.07 kips 1.00Vn = 40.24 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.4DL	0.2	5.0	10.0	1.14	0.90	18.14
	Init DL	1.4DL	0.2	5.0	---	---		
	Max +	1.4DL	0.2	5.0	---	---	0.90	80.27
Controlling		1.4DL	0.2	5.0	10.0	1.14	0.90	18.14

REACTIONS (kips):

	Left	Right
Initial reaction	0.05	0.05
DL reaction	0.05	0.05
Max +total reaction (factored)	0.07	0.07

DEFLECTIONS: **Ratio**

Initial load (in) at 5.00 ft = -0.003 L/D = 4729
6

Live load (in) at 5.00 ft = -0.000
Post Comp load (in) at 5.00 ft = -0.000

PRCNC20221036

Net Total load (in)	at	5.00 ft	=	-0.003	L/D	=	4729 6	> 240	0.01

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 183**

SPAN INFORMATION (ft): I-End (145.42,118.17) J-End (145.42,128.33)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.17

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.50	Y bar(in)	=	11.51
Mnf (kip-ft)	=	134.88	Mn (kip-ft)	=	113.08
C (kips)	=	107.69	PNA (in)	=	9.69
Ieff (in4)	=	215.12	Itr (in4)	=	260.62
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 60.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.166	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 0.09 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.4DL	0.2	5.1	10.2	1.14	0.90	22.00
	Init DL	1.4DL	0.2	5.1	---	---		
	Max +	1.4DL	0.2	5.1	---	---	0.90	101.77
Controlling		1.4DL	0.2	5.1	10.2	1.14	0.90	22.00

REACTIONS (kips):

	Left	Right
Initial reaction	0.06	0.06
DL reaction	0.06	0.06
Max +total reaction (factored)	0.09	0.09

DEFLECTIONS:

						Ratio
Initial load (in)	at	5.08 ft	=	-0.002	L/D =	6573 7
Live load (in)	at	5.08 ft	=	-0.000		
Post Comp load (in)	at	5.08 ft	=	-0.000		

PRCNC20221036

Net Total load (in)	at	5.08 ft	=	-0.002	L/D	=	6573 7	>	240	0.00

Floor Type: Level 2 **Beam Number = 184**

SPAN INFORMATION (ft): I-End (226.09,98.10) J-End (226.97,98.33)

Beam Size (Optimum) = W8X10 Fy = 50.0 ksi
Total Beam Length (ft) = 0.92
Cantilever on right (ft) = 0.92
Mp (kip-ft) = 36.96

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.917	3.58	2.63	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.162	0.239	0.0%	Red	0.000
	0.916	0.162	0.239			0.000
2	0.000	0.012	0.018	0.0%	Red	0.000
	0.916	0.012	0.018			0.000
3	0.000	0.010	0.000	---	NonR	0.000
	0.916	0.010	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 9.09 kips 1.00Vn = 40.24 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Right	Max -	1.2DL+1.6LL	-8.1	0.0	0.9	1.00	0.90	32.87
Controlling		1.2DL+1.6LL	-8.1	0.0	0.9	1.00	0.90	32.87

REACTIONS (kips):

	Left	**Right**
DL reaction	3.75	---
Max +LL reaction	2.87	---
Max +total reaction (factored)	9.09	---

DEFLECTIONS:

Right cantilever:

					Ratio
Dead load (in)	=	-0.002	L/D =	12147	
Pos Live load (in)	=	-0.001	L/D =	16293 > 360	0.02
Pos Total load (in)	=	-0.003	L/D =	6959 > 240	0.03

PRCNC20221036

Floor Type: Level 2 **Beam Number = 185**

SPAN INFORMATION (ft): I-End (223.69,110.57) J-End (226.97,98.33)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 12.67

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	21.00	Y bar(in)	=	13.79
Mnf (kip-ft)	=	312.68	Mn (kip-ft)	=	274.09
C (kips)	=	107.69	PNA (in)	=	12.16
Ieff (in4)	=	674.44	Itr (in4)	=	827.68
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 27 Partial = 12 Actual = 12
Number of Stud Rows = 1 Percent of Full Composite Action = 42.63

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
7.889	2.95	2.61	4.22	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.06

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.250	0.000	0.000	---	NonR	0.000	0.000
	12.666	0.250	0.000	0.000			0.000	0.000
2	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	12.666	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 8.51 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	14.9	7.9	7.9	1.64	0.90	165.75
	Init DL	1.4DL	11.6	7.9	---	---		
	Max +	1.2DL+1.6LL	36.9	7.9	---	---	0.90	246.68
Controlling		1.2DL+1.6LL	36.9	7.9	---	---	0.90	246.68

REACTIONS (kips):

	Left	Right
Initial reaction	1.55	2.45
DL reaction	2.86	3.58
Max +LL reaction	1.59	2.63

	Left	Right
Max +total reaction (factored)	5.98	8.51

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.71 ft	=	-0.022	L/D	=	6945			
Live load (in)	at	6.71 ft	=	-0.015	L/D	=	1042 9	>	360	0.03
Post Comp load (in)	at	6.71 ft	=	-0.023	L/D	=	6577	>	240	0.04
Net Total load (in)	at	6.71 ft	=	-0.045	L/D	=	3378	>	240	0.07

Gravity Beam Design

Floor Type: Level 2 **Beam Number = 189**

SPAN INFORMATION (ft): I-End (223.60,110.93) J-End (223.69,110.57)

Beam Size (Optimum) = W8X10 Fy = 50.0 ksi
Total Beam Length (ft) = 0.37
Cantilever on left (ft) = 0.37
Mp (kip-ft) = 36.96

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
0.000	1.40	1.09	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.250	0.000	---	NonR	0.000
	0.371	0.250	0.000			0.000
2	0.000	0.010	0.000	---	NonR	0.000
	0.371	0.010	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.54 kips 1.00Vn = 40.24 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Left	Max -	1.2DL+1.6LL	-1.3	0.4	0.4	1.00	0.90	32.87
Controlling		1.2DL+1.6LL	-1.3	0.4	0.4	1.00	0.90	32.87

REACTIONS (kips):

	Left	**Right**
DL reaction	---	1.49
Max +LL reaction	---	1.09
Max +total reaction (factored)	---	3.54

DEFLECTIONS: **Ratio**

Left cantilever:

PRCNC20221036

Floor Type: Level 2 **Beam Number = 190**

SPAN INFORMATION (ft): I-End (218.59,110.93) J-End (223.60,110.93)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.250	0.000	---	NonR	0.000
	5.003	0.250	0.000			0.000
2	0.000	0.012	0.017	0.0%	Red	0.000
	3.535	0.012	0.017			0.000
3	3.535	0.012	0.017	0.0%	Red	0.000
	4.965	0.010	0.014			0.000
4	4.965	0.010	0.014	0.0%	Red	0.000
	5.003	0.000	0.000			0.000
5	0.000	0.314	0.461	0.0%	Red	0.000
	5.003	0.271	0.399			0.000
6	0.000	0.012	0.000	---	NonR	0.000
	5.003	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 3.55 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	4.4	2.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	4.4	2.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	1.43	1.40
Max +LL reaction	1.15	1.09
Max +total reaction (factored)	3.55	3.42

DEFLECTIONS:

									Ratio
Dead load (in)	at	2.50 ft	=	-0.005	L/D	=	11727		
Live load (in)	at	2.50 ft	=	-0.004	L/D	=	14842	> 360	0.02
Net Total load (in)	at	2.50 ft	=	-0.009	L/D	=	6551	> 240	0.04

PRCNC20221036

Floor Type: Level 2 **Beam Number = 191**

SPAN INFORMATION (ft): I-End (217.58,110.93) J-End (218.59,110.93)

Beam Size (User Selected) = W8X10 Fy = 50.0 ksi
Total Beam Length (ft) = 1.01
Mp (kip-ft) = 36.96

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.000	0.000	0.0%	Red	0.000
	0.625	0.042	0.062			0.000
2	0.634	0.012	0.017	0.0%	Red	0.000
	1.011	0.012	0.017			0.000
3	0.000	0.009	0.014	0.0%	Red	0.000
	1.011	0.000	0.000			0.000
4	0.000	0.010	0.000	---	NonR	0.000
	1.011	0.010	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.05 kips 1.00Vn = 40.24 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.4DL	0.0	0.5	0.0	1.00	0.90	32.87
Controlling		1.2DL+1.6LL	0.0	0.5	0.0	1.00	0.90	32.87

REACTIONS (kips):

	Left	**Right**
DL reaction	0.02	0.02
Max +LL reaction	0.02	0.02
Max +total reaction (factored)	0.05	0.04

DEFLECTIONS: **Ratio**

Dead load (in)	at	0.50 ft	=	-0.000	
Live load (in)	at	0.50 ft	=	-0.000	
Net Total load (in)	at	0.50 ft	=	-0.000	

Floor Type: Level 2 **Beam Number = 195**

SPAN INFORMATION (ft): I-End (213.98,99.80) J-End (225.73,102.95)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 12.17

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	36.50	Y bar(in)	=	11.76
Mnf (kip-ft)	=	136.94	Mn (kip-ft)	=	105.79
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	204.67	Itr (in4)	=	270.05
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 17.2 Rg = 1.00 Rp = 0.60
\# of studs: Max = 12 Partial = 12 Actual = 12
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	7.333	0.325	0.287	0.478			0.000	0.119
2	7.334	0.325	0.287	0.478	0.0%	Red	0.000	0.119
	12.166	0.281	0.248	0.413			0.000	0.103
3	0.000	0.162	0.143	0.239	0.0%	Red	0.000	0.060
	12.166	0.162	0.143	0.239			0.000	0.060
4	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	12.166	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.57 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	15.0	6.1	0.0	1.00	0.90	46.90
	Init DL	1.4DL	11.3	6.0	---	---		
	Max +	1.2DL+1.6LL	32.0	6.1	---	---	0.90	95.21
Controlling		1.2DL+1.6LL	32.0	6.1	---	---	0.90	95.21

REACTIONS (kips):

	Left	Right
Initial reaction	3.76	3.66
DL reaction	3.02	2.95
Max +LL reaction	4.34	4.22
Max +total reaction (factored)	10.57	10.29

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	6.08 ft	=	-0.138	L/D	=	1056			
Live load (in)	at	6.08 ft	=	-0.059	L/D	=	2479	>	360	0.15
Post Comp load (in)	at	6.08 ft	=	-0.064	L/D	=	2296	>	240	0.10
Net Total load (in)	at	6.08 ft	=	-0.202	L/D	=	723	>	240	0.33

Floor Type: Level 2 **Beam Number = 196**

SPAN INFORMATION (ft): I-End (155.92,84.24) J-End (155.92,94.13)

Beam Size (User Selected) = W12X40 Fy = 50.0 ksi
Total Beam Length (ft) = 9.89
Mp (kip-ft) = 237.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.084	0.124	0.0%	Red	0.000
	9.892	0.084	0.124			0.000
2	0.000	0.040	0.000	---	NonR	0.000
	9.892	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.71 kips 1.00Vn = 105.31 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	4.2	4.9	0.0	1.00	0.90	213.75
Controlling		1.2DL+1.6LL	4.2	4.9	0.0	1.00	0.90	213.75

REACTIONS (kips):

	Left	**Right**
DL reaction	0.61	0.61
Max +LL reaction	0.61	0.61
Max +total reaction (factored)	1.71	1.71

DEFLECTIONS:

										Ratio
Dead load (in)	at	4.95 ft	=	-0.003	L/D	=	3958 5			
Live load (in)	at	4.95 ft	=	-0.003	L/D	=	3966 2	>	360	0.01
Net Total load (in)	at	4.95 ft	=	-0.006	L/D	=	1981 2	>	240	0.01

PRCNC20221036

Floor Type: Level 2 **Beam Number = 197**

SPAN INFORMATION (ft): I-End (155.92,74.35) J-End (155.92,84.24)

Beam Size (User Selected) = W12X40 Fy = 50.0 ksi
Total Beam Length (ft) = 9.89
Mp (kip-ft) = 237.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.084	0.124	0.0%	Red	0.000
	9.892	0.084	0.124			0.000
2	0.000	0.040	0.000	---	NonR	0.000
	9.892	0.040	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.71 kips 1.00Vn = 105.31 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	4.2	4.9	0.0	1.00	0.90	213.75
Controlling		1.2DL+1.6LL	4.2	4.9	0.0	1.00	0.90	213.75

REACTIONS (kips):

	Left	**Right**
DL reaction	0.61	0.61
Max +LL reaction	0.61	0.61
Max +total reaction (factored)	1.71	1.71

DEFLECTIONS:

								Ratio
Dead load (in)	at	4.95 ft	=	-0.003	L/D =	3958 5		
Live load (in)	at	4.95 ft	=	-0.003	L/D =	3966 2	> 360	0.01
Net Total load (in)	at	4.95 ft	=	-0.006	L/D =	1981 2	> 240	0.01

PRCNC20221036

Floor Type: Level 2 **Beam Number = 198**

SPAN INFORMATION (ft): I-End (84.47,65.10) J-End (86.94,55.87)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 9.56

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	28.67	Y bar(in)	=	11.42
Mnf (kip-ft)	=	134.07	Mn (kip-ft)	=	105.11
C (kips)	=	86.15	PNA (in)	=	9.47
Ieff (in4)	=	195.74	Itr (in4)	=	257.26
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 18 Partial = 9 Actual = 9
Number of Stud Rows = 1 Percent of Full Composite Action = 48.67

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
4.778	0.84	0.75	1.19	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.30

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	9.555	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 1.53 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	3.4	4.8	4.8	1.64	0.90	46.90
	Init DL	1.4DL	2.7	4.8	---	---		
	Max +	1.2DL+1.6LL	7.1	4.8	---	---	0.90	94.60
Controlling		1.2DL+1.6LL	7.1	4.8	---	---	0.90	94.60

REACTIONS (kips):

	Left	Right
Initial reaction	0.58	0.58
DL reaction	0.48	0.48
Max +LL reaction	0.60	0.60
Max +total reaction (factored)	1.53	1.53

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	4.78 ft	=	-0.016	L/D	=	6958			
Live load (in)	at	4.78 ft	=	-0.007	L/D	=	1735 2	>	360	0.02
Post Comp load (in)	at	4.78 ft	=	-0.007	L/D	=	1606 7	>	240	0.01
Net Total load (in)	at	4.78 ft	=	-0.024	L/D	=	4855	>	240	0.05

Floor Type: Level 2 **Beam Number = 199**

SPAN INFORMATION (ft): I-End (80.88,59.19) J-End (85.70,60.48)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.325	0.478	0.0%	Red	0.000
	5.000	0.325	0.478			0.000
2	0.000	0.012	0.000	---	NonR	0.000
	5.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.92 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	3.7	2.5	0.0	1.00	0.90	46.90
Controlling		1.2DL+1.6LL	3.7	2.5	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	0.84	0.84
Max +LL reaction	1.19	1.19
Max +total reaction (factored)	2.92	2.92

DEFLECTIONS:

										Ratio
Dead load (in)	at	2.50 ft	=	-0.003	L/D	=	1975 7			
Live load (in)	at	2.50 ft	=	-0.004	L/D	=	1393 3	>	360	0.03
Net Total load (in)	at	2.50 ft	=	-0.007	L/D	=	8171	>	240	0.03

PRCNC20221036

Gravity Beam Design

Floor Type: Mezzanine **Beam Number = 3**

SPAN INFORMATION (ft): I-End (245.92,135.17) J-End (245.92,146.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 11.33

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	24.50	Y bar(in)	=	14.22
Mnf (kip-ft)	=	324.07	Mn (kip-ft)	=	275.06
C (kips)	=	107.69	PNA (in)	=	12.16
Ieff (in4)	=	672.55	Itr (in4)	=	867.01
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 28 Partial = 11 Actual = 11
Number of Stud Rows = 1 Percent of Full Composite Action = 38.45

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
4.833	13.10	4.82	2.98	0.0	0.00	0.00	0.0	0.00	Snow	0.00	1.86

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.010	0.000	0.000	---	NonR	0.000	0.000
	11.333	0.010	0.000	0.000			0.000	0.000
2	0.000	0.093	0.038	0.025	0.0%	Red	0.000	0.016
	11.333	0.093	0.038	0.025			0.000	0.016
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	11.333	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 12.85 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	25.9	4.8	6.5	1.63	0.90	165.75
	Init DL	1.4DL	20.1	4.8	---	---		
	Max +	1.2DL+1.6LL	59.9	4.8	---	---	0.90	247.55
Controlling		1.2DL+1.6LL	59.9	4.8	---	---	0.90	247.55

REACTIONS (kips):

	Left	Right
Initial reaction	4.28	3.30
DL reaction	8.24	6.32
Max +LL reaction	1.85	1.41
Max +total reaction (factored)	12.85	9.84

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.44 ft	=	-0.031	L/D	=	4415			
Live load (in)	at	5.44 ft	=	-0.008	L/D	=	1647 4	>	360	0.02
Post Comp load (in)	at	5.44 ft	=	-0.031	L/D	=	4369	>	240	0.05
Net Total load (in)	at	5.44 ft	=	-0.062	L/D	=	2196	>	240	0.11

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Mezzanine **Beam Number = 4**

SPAN INFORMATION (ft): I-End (215.92,135.17) J-End (245.92,135.17)

Beam Size (User Selected) = W18X35 Fy = 50.0 ksi
Total Beam Length (ft) = 30.00
Mp (kip-ft) = 277.08

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
5.000	0.15	0.03	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.010	0.000	---	NonR	0.000
	30.000	0.010	0.000			0.000
2	5.000	0.358	0.097	0.0%	Red	0.000
	15.000	0.358	0.097			0.000
3	15.000	0.741	0.074	0.0%	Red	0.000
	22.000	0.741	0.074			0.000
4	15.000	0.083	0.023	0.0%	Red	0.000
	22.000	0.083	0.023			0.000
5	22.000	0.358	0.097	0.0%	Red	0.000
	27.500	0.358	0.097			0.000
6	27.500	0.874	0.087	0.0%	Red	0.000
	30.000	0.874	0.087			0.000
7	27.500	0.034	0.009	0.0%	Red	0.000
	30.000	0.034	0.009			0.000
8	5.000	0.093	0.025	0.0%	Red	0.000
	30.000	0.093	0.025			0.000
9	0.000	0.035	0.000	---	NonR	0.000
	30.000	0.035	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 15.57 kips 1.00Vn = 159.30 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	109.6	16.4	0.0	1.00	0.90	249.38
Controlling		1.2DL+1.6LL	109.6	16.4	0.0	1.00	0.90	249.38

REACTIONS (kips):

	Left	**Right**
DL reaction	6.80	10.60
Max +LL reaction	1.29	1.78
Max +total reaction (factored)	10.23	15.57

DEFLECTIONS:

							Ratio
Dead load (in)	at 15.30 ft	=	-0.784	L/D =	459		
Live load (in)	at 15.30 ft	=	-0.141	L/D =	2551	> 360	0.14
Net Total load (in)	at 15.30 ft	=	-0.926	L/D =	389	> PRCNC20221036	

Floor Type: Mezzanine **Beam Number = 17**

SPAN INFORMATION (ft): I-End (219.58,146.50) J-End (245.92,146.50)

Beam Size (User Selected) = W16X36 Fy = 50.0 ksi
Total Beam Length (ft) = 26.33
Mp (kip-ft) = 266.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.333	0.31	0.07	0.5	0.00	0.00	0.0	0.00	Snow	0.00
1.333	0.20	0.04	0.5	0.00	0.00	0.0	0.00	Snow	0.00
21.333	1.57	0.25	0.5	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	1.334	1.175	0.318	0.5%	Red	0.000
	11.333	1.175	0.318			0.000
2	1.334	0.125	0.013	0.5%	Red	0.000
	3.333	0.125	0.013			0.000
3	3.334	0.046	0.013	0.5%	Red	0.000
	11.333	0.046	0.013			0.000
4	11.334	1.683	0.168	0.5%	Red	0.000
	13.833	1.683	0.168			0.000
5	11.334	0.598	0.162	0.5%	Red	0.000
	13.833	0.598	0.162			0.000
6	13.834	0.740	0.200	0.5%	Red	0.000
	21.333	0.740	0.200			0.000
7	21.334	0.370	0.100	0.5%	Red	0.000
	23.333	0.370	0.100			0.000
8	23.334	1.000	0.100	0.5%	Red	0.000
	26.333	1.000	0.100			0.000
9	13.834	0.481	0.130	0.5%	Red	0.000
	20.833	0.481	0.130			0.000
10	20.834	0.808	0.081	0.5%	Red	0.000
	23.333	0.808	0.081			0.000
11	20.834	0.182	0.049	0.5%	Red	0.000
	23.333	0.182	0.049			0.000
12	23.334	0.481	0.130	0.5%	Red	0.000
	26.333	0.481	0.130			0.000
13	0.000	0.036	0.000	---	NonR	0.000
	26.333	0.036	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 30.82 kips 1.00Vn = 140.71 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	202.7	13.1	0.0	1.00	0.90	240.00
Controlling		1.2DL+1.6LL	202.7	13.1	0.0	1.00	[illegible]	[illegible]

Gravity Beam Design

REACTIONS (kips):

	Left	**Right**
DL reaction	17.41	20.26
Max +LL reaction	4.00	4.07
Max +total reaction (factored)	27.29	30.82

DEFLECTIONS: (Camber = 3/4)

									Ratio
Dead load (in)	at 13.17 ft	=	-1.243	L/D	=	254			
Live load (in)	at 13.17 ft	=	-0.272	L/D	=	1160	>	360	0.31
Net Total load (in)	at 13.17 ft	=	-0.765	L/D	=	413	>	240	0.58

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Mezzanine **Beam Number = 18**

SPAN INFORMATION (ft): I-End (219.58,156.50) J-End (245.92,156.50)

Beam Size (User Selected) = W16X36 Fy = 50.0 ksi
Total Beam Length (ft) = 26.33
Mp (kip-ft) = 266.67

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.333	0.15	0.03	0.0	0.00	0.00	0.0	0.00	Snow	0.00
1.333	0.31	0.07	0.0	0.00	0.00	0.0	0.00	Snow	0.00
21.333	1.57	0.25	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	1.334	0.370	0.100	0.0%	Red	0.000
	10.333	0.370	0.100			0.000
2	10.334	0.237	0.064	0.0%	Red	0.000
	23.333	0.237	0.064			0.000
3	10.334	0.360	0.036	0.0%	Red	0.000
	18.333	0.360	0.036			0.000
4	18.334	0.133	0.036	0.0%	Red	0.000
	23.333	0.133	0.036			0.000
5	23.334	2.000	0.200	0.0%	Red	0.000
	26.333	2.000	0.200			0.000
6	1.334	0.875	0.088	0.0%	Red	0.000
	3.333	0.875	0.088			0.000
7	1.334	0.416	0.112	0.0%	Red	0.000
	11.333	0.416	0.112			0.000
8	3.334	0.324	0.088	0.0%	Red	0.000
	11.333	0.324	0.088			0.000
9	11.334	0.694	0.188	0.0%	Red	0.000
	13.833	0.694	0.188			0.000
10	11.334	0.125	0.012	0.0%	Red	0.000
	13.833	0.125	0.012			0.000
11	13.834	0.740	0.200	0.0%	Red	0.000
	21.333	0.740	0.200			0.000
12	21.334	0.370	0.100	0.0%	Red	0.000
	23.333	0.370	0.100			0.000
13	0.000	0.036	0.000	---	NonR	0.000
	26.333	0.036	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 29.20 kips 1.00Vn = 140.71 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	180.8	13.4	0.0	1.00	0.90	240.00
Controlling		1.2DL+1.6LL	180.8	13.4	0.0	1.00	0.90	240.00

REACTIONS (kips):

	Left	**Right**
DL reaction	16.35	19.41
Max +LL reaction	3.65	3.69
Max +total reaction (factored)	25.47	29.20

DEFLECTIONS: (Camber = 3/4)

									Ratio
Dead load (in)	at 13.30 ft	=	-1.113	L/D	=	284			
Live load (in)	at 13.17 ft	=	-0.249	L/D	=	1270	>	360	0.28
Net Total load (in)	at 13.17 ft	=	-0.612	L/D	=	516	>	240	0.46

PRCNC20221036

Floor Type: Mezzanine **Beam Number = 19**

SPAN INFORMATION (ft): I-End (219.58,166.50) J-End (245.92,166.50)

Beam Size (User Selected) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 26.33
Mp (kip-ft) = 225.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.333	0.15	0.03	0.0	0.00	0.00	0.0	0.00	Snow	0.00
1.333	0.15	0.03	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	1.334	0.364	0.098	0.0%	Red	0.000
	26.333	0.364	0.098			0.000
2	1.334	0.370	0.100	0.0%	Red	0.000
	10.333	0.370	0.100			0.000
3	10.334	0.237	0.064	0.0%	Red	0.000
	26.333	0.237	0.064			0.000
4	10.334	0.360	0.036	0.0%	Red	0.000
	18.333	0.360	0.036			0.000
5	18.334	0.133	0.036	0.0%	Red	0.000
	26.333	0.133	0.036			0.000
6	0.000	0.031	0.000	---	NonR	0.000
	26.333	0.031	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 17.43 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	118.8	13.3	0.0	1.00	0.90	202.50
Controlling		1.2DL+1.6LL	118.8	13.3	0.0	1.00	0.90	202.50

REACTIONS (kips):

	Left	**Right**
DL reaction	10.23	11.05
Max +LL reaction	2.42	2.61
Max +total reaction (factored)	16.15	17.43

DEFLECTIONS:

								Ratio
Dead load (in)	at 13.17 ft	=	-0.863	L/D	=	366		
Live load (in)	at 13.17 ft	=	-0.197	L/D	=	1606	> 360	0.22
Net Total load (in)	at 13.17 ft	=	-1.060	L/D	=	298	> 240	0.80

PRCNC20221036

Gravity Beam Design

Floor Type: Mezzanine **Beam Number = 20**

SPAN INFORMATION (ft): I-End (219.58,171.42) J-End (245.92,171.42)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 26.33
Mp (kip-ft) = 184.17

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.333	0.16	0.03	0.0	0.00	0.00	0.0	0.00	Snow	0.00
1.333	0.15	0.03	0.0	0.00	0.00	0.0	0.00	Snow	0.00
4.167	0.28	0.06	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	4.167	0.000	0.000	0.0%	Red	0.000
	4.833	0.099	0.027			0.000
2	4.842	0.037	0.010	0.0%	Red	0.000
	26.333	0.037	0.010			0.000
3	1.334	0.376	0.102	0.0%	Red	0.000
	4.166	0.376	0.102			0.000
4	1.334	0.364	0.098	0.0%	Red	0.000
	26.333	0.364	0.098			0.000
5	0.000	0.026	0.000	---	NonR	0.000
	26.333	0.026	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 10.41 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.2DL+1.6LL	62.6	12.8	0.0	1.00	0.90	165.75
Controlling		1.2DL+1.6LL	62.6	12.8	0.0	1.00	0.90	165.75

REACTIONS (kips):

	Left	**Right**
DL reaction	6.50	5.77
Max +LL reaction	1.63	1.46
Max +total reaction (factored)	10.41	9.27

DEFLECTIONS:

						Ratio
Dead load (in)	at 13.03 ft	= -0.562	L/D =	562		
Live load (in)	at 13.03 ft	= -0.142	L/D =	2220	> 360	0.16
Net Total load (in)	at 13.03 ft	= -0.704	L/D =	449	> 240	0.54

PRCNC20221036

Floor Type: Mezzanine **Beam Number = 22**

SPAN INFORMATION (ft): I-End (223.75,171.42) J-End (223.75,176.50)

Beam Size (User Selected) = W16X26 Fy = 50.0 ksi
Total Beam Length (ft) = 5.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	15.25	Y bar(in)	=	12.88
Mnf (kip-ft)	=	291.92	Mn (kip-ft)	=	226.08
C (kips)	=	43.07	PNA (in)	=	9.57
Ieff (in4)	=	535.31	Itr (in4)	=	746.25
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 16 Partial = 5 Actual = 5
Number of Stud Rows = 1 Percent of Full Composite Action = 27.55

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.000	0.000	0.000	0.0%	Red	0.000	0.000
	0.666	0.099	0.040	0.027			0.000	0.017
2	0.675	0.099	0.040	0.027	0.0%	Red	0.000	0.017
	5.083	0.099	0.040	0.027			0.000	0.017
3	0.000	0.026	0.026	0.000	---	NonR	0.000	0.000
	5.083	0.026	0.026	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.49 kips 0.90Vn = 105.97 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.3	2.5	5.1	1.14	0.90	165.75
	Init DL	1.4DL	0.3	2.6	---	---		
	Max +	1.2DL+1.6LL	0.6	2.5	---	---	0.90	203.47
Controlling		1.2DL+1.6LL	0.6	2.5	---	---	0.90	203.47

REACTIONS (kips):

	Left	Right
Initial reaction	0.19	0.21
DL reaction	0.28	0.32
Max +LL reaction	0.06	0.07
Max +total reaction (factored)	0.44	0.49

DEFLECTIONS:

PRCNC20221036

Initial load (in)	at	2.54 ft	=	-0.000
Live load (in)	at	2.54 ft	=	-0.000
Post Comp load (in)	at	2.54 ft	=	-0.000
Net Total load (in)	at	2.54 ft	=	-0.000

Floor Type: Mezzanine **Beam Number = 36**

SPAN INFORMATION (ft): I-End (220.92,135.17) J-End (220.92,140.00)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 4.83

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	11.25	Y bar(in)	=	9.67
Mnf (kip-ft)	=	106.47	Mn (kip-ft)	=	82.58
C (kips)	=	43.07	PNA (in)	=	7.20
Ieff (in4)	=	143.18	Itr (in4)	=	199.68
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 12 Partial = 5 Actual = 5
Number of Stud Rows = 1 Percent of Full Composite Action = 37.53

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.049	0.020	0.013	0.0%	Red	0.000	0.008
	4.833	0.049	0.020	0.013			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	4.833	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.23 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.2	2.4	4.8	1.14	0.90	45.42
	Init DL	1.4DL	0.1	2.4	---	---		
	Max +	1.2DL+1.6LL	0.3	2.4	---	---	0.90	74.32
Controlling		1.2DL+1.6LL	0.3	2.4	---	---	0.90	74.32

REACTIONS (kips):

	Left	Right
Initial reaction	0.10	0.10
DL reaction	0.15	0.15
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.23	0.23

DEFLECTIONS: **Ratio**

Initial load (in) at 2.42 ft = -0.000
Live load (in) at 2.42 ft = -0.000

PRCNC20221036

Post Comp load (in)	at	2.42 ft	=	-0.000
Net Total load (in)	at	2.42 ft	=	-0.000

Gravity Beam Design

Floor Type: Mezzanine **Beam Number = 37**

SPAN INFORMATION (ft): I-End (220.92,140.00) J-End (220.92,146.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 6.50

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	= 13.75		Y bar(in)	=	10.09
Mnf (kip-ft)	= 114.29		Mn (kip-ft)	=	93.74
C (kips)	= 64.61		PNA (in)	=	8.34
Ieff (in4)	= 161.78		Itr (in4)	=	212.90
Stud length (in)	= 4.00		Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 14 Partial = 6 Actual = 6
Number of Stud Rows = 1 Percent of Full Composite Action = 46.06

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.049	0.020	0.013	0.0%	Red	0.000	0.008
	6.500	0.049	0.020	0.013			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	6.500	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.31 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.3	3.3	6.5	1.14	0.90	38.74
	Init DL	1.4DL	0.2	3.3	---	---		
	Max +	1.2DL+1.6LL	0.5	3.3	---	---	0.90	84.36
Controlling		1.2DL+1.6LL	0.3	3.3	6.5	1.14	0.90	38.74

REACTIONS (kips):

	Left	Right
Initial reaction	0.13	0.13
DL reaction	0.20	0.20
Max +LL reaction	0.04	0.04
Max +total reaction (factored)	0.31	0.31

DEFLECTIONS: **Ratio**

Initial load (in) at 3.25 ft = -0.001
Live load (in) at 3.25 ft = -0.000

PRCNC20221036

Post Comp load (in)	at	3.25 ft	=	-0.000						
Net Total load (in)	at	3.25 ft	=	-0.001	L/D	=	6553 5	>	240	0.00

Floor Type: Mezzanine **Beam Number = 38**

SPAN INFORMATION (ft): I-End (220.92,146.50) J-End (220.92,156.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	19.00	Y bar(in)	=	10.72
Mnf (kip-ft)	=	127.26	Mn (kip-ft)	=	110.26
C (kips)	=	107.69	PNA (in)	=	9.69
Ieff (in4)	=	193.87	Itr (in4)	=	233.37
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 60.83

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.049	0.020	0.013	0.0%	Red	0.000	0.008
	10.000	0.049	0.020	0.013			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.47 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.6	5.0	10.0	1.14	0.90	22.60
	Init DL	1.4DL	0.6	5.0	---	---		
	Max +	1.2DL+1.6LL	1.2	5.0	---	---	0.90	99.23
Controlling		1.2DL+1.6LL	0.6	5.0	10.0	1.14	0.90	22.60

REACTIONS (kips):

	Left	Right
Initial reaction	0.20	0.20
DL reaction	0.31	0.31
Max +LL reaction	0.07	0.07
Max +total reaction (factored)	0.47	0.47

DEFLECTIONS: **Ratio**

Initial load (in) at 5.00 ft = -0.005 L/D = 2596
6

PRCNC20221036

Live load (in)	at	5.00 ft	=	-0.001						
Post Comp load (in)	at	5.00 ft	=	-0.002	L/D	=	70276	>	240	0.00
Net Total load (in)	at	5.00 ft	=	-0.006	L/D	=	18960	>	240	0.01

Gravity Beam Design

Floor Type: Mezzanine **Beam Number = 40**

SPAN INFORMATION (ft): I-End (220.92,166.50) J-End (220.92,171.42)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 4.92

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	11.38	Y bar(in)	=	9.70
Mnf (kip-ft)	=	106.86	Mn (kip-ft)	=	82.60
C (kips)	=	43.07	PNA (in)	=	7.20
Ieff (in4)	=	143.13	Itr (in4)	=	200.42
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 12 Partial = 5 Actual = 5
Number of Stud Rows = 1 Percent of Full Composite Action = 37.12

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.049	0.020	0.013	0.0%	Red	0.000	0.008
	4.916	0.049	0.020	0.013			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	4.916	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.23 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.2	2.5	4.9	1.14	0.90	45.09
	Init DL	1.4DL	0.1	2.5	---	---		
	Max +	1.2DL+1.6LL	0.3	2.5	---	---	0.90	74.34
Controlling		1.2DL+1.6LL	0.3	2.5	---	---	0.90	74.34

REACTIONS (kips):

	Left	Right
Initial reaction	0.10	0.10
DL reaction	0.15	0.15
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.23	0.23

DEFLECTIONS: **Ratio**

Initial load (in) at 2.46 ft = -0.000
Live load (in) at 2.46 ft = -0.000

PRCNC20221036

Post Comp load (in)	at	2.46 ft	=	-0.000
Net Total load (in)	at	2.46 ft	=	-0.000

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Mezzanine **Beam Number = 41**

SPAN INFORMATION (ft): I-End (220.92,171.42) J-End (220.92,176.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.08

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	11.62	Y bar(in)	=	9.74
Mnf (kip-ft)	=	107.65	Mn (kip-ft)	=	82.64
C (kips)	=	43.07	PNA (in)	=	7.20
Ieff (in4)	=	143.04	Itr (in4)	=	201.86
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 12 Partial = 5 Actual = 5
Number of Stud Rows = 1 Percent of Full Composite Action = 36.32

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.049	0.020	0.013	0.0%	Red	0.000	0.008
	5.083	0.049	0.020	0.013			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	5.083	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.24 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.2	2.5	5.1	1.14	0.90	44.42
	Init DL	1.4DL	0.1	2.5	---	---		
	Max +	1.2DL+1.6LL	0.3	2.5	---	---	0.90	74.38
Controlling		1.2DL+1.6LL	0.3	2.5	---	---	0.90	74.38

REACTIONS (kips):

	Left	Right
Initial reaction	0.10	0.10
DL reaction	0.16	0.16
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.24	0.24

DEFLECTIONS: **Ratio**

Initial load (in) at 2.54 ft = -0.000
Live load (in) at 2.54 ft = -0.000

PRCNC20221036

Post Comp load (in)	at	2.54 ft	=	-0.000
Net Total load (in)	at	2.54 ft	=	-0.000

Gravity Beam Design

Floor Type: Mezzanine **Beam Number = 43**

SPAN INFORMATION (ft): I-End (219.58,161.50) J-End (245.92,161.50)

Beam Size (User Selected) = W16X31 Fy = 50.0 ksi
Total Beam Length (ft) = 26.33
Mp (kip-ft) = 225.00

POINT LOADS (kips):

Dist	DL	RedLL	Red%	NonRLL	StorLL	Red%	RoofLL	Red%	PartL
1.333	0.15	0.03	0.0	0.00	0.00	0.0	0.00	Snow	0.00
1.333	0.15	0.03	0.0	0.00	0.00	0.0	0.00	Snow	0.00

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	1.334	0.740	0.200	0.0%	Red	0.000
	10.333	0.740	0.200			0.000
2	10.334	1.680	0.168	0.0%	Red	0.000
	18.333	1.680	0.168			0.000
3	10.334	0.059	0.016	0.0%	Red	0.000
	26.333	0.059	0.016			0.000
4	18.334	0.311	0.084	0.0%	Red	0.000
	26.333	0.311	0.084			0.000
5	10.334	0.059	0.016	0.0%	Red	0.000
	23.333	0.059	0.016			0.000
6	18.334	0.311	0.084	0.0%	Red	0.000
	23.333	0.311	0.084			0.000
7	23.334	1.000	0.100	0.0%	Red	0.000
	26.333	1.000	0.100			0.000
8	0.000	0.031	0.000	---	NonR	0.000
	26.333	0.031	0.000			0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 24.05 kips 1.00Vn = 131.18 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	Max +	1.2DL+1.6LL	165.5	13.6	0.0	1.00	0.90	202.50
Controlling		1.2DL+1.6LL	165.5	13.6	0.0	1.00	0.90	202.50

REACTIONS (kips):

	Left	**Right**
DL reaction	13.45	16.53
Max +LL reaction	2.44	2.63
Max +total reaction (factored)	20.03	24.05

DEFLECTIONS: (Camber = 1)

						Ratio
Dead load (in)	at 13.30 ft	=	-1.270	L/D = 249		
Live load (in)	at 13.30 ft	=	-0.198	L/D = 1593	> 360	0.23
Net Total load (in)	at 13.30 ft	=	-0.468	L/D = 675	> 240	0.36

PRCNC20221036

Gravity Beam Design

Floor Type: Mezzanine **Beam Number = 44**

SPAN INFORMATION (ft): I-End (220.92,156.50) J-End (220.92,161.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	11.50	Y bar(in)	=	9.72
Mnf (kip-ft)	=	107.26	Mn (kip-ft)	=	82.62
C (kips)	=	43.07	PNA (in)	=	7.20
Ieff (in4)	=	143.09	Itr (in4)	=	201.14
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 12 Partial = 5 Actual = 5
Number of Stud Rows = 1 Percent of Full Composite Action = 36.71

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.049	0.020	0.013	0.0%	Red	0.000	0.008
	5.000	0.049	0.020	0.013			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	5.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.24 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.2	2.5	5.0	1.14	0.90	44.76
	Init DL	1.4DL	0.1	2.5	---	---		
	Max +	1.2DL+1.6LL	0.3	2.5	---	---	0.90	74.36
Controlling		1.2DL+1.6LL	0.3	2.5	---	---	0.90	74.36

REACTIONS (kips):

	Left	Right
Initial reaction	0.10	0.10
DL reaction	0.15	0.15
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.24	0.24

DEFLECTIONS: **Ratio**

Initial load (in) at 2.50 ft = -0.000
Live load (in) at 2.50 ft = -0.000

PRCNC20221036

Post Comp load (in)	at	2.50 ft	=	-0.000
Net Total load (in)	at	2.50 ft	=	-0.000

Floor Type: Mezzanine **Beam Number = 45**

SPAN INFORMATION (ft): I-End (220.92,161.50) J-End (220.92,166.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	11.50	Y bar(in)	=	9.72
Mnf (kip-ft)	=	107.26	Mn (kip-ft)	=	82.62
C (kips)	=	43.07	PNA (in)	=	7.20
Ieff (in4)	=	143.09	Itr (in4)	=	201.14
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 12 Partial = 5 Actual = 5
Number of Stud Rows = 1 Percent of Full Composite Action = 36.71

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.049	0.020	0.013	0.0%	Red	0.000	0.008
	5.000	0.049	0.020	0.013			0.000	0.008
2	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	5.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 0.24 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
			kip-ft	ft	ft			kip-ft
Center	PreCmp+	1.2DL+1.6LL	0.2	2.5	5.0	1.14	0.90	44.76
	Init DL	1.4DL	0.1	2.5	---	---		
	Max +	1.2DL+1.6LL	0.3	2.5	---	---	0.90	74.36
Controlling		1.2DL+1.6LL	0.3	2.5	---	---	0.90	74.36

REACTIONS (kips):

	Left	Right
Initial reaction	0.10	0.10
DL reaction	0.15	0.15
Max +LL reaction	0.03	0.03
Max +total reaction (factored)	0.24	0.24

DEFLECTIONS: **Ratio**

Initial load (in) at 2.50 ft = -0.000
Live load (in) at 2.50 ft = -0.000

PRCNC20221036

Post Comp load (in)	at	2.50 ft	=	-0.000
Net Total load (in)	at	2.50 ft	=	-0.000

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 13:29:13
Steel Code: AISC 360-16 LRFD

Floor Type: Mezzanine **Beam Number = 46**

SPAN INFORMATION (ft): I-End (240.92,146.50) J-End (240.92,156.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 10.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	30.00	Y bar(in)	=	11.48
Mnf (kip-ft)	=	134.67	Mn (kip-ft)	=	113.00
C (kips)	=	107.69	PNA (in)	=	9.69
Ieff (in4)	=	214.43	Itr (in4)	=	259.73
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
\# of studs: Full = 18 Partial = 10 Actual = 10
Number of Stud Rows = 1 Percent of Full Composite Action = 60.84

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
5.000	3.01	0.78	0.50	0.0	0.00	0.00	0.0	0.00	Snow	0.00	0.31

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.012	0.012	0.000	---	NonR	0.000	0.000
	10.000	0.012	0.012	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 2.28 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	3.8	5.0	5.0	1.64	0.90	46.90
	Init DL	1.4DL	2.9	5.0	---	---		
	Max +	1.2DL+1.6LL	11.2	5.0	---	---	0.90	101.70
Controlling		1.2DL+1.6LL	11.2	5.0	---	---	0.90	101.70

REACTIONS (kips):

	Left	Right
Initial reaction	0.61	0.61
DL reaction	1.57	1.57
Max +LL reaction	0.25	0.25
Max +total reaction (factored)	2.28	2.28

PRCNC20221036

DEFLECTIONS:

										Ratio
Initial load (in)	at	5.00 ft	=	-0.020	L/D	=	6082			
Live load (in)	at	5.00 ft	=	-0.003	L/D	=	4147 1	>	360	0.01
Post Comp load (in)	at	5.00 ft	=	-0.016	L/D	=	7584	>	240	0.03
Net Total load (in)	at	5.00 ft	=	-0.036	L/D	=	3375	>	240	0.07

Floor Type: Mezzanine **Beam Number = 47**

SPAN INFORMATION (ft): I-End (240.92,151.50) J-End (245.92,151.50)

Beam Size (User Selected) = W10X12 Fy = 50.0 ksi
Total Beam Length (ft) = 5.00
Mp (kip-ft) = 52.50

LINE LOADS (k/ft):

Load	Dist	DL	LL	Red%	Type	PartL
1	0.000	0.740	0.200	0.0%	Red	0.000
	2.000	0.740	0.200			0.000
2	2.000	2.000	0.200	0.0%	Red	0.000
	5.000	2.000	0.200			0.000
3	0.000	0.012	0.000	---	NonR	0.000
	5.000	0.012	0.000			0.000

SHEAR (Ultimate): Max Vu (1.4DL) = 6.33 kips 1.00Vn = 56.26 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	Max +	1.4DL	7.1	2.8	0.0	1.00	0.90	46.90
Controlling		1.4DL	7.1	2.8	0.0	1.00	0.90	46.90

REACTIONS (kips):

	Left	**Right**
DL reaction	3.01	4.52
Max +LL reaction	0.50	0.50
Max +total reaction (factored)	4.42	6.33

DEFLECTIONS:

									Ratio
Dead load (in)	at	2.57 ft	=	-0.014	L/D	=	4210		
Live load (in)	at	2.57 ft	=	-0.002	L/D	=	3332 9	> 360	0.01
Net Total load (in)	at	2.57 ft	=	-0.016	L/D	=	3738	> 240	0.06

Typical Beam Bolted End Connection

PRCNC20221036

TYPICAL SHEAR TAB STEEL BEAM CONNECTION - 3/4" DIA F1852 BOLTS (TENSION CONTROL)

BEAM	Fy	50	ksi	SHEAR	Fy	36	ksi	BOLTS	Ag	0.442	in2	WELDS Fexx	70 ksi
A992	Fu	65	ksi	PLATE	Fu	58	ksi		Fnv	54	ksi		
									bolt spacing	3	in		
									bolt edge dist Lev	1.5	in		
									bolt edge dist Leh	2	in		
									STD bolt hole reduc.	0.875	in round	STD in beam web	
									SSL bolt hole reduc.	0.875	in X 1.06 in horiz	SSL in shear tab	
									Bolt Hole reductions taken from AISC Table 9-1				

LRFD

LRFD	A) CHECK BOLTS					B) CHECK WELDS					C) CHECK SHEAR TAB								Block Shear Rupture				D) CHECK BEAM WEB - No Cope								Block Shear Rupture				
Number of Bolts	Bolt Dia.	Number of Bolts	Shear strength φRn	Bearing strength at Beam φRn	Bearing strength at Shear Tab φRn	Weld size	Weld length	"a" per AISC Table 8-4	"C" per AISC Table 8-4	Weld Strength φRn	Shear Plate Thick.	Agv	Anv	Shear Yielding φRn	Shear Rupture φRn	Ant - block	Agv - block	Anv - block	Tension Rupture Component	Shear Yielding Component	Shear Rupture Component	Block Shear Rupture φRn	Min Beam Web Thick.	Agv	Anv	Shear Yielding φRn	Shear Rupture φRn	Ant - block	Agv - block	Anv - block	Tension Rupture Component	Shear Yielding Component	Shear Rupture Component	Block Shear Rupture φRn	FINAL CONN. CAPACITY φRn
	in		kips	kips	kips	in	in			kips	in	in2	in2			in2	in2	in2	kips	kips	kips	kips	in	in2	in2			in2	in2	in2	kips	kips	kips	kips	kips
			J3.6	J3.10	J3.10									J4.2a	J4.2b				J4.3	J4.3	J4.3	J4.3				J4.2a	J4.2b				J4.3	J4.3	J4.3	J4.3	
W8x10																																			
2	0.75	2	35.8	29.8	58.7	1/4	6.0	0.42	2.58	46.4	0.375	2.250	1.59	48.6	41.6	0.551	1.688	1.195	24.0	27.3	31.2	51.3	0.17	1.4025	1.11	42.1	32.3	0.266	0.935	0.712	12.9	21.0	20.8	33.8	29.8
W10x12																																			
2	0.75	2	35.8	33.3	58.7	1/4	6.0	0.42	2.58	46.4	0.375	2.250	1.59	48.6	41.6	0.551	1.688	1.195	24.0	27.3	31.2	51.3	0.19	1.5675	1.24	47.0	36.1	0.297	1.045	0.796	14.5	23.5	23.3	37.7	33.3
3	0.75	3	53.7	52.7	88.1	1/4	9.0	0.28	3.17	85.6	0.375	3.375	2.39	72.9	62.4	0.551	2.813	1.992	24.0	45.6	52.0	69.5	0.20	2.25	1.73	67.5	50.5	0.313	1.700	1.263	15.2	38.3	36.9	52.2	50.5
4	0.75	4	71.6	87.8	117.5	1/4	12.0	0.21	3.47	124.9	0.375	4.500	3.19	97.2	83.2	0.551	3.938	2.789	24.0	63.8	72.8	87.8	0.25	3.5625	2.69	106.9	78.6	0.391	2.875	2.109	19.0	64.7	61.7	80.7	71.6
5	0.75	5	89.5	131.6	146.8	1/4	15.0	0.17	3.60	162.0	0.375	5.625	3.98	121.5	104.0	0.551	5.063	3.586	24.0	82.0	93.6	106.0	0.30	5.175	3.86	155.3	113.0	0.469	4.350	3.169	22.9	97.9	92.7	115.5	89.5
6	0.75	6	107.4	184.3	176.2	1/4	18.0	0.14	3.68	198.7	0.375	6.750	4.78	145.8	124.8	0.551	6.188	4.383	24.0	100.2	114.4	124.2	0.35	7.0875	5.25	212.6	153.6	0.547	6.125	4.441	26.7	137.8	129.9	156.5	107.4
7	0.75	7	125.3	282.6	205.5	1/4	21.0	0.12	3.70	233.1	0.375	7.875	5.58	170.1	145.6	0.551	7.313	5.180	24.0	118.5	135.2	142.4	0.46	10.695	7.88	320.9	230.4	0.719	9.430	6.814	35.0	212.2	199.3	234.3	125.3
8	0.75	8	143.2	329.9	234.9	1/4	24.0	0.10	3.71	267.1	0.375	9.000	6.38	194.4	166.4	0.551	8.438	5.977	24.0	136.7	156.0	160.7	0.47	12.3375	9.05	370.1	264.6	0.734	11.045	7.961	35.8	248.5	232.8	268.6	143.2
9	0.75	9	161.1	434.4	264.3	1/4	27.0	0.09	3.71	300.5	0.375	10.125	7.17	218.7	187.2	0.551	9.563	6.773	24.0	154.9	176.8	178.9	0.55	16.0875	11.76	482.6	343.9	0.859	14.575	10.484	41.9	327.9	306.7	348.6	161.1
10	0.75	10	179.0	526.5	293.6	1/4	30.0	0.08	3.71	333.9	0.375	11.250	7.97	243.0	208.0	0.551	10.688	7.570	24.0	173.1	197.6	197.1	0.6	19.35	14.10	580.5	412.4	0.938	17.700	12.713	45.7	398.3	371.8	417.5	179.0
11	0.75	11	196.9	608.1	323.0	1/4	33.0	0.08	3.71	367.3	0.375	12.375	8.77	267.3	228.8	0.551	11.813	8.367	24.0	191.4	218.4	215.3	0.63	22.2075	16.14	666.2	472.2	0.984	20.475	14.687	48.0	460.7	429.6	477.6	196.9
12	0.75	12	214.8	747.6	352.4	1/4	36.0	0.07	3.71	400.7	0.375	13.500	9.56	291.6	249.6	0.551	12.938	9.164	24.0	209.6	239.2	233.6	0.71	27.1575	19.70	814.7	576.3	1.109	25.205	18.061	54.1	567.1	528.3	582.4	214.8

ASD

ASD	A) CHECK BOLTS					B) CHECK WELDS					C) CHECK SHEAR TAB								Block Shear Rupture				D) CHECK BEAM WEB - No Cope								Block Shear Rupture				
Number of Bolts	Bolt Dia.	Number of Bolts	Shear strength Rn/Ω	Bearing strength at Beam Rn/Ω	Bearing strength at Shear Tab Rn/Ω	Weld size	Weld length	"a" per AISC Table 8-4	"C" per AISC Table 8-4	Weld Strength Rn/Ω	Shear Plate Thick.	Agv	Anv	Shear Yielding Rn/Ω	Shear Rupture Rn/Ω	Ant - block	Agv - block	Anv - block	Tension Rupture Component	Shear Yielding Component	Shear Rupture Component	Block Shear Rupture Rn/Ω	Min Beam Web Thick.	Agv	Anv	Shear Yielding Rn/Ω	Shear Rupture Rn/Ω	Ant - block	Agv - block	Anv - block	Tension Rupture Component	Shear Yielding Component	Shear Rupture Component	Block Shear Rupture Rn/Ω	FINAL CONN. CAPACITY Rn/Ω
	in		kips	kips	kips	in	in			kips	in	in2	in2			in2	in2	in2	kips	kips	kips	kips	in	in2	in2			in2	in2	in2	kips	kips	kips	kips	kips
			J3.6	J3.10	J3.10									J4.2a	J4.2b				J4.3	J4.3	J4.3	J4.3				J4.2a	J4.2b				J4.3	J4.3	J4.3	J4.3	
W8x10																																			
2	0.75	2	23.9	19.9	39.2	1/4	6.0	0.42	2.58	31.0	0.375	2.250	1.59	32.4	27.7	0.551	1.688	1.195	16.0	18.2	20.8	34.2	0.17	1.4025	1.11	28.1	21.5	0.266	0.935	0.712	8.6	14.0	13.9	22.5	19.9
W10x12																																			
2	0.75	2	23.9	22.2	39.2	1/4	6.0	0.42	2.58	31.0	0.375	2.250	1.59	32.4	27.7	0.551	1.688	1.195	16.0	18.2	20.8	34.2	0.19	1.5675	1.24	31.4	24.1	0.297	1.045	0.796	9.6	15.7	15.5	25.2	22.2
3	0.75	3	35.8	35.1	58.7	1/4	9.0	0.28	3.17	57.1	0.375	3.375	2.39	48.6	41.6	0.551	2.813	1.992	16.0	30.4	34.7	46.4	0.20	2.25	1.73	45.0	33.6	0.313	1.700	1.263	10.2	25.5	24.6	34.8	33.6
4	0.75	4	47.7	58.5	78.3	1/4	12.0	0.21	3.47	83.3	0.375	4.500	3.19	64.8	55.5	0.551	3.938	2.789	16.0	42.5	48.5	58.5	0.25	3.5625	2.69	71.3	52.4	0.391	2.875	2.109	12.7	43.1	41.1	53.8	47.7
5	0.75	5	59.7	87.8	97.9	1/4	15.0	0.17	3.60	108.0	0.375	5.625	3.98	81.0	69.3	0.551	5.063	3.586	16.0	54.7	62.4	70.7	0.30	5.175	3.86	103.5	75.3	0.469	4.350	3.169	15.2	65.3	61.8	77.0	59.7
6	0.75	6	71.6	122.9	117.5	1/4	18.0	0.14	3.68	132.5	0.375	6.750	4.78	97.2	83.2	0.551	6.188	4.383	16.0	66.8	76.3	82.8	0.35	7.0875	5.25	141.8	102.4	0.547	6.125	4.441	17.8	91.9	86.6	104.4	71.6
7	0.75	7	83.5	188.4	137.0	1/4	21.0	0.12	3.70	155.4	0.375	7.875	5.58	113.4	97.1	0.551	7.313	5.180	16.0	79.0	90.1	95.0	0.46	10.695	7.88	213.9	153.6	0.719	9.430	6.814	23.4	141.5	132.9	156.2	83.5
8	0.75	8	95.5	220.0	156.6	1/4	24.0	0.10	3.71	178.1	0.375	9.000	6.38	129.6	110.9	0.551	8.438	5.977	16.0	91.1	104.0	107.1	0.47	12.3375	9.05	246.8	176.4	0.734	11.045	7.961	23.9	165.7	155.2	179.1	95.5
9	0.75	9	107.4	289.6	176.2	1/4	27.0	0.09	3.71	200.3	0.375	10.125	7.17	145.8	124.8	0.551	9.563	6.773	16.0	103.3	117.9	119.3	0.55	16.0875	11.76	321.8	229.2	0.859	14.575	10.484	27.9	218.6	204.4	232.4	107.4
10	0.75	10	119.3	351.0	195.8	1/4	30.0	0.08	3.71	222.6	0.375	11.250	7.97	162.0	138.7	0.551	10.688	7.570	16.0	115.4	131.7	131.4	0.6	19.35	14.10	387.0	275.0	0.938	17.700	12.713	30.5	265.5	247.9	278.4	119.3
11	0.75	11	131.3	405.4	215.3	1/4	33.0	0.08	3.71	244.9	0.375	12.375	8.77	178.2	152.5	0.551	11.813	8.367	16.0	127.6	145.6	143.6	0.63	22.2075	16.14	444.2	314.8	0.984	20.475	14.687	32.0	307.1	286.4	318.4	131.3
12	0.75	12	143.2	498.4	234.9	1/4	36.0	0.07	3.71	267.1	0.375	13.500	9.56	194.4	166.4	0.551	12.938	9.164	16.0	139.7	159.5	155.7	0.71	27.1575	19.70	543.2	384.2	1.109	25.205	18.061	36.1	378.1	352.2	388.2	143.2

TYPICAL SHEAR TAB STEEL BEAM CONNECTION - 3/4" DIA F1852 BOLTS (TENSION CONTROL) - COPED BEAMS

BEAM	Fy	50	ksi	SHEAR PLATE	Fy	36	ksi	WELDS	Fexx 70 ksi
A992	Fu	65	ksi		Fu	58	ksi		

BOLTS				
Ag	0.442	in2		
Fnv	54	ksi		
bolts spacing	3	in		
bolt edge dist Lev	1.5	in		
bolt edge dist Leh	2	in		
STD bolt hole reduc.	0.875	in round		STD in beam web
SSL bolt hole reduc.	0.875	in X	1.06 in horiz	SSL in shear tab
Bolt Hole reductions taken from AISC Table 9-1				

Bolts	twmin	End Reac LRFD	End Reac ASD
2	0.17	29.8	19.9
3	0.20	50.5	33.6
4	0.25	71.6	47.7
5	0.30	89.5	59.7
6	0.35	107.4	71.6
7	0.46	125.3	83.5
8	0.47	143.2	95.5
9	0.55	161.1	107.4
10	0.6	179.0	119.3
11	0.63	196.9	131.3
12	0.71	214.8	143.2

LRFD

AISC 360-05, p.9-6

	Beam Depth	Number of Bolts	TOP COPE ONLY Top Cope (in)	Bottom Cope	tw min	c (in)	e (in)	Snet min per AISC Table 9-2 (in3)	***Flexural Rupture Strength φMn*** (k-in)	Ru allowed (kips)	ho=d-dc	f	k	Fcr (ksi)	***Flexural Local Buckling Strength φMn*** (k-in)	Ru allowed (kips)	TOP & BOT COPE c (in)	e (in)	ho min (in3)	Snet (in3)	***Flexural Rupture Strength φMn*** (k-in)	Ru allowed (kips)	fd
W8	8	2	1.5	1.5	0.17	4	4.5	1.54	75.1	**16.7**	6.5	1.00	4.90	87.88	121.8	**27.1**	3	3.5	5	0.71	34.5	**9.9**	2.09
W10	10	2	1.5	1.5	0.19	6	6.5	2.91	141.9	**21.8**	8.5	1.20	3.91	61.42	160.9	**24.7**	4	4.5	7	1.55	75.6	**16.8**	2.38
W12	12	3	1.5	1.5	0.2	6	6.5	4.71	229.6	**35.3**	10.5	1.00	5.54	52.67	223.3	**34.4**	4	4.5	9	2.70	131.6	**29.3**	2.56
W14	14	3	1.5	1.5	0.23	6	6.5	7.97	388.5	**59.8**	12.5	0.86	7.39	56.17	402.9	**62.0**	4	4.5	11	4.64	226.1	**50.2**	2.70
W16	16	4	1.5	1.5	0.25	7	7.5	11.6	565.5	**75.4**	14.5	0.88	7.32	49.88	520.7	**69.4**	5	5.5	13	7.04	343.3	**62.4**	2.80
W18	18	4	2	2	0.3	7	7.5	18.2	887.3	**118.3**	16	0.78	8.61	61.68	1010.3	**134.7**	5	5.5	14	9.80	477.8	**86.9**	2.67
	18	5	2	2	0.3	9	9.5	18.2	887.3	**93.4**	16	1.00	5.68	52.38	858.0	**90.3**	5	5.5	14	9.80	477.8	**86.9**	2.67
W21	21	5	3	3	0.3	9	9.5	26.3	1282.1	**135.0**	18	0.86	6.90	43.09	1019.9	**107.4**	6	6.5	15	11.25	548.4	**84.4**	2.43
	21	6	3	3	0.35	11	11.5	26.3	1282.1	**111.5**	18	1.05	4.96	51.47	1218.4	**105.9**	8	8.5	15	13.13	639.8	**75.3**	2.43
W24	24	5	3	3	0.3	9	9.5	39.7	1935.4	**203.7**	21	0.75	8.90	35.72	1276.3	**134.3**	6	6.5	18	16.20	789.8	**121.5**	2.56
	24	6	3	3	0.35	11	11.5	39.7	1935.4	**168.3**	21	0.92	6.39	42.67	1524.7	**132.6**	8	8.5	18	18.90	921.4	**108.4**	2.56
W27	27	6	3	3	0.35	11	11.5	64.5	3144.4	**273.4**	24	0.81	7.97	36.20	2101.4	**182.7**	8	8.5	21	25.73	1254.1	**147.5**	2.67
	27	7	3	3	0.46	16	16.5	64.5	3144.4	**190.6**	24	1.19	4.30	49.01	2845.3	**172.4**	14	14.5	21	33.81	1648.2	**113.7**	2.67
W30	30	6	3	3	0.35	11	11.5	80.9	3943.9	**342.9**	27	0.73	9.68	31.26	2276.4	**197.9**	8	8.5	24	33.60	1638.0	**192.7**	2.75
	30	7	3	3	0.46	16	16.5	80.9	3943.9	**239.0**	27	1.07	5.22	42.33	3082.1	**186.8**	14	14.5	24	44.16	2152.8	**148.5**	2.75
	30	8	3	3	0.47	18	18.5	80.9	3943.9	**213.2**	27	1.20	4.30	40.93	2980.4	**161.1**	16	16.5	24	45.12	2199.6	**133.3**	2.75
W33	33	7	3	3	0.46	16	16.5	120	5850.0	**354.5**	30	0.97	6.21	37.09	4005.7	**242.8**	14	14.5	27	55.89	2724.6	**187.9**	2.82
	33	8	3	3	0.47	18	18.5	120	5850.0	**316.2**	30	1.09	5.11	35.87	3873.5	**209.4**	16	16.5	27	57.11	2783.9	**168.7**	2.82
	33	9	3	3	0.55	18	18.5	120	5850.0	**316.2**	30	1.09	5.11	49.11	5304.4	**286.7**	18	18.5	27	66.83	3257.7	**176.1**	2.82
W36	36	8	3	3	0.47	18	18.5	154	7507.5	**405.8**	33	1.00	5.98	31.80	4407.3	**238.2**	16	16.5	30	70.50	3436.9	**208.3**	2.88
	36	9	3	3	0.55	18	18.5	154	7507.5	**405.8**	33	1.00	5.98	43.54	6035.3	**326.2**	18	18.5	30	82.50	4021.9	**217.4**	2.88
	36	10	3	3	0.6	18	18.5	154	7507.5	**405.8**	33	1.00	5.98	51.82	7182.5	**388.2**	18	18.5	30	90.00	4387.5	**237.2**	2.88
W40	40	9	3	3	0.55	18	18.5	186	9067.5	**490.1**	37	0.90	7.22	37.65	6302.9	**340.7**	18	18.5	34	105.97	5165.9	**279.2**	2.94
	40	10	3	3	0.6	18	18.5	186	9067.5	**490.1**	37	0.90	7.22	44.81	7501.0	**405.5**	18	18.5	34	115.60	5635.5	**304.6**	2.94
	40	11	3	3	0.63	18	18.5	186	9067.5	**490.1**	37	0.90	7.22	49.40	8269.9	**447.0**	18	18.5	34	121.38	5917.3	**319.9**	2.94
W44	44	10	3	3	0.6	18	18.5	288	14040.0	**758.9**	41	0.82	8.56	39.30	10186.0	**550.6**	18	18.5	38	144.40	7039.5	**380.5**	2.99
	44	11	3	3	0.63	18	18.5	288	14040.0	**758.9**	41	0.82	8.56	43.33	11230.0	**607.0**	18	18.5	38	151.62	7391.5	**399.5**	2.99
	44	12	3	3	0.71	18	18.5	288	14040.0	758.9	41	0.82	8.56	55.03	14263.2	**771.0**	18	18.5	38	170.87	8330.1	**450.3**	2.99

	Beam Depth	Number of Bolts	Fcr (ksi)	***Flexural Lateral-Torsional Buckling Strength φMn*** (k-in)	Ru allowed (kips)	Min Beam Web Thick.	Agv	Anv	Beam Web Shear Shear Yielding φRn (J4.2a)	Shear Rupture φRn (J4.2b)	Ant - block	Agv - block	Anv - block	Beam Web Block Shear Rupture Tension Rupture Component (J4.3)	Shear Yielding Component (J4.3)	Shear Rupture Component (J4.3)	Block Shear Rupture φRn (J4.3)	**FINAL CONN. CAPACITY φRn** (kips)	Conn. Capacity NO COPE	Copes OK?	**FINAL COPED BEAM CAPACITY φRn**
W8	8	2	227.86	145.3	**41.5**	0.17	0.85	0.55	**16.6**	**16.2**	0.266	0.765	0.542	12.9	17.2	15.8	**28.8**	9.9	29.8	reduce capacity	**9.0**
W10	10	2	172.96	241.5	**53.7**	0.19	1.33	1.00	**29.9**	**29.2**	0.297	0.855	0.606	14.5	19.2	17.7	**32.2**	16.8	29.8	reduce capacity	**16.0**
W12	12	3	160.83	390.8	**86.8**	0.20	1.80	1.28	**38.3**	**37.3**	0.313	1.500	1.063	15.2	33.8	31.1	**46.3**	29.3	50.5	reduce capacity	**29.0**
W14	14	3	183.12	764.4	**169.9**	0.23	2.53	1.93	**57.8**	**56.3**	0.359	1.725	1.222	17.5	38.8	35.7	**53.3**	50.2	50.5	reduce capacity	**50.0**
W16	16	4	151.91	962.7	**175.0**	0.25	3.25	2.38	**71.3**	**69.5**	0.391	2.625	1.859	19.0	59.1	54.4	**73.4**	62.4	71.6	reduce capacity	**62.0**
W18	18	4	193.67	1708.1	**310.6**	0.30	4.20	3.15	**94.5**	**92.1**	0.469	3.150	2.231	22.9	70.9	65.3	**88.1**	86.9	71.6	yes	**71.6**
	18	5	193.67	1708.1	**310.6**	0.30	4.20	2.89	**86.6**	**84.5**	0.469	4.050	2.869	22.9	91.1	83.9	**106.8**	84.5	89.5	reduce capacity	**84.0**
W21	21	5	137.18	1388.9	**213.7**	0.30	4.50	3.19	**95.6**	**93.2**	0.469	4.050	2.869	22.9	91.1	83.9	**106.8**	84.4	89.5	reduce capacity	**84.0**
	21	6	140.04	1654.2	**194.6**	0.35	5.25	3.41	**102.4**	**99.8**	0.547	5.775	4.091	26.7	129.9	119.7	**146.3**	75.3	107.4	reduce capacity	**75.0**
W24	24	5	120.62	1758.7	**270.6**	0.30	5.40	4.09	**122.6**	**119.6**	0.469	4.050	2.869	22.9	91.1	83.9	**106.8**	106.8	89.5	yes	**89.5**
	24	6	123.13	2094.5	**246.4**	0.35	6.30	4.46	**133.9**	**130.5**	0.547	5.775	4.091	26.7	129.9	119.7	**146.3**	108.4	107.4	yes	**107.4**
W27	27	6	109.83	2542.9	**299.2**	0.35	7.35	5.51	**165.4**	**161.2**	0.547	5.775	4.091	26.7	129.9	119.7	**146.3**	146.3	107.4	yes	**107.4**
	27	7	108.41	3298.9	**227.5**	0.46	9.66	6.84	**205.3**	**200.1**	0.719	8.970	6.354	35.0	201.8	185.8	**220.9**	113.7	125.3	reduce capacity	**113.0**
W30	30	6	99.11	2997.0	**352.6**	0.35	8.40	6.56	**196.9**	**192.0**	0.547	5.775	4.091	26.7	129.9	119.7	**146.3**	146.3	107.4	yes	**107.4**
	30	7	97.82	3887.9	**268.1**	0.46	11.04	8.22	**246.7**	**240.5**	0.719	8.970	6.354	35.0	201.8	185.8	**220.9**	148.5	125.3	yes	**125.3**
	30	8	89.36	3628.7	**219.9**	0.47	11.28	7.99	**239.7**	**233.7**	0.734	10.575	7.491	35.8	237.9	219.1	**254.9**	133.3	143.2	reduce capacity	**133.0**
W33	33	7	89.11	4482.4	**309.1**	0.46	12.42	9.60	**288.1**	**280.9**	0.719	8.970	6.354	35.0	201.8	185.8	**220.9**	187.9	125.3	yes	**125.3**
	33	8	81.40	4183.5	**253.5**	0.47	12.69	9.40	**282.0**	**275.0**	0.734	10.575	7.491	35.8	237.9	219.1	**254.9**	168.7	143.2	yes	**143.2**
	33	9	99.08	5959.1	**322.1**	0.55	14.85	10.52	**315.6**	**307.7**	0.859	14.025	9.934	41.9	315.6	290.6	**332.5**	176.1	161.1	yes	**161.1**
W36	36	8	74.74	4742.0	**287.4**	0.47	14.10	10.81	**324.3**	**316.2**	0.734	10.575	7.491	35.8	237.9	219.1	**254.9**	208.3	143.2	yes	**143.2**
	36	9	90.97	6754.7	**365.1**	0.55	16.50	12.17	**365.1**	**355.9**	0.859	14.025	9.934	41.9	315.6	290.6	**332.5**	217.4	161.1	yes	**161.1**
	36	10	108.26	8769.4	**474.0**	0.60	18.00	12.75	**382.5**	**372.9**	0.938	17.100	12.113	45.7	384.8	354.3	**400.0**	237.2	179.0	yes	**179.0**
W40	40	9	82.01	7821.7	**422.8**	0.55	18.70	14.37	**431.1**	**420.3**	0.859	14.025	9.934	41.9	315.6	290.6	**332.5**	279.2	161.1	yes	**161.1**
	40	10	97.60	10154.7	**548.9**	0.60	20.40	15.15	**454.5**	**443.1**	0.938	17.100	12.113	45.7	384.8	354.3	**400.0**	304.6	179.0	yes	**179.0**
	40	11	107.61	11755.4	**635.4**	0.63	21.42	15.36	**460.7**	**449.2**	0.984	19.845	14.057	48.0	446.5	411.2	**459.2**	319.9	196.9	yes	**196.9**
W44	44	10	88.85	11547.0	**624.2**	0.60	22.80	17.55	**526.5**	**513.3**	0.938	17.100	12.113	45.7	384.8	354.3	**400.0**	380.5	179.0	yes	**179.0**
	44	11	97.96	13367.1	**722.5**	0.63	23.94	17.88	**536.3**	**522.9**	0.984	19.845	14.057	48.0	446.5	411.2	**459.2**	399.5	196.9	yes	**196.9**
	44	12	124.42	19133.3	**1034.2**	0.71	26.98	19.53	**585.8**	**571.1**	1.109	24.495	17.351	54.1	551.1	507.5	**561.6**	450.3	214.8	yes	**214.8**

ASD

AISC 360-05, p.9-6

	Beam Depth	Number of Bolts	TOP COPE ONLY Top Cope (in)	Bottom Cope	tw min	c (in)	e (in)	Snet min per AISC Table 9-2 (in3)	***Flexural Rupture Strength Mn/Ω*** (k-in)	Ra allowed (kips)	ho=d-dc	f	k	Fcr (ksi)	***Flexural Local Buckling Strength Mn/Ω*** (k-in)	Ra allowed (kips)	TOP & BOT COPE c (in)	e (in)	ho min (in3)	Snet (in3)	***Flexural Rupture Strength Mn/Ω*** (k-in)	Ra allowed (kips)	fd
W8	8	2	1.5	1.5	0.17	4	4.5	1.54	50.1	11.1	6.5	1.00	4.90	87.88	81.0	18.0	3	3.5	5	0.71	23.0	6.6	2.09
W10	10	2	1.5	1.5	0.19	6	6.5	2.91	94.6	14.6	8.5	1.20	3.91	61.42	107.0	16.5	4	4.5	7	1.55	50.4	11.2	2.38
W12	12	3	1.5	1.5	0.2	6	6.5	4.71	153.1	23.6	10.5	1.00	5.54	52.67	148.6	22.9	4	4.5	9	2.70	87.8	19.5	2.56
W14	14	3	1.5	1.5	0.23	6	6.5	7.97	259.0	39.9	12.5	0.86	7.39	56.17	268.1	41.2	4	4.5	11	4.64	150.7	33.5	2.70
W16	16	4	1.5	1.5	0.25	7	7.5	11.6	377.0	50.3	14.5	0.88	7.32	49.88	346.4	46.2	5	5.5	13	7.04	228.9	41.6	2.80
W18	18	4	2	2	0.3	7	7.5	18.2	591.5	78.9	16	0.78	8.61	61.68	672.2	89.6	5	5.5	14	9.80	318.5	57.9	2.67
	18	5	2	2	0.3	9	9.5	18.2	591.5	62.3	16	1.00	5.68	52.38	570.9	60.1	6	6.5	14	9.80	318.5	49.0	2.67
W21	21	5	3	3	0.3	9	9.5	26.3	854.8	90.0	18	0.86	6.90	43.09	678.5	71.4	6	6.5	15	11.25	365.6	56.3	2.43
	21	6	3	3	0.35	11	11.5	26.3	854.8	74.3	18	1.05	4.96	51.47	810.6	70.5	8	8.5	15	13.13	426.6	50.2	2.43
W24	24	5	3	3	0.3	9	9.5	39.7	1290.3	135.8	21	0.75	8.90	35.72	849.2	89.4	6	6.5	18	16.20	526.5	81.0	2.56
	24	6	3	3	0.35	9	9.5	39.7	1290.3	135.8	21	0.75	8.90	48.62	1155.8	121.7	8	8.5	18	18.90	614.3	72.3	2.56
	24	7	3	3	0.35	9	9.5	39.7	1290.3	135.8	21	0.75	8.90	48.62	1155.8	121.7	5	5.5	18	18.90	614.3	111.7	2.56
W27	27	6	3	3	0.35	11	11.5	64.5	2096.3	182.3	24	0.81	7.97	36.20	1398.2	121.6	8	8.5	21	25.73	836.1	98.4	2.67
	27	7	3	3	0.46	16	16.5	64.5	2096.3	127.0	24	1.19	4.30	49.01	1893.1	114.7	14	14.5	21	33.81	1098.8	75.8	2.67
W30	30	6	3	3	0.35	11	11.5	80.9	2629.3	228.6	27	0.73	9.68	31.26	1514.6	131.7	8	8.5	24	33.60	1092.0	128.5	2.75
	30	7	3	3	0.46	16	16.5	80.9	2629.3	159.3	27	1.07	5.22	42.33	2050.6	124.3	14	14.5	24	44.16	1435.2	99.0	2.75
	30	8	3	3	0.47	18	18.5	80.9	2629.3	142.1	27	1.20	4.30	40.93	1983.0	107.2	16	16.5	24	45.12	1466.4	88.9	2.75
W33	33	7	3	3	0.46	16	16.5	120	3900.0	236.4	30	0.97	6.21	37.09	2665.1	161.5	14	14.5	27	55.89	1816.4	125.3	2.82
	33	8	3	3	0.47	18	18.5	120	3900.0	210.8	30	1.09	5.11	35.87	2577.2	139.3	16	16.5	27	57.11	1855.9	112.5	2.82
	33	9	3	3	0.55	18	18.5	120	3900.0	210.8	30	1.09	5.11	49.11	3529.2	190.8	18	18.5	27	66.83	2171.8	117.4	2.82
W36	36	8	3	3	0.47	18	18.5	154	5005.0	270.5	33	1.00	5.98	31.80	2932.3	158.5	16	16.5	30	70.50	2291.3	138.9	2.88
	36	9	3	3	0.55	18	18.5	154	5005.0	270.5	33	1.00	5.98	43.54	4015.5	217.1	18	18.5	30	82.50	2681.3	144.9	2.88
	36	10	3	3	0.6	18	18.5	154	5005.0	270.5	33	1.00	5.98	51.82	4778.8	258.3	18	18.5	30	90.00	2925.0	158.1	2.88
W40	40	9	3	3	0.55	18	18.5	186	6045.0	326.8	37	0.90	7.22	37.65	4193.6	226.7	18	18.5	34	105.97	3443.9	186.2	2.94
	40	10	3	3	0.6	18	18.5	186	6045.0	326.8	37	0.90	7.22	44.81	4990.7	269.8	18	18.5	34	115.60	3757.0	203.1	2.94
	40	11	3	3	0.63	18	18.5	186	6045.0	326.8	37	0.90	7.22	49.40	5502.2	297.4	18	18.5	34	121.38	3944.9	213.2	2.94
W44	44	10	3	3	0.6	18	18.5	288	9360.0	505.9	41	0.82	8.56	39.30	6777.1	366.3	18	18.5	38	144.40	4693.0	253.7	2.99
	44	11	3	3	0.63	18	18.5	288	9360.0	505.9	41	0.82	8.56	43.33	7471.8	403.9	18	18.5	38	151.62	4927.7	266.4	2.99
	44	12	3	3	0.71	18	18.5	288	9360.0	505.9	41	0.82	8.56	55.03	9489.8	513.0	18	18.5	38	170.87	5553.4	300.2	2.99

	Beam Depth	Number of Bolts	Fcr (ksi)	***Flexural Lateral-Torsional Buckling Strength Mn/Ω*** (k-in)	Ra allowed (kips)	Min Beam Web Thick.	Agv	Anv	Beam Web Shear Shear Yielding Rn/Ω (J4.2a)	Shear Rupture Rn/Ω (J4.2b)	Ant - block	Agv - block	Anv - block	Beam Web Block Shear Rupture Tension Rupture Component (J4.3)	Shear Yielding Component (J4.3)	Shear Rupture Component (J4.3)	Block Shear Rupture Rn/Ω (J4.3)	**FINAL CONN. CAPACITY Mn/Ω** (kips)	Conn. Capacity NO COPE	Copes OK?	**FINAL COPED BEAM CAPACITY Rn/Ω**
W8	8	2	227.86	96.6	27.6	0.17	0.85	0.55	**11.1**	**10.8**	0.266	0.765	0.542	8.6	11.5	10.6	**19.2**	6.6	19.9	reduce capacity	**6.0**
W10	10	2	172.96	160.7	35.7	0.19	1.33	1.00	**20.0**	**19.5**	0.297	0.855	0.606	9.6	12.8	11.8	**21.5**	11.2	19.9	reduce capacity	**11.0**
W12	12	3	160.83	260.0	57.8	0.20	1.80	1.28	**25.5**	**24.9**	0.313	1.500	1.063	10.2	22.5	20.7	**30.9**	19.5	33.6	reduce capacity	**19.0**
W14	14	3	183.12	508.6	113.0	0.23	2.53	1.93	**38.5**	**37.6**	0.359	1.725	1.222	11.7	25.9	23.8	**35.5**	33.5	33.6	reduce capacity	**33.0**
W16	16	4	151.91	640.5	116.5	0.25	3.25	2.38	**47.5**	**46.3**	0.391	2.625	1.859	12.7	39.4	36.3	**49.0**	41.6	47.7	reduce capacity	**41.0**
W18	18	4	193.67	1136.5	206.6	0.30	4.20	3.15	**63.0**	**61.4**	0.469	3.150	2.231	15.2	47.3	43.5	**58.7**	57.9	47.7	yes	**47.7**
	18	5	161.39	947.1	145.7	0.30	4.20	2.89	**57.8**	**56.3**	0.469	4.050	2.869	15.2	60.8	55.9	**71.2**	49.0	59.7	reduce capacity	**49.0**
W21	21	5	137.18	924.1	142.2	0.30	4.50	3.19	**63.8**	**62.2**	0.469	4.050	2.869	15.2	60.8	55.9	**71.2**	56.3	59.7	reduce capacity	**56.0**
	21	6	140.04	1100.6	129.5	0.35	5.25	3.41	**68.3**	**66.5**	0.547	5.775	4.091	17.8	86.6	79.8	**97.5**	50.2	71.6	reduce capacity	**50.0**
W24	24	5	120.62	1170.1	180.0	0.30	5.40	4.09	**81.8**	**79.7**	0.469	4.050	2.869	15.2	60.8	55.9	**71.2**	81.0	59.7	yes	**59.7**
	24	6	123.13	1393.5	163.9	0.35	6.30	4.46	**89.3**	**87.0**	0.547	5.775	4.091	17.8	86.6	79.8	**97.5**	72.3	71.6	yes	**71.6**
	24	7	197.01	2229.7	405.4	0.35	6.30	4.16	**83.1**	**81.0**	0.547	6.825	4.834	17.8	102.4	94.3	**112.0**	111.7	83.5	yes	**83.5**
W27	27	6	109.83	1691.9	199.0	0.35	7.35	5.51	**110.3**	**107.5**	0.547	5.775	4.091	17.8	86.6	79.8	**97.5**	98.4	71.6	yes	**71.6**
	27	7	108.41	2194.9	151.4	0.46	9.66	6.84	**136.9**	**133.4**	0.719	8.970	6.354	23.4	134.6	123.9	**147.3**	75.8	83.5	reduce capacity	**75.0**
W30	30	6	99.11	1994.0	234.6	0.35	8.40	6.56	**131.3**	**128.0**	0.547	5.775	4.091	17.8	86.6	79.8	**97.5**	128.5	71.6	yes	**71.6**
	30	7	97.82	2586.8	178.4	0.46	11.04	8.22	**164.5**	**160.3**	0.719	8.970	6.354	23.4	134.6	123.9	**147.3**	99.0	83.5	yes	**83.5**
	30	8	89.36	2414.3	146.3	0.47	11.28	7.99	**159.8**	**155.8**	0.734	10.575	7.491	23.9	158.6	146.1	**169.9**	88.9	95.5	reduce capacity	**88.0**
W33	33	7	89.11	2982.3	205.7	0.46	12.42	9.60	**192.1**	**187.2**	0.719	8.970	6.354	23.4	134.6	123.9	**147.3**	125.3	83.5	yes	**83.5**
	33	8	81.40	2783.4	168.7	0.47	12.69	9.40	**188.0**	**183.3**	0.734	10.575	7.491	23.9	158.6	146.1	**169.9**	112.5	95.5	yes	**95.5**
	33	9	99.08	3964.8	214.3	0.55	14.85	10.52	**210.4**	**205.1**	0.859	14.025	9.934	27.9	210.4	193.7	**221.7**	117.4	107.4	yes	**107.4**
W36	36	8	74.74	3155.0	191.2	0.47	14.10	10.81	**216.2**	**210.8**	0.734	10.575	7.491	23.9	158.6	146.1	**169.9**	138.9	95.5	yes	**95.5**
	36	9	90.97	4494.1	242.9	0.55	16.50	12.17	**243.4**	**237.3**	0.859	14.025	9.934	27.9	210.4	193.7	**221.7**	144.9	107.4	yes	**107.4**
	36	10	108.26	5834.6	315.4	0.60	18.00	12.75	**255.0**	**248.6**	0.938	17.100	12.113	30.5	256.5	236.2	**266.7**	158.1	119.3	yes	**119.3**
W40	40	9	82.01	5204.1	281.3	0.55	18.70	14.37	**287.4**	**280.2**	0.859	14.025	9.934	27.9	210.4	193.7	**221.7**	186.2	107.4	yes	**107.4**
	40	10	97.60	6756.3	365.2	0.60	20.40	15.15	**303.0**	**295.4**	0.938	17.100	12.113	30.5	256.5	236.2	**266.7**	203.1	119.3	yes	**119.3**
	40	11	107.61	7821.3	422.8	0.63	21.42	15.36	**307.1**	**299.4**	0.984	19.845	14.057	32.0	297.7	274.1	**306.1**	213.2	131.3	yes	**131.3**
W44	44	10	88.85	7682.6	415.3	0.60	22.80	17.55	**351.0**	**342.2**	0.938	17.100	12.113	30.5	256.5	236.2	**266.7**	253.7	119.3	yes	**119.3**
	44	11	97.96	8893.6	480.7	0.63	23.94	17.88	**357.5**	**348.6**	0.984	19.845	14.057	32.0	297.7	274.1	**306.1**	266.4	131.3	yes	**131.3**
	44	12	124.42	12730.1	688.1	0.71	26.98	19.53	**390.5**	**380.7**	1.109	24.495	17.351	36.1	367.4	338.3	**374.4**	300.2	143.2	yes	**143.2**

integrus
ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

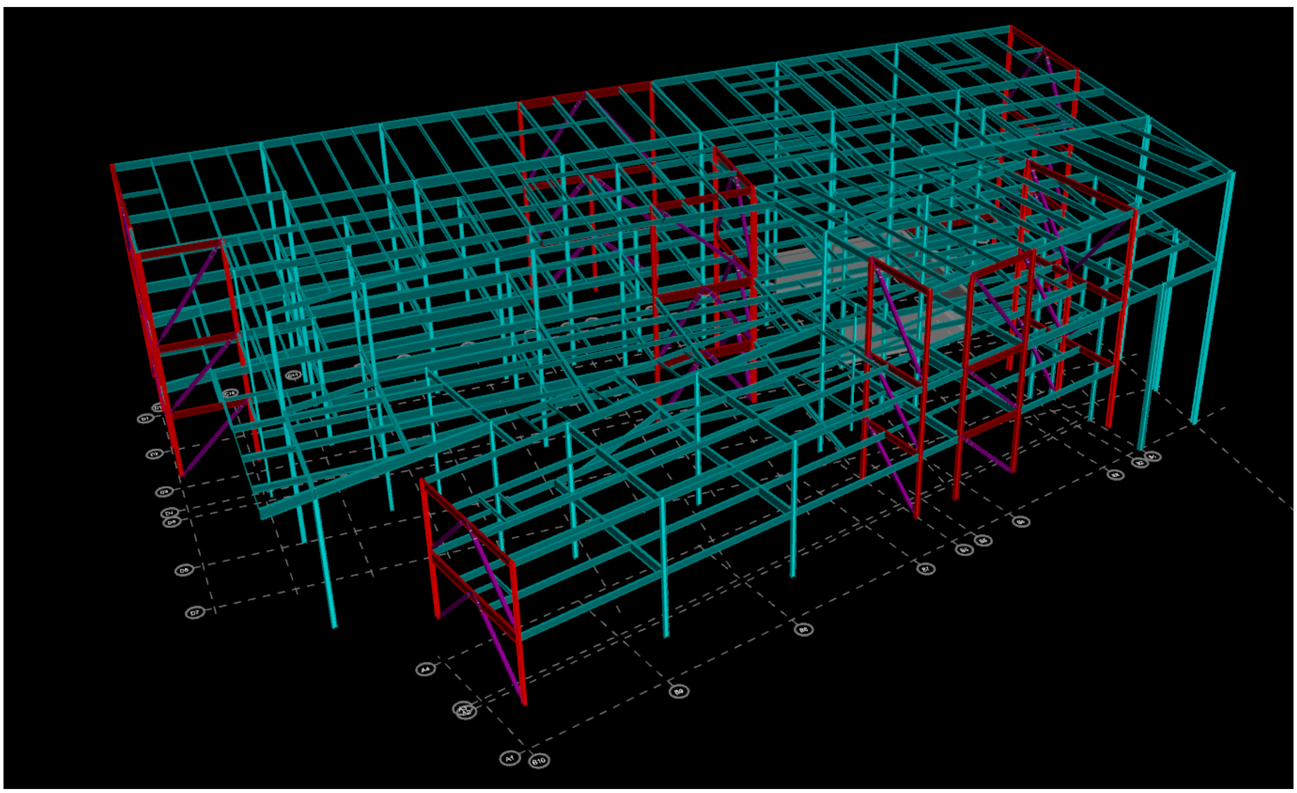
Gravity Load Resisting System -

Vertical Elements - Columns

PRCNC20221036

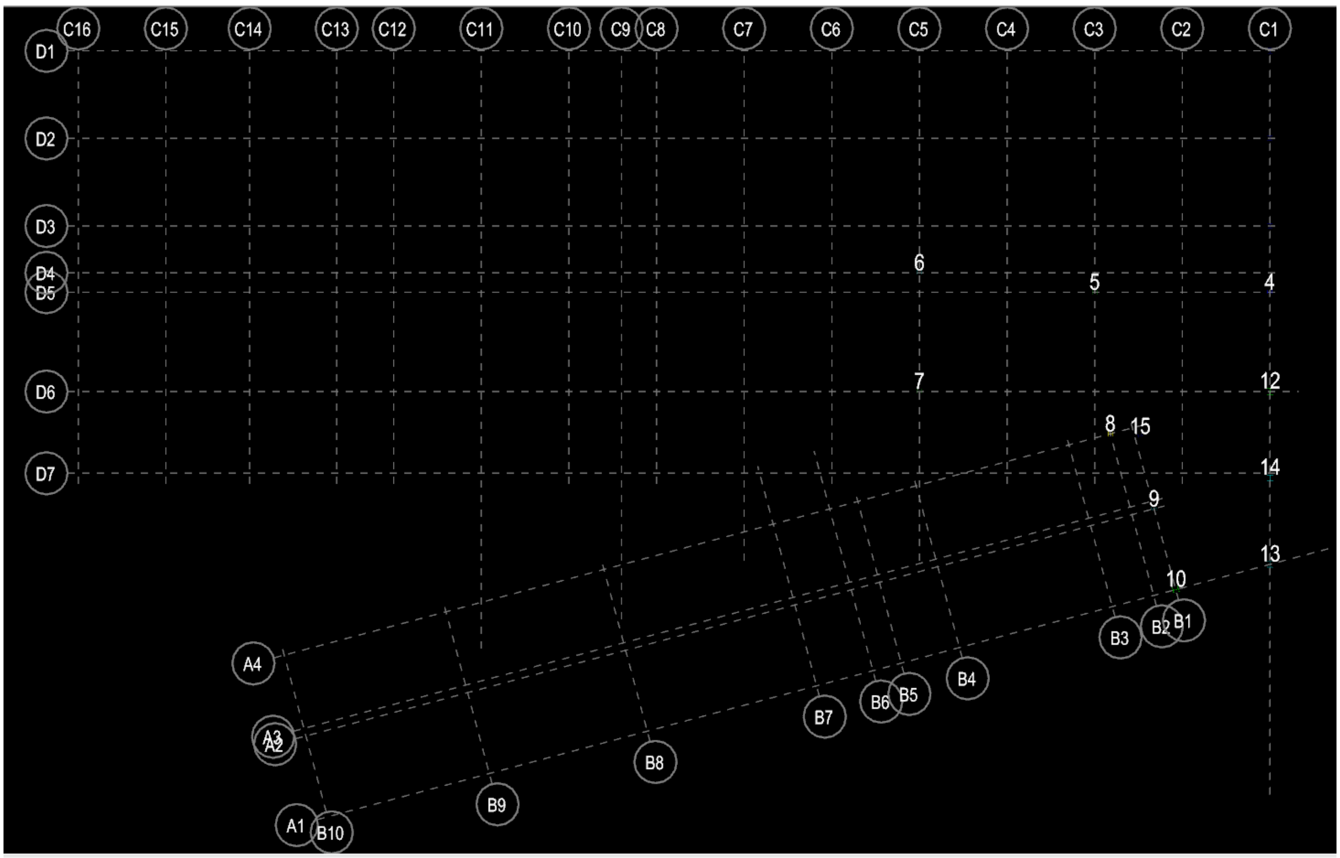
Gravity Column Design - RAM SS

See Gravity Beam Design Section for Building Loads



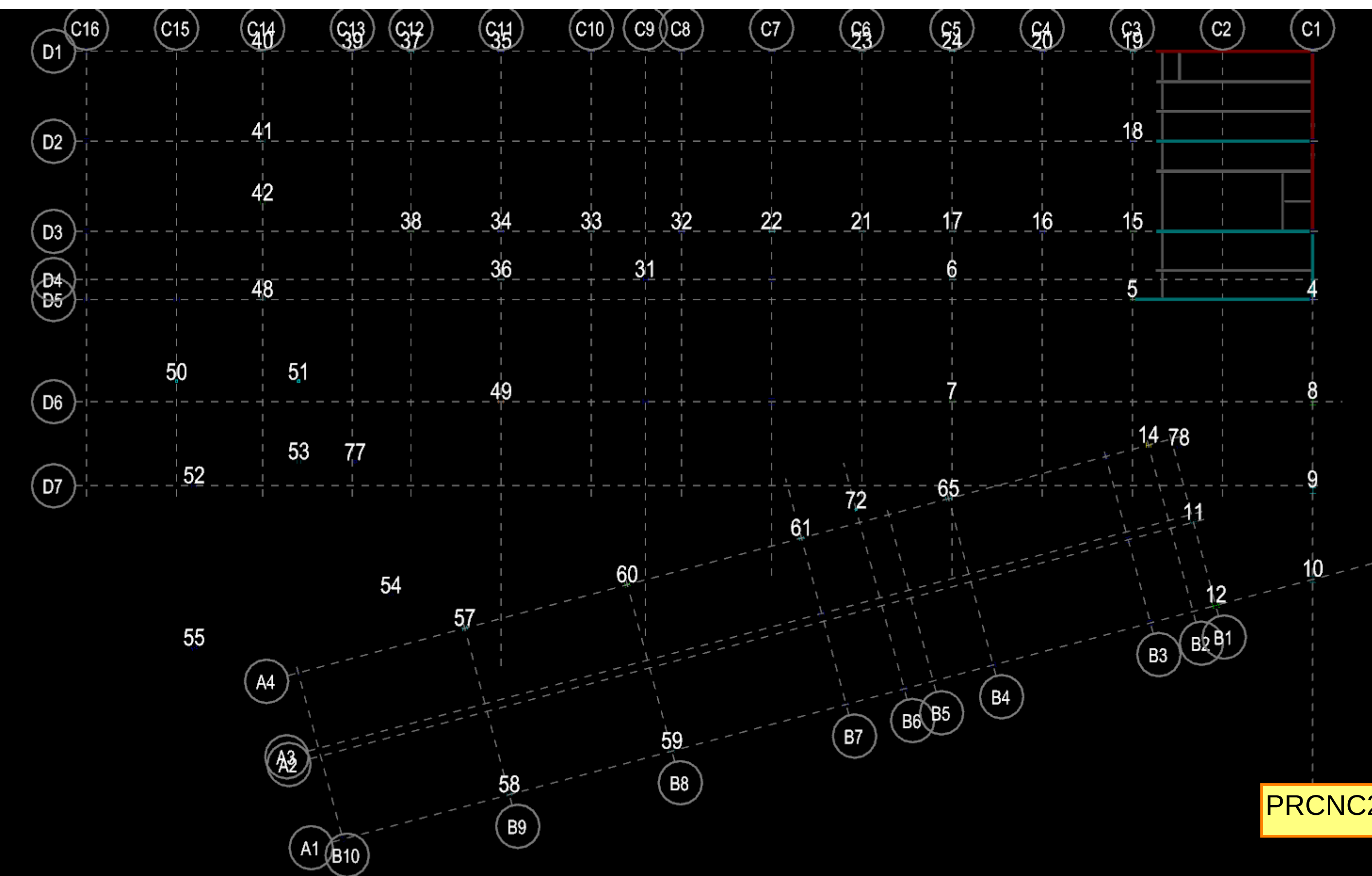
PRCNC20221036

Gravity Column Numbers - Level 1



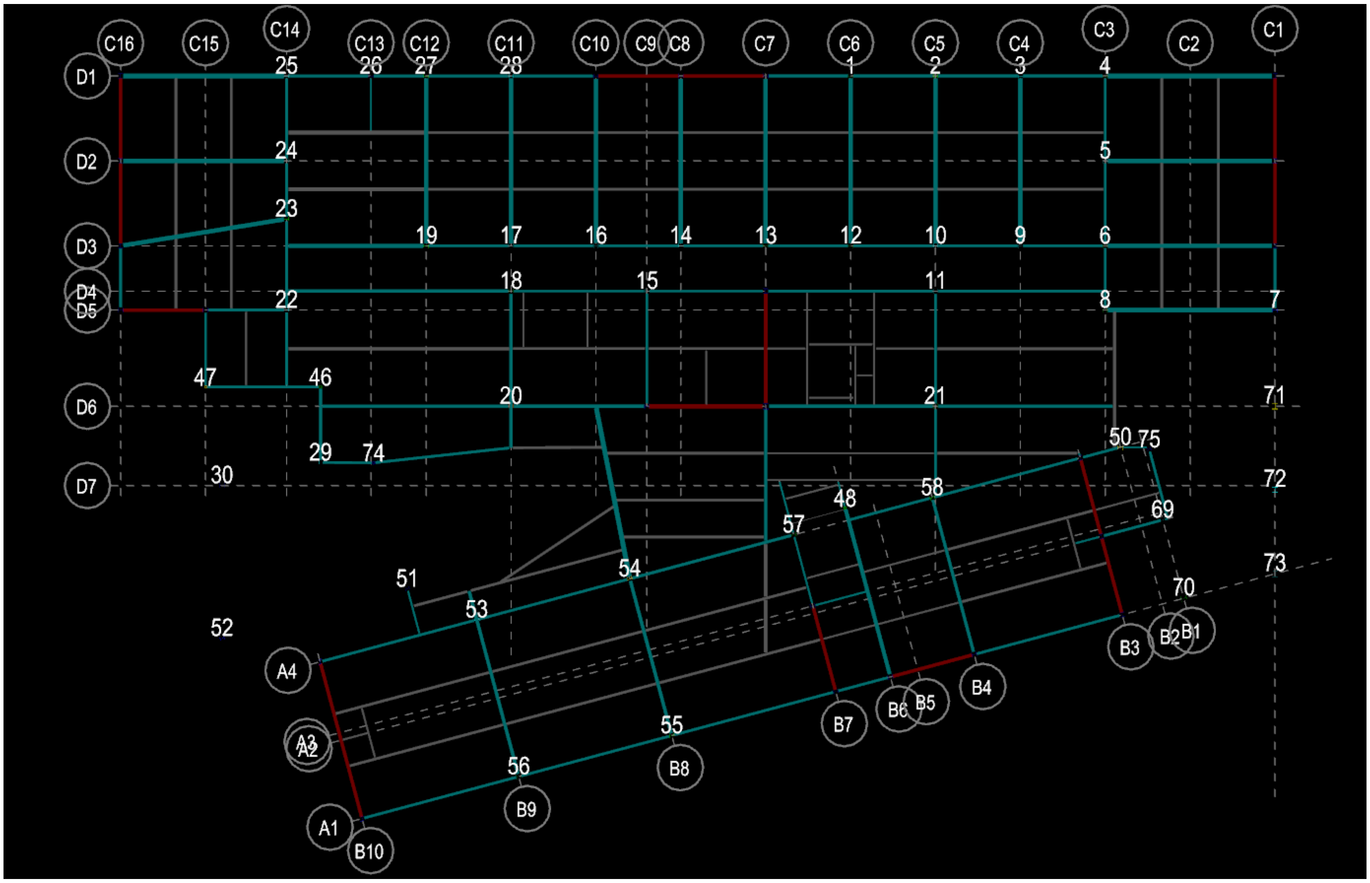
PRCNC20221036

Gravity Column Numbers - Mezzanine



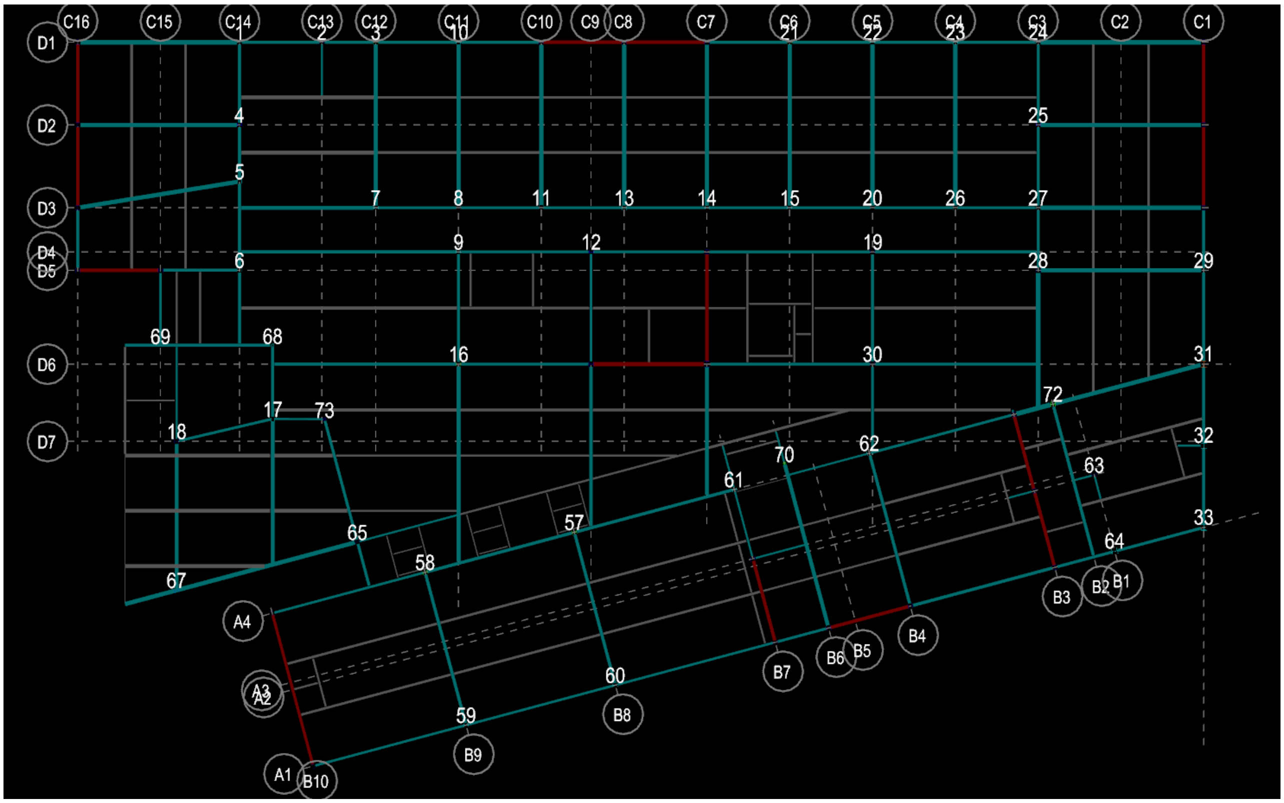
PRCNC20221036

Gravity Column Numbers - Level 2



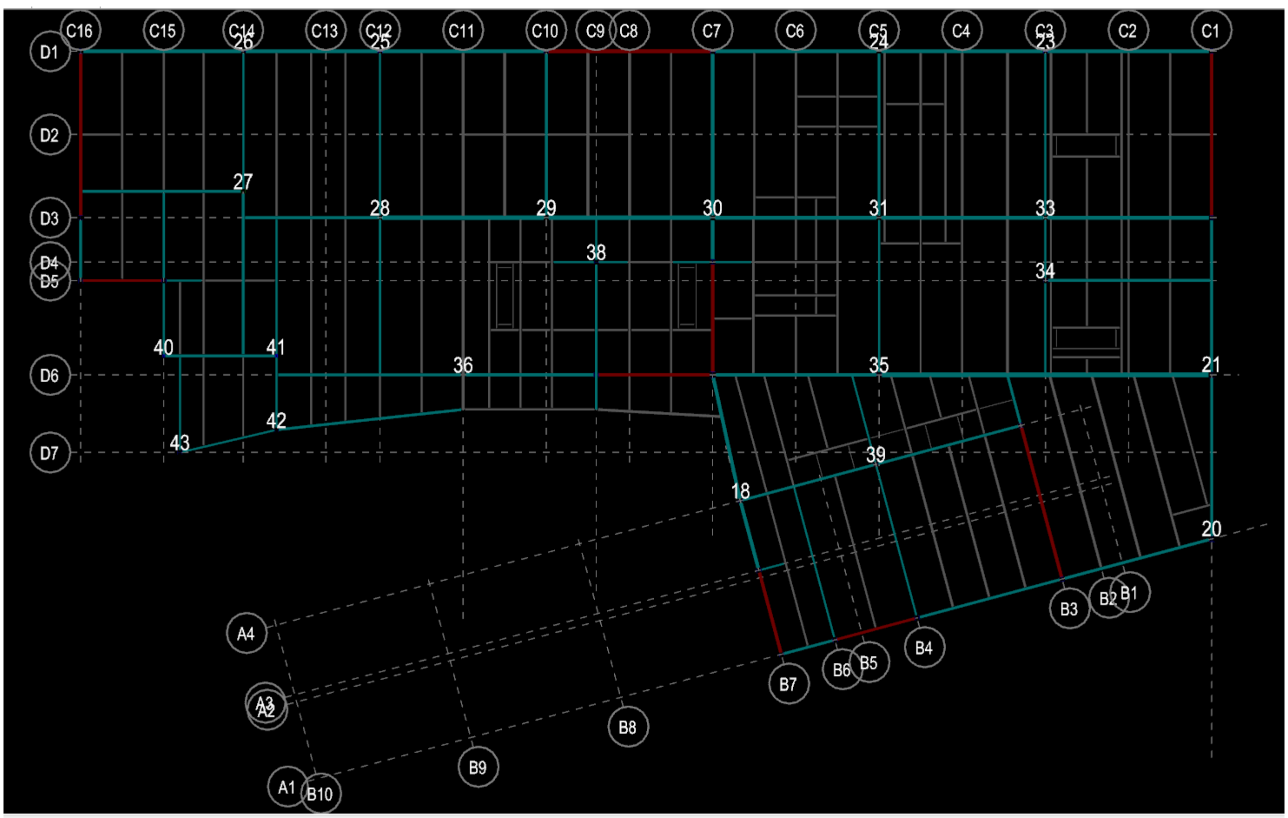
PRCNC20221036

Gravity Column Numbers - Level 3



PRCNC20221036

Gravity Column Numbers - Roof



PRCNC20221036

Gravity Column Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/29/22 14:05:27
Steel Code: AISC360-16 LRFD

Story level Roof, Column Line 56.92ft-121.58ft, Column # 40

Fy (ksi)	= 50.00	Column Size	= HSS5X5X3/8
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.00	5.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	8.05	0.00	6.14

DEMAND CAPACITY RATIO: (1.2DL + 1.6RF)

Pu (kip)	=	19.49	0.90Pnx (kip)	=	88.02	Pu/0.90Pnx	=	0.221
			0.90Pny (kip)	=	88.02	Pu/0.90Pny	=	0.221
			0.90Pn (kip)	=	88.02	Pu/0.90Pn	=	0.221

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			8.05	0.00	6.14
Moments	Top	Mx (kip-ft)	2.89	0.00	2.35
		My (kip-ft)	-0.29	0.00	-0.21
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6RF)

Pu (kip)	=	19.49	0.90*Pn (kip)	=	88.02
Mux (kip-ft)	=	7.23	0.90*Mnx (kip-ft)	=	39.75
Muy (kip-ft)	=	-0.68	0.90*Mny (kip-ft)	=	39.75
Rm	=	1.00			
Cbx	=	1.67	Cby	=	1.67
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	111.51	Pey (kip)	=	111.51
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.221

PRCNC20221036

Eq H1-1a: 0.221 + 8/9(0.182 + 0.017) = 0.398

Story level Level 3, Column Line 56.92ft-121.58ft, Column # 69

Fy (ksi)	=	50.00	Column Size	=	HSS5X5X3/8
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	0.00	0.00
	Bottom	5.00	5.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	25.30	10.70	9.29

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	52.12	0.90Pnx (kip)	=	145.91	Pu/0.90Pnx	=	0.357
			0.90Pny (kip)	=	145.91	Pu/0.90Pny	=	0.357
			0.90Pn (kip)	=	145.91	Pu/0.90Pn	=	0.357

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			25.30	10.70	9.29
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	2.76	2.94	0.00
		My (kip-ft)	-0.48	-0.64	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	52.12	0.90*Pn (kip)	=	145.91
Mux (kip-ft)	=	8.03	0.90*Mnx (kip-ft)	=	39.75
Muy (kip-ft)	=	-1.61	0.90*Mny (kip-ft)	=	39.75
Rm	=	1.00			
Cbx	=	1.67	Cby	=	1.67
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	200.51	Pey (kip)	=	200.51
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.357

PRCNC20221036

Eq H1-1a: $0.357 + 8/9(0.202 + 0.040) = 0.573$

Story level Level 2, Column Line 56.92ft-121.58ft, Column # 47

Fy (ksi)	=	50.00	Column Size	=	HSS5X5X3/8
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.00	5.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	41.18	24.68	9.29

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	93.56	0.90Pnx (kip)	=	145.91	Pu/0.90Pnx	=	0.641
			0.90Pny (kip)	=	145.91	Pu/0.90Pny	=	0.641
			0.90Pn (kip)	=	145.91	Pu/0.90Pn	=	0.641

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			41.18	24.68	9.29
Moments	Top	Mx (kip-ft)	2.76	2.71	0.00
		My (kip-ft)	-0.48	-0.54	0.00
	Bot	Mx (kip-ft)	0.09	0.09	0.00
		My (kip-ft)	-0.02	-0.02	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	93.56	0.90*Pn (kip)	=	145.91
Mux (kip-ft)	=	8.61	0.90*Mnx (kip-ft)	=	39.75
Muy (kip-ft)	=	-1.63	0.90*Mny (kip-ft)	=	39.75
Rm	=	1.00			
Cbx	=	1.67	Cby	=	1.67
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	200.51	Pey (kip)	=	200.51
B1x	=	1.12	B1y	=	1.12

INTERACTION EQUATION

Pu/0.90*Pn = 0.641

PRCNC20221036

Eq H1-1a: 0.641 + 8/9(0.217 + 0.041) = 0.870

Gravity Column Design

Story level Mezzanine, Column Line 56.92ft-121.58ft, Column # 50

Fy (ksi)	=	50.00	Column Size	=	HSS5X5X3/8
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.00	5.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	41.19	24.68	9.29

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	93.57	0.90Pnx (kip)	=	145.91	Pu/0.90Pnx	=	0.641
			0.90Pny (kip)	=	145.91	Pu/0.90Pny	=	0.641
			0.90Pn (kip)	=	145.91	Pu/0.90Pn	=	0.641

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			41.19	24.68	9.29
Moments	Top	Mx (kip-ft)	0.09	0.09	0.00
		My (kip-ft)	-0.02	-0.02	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	93.57	0.90*Pn (kip)	=	145.91
Mux (kip-ft)	=	0.29	0.90*Mnx (kip-ft)	=	39.75
Muy (kip-ft)	=	-0.06	0.90*Mny (kip-ft)	=	39.75
Rm	=	1.00			
Cbx	=	1.67	Cby	=	1.67
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	200.51	Pey (kip)	=	200.51
B1x	=	1.13	B1y	=	1.13

INTERACTION EQUATION

Pu/0.90*Pn = 0.641

PRCNC20221036

Eq H1-1a: 0.641 + 8/9(0.007 + 0.001) = 0.649

Gravity Column Design

Story level Level 3, Column Line 59.83ft-77.19ft, Column # 67

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		29.33	29.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	0.00	0.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	10.43	0.00	12.12

DEMAND CAPACITY RATIO: (1.2DL + 1.6RF)

Pu (kip)	=	31.91	0.90Pnx (kip)	=	261.23	Pu/0.90Pnx	=	0.122
			0.90Pny (kip)	=	66.73	Pu/0.90Pny	=	0.478
			0.90Pn (kip)	=	66.73	Pu/0.90Pn	=	0.478

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			10.43	0.00	12.12
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6RF)

Pu (kip)	=	31.91	0.90*Pn (kip)	=	66.73
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	62.97
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	1.00
Pex (kip)	=	395.01	Pey (kip)	=	84.55
B1x	=	1.09	B1y	=	1.61

INTERACTION EQUATION

Pu/0.90*Pn = 0.478

PRCNC20221036

Pr/Pc = 0.478

Gravity Column Design

Story level Level 2, Column Line 59.83ft-77.19ft, Column # 52

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		29.33	29.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	0.00	0.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	10.89	0.00	12.12

DEMAND CAPACITY RATIO: (1.2DL + 1.6RF)

Pu (kip)	=	32.47	0.90Pnx (kip)	=	261.23	Pu/0.90Pnx	=	0.124
			0.90Pny (kip)	=	66.73	Pu/0.90Pny	=	0.487
			0.90Pn (kip)	=	66.73	Pu/0.90Pn	=	0.487

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			10.89	0.00	12.12
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6RF)

Pu (kip)	=	32.47	0.90*Pn (kip)	=	66.73
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	62.97
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	1.00
Pex (kip)	=	395.01	Pey (kip)	=	84.55
B1x	=	1.09	B1y	=	1.62

INTERACTION EQUATION

Pu/0.90*Pn = 0.487

PRCNC20221036

Pr/Pc = 0.487

Story level Mezzanine, Column Line 59.83ft-77.19ft, Column # 55

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		29.33	29.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	0.00	0.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	10.91	0.00	12.12

DEMAND CAPACITY RATIO: (1.2DL + 1.6RF)

Pu (kip)	=	32.49	0.90Pnx (kip)	=	261.23	Pu/0.90Pnx	=	0.124
			0.90Pny (kip)	=	66.73	Pu/0.90Pny	=	0.487
			0.90Pn (kip)	=	66.73	Pu/0.90Pn	=	0.487

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			10.91	0.00	12.12
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6RF)

Pu (kip)	=	32.49	0.90*Pn (kip)	=	66.73
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	62.97
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	1.00
Pex (kip)	=	395.01	Pey (kip)	=	84.55
B1x	=	1.09	B1y	=	1.62

INTERACTION EQUATION

Pu/0.90*Pn = 0.487

PRCNC20221036

Pr/Pc = 0.487

Story level Roof, Column Line 59.83ft-104.17ft, Column # 43

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	7.50	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	3.84	0.00	2.26

DEMAND CAPACITY RATIO: (1.2DL + 1.6RF)

Pu (kip)	=	8.23	0.90Pnx (kip)	=	522.33	Pu/0.90Pnx	=	0.016
			0.90Pny (kip)	=	345.86	Pu/0.90Pny	=	0.024
			0.90Pn (kip)	=	345.86	Pu/0.90Pn	=	0.024

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			3.84	0.00	2.26
Moments	Top	Mx (kip-ft)	1.27	0.00	1.03
		My (kip-ft)	-0.53	0.00	-0.38
	Bot	Mx (kip-ft)	1.52	0.00	0.22
		My (kip-ft)	1.10	0.00	3.77

Reverse curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6RF)

Pu (kip)	=	8.23	0.90*Pn (kip)	=	345.86
Mux (kip-ft)	=	3.18	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	7.35	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	2.21			
Cmx	=	0.33	Cmy	=	0.67
Pex (kip)	=	1397.79	Pey (kip)	=	479.98
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.024

PRCNC20221036

Eq H1-1b: 0.012 + 0.014 + 0.069 = 0.095

Gravity Column Design

Story level Level 3, Column Line 59.83ft-104.17ft, Column # 18

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		29.33	29.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	19.59	0.00	13.78

DEMAND CAPACITY RATIO: (1.2DL + 1.6RF)

Pu (kip)	=	45.56	0.90Pnx (kip)	=	401.12	Pu/0.90Pnx	=	0.114
			0.90Pny (kip)	=	170.29	Pu/0.90Pny	=	0.268
			0.90Pn (kip)	=	170.29	Pu/0.90Pn	=	0.268

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			19.59	0.00	13.78
Moments	Top	Mx (kip-ft)	1.02	0.00	0.15
		My (kip-ft)	0.74	0.00	2.31
	Bot	Mx (kip-ft)	0.51	0.00	0.07
		My (kip-ft)	0.37	0.00	1.15

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6RF)

Pu (kip)	=	45.56	0.90*Pn (kip)	=	170.29
Mux (kip-ft)	=	1.46	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	4.58	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	628.32	Pey (kip)	=	215.75
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.268

PRCNC20221036

Eq H1-1a: 0.268 + 8/9(0.006 + 0.043) = 0.312

Gravity Column Design

Story level Level 2, Column Line 59.83ft-104.17ft, Column # 30

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		29.33	29.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	26.28	5.00	13.78

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	56.09	0.90Pnx (kip)	=	401.12	Pu/0.90Pnx	=	0.140
			0.90Pny (kip)	=	170.29	Pu/0.90Pny	=	0.329
			0.90Pn (kip)	=	170.29	Pu/0.90Pn	=	0.329

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			26.28	5.00	13.78
Moments	Top	Mx (kip-ft)	0.51	0.00	0.07
		My (kip-ft)	0.37	0.00	1.15
	Bot	Mx (kip-ft)	0.02	0.00	0.00
		My (kip-ft)	0.01	0.00	0.04

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	56.09	0.90*Pn (kip)	=	170.29
Mux (kip-ft)	=	0.73	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	2.29	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	628.32	Pey (kip)	=	215.75
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.329

PRCNC20221036

Eq H1-1a: 0.329 + 8/9(0.003 + 0.022) = 0.351

Gravity Column Design

Story level Mezzanine, Column Line 59.83ft-104.17ft, Column # 52

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		29.33	29.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	26.31	5.00	13.78

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	56.12	0.90Pnx (kip)	=	401.12	Pu/0.90Pnx	=	0.140
			0.90Pny (kip)	=	170.29	Pu/0.90Pny	=	0.330
			0.90Pn (kip)	=	170.29	Pu/0.90Pn	=	0.330

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			26.31	5.00	13.78
Moments	Top	Mx (kip-ft)	0.02	0.00	0.00
		My (kip-ft)	0.01	0.00	0.04
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	56.12	0.90*Pn (kip)	=	170.29
Mux (kip-ft)	=	0.02	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	0.08	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	628.32	Pey (kip)	=	215.75
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.330

PRCNC20221036

Eq H1-1a: 0.330 + 8/9(0.000 + 0.001) = 0.330

Story level Level 3, Column Line C14-D5, Column # 6

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	29.03	24.18	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	73.53	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.191
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.307
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.307

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 10:

			Dead	Live	Roof
Axial (kip)			29.03	16.59	0.00
Moments	Top	Mx (kip-ft)	-2.18	-1.82	0.00
		My (kip-ft)	-3.81	-7.35	0.00
	Bot	Mx (kip-ft)	-1.09	0.00	0.00
		My (kip-ft)	-1.91	2.05	0.00

Reverse curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	61.37	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-5.53	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-16.34	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.98			
Cmx	=	0.51	Cmy	=	0.62
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.256

PRCNC20221036

Eq H1-1a: 0.256 + 8/9(0.038 + 0.311) = 0.567

Story level Level 2, Column Line C14-D5, Column # 22

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	58.03	39.79	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	133.29	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.347
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.556
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.556

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 10:

			Dead	Live	Roof
Axial (kip)			58.03	33.54	0.00
Moments	Top	Mx (kip-ft)	-1.09	-0.75	0.00
		My (kip-ft)	-1.91	-3.02	0.00
	Bot	Mx (kip-ft)	-0.04	-0.03	-0.00
		My (kip-ft)	-0.07	-0.10	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	123.29	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-2.50	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-7.13	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.515

PRCNC20221036

Eq H1-1a: 0.515 + 8/9(0.017 + 0.136) = 0.651

Gravity Column Design

Story level Mezzanine, Column Line C14-D5, Column # 48

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	58.04	39.79	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	133.31	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.347
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.556
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.556

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			58.04	39.79	0.00
Moments	Top	Mx (kip-ft)	-0.04	-0.03	-0.00
		My (kip-ft)	-0.07	-0.05	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	133.31	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.09	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-0.15	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.556

PRCNC20221036

Eq H1-1a: 0.556 + 8/9(0.001 + 0.003) = 0.559

Story level Roof, Column Line 71.25ft-151.25ft, Column # 27

Fy (ksi) = 50.00 Column Size = W10X33

Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	24.40	0.00	20.06

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	61.37	0.90Pnx (kip)	=	346.74	Pu/0.90Pnx	=	0.177
			0.90Pny (kip)	=	148.46	Pu/0.90Pny	=	0.413
			0.90Pn (kip)	=	148.46	Pu/0.90Pn	=	0.413

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			24.40	0.00	17.56
Moments	Top	Mx (kip-ft)	-5.88	0.00	-4.89
		My (kip-ft)	4.61	0.00	5.18
	Bot	Mx (kip-ft)	-2.76	-3.48	0.00
		My (kip-ft)	1.15	-1.97	0.00

Reverse curvature about X-Axis

Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	57.38	0.90*Pn (kip)	=	148.46
Mux (kip-ft)	=	-14.89	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	13.82	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.14			
Cmx	=	0.46	Cmy	=	0.59
Pex (kip)	=	878.76	Pey (kip)	=	188.08
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.387

PRCNC20221036

Eq H1-1a: 0.387 + 8/9(0.102 + 0.263) = 0.711

Gravity Column Design

Story level Level 3, Column Line 71.25ft-151.25ft, Column # 5

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	53.09	23.64	20.06

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	111.56	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.290
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.466
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.466

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			53.09	23.64	20.06
Moments	Top	Mx (kip-ft)	-3.70	-2.99	0.00
		My (kip-ft)	1.54	1.31	0.00
	Bot	Mx (kip-ft)	-3.23	0.00	0.00
		My (kip-ft)	1.35	2.61	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	111.56	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-9.22	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	5.80	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.16			
Cmx	=	0.43	Cmy	=	0.33
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.466

PRCNC20221036

Eq H1-1a: 0.466 + 8/9(0.063 + 0.110) = 0.620

Gravity Column Design

Story level Level 2, Column Line 71.25ft-151.25ft, Column # 23

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	81.76	38.84	20.06

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	170.29	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.443
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.711
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.711

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			81.76	34.36	20.06
Moments	Top	Mx (kip-ft)	-3.23	-2.15	0.00
		My (kip-ft)	1.35	2.15	0.00
	Bot	Mx (kip-ft)	-0.11	-0.07	-0.00
		My (kip-ft)	0.05	0.07	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	163.12	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-7.30	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	5.85	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.16

INTERACTION EQUATION

Pu/0.90*Pn = 0.681

PRCNC20221036

Eq H1-1a: 0.681 + 8/9(0.050 + 0.111) = 0.825

Story level Mezzanine, Column Line 71.25ft-151.25ft, Column # 42

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	81.78	38.84	20.06

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	170.31	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.443
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.711
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.711

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			81.78	38.84	20.06
Moments	Top	Mx (kip-ft)	-0.11	-0.07	-0.00
		My (kip-ft)	0.05	0.03	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	-0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	170.31	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.25	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.13	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.21

INTERACTION EQUATION

Pu/0.90*Pn = 0.711

PRCNC20221036

Eq H1-1a: 0.711 + 8/9(0.002 + 0.002) = 0.715

Gravity Column Design

Story level Level 3, Column Line C14-D2, Column # 4

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	26.50	22.36	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	67.58	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.176
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.282
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.282

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 10:

			Dead	Live	Roof
Axial (kip)			26.50	16.57	0.00
Moments	Top	Mx (kip-ft)	-6.48	-5.38	0.00
		My (kip-ft)	-1.25	-4.21	0.00
	Bot	Mx (kip-ft)	-3.24	0.00	0.00
		My (kip-ft)	-0.62	1.56	0.00

Reverse curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	58.32	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-16.39	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-8.24	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.98			
Cmx	=	0.51	Cmy	=	0.69
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.243

PRCNC20221036

Eq H1-1a: 0.243 + 8/9(0.113 + 0.157) = 0.483

Story level Level 2, Column Line C14-D2, Column # 24

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	52.99	36.61	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	122.16	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.318
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.510
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.510

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 10:

			Dead	Live	Roof
Axial (kip)			52.99	31.87	0.00
Moments	Top	Mx (kip-ft)	-3.24	-2.20	0.00
		My (kip-ft)	-0.62	-1.72	0.00
	Bot	Mx (kip-ft)	-0.11	-0.08	-0.00
		My (kip-ft)	-0.02	-0.06	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	114.58	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-7.41	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-3.51	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.478

Eq H1-1a: 0.478 + 8/9(0.051 + 0.067) = 0.583

Gravity Column Design

Story level Mezzanine, Column Line C14-D2, Column # 41

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	53.00	36.61	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	122.18	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.318
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.510
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.510

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			53.00	36.61	0.00
Moments	Top	Mx (kip-ft)	-0.11	-0.08	-0.00
		My (kip-ft)	-0.02	-0.02	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	-0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	122.18	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.25	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-0.05	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.510

PRCNC20221036

Eq H1-1a: 0.510 + 8/9(0.002 + 0.001) = 0.512

Story level Roof, Column Line C14-D1, Column # 26

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	15.09	0.00	11.40

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	36.35	0.90Pnx (kip)	=	346.74	Pu/0.90Pnx	=	0.105
			0.90Pny (kip)	=	148.46	Pu/0.90Pny	=	0.245
			0.90Pn (kip)	=	148.46	Pu/0.90Pn	=	0.245

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			15.09	0.00	11.40
Moments	Top	Mx (kip-ft)	-0.07	0.00	-0.03
		My (kip-ft)	1.52	0.00	1.35
	Bot	Mx (kip-ft)	-3.39	-2.37	0.00
		My (kip-ft)	1.35	1.79	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	36.35	0.90*Pn (kip)	=	148.46
Mux (kip-ft)	=	-5.25	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	3.98	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.69			
Cmx	=	0.59	Cmy	=	0.35
Pex (kip)	=	878.76	Pey (kip)	=	188.08
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.245

PRCNC20221036

Eq H1-1a: 0.245 + 8/9(0.036 + 0.076) = 0.344

Story level Level 3, Column Line C14-D1, Column # 1

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	59.16	18.03	11.40

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	105.55	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.275
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.441
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.441

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			59.16	18.03	11.40
Moments	Top	Mx (kip-ft)	-4.54	-1.32	0.00
		My (kip-ft)	1.81	2.02	0.00
	Bot	Mx (kip-ft)	-1.23	-1.05	0.00
		My (kip-ft)	1.58	1.77	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	105.55	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-7.55	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	5.41	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.16			
Cmx	=	0.43	Cmy	=	0.25
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.441

PRCNC20221036

Eq H1-1a: 0.441 + 8/9(0.052 + 0.103) = 0.578

Story level Level 2, Column Line C14-D1, Column # 25

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	75.86	28.08	11.40

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	141.67	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.369
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.591
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.591

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			75.86	28.08	11.40
Moments	Top	Mx (kip-ft)	-1.23	-0.84	0.00
		My (kip-ft)	1.58	1.42	0.00
	Bot	Mx (kip-ft)	-0.04	-0.03	-0.00
		My (kip-ft)	0.05	0.05	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	141.67	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-2.81	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	4.30	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.03

INTERACTION EQUATION

Pu/0.90*Pn = 0.591

PRCNC20221036

Eq H1-1a: 0.591 + 8/9(0.019 + 0.082) = 0.681

Story level Mezzanine, Column Line C14-D1, Column # 40

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	75.88	28.08	11.40

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	141.69	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.369
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.591
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.591

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			75.88	28.08	11.40
Moments	Top	Mx (kip-ft)	-0.04	-0.03	-0.00
		My (kip-ft)	0.05	0.05	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	141.69	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.10	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.15	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.03

INTERACTION EQUATION

Pu/0.90*Pn = 0.591

PRCNC20221036

Eq H1-1a: 0.591 + 8/9(0.001 + 0.003) = 0.594

Gravity Column Design

Story level Roof, Column Line 77.25ft-108.25ft, Column # 42

Fy (ksi)	= 50.00	Column Size	= W8X31
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	6.50	6.50
	Bottom	6.50	6.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	9.01	0.00	6.70

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	21.54	0.90Pnx (kip)	=	293.01	Pu/0.90Pnx	=	0.073
			0.90Pny (kip)	=	150.48	Pu/0.90Pny	=	0.143
			0.90Pn (kip)	=	150.48	Pu/0.90Pn	=	0.143

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 9:

			Dead	Live	Roof
Axial (kip)			9.01	0.00	5.25
Moments	Top	Mx (kip-ft)	0.60	0.00	1.15
		My (kip-ft)	-1.98	0.00	-1.70
	Bot	Mx (kip-ft)	-0.40	0.00	-0.18
		My (kip-ft)	-4.77	-3.96	-0.25

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	13.44	0.90*Pn (kip)	=	150.48
Mux (kip-ft)	=	1.29	0.90*Mnx (kip-ft)	=	108.56
Muy (kip-ft)	=	-12.17	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.29			
Cmx	=	0.78	Cmy	=	0.49
Pex (kip)	=	565.28	Pey (kip)	=	190.65
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.089

PRCNC20221036

Eq H1-1b: 0.045 + 0.012 + 0.231 = 0.287

Story level Level 3, Column Line 77.25ft-108.25ft, Column # 17

Fy (ksi)	=	50.00	Column Size	=	W8X31
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	6.50	6.50
	Bottom	6.50	6.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	41.77	16.92	13.32

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	83.85	0.90Pnx (kip)	=	340.44	Pu/0.90Pnx	=	0.246
			0.90Pny (kip)	=	235.30	Pu/0.90Pny	=	0.356
			0.90Pn (kip)	=	235.30	Pu/0.90Pn	=	0.356

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 10:

			Dead	Live	Roof
Axial (kip)			41.77	16.92	9.12
Moments	Top	Mx (kip-ft)	-0.54	0.11	-0.05
		My (kip-ft)	-6.39	-5.13	-0.33
	Bot	Mx (kip-ft)	0.52	0.66	0.00
		My (kip-ft)	-2.62	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	81.75	0.90*Pn (kip)	=	235.30
Mux (kip-ft)	=	1.68	0.90*Mnx (kip-ft)	=	113.88
Muy (kip-ft)	=	-16.05	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.39			
Cmx	=	0.72	Cmy	=	0.52
Pex (kip)	=	1016.40	Pey (kip)	=	342.80
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.347

PRCNC20221036

Eq H1-1a: 0.347 + 8/9(0.015 + 0.304) = 0.631

Story level Level 2, Column Line 77.25ft-108.25ft, Column # 29

Fy (ksi) = 50.00 Column Size = W8X31
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

	X-Axis	Y-Axis
Lu (ft)	14.67	14.67
K	1	1
Braced Against Joint Translation	Yes	Yes
Column Eccentricity (in) Top	6.50	6.50
Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	53.79	28.57	13.32

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip) =	116.93	0.90Pnx (kip) =	340.44	Pu/0.90Pnx	=	0.343
		0.90Pny (kip) =	235.30	Pu/0.90Pny	=	0.497
		0.90Pn (kip) =	235.30	Pu/0.90Pn	=	0.497

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	53.79	28.57	13.32
Moments Top Mx (kip-ft)	0.52	0.61	0.00
My (kip-ft)	-2.62	-2.75	0.00
Bot Mx (kip-ft)	0.02	0.02	0.00
My (kip-ft)	-0.09	-0.09	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	116.93	0.90*Pn (kip)	=	235.30
Mux (kip-ft)	=	1.61	0.90*Mnx (kip-ft)	=	113.88
Muy (kip-ft)	=	-7.54	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1016.40	Pey (kip)	=	342.80
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.497

PRCNC20221036

Eq H1-1a: 0.497 + 8/9(0.014 + 0.143) = 0.636

Story level Mezzanine, Column Line 77.25ft-108.25ft, Column # 53

Fy (ksi)	=	50.00	Column Size	=	W8X31
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	6.50	6.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	53.81	28.57	13.32

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	116.95	0.90Pnx (kip)	=	340.44	Pu/0.90Pnx	=	0.344
			0.90Pny (kip)	=	235.30	Pu/0.90Pny	=	0.497
			0.90Pn (kip)	=	235.30	Pu/0.90Pn	=	0.497

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			53.81	28.57	13.32
Moments	Top	Mx (kip-ft)	0.02	0.02	0.00
		My (kip-ft)	-0.09	-0.09	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	116.95	0.90*Pn (kip)	=	235.30
Mux (kip-ft)	=	0.05	0.90*Mnx (kip-ft)	=	113.88
Muy (kip-ft)	=	-0.26	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1016.40	Pey (kip)	=	342.80
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.497

PRCNC20221036

Eq H1-1a: 0.497 + 8/9(0.000 + 0.005) = 0.502

Gravity Column Design

Story level Roof, Column Line 77.25ft-121.58ft, Column # 41

Fy (ksi)	=	50.00	Column Size	=	HSS6X6X1/2
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.50	5.50
	Bottom	5.50	5.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	18.21	0.00	14.84

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	45.58	0.90Pnx (kip)	=	192.81	Pu/0.90Pnx	=	0.236
			0.90Pny (kip)	=	192.81	Pu/0.90Pny	=	0.236
			0.90Pn (kip)	=	192.81	Pu/0.90Pn	=	0.236

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			18.21	0.00	12.55
Moments	Top	Mx (kip-ft)	-3.15	0.00	-2.61
		My (kip-ft)	2.53	0.00	3.14
	Bot	Mx (kip-ft)	-1.89	-2.39	-0.02
		My (kip-ft)	3.31	0.00	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	41.93	0.90*Pn (kip)	=	192.81
Mux (kip-ft)	=	-7.96	0.90*Mnx (kip-ft)	=	74.25
Muy (kip-ft)	=	8.07	0.90*Mny (kip-ft)	=	74.25
Rm	=	1.00			
Cbx	=	2.16	Cby	=	2.17
Cmx	=	0.42	Cmy	=	0.40
Pex (kip)	=	248.21	Pey (kip)	=	248.21
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.217

PRCNC20221036

Eq H1-1a: 0.217 + 8/9(0.107 + 0.109) = 0.409

Gravity Column Design

Story level Level 3, Column Line 77.25ft-121.58ft, Column # 68

Fy (ksi)	=	50.00	Column Size	=	HSS6X6X1/2
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.50	5.50
	Bottom	5.50	5.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	45.26	24.15	15.11

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	100.50	0.90Pnx (kip)	=	277.60	Pu/0.90Pnx	=	0.362
			0.90Pny (kip)	=	277.60	Pu/0.90Pny	=	0.362
			0.90Pn (kip)	=	277.60	Pu/0.90Pn	=	0.362

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			45.26	24.15	15.11
Moments	Top	Mx (kip-ft)	-2.54	-2.32	-0.03
		My (kip-ft)	4.44	4.02	0.04
	Bot	Mx (kip-ft)	-2.41	-2.29	0.00
		My (kip-ft)	3.55	3.48	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	100.50	0.90*Pn (kip)	=	277.60
Mux (kip-ft)	=	-6.77	0.90*Mnx (kip-ft)	=	74.25
Muy (kip-ft)	=	11.78	0.90*Mny (kip-ft)	=	74.25
Rm	=	1.00			
Cbx	=	2.27	Cby	=	2.24
Cmx	=	0.21	Cmy	=	0.27
Pex (kip)	=	446.29	Pey (kip)	=	446.29
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.362

PRCNC20221036

Eq H1-1a: 0.362 + 8/9(0.091 + 0.159) = 0.584

Story level Level 2, Column Line 77.25ft-121.58ft, Column # 46

Fy (ksi)	=	50.00	Column Size	=	HSS6X6X1/2
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.50	5.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	71.75	42.41	15.11

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	161.52	0.90Pnx (kip)	=	277.60	Pu/0.90Pnx	=	0.582
			0.90Pny (kip)	=	277.60	Pu/0.90Pny	=	0.582
			0.90Pn (kip)	=	277.60	Pu/0.90Pn	=	0.582

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			71.75	42.41	15.11
Moments	Top	Mx (kip-ft)	-2.41	-1.90	0.00
		My (kip-ft)	3.55	3.08	0.00
	Bot	Mx (kip-ft)	-0.08	-0.06	-0.00
		My (kip-ft)	0.12	0.10	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	161.52	0.90*Pn (kip)	=	277.60
Mux (kip-ft)	=	-5.94	0.90*Mnx (kip-ft)	=	74.25
Muy (kip-ft)	=	9.18	0.90*Mny (kip-ft)	=	74.25
Rm	=	1.00			
Cbx	=	1.67	Cby	=	1.67
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	446.29	Pey (kip)	=	446.29
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.582

PRCNC20221036

Eq H1-1a: 0.582 + 8/9(0.080 + 0.124) = 0.763

Gravity Column Design

Story level Mezzanine, Column Line 77.25ft-121.58ft, Column # 51

Fy (ksi)	= 50.00	Column Size	= HSS6X6X1/2
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.50	5.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	71.77	42.41	15.11

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip) =	161.54	0.90Pnx (kip) =	277.60	Pu/0.90Pnx =	0.582
		0.90Pny (kip) =	277.60	Pu/0.90Pny =	0.582
		0.90Pn (kip) =	277.60	Pu/0.90Pn =	0.582

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			71.77	42.41	15.11
Moments	Top	Mx (kip-ft)	-0.08	-0.06	-0.00
		My (kip-ft)	0.12	0.10	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip) =	161.54	0.90*Pn (kip) =	277.60
Mux (kip-ft) =	-0.20	0.90*Mnx (kip-ft) =	74.25
Muy (kip-ft) =	0.31	0.90*Mny (kip-ft) =	74.25
Rm =	1.00		
Cbx =	1.67	Cby =	1.67
Cmx =	0.60	Cmy =	0.60
Pex (kip) =	446.29	Pey (kip) =	446.29
B1x =	1.00	B1y =	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.582

PRCNC20221036

Eq H1-1a: 0.582 + 8/9(0.003 + 0.004) = 0.588

Story level Level 3, Column Line C13-D1, Column # 2

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	21.07	7.61	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	37.45	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.097
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.156
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.156

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 12:

			Dead	Live	Roof
Axial (kip)			21.07	4.60	0.00
Moments	Top	Mx (kip-ft)	-2.64	-2.82	0.00
		My (kip-ft)	0.03	0.00	0.00
	Bot	Mx (kip-ft)	-0.34	0.84	0.00
		My (kip-ft)	0.01	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	32.64	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-7.68	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.04	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.54			
Cmx	=	0.65	Cmy	=	0.43
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.136

Eq H1-1b: 0.068 + 0.053 + 0.001 = 0.122

Story level Level 2, Column Line C13-D1, Column # 26

Fy (ksi)	= 50.00		Column Size	= W10X33
Orientation (deg.)	= 0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	26.86	14.08	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	54.76	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.143
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.229
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.229

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			26.86	14.08	0.00
Moments	Top	Mx (kip-ft)	-0.34	-0.43	0.00
		My (kip-ft)	0.01	0.00	0.00
	Bot	Mx (kip-ft)	-0.01	-0.01	-0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	54.76	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-1.10	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.02	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.229

PRCNC20221036

Eq H1-1a: 0.229 + 8/9(0.008 + 0.000) = 0.236

Story level Mezzanine, Column Line C13-D1, Column # 39

Fy (ksi)	= 50.00	Column Size	= W10X33
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	26.88	14.08	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	54.78	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.143
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.229
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.229

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			26.88	14.08	0.00
Moments	Top	Mx (kip-ft)	-0.01	-0.01	-0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	54.78	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.04	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.229

PRCNC20221036

Eq H1-1a: 0.229 + 8/9(0.000 + 0.000) = 0.229

Story level Level 3, Column Line 86.64ft-108.18ft, Column # 73

Fy (ksi)	=	50.00	Column Size	=	HSS6X6X1/2
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.50	5.50
	Bottom	5.50	5.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	12.06	0.37	4.86

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	22.43	0.90Pnx (kip)	=	277.60	Pu/0.90Pnx	=	0.081
			0.90Pny (kip)	=	277.60	Pu/0.90Pny	=	0.081
			0.90Pn (kip)	=	277.60	Pu/0.90Pn	=	0.081

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			12.06	0.37	4.86
Moments	Top	Mx (kip-ft)	-1.10	-0.17	-0.27
		My (kip-ft)	4.20	0.00	1.96
	Bot	Mx (kip-ft)	0.62	0.86	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	22.43	0.90*Pn (kip)	=	277.60
Mux (kip-ft)	=	-1.84	0.90*Mnx (kip-ft)	=	74.25
Muy (kip-ft)	=	8.18	0.90*Mny (kip-ft)	=	74.25
Rm	=	1.00			
Cbx	=	1.17	Cby	=	1.67
Cmx	=	0.86	Cmy	=	0.60
Pex (kip)	=	446.29	Pey (kip)	=	446.29
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.081

PRCNC20221036

Eq H1-1b: 0.040 + 0.025 + 0.110 = 0.175

Story level Level 2, Column Line 86.64ft-108.18ft, Column # 74

Fy (ksi)	=	50.00	Column Size	=	HSS6X6X1/2
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.50	5.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	19.07	9.27	4.86

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	40.15	0.90Pnx (kip)	=	277.60	Pu/0.90Pnx	=	0.145
			0.90Pny (kip)	=	277.60	Pu/0.90Pny	=	0.145
			0.90Pn (kip)	=	277.60	Pu/0.90Pn	=	0.145

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 8:

			Dead	Live	Roof
Axial (kip)			19.07	6.70	4.86
Moments	Top	Mx (kip-ft)	0.62	1.45	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.02	0.05	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	36.03	0.90*Pn (kip)	=	277.60
Mux (kip-ft)	=	3.06	0.90*Mnx (kip-ft)	=	74.25
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	74.25
Rm	=	1.00			
Cbx	=	1.67	Cby	=	1.00
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	446.29	Pey (kip)	=	446.29
B1x	=	1.00	B1y	=	1.09

INTERACTION EQUATION

Pu/0.90*Pn = 0.130

PRCNC20221036

Eq H1-1b: 0.065 + 0.041 + 0.000 = 0.106

Story level Mezzanine, Column Line 86.64ft-108.18ft, Column # 77

Fy (ksi)	=	50.00	Column Size	=	HSS6X6X1/2
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.50	5.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	19.08	9.27	4.86

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	40.17	0.90Pnx (kip)	=	277.60	Pu/0.90Pnx	=	0.145
			0.90Pny (kip)	=	277.60	Pu/0.90Pny	=	0.145
			0.90Pn (kip)	=	277.60	Pu/0.90Pn	=	0.145

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			19.08	9.27	4.86
Moments	Top	Mx (kip-ft)	0.02	0.03	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	40.17	0.90*Pn (kip)	=	277.60
Mux (kip-ft)	=	0.07	0.90*Mnx (kip-ft)	=	74.25
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	74.25
Rm	=	1.00			
Cbx	=	1.67	Cby	=	1.00
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	446.29	Pey (kip)	=	446.29
B1x	=	1.00	B1y	=	1.10

INTERACTION EQUATION

Pu/0.90*Pn = 0.145

PRCNC20221036

Eq H1-1b: 0.072 + 0.001 + 0.000 = 0.073

Story level Level 3, Column Line 92.59ft-85.97ft, Column # 65

Fy (ksi)	=	50.00	Column Size	=	W8X31
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		29.33	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	6.50	6.50
	Bottom	0.00	6.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	17.78	0.00	10.32

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	37.85	0.90Pnx (kip)	=	193.69	Pu/0.90Pnx	=	0.195
			0.90Pny (kip)	=	235.30	Pu/0.90Pny	=	0.161
			0.90Pn (kip)	=	193.69	Pu/0.90Pn	=	0.195

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 16:

			Dead	Live	Roof
Axial (kip)			17.78	0.00	8.68
Moments	Top	Mx (kip-ft)	0.62	0.00	-2.36
		My (kip-ft)	-4.56	0.00	-2.35
	Bot	Mx (kip-ft)	0.31	-0.00	-1.18
		My (kip-ft)	0.22	0.28	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	35.23	0.90*Pn (kip)	=	193.69
Mux (kip-ft)	=	-3.03	0.90*Mnx (kip-ft)	=	96.12
Muy (kip-ft)	=	-10.29	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	254.10	Pey (kip)	=	342.80
B1x	=	1.00	B1y	=	1.11

INTERACTION EQUATION

Pu/0.90*Pn = 0.182

PRCNC20221036

Eq H1-1b: 0.091 + 0.031 + 0.195 = 0.317

Story level Level 2, Column Line 92.59ft-85.97ft, Column # 51

Fy (ksi)	=	50.00	Column Size	=	W8X31
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		29.33	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	6.50	6.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	19.05	1.02	10.32

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	39.88	0.90Pnx (kip)	=	193.69	Pu/0.90Pnx	=	0.206
			0.90Pny (kip)	=	235.30	Pu/0.90Pny	=	0.169
			0.90Pn (kip)	=	193.69	Pu/0.90Pn	=	0.206

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			19.05	1.02	10.32
Moments	Top	Mx (kip-ft)	0.31	-0.00	-0.76
		My (kip-ft)	0.22	0.28	0.00
	Bot	Mx (kip-ft)	0.01	-0.00	-0.03
		My (kip-ft)	0.01	0.01	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	39.88	0.90*Pn (kip)	=	193.69
Mux (kip-ft)	=	-0.85	0.90*Mnx (kip-ft)	=	96.12
Muy (kip-ft)	=	0.46	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	254.10	Pey (kip)	=	342.80
B1x	=	1.00	B1y	=	1.13

INTERACTION EQUATION

Pu/0.90*Pn = 0.206

PRCNC20221036

Eq H1-1a: 0.206 + 8/9(0.009 + 0.009) = 0.222

Gravity Column Design

Story level Mezzanine, Column Line 92.59ft-85.97ft, Column # 54

Fy (ksi) = 50.00 Column Size = W8X31
Orientation (deg.) = 15.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		29.33	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	6.50	6.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	19.07	1.02	10.32

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	39.90	0.90Pnx (kip)	=	193.69	Pu/0.90Pnx	=	0.206
			0.90Pny (kip)	=	235.30	Pu/0.90Pny	=	0.170
			0.90Pn (kip)	=	193.69	Pu/0.90Pn	=	0.206

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			19.07	1.02	10.32
Moments	Top	Mx (kip-ft)	0.01	-0.00	-0.03
		My (kip-ft)	0.01	0.01	0.00
	Bot	Mx (kip-ft)	-0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	39.90	0.90*Pn (kip)	=	193.69
Mux (kip-ft)	=	-0.03	0.90*Mnx (kip-ft)	=	96.12
Muy (kip-ft)	=	0.02	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	254.10	Pey (kip)	=	342.80
B1x	=	1.00	B1y	=	1.13

INTERACTION EQUATION

Pu/0.90*Pn = 0.206

PRCNC20221036

Eq H1-1a: 0.206 + 8/9(0.000 + 0.000) = 0.207

Story level Roof, Column Line C12-D3, Column # 28

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	7.46	6.49

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.47	2.55	23.78

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	91.50	0.90Pnx (kip)	=	413.61	Pu/0.90Pnx	=	0.221
			0.90Pny (kip)	=	182.53	Pu/0.90Pny	=	0.501
			0.90Pn (kip)	=	182.53	Pu/0.90Pn	=	0.501

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.47	2.55	23.78
Moments	Top	Mx (kip-ft)	10.57	1.59	1.12
		My (kip-ft)	-0.08	0.00	-0.09
	Bot	Mx (kip-ft)	-0.91	-1.16	0.00
		My (kip-ft)	-3.65	-4.59	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	91.50	0.90*Pn (kip)	=	182.53
Mux (kip-ft)	=	15.27	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	-6.67	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.55			
Cmx	=	0.64	Cmy	=	0.59
Pex (kip)	=	1074.04	Pey (kip)	=	231.25
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.501

PRCNC20221036

Eq H1-1a: 0.501 + 8/9(0.087 + 0.103) = 0.671

Story level Level 3, Column Line C12-D3, Column # 7

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	7.46	6.49

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	72.85	26.53	23.78

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	141.76	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.310
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.489
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.489

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			72.85	26.53	23.78
Moments	Top	Mx (kip-ft)	-1.23	-0.99	0.00
		My (kip-ft)	-4.89	-3.91	0.00
	Bot	Mx (kip-ft)	-1.07	-2.20	0.00
		My (kip-ft)	-4.27	0.00	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	141.76	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	-4.80	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	-12.13	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	2.20			
Cmx	=	0.35	Cmy	=	0.43
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.489

PRCNC20221036

Eq H1-1a: 0.489 + 8/9(0.027 + 0.188) = 0.680

Gravity Column Design

Story level Level 2, Column Line C12-D3, Column # 19

Fy (ksi)	= 50.00	Column Size	= W10X39
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

	X-Axis	Y-Axis
Lu (ft)	14.67	14.67
K	1	1
Braced Against Joint Translation	Yes	Yes
Column Eccentricity (in) Top	7.46	6.49
Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	102.20	41.98	23.78

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip) =	201.70	0.90Pnx (kip) =	456.86	Pu/0.90Pnx =	0.441
		0.90Pny (kip) =	290.09	Pu/0.90Pny =	0.695
		0.90Pn (kip) =	290.09	Pu/0.90Pn =	0.695

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	102.20	41.98	23.78
Moments Top Mx (kip-ft)	-1.07	-0.71	0.00
My (kip-ft)	-4.27	-2.81	0.00
Bot Mx (kip-ft)	-0.04	-0.02	-0.00
My (kip-ft)	-0.15	-0.10	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip) =	201.70	0.90*Pn (kip) =	290.09
Mux (kip-ft) =	-2.42	0.90*Mnx (kip-ft) =	175.50
Muy (kip-ft) =	-11.21	0.90*Mny (kip-ft) =	64.50
Rm =	1.00		
Cbx =	1.67		
Cmx =	0.60	Cmy =	0.60
Pex (kip) =	1931.15	Pey (kip) =	415.80
B1x =	1.00	B1y =	1.17

INTERACTION EQUATION

Pu/0.90*Pn = 0.695

PRCNC20221036

Eq H1-1a: 0.695 + 8/9(0.014 + 0.174) = 0.862

Gravity Column Design

Story level Mezzanine, Column Line C12-D3, Column # 38

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	102.22	41.98	23.78

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	201.73	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.442
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.695
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.695

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			102.22	41.98	23.78
Moments	Top	Mx (kip-ft)	-0.04	-0.02	-0.00
		My (kip-ft)	-0.15	-0.10	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	201.73	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	-0.08	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	-0.38	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.17

INTERACTION EQUATION

Pu/0.90*Pn = 0.695

PRCNC20221036

Eq H1-1a: 0.695 + 8/9(0.000 + 0.006) = 0.701

Story level Roof, Column Line C12-D1, Column # 25

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	21.50	0.85	12.82

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	46.74	0.90Pnx (kip)	=	346.74	Pu/0.90Pnx	=	0.135
			0.90Pny (kip)	=	148.46	Pu/0.90Pny	=	0.315
			0.90Pn (kip)	=	148.46	Pu/0.90Pn	=	0.315

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			21.50	0.85	12.82
Moments	Top	Mx (kip-ft)	3.68	0.52	0.59
		My (kip-ft)	1.88	0.00	1.67
	Bot	Mx (kip-ft)	1.15	0.42	0.00
		My (kip-ft)	3.64	4.57	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	46.74	0.90*Pn (kip)	=	148.46
Mux (kip-ft)	=	5.63	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	6.66	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.05			
Cmx	=	0.49	Cmy	=	0.30
Pex (kip)	=	878.76	Pey (kip)	=	188.08
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.315

PRCNC20221036

Eq H1-1a: 0.315 + 8/9(0.039 + 0.127) = 0.462

Story level Level 3, Column Line C12-D1, Column # 3

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	58.38	22.07	12.82

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	111.78	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.291
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.467
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.467

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			58.38	22.07	12.82
Moments	Top	Mx (kip-ft)	1.54	0.44	0.00
		My (kip-ft)	4.89	4.74	0.00
	Bot	Mx (kip-ft)	0.34	0.35	0.00
		My (kip-ft)	4.26	4.14	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	111.78	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	2.55	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	13.45	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.15			
Cmx	=	0.45	Cmy	=	0.25
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.467

Eq H1-1a: 0.467 + 8/9(0.018 + 0.256) = 0.710

Story level Level 2, Column Line C12-D1, Column # 27

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	79.94	31.88	12.82

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	153.35	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.399
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.640
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.640

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			79.94	31.88	12.82
Moments	Top	Mx (kip-ft)	0.34	0.26	0.00
		My (kip-ft)	4.26	3.06	0.00
	Bot	Mx (kip-ft)	0.01	0.01	0.00
		My (kip-ft)	0.15	0.10	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	153.35	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.83	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	11.00	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.10

INTERACTION EQUATION

Pu/0.90*Pn = 0.640

PRCNC20221036

Eq H1-1a: 0.640 + 8/9(0.006 + 0.209) = 0.831

Gravity Column Design

Story level Mezzanine, Column Line C12-D1, Column # 37

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	79.95	31.88	12.82

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	153.37	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.399
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.640
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.640

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			79.95	31.88	12.82
Moments	Top	Mx (kip-ft)	0.01	0.01	0.00
		My (kip-ft)	0.15	0.10	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	153.37	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.03	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.37	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.10

INTERACTION EQUATION

Pu/0.90*Pn = 0.640

PRCNC20221036

Eq H1-1a: 0.640 + 8/9(0.000 + 0.007) = 0.647

Story level Level 3, Column Line B9-A4, Column # 58

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	67.35	2.12	20.89

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	115.32	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.252
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.398
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.398

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			67.35	2.12	20.89
Moments	Top	Mx (kip-ft)	15.92	1.32	4.43
		My (kip-ft)	13.04	0.00	4.40
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	115.32	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	26.85	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	22.68	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.398

PRCNC20221036

Eq H1-1a: 0.398 + 8/9(0.153 + 0.352) = 0.846

Story level Level 2, Column Line B9-A4, Column # 53

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

	X-Axis	Y-Axis
Lu (ft)	14.67	14.67
K	1	1
Braced Against Joint Translation	Yes	Yes
Column Eccentricity (in) Top	0.00	0.00
Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	110.90	36.51	20.89

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	201.95	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.442
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.696
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.696

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	110.90	36.51	20.89
Moments Top Mx (kip-ft)	0.00	0.00	0.00
My (kip-ft)	0.00	0.00	0.00
Bot Mx (kip-ft)	0.00	0.00	0.00
My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	201.95	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	146.58
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	1.00
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.12	B1y	=	1.94

INTERACTION EQUATION

Pu/0.90*Pn = 0.696

PRCNC20221036

Pr/Pc = 0.696

Gravity Column Design

Story level Mezzanine, Column Line B9-A4, Column # 57

Fy (ksi)	= 50.00	Column Size	= W10X39
Orientation (deg.)	= 15.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	0.00	0.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	110.92	36.51	20.89

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	201.97	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.442
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.696
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.696

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			110.92	36.51	20.89
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	201.97	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	146.58
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	1.00
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.12	B1y	=	1.94

INTERACTION EQUATION

Pu/0.90*Pn = 0.696

PRCNC20221036

Pr/Pc = 0.696

Gravity Column Design

Story level Roof, Column Line C11-D6, Column # 36

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	0.00	0.00
	Bottom	7.46	6.49

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	28.66	0.00	19.47

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	65.54	0.90Pnx (kip)	=	413.61	Pu/0.90Pnx	=	0.158
			0.90Pny (kip)	=	182.53	Pu/0.90Pny	=	0.359
			0.90Pn (kip)	=	182.53	Pu/0.90Pn	=	0.359

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			28.66	0.00	19.47
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	-0.95	-4.13	0.00
		My (kip-ft)	6.37	2.12	1.73

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	65.54	0.90*Pn (kip)	=	182.53
Mux (kip-ft)	=	-3.20	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	11.47	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1074.04	Pey (kip)	=	231.25
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.359

PRCNC20221036

Eq H1-1a: 0.359 + 8/9(0.018 + 0.178) = 0.533

Story level Level 3, Column Line C11-D6, Column # 16

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	98.07	29.44	26.96

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	178.27	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.390
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.615
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.615

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			98.07	20.90	26.96
Moments	Top	Mx (kip-ft)	-1.27	-0.93	0.00
		My (kip-ft)	8.54	1.66	2.32
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	171.27	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	-1.99	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	15.09	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.02

INTERACTION EQUATION

Pu/0.90*Pn = 0.590

PRCNC20221036

Eq H1-1a: 0.590 + 8/9(0.011 + 0.234) = 0.808

Gravity Column Design

Story level Level 2, Column Line C11-D6, Column # 20

Fy (ksi)	= 50.00	Column Size	=	W10X39
Orientation (deg.)	= 0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	0.00	0.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	145.20	57.37	26.96

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	279.52	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.612
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.964
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.964

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			145.20	57.37	26.96
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	279.52	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	146.58
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	1.00
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.17	B1y	=	3.05

INTERACTION EQUATION

Pu/0.90*Pn = 0.964

PRCNC20221036

Pr/Pc = 0.964

Gravity Column Design

Story level Mezzanine, Column Line C11-D6, Column # 49

Fy (ksi) = 50.00 Column Size = W10X39
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	0.00	0.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	145.22	57.37	26.96

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	279.54	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.612
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.964
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.964

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			145.22	57.37	26.96
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	279.54	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	146.58
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	1.00
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.17	B1y	=	3.05

INTERACTION EQUATION

Pu/0.90*Pn = 0.964

PRCNC20221036

Pr/Pc = 0.964

Story level Level 3, Column Line C11-D4, Column # 9

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	30.30	25.07	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	76.47	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.199
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.319
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.319

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			30.30	25.07	0.00
Moments	Top	Mx (kip-ft)	-4.85	-4.03	0.00
		My (kip-ft)	5.96	4.93	0.00
	Bot	Mx (kip-ft)	-2.42	-2.01	0.00
		My (kip-ft)	2.34	2.47	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	76.47	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-12.26	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	15.04	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.17			
Cmx	=	0.40	Cmy	=	0.42
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.319

PRCNC20221036

Eq H1-1a: 0.319 + 8/9(0.084 + 0.286) = 0.649

Gravity Column Design

Story level Level 2, Column Line C11-D4, Column # 18

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	58.24	41.33	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	136.02	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.354
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.568
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.568

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			58.24	41.33	0.00
Moments	Top	Mx (kip-ft)	-2.42	-1.66	0.00
		My (kip-ft)	2.34	2.03	0.00
	Bot	Mx (kip-ft)	-0.08	-0.06	-0.00
		My (kip-ft)	0.08	0.07	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	136.02	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-5.56	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	6.09	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.568

PRCNC20221036

Eq H1-1a: 0.568 + 8/9(0.038 + 0.116) = 0.705

Gravity Column Design

Story level Mezzanine, Column Line C11-D4, Column # 36

Fy (ksi) = 50.00 Column Size = W10X33

Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	58.26	41.33	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	136.04	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.354
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.568
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.568

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			58.26	41.33	0.00
Moments	Top	Mx (kip-ft)	-0.08	-0.06	-0.00
		My (kip-ft)	0.08	0.07	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis

Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	136.04	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.19	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.21	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.568

PRCNC20221036

Eq H1-1a: 0.568 + 8/9(0.001 + 0.004) = 0.572

Story level Level 3, Column Line C11-D3, Column # 8

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	21.79	19.79	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	57.81	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.150
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.241
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.241

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			21.79	19.79	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-6.34	-5.62	0.00
	Bot	Mx (kip-ft)	0.00	1.44	0.00
		My (kip-ft)	-3.17	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	57.81	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	2.30	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-16.60	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.51
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.241

Eq H1-1a: 0.241 + 8/9(0.016 + 0.316) = 0.536

Story level Level 2, Column Line C11-D3, Column # 17

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.57	32.15	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	103.73	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.270
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.433
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.433

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.57	32.15	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-3.17	-2.28	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.11	-0.08	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	103.73	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	-7.46	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.07	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.433

PRCNC20221036

Eq H1-1a: 0.433 + 8/9(0.000 + 0.142) = 0.559

Gravity Column Design

Story level Mezzanine, Column Line C11-D3, Column # 34

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.58	32.15	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	103.75	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.270
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.433
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.433

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.58	32.15	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.11	-0.08	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	-0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	103.75	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	-0.25	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.07	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.433

PRCNC20221036

Eq H1-1a: 0.433 + 8/9(0.000 + 0.005) = 0.437

Story level Level 3, Column Line C11-D1, Column # 10

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	37.18	19.55	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	75.90	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.198
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.317
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.317

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			37.18	19.55	0.00
Moments	Top	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	6.34	6.53	0.00
	Bot	Mx (kip-ft)	0.00	1.04	0.00
		My (kip-ft)	3.17	3.26	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	75.90	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	1.67	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	18.05	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.40
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.317

PRCNC20221036

Eq H1-1a: 0.317 + 8/9(0.011 + 0.344) = 0.633

Story level Level 2, Column Line C11-D1, Column # 28

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	55.80	30.83	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	116.29	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.303
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.485
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.485

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			55.80	30.83	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	3.17	2.62	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.11	0.09	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	116.29	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	7.99	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.485

PRCNC20221036

Eq H1-1a: 0.485 + 8/9(0.000 + 0.152) = 0.621

Gravity Column Design

Story level Mezzanine, Column Line C11-D1, Column # 35

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	55.82	30.83	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	116.31	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.303
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.485
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.485

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			55.82	30.83	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.11	0.09	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	116.31	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	0.27	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.485

PRCNC20221036

Eq H1-1a: 0.485 + 8/9(0.000 + 0.005) = 0.490

Story level Level 3, Column Line B9-A1, Column # 59

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	38.35	0.00	12.71

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	66.36	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.173
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.277
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.277

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			38.35	0.00	12.71
Moments	Top	Mx (kip-ft)	-0.10	0.00	-0.03
		My (kip-ft)	-13.01	0.00	-4.39
	Bot	Mx (kip-ft)	-0.04	-2.38	0.00
		My (kip-ft)	-5.04	0.00	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	66.36	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-1.24	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-22.63	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.84			
Cmx	=	0.54	Cmy	=	0.49
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.277

PRCNC20221036

Eq H1-1a: 0.277 + 8/9(0.009 + 0.431) = 0.668

Story level Level 2, Column Line B9-A1, Column # 56

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	68.93	26.04	12.71

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	130.73	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.340
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.546
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.546

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			68.93	26.04	12.71
Moments	Top	Mx (kip-ft)	-0.04	-0.03	0.00
		My (kip-ft)	-5.04	-4.49	0.00
	Bot	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	-0.17	-0.15	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	130.73	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.10	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-13.24	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.546

PRCNC20221036

Eq H1-1a: 0.546 + 8/9(0.001 + 0.252) = 0.770

Gravity Column Design

Story level Mezzanine, Column Line B9-A1, Column # 58

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	68.95	26.04	12.71

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	130.75	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.340
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.546
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.546

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			68.95	26.04	12.71
Moments	Top	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	-0.17	-0.15	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	130.75	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.00	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-0.45	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.546

PRCNC20221036

Eq H1-1a: 0.546 + 8/9(0.000 + 0.009) = 0.553

Story level Roof, Column Line C10-D3, Column # 29

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	7.50	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	88.82	5.10	24.36

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	148.10	0.90Pnx (kip)	=	522.33	Pu/0.90Pnx	=	0.284
			0.90Pny (kip)	=	345.86	Pu/0.90Pny	=	0.428
			0.90Pn (kip)	=	345.86	Pu/0.90Pn	=	0.428

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			88.82	5.10	24.36
Moments	Top	Mx (kip-ft)	0.31	-0.00	0.17
		My (kip-ft)	-9.32	0.00	-2.11
	Bot	Mx (kip-ft)	0.00	-1.80	0.00
		My (kip-ft)	-3.13	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	148.10	0.90*Pn (kip)	=	345.86
Mux (kip-ft)	=	-0.90	0.90*Mnx (kip-ft)	=	210.65
Muy (kip-ft)	=	-14.55	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.13			
Cmx	=	0.89	Cmy	=	0.50
Pex (kip)	=	1397.79	Pey (kip)	=	479.98
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.428

PRCNC20221036

Eq H1-1a: 0.428 + 8/9(0.004 + 0.137) = 0.554

Gravity Column Design

Story level Level 3, Column Line C10-D3, Column # 11

Fy (ksi) = 50.00 Column Size = W10X49
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	7.50	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	110.84	24.89	24.36

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	185.00	0.90Pnx (kip)	=	574.78	Pu/0.90Pnx	=	0.322
			0.90Pny (kip)	=	457.01	Pu/0.90Pny	=	0.405
			0.90Pn (kip)	=	457.01	Pu/0.90Pn	=	0.405

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			110.84	24.89	24.36
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-4.20	-3.73	0.00
	Bot	Mx (kip-ft)	0.00	1.46	0.00
		My (kip-ft)	-3.67	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	185.00	0.90*Pn (kip)	=	457.01
Mux (kip-ft)	=	2.34	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	-11.01	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.44
Pex (kip)	=	2513.27	Pey (kip)	=	863.01
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.405

PRCNC20221036

Eq H1-1a: 0.405 + 8/9(0.010 + 0.104) = 0.506

Story level Level 2, Column Line C10-D3, Column # 16

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	132.84	37.25	24.36

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	231.20	0.90Pnx (kip)	=	574.78	Pu/0.90Pnx	=	0.402
			0.90Pny (kip)	=	457.01	Pu/0.90Pny	=	0.506
			0.90Pn (kip)	=	457.01	Pu/0.90Pn	=	0.506

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			132.84	37.25	24.36
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-3.67	-2.64	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.13	-0.09	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	231.20	0.90*Pn (kip)	=	457.01
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	205.62
Muy (kip-ft)	=	-8.63	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	2513.27	Pey (kip)	=	863.01
B1x	=	1.10	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.506

Eq H1-1a: 0.506 + 8/9(0.000 + 0.081) = 0.578

Story level Mezzanine, Column Line C10-D3, Column # 33

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	132.87	37.25	24.36

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	231.22	0.90Pnx (kip)	=	574.78	Pu/0.90Pnx	=	0.402
			0.90Pny (kip)	=	457.01	Pu/0.90Pny	=	0.506
			0.90Pn (kip)	=	457.01	Pu/0.90Pn	=	0.506

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			132.87	37.25	24.36
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.13	-0.09	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	231.22	0.90*Pn (kip)	=	457.01
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	205.62
Muy (kip-ft)	=	-0.29	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	2513.27	Pey (kip)	=	863.01
B1x	=	1.10	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.506

PRCNC20221036

Eq H1-1a: 0.506 + 8/9(0.000 + 0.003) = 0.508

Story level Level 3, Column Line B8-A4, Column # 57

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	7.46	6.49

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	78.86	4.44	23.35

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	134.21	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.294
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.463
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.463

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			78.86	4.44	23.35
Moments	Top	Mx (kip-ft)	11.99	2.00	2.98
		My (kip-ft)	13.72	0.00	4.50
	Bot	Mx (kip-ft)	1.17	1.51	0.00
		My (kip-ft)	0.43	0.95	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	134.21	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	20.17	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	23.66	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.79			
Cmx	=	0.56	Cmy	=	0.58
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.463

PRCNC20221036

Eq H1-1a: $0.463 + 8/9(0.115 + 0.367) = 0.891$

Gravity Column Design

Story level Level 2, Column Line B8-A4, Column # 54

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	137.20	41.85	23.35

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	243.28	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.532
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.839
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.839

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			137.20	29.45	23.35
Moments	Top	Mx (kip-ft)	1.17	0.77	0.00
		My (kip-ft)	0.43	3.84	0.00
	Bot	Mx (kip-ft)	0.04	0.03	0.00
		My (kip-ft)	0.01	0.13	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	223.44	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	2.64	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	8.64	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.30

INTERACTION EQUATION

Pu/0.90*Pn = 0.770

PRCNC20221036

Eq H1-1a: 0.770 + 8/9(0.015 + 0.134) = 0.903

Gravity Column Design

Story level Mezzanine, Column Line B8-A4, Column # 60

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	137.22	41.85	23.35

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	243.30	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.533
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.839
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.839

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			137.22	41.85	23.35
Moments	Top	Mx (kip-ft)	0.04	0.03	0.00
		My (kip-ft)	0.01	0.02	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	243.30	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	0.09	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	0.06	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.45

INTERACTION EQUATION

Pu/0.90*Pn = 0.839

PRCNC20221036

Eq H1-1a: 0.839 + 8/9(0.001 + 0.001) = 0.840

Story level Roof, Column Line C9-D4, Column # 38

Fy (ksi)	= 50.00	Column Size	=	W10X33
Orientation (deg.)	= 0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	5.40	0.00	2.97

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	11.23	0.90Pnx (kip)	=	346.74	Pu/0.90Pnx	=	0.032
			0.90Pny (kip)	=	148.46	Pu/0.90Pny	=	0.076
			0.90Pn (kip)	=	148.46	Pu/0.90Pn	=	0.076

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			5.40	0.00	2.97
Moments	Top	Mx (kip-ft)	-0.20	0.00	0.00
		My (kip-ft)	0.56	0.00	0.70
	Bot	Mx (kip-ft)	0.03	2.50	0.00
		My (kip-ft)	1.81	2.47	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	7.96	0.90*Pn (kip)	=	148.46
Mux (kip-ft)	=	4.04	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	6.12	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.60			
Cmx	=	0.62	Cmy	=	0.53
Pex (kip)	=	878.76	Pey (kip)	=	188.08
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.054

PRCNC20221036

Eq H1-1b: 0.027 + 0.028 + 0.117 = 0.171

Story level Level 3, Column Line C9-D4, Column # 12

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	27.02	20.25	2.97

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	66.32	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.173
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.277
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.277

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			27.02	20.25	2.97
Moments	Top	Mx (kip-ft)	0.04	0.07	0.00
		My (kip-ft)	2.42	2.27	0.00
	Bot	Mx (kip-ft)	0.86	1.91	0.00
		My (kip-ft)	2.44	1.94	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	66.32	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	4.09	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	6.54	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.71			
Cmx	=	0.58	Cmy	=	0.23
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.277

PRCNC20221036

Eq H1-1a: 0.277 + 8/9(0.028 + 0.125) = 0.413

Story level Level 2, Column Line C9-D4, Column # 15

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	52.54	32.57	2.97

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	116.65	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.304
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.487
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.487

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			52.54	32.57	2.97
Moments	Top	Mx (kip-ft)	0.86	-0.03	0.00
		My (kip-ft)	2.44	1.58	0.00
	Bot	Mx (kip-ft)	0.03	-0.00	0.00
		My (kip-ft)	0.08	0.05	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	116.65	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.98	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	5.46	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.487

PRCNC20221036

Eq H1-1a: 0.487 + 8/9(0.007 + 0.104) = 0.585

Story level Mezzanine, Column Line C9-D4, Column # 31

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	52.56	32.57	2.97

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	116.67	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.304
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.487
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.487

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			52.56	32.57	2.97
Moments	Top	Mx (kip-ft)	0.03	-0.00	0.00
		My (kip-ft)	0.08	0.05	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	116.67	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.03	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.19	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.487

PRCNC20221036

Eq H1-1a: 0.487 + 8/9(0.000 + 0.004) = 0.490

Story level Level 3, Column Line B8-A1, Column # 60

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	40.28	0.00	13.01

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	69.16	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.180
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.289
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.289

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			40.28	0.00	13.01
Moments	Top	Mx (kip-ft)	0.52	0.00	0.10
		My (kip-ft)	-13.69	0.00	-4.49
	Bot	Mx (kip-ft)	0.12	2.49	0.00
		My (kip-ft)	-5.53	0.00	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	69.16	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	1.39	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-23.61	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.19			
Cmx	=	0.38	Cmy	=	0.49
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.289

PRCNC20221036

Eq H1-1a: 0.289 + 8/9(0.010 + 0.450) = 0.697

Gravity Column Design

Story level Level 2, Column Line B8-A1, Column # 55

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	72.93	26.47	13.01

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	136.37	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.355
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.569
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.569

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			72.93	26.47	13.01
Moments	Top	Mx (kip-ft)	0.12	0.10	0.00
		My (kip-ft)	-5.53	-4.57	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.19	-0.16	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	136.37	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.31	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-14.02	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.01

INTERACTION EQUATION

Pu/0.90*Pn = 0.569

PRCNC20221036

Eq H1-1a: 0.569 + 8/9(0.002 + 0.267) = 0.808

Gravity Column Design

Story level Mezzanine, Column Line B8-A1, Column # 59

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	72.94	26.47	13.01

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	136.39	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.355
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.569
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.569

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			72.94	26.47	13.01
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.19	-0.16	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	136.39	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.01	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-0.48	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.01

INTERACTION EQUATION

Pu/0.90*Pn = 0.569

PRCNC20221036

Eq H1-1a: 0.569 + 8/9(0.000 + 0.009) = 0.577

Story level Level 3, Column Line C8-D3, Column # 13

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	21.79	27.78	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	70.60	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.184
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.295
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.295

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			21.79	27.78	0.00
Moments	Top	Mx (kip-ft)	-0.00	1.01	0.00
		My (kip-ft)	-6.34	-8.20	0.00
	Bot	Mx (kip-ft)	0.00	-1.68	0.00
		My (kip-ft)	-3.17	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	70.60	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-2.69	0.90*Mnx (kip-ft)	=	139.84
Muy (kip-ft)	=	-20.73	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.19			
Cmx	=	0.84	Cmy	=	0.53
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.295

PRCNC20221036

Eq H1-1a: 0.295 + 8/9(0.019 + 0.395) = 0.663

Story level Level 2, Column Line C8-D3, Column # 14

Fy (ksi)	= 50.00	Column Size	=	W10X33
Orientation (deg.)	= 0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.57	41.03	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	117.93	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.307
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.492
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.492

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.57	41.03	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-3.17	-2.42	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.11	-0.08	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	117.93	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	-7.68	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.08	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.492

PRCNC20221036

Eq H1-1a: 0.492 + 8/9(0.000 + 0.146) = 0.622

Story level Mezzanine, Column Line C8-D3, Column # 32

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.58	41.03	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	117.95	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.307
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.492
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.492

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.58	41.03	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.11	-0.08	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	117.95	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	-0.26	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.08	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.492

PRCNC20221036

Eq H1-1a: 0.492 + 8/9(0.000 + 0.005) = 0.497

Story level Roof, Column Line C7-D3, Column # 30

Fy (ksi)	=	50.00	Column Size	=	W10X45
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	6.51
	Bottom	7.55	6.51

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	53.99	2.55	22.31

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	101.77	0.90Pnx (kip)	=	481.08	Pu/0.90Pnx	=	0.212
			0.90Pny (kip)	=	216.60	Pu/0.90Pny	=	0.470
			0.90Pn (kip)	=	216.60	Pu/0.90Pn	=	0.470

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			53.99	2.55	22.31
Moments	Top	Mx (kip-ft)	-4.16	-1.60	-0.04
		My (kip-ft)	-1.79	0.00	-1.35
	Bot	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	-2.72	-4.27	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	101.77	0.90*Pn (kip)	=	216.60
Mux (kip-ft)	=	-5.87	0.90*Mnx (kip-ft)	=	205.88
Muy (kip-ft)	=	-5.40	0.90*Mny (kip-ft)	=	76.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.28
Pex (kip)	=	1274.45	Pey (kip)	=	274.42
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.470

PRCNC20221036

Eq H1-1a: 0.470 + 8/9(0.029 + 0.071) = 0.558

Story level Level 3, Column Line C7-D3, Column # 14

Fy (ksi)	=	50.00	Column Size	=	W10X45
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	6.51
	Bottom	7.55	6.51

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	75.96	36.37	22.31

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	160.50	0.90Pnx (kip)	=	530.05	Pu/0.90Pnx	=	0.303
			0.90Pny (kip)	=	340.47	Pu/0.90Pny	=	0.471
			0.90Pn (kip)	=	340.47	Pu/0.90Pn	=	0.471

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			75.96	36.37	22.31
Moments	Top	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	-3.65	-5.73	0.00
	Bot	Mx (kip-ft)	-0.00	2.42	0.00
		My (kip-ft)	-3.18	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	160.50	0.90*Pn (kip)	=	340.47
Mux (kip-ft)	=	3.87	0.90*Mnx (kip-ft)	=	205.88
Muy (kip-ft)	=	-13.55	0.90*Mny (kip-ft)	=	76.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.49
Pex (kip)	=	2291.51	Pey (kip)	=	493.41
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.471

PRCNC20221036

Eq H1-1a: 0.471 + 8/9(0.019 + 0.178) = 0.646

Story level Level 2, Column Line C7-D3, Column # 13

Fy (ksi)	=	50.00	Column Size	=	W10X45
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	6.51
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	97.91	60.45	22.31

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	225.36	0.90Pnx (kip)	=	530.05	Pu/0.90Pnx	=	0.425
			0.90Pny (kip)	=	340.47	Pu/0.90Pny	=	0.662
			0.90Pn (kip)	=	340.47	Pu/0.90Pn	=	0.662

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			97.91	60.45	22.31
Moments	Top	Mx (kip-ft)	-0.00	0.62	0.00
		My (kip-ft)	-3.18	-3.90	0.00
	Bot	Mx (kip-ft)	-0.00	0.02	0.00
		My (kip-ft)	-0.11	-0.13	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	225.36	0.90*Pn (kip)	=	340.47
Mux (kip-ft)	=	1.00	0.90*Mnx (kip-ft)	=	205.88
Muy (kip-ft)	=	-11.10	0.90*Mny (kip-ft)	=	76.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	2291.51	Pey (kip)	=	493.41
B1x	=	1.00	B1y	=	1.10

INTERACTION EQUATION

Pu/0.90*Pn = 0.662

PRCNC20221036

Eq H1-1a: 0.662 + 8/9(0.005 + 0.146) = 0.796

Story level Mezzanine, Column Line C7-D3, Column # 22

Fy (ksi)	=	50.00	Column Size	=	W10X45
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	6.51
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	97.93	60.45	22.31

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	225.39	0.90Pnx (kip)	=	530.05	Pu/0.90Pnx	=	0.425
			0.90Pny (kip)	=	340.47	Pu/0.90Pny	=	0.662
			0.90Pn (kip)	=	340.47	Pu/0.90Pn	=	0.662

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			97.93	60.45	22.31
Moments	Top	Mx (kip-ft)	-0.00	0.02	0.00
		My (kip-ft)	-0.11	-0.13	-0.00
	Bot	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	-0.00	-0.00	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	225.39	0.90*Pn (kip)	=	340.47
Mux (kip-ft)	=	0.03	0.90*Mnx (kip-ft)	=	205.88
Muy (kip-ft)	=	-0.38	0.90*Mny (kip-ft)	=	76.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	2291.51	Pey (kip)	=	493.41
B1x	=	1.00	B1y	=	1.10

INTERACTION EQUATION

Pu/0.90*Pn = 0.662

PRCNC20221036

Eq H1-1a: 0.662 + 8/9(0.000 + 0.005) = 0.667

Story level Roof, Column Line B7-A4, Column # 18

Fy (ksi)	= 50.00	Column Size	= W10X33
Orientation (deg.)	= 15.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	12.89	0.00	9.47

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	30.62	0.90Pnx (kip)	=	346.74	Pu/0.90Pnx	=	0.088
			0.90Pny (kip)	=	148.46	Pu/0.90Pny	=	0.206
			0.90Pn (kip)	=	148.46	Pu/0.90Pn	=	0.206

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			12.89	0.00	9.47
Moments	Top	Mx (kip-ft)	5.38	0.00	4.52
		My (kip-ft)	-0.74	0.00	-0.48
	Bot	Mx (kip-ft)	-9.23	-1.98	-1.75
		My (kip-ft)	1.46	0.63	0.25

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	30.62	0.90Pnx (kip)	=	346.74
			0.90Pny (kip)	=	148.46
Mux (kip-ft)	=	-14.92	0.90*Mnx (kip-ft)	=	102.90
Muy (kip-ft)	=	2.56	0.90*Mny (kip-ft)	=	52.50
			Mcx (kip-ft)	=	99.61
Rm	=	1.00			
Cbx	=	1.03			
Cmx	=	0.97	Cmy	=	0.87
Pex (kip)	=	878.76	Pey (kip)	=	188.08
B1x	=	1.00	B1y	=	1.04

PRCNC20221036

INTERACTION EQUATION

Pu/0.90*Pn = 0.206
Eq H1-1b Per H1.3: 0.044 + 0.145 + 0.000 = 0.189
Eq H1-3: 0.288 + 0.021 = 0.309

Gravity Column Design

Story level Level 3, Column Line B7-A4, Column # 61

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	59.17	10.57	17.34

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	104.04	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.271
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.434
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.434

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			59.17	10.27	17.29
Moments	Top	Mx (kip-ft)	-12.38	-2.57	-2.35
		My (kip-ft)	1.96	0.92	0.35
	Bot	Mx (kip-ft)	-7.09	-9.24	0.00
		My (kip-ft)	0.52	-0.72	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	103.81	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-19.90	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	3.38	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.20			
Cmx	=	0.34	Cmy	=	0.57
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.433

PRCNC20221036

Eq H1-1a: 0.433 + 8/9(0.137 + 0.064) = 0.612

Story level Level 2, Column Line B7-A4, Column # 57

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	88.64	29.28	17.34

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	161.89	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.421
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.676
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.676

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			88.64	29.28	17.34
Moments	Top	Mx (kip-ft)	-7.09	-5.59	0.00
		My (kip-ft)	0.52	0.39	0.00
	Bot	Mx (kip-ft)	-0.24	-0.19	-0.00
		My (kip-ft)	0.02	0.01	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	161.89	0.90Pnx (kip)	=	384.22
			0.90Pny (kip)	=	239.59
Mux (kip-ft)	=	-17.45	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	1.45	0.90*Mny (kip-ft)	=	52.50
			Mcx (kip-ft)	=	117.52
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.15

PRCNC20221036

INTERACTION EQUATION

Pu/0.90*Pn = 0.676
Eq H1-1a Per H1.3: 0.421 + 8/9(0.120 + 0.000) = 0.528
Eq H1-3: 0.785 + 0.008 = 0.793

Story level Mezzanine, Column Line B7-A4, Column # 61

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	88.65	29.28	17.34

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	161.91	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.421
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.676
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.676

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			88.65	29.28	17.34
Moments	Top	Mx (kip-ft)	-0.24	-0.19	-0.00
		My (kip-ft)	0.02	0.01	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	161.91	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.60	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.05	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.15

INTERACTION EQUATION

Pu/0.90*Pn = 0.676

PRCNC20221036

Eq H1-1a: 0.676 + 8/9(0.004 + 0.001) = 0.680

Story level Level 3, Column Line 169.96ft-100.22ft, Column # 70

Fy (ksi)	= 50.00	Column Size	= HSS5X5X5/16
Orientation (deg.)	= 15.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.00	5.00
	Bottom	5.00	5.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	15.23	15.82	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	= 43.58	0.90Pnx (kip)	=	126.44	Pu/0.90Pnx	=	0.345
		0.90Pny (kip)	=	126.44	Pu/0.90Pny	=	0.345
		0.90Pn (kip)	=	126.44	Pu/0.90Pn	=	0.345

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			15.23	15.46	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	5.93	6.44	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	3.04	-0.04	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	43.01	0.90*Pn (kip)	=	126.44
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	34.35
Muy (kip-ft)	=	17.42	0.90*Mny (kip-ft)	=	34.35
Rm	=	1.00			
Cbx	=	1.00	Cby	=	1.93
Cmx	=	1.00	Cmy	=	0.52
Pex (kip)	=	175.56	Pey (kip)	=	175.56
B1x	=	1.32	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.340

Eq H1-1a: 0.340 + 8/9(0.000 + 0.507) = 0.791

Story level Level 2, Column Line 169.96ft-100.22ft, Column # 48

Fy (ksi)	=	50.00	Column Size	=	HSS5X5X5/16
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.00	5.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	30.51	25.34	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	77.16	0.90Pnx (kip)	=	126.44	Pu/0.90Pnx	=	0.610
			0.90Pny (kip)	=	126.44	Pu/0.90Pny	=	0.610
			0.90Pn (kip)	=	126.44	Pu/0.90Pn	=	0.610

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			30.51	25.34	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	3.04	2.57	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.10	0.09	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	77.16	0.90*Pn (kip)	=	126.44
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	34.35
Muy (kip-ft)	=	8.30	0.90*Mny (kip-ft)	=	34.35
Rm	=	1.00			
Cbx	=	1.00	Cby	=	1.67
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	175.56	Pey (kip)	=	175.56
B1x	=	1.78	B1y	=	1.07

INTERACTION EQUATION

Pu/0.90*Pn = 0.610

PRCNC20221036

Eq H1-1a: 0.610 + 8/9(0.000 + 0.242) = 0.825

Gravity Column Design

Story level Mezzanine, Column Line 169.96ft-100.22ft, Column # 72

Fy (ksi)	=	50.00	Column Size	=	HSS5X5X5/16
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	5.00	5.00
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	30.52	25.34	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	77.17	0.90Pnx (kip)	=	126.44	Pu/0.90Pnx	=	0.610
			0.90Pny (kip)	=	126.44	Pu/0.90Pny	=	0.610
			0.90Pn (kip)	=	126.44	Pu/0.90Pn	=	0.610

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			30.52	25.34	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.10	0.09	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	77.17	0.90*Pn (kip)	=	126.44
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	34.35
Muy (kip-ft)	=	0.28	0.90*Mny (kip-ft)	=	34.35
Rm	=	1.00			
Cbx	=	1.00	Cby	=	1.67
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	175.56	Pey (kip)	=	175.56
B1x	=	1.78	B1y	=	1.07

INTERACTION EQUATION

Pu/0.90*Pn = 0.610

PRCNC20221036

Eq H1-1a: 0.610 + 8/9(0.000 + 0.008) = 0.618

Gravity Column Design

Story level Level 3, Column Line C6-D3, Column # 15

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	21.79	27.78	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	70.60	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.184
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.295
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.295

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			21.79	27.78	0.00
Moments	Top	Mx (kip-ft)	-0.00	-1.01	0.00
		My (kip-ft)	-6.34	-8.20	0.00
	Bot	Mx (kip-ft)	-0.00	-2.19	0.00
		My (kip-ft)	-3.17	0.00	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	70.60	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-3.50	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-20.73	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.17			
Cmx	=	0.42	Cmy	=	0.53
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.295

Eq H1-1a: 0.295 + 8/9(0.024 + 0.395) = 0.667

Story level Level 2, Column Line C6-D3, Column # 12

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.56	49.55	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	131.55	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.342
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.549
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.549

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.56	49.55	0.00
Moments	Top	Mx (kip-ft)	-0.00	-0.70	0.00
		My (kip-ft)	-3.17	-3.71	0.00
	Bot	Mx (kip-ft)	-0.00	-0.02	-0.00
		My (kip-ft)	-0.11	-0.13	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	131.55	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-1.11	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-9.74	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.549

PRCNC20221036

Eq H1-1a: 0.549 + 8/9(0.008 + 0.185) = 0.721

Gravity Column Design

Story level Mezzanine, Column Line C6-D3, Column # 21

Fy (ksi)	= 50.00	Column Size	= W10X33
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.58	49.55	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	131.57	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.342
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.549
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.549

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.58	49.55	0.00
Moments	Top	Mx (kip-ft)	-0.00	-0.02	-0.00
		My (kip-ft)	-0.11	-0.13	-0.00
	Bot	Mx (kip-ft)	-0.00	-0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	131.57	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.04	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-0.33	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.549

PRCNC20221036

Eq H1-1a: 0.549 + 8/9(0.000 + 0.006) = 0.555

Story level Level 3, Column Line C6-D1, Column # 21

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	37.18	24.18	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	83.30	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.217
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.348
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.348

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			37.18	24.18	0.00
Moments	Top	Mx (kip-ft)	-0.00	-0.07	0.00
		My (kip-ft)	6.34	8.49	0.00
	Bot	Mx (kip-ft)	-0.00	-1.18	0.00
		My (kip-ft)	3.17	4.21	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	83.30	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-1.89	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	21.18	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.74			
Cmx	=	0.58	Cmy	=	0.40
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.348

PRCNC20221036

Eq H1-1a: 0.348 + 8/9(0.013 + 0.403) = 0.718

Story level Level 2, Column Line C6-D1, Column # 1

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	55.80	40.79	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	132.22	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.344
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.552
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.552

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			55.80	40.79	0.00
Moments	Top	Mx (kip-ft)	-0.00	-0.02	0.00
		My (kip-ft)	3.17	3.74	0.00
	Bot	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	0.11	0.13	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	132.22	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.04	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	9.79	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.552

PRCNC20221036

Eq H1-1a: 0.552 + 8/9(0.000 + 0.186) = 0.718

Gravity Column Design

Story level Mezzanine, Column Line C6-D1, Column # 23

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	55.82	40.79	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	132.24	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.344
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.552
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.552

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			55.82	40.79	0.00
Moments	Top	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	0.11	0.13	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	132.24	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-0.00	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.33	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.552

PRCNC20221036

Eq H1-1a: 0.552 + 8/9(0.000 + 0.006) = 0.558

Story level Roof, Column Line B4-A4, Column # 39

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	7.46	6.49

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	20.35	0.00	16.54

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	50.88	0.90Pnx (kip)	=	413.61	Pu/0.90Pnx	=	0.123
			0.90Pny (kip)	=	182.53	Pu/0.90Pny	=	0.279
			0.90Pn (kip)	=	182.53	Pu/0.90Pn	=	0.279

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			20.35	0.00	16.54
Moments	Top	Mx (kip-ft)	0.44	0.00	0.34
		My (kip-ft)	0.68	0.00	0.63
	Bot	Mx (kip-ft)	3.02	5.80	0.00
		My (kip-ft)	3.44	4.69	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	50.88	0.90*Pn (kip)	=	182.53
Mux (kip-ft)	=	6.53	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	6.47	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.87			
Cmx	=	0.53	Cmy	=	0.49
Pex (kip)	=	1074.04	Pey (kip)	=	231.25
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.279

PRCNC20221036

Eq H1-1a: 0.279 + 8/9(0.037 + 0.100) = 0.401

Gravity Column Design

Story level Level 3, Column Line B4-A4, Column # 62

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	7.46	6.49

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	56.64	28.84	16.55

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	122.39	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.268
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.422
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.422

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			56.64	28.84	16.55
Moments	Top	Mx (kip-ft)	4.04	3.15	0.00
		My (kip-ft)	4.61	3.70	0.00
	Bot	Mx (kip-ft)	4.44	4.58	0.00
		My (kip-ft)	4.03	3.23	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	122.39	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	12.65	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	11.45	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	2.23			
Cmx	=	0.29	Cmy	=	0.25
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.422

PRCNC20221036

Eq H1-1a: 0.422 + 8/9(0.072 + 0.178) = 0.644

Story level Level 2, Column Line B4-A4, Column # 58

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	93.97	48.54	16.55

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	198.71	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.435
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.685
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.685

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			93.97	48.54	16.55
Moments	Top	Mx (kip-ft)	4.44	2.99	0.00
		My (kip-ft)	4.03	2.67	0.00
	Bot	Mx (kip-ft)	0.15	0.10	0.00
		My (kip-ft)	0.14	0.09	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	198.71	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	10.11	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	10.47	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.15

INTERACTION EQUATION

Pu/0.90*Pn = 0.685

Eq H1-1a: 0.685 + 8/9(0.058 + 0.162) = 0.880

Story level Mezzanine, Column Line B4-A4, Column # 65

Fy (ksi)	=	50.00	Column Size	=	W10X39
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.46	6.49
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	93.99	48.54	16.55

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	198.74	0.90Pnx (kip)	=	456.86	Pu/0.90Pnx	=	0.435
			0.90Pny (kip)	=	290.09	Pu/0.90Pny	=	0.685
			0.90Pn (kip)	=	290.09	Pu/0.90Pn	=	0.685

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			93.99	48.54	16.55
Moments	Top	Mx (kip-ft)	0.15	0.10	0.00
		My (kip-ft)	0.14	0.09	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	198.74	0.90*Pn (kip)	=	290.09
Mux (kip-ft)	=	0.34	0.90*Mnx (kip-ft)	=	175.50
Muy (kip-ft)	=	0.36	0.90*Mny (kip-ft)	=	64.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1931.15	Pey (kip)	=	415.80
B1x	=	1.00	B1y	=	1.15

INTERACTION EQUATION

Pu/0.90*Pn = 0.685

Eq H1-1a: 0.685 + 8/9(0.002 + 0.006) = 0.692

Story level Roof, Column Line C5-D6, Column # 35

Fy (ksi)	=	50.00	Column Size	=	W10X60
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.60	7.55
	Bottom	7.60	7.55

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.01	0.00	28.39

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	97.04	0.90Pnx (kip)	=	644.74	Pu/0.90Pnx	=	0.151
			0.90Pny (kip)	=	427.88	Pu/0.90Pny	=	0.227
			0.90Pn (kip)	=	427.88	Pu/0.90Pn	=	0.227

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			43.01	0.00	28.39
Moments	Top	Mx (kip-ft)	9.46	0.00	6.18
		My (kip-ft)	-2.42	0.00	-2.01
	Bot	Mx (kip-ft)	-0.42	-4.27	0.00
		My (kip-ft)	0.19	3.01	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	97.04	0.90Pnx (kip)	=	644.74
			0.90Pny (kip)	=	427.88
Mux (kip-ft)	=	21.24	0.90*Mnx (kip-ft)	=	279.75
Muy (kip-ft)	=	-6.12	0.90*Mny (kip-ft)	=	131.25
			Mcx (kip-ft)	=	239.43
Rm	=	1.00			
Cbx	=	1.54			
Cmx	=	0.65	Cmy	=	0.71
Pex (kip)	=	1752.37	Pey (kip)	=	596.12
B1x	=	1.00	B1y	=	1.00

PRCNC20221036

INTERACTION EQUATION

Pu/0.90*Pn = 0.227
Eq H1-1b Per H1.3: 0.075 + 0.076 + 0.000 = 0.151
Eq H1-3: 0.314 + 0.003 = 0.318

Story level Level 3, Column Line C5-D6, Column # 30

Fy (ksi)	=	50.00	Column Size	=	W10X60
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.60	7.55
	Bottom	7.60	7.55

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	81.54	29.77	28.40

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	159.67	0.90Pnx (kip)	=	708.16	Pu/0.90Pnx	=	0.225
			0.90Pny (kip)	=	563.76	Pu/0.90Pny	=	0.283
			0.90Pn (kip)	=	563.76	Pu/0.90Pn	=	0.283

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 4:

			Dead	Live	Roof
Axial (kip)			81.54	29.77	28.40
Moments	Top	Mx (kip-ft)	-0.56	-0.41	0.00
		My (kip-ft)	0.25	0.17	0.00
	Bot	Mx (kip-ft)	-0.54	-3.64	0.00
		My (kip-ft)	-0.23	-2.48	0.00

Reverse curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	159.67	0.90*Pn (kip)	=	563.76
Mux (kip-ft)	=	-6.48	0.90*Mnx (kip-ft)	=	279.75
Muy (kip-ft)	=	-4.25	0.90*Mny (kip-ft)	=	131.25
Rm	=	1.00			
Cbx	=	1.93			
Cmx	=	0.52	Cmy	=	0.65
Pex (kip)	=	3150.83	Pey (kip)	=	1071.84
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.283

PRCNC20221036

Eq H1-1a: 0.283 + 8/9(0.023 + 0.032) = 0.333

Story level Level 2, Column Line C5-D6, Column # 21

Fy (ksi)	=	50.00	Column Size	=	W10X60
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.60	7.55
	Bottom	7.60	7.55

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	120.52	49.68	28.40

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	238.31	0.90Pnx (kip)	=	571.18	Pu/0.90Pnx	=	0.417
			0.90Pny (kip)	=	299.10	Pu/0.90Pny	=	0.797
			0.90Pn (kip)	=	299.10	Pu/0.90Pn	=	0.797

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			120.52	49.68	28.40
Moments	Top	Mx (kip-ft)	-0.32	-0.13	0.00
		My (kip-ft)	-0.14	-0.07	0.00
	Bot	Mx (kip-ft)	-0.14	-0.06	-0.00
		My (kip-ft)	-0.06	-0.03	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	238.31	0.90*Pn (kip)	=	299.10
Mux (kip-ft)	=	-0.60	0.90*Mnx (kip-ft)	=	279.75
Muy (kip-ft)	=	-0.44	0.90*Mny (kip-ft)	=	131.25
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1113.95	Pey (kip)	=	378.94
B1x	=	1.00	B1y	=	1.62

INTERACTION EQUATION

Pu/0.90*Pn = 0.797

PRCNC20221036

Eq H1-1a: 0.797 + 8/9(0.002 + 0.003) = 0.802

Gravity Column Design

Story level Mezzanine, Column Line C5-D6, Column # 7

Fy (ksi)	=	50.00	Column Size	=	W10X60
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.60	7.55
	Bottom	7.60	7.55

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	120.55	49.68	28.40

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	238.35	0.90Pnx (kip)	=	571.18	Pu/0.90Pnx	=	0.417
			0.90Pny (kip)	=	299.10	Pu/0.90Pny	=	0.797
			0.90Pn (kip)	=	299.10	Pu/0.90Pn	=	0.797

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			120.55	49.68	28.40
Moments	Top	Mx (kip-ft)	-0.14	-0.06	-0.00
		My (kip-ft)	-0.06	-0.03	-0.00
	Bot	Mx (kip-ft)	-0.13	-0.05	-0.00
		My (kip-ft)	-0.06	-0.03	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	238.35	0.90*Pn (kip)	=	299.10
Mux (kip-ft)	=	-0.26	0.90*Mnx (kip-ft)	=	279.75
Muy (kip-ft)	=	-0.19	0.90*Mny (kip-ft)	=	131.25
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1113.95	Pey (kip)	=	378.94
B1x	=	1.00	B1y	=	1.62

INTERACTION EQUATION

Pu/0.90*Pn = 0.797

PRCNC20221036

Eq H1-1a: 0.797 + 8/9(0.001 + 0.001) = 0.799

Story level Level 1, Column Line C5-D6, Column # 7

Fy (ksi) = 50.00 Column Size = W10X60
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.60	7.55
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	121.15	49.68	28.40

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip) =	239.07	0.90Pnx (kip) =	571.18	Pu/0.90Pnx =	0.419
		0.90Pny (kip) =	299.10	Pu/0.90Pny =	0.799
		0.90Pn (kip) =	299.10	Pu/0.90Pn =	0.799

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			121.15	49.68	28.40
Moments	Top	Mx (kip-ft)	-0.13	-0.05	-0.00
		My (kip-ft)	-0.06	-0.03	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip) =	239.07	0.90*Pn (kip) =	299.10
Mux (kip-ft) =	-0.24	0.90*Mnx (kip-ft) =	279.75
Muy (kip-ft) =	-0.18	0.90*Mny (kip-ft) =	131.25
Rm =	1.00		
Cbx =	1.67		
Cmx =	0.60	Cmy =	0.60
Pex (kip) =	1113.95	Pey (kip) =	378.94
B1x =	1.00	B1y =	1.63

INTERACTION EQUATION

Pu/0.90*Pn = 0.799

PRCNC20221036

Eq H1-1a: 0.799 + 8/9(0.001 + 0.001) = 0.801

Story level Level 3, Column Line C5-D4, Column # 19

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	7.50	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	28.65	24.24	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	73.15	0.90Pnx (kip)	=	574.78	Pu/0.90Pnx	=	0.127
			0.90Pny (kip)	=	457.01	Pu/0.90Pny	=	0.160
			0.90Pn (kip)	=	457.01	Pu/0.90Pn	=	0.160

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 12:

			Dead	Live	Roof
Axial (kip)			28.65	15.61	0.00
Moments	Top	Mx (kip-ft)	-0.37	-5.65	0.00
		My (kip-ft)	4.85	4.11	0.00
	Bot	Mx (kip-ft)	-0.28	3.38	0.00
		My (kip-ft)	3.18	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	59.35	0.90*Pn (kip)	=	457.01
Mux (kip-ft)	=	-9.47	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	12.39	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.23			
Cmx	=	0.81	Cmy	=	0.48
Pex (kip)	=	2513.27	Pey (kip)	=	863.01
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.130

PRCNC20221036

Eq H1-1b: 0.065 + 0.042 + 0.117 = 0.224

Story level Level 2, Column Line C5-D4, Column # 11

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	7.50	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	57.47	40.04	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	133.03	0.90Pnx (kip)	=	461.62	Pu/0.90Pnx	=	0.288
			0.90Pny (kip)	=	240.83	Pu/0.90Pny	=	0.552
			0.90Pn (kip)	=	240.83	Pu/0.90Pn	=	0.552

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			57.47	40.04	0.00
Moments	Top	Mx (kip-ft)	-0.17	-0.08	0.00
		My (kip-ft)	1.89	1.31	0.00
	Bot	Mx (kip-ft)	-0.07	-0.03	-0.00
		My (kip-ft)	0.80	0.56	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	133.03	0.90*Pn (kip)	=	240.83
Mux (kip-ft)	=	-0.32	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	4.64	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	888.55	Pey (kip)	=	305.11
B1x	=	1.00	B1y	=	1.06

INTERACTION EQUATION

Pu/0.90*Pn = 0.552

PRCNC20221036

Eq H1-1a: 0.552 + 8/9(0.001 + 0.044) = 0.593

Story level Mezzanine, Column Line C5-D4, Column # 6

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	7.50	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	57.50	40.04	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	133.06	0.90Pnx (kip)	=	461.62	Pu/0.90Pnx	=	0.288
			0.90Pny (kip)	=	240.83	Pu/0.90Pny	=	0.553
			0.90Pn (kip)	=	240.83	Pu/0.90Pn	=	0.553

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			57.50	40.04	0.00
Moments	Top	Mx (kip-ft)	-0.07	-0.03	-0.00
		My (kip-ft)	0.80	0.56	0.00
	Bot	Mx (kip-ft)	-0.07	-0.03	-0.00
		My (kip-ft)	0.77	0.53	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	133.06	0.90*Pn (kip)	=	240.83
Mux (kip-ft)	=	-0.14	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	1.98	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	888.55	Pey (kip)	=	305.11
B1x	=	1.00	B1y	=	1.06

INTERACTION EQUATION

Pu/0.90*Pn = 0.553

PRCNC20221036

Eq H1-1a: 0.553 + 8/9(0.001 + 0.019) = 0.570

Story level Level 1, Column Line C5-D4, Column # 6

Fy (ksi)	= 50.00	Column Size	= W10X49
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	57.99	40.04	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	133.65	0.90Pnx (kip)	=	461.62	Pu/0.90Pnx	=	0.290
			0.90Pny (kip)	=	240.83	Pu/0.90Pny	=	0.555
			0.90Pn (kip)	=	240.83	Pu/0.90Pn	=	0.555

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			57.99	40.04	0.00
Moments	Top	Mx (kip-ft)	-0.07	-0.03	-0.00
		My (kip-ft)	0.77	0.53	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	133.65	0.90*Pn (kip)	=	240.83
Mux (kip-ft)	=	-0.13	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	1.89	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	888.55	Pey (kip)	=	305.11
B1x	=	1.00	B1y	=	1.07

INTERACTION EQUATION

Pu/0.90*Pn = 0.555

PRCNC20221036

Eq H1-1a: 0.555 + 8/9(0.001 + 0.018) = 0.571

Gravity Column Design

Story level Roof, Column Line C5-D3, Column # 31

Fy (ksi)	= 50.00		Column Size	= W10X45
Orientation (deg.)	= 0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	6.51
	Bottom	7.55	6.51

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	54.39	0.00	25.57

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	106.18	0.90Pnx (kip)	=	481.08	Pu/0.90Pnx	=	0.221
			0.90Pny (kip)	=	216.60	Pu/0.90Pny	=	0.490
			0.90Pn (kip)	=	216.60	Pu/0.90Pn	=	0.490

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			54.39	0.00	25.57
Moments	Top	Mx (kip-ft)	4.13	0.00	1.49
		My (kip-ft)	0.94	0.00	0.57
	Bot	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	-2.72	-3.48	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	106.18	0.90*Pn (kip)	=	216.60
Mux (kip-ft)	=	7.35	0.90*Mnx (kip-ft)	=	205.88
Muy (kip-ft)	=	-6.22	0.90*Mny (kip-ft)	=	76.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.76
Pex (kip)	=	1274.45	Pey (kip)	=	274.42
B1x	=	1.00	B1y	=	1.24

INTERACTION EQUATION

Pu/0.90*Pn = 0.490

PRCNC20221036

Eq H1-1a: 0.490 + 8/9(0.036 + 0.082) = 0.595

Story level Level 3, Column Line C5-D3, Column # 20

Fy (ksi)	= 50.00	Column Size	=	W10X45
Orientation (deg.)	= 0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	6.51
	Bottom	7.55	6.51

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	76.36	19.79	25.57

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	142.43	0.90Pnx (kip)	=	530.05	Pu/0.90Pnx	=	0.269
			0.90Pny (kip)	=	340.47	Pu/0.90Pny	=	0.418
			0.90Pn (kip)	=	340.47	Pu/0.90Pn	=	0.418

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			76.36	19.79	25.57
Moments	Top	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	-3.65	-3.24	0.00
	Bot	Mx (kip-ft)	0.00	1.47	0.00
		My (kip-ft)	-3.18	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	136.07	0.90*Pn (kip)	=	340.47
Mux (kip-ft)	=	2.36	0.90*Mnx (kip-ft)	=	205.88
Muy (kip-ft)	=	-9.55	0.90*Mny (kip-ft)	=	76.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.44
Pex (kip)	=	2291.51	Pey (kip)	=	493.41
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.400

PRCNC20221036

Eq H1-1a: 0.400 + 8/9(0.011 + 0.125) = 0.521

Story level Level 2, Column Line C5-D3, Column # 10

Fy (ksi)	=	50.00	Column Size	=	W10X45
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	6.51
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	98.31	32.15	25.57

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	182.20	0.90Pnx (kip)	=	530.05	Pu/0.90Pnx	=	0.344
			0.90Pny (kip)	=	340.47	Pu/0.90Pny	=	0.535
			0.90Pn (kip)	=	340.47	Pu/0.90Pn	=	0.535

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			98.31	32.15	25.57
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-3.18	-2.30	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.11	-0.08	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	182.20	0.90*Pn (kip)	=	340.47
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	176.44
Muy (kip-ft)	=	-7.49	0.90*Mny (kip-ft)	=	76.13
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	2291.51	Pey (kip)	=	493.41
B1x	=	1.09	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.535

Eq H1-1a: 0.535 + 8/9(0.000 + 0.098) = 0.623

Story level Mezzanine, Column Line C5-D3, Column # 17

Fy (ksi)	=	50.00	Column Size	=	W10X45
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	6.51
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	98.33	32.15	25.57

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	182.23	0.90Pnx (kip)	=	530.05	Pu/0.90Pnx	=	0.344
			0.90Pny (kip)	=	340.47	Pu/0.90Pny	=	0.535
			0.90Pn (kip)	=	340.47	Pu/0.90Pn	=	0.535

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			98.33	32.15	25.57
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.11	-0.08	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	182.23	0.90*Pn (kip)	=	340.47
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	176.44
Muy (kip-ft)	=	-0.26	0.90*Mny (kip-ft)	=	76.13
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	2291.51	Pey (kip)	=	493.41
B1x	=	1.09	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.535

Eq H1-1a: 0.535 + 8/9(0.000 + 0.003) = 0.538

Gravity Column Design

Story level Roof, Column Line C5-D1, Column # 24

Fy (ksi)	= 50.00	Column Size	=	W10X33
Orientation (deg.)	= 0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	29.12	0.00	14.07

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	57.45	0.90Pnx (kip)	=	346.74	Pu/0.90Pnx	=	0.166
			0.90Pny (kip)	=	148.46	Pu/0.90Pny	=	0.387
			0.90Pn (kip)	=	148.46	Pu/0.90Pn	=	0.387

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			29.12	0.00	14.07
Moments	Top	Mx (kip-ft)	3.12	0.00	0.90
		My (kip-ft)	1.97	0.00	1.03
	Bot	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	2.71	3.46	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	57.45	0.90*Pn (kip)	=	148.46
Mux (kip-ft)	=	5.18	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	4.98	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.28
Pex (kip)	=	878.76	Pey (kip)	=	188.08
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.387

PRCNC20221036

Eq H1-1a: 0.387 + 8/9(0.036 + 0.095) = 0.503

Story level Level 3, Column Line C5-D1, Column # 22

Fy (ksi) = 50.00   Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	66.30	19.55	14.07

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	117.88	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.307
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.492
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.492

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			66.30	19.55	14.07
Moments	Top	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	3.63	3.74	0.00
	Bot	Mx (kip-ft)	-0.00	-1.03	0.00
		My (kip-ft)	3.17	3.26	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	117.88	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-1.64	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	10.34	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.25
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.492

Eq H1-1a: 0.492 + 8/9(0.011 + 0.197) = 0.677

Story level Level 2, Column Line C5-D1, Column # 2

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.17	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	84.92	30.83	14.07

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	158.27	0.90Pnx (kip)	=	387.54	Pu/0.90Pnx	=	0.408
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.661
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.661

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			84.92	30.83	14.07
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	3.17	2.62	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.11	0.09	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	158.27	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	9.01	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1693.53	Pey (kip)	=	338.18
B1x	=	1.10	B1y	=	1.13

INTERACTION EQUATION

Pu/0.90*Pn = 0.661

PRCNC20221036

Eq H1-1a: 0.661 + 8/9(0.000 + 0.172) = 0.813

Story level Mezzanine, Column Line C5-D1, Column # 24

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		0.50	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	84.94	30.83	14.07

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	158.29	0.90Pnx (kip)	=	436.88	Pu/0.90Pnx	=	0.362
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.661
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.661

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			84.94	30.83	14.07
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.11	0.09	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	158.29	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	0.31	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1359538.00	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.13

INTERACTION EQUATION

Pu/0.90*Pn = 0.661

PRCNC20221036

Eq H1-1a: 0.661 + 8/9(0.000 + 0.006) = 0.666

Story level Level 3, Column Line C4-D3, Column # 26

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	21.79	19.79	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	57.81	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.150
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.241
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.241

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			21.79	19.79	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-6.34	-5.62	0.00
	Bot	Mx (kip-ft)	0.00	1.44	0.00
		My (kip-ft)	-3.17	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	57.81	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	2.30	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-16.60	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.51
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.241

PRCNC20221036

Eq H1-1a: 0.241 + 8/9(0.016 + 0.316) = 0.536

Story level Level 2, Column Line C4-D3, Column # 9

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.57	32.15	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	103.73	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.270
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.433
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.433

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.57	32.15	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-3.17	-2.28	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.11	-0.08	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	103.73	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	-7.46	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.07	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.433

PRCNC20221036

Eq H1-1a: 0.433 + 8/9(0.000 + 0.142) = 0.559

Gravity Column Design

Story level Mezzanine, Column Line C4-D3, Column # 16

Fy (ksi)	= 50.00	Column Size	= W10X33
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.58	32.15	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	103.75	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.270
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.433
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.433

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.58	32.15	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	-0.11	-0.08	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	103.75	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	-0.25	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.07	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.433

PRCNC20221036

Eq H1-1a: 0.433 + 8/9(0.000 + 0.005) = 0.437

Gravity Column Design

Story level Level 3, Column Line C4-D1, Column # 23

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	37.18	19.55	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	75.90	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.198
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.317
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.317

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			37.18	19.55	0.00
Moments	Top	Mx (kip-ft)	-0.00	-0.00	-0.00
		My (kip-ft)	6.34	6.53	0.00
	Bot	Mx (kip-ft)	-0.00	-1.03	0.00
		My (kip-ft)	3.17	3.26	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	75.90	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-1.64	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	18.05	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.40
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.317

PRCNC20221036

Eq H1-1a: 0.317 + 8/9(0.011 + 0.344) = 0.632

Gravity Column Design

Story level Level 2, Column Line C4-D1, Column # 3

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.17	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	55.80	30.83	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	116.29	0.90Pnx (kip)	=	387.54	Pu/0.90Pnx	=	0.300
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.485
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.485

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			55.80	30.83	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	3.17	2.62	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.11	0.09	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	116.29	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	7.99	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1693.53	Pey (kip)	=	338.18
B1x	=	1.07	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.485

PRCNC20221036

Gravity Column Design

Eq H1-1a: 0.485 + 8/9(0.000 + 0.152) = 0.621

Story level Mezzanine, Column Line C4-D1, Column # 20

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		0.50	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	55.82	30.83	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	116.31	0.90Pnx (kip)	=	436.88	Pu/0.90Pnx	=	0.266
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.485
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.485

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			55.82	30.83	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.11	0.09	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	116.31	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	0.27	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1359538.00	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.485

PRCNC20221036

Eq H1-1a: 0.485 + 8/9(0.000 + 0.005) = 0.490

Story level Roof, Column Line C3-D5, Column # 34

Fy (ksi)	=	50.00	Column Size	=	W10X54
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	7.50
	Bottom	7.55	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	16.42	0.00	7.54

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	31.76	0.90Pnx (kip)	=	574.97	Pu/0.90Pnx	=	0.055
			0.90Pny (kip)	=	380.69	Pu/0.90Pny	=	0.083
			0.90Pn (kip)	=	380.69	Pu/0.90Pn	=	0.083

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			16.42	0.00	7.54
Moments	Top	Mx (kip-ft)	8.50	0.00	3.69
		My (kip-ft)	0.24	0.00	0.21
	Bot	Mx (kip-ft)	3.41	4.58	0.00
		My (kip-ft)	1.97	6.04	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	23.47	0.90*Pn (kip)	=	380.69
Mux (kip-ft)	=	12.04	0.90*Mnx (kip-ft)	=	249.75
Muy (kip-ft)	=	12.03	0.90*Mny (kip-ft)	=	117.38
Rm	=	1.00			
Cbx	=	2.26			
Cmx	=	0.22	Cmy	=	0.59
Pex (kip)	=	1557.09	Pey (kip)	=	529.31
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.062

PRCNC20221036

Eq H1-1b: 0.031 + 0.048 + 0.103 = 0.182

Story level Level 3, Column Line C3-D5, Column # 28

Fy (ksi)	=	50.00	Column Size	=	W10X54
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	7.50
	Bottom	7.55	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	55.25	31.70	7.54

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	120.78	0.90Pnx (kip)	=	631.80	Pu/0.90Pnx	=	0.191
			0.90Pny (kip)	=	502.32	Pu/0.90Pny	=	0.240
			0.90Pn (kip)	=	502.32	Pu/0.90Pn	=	0.240

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			55.25	31.70	7.54
Moments	Top	Mx (kip-ft)	4.57	3.77	0.00
		My (kip-ft)	2.64	2.37	0.00
	Bot	Mx (kip-ft)	6.59	4.13	0.00
		My (kip-ft)	-3.48	-2.87	0.00

Reverse curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	120.78	0.90*Pn (kip)	=	502.32
Mux (kip-ft)	=	14.51	0.90*Mnx (kip-ft)	=	249.75
Muy (kip-ft)	=	-9.21	0.90*Mny (kip-ft)	=	117.38
Rm	=	1.00			
Cbx	=	2.23			
Cmx	=	0.28	Cmy	=	0.92
Pex (kip)	=	2799.71	Pey (kip)	=	951.72
B1x	=	1.00	B1y	=	1.05

INTERACTION EQUATION

Pu/0.90*Pn = 0.240

PRCNC20221036

Eq H1-1a: 0.240 + 8/9(0.058 + 0.078) = 0.362

Story level Level 2, Column Line C3-D5, Column # 8

Fy (ksi) = 50.00   Column Size = W10X54
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.17	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	7.50
	Bottom	7.55	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	86.20	45.64	7.54

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	180.24	0.90Pnx (kip)	=	636.82	Pu/0.90Pnx	=	0.283
			0.90Pny (kip)	=	265.58	Pu/0.90Pny	=	0.679
			0.90Pn (kip)	=	265.58	Pu/0.90Pn	=	0.679

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			86.20	45.64	7.54
Moments	Top	Mx (kip-ft)	6.82	3.70	0.00
		My (kip-ft)	-2.07	-1.47	0.00
	Bot	Mx (kip-ft)	1.82	0.18	0.00
		My (kip-ft)	-0.88	-0.63	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	180.24	0.90*Pn (kip)	=	265.58
Mux (kip-ft)	=	15.00	0.90*Mnx (kip-ft)	=	191.21
Muy (kip-ft)	=	-6.26	0.90*Mny (kip-ft)	=	117.38
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	3000.82	Pey (kip)	=	336.47
B1x	=	1.06	B1y	=	1.29

INTERACTION EQUATION

Pu/0.90*Pn = 0.679

PRCNC20221036

Eq H1-1a: 0.679 + 8/9(0.078 + 0.053) = 0.796

Story level Mezzanine, Column Line C3-D5, Column # 5

Fy (ksi)	=	50.00	Column Size	=	W10X54
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		10.50	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	7.50
	Bottom	7.55	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	93.03	45.89	7.54

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	188.82	0.90Pnx (kip)	=	669.24	Pu/0.90Pnx	=	0.282
			0.90Pny (kip)	=	265.58	Pu/0.90Pny	=	0.711
			0.90Pn (kip)	=	265.58	Pu/0.90Pn	=	0.711

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			93.03	45.89	7.54
Moments	Top	Mx (kip-ft)	2.46	0.24	0.00
		My (kip-ft)	-0.88	-0.62	-0.00
	Bot	Mx (kip-ft)	2.34	0.22	0.00
		My (kip-ft)	-0.84	-0.59	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	188.82	0.90*Pn (kip)	=	265.58
Mux (kip-ft)	=	3.44	0.90*Mnx (kip-ft)	=	191.21
Muy (kip-ft)	=	-2.81	0.90*Mny (kip-ft)	=	117.38
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	5462.60	Pey (kip)	=	336.47
B1x	=	1.04	B1y	=	1.37

INTERACTION EQUATION

Pu/0.90*Pn = 0.711

PRCNC20221036

Eq H1-1a: 0.711 + 8/9(0.018 + 0.024) = 0.748

Story level Level 1, Column Line C3-D5, Column # 5

Fy (ksi)	=	50.00	Column Size	=	W10X54
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		10.50	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.55	7.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	93.57	45.89	7.54

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	189.47	0.90Pnx (kip)	=	669.24	Pu/0.90Pnx	=	0.283
			0.90Pny (kip)	=	265.58	Pu/0.90Pny	=	0.713
			0.90Pn (kip)	=	265.58	Pu/0.90Pn	=	0.713

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			93.57	45.89	7.54
Moments	Top	Mx (kip-ft)	2.34	0.22	0.00
		My (kip-ft)	-0.84	-0.59	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	189.47	0.90*Pn (kip)	=	265.58
Mux (kip-ft)	=	3.28	0.90*Mnx (kip-ft)	=	191.21
Muy (kip-ft)	=	-2.68	0.90*Mny (kip-ft)	=	117.38
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	5462.60	Pey (kip)	=	336.47
B1x	=	1.04	B1y	=	1.37

INTERACTION EQUATION

Pu/0.90*Pn = 0.713

PRCNC20221036

Eq H1-1a: 0.713 + 8/9(0.017 + 0.023) = 0.749

Story level Roof, Column Line C3-D3, Column # 33

Fy (ksi)	= 50.00	Column Size	= W10X33
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

	X-Axis	Y-Axis
Lu (ft)	19.67	19.67
K	1	1
Braced Against Joint Translation	Yes	Yes
Column Eccentricity (in) Top	7.36	6.48
Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	38.71	0.00	21.09

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	= 80.20	0.90Pnx (kip)	=	346.74	Pu/0.90Pnx	=	0.231
		0.90Pny (kip)	=	148.46	Pu/0.90Pny	=	0.540
		0.90Pn (kip)	=	148.46	Pu/0.90Pn	=	0.540

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 10:

	Dead	Live	Roof
Axial (kip)	38.71	0.00	20.43
Moments Top Mx (kip-ft)	1.73	0.00	-0.98
My (kip-ft)	-0.68	0.00	-0.95
Bot Mx (kip-ft)	1.48	3.45	0.00
My (kip-ft)	0.10	1.58	0.00

Reverse curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	79.14	0.90*Pn (kip)	=	148.46
Mux (kip-ft)	=	3.50	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-3.05	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.84			
Cmx	=	0.54	Cmy	=	0.76
Pex (kip)	=	878.76	Pey (kip)	=	188.08
B1x	=	1.00	B1y	=	1.31

INTERACTION EQUATION

Pu/0.90*Pn = 0.533

PRCNC20221036

Eq H1-1a: 0.533 + 8/9(0.024 + 0.058) = 0.606

Story level Level 3, Column Line C3-D3, Column # 27

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

	X-Axis	Y-Axis
Lu (ft)	14.67	14.67
K	1	1
Braced Against Joint Translation	Yes	Yes
Column Eccentricity (in) Top	7.36	6.48
Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	63.88	21.88	21.09

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip) = 122.21	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.318
	0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.510
	0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.510

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

	Dead	Live	Roof
Axial (kip)	63.88	21.88	21.09
Moments Top Mx (kip-ft)	1.99	1.50	0.00
My (kip-ft)	0.14	0.12	0.00
Bot Mx (kip-ft)	1.74	2.68	0.00
My (kip-ft)	0.11	1.22	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	122.21	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	6.37	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	2.09	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.22			
Cmx	=	0.30	Cmy	=	0.53
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.510

PRCNC20221036

Eq H1-1a: 0.510 + 8/9(0.044 + 0.040) = 0.584

Story level Level 2, Column Line C3-D3, Column # 6

Fy (ksi)	= 50.00	Column Size	= W10X33
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	89.00	35.77	21.09

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	174.59	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.454
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.729
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.729

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			89.00	32.39	21.09
Moments	Top	Mx (kip-ft)	1.74	1.07	0.00
		My (kip-ft)	0.11	1.00	0.00
	Bot	Mx (kip-ft)	0.06	0.04	0.00
		My (kip-ft)	0.00	0.03	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	169.17	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	3.79	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	2.08	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.20

INTERACTION EQUATION

Pu/0.90*Pn = 0.706

PRCNC20221036

Eq H1-1a: 0.706 + 8/9(0.026 + 0.040) = 0.764

Gravity Column Design

Story level Mezzanine, Column Line C3-D3, Column # 15

Fy (ksi)	= 50.00	Column Size	= W10X33
Orientation (deg.)	= 0.0		

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	89.02	35.77	21.09

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	174.61	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.454
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.729
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.729

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			89.02	35.77	21.09
Moments	Top	Mx (kip-ft)	0.06	0.04	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	-0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	174.61	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.13	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.01	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.24

INTERACTION EQUATION

Pu/0.90*Pn = 0.729

PRCNC20221036

Eq H1-1a: 0.729 + 8/9(0.001 + 0.000) = 0.730

Story level Level 3, Column Line C3-D2, Column # 25

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	24.77	21.65	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	64.36	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.168
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.269
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.269

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			24.77	15.82	0.00
Moments	Top	Mx (kip-ft)	7.20	6.13	0.00
		My (kip-ft)	0.00	3.15	0.00
	Bot	Mx (kip-ft)	3.60	0.00	0.00
		My (kip-ft)	0.00	-1.57	0.00

Reverse curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	55.03	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	18.45	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	5.03	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.98			
Cmx	=	0.51	Cmy	=	0.80
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.230

PRCNC20221036

Eq H1-1a: 0.230 + 8/9(0.127 + 0.096) = 0.428

Story level Level 2, Column Line C3-D2, Column # 5

Fy (ksi)	= 50.00	Column Size	=	W10X33
Orientation (deg.)	= 0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	49.53	35.37	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	116.02	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.302
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.484
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.484

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			49.53	30.61	0.00
Moments	Top	Mx (kip-ft)	3.60	2.50	0.00
		My (kip-ft)	0.00	1.29	0.00
	Bot	Mx (kip-ft)	0.12	0.09	0.00
		My (kip-ft)	0.00	0.04	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	108.41	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	8.33	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	2.06	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.452

PRCNC20221036

Eq H1-1a: 0.452 + 8/9(0.057 + 0.039) = 0.538

Gravity Column Design

Story level Mezzanine, Column Line C3-D2, Column # 18

Fy (ksi) = 50.00 Column Size = W10X33
Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	49.54	35.37	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	116.04	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.302
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.484
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.484

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			49.54	35.37	0.00
Moments	Top	Mx (kip-ft)	0.12	0.09	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	116.04	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.28	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.52

INTERACTION EQUATION

Pu/0.90*Pn = 0.484

PRCNC20221036

Eq H1-1a: 0.484 + 8/9(0.002 + 0.000) = 0.486

Story level Roof, Column Line C3-D1, Column # 23

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	23.32	0.00	13.72

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	49.94	0.90Pnx (kip)	=	346.74	Pu/0.90Pnx	=	0.144
			0.90Pny (kip)	=	148.46	Pu/0.90Pny	=	0.336
			0.90Pn (kip)	=	148.46	Pu/0.90Pn	=	0.336

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 2:

			Dead	Live	Roof
Axial (kip)			23.32	0.00	13.72
Moments	Top	Mx (kip-ft)	1.59	0.00	0.59
		My (kip-ft)	1.09	0.00	0.95
	Bot	Mx (kip-ft)	3.52	2.43	0.00
		My (kip-ft)	1.04	1.44	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	49.94	0.90*Pn (kip)	=	148.46
Mux (kip-ft)	=	5.43	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	2.83	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.18			
Cmx	=	0.39	Cmy	=	0.32
Pex (kip)	=	878.76	Pey (kip)	=	188.08
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.336

PRCNC20221036

Eq H1-1a: $0.336 + 8/9(0.037 + 0.054) = 0.417$

Story level Level 3, Column Line C3-D1, Column # 24

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	66.70	17.32	13.72

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	114.60	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.298
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.478
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.478

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			66.70	17.32	13.72
Moments	Top	Mx (kip-ft)	4.72	1.40	0.00
		My (kip-ft)	1.40	1.66	0.00
	Bot	Mx (kip-ft)	1.25	1.09	0.00
		My (kip-ft)	1.22	1.45	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	114.60	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	7.90	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	4.34	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.16			
Cmx	=	0.44	Cmy	=	0.25
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.478

PRCNC20221036

Eq H1-1a: 0.478 + 8/9(0.054 + 0.083) = 0.600

Story level Level 2, Column Line C3-D1, Column # 4

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.17	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	82.23	26.87	13.72

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	148.52	0.90Pnx (kip)	=	387.54	Pu/0.90Pnx	=	0.383
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.620
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.620

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			82.23	26.87	13.72
Moments	Top	Mx (kip-ft)	1.29	0.91	0.00
		My (kip-ft)	1.22	1.16	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.04	0.04	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	148.52	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	3.29	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	3.55	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1693.53	Pey (kip)	=	338.18
B1x	=	1.10	B1y	=	1.07

INTERACTION EQUATION

Pu/0.90*Pn = 0.620

PRCNC20221036

Eq H1-1a: 0.620 + 8/9(0.028 + 0.068) = 0.705

Story level Mezzanine, Column Line C3-D1, Column # 19

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		0.50	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	82.24	26.87	13.72

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	148.54	0.90Pnx (kip)	=	436.88	Pu/0.90Pnx	=	0.340
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.620
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.620

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			82.24	26.87	13.72
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.04	0.04	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	148.54	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	117.52
Muy (kip-ft)	=	0.12	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	1359538.00	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.07

INTERACTION EQUATION

Pu/0.90*Pn = 0.620

PRCNC20221036

Eq H1-1a: 0.620 + 8/9(0.000 + 0.002) = 0.622

Gravity Column Design

Story level Level 3, Column Line B2-A4, Column # 72

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	7.50	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	38.24	86.84	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	184.84	0.90Pnx (kip)	=	574.78	Pu/0.90Pnx	=	0.322
			0.90Pny (kip)	=	457.01	Pu/0.90Pny	=	0.404
			0.90Pn (kip)	=	457.01	Pu/0.90Pn	=	0.404

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 8:

			Dead	Live	Roof
Axial (kip)			38.24	70.83	0.00
Moments	Top	Mx (kip-ft)	2.16	21.33	0.00
		My (kip-ft)	8.00	22.93	0.00
	Bot	Mx (kip-ft)	-4.10	-5.02	0.00
		My (kip-ft)	-0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	159.22	0.90*Pn (kip)	=	457.01
Mux (kip-ft)	=	36.73	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	46.29	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.35			
Cmx	=	0.74	Cmy	=	0.60
Pex (kip)	=	2513.27	Pey (kip)	=	863.01
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.348

PRCNC20221036

Eq H1-1a: 0.348 + 8/9(0.162 + 0.436) = 0.880

Gravity Column Design

Story level Level 2, Column Line B2-A4, Column # 50

Fy (ksi) = 50.00 | Column Size = W10X49

Orientation (deg.) = 0.0

INPUT DESIGN PARAMETERS:

	X-Axis	Y-Axis
Lu (ft)	24.67	24.67
K	1	1
Braced Against Joint Translation	Yes	Yes
Column Eccentricity (in) Top	7.50	7.50
Column Eccentricity (in) Bottom	7.50	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	52.26	95.08	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	214.84	0.90Pnx (kip)	=	461.62	Pu/0.90Pnx	=	0.465
			0.90Pny (kip)	=	240.83	Pu/0.90Pny	=	0.892
			0.90Pn (kip)	=	240.83	Pu/0.90Pn	=	0.892

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	52.26	95.08	0.00
Moments Top Mx (kip-ft)	-2.44	-2.24	0.00
My (kip-ft)	0.00	0.00	0.00
Bot Mx (kip-ft)	-1.04	-0.95	-0.00
My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	214.84	0.90*Pn (kip)	=	240.83
Mux (kip-ft)	=	-6.50	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	888.55	Pey (kip)	=	305.11
B1x	=	1.00	B1y	=	3.38

INTERACTION EQUATION

Pu/0.90*Pn = 0.892

PRCNC20221036

Eq H1-1a: 0.892 + 8/9(0.029 + 0.000) = 0.918

Story level Mezzanine, Column Line B2-A4, Column # 14

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	7.50	7.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	52.29	95.08	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	214.87	0.90Pnx (kip)	=	461.62	Pu/0.90Pnx	=	0.465
			0.90Pny (kip)	=	240.83	Pu/0.90Pny	=	0.892
			0.90Pn (kip)	=	240.83	Pu/0.90Pn	=	0.892

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			52.29	95.08	0.00
Moments	Top	Mx (kip-ft)	-1.04	-0.95	-0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	-0.99	-0.91	-0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	214.87	0.90*Pn (kip)	=	240.83
Mux (kip-ft)	=	-2.77	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	888.55	Pey (kip)	=	305.11
B1x	=	1.00	B1y	=	3.38

INTERACTION EQUATION

Pu/0.90*Pn = 0.892

PRCNC20221036

Eq H1-1a: 0.892 + 8/9(0.012 + 0.000) = 0.903

Story level Level 1, Column Line B2-A4, Column # 8

Fy (ksi)	=	50.00	Column Size	=	W10X49
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.50	7.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	52.78	95.08	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	215.46	0.90Pnx (kip)	=	461.62	Pu/0.90Pnx	=	0.467
			0.90Pny (kip)	=	240.83	Pu/0.90Pny	=	0.895
			0.90Pn (kip)	=	240.83	Pu/0.90Pn	=	0.895

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			52.78	95.08	0.00
Moments	Top	Mx (kip-ft)	-0.99	-0.91	-0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	215.46	0.90*Pn (kip)	=	240.83
Mux (kip-ft)	=	-2.64	0.90*Mnx (kip-ft)	=	226.50
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	106.13
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	888.55	Pey (kip)	=	305.11
B1x	=	1.00	B1y	=	3.40

INTERACTION EQUATION

Pu/0.90*Pn = 0.895

PRCNC20221036

Eq H1-1a: 0.895 + 8/9(0.012 + 0.000) = 0.905

Story level Level 2, Column Line 223.69ft-110.57ft, Column # 75

Fy (ksi)	=	50.00	Column Size	=	W8X31
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	6.50	6.50
	Bottom	6.50	6.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	4.79	2.68	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	10.05	0.90Pnx (kip)	=	241.41	Pu/0.90Pnx	=	0.042
			0.90Pny (kip)	=	95.66	Pu/0.90Pny	=	0.105
			0.90Pn (kip)	=	95.66	Pu/0.90Pn	=	0.105

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			4.79	1.59	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	1.01	0.86	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.43	0.37	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	8.30	0.90*Pn (kip)	=	95.66
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	72.43
Muy (kip-ft)	=	2.59	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	359.34	Pey (kip)	=	121.20
B1x	=	1.02	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.087

PRCNC20221036

Eq H1-1b: 0.043 + 0.000 + 0.049 = 0.093

Story level Mezzanine, Column Line 223.69ft-110.57ft, Column # 78

Fy (ksi)	=	50.00	Column Size	=	W8X31
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	6.50	6.50
	Bottom	6.50	6.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	4.81	2.68	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	10.07	0.90Pnx (kip)	=	241.41	Pu/0.90Pnx	=	0.042
			0.90Pny (kip)	=	95.66	Pu/0.90Pny	=	0.105
			0.90Pn (kip)	=	95.66	Pu/0.90Pn	=	0.105

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			4.81	2.68	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.43	0.19	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.41	0.19	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	10.07	0.90*Pn (kip)	=	95.66
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	72.43
Muy (kip-ft)	=	0.83	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	359.34	Pey (kip)	=	121.20
B1x	=	1.03	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.105

PRCNC20221036

Eq H1-1b: 0.053 + 0.000 + 0.016 = 0.068

Story level Level 1, Column Line 223.69ft-110.57ft, Column # 15

Fy (ksi)	=	50.00	Column Size	=	W8X31
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	6.50	6.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	5.12	2.68	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	10.44	0.90Pnx (kip)	=	241.41	Pu/0.90Pnx	=	0.043
			0.90Pny (kip)	=	95.66	Pu/0.90Pny	=	0.109
			0.90Pn (kip)	=	95.66	Pu/0.90Pn	=	0.109

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			5.12	2.68	0.00
Moments	Top	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.41	0.19	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	10.44	0.90*Pn (kip)	=	95.66
Mux (kip-ft)	=	0.00	0.90*Mnx (kip-ft)	=	72.43
Muy (kip-ft)	=	0.79	0.90*Mny (kip-ft)	=	52.79
Rm	=	1.00			
Cbx	=	1.00			
Cmx	=	1.00	Cmy	=	0.60
Pex (kip)	=	359.34	Pey (kip)	=	121.20
B1x	=	1.03	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.109

PRCNC20221036

Eq H1-1b: 0.055 + 0.000 + 0.015 = 0.070

Story level Level 3, Column Line B1-A2, Column # 63

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	1.17	2.34	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	5.15	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.013
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.021
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.021

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 3:

			Dead	Live	Roof
Axial (kip)			1.17	2.34	0.00
Moments	Top	Mx (kip-ft)	-0.40	-1.44	0.00
		My (kip-ft)	0.02	0.00	0.00
	Bot	Mx (kip-ft)	-0.04	-2.39	0.00
		My (kip-ft)	0.00	0.00	0.00

Reverse curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	5.15	0.90Pnx (kip)	=	384.22
			0.90Pny (kip)	=	239.59
Mux (kip-ft)	=	-3.88	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	0.02	0.90*Mny (kip-ft)	=	52.50
			Mcx (kip-ft)	=	117.52
Rm	=	1.00			
Cbx	=	2.22			
Cmx	=	0.31	Cmy	=	0.60
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.013

Eq H1-3: 0.032 + 0.000 = 0.032

Eq H1-1b Per H1.3: 0.007 + 0.027 + 0.000 = 0.033

Gravity Column Design

Story level Level 2, Column Line B1-A2, Column # 69

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	17.99	16.92	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	48.65	0.90Pnx (kip)	=	303.70	Pu/0.90Pnx	=	0.160
			0.90Pny (kip)	=	94.37	Pu/0.90Pny	=	0.516
			0.90Pn (kip)	=	94.37	Pu/0.90Pn	=	0.516

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			17.99	16.92	0.00
Moments	Top	Mx (kip-ft)	-0.03	-0.48	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	-0.01	-0.21	-0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	48.65	0.90*Pn (kip)	=	94.37
Mux (kip-ft)	=	-0.80	0.90*Mnx (kip-ft)	=	130.34
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	558.61	Pey (kip)	=	119.56
B1x	=	1.00	B1y	=	1.69

INTERACTION EQUATION

Pu/0.90*Pn = 0.516

Eq H1-1a: 0.516 + 8/9(0.006 + 0.000) = 0.521

Story level Mezzanine, Column Line B1-A2, Column # 11

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	18.00	16.92	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	48.67	0.90Pnx (kip)	=	303.70	Pu/0.90Pnx	=	0.160
			0.90Pny (kip)	=	94.37	Pu/0.90Pny	=	0.516
			0.90Pn (kip)	=	94.37	Pu/0.90Pn	=	0.516

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			18.00	16.92	0.00
Moments	Top	Mx (kip-ft)	-0.01	-0.21	-0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	-0.01	-0.20	-0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	48.67	0.90*Pn (kip)	=	94.37
Mux (kip-ft)	=	-0.34	0.90*Mnx (kip-ft)	=	130.34
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	558.61	Pey (kip)	=	119.56
B1x	=	1.00	B1y	=	1.69

INTERACTION EQUATION

Pu/0.90*Pn = 0.516

PRCNC20221036

Eq H1-1a: 0.516 + 8/9(0.003 + 0.000) = 0.518

Story level Level 1, Column Line B1-A2, Column # 9

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		24.67	24.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	18.33	16.92	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	49.07	0.90Pnx (kip)	=	303.70	Pu/0.90Pnx	=	0.162
			0.90Pny (kip)	=	94.37	Pu/0.90Pny	=	0.520
			0.90Pn (kip)	=	94.37	Pu/0.90Pn	=	0.520

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			18.33	16.92	0.00
Moments	Top	Mx (kip-ft)	-0.01	-0.20	-0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	49.07	0.90*Pn (kip)	=	94.37
Mux (kip-ft)	=	-0.33	0.90*Mnx (kip-ft)	=	130.34
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	558.61	Pey (kip)	=	119.56
B1x	=	1.00	B1y	=	1.70

INTERACTION EQUATION

Pu/0.90*Pn = 0.520

PRCNC20221036

Eq H1-1a: 0.520 + 8/9(0.003 + 0.000) = 0.522

Story level Level 3, Column Line B1-A1, Column # 64

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	34.04	46.34	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	114.99	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.240
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.652
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.652

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			34.04	46.34	0.00
Moments	Top	Mx (kip-ft)	2.57	-12.07	0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	1.61	-7.57	-0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	114.99	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	-16.23	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	2.06

INTERACTION EQUATION

Pu/0.90*Pn = 0.652

PRCNC20221036

Eq H1-1a: 0.652 + 8/9(0.049 + 0.000) = 0.695

Story level Level 2, Column Line B1-A1, Column # 70

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	39.96	49.84	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	127.69	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.266
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.724
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.724

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			39.96	49.84	0.00
Moments	Top	Mx (kip-ft)	1.61	-7.57	-0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.69	-3.22	-0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	127.69	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	-10.18	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	2.33

INTERACTION EQUATION

Pu/0.90*Pn = 0.724

Eq H1-1a: 0.724 + 8/9(0.031 + 0.000) = 0.751

Story level Mezzanine, Column Line B1-A1, Column # 12

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	44.99	53.34	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	139.33	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.291
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.790
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.790

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			44.99	53.34	0.00
Moments	Top	Mx (kip-ft)	0.69	-3.22	-0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.65	-3.07	-0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	139.33	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	-4.33	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	2.65

INTERACTION EQUATION

Pu/0.90*Pn = 0.790

PRCNC20221036

Eq H1-1a: 0.790 + 8/9(0.013 + 0.000) = 0.801

Gravity Column Design

Story level Level 1, Column Line B1-A1, Column # 10

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	15.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	45.64	53.34	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	140.11	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.292
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.794
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.794

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			45.64	53.34	0.00
Moments	Top	Mx (kip-ft)	0.65	-3.07	-0.00
		My (kip-ft)	0.00	0.00	0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	140.11	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	-4.13	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	0.00	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	1.00
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	2.68

INTERACTION EQUATION

Pu/0.90*Pn = 0.794

PRCNC20221036

Eq H1-1a: 0.794 + 8/9(0.012 + 0.000) = 0.805

Story level Roof, Column Line 245.92ft-88.57ft, Column # 20

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	12.18	0.00	8.54

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	28.27	0.90Pnx (kip)	=	742.79	Pu/0.90Pnx	=	0.038
			0.90Pny (kip)	=	549.68	Pu/0.90Pny	=	0.051
			0.90Pn (kip)	=	549.68	Pu/0.90Pn	=	0.051

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			12.18	0.00	8.54
Moments	Top	Mx (kip-ft)	2.36	0.00	1.75
		My (kip-ft)	-5.38	0.00	-4.31
	Bot	Mx (kip-ft)	6.55	5.64	0.00
		My (kip-ft)	-7.13	-5.86	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	18.88	0.90*Pn (kip)	=	549.68
Mux (kip-ft)	=	16.87	0.90*Mnx (kip-ft)	=	356.22
Muy (kip-ft)	=	-17.92	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.95			
Cmx	=	0.51	Cmy	=	0.41
Pex (kip)	=	2739.05	Pey (kip)	=	894.17
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.034

PRCNC20221036

Eq H1-1b: 0.017 + 0.047 + 0.111 = 0.176

Story level Level 3, Column Line 245.92ft-88.57ft, Column # 33

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	42.01	24.27	8.54

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	93.50	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.195
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.530
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.530

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			42.01	24.27	8.54
Moments	Top	Mx (kip-ft)	3.27	2.82	0.00
		My (kip-ft)	-3.56	-2.93	0.00
	Bot	Mx (kip-ft)	2.05	1.77	0.00
		My (kip-ft)	-2.24	-1.84	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	93.50	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	8.44	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	-9.24	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	1.03

INTERACTION EQUATION

Pu/0.90*Pn = 0.530

PRCNC20221036

Gravity Column Design

Eq H1-1a: $0.530 + 8/9(0.025 + 0.057) = 0.604$

Story level Level 2, Column Line 245.92ft-88.57ft, Column # 73

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	42.93	24.27	8.54

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	94.61	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.197
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.536
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.536

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			42.93	24.27	8.54
Moments	Top	Mx (kip-ft)	2.05	1.77	0.00
		My (kip-ft)	-2.24	-1.84	-0.00
	Bot	Mx (kip-ft)	0.87	0.75	0.00
		My (kip-ft)	-0.95	-0.78	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	94.61	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	5.29	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	-5.85	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	1.04

INTERACTION EQUATION

Pu/0.90*Pn = 0.536

PRCNC20221036

Eq H1-1a: 0.536 + 8/9(0.016 + 0.036) = 0.583

Story level Mezzanine, Column Line 245.92ft-88.57ft, Column # 10

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	42.96	24.27	8.54

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	94.65	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.197
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.536
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.536

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			42.96	24.27	8.54
Moments	Top	Mx (kip-ft)	0.87	0.75	0.00
		My (kip-ft)	-0.95	-0.78	-0.00
	Bot	Mx (kip-ft)	0.83	0.72	0.00
		My (kip-ft)	-0.91	-0.74	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	94.65	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	2.25	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	-2.49	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	1.04

INTERACTION EQUATION

Pu/0.90*Pn = 0.536

PRCNC20221036

Eq H1-1a: 0.536 + 8/9(0.007 + 0.015) = 0.556

Story level Level 1, Column Line 245.92ft-88.57ft, Column # 13

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	43.61	24.27	8.54

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	95.43	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.199
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.541
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.541

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			43.61	24.27	8.54
Moments	Top	Mx (kip-ft)	0.83	0.72	0.00
		My (kip-ft)	-0.91	-0.74	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	95.43	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	2.15	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	-2.39	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	1.05

INTERACTION EQUATION

Pu/0.90*Pn = 0.541

PRCNC20221036

Eq H1-1a: 0.541 + 8/9(0.006 + 0.015) = 0.560

Story level Level 3, Column Line 245.92ft-103.42ft, Column # 32

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	34.30	43.92	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	111.44	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.232
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.632
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.632

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			34.30	43.92	0.00
Moments	Top	Mx (kip-ft)	0.42	1.49	0.00
		My (kip-ft)	-0.51	-1.80	0.00
	Bot	Mx (kip-ft)	0.27	0.93	0.00
		My (kip-ft)	-0.32	-1.13	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	111.44	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	2.89	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	-4.19	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	1.20

INTERACTION EQUATION

Pu/0.90*Pn = 0.632

PRCNC20221036

Eq H1-1a: 0.632 + 8/9(0.009 + 0.026) = 0.662

Gravity Column Design

Story level Level 2, Column Line 245.92ft-103.42ft, Column # 72

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	35.22	43.92	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	112.55	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.235
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.638
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.638

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			35.22	43.92	0.00
Moments	Top	Mx (kip-ft)	0.27	0.93	0.00
		My (kip-ft)	-0.32	-1.13	-0.00
	Bot	Mx (kip-ft)	0.11	0.40	0.00
		My (kip-ft)	-0.14	-0.48	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	112.55	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	1.81	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	-2.65	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	1.21

INTERACTION EQUATION

Pu/0.90*Pn = 0.638

PRCNC20221036

Eq H1-1a: 0.638 + 8/9(0.005 + 0.016) = 0.657

Story level Mezzanine, Column Line 245.92ft-103.42ft, Column # 9

Fy (ksi)	= 50.00		Column Size	= W12X65
Orientation (deg.)	= 90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	8.55	8.50

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	35.26	43.92	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	= 112.58	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.235
		0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.638
		0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.638

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			35.26	43.92	0.00
Moments	Top	Mx (kip-ft)	0.11	0.40	0.00
		My (kip-ft)	-0.14	-0.48	-0.00
	Bot	Mx (kip-ft)	0.11	0.38	0.00
		My (kip-ft)	-0.13	-0.46	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	112.58	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	0.77	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	-1.13	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	1.21

INTERACTION EQUATION

Pu/0.90*Pn = 0.638

PRCNC20221036

Eq H1-1a: 0.638 + 8/9(0.002 + 0.007) = 0.646

Gravity Column Design

Story level Level 1, Column Line 245.92ft-103.42ft, Column # 14

Fy (ksi)	=	50.00	Column Size	=	W12X65
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.55	8.50
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	35.91	43.92	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	113.36	0.90Pnx (kip)	=	479.44	Pu/0.90Pnx	=	0.236
			0.90Pny (kip)	=	176.44	Pu/0.90Pny	=	0.643
			0.90Pn (kip)	=	176.44	Pu/0.90Pn	=	0.643

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			35.91	43.92	0.00
Moments	Top	Mx (kip-ft)	0.11	0.38	0.00
		My (kip-ft)	-0.13	-0.46	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	113.36	0.90*Pn (kip)	=	176.44
Mux (kip-ft)	=	0.74	0.90*Mnx (kip-ft)	=	333.42
Muy (kip-ft)	=	-1.08	0.90*Mny (kip-ft)	=	160.81
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	684.76	Pey (kip)	=	223.54
B1x	=	1.00	B1y	=	1.22

INTERACTION EQUATION

Pu/0.90*Pn = 0.643

PRCNC20221036

Eq H1-1a: 0.643 + 8/9(0.002 + 0.007) = 0.650

Gravity Column Design

Story level Roof, Column Line C1-D6, Column # 21

Fy (ksi)	=	50.00	Column Size	=	W12X79
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		19.67	19.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.70	8.55
	Bottom	8.70	8.55

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	37.07	0.00	22.58

DEMAND CAPACITY RATIO: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	80.61	0.90Pnx (kip)	=	905.15	Pu/0.90Pnx	=	0.089
			0.90Pny (kip)	=	674.12	Pu/0.90Pny	=	0.120
			0.90Pn (kip)	=	674.12	Pu/0.90Pn	=	0.120

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 8:

			Dead	Live	Roof
Axial (kip)			37.07	0.00	20.98
Moments	Top	Mx (kip-ft)	2.51	0.00	2.71
		My (kip-ft)	-19.56	0.00	-12.29
	Bot	Mx (kip-ft)	0.78	-5.99	0.00
		My (kip-ft)	-5.73	0.00	0.00

Single curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 0.5LL + 1.6RF)

Pu (kip)	=	78.06	0.90*Pn (kip)	=	674.12
Mux (kip-ft)	=	7.35	0.90*Mnx (kip-ft)	=	446.25
Muy (kip-ft)	=	-43.13	0.90*Mny (kip-ft)	=	203.63
Rm	=	1.00			
Cbx	=	1.40			
Cmx	=	0.71	Cmy	=	0.54
Pex (kip)	=	3401.97	Pey (kip)	=	1110.01
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.116

PRCNC20221036

Eq H1-1b: 0.058 + 0.016 + 0.212 = 0.286

Gravity Column Design

Story level Level 3, Column Line C1-D6, Column # 31

Fy (ksi)	=	50.00	Column Size	=	W12X79
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.70	8.55
	Bottom	8.70	8.55

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	79.69	47.51	22.58

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	182.94	0.90Pnx (kip)	=	589.90	Pu/0.90Pnx	=	0.310
			0.90Pny (kip)	=	219.03	Pu/0.90Pny	=	0.835
			0.90Pn (kip)	=	219.03	Pu/0.90Pn	=	0.835

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			79.69	47.51	22.58
Moments	Top	Mx (kip-ft)	0.39	-1.73	0.00
		My (kip-ft)	-2.86	-7.10	0.00
	Bot	Mx (kip-ft)	0.24	-1.08	-0.00
		My (kip-ft)	-1.80	-4.45	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	182.94	0.90*Pn (kip)	=	219.03
Mux (kip-ft)	=	-2.30	0.90*Mnx (kip-ft)	=	446.25
Muy (kip-ft)	=	-26.05	0.90*Mny (kip-ft)	=	203.63
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	850.49	Pey (kip)	=	277.50
B1x	=	1.00	B1y	=	1.76

INTERACTION EQUATION

Pu/0.90*Pn = 0.835

PRCNC20221036

Eq H1-1a: 0.835 + 8/9(0.005 + 0.128) = 0.954

Gravity Column Design

Story level Level 2, Column Line C1-D6, Column # 71

Fy (ksi)	=	50.00	Column Size	=	W12X79
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.70	8.55
	Bottom	8.70	8.55

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	80.81	47.51	22.58

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	184.28	0.90Pnx (kip)	=	589.90	Pu/0.90Pnx	=	0.312
			0.90Pny (kip)	=	219.03	Pu/0.90Pny	=	0.841
			0.90Pn (kip)	=	219.03	Pu/0.90Pn	=	0.841

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			80.81	47.51	22.58
Moments	Top	Mx (kip-ft)	0.24	-1.08	-0.00
		My (kip-ft)	-1.80	-4.45	-0.00
	Bot	Mx (kip-ft)	0.10	-0.46	-0.00
		My (kip-ft)	-0.76	-1.89	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	184.28	0.90*Pn (kip)	=	219.03
Mux (kip-ft)	=	-1.44	0.90*Mnx (kip-ft)	=	446.25
Muy (kip-ft)	=	-16.57	0.90*Mny (kip-ft)	=	203.63
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	850.49	Pey (kip)	=	277.50
B1x	=	1.00	B1y	=	1.79

INTERACTION EQUATION

Pu/0.90*Pn = 0.841

PRCNC20221036

Eq H1-1a: 0.841 + 8/9(0.003 + 0.081) = 0.917

Gravity Column Design

Story level Mezzanine, Column Line C1-D6, Column # 8

Fy (ksi)	=	50.00	Column Size	=	W12X79
Orientation (deg.)	=	90.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.70	8.55
	Bottom	8.70	8.55

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	80.85	47.51	22.58

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	184.33	0.90Pnx (kip)	=	589.90	Pu/0.90Pnx	=	0.312
			0.90Pny (kip)	=	219.03	Pu/0.90Pny	=	0.842
			0.90Pn (kip)	=	219.03	Pu/0.90Pn	=	0.842

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			80.85	47.51	22.58
Moments	Top	Mx (kip-ft)	0.10	-0.46	-0.00
		My (kip-ft)	-0.76	-1.89	-0.00
	Bot	Mx (kip-ft)	0.10	-0.44	-0.00
		My (kip-ft)	-0.73	-1.80	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	184.33	0.90*Pn (kip)	=	219.03
Mux (kip-ft)	=	-0.61	0.90*Mnx (kip-ft)	=	446.25
Muy (kip-ft)	=	-7.06	0.90*Mny (kip-ft)	=	203.63
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	850.49	Pey (kip)	=	277.50
B1x	=	1.00	B1y	=	1.79

INTERACTION EQUATION

Pu/0.90*Pn = 0.842

PRCNC20221036

Eq H1-1a: 0.842 + 8/9(0.001 + 0.035) = 0.874

Gravity Column Design

Story level Level 1, Column Line C1-D6, Column # 12

Fy (ksi) = 50.00 Column Size = W12X79
Orientation (deg.) = 90.0

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		39.33	39.33
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	8.70	8.55
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	81.64	47.51	22.58

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	185.28	0.90Pnx (kip)	=	589.90	Pu/0.90Pnx	=	0.314
			0.90Pny (kip)	=	219.03	Pu/0.90Pny	=	0.846
			0.90Pn (kip)	=	219.03	Pu/0.90Pn	=	0.846

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			81.64	47.51	22.58
Moments	Top	Mx (kip-ft)	0.10	-0.44	-0.00
		My (kip-ft)	-0.73	-1.80	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL + 0.5RF)

Pu (kip)	=	185.28	0.90*Pn (kip)	=	219.03
Mux (kip-ft)	=	-0.58	0.90*Mnx (kip-ft)	=	446.25
Muy (kip-ft)	=	-6.79	0.90*Mny (kip-ft)	=	203.63
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	850.49	Pey (kip)	=	277.50
B1x	=	1.00	B1y	=	1.81

INTERACTION EQUATION

Pu/0.90*Pn = 0.846

PRCNC20221036

Eq H1-1a: 0.846 + 8/9(0.001 + 0.033) = 0.877

Story level Level 3, Column Line C1-D5, Column # 29

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.67	14.67
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	37.80	20.35	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	77.91	0.90Pnx (kip)	=	384.22	Pu/0.90Pnx	=	0.203
			0.90Pny (kip)	=	239.59	Pu/0.90Pny	=	0.325
			0.90Pn (kip)	=	239.59	Pu/0.90Pn	=	0.325

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 6:

			Dead	Live	Roof
Axial (kip)			37.80	17.53	0.00
Moments	Top	Mx (kip-ft)	-7.59	-8.17	0.00
		My (kip-ft)	3.28	2.28	0.00
	Bot	Mx (kip-ft)	-3.12	-1.83	0.00
		My (kip-ft)	-0.64	-0.68	0.00

Reverse curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	73.41	0.90*Pn (kip)	=	239.59
Mux (kip-ft)	=	-22.19	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	7.58	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.08			
Cmx	=	0.48	Cmy	=	0.70
Pex (kip)	=	1580.03	Pey (kip)	=	338.18
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.306

PRCNC20221036

Eq H1-1a: 0.306 + 8/9(0.152 + 0.144) = 0.570

Story level Level 2, Column Line C1-D5, Column # 7

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		14.17	14.17
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	51.02	25.73	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	102.40	0.90Pnx (kip)	=	387.54	Pu/0.90Pnx	=	0.264
			0.90Pny (kip)	=	249.44	Pu/0.90Pny	=	0.411
			0.90Pn (kip)	=	249.44	Pu/0.90Pn	=	0.411

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			51.02	25.73	0.00
Moments	Top	Mx (kip-ft)	-3.23	-1.68	0.00
		My (kip-ft)	-0.67	-0.62	0.00
	Bot	Mx (kip-ft)	-2.77	-0.33	0.00
		My (kip-ft)	-1.90	-0.30	0.00

Reverse curvature about X-Axis
Reverse curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	102.40	0.90*Pn (kip)	=	249.44
Mux (kip-ft)	=	-6.56	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-2.76	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	2.19			
Cmx	=	0.36	Cmy	=	0.34
Pex (kip)	=	1693.53	Pey (kip)	=	362.48
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.411

PRCNC20221036

Eq H1-1a: 0.411 + 8/9(0.045 + 0.053) = 0.497

Story level Mezzanine, Column Line C1-D5, Column # 4

Fy (ksi)	= 50.00	Column Size	=	W10X33
Orientation (deg.)	= 0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		10.50	10.50
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	7.36	6.48

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	69.88	26.38	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	126.06	0.90Pnx (kip)	=	409.08	Pu/0.90Pnx	=	0.308
			0.90Pny (kip)	=	321.13	Pu/0.90Pny	=	0.393
			0.90Pn (kip)	=	321.13	Pu/0.90Pn	=	0.393

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			69.88	26.38	0.00
Moments	Top	Mx (kip-ft)	-3.74	-0.42	0.00
		My (kip-ft)	-2.56	-0.38	0.00
	Bot	Mx (kip-ft)	-3.56	-0.40	-0.00
		My (kip-ft)	-2.44	-0.36	-0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	126.06	0.90*Pn (kip)	=	321.13
Mux (kip-ft)	=	-5.15	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-3.68	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	3082.85	Pey (kip)	=	659.84
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.393

PRCNC20221036

Eq H1-1a: 0.393 + 8/9(0.035 + 0.070) = 0.486

Story level Level 1, Column Line C1-D5, Column # 4

Fy (ksi)	=	50.00	Column Size	=	W10X33
Orientation (deg.)	=	0.0			

INPUT DESIGN PARAMETERS:

		X-Axis	Y-Axis
Lu (ft)		10.50	10.50
K		1	1
Braced Against Joint Translation		Yes	Yes
Column Eccentricity (in)	Top	7.36	6.48
	Bottom	0.00	0.00

CONTROLLING AXIAL COLUMN LOADS - Skip-Load Case 1:

	Dead	Live	Roof
Axial (kip)	70.21	26.38	0.00

DEMAND CAPACITY RATIO: (1.2DL + 1.6LL)

Pu (kip)	=	126.46	0.90Pnx (kip)	=	409.08	Pu/0.90Pnx	=	0.309
			0.90Pny (kip)	=	321.13	Pu/0.90Pny	=	0.394
			0.90Pn (kip)	=	321.13	Pu/0.90Pn	=	0.394

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

CONTROLLING COMBINED COLUMN LOADS - Skip-Load Case 1:

			Dead	Live	Roof
Axial (kip)			70.21	26.38	0.00
Moments	Top	Mx (kip-ft)	-3.56	-0.40	-0.00
		My (kip-ft)	-2.44	-0.36	-0.00
	Bot	Mx (kip-ft)	0.00	0.00	0.00
		My (kip-ft)	0.00	0.00	0.00

Single curvature about X-Axis
Single curvature about Y-Axis

CALCULATED PARAMETERS: (1.2DL + 1.6LL)

Pu (kip)	=	126.46	0.90*Pn (kip)	=	321.13
Mux (kip-ft)	=	-4.90	0.90*Mnx (kip-ft)	=	145.50
Muy (kip-ft)	=	-3.50	0.90*Mny (kip-ft)	=	52.50
Rm	=	1.00			
Cbx	=	1.67			
Cmx	=	0.60	Cmy	=	0.60
Pex (kip)	=	3082.85	Pey (kip)	=	659.84
B1x	=	1.00	B1y	=	1.00

INTERACTION EQUATION

Pu/0.90*Pn = 0.394

PRCNC20221036

Eq H1-1a: 0.394 + 8/9(0.034 + 0.067) = 0.483

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Gravity Load Resisting System - **Foundations**

PRCNC20221036

GRAVITY FOOTING DESIGN

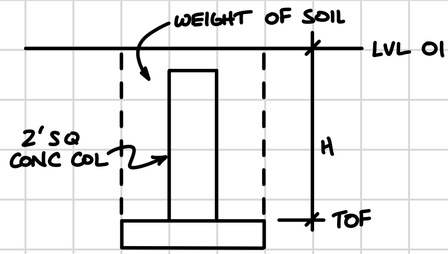
COLUMN REACTIONS FROM RAM ATTACHED PLANS SHOW REACTIONS + FOOTING SIZES ASSOCIATED FROM ATTACHED RAM OUTPUT

SOME FOOTINGS BURIED DUE TO STEP FROM LVL 0 TO 1 AND STEPPED SITE

ADDED SOIL + CONC COLUMN

CONC COLUMN $150^{\#}/FT^3 \times 2' \times 2' = 600^{\#}/FT \times$ HEIGHT

SOIL $110^{\#}/FT^3 \times (AREA - 4FT^2) \times$ HEIGHT



WHERE TOF = 89' HEIGHT = 11'-0"

ADD $600^{\#}/FT \times 11' + 110^{\#}/FT^3 \times 11'(AREA - 4FT^2) = 6600^{\#} + 1210^{\#}/FT^2\,(AREA - 4FT^2)$

IF C60 $6600^{\#} + 1210^{\#}/FT^2(36FT^2 - 4FT^2) = 6600^{\#} + 38{,}720^{\#} = 45{,}320^{\#}$

IF C70 " + " $(49FT^2 - 4FT^2) =$ " $+ 54{,}450^{\#} = 61{,}050^{\#}$

IF C80 " + " $(64FT^2 - 4FT^2) =$ " $+ 72{,}600^{\#} = 79{,}200^{\#}$

IF C90 " + " $(81FT^2 - 4FT^2) =$ " $+ 93{,}170^{\#} = 99{,}770^{\#}$

WHERE TOF = 84' ONE LOC ADJACENT ELEVATOR PIT GRIDS C7/D3

HEIGHT = 16', ASSUME C100 SINCE NEED C8 ALREADY w/o SOIL

ADD $600^{\#}/FT \times 16' + 110^{\#}/FT^3 \times 16'(100FT^2 - 4FT^2) = 9600^{\#} + 168{,}960^{\#} = 178{,}560^{\#}$

COL LOAD $209.4^k + 178.56^k = 387.96^k \longrightarrow$ CONSERVATIVE SINCE SOIL ARCHING & LIVE LOAD REDUCTION

C100 325^k CAPACITY OKAY

WHERE TOF = 86' ONE LOC ADJACENT BASEMENT/RETAINING WALL STEPS AT GRIDS C6/D3

HEIGHT = 14', ASSUME C70 SINCE NEED C5/C6 ALREADY w/o SOIL

ADD $600^{\#}/FT \times 14' + 110^{\#}/FT^3 \times 14'(49FT^2 - 4FT^2) = 8400^{\#} + 69{,}300^{\#} = 77{,}700^{\#}$

COL LOAD $93.1^k + 77.7^k = 170.8^k \longrightarrow$ CONSERVATIVE SINCE SOIL ARCHING & LIVE LOAD REDUCTION

C70 161.7^k CAPACITY OKAY

WHERE TOF = 96'-6" TWO LOCATIONS AT GRIDS C11/D3 & D4

HEIGHT = 3.5', ASSUME C70 SINCE NEED C5/C6 ALREADY w/o SOIL

ADD $600^{\#}/FT \times 3.5' + 110^{\#}/FT^3 \times 3.5'(49FT^2 - 4FT^2) = 2100^{\#} + 17{,}325^{\#} = 19{,}425^{\#}$

COL LOAD $99.6^k + 19.5^k = 119.1^k$ C70 161.7^k CAPACITY OKAY

PRCNC20221036

integrus ARCHITECTURE

10 S. Cedar Street, Spokane, WA 99201, 509-838-8681, Fax 509-838-2194
117 S. Main Street, Suite 100, Seattle, WA 98104, 206-628-3137, Fax 206-628-3138

Title			Job Number
STRUCTURAL ENGINEERS	By	Date	Sheet

GRAVITY FOOTING DESIGN CONTINUE

FOOTING DESIGN

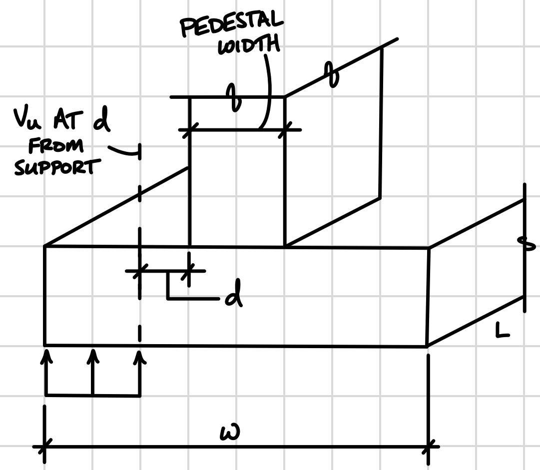
ONE WAY SHEAR: V_u AT 'd' FROM FACE OF SUPPORT

CONCRETE DESIGN PER LRFD, SOIL BRG IS ASD → 1.4 FACTOR

3500 psf BRG × 1.4 = 4900 psf

$$V_u = \left[\tfrac{w}{2} - \left(\frac{\text{PEDESTAL WIDTH}}{2} + d \right) / 12" \right] \times L \times \text{LRFD BRG PRESSURE}$$

$$\phi V_n = 0.75 \times 2 \sqrt{f'_c} \times b \times d$$



FOR SPREADSHEET EXAMPLE 7'×7'×16" THICK w/ 4500 psi

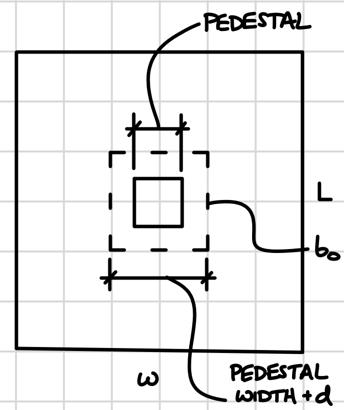
d = THICKNESS − 4" = 16" − 4" = 12"

$$V_u = \left[7/2 - \left(\tfrac{16"}{2} + 12" \right) / 12" \right] \times 7' \times 4900_{psf} = 62.88^k = 62.9^k \text{ (MATCHES SPREADSHEET OUTPUT)}$$

$$\phi V_n = 0.75 \times 2 \sqrt{4500_{psi}} \times 7' (12/1) \times 12" = 101.4^k \text{ (MATCHES SPREADSHEET OUTPUT)} > V_u, \text{ OKAY}$$

TWO WAY SHEAR $V_u = \left[w \times L - (\text{PEDESTAL WIDTH} + d)^2 / 144 \right] \times$ LRFD BRG PRESSURE

$$\phi V_n = 0.75 \times 4 \sqrt{f'_c} \times b_o \times d$$



FOR SPREADSHEET EXAMPLE

$$V_u = \left[7' \times 7' - (16" + 12")^2 / 144 \right] \times 4900_{psf} = 213.4^k \text{ (MATCHES SPREADSHEET OUTPUT)}$$

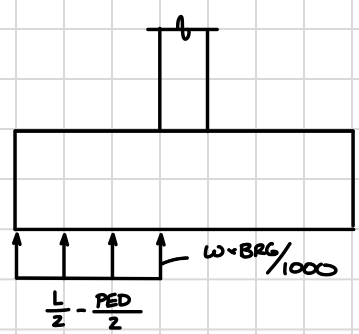
$$\phi V_n = 0.75 \times 4 \sqrt{4500_{psi}} \times (4(16" + 12")) \times 12 = 270.5^k \text{ " " } > V_u, \text{ OKAY}$$

SOIL BRG $\dfrac{w \times L \times \text{SOIL BRG} - \text{FTG WEIGHT}}{1000}$

FOR SPREADSHEET EXAMPLE $\dfrac{7' \times 7' \times 3500_{psf} - 150^{\#}/_{ft^3} \times 7' \times 7' (16/12)}{1000} = 161.7^k$ (MATCHES SPREADSHEET OUTPUT)

MOMENT CAPACITY: $M_u = \dfrac{w \times \text{LRFD BRG PRESSURE}}{1000} \times \left[\dfrac{L}{2} - \dfrac{\text{PEDESTAL WIDTH}}{2 \times 12} \right]^2 / 2$

$$\phi_b M_n = 0.9 A_s f_y (d - a/2), \quad a = A_s f_y / 0.85 \times f'_c \times b$$



FOR SPREADSHEET EXAMPLE

$$M_u = \left[\frac{7' \times 4900_{psf}}{1000} \right] \times \left[\frac{7'}{2} - \frac{16"}{2 \times 12} \right]^2 / 2 = 137.7^{k\,FT} \text{ (MATCHES SPREADSHEET OUTPUT)}$$

$\phi_b M_n$ $A_s = 3.08_{in}^2$ (7-#6 → $\rho = 0.0023 > \rho_{min}$), $f_y = 60{,}000_{psi}$

$$= 0.9 \times 3.08_{in}^2 \times 60^{ksi} \left(12" - \tfrac{1}{2} \left[3.08 \times 60^{ksi} / 0.85 \times 4.5^{ksi} \times 84" \right] \right) = 162.3^{k\,FT} \text{ (MATCHES SPREADSHEET OUTPUT)} > M_u, \text{ OKAY}$$

PRCNC20221036

COLUMN SPREAD FOOTING DESIGN:

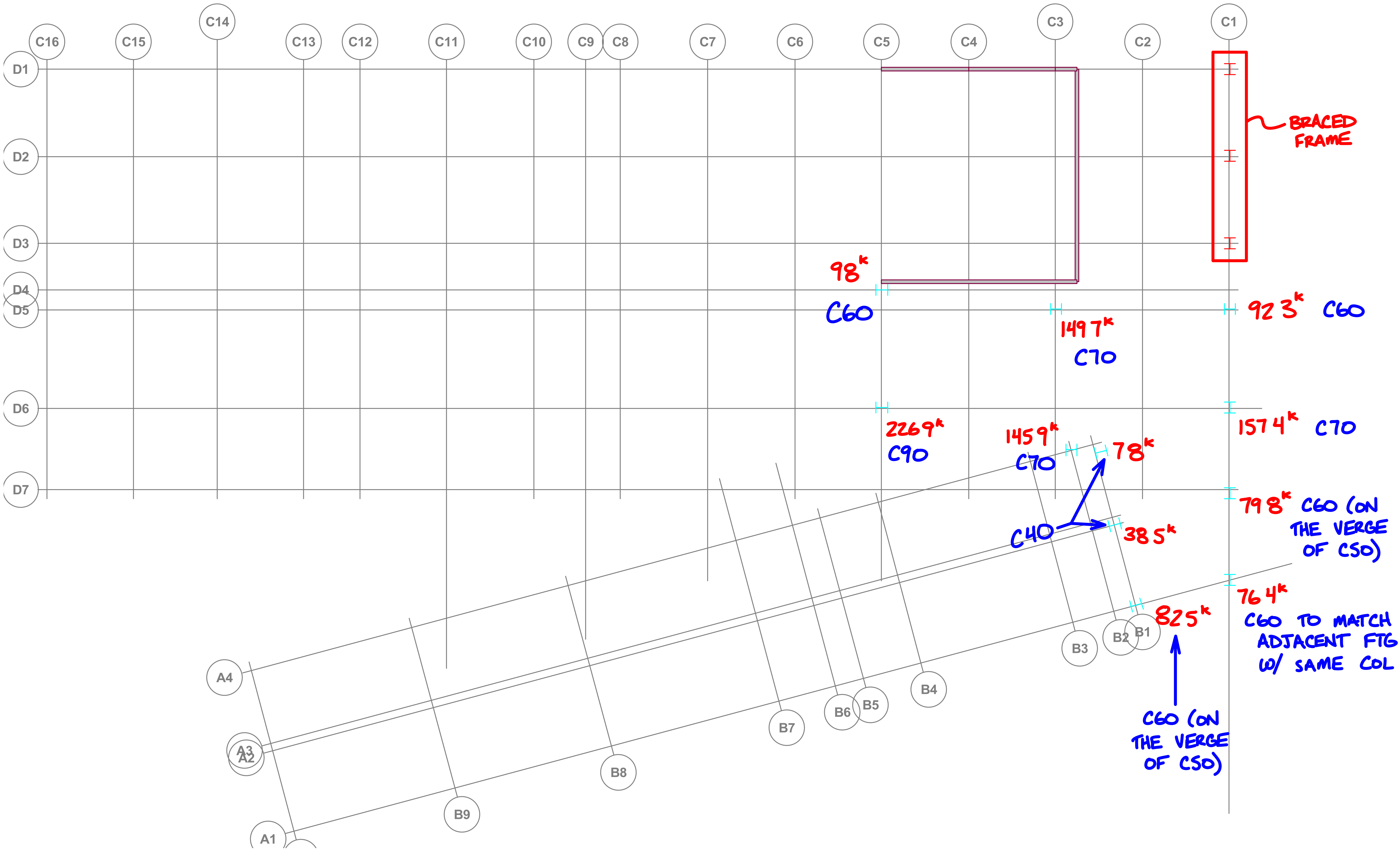
PROJECT Pierce STEM
DATE: 6-28-22
ENGINEER: BLO

ASSUPTIONS:

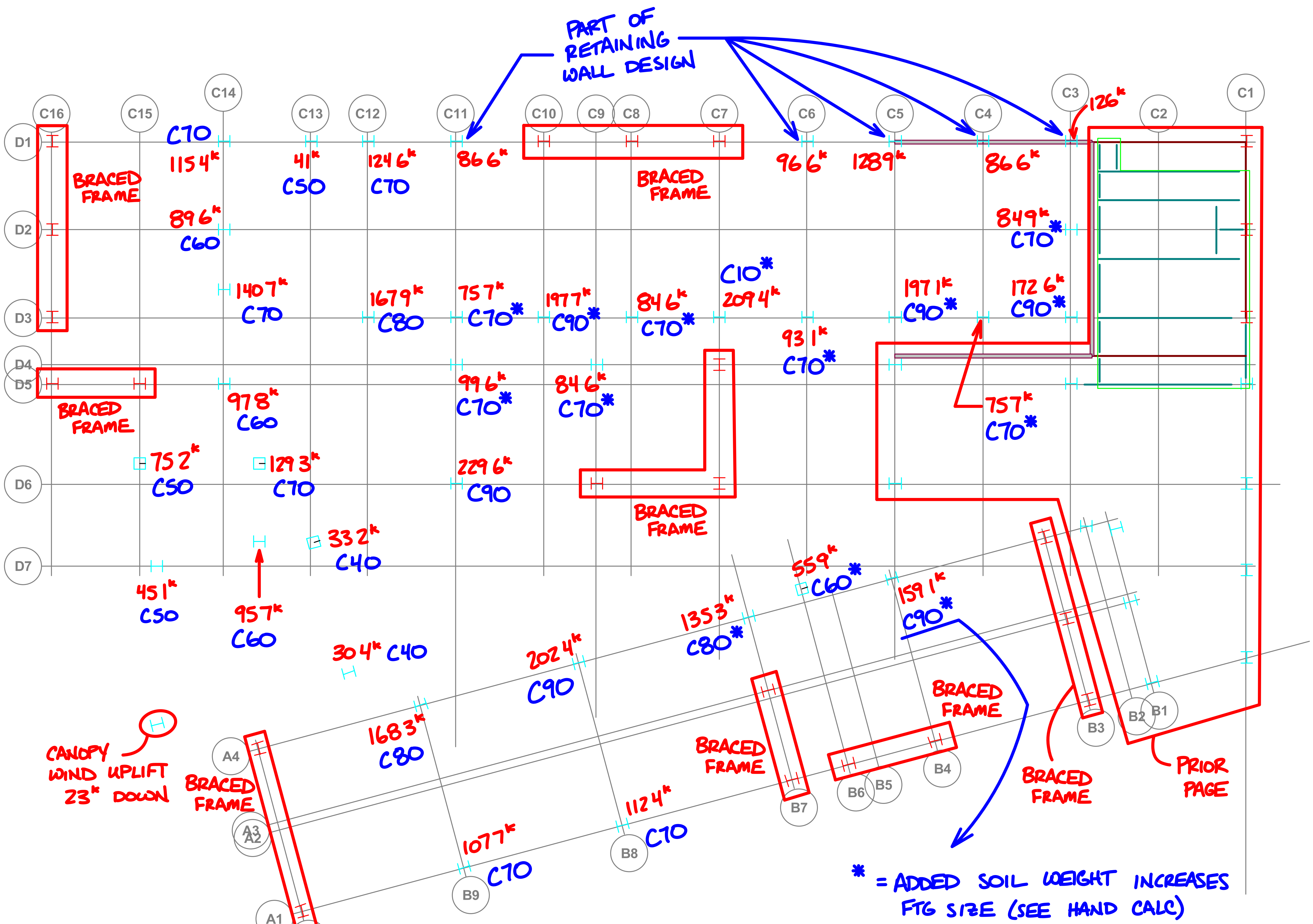
1. Footings are designed for maximum bearing pressure using global load factor.
2. Pedestal base width is assumed for each footing. Footing calculations are based on this pedestal width.
3. Distance d equals footing depth - 4 inches.
4. Factored one-way shear is determined at a distance d from face of pedestal.
5. Nominal one-way shear strength of concrete is determined using ACI 318-14, Sect. 22.5.
6. Factored two-way shear is determined at a distance d/2 from face of pedestal.
7. Nominal two-way shear strength of concrete is determined using ACI 318-14, Sect. 22.6.
8. Factored moment is determined at face of pedestal.
9. Nominal flexural strength of footing is determined according to ACI 318-14, Sect. 14.4.3.
10. 5% under for footing flexural strength is considered adequate since load factor is conservative and footing will never see full design load.
11. All footing reinforcing shall be developed at pedestall. Therefore end 180 degree hooks not required.

INPUT		
Fy	60	ksi
F'c	4.5	ksi
Allowable Bearing	3500	psf
Load Factor	1.4	

COLUMN FOOTING SIZE					SECT. PROP.				DESIGN	ONE-WAY SHEAR		TWO-WAY SHEAR		FLEXURE						ALLOW.
FTG MARK	LENGTH (ft)	WIDTH (ft)	THICK (in)	FTG WT (kips)	Pedestal Width (in)	d (in)	b (in)	bo (in)	LOAD Wu (psf)	Vu (kips)	0.75Vc (kips)	Vu (kips)	0.75Vc (kips)	Mu (k-ft)	BARS	As (in^2)	BARS	0.9Mn (k-ft)	STL RATIO	LOAD (kips)
C40	4.0	4.0	12.0	2.4	14.0	8.0	48.0	88.0	4900	14.7	38.6	61.9	141.7	19.7		1.24	(4) #5	43.5	0.00215	53.6
C50	5.0	5.0	12.0	3.8	14.0	8.0	60.0	88.0	4900	30.6	48.3	106.0	141.7	45.0		1.55	(5) #5	54.4	0.00215	83.75
C60	6.0	6.0	16.0	7.2	14.0	12.0	72.0	104.0	4900	41.7	86.9	153.4	251.2	85.9		2.64	(6) #6	139.1	0.00229	118.8
C70	7.0	7.0	16.0	9.8	16.0	12.0	84.0	112.0	4900	62.9	101.4	213.4	270.5	137.7		3.08	(7) #6	162.3	0.00229	161.7
C80	8.0	8.0	18.0	14.4	16.0	14.0	96.0	120.0	4900	84.9	135.2	283.0	338.1	217.8		3.96	(9) #6	243.7	0.00229	209.6
C90	9.0	9.0	20.0	20.3	16.0	16.0	108.0	128.0	4900	110.3	173.9	362.1	412.2	324.0		4.84	(11) #6	340.8	0.00224	263.25
C100	10.0	10.0	20.0	25.0	24.0	16.0	120.0	160.0	4900	130.7	193.2	435.6	515.2	392.0		5.72	(13) #6	402.2	0.00238	325



PRCNC20221036



PRCNC20221036

Column Load Summary

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22 06/27/22 09:27:10
Building Code: IBC Steel Code: AISC360-16 LRFD

UNFACTORED COLUMN LOADS:

Units: kips

Column Line C16-D5

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	7	19.67	2.4	1.3	1.8	0.0	3.7	5.5
Level 3	46	14.67	23.4	2.3	8.3	0.0	25.7	34.0
Level 2	41	14.17	28.0	3.3	14.1	0.0	31.3	45.4
Mezzanine	46	0.50	28.0	3.3	14.1	0.0	31.3	45.4

Column Line C16-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	6	19.67	11.1	1.3	8.7	0.0	12.5	21.2
Level 3	41	14.67	43.3	2.3	26.5	0.0	45.6	72.0
Level 2	40	14.17	59.1	3.3	36.5	0.0	62.4	98.9
Mezzanine	45	0.50	59.1	3.3	36.5	0.0	62.4	98.9

Column Line C16-D2

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	40	14.67	35.7	1.0	18.7	0.0	36.7	55.4
Level 2	39	14.17	52.8	2.0	29.4	0.0	54.7	84.1
Mezzanine	44	0.50	52.8	2.0	29.4	0.0	54.8	84.2

Column Line C16-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	5	19.67	10.1	1.3	7.5	0.0	11.4	19.0
Level 3	39	14.67	47.9	2.3	21.0	0.0	50.2	71.2
Level 2	38	14.17	58.3	3.3	28.0	0.0	61.6	89.5
Mezzanine	43	0.50	58.3	3.3	28.0	0.0	61.6	89.6

Column Line 56.92ft-121.58ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	40	19.67	7.6	0.4	6.1	0.0	8.1	14.2
Level 3	69	14.67	24.6	0.7	20.0	0.0	25.3	45.3
Level 2	47	14.17	40.2	1.0	34.0	0.0	41.2	75.2
Mezzanine	50	0.50	40.2	1.0	34.0	0.0	41.2	75.2

Column Load Summary

Column Line C15-D5

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	8	19.67	4.7	1.5	3.7	0.0	6.2	9.9
Level 3	47	14.67	28.2	2.7	18.4	0.0	30.9	49.3
Level 2	42	14.17	39.4	3.7	26.4	0.0	43.2	69.6
Mezzanine	47	0.50	39.4	3.8	26.4	0.0	43.2	69.6

Column Line 59.83ft-77.19ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	67	14.67	9.9	0.5	12.1	-0.7	9.7	22.5
Level 2	52	14.17	9.9	1.0	12.1	-0.7	10.2	23.0
Mezzanine	55	0.50	9.9	1.0	12.1	-0.7	10.2	23.0

Column Line 59.83ft-104.17ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	43	19.67	2.9	1.0	2.3	0.0	3.8	6.1
Level 3	18	14.67	17.9	1.7	13.8	0.0	19.6	33.4
Level 2	30	14.17	23.9	2.4	18.8	0.0	26.3	45.1
Mezzanine	52	0.50	23.9	2.4	18.8	0.0	26.3	45.1

Column Line C14-D5

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	6	14.67	28.5	0.5	24.2	0.0	29.0	53.2
Level 2	22	14.17	57.1	1.0	39.8	0.0	58.0	97.8
Mezzanine	48	0.50	57.1	1.0	39.8	0.0	58.0	97.8

Column Line 71.25ft-151.25ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	27	19.67	23.7	0.6	20.1	0.0	24.4	44.5
Level 3	5	14.67	52.0	1.1	43.7	0.0	53.1	96.8
Level 2	23	14.17	80.2	1.6	58.9	0.0	81.8	140.7
Mezzanine	42	0.50	80.2	1.6	58.9	0.0	81.8	140.7

Column Line C14-D2

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	4	14.67	26.0	0.5	22.4	0.0	26.5	48.9
Level 2	24	14.17	52.0	1.0	36.6	0.0	53.0	89.6
Mezzanine	41	0.50	52.0	1.0	36.6	0.0	53.0	89.6

Column Load Summary

Column Line C14-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	26	19.67	14.4	0.6	11.4	0.0	15.1	26.5
Level 3	1	14.67	58.0	1.1	29.4	0.0	59.2	88.6
Level 2	25	14.17	74.3	1.6	39.5	0.0	75.9	115.3
Mezzanine	40	0.50	74.3	1.6	39.5	0.0	75.9	115.4

Column Line B10-A4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	55	14.67	21.0	0.5	6.9	0.0	21.5	28.4
Level 2	60	14.17	38.5	1.0	25.8	0.0	39.5	65.3
Mezzanine	75	0.50	38.5	1.0	25.8	0.0	39.5	65.3

Column Line 77.25ft-108.25ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	42	19.67	8.4	0.6	6.7	0.0	9.0	15.7
Level 3	17	14.67	40.7	1.1	30.2	-1.2	40.6	72.0
Level 2	29	14.17	52.3	1.5	41.9	-1.2	52.6	95.7
Mezzanine	53	0.50	52.3	1.5	41.9	-1.2	52.6	95.7

Column Line 77.25ft-121.58ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	41	19.67	17.6	0.7	14.8	0.0	18.2	33.0
Level 3	68	14.67	44.1	1.1	39.3	-0.4	44.8	84.5
Level 2	46	14.17	70.1	1.6	57.5	-0.4	71.3	129.3
Mezzanine	51	0.50	70.1	1.6	57.5	-0.4	71.4	129.3

Column Line B10-A1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	56	14.67	20.3	0.5	6.7	0.0	20.8	27.5
Level 2	61	14.17	37.4	1.0	25.2	0.0	38.4	63.6
Mezzanine	74	0.50	37.4	1.0	25.2	0.0	38.4	63.6

Column Line C13-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	2	14.67	20.6	0.5	7.6	0.0	21.1	28.7
Level 2	26	14.17	25.9	1.0	14.1	0.0	26.9	40.9
Mezzanine	39	0.50	25.9	1.0	14.1	0.0	26.9	41.0

Column Line 86.64ft-108.18ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	73	14.67	11.6	0.5	5.2	0.0	12.1	17.3
Level 2	74	14.17	18.1	1.0	14.1	0.0	19.1	33.2
Mezzanine	77	0.50	18.1	1.0	14.1	0.0	19.1	33.2

Column Line 92.59ft-85.97ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	65	14.67	17.3	0.5	10.3	-0.9	16.9	28.1
Level 2	51	14.17	18.2	0.9	11.3	-0.9	18.1	30.4
Mezzanine	54	0.50	18.2	0.9	11.3	-0.9	18.2	30.4

Column Line C12-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	28	19.67	42.7	0.8	26.3	-0.4	43.0	69.8
Level 3	7	14.67	71.5	1.3	50.3	-0.4	72.4	123.1
Level 2	19	14.17	100.3	1.9	65.8	-0.4	101.7	167.9
Mezzanine	38	0.50	100.3	1.9	65.8	-0.4	101.8	167.9

Column Line C12-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	25	19.67	20.8	0.6	13.7	0.0	21.5	35.1
Level 3	3	14.67	57.2	1.1	34.9	0.0	58.3	93.2
Level 2	27	14.17	78.3	1.6	44.7	0.0	79.9	124.6
Mezzanine	37	0.50	78.3	1.6	44.7	0.0	79.9	124.6

Column Line B9-A4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	58	14.67	66.8	0.6	23.0	0.0	67.4	90.4
Level 2	53	14.17	109.8	1.1	57.4	0.0	110.9	168.3
Mezzanine	57	0.50	109.8	1.1	57.4	0.0	110.9	168.3

Column Line C11-D6

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	36	19.67	27.9	0.8	19.5	0.0	28.7	48.1
Level 3	16	14.67	96.7	1.3	56.4	0.0	98.1	154.5
Level 2	20	14.17	143.3	1.9	84.3	0.0	145.2	229.5
Mezzanine	49	0.50	143.3	1.9	84.3	0.0	145.2	229.6

Column Load Summary

Column Line C11-D4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	9	14.67	29.8	0.5	25.1	0.0	30.3	55.4
Level 2	18	14.17	57.3	1.0	41.3	-1.7	56.5	99.6
Mezzanine	36	0.50	57.3	1.0	41.3	-1.7	56.5	99.6

Column Line C11-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	8	14.67	21.3	0.5	19.8	0.0	21.8	41.6
Level 2	17	14.17	42.6	1.0	32.2	0.0	43.6	75.7
Mezzanine	34	0.50	42.6	1.0	32.2	0.0	43.6	75.7

Column Line C11-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	10	14.67	36.7	0.5	19.5	0.0	37.2	56.7
Level 2	28	14.17	54.8	1.0	30.8	0.0	55.8	86.6
Mezzanine	35	0.50	54.8	1.0	30.8	0.0	55.8	86.6

Column Line B9-A1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	59	14.67	37.9	0.5	12.7	0.0	38.3	51.1
Level 2	56	14.17	68.0	1.0	38.7	-1.0	67.9	107.7
Mezzanine	58	0.50	68.0	1.0	38.7	-1.0	68.0	107.7

Column Line C10-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	29	19.67	91.1	1.0	29.5	-0.4	91.7	121.5
Level 3	11	14.67	112.4	1.7	49.2	-0.4	113.7	163.3
Level 2	16	14.17	133.7	2.4	61.6	-0.4	135.7	197.7
Mezzanine	33	0.50	133.7	2.4	61.6	-0.4	135.7	197.7

Column Line C10-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	1	19.67	37.2	1.3	15.8	0.0	38.5	54.3
Level 3	43	14.67	74.0	2.3	35.3	0.0	76.4	111.7
Level 2	32	14.17	92.2	3.3	46.6	0.0	95.5	142.1
Mezzanine	27	0.50	92.2	3.3	46.6	0.0	95.5	142.2

Column Line B8-A4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	57	14.67	78.3	0.6	27.8	0.0	78.9	106.7
Level 2	54	14.17	136.1	1.1	65.2	0.0	137.2	202.4
Mezzanine	60	0.50	136.1	1.1	65.2	0.0	137.2	202.4

Column Line C9-D6

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	9	19.67	23.6	1.7	14.3	0.0	25.3	39.6
Level 3	42	14.67	73.3	3.0	43.6	0.0	76.3	120.0
Level 2	31	14.17	106.8	4.3	61.6	0.0	111.1	172.6
Mezzanine	28	0.50	106.8	4.3	61.6	0.0	111.1	172.7

Column Line C9-D4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	38	19.67	4.7	0.6	3.0	-0.9	4.5	8.4
Level 3	12	14.67	25.9	1.1	23.2	-0.9	26.2	50.3
Level 2	15	14.17	47.0	1.6	35.9	-0.9	47.8	84.6
Mezzanine	31	0.50	47.0	1.6	35.9	-0.9	47.8	84.6

Column Line B8-A1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	60	14.67	39.8	0.5	13.0	0.0	40.3	53.3
Level 2	55	14.17	72.0	1.0	39.5	0.0	72.9	112.4
Mezzanine	59	0.50	72.0	1.0	39.5	0.0	72.9	112.4

Column Line C8-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	13	14.67	21.3	0.5	27.8	0.0	21.8	49.6
Level 2	14	14.17	42.6	1.0	41.0	0.0	43.6	84.6
Mezzanine	32	0.50	42.6	1.0	41.0	0.0	43.6	84.6

Column Line C8-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	44	14.67	37.0	1.0	24.2	0.0	38.0	62.2
Level 2	33	14.17	55.3	2.0	36.1	0.0	57.2	93.3
Mezzanine	26	0.50	55.3	2.0	36.1	0.0	57.2	93.3

Column Line C7-D6

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	10	19.67	33.6	3.0	15.7	0.0	36.6	52.3
Level 3	34	14.67	77.9	5.2	44.5	0.0	83.2	127.6
Level 2	43	14.17	118.7	7.4	65.6	0.0	126.1	191.7
Mezzanine	29	0.50	118.7	7.5	65.6	0.0	126.2	191.8

Column Line C7-D4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	11	19.67	12.5	1.5	2.9	0.0	14.0	16.9
Level 3	35	14.67	34.9	2.7	23.7	0.0	37.5	61.2
Level 2	44	14.17	57.6	3.7	36.7	0.0	61.3	98.0
Mezzanine	30	0.50	57.6	3.8	36.7	0.0	61.4	98.1

Column Line C7-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	30	19.67	81.8	0.9	24.8	0.0	82.7	107.5
Level 3	14	14.67	103.1	1.6	58.7	0.0	104.7	163.3
Level 2	13	14.17	124.4	2.2	82.7	0.0	126.6	209.3
Mezzanine	22	0.50	124.4	2.2	82.7	0.0	126.6	209.4

Column Line C7-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	2	19.67	31.7	1.3	14.9	0.0	33.0	48.0
Level 3	45	14.67	68.6	2.3	42.5	0.0	70.9	113.4
Level 2	34	14.17	86.8	3.3	60.7	0.0	90.0	150.8
Mezzanine	25	0.50	86.8	3.3	60.7	0.0	90.1	150.8

Column Line B7-A4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	18	19.67	12.2	0.6	9.5	0.0	12.9	22.4
Level 3	61	14.67	58.0	1.1	27.9	0.0	59.2	87.1
Level 2	57	14.17	87.0	1.6	46.6	0.0	88.6	135.3
Mezzanine	61	0.50	87.0	1.6	46.6	0.0	88.7	135.3

Column Line B7-A3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	14	19.67	2.2	1.3	1.3	0.0	3.6	4.9
Level 3	48	14.67	39.2	2.3	14.3	0.0	41.5	55.8
Level 2	68	14.17	58.8	3.3	29.4	0.0	62.0	91.5
Mezzanine	73	0.50	58.8	3.3	29.4	0.0	62.1	91.5

Column Line B7-A1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	15	19.67	2.7	0.9	1.9	0.0	3.6	5.5
Level 3	49	14.67	34.2	1.6	10.5	0.0	35.8	46.3
Level 2	67	14.17	47.6	2.2	24.6	0.0	49.8	74.4
Mezzanine	62	0.50	47.6	2.2	24.6	0.0	49.9	74.4

Column Line 169.96ft-100.22ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	70	14.67	15.0	0.3	15.8	0.0	15.2	31.0
Level 2	48	14.17	30.0	0.5	25.3	0.0	30.5	55.9
Mezzanine	72	0.50	30.0	0.5	25.3	0.0	30.5	55.9

Column Line C6-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	15	14.67	21.3	0.5	27.8	0.0	21.8	49.6
Level 2	12	14.17	42.6	1.0	49.5	0.0	43.6	93.1
Mezzanine	21	0.50	42.6	1.0	49.5	0.0	43.6	93.1

Column Line C6-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	21	14.67	36.7	0.5	24.2	0.0	37.2	61.4
Level 2	1	14.17	54.8	1.0	40.8	0.0	55.8	96.6
Mezzanine	23	0.50	54.8	1.0	40.8	0.0	55.8	96.6

Column Line B6-A1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	16	19.67	7.0	1.5	5.7	0.0	8.5	14.2
Level 3	50	14.67	38.1	2.7	23.6	0.0	40.8	64.4
Level 2	66	14.17	53.6	3.7	33.8	0.0	57.3	91.1
Mezzanine	63	0.50	53.6	3.8	33.8	0.0	57.4	91.1

Column Line B4-A4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	39	19.67	19.6	0.8	16.5	0.0	20.3	36.9
Level 3	62	14.67	55.3	1.3	45.4	0.0	56.6	102.0
Level 2	58	14.17	92.1	1.9	65.1	0.0	94.0	159.1
Mezzanine	65	0.50	92.1	1.9	65.1	0.0	94.0	159.1

Column Line C5-D6

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	35	19.67	69.5	1.2	28.4	0.0	70.7	99.1
Level 3	30	14.67	107.2	2.1	58.1	0.0	109.2	167.4
Level 2	21	14.17	145.3	2.9	78.0	0.0	148.2	226.3
Mezzanine	7	0.50	145.3	3.0	78.0	0.0	148.3	226.3
Level 1	7	10.00	145.3	3.6	78.0	0.0	148.9	226.9

Column Line C5-D4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	19	14.67	27.9	0.7	24.2	0.0	28.6	52.9
Level 2	11	14.17	56.1	1.4	40.0	0.0	57.5	97.5
Mezzanine	6	0.50	56.1	1.4	40.0	0.0	57.5	97.5
Level 1	6	10.00	56.1	1.9	40.0	0.0	58.0	98.0

Column Line C5-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	31	19.67	94.6	0.9	25.5	0.0	95.5	121.0
Level 3	20	14.67	115.9	1.6	45.3	0.0	117.4	162.7
Level 2	10	14.17	137.2	2.2	57.7	0.0	139.4	197.1
Mezzanine	17	0.50	137.2	2.2	57.7	0.0	139.4	197.1

Column Line C5-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	24	19.67	27.5	0.6	14.1	0.0	28.2	42.2
Level 3	22	14.67	64.2	1.1	33.6	0.0	65.3	99.0
Level 2	2	14.17	82.4	1.6	44.9	0.0	84.0	128.9
Mezzanine	24	0.50	82.4	1.6	44.9	0.0	84.0	128.9

Column Line B4-A1

Column Load Summary

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	17	19.67	11.6	1.3	9.5	0.0	12.9	22.4
Level 3	51	14.67	61.7	2.3	33.4	0.0	64.0	97.4
Level 2	65	14.17	85.2	3.3	47.7	0.0	88.5	136.2
Mezzanine	64	0.50	85.2	3.3	47.7	0.0	88.5	136.2

Column Line C4-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	26	14.67	21.3	0.5	19.8	0.0	21.8	41.6
Level 2	9	14.17	42.6	1.0	32.2	0.0	43.6	75.7
Mezzanine	16	0.50	42.6	1.0	32.2	0.0	43.6	75.7

Column Line C4-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	23	14.67	36.7	0.5	19.5	0.0	37.2	56.7
Level 2	3	14.17	54.8	1.0	30.8	0.0	55.8	86.6
Mezzanine	20	0.50	54.8	1.0	30.8	0.0	55.8	86.6

Column Line B3-A4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	12	19.67	11.7	1.3	9.5	0.0	13.0	22.6
Level 3	54	14.67	35.9	2.3	40.2	0.0	38.3	78.4
Level 2	64	14.17	55.9	3.3	52.9	0.0	59.2	112.0
Mezzanine	70	0.50	55.9	3.3	52.9	0.0	59.2	112.0

See Column Loads Report for applied moments.

Column Line B3-A2

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	53	14.67	15.4	1.0	20.0	0.0	16.4	36.4
Level 2	63	14.17	44.5	2.0	42.4	0.0	46.4	88.8
Mezzanine	69	0.50	44.5	2.0	42.4	0.0	46.4	88.8

Column Line C3-D5

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	34	19.67	19.4	1.1	7.5	0.0	20.5	28.0
Level 3	28	14.67	57.4	1.8	39.2	0.0	59.3	98.5
Level 2	8	14.17	87.6	2.6	53.2	0.0	90.2	143.4
Mezzanine	5	0.50	93.1	2.6	53.4	0.0	95.8	149.2

Level 1	5	10.00	93.1	3.2	53.4	0.0	96.3	149.7

Column Line C3-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	33	19.67	64.8	0.6	21.1	0.0	65.4	86.5
Level 3	27	14.67	89.5	1.1	43.0	0.0	90.6	133.6
Level 2	6	14.17	114.1	1.6	56.9	0.0	115.7	172.6
Mezzanine	15	0.50	114.1	1.6	56.9	0.0	115.7	172.6

Column Line C3-D2

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	25	14.67	24.3	0.5	21.6	0.0	24.8	46.4
Level 2	5	14.17	48.6	1.0	35.4	0.0	49.5	84.9
Mezzanine	18	0.50	48.6	1.0	35.4	0.0	49.5	84.9

Column Line C3-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	23	19.67	25.8	0.6	13.7	0.0	26.5	40.2
Level 3	24	14.67	68.7	1.1	31.0	0.0	69.8	100.9
Level 2	4	14.17	83.8	1.6	40.6	0.0	85.4	125.9
Mezzanine	19	0.50	83.8	1.6	40.6	0.0	85.4	126.0

Column Line B2-A4

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	72	14.67	36.5	0.7	85.9	0.0	37.2	123.1
Level 2	50	14.17	49.8	1.4	94.1	0.0	51.3	145.4
Mezzanine	14	0.50	49.8	1.4	94.1	0.0	51.3	145.4
Level 1	8	10.00	49.8	1.9	94.1	0.0	51.8	145.9

Column Line B3-A1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	13	19.67	16.8	1.3	13.4	0.0	18.1	31.5
Level 3	52	14.67	53.6	2.3	49.0	0.0	56.0	105.0
Level 2	62	14.17	65.3	3.3	59.5	0.0	68.6	128.1
Mezzanine	68	0.50	65.3	3.3	59.5	0.0	68.6	128.1

Column Line 223.69ft-110.57ft

PRCNC20221036

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 2	75	14.17	4.4	0.4	2.7	0.0	4.8	7.5
Mezzanine	78	0.50	4.4	0.5	2.7	0.0	4.8	7.5
Level 1	15	10.00	4.4	0.8	2.7	0.0	5.1	7.8

See Column Loads Report for applied moments.

Column Line B1-A2

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	63	14.67	0.7	0.5	2.3	0.0	1.2	3.5
Level 2	69	14.17	18.2	1.0	19.0	0.0	19.2	38.2
Mezzanine	11	0.50	18.2	1.0	19.0	0.0	19.2	38.2
Level 1	9	10.00	18.2	1.3	19.0	0.0	19.5	38.5

See Column Loads Report for applied moments.

Column Line B1-A1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	64	14.67	29.1	1.0	44.9	0.0	30.0	74.9
Level 2	70	14.17	31.8	1.9	48.2	0.0	33.7	81.8
Mezzanine	12	0.50	31.8	1.9	48.2	0.0	33.7	81.9
Level 1	10	10.00	31.8	2.6	48.2	0.0	34.3	82.5

Column Line 245.92ft-88.57ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	20	19.67	10.9	1.3	8.5	0.0	12.2	20.7
Level 3	33	14.67	39.8	2.2	32.8	0.0	42.0	74.8
Level 2	73	14.17	39.8	3.2	32.8	0.0	42.9	75.7
Mezzanine	10	0.50	39.8	3.2	32.8	0.0	43.0	75.8
Level 1	13	10.00	39.8	3.8	32.8	0.0	43.6	76.4

Column Line 245.92ft-103.42ft

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	32	14.67	33.4	1.0	43.9	0.0	34.3	78.2
Level 2	72	14.17	33.4	1.9	43.9	0.0	35.2	79.1
Mezzanine	9	0.50	33.4	1.9	43.9	0.0	35.3	79.2
Level 1	14	10.00	33.4	2.6	43.9	0.0	35.9	79.8

Column Line C1-D6

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	21	19.67	41.2	1.6	22.6	0.0	42.7	65.3
Level 3	31	14.67	82.6	2.7	70.1	0.0	85.4	155.5
Level 2	71	14.17	82.6	3.8	70.1	0.0	86.5	156.6
Mezzanine	8	0.50	82.6	3.9	70.1	0.0	86.5	156.6
Level 1	12	10.00	82.6	4.7	70.1	0.0	87.3	157.4

Column Line C1-D5

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	29	14.67	37.3	0.5	20.3	0.0	37.8	58.1
Level 2	7	14.17	50.1	1.0	25.7	0.0	51.0	76.8
Mezzanine	4	0.50	64.6	1.0	26.4	0.0	65.6	92.0
Level 1	4	10.00	64.6	1.3	26.4	0.0	65.9	92.3

Column Line C1-D3

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	4	19.67	21.4	1.3	13.5	0.0	22.7	36.2
Level 3	36	14.67	53.8	2.3	31.4	0.0	56.1	87.5
Level 2	37	14.17	69.9	3.3	41.7	0.0	73.2	114.8
Mezzanine	3	0.50	99.4	3.3	43.2	0.0	102.7	145.9
Level 1	3	10.00	99.4	4.0	43.2	0.0	103.4	146.6

Column Line C1-D2

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Level 3	37	14.67	36.8	1.0	19.5	0.0	37.8	57.3
Level 2	36	14.17	55.0	2.0	30.8	0.0	57.0	87.8
Mezzanine	2	0.50	83.0	2.0	32.3	0.0	85.0	117.2
Level 1	2	10.00	83.0	2.7	32.3	0.0	85.6	117.9

Column Line C1-D1

Level	Col#	Length	Dead	Self	+Live	-Live	MinTot	MaxTot
Roof	22	19.67	10.9	1.3	7.2	0.0	12.2	19.4
Level 3	38	14.67	49.3	2.3	20.9	0.0	51.6	72.5
Level 2	35	14.17	59.9	3.3	27.9	0.0	63.2	91.1
Mezzanine	1	0.50	69.9	3.3	28.3	0.0	73.2	101.5
Level 1	1	10.00	69.9	4.0	28.3	0.0	73.9	102.2

GRAVITY COLUMN BASE PL DESIGN

DESIGN PER AISC SEE SPREADSHEET OUTPUT ATTACHED AND EXAMPLE BELOW

HSS 5×5 w/ 14"SQ BASE PL, $P_u = 93\,6^k$ PER ATTACHED RAM OUTPUT

$$t_{MIN} = \ell\sqrt{2P_u / 0\,9F_y BN}\ , \quad P_u = 93\,6^k,\ F_y = 36^{ksi},\ B = N = 14"$$

$$\ell = MAX(m, n, \lambda n')$$

$$m = n = \frac{N - 0\,95d}{2} = \frac{14" - 0\,95 \times 5"}{2} = 4\,625"$$

$$\lambda n' \quad n' = \sqrt{d b_f}/4 = \sqrt{5" \times 5"}/4 = 1\,25$$

$$\lambda = \frac{2\sqrt{X}}{1 + \sqrt{1 - X}} \leq 1\,0$$

$$X = \left(\frac{4 d b_f}{(d + b_f)^2}\right) \times \frac{P_u}{\phi_c P_p}$$

TYPICALLY CONTROLS

$$\phi_c P_p = 0\,65\left[0\,85 f'_c A_1\sqrt{A_2/A_1} \leq 1\,7 f'_c A_1\right]$$

$$= 0\,65\left[0\,85 \times 4^{ksi} \times 14" \times 14" \sqrt{\frac{5 \times 5 \times 144}{14 \times 14}} \leq 1\,7 \times 4^{ksi} \times 14" \times 14"\right]$$

$$= 0\,65\left[2856^k \leq 1332\,8^k\right] \longrightarrow = 0\,65 \times 1332\,8^k = 866\,32^k$$

$$X = \left(\frac{4 \times 5" \times 5"}{(5" + 5")^2}\right)\frac{93\,6^k}{866\,32^k} = 0\,1084$$

$$\lambda = \frac{2\sqrt{0\,1084}}{1 + \sqrt{1 - 0\,1084}} = 0\,338$$

$$\lambda n' = 0\,338 \times 1\,25 = 0\,4226$$

$$\ell = MAX(4\,625" \text{ OR } 0\,4226) \longrightarrow 4\,625"$$

$$t_{min} = 4\,625"\sqrt{\frac{2 \times 93\,6^k}{0\,9 \times 36^{ksi} \times 14" \times 14"}} = 0\,794"$$

AISC ASSUMES LOAD OVER ENTIRE BASE PL, ALLOWED TO ITERATE AND REDUCE LOAD DISTRIBUTION OVER SMALLER BASE PL & STILL PROVIDE 14"SQ FOR GEOMETRY/ANCHOR BOLTS

SEE ATTACHED SPREADSHEET → 11"SQ BASE PL REQUIRES $t_{MIN} = 0\,68"$ → 3/4" ACCEPTABLE
→ ALL VALUES FOR 14"SQ HAND CALC MATCH SPREADSHEET (COULD GO THINNER)

CASE A 14"SQ BASE PL → HSS5×5 & HSS6×6 3/4" PL PER ATTACHED
CASE B: 16"SQ " " → W8×31, W10×33, W10×39, W10×45 1" PL PER ATTACHED
CASE C 20"SQ " " → W10×49, W10×54, W10×60, W12×65, W12×79 1" PL PER ATTACHED

Gravity Column Design Summary

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22 06/28/22 13:15:10
Building Code: IBC Steel Code: AISC360-16 LRFD

BASE PLATE CASE

DEMAND/CAPACITY LIMIT FOR STRENGTH : 1.000

Column Line 56.92ft-121.58ft

A

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	19.5	7.2	-0.7	1	0.40 Eq H1-1a	0.0	50	HSS5X5X3/8
Level 3	52.1	8.0	-1.6	1	0.57 Eq H1-1a	0.0	50	HSS5X5X3/8
Level 2	93.6	8.6	-1.6	1	0.87 Eq H1-1a	0.0	50	HSS5X5X3/8
Mezzanine	93.6	0.3	-0.1	1	0.65 Eq H1-1a	0.0	50	HSS5X5X3/8

Column Line 59.83ft-77.19ft

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	31.9	0.0	0.0	1	0.48 Eq Axial	15.0	50	W10X33
Level 2	32.5	0.0	0.0	1	0.49 Eq Axial	15.0	50	W10X33
Mezzanine	32.5	0.0	0.0	1	0.49 Eq Axial	15.0	50	W10X33

Column Line 59.83ft-104.17ft

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	8.2	3.2	7.4	2	0.10 Eq H1-1b	0.0	50	W10X49
Level 3	45.6	1.5	4.6	1	0.31 Eq H1-1a	0.0	50	W10X49
Level 2	56.1	0.7	2.3	1	0.35 Eq H1-1a	0.0	50	W10X49
Mezzanine	56.1	0.0	0.1	1	0.33 Eq H1-1a	0.0	50	W10X49

Column Line C14-D5

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	61.4	-5.5	-16.3	10	0.57 Eq H1-1a	0.0	50	W10X33
Level 2	123.3	-2.5	-7.1	10	0.65 Eq H1-1a	0.0	50	W10X33
Mezzanine	133.3	-0.1	-0.2	1	0.56 Eq H1-1a	0.0	50	W10X33

Column Line 71.25ft-151.25ft

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	57.4	-14.9	13.8	6	0.71 Eq H1-1a	0.0	50	W10X33
Level 3	111.6	-9.2	5.8	2	0.62 Eq H1-1a	0.0	50	W10X33
Level 2	163.1	-7.3	5.9	6	0.82 Eq H1-1a	0.0	50	W10X33
Mezzanine	170.3	-0.2	0.1	1	0.71 Eq H1-1a	0.0	50	W10X33

Column Line C14-D2

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	58.3	-16.4	-8.2	10	0.48 Eq H1-1a	0.0	50	W10X33
Level 2	114.6	-7.4	-3.5	10	0.58 Eq H1-1a	0.0	50	W10X33
Mezzanine	122.2	-0.3	-0.0	1	0.51 Eq H1-1a	0.0	50	W10X33

Column Line C14-D1

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	36.3	-5.2	4.0	3	0.34 Eq H1-1a	0.0	50	W10X33

PRCNC20221036

Gravity Column Design Summary

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	105.5	-7.6	5.4	1	0.58 Eq H1-1a	0.0	50	W10X33
Level 2	141.7	-2.8	4.3	1	0.68 Eq H1-1a	0.0	50	W10X33
Mezzanine	141.7	-0.1	0.1	1	0.59 Eq H1-1a	0.0	50	W10X33

Column Line 77.25ft-108.25ft

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	13.4	1.3	-12.2	9	0.29 Eq H1-1b	0.0	50	W8X31
Level 3	81.8	1.7	-16.1	10	0.63 Eq H1-1a	0.0	50	W8X31
Level 2	116.9	1.6	-7.5	1	0.64 Eq H1-1a	0.0	50	W8X31
Mezzanine	116.9	0.1	-0.3	1	0.50 Eq H1-1a	0.0	50	W8X31

Column Line 77.25ft-121.58ft

A

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	41.9	-8.0	8.1	6	0.41 Eq H1-1a	0.0	50	HSS6X6X1/2
Level 3	100.5	-6.8	11.8	1	0.58 Eq H1-1a	0.0	50	HSS6X6X1/2
Level 2	161.5	-5.9	9.2	1	0.76 Eq H1-1a	0.0	50	HSS6X6X1/2
Mezzanine	161.5	-0.2	0.3	1	0.59 Eq H1-1a	0.0	50	HSS6X6X1/2

Column Line C13-D1

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	32.6	0.0	0.0	1	0.16 Eq Axial	0.0	50	W10X33
Level 2	54.8	-1.1	0.0	1	0.24 Eq H1-1a	0.0	50	W10X33
Mezzanine	54.8	-0.0	0.0	1	0.23 Eq H1-1a	0.0	50	W10X33

Column Line 86.64ft-108.18ft

A

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	22.4	-1.8	8.2	1	0.18 Eq H1-1b	15.0	50	HSS6X6X1/2
Level 2	36.0	0.0	0.0	1	0.14 Eq Axial	15.0	50	HSS6X6X1/2
Mezzanine	40.2	0.0	0.0	1	0.14 Eq Axial	15.0	50	HSS6X6X1/2

Column Line 92.59ft-85.97ft

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	35.2	-3.0	-10.3	16	0.32 Eq H1-1b	15.0	50	W8X31
Level 2	39.9	-0.9	0.5	1	0.22 Eq H1-1a	15.0	50	W8X31
Mezzanine	39.9	-0.0	0.0	1	0.21 Eq H1-1a	15.0	50	W8X31

Column Line C12-D3

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	91.4	15.2	-6.7	1	0.67 Eq H1-1a	0.0	50	W10X39
Level 3	141.7	-4.8	-12.1	3	0.68 Eq H1-1a	0.0	50	W10X39
Level 2	201.6	-2.4	-11.2	1	0.86 Eq H1-1a	0.0	50	W10X39
Mezzanine	201.7	-0.1	-0.4	1	0.70 Eq H1-1a	0.0	50	W10X39

Column Line C12-D1

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	46.7	5.6	6.7	1	0.46 Eq H1-1a	0.0	50	W10X33
Level 3	111.7	2.5	13.4	1	0.71 Eq H1-1a	0.0	50	W10X33
Level 2	153.3	0.8	11.0	1	0.83 Eq H1-1a	0.0	50	W10X33
Mezzanine	153.3	0.0	0.4	1	0.65 Eq H1-1a	0.0	50	W10X33

Column Line B9-A4

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	115.3	26.8	22.7	1	0.85 Eq H1-1a	15.0	50	W10X39
Level 2	201.9	0.0	0.0	1	0.70 Eq Axial	15.0	50	W10X39
Mezzanine	202.0	0.0	0.0	1	0.70 Eq Axial	15.0	50	W10X39

Column Line C11-D6

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	65.5	-3.2	11.5	3	0.53 Eq H1-1a	0.0	50	W10X39
Level 3	171.3	-2.0	15.1	6	0.81 Eq H1-1a	0.0	50	W10X39
Level 2	279.5	0.0	0.0	1	0.96 Eq Axial	0.0	50	W10X39
Mezzanine	279.5	0.0	0.0	1	0.96 Eq Axial	0.0	50	W10X39

Column Line C11-D4

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	76.5	-12.3	15.0	1	0.65 Eq H1-1a	0.0	50	W10X33
Level 2	136.0	-5.6	6.1	1	0.70 Eq H1-1a	0.0	50	W10X33
Mezzanine	136.0	-0.2	0.2	1	0.57 Eq H1-1a	0.0	50	W10X33

Column Line C11-D3

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	57.8	2.3	-16.6	2	0.54 Eq H1-1a	0.0	50	W10X33
Level 2	103.7	0.0	-7.5	1	0.56 Eq H1-1a	0.0	50	W10X33
Mezzanine	103.7	0.0	-0.3	1	0.44 Eq H1-1a	0.0	50	W10X33

Column Line C11-D1

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	75.9	1.7	18.1	2	0.63 Eq H1-1a	0.0	50	W10X33
Level 2	116.3	0.0	8.0	1	0.62 Eq H1-1a	0.0	50	W10X33
Mezzanine	116.3	0.0	0.3	1	0.49 Eq H1-1a	0.0	50	W10X33

Column Line B9-A1

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	66.4	-1.2	-22.6	3	0.67 Eq H1-1a	15.0	50	W10X33
Level 2	130.7	-0.1	-13.2	1	0.77 Eq H1-1a	15.0	50	W10X33
Mezzanine	130.8	-0.0	-0.5	1	0.55 Eq H1-1a	15.0	50	W10X33

Gravity Column Design Summary

Column Line C10-D3

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	152.0	3.5	-14.4	1	0.57 Eq H1-1a	0.0	50	W10X49
Level 3	188.9	2.3	-11.0	2	0.51 Eq H1-1a	0.0	50	W10X49
Level 2	235.1	0.0	-8.6	1	0.59 Eq H1-1a	0.0	50	W10X49
Mezzanine	235.1	0.0	-0.3	1	0.52 Eq H1-1a	0.0	50	W10X49

Column Line B8-A4

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	134.2	20.2	23.7	1	0.89 Eq H1-1a	15.0	50	W10X39
Level 2	223.4	2.6	8.6	6	0.90 Eq H1-1a	15.0	50	W10X39
Mezzanine	243.3	0.1	0.1	1	0.84 Eq H1-1a	15.0	50	W10X39

Column Line C9-D4

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	8.0	4.0	6.1	2	0.17 Eq H1-1b	0.0	50	W10X33
Level 3	66.3	3.3	6.5	2	0.41 Eq H1-1a	0.0	50	W10X33
Level 2	112.6	0.1	5.1	1	0.56 Eq H1-1a	0.0	50	W10X33
Mezzanine	112.6	0.0	0.2	1	0.47 Eq H1-1a	0.0	50	W10X33

Column Line B8-A1

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	69.2	1.4	-23.6	2	0.70 Eq H1-1a	15.0	50	W10X33
Level 2	136.4	0.3	-14.0	1	0.81 Eq H1-1a	15.0	50	W10X33
Mezzanine	136.4	0.0	-0.5	1	0.58 Eq H1-1a	15.0	50	W10X33

Column Line C8-D3

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	70.6	-2.7	-20.7	3	0.66 Eq H1-1a	0.0	50	W10X33
Level 2	117.9	0.0	-7.7	1	0.62 Eq H1-1a	0.0	50	W10X33
Mezzanine	118.0	0.0	-0.3	1	0.50 Eq H1-1a	0.0	50	W10X33

Column Line C7-D3

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	134.7	-1.9	-9.0	10	0.74 Eq H1-1a	0.0	50	W10X45
Level 3	194.9	3.9	-13.5	2	0.75 Eq H1-1a	0.0	50	W10X45
Level 2	259.8	1.0	-12.7	1	0.92 Eq H1-1a	0.0	50	W10X45
Mezzanine	259.8	0.0	-0.4	1	0.77 Eq H1-1a	0.0	50	W10X45

Column Line B7-A4

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	30.6	-14.9	2.6	1	0.31 Eq H1-3b	15.0	50	W10X33
Level 3	103.8	-19.9	3.4	6	0.61 Eq H1-1a	15.0	50	W10X33
Level 2	161.9	-17.5	1.4	1	0.79 Eq H1-3b	15.0	50	

PRCNC20221036

Mezzanine	161.9	-0.6	0.0	1	0.68 Eq H1-1a	15.0	50	W10X33

Column Line 169.96ft-100.22ft

A

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	43.0	0.0	17.4	6	0.79 Eq H1-1a	15.0	50	HSS5X5X5/16
Level 2	77.2	0.0	8.3	1	0.82 Eq H1-1a	15.0	50	HSS5X5X5/16
Mezzanine	77.2	0.0	0.3	1	0.62 Eq H1-1a	15.0	50	HSS5X5X5/16

Column Line C6-D3

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	70.6	-3.5	-20.7	3	0.67 Eq H1-1a	0.0	50	W10X33
Level 2	131.6	-1.1	-9.7	1	0.72 Eq H1-1a	0.0	50	W10X33
Mezzanine	131.6	-0.0	-0.3	1	0.56 Eq H1-1a	0.0	50	W10X33

Column Line C6-D1

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	83.3	-1.9	21.2	3	0.72 Eq H1-1a	0.0	50	W10X33
Level 2	132.2	-0.0	9.8	1	0.72 Eq H1-1a	0.0	50	W10X33
Mezzanine	132.2	-0.0	0.3	1	0.56 Eq H1-1a	0.0	50	W10X33

Column Line B4-A4

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	50.9	6.5	6.5	2	0.40 Eq H1-1a	15.0	50	W10X39
Level 3	122.4	12.7	11.5	2	0.64 Eq H1-1a	15.0	50	W10X39
Level 2	198.7	10.1	10.5	1	0.88 Eq H1-1a	15.0	50	W10X39
Mezzanine	198.7	0.3	0.4	1	0.69 Eq H1-1a	15.0	50	W10X39

Column Line C5-D6

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	130.2	28.1	-10.9	1	0.47 Eq H1-1a	0.0	50	W10X60
Level 3	192.9	-6.5	-4.2	4	0.39 Eq H1-1a	0.0	50	W10X60
Level 2	271.5	-0.6	-0.6	1	0.91 Eq H1-1a	0.0	50	W10X60
Mezzanine	271.6	-0.3	-0.2	1	0.91 Eq H1-1a	0.0	50	W10X60
Level 1	272.3	-0.2	-0.2	1	0.91 Eq H1-1a	0.0	50	W10X60

Column Line C5-D4

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	59.3	-9.5	12.4	12	0.22 Eq H1-1b	0.0	50	W10X49
Level 2	133.0	-0.3	4.6	1	0.59 Eq H1-1a	0.0	50	W10X49
Mezzanine	133.1	-0.1	2.0	1	0.57 Eq H1-1a	0.0	50	W10X49
Level 1	133.7	-0.1	1.9	1	0.57 Eq H1-1a	0.0	50	W10X49

PRCNC20221036

Column Line C5-D3

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	150.0	3.0	-9.9	6	0.82 Eq H1-1a	0.0	50	W10X45
Level 3	185.3	2.4	-9.6	2	0.67 Eq H1-1a	0.0	50	W10X45
Level 2	231.5	0.0	-8.5	1	0.78 Eq H1-1a	0.0	50	W10X45
Mezzanine	231.5	0.0	-0.3	1	0.68 Eq H1-1a	0.0	50	W10X45

Column Line C5-D1

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	56.3	0.6	7.0	2	0.50 Eq H1-1a	0.0	50	W10X33
Level 3	116.7	1.6	10.3	2	0.67 Eq H1-1a	0.0	50	W10X33
Level 2	157.1	0.0	9.0	1	0.81 Eq H1-1a	0.0	50	W10X33
Mezzanine	157.1	0.0	0.3	1	0.66 Eq H1-1a	0.0	50	W10X33

Column Line C4-D3

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	57.8	2.3	-16.6	2	0.54 Eq H1-1a	0.0	50	W10X33
Level 2	103.7	0.0	-7.5	1	0.56 Eq H1-1a	0.0	50	W10X33
Mezzanine	103.7	0.0	-0.3	1	0.44 Eq H1-1a	0.0	50	W10X33

Column Line C4-D1

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	75.9	1.6	18.1	2	0.63 Eq H1-1a	0.0	50	W10X33
Level 2	116.3	0.0	8.0	1	0.62 Eq H1-1a	0.0	50	W10X33
Mezzanine	116.3	0.0	0.3	1	0.49 Eq H1-1a	0.0	50	W10X33

Column Line C3-D5

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	28.3	12.0	12.0	2	0.19 Eq H1-1b	0.0	50	W10X54
Level 3	125.6	14.5	-9.3	1	0.37 Eq H1-1a	0.0	50	W10X54
Level 2	185.1	15.0	-6.5	1	0.82 Eq H1-1a	0.0	50	W10X54
Mezzanine	192.1	2.9	-2.9	1	0.76 Eq H1-1a	0.0	50	W10X54
Level 1	192.8	2.7	-2.7	1	0.76 Eq H1-1a	0.0	50	W10X54

Column Line C3-D3

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	111.2	-15.6	-5.9	10	0.94 Eq H1-1a	0.0	50	W10X33
Level 3	147.6	6.4	3.7	7	0.72 Eq H1-1a	0.0	50	W10X33
Level 2	201.2	3.8	2.6	6	0.91 Eq H1-1a	0.0	50	W10X33
Mezzanine	206.7	0.1	0.0	1	0.86 Eq H1-1a	0.0	50	W10X33

Column Line C3-D2

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	55.0	18.5	5.0	6	0.43 Eq H1-1a	0.0	50	PRCNC20221036

B

Level 2	108.4	8.3	2.1	6	0.54 Eq H1-1a	0.0	50	W10X33
Mezzanine	116.0	0.3	0.0	1	0.49 Eq H1-1a	0.0	50	W10X33

Column Line C3-D1

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	53.7	5.4	3.5	2	0.45 Eq H1-1a	0.0	50	W10X33
Level 3	118.4	7.9	4.3	1	0.62 Eq H1-1a	0.0	50	W10X33
Level 2	152.3	3.3	3.6	1	0.72 Eq H1-1a	0.0	50	W10X33
Mezzanine	152.3	0.0	0.1	1	0.64 Eq H1-1a	0.0	50	W10X33

Column Line B2-A4

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	156.5	36.7	44.6	8	0.86 Eq H1-1a	0.0	50	W10X49
Level 2	212.1	-6.5	0.0	1	0.91 Eq H1-1a	0.0	50	W10X49
Mezzanine	212.2	-2.8	0.0	1	0.89 Eq H1-1a	0.0	50	W10X49
Level 1	212.7	-2.6	0.0	1	0.89 Eq H1-1a	0.0	50	W10X49

Column Line 223.69ft-110.57ft

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 2	8.3	0.0	0.0	1	0.11 Eq Axial	15.0	50	W8X31
Mezzanine	10.1	0.0	0.0	1	0.11 Eq Axial	15.0	50	W8X31
Level 1	10.4	0.0	0.0	1	0.11 Eq Axial	15.0	50	W8X31

Column Line B1-A2

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	5.1	2.9	0.0	2	0.03 Eq H1-3b	15.0	50	W10X33
Level 2	53.4	-0.4	0.0	1	0.57 Eq H1-1a	15.0	50	W10X33
Mezzanine	53.4	-0.2	0.0	1	0.57 Eq H1-1a	15.0	50	W10X33
Level 1	53.8	-0.2	0.0	1	0.57 Eq H1-1a	15.0	50	W10X33

Column Line B1-A1

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	107.8	-15.9	0.0	1	0.65 Eq H1-1a	15.0	50	W12X65
Level 2	117.5	-9.9	0.0	1	0.69 Eq H1-1a	15.0	50	W12X65
Mezzanine	117.5	-4.2	0.0	1	0.68 Eq H1-1a	15.0	50	W12X65
Level 1	118.3	-4.0	0.0	1	0.68 Eq H1-1a	15.0	50	W12X65

Column Line 245.92ft-88.57ft

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	18.9	16.9	-17.9	1	0.18 Eq H1-1b	90.0	50	W12X65
Level 3	93.5	8.4	-9.2	1	0.60 Eq H1-1a	90.0	50	W12X65
Level 2	94.6	5.3	-5.8	1	0.58 Eq H1-1a	90.0	50	W12X65
Mezzanine	94.6	2.3	-2.5	1	0.56 Eq H1-1a	90.0	50	W12X65
Level 1	95.4	2.1	-2.4	1	0.56 Eq H1-1a	90.0	50	[illegible]

PRCNC20221036

Column Line 245.92ft-103.42ft

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	111.4	2.9	-4.2	1	0.66 Eq H1-1a	90.0	50	W12X65
Level 2	112.5	1.8	-2.7	1	0.66 Eq H1-1a	90.0	50	W12X65
Mezzanine	112.6	0.8	-1.1	1	0.65 Eq H1-1a	90.0	50	W12X65
Level 1	113.4	0.7	-1.1	1	0.65 Eq H1-1a	90.0	50	W12X65

Column Line C1-D6

C

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Roof	84.9	7.4	-48.0	8	0.32 Eq H1-1b	90.0	50	W12X79
Level 3	189.7	-2.3	-28.1	1	0.99 Eq H1-1a	90.0	50	W12X79
Level 2	191.1	-1.4	-17.9	1	0.95 Eq H1-1a	90.0	50	W12X79
Mezzanine	191.1	-0.6	-7.6	1	0.91 Eq H1-1a	90.0	50	W12X79
Level 1	192.1	-0.6	-7.3	1	0.91 Eq H1-1a	90.0	50	W12X79

Column Line C1-D5

B

Level	Pu	Mux	Muy	LC	Interaction Eq.	Angle	Fy	Size
Level 3	73.4	-22.2	7.6	6	0.57 Eq H1-1a	0.0	50	W10X33
Level 2	102.4	-6.6	-2.5	1	0.49 Eq H1-1a	0.0	50	W10X33
Mezzanine	120.9	-3.7	-3.3	1	0.46 Eq H1-1a	0.0	50	W10X33
Level 1	121.3	-3.6	-3.2	1	0.45 Eq H1-1a	0.0	50	W10X33

A - 14" Square Base Plate Case (HSS5x5) (Pu = 93.6 KIPS)									
Base Plate Size:	14	13	12	11	10	9	8	7	6
d & b:	5	5	5	5	5	5	5	5	5
Pu:	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6
phi Pp:	866.32	746.98	636.48	534.82	442	358.02	282.88	216.58	159.12
m & n:	4.625	4.125	3.625	3.125	2.625	2.125	1.625	1.125	0.625
X:	0.108043	0.125305	0.147059	0.175012	0.211765	0.261438	0.330882	0.432173	0.588235
λ:	0.338092	0.365827	0.398724	0.43845	0.487523	0.549974	0.632811	0.749795	0.934361
λn':	0.422615	0.457284	0.498405	0.548063	0.609403	0.687468	0.791013	0.937243	1.167951
l:	4.625	4.125	3.625	3.125	2.625	2.125	1.625	1.125	1.167951
tmin:	0.79408	0.762713	0.726118	0.68287	0.630971	0.56754	0.488252	0.386309	0.467901
A - 14" Square Base Plate with 3/4" PLATE									

A - 14" Square Base Plate Case (HSS6x6) (Pu = 161.5 KIPS)								
Base Plate Size:	14	13	12	11	10	9	8	7
d & b:	6	6	6	6	6	6	6	6
Pu:	161.5	161.5	161.5	161.5	161.5	161.5	161.5	161.5
phi Pp:	866.32	746.98	636.48	534.82	442	358.02	282.88	216.58
m & n:	4.15	3.65	3.15	2.65	2.15	1.65	1.15	0.65
X:	0.186421	0.216204	0.253739	0.301971	0.365385	0.451092	0.570913	0.745683
λ:	0.454014	0.49326	0.540517	0.598773	0.672895	0.771601	0.913072	1.148082
λn':	0.681022	0.73989	0.810776	0.89816	1.009342	1.157402	1.369607	1.722123
l:	4.15	3.65	3.15	2.65	2.15	1.65	1.369607	1.722123
tmin:	0.935942	0.886499	0.828816	0.760645	0.67884	0.578856	0.540549	0.776775
A - 14" Square Base Plate with 3/4" PLATE								

B - 16" Square Base Plate Case (W8x31) (Pu = 116.9 KIPS)								
Base Plate Size:	16	15	14	13	12	11	10	9
d & b:	8	8	8	8	8	8	8	8
Pu:	116.9	116.9	116.9	116.9	116.9	116.9	116.9	116.9
phi Pp:	1131.52	994.5	866.32	746.98	636.48	534.82	442	358.02
m & n:	4.2	3.7	3.2	2.7	2.2	1.7	1.2	0.7
X:	0.103312	0.117547	0.134939	0.156497	0.183666	0.218578	0.26448	0.326518
λ:	0.330183	0.353565	0.380646	0.412418	0.450287	0.496315	0.553692	0.627704
λn':	0.660366	0.707131	0.761292	0.824837	0.900574	0.992629	1.107384	1.255408
l:	4.2	3.7	3.2	2.7	2.2	1.7	1.2	1.255408
tmin:	0.705146	0.662613	0.614005	0.557918	0.492483	0.415151	0.322352	0.374707
B - 16" Square Base Plate with 3/4" PLATE								

B - 16" Square Base Plate Case (W10x33, W10x39, W10x45) (Pu = 279.5 KIPS)						
Base Plate Size:	16	15	14	13	12	11
d:	10	10	10	10	10	10
b:	8	8	8	8	8	8
Pu:	279.5	279.5	279.5	279.5	279.5	279.5
phi Pp:	1131.52	994.5	866.32	746.98	636.48	534.82
m:	3.25	2.75	2.25	1.75	1.25	0.75
n:	4.8	4.3	3.8	3.3	2.8	2.3
X:	0.243963	0.277576	0.318646	0.369554	0.433713	0.516154
λ:	0.528404	0.569587	0.618467	0.677712	0.751567	0.84742
λn':	1.181547	1.273634	1.382933	1.515409	1.680555	1.894888
l:	4.8	4.3	3.8	3.3	2.8	2.3
tmin:	1.246105	1.190723	1.127428	1.054397	0.969193	0.868497
B - 16" Square Base Plate with 1" PLATE						

C - 20" Square Base Plate Case (W10x49, W10x54, W10x60) (Pu = 272.3 KIPS)										
Base Plate Size:	20	19	18	17	16	15	14	13	12	11
d & b:	10	10	10	10	10	10	10	10	10	10
Pu:	272.3	272.3	272.3	272.3	272.3	272.3	272.3	272.3	272.3	272.3
phi Pp:	1768	1595.62	1432.08	1277.38	1131.52	994.5	866.32	746.98	636.48	534.82
m & n:	5.25	4.75	4.25	3.75	3.25	2.75	2.25	1.75	1.25	0.75
X:	0.154016	0.170655	0.190143	0.213171	0.24065	0.273806	0.314318	0.364535	0.427822	0.509143
λ:	0.408849	0.432414	0.459023	0.489344	0.524269	0.565029	0.613373	0.671912	0.744787	0.83916
λn':	1.022122	1.081036	1.147558	1.223359	1.310673	1.412572	1.533432	1.67978	1.861967	2.0979
l:	5.25	4.75	4.25	3.75	3.25	2.75	2.25	1.75	1.861967	2.0979
tmin:	1.076207	1.024959	0.968016	0.904375	0.832779	0.751636	0.658902	0.551901	0.636146	0.781913
C - 20" Square Base Plate with 1" PLATE										

C - 20" Square Base Plate Case (W12x65, W12x79) (Pu = 192.1 KIPS)								
Base Plate Size:	20	19	18	17	16	15	14	13
d & b:	12	12	12	12	12	12	12	12
Pu:	192.1	192.1	192.1	192.1	192.1	192.1	192.1	192.1
phi Pp:	1768	1595.62	1432.08	1277.38	1131.52	994.5	866.32	746.98
m & n:	4.3	3.8	3.3	2.8	2.3	1.8	1.3	0.8
X:	0.108654	0.120392	0.134141	0.150386	0.169772	0.193162	0.221743	0.257169
λ:	0.339103	0.358099	0.379434	0.403588	0.431185	0.463063	0.50037	0.544739
λn':	1.017309	1.074298	1.138303	1.210763	1.293555	1.389188	1.50111	1.634216
l:	4.3	3.8	3.3	2.8	2.3	1.8	1.50111	1.634216
tmin:	0.740363	0.68871	0.631317	0.567173	0.49501	0.413226	0.369225	0.432885
C - 20" Square Base Plate with 1" PLATE								

PRCNC20221036

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Lateral Load Resisting System

PRCNC20221036

Pierce College Puyallup New STEM Building
22135.00

Lateral Load Resisting System -

Horizontal Elements - Diaphragms

PRCNC20221036

Pierce College

Integrus Proje 22135.00

Diaphragm DESIGN

ENGR AM

Level 2 (COMPOSITE DECK)

Frame Number	Direction	Frame Shear (k) (RAMSTEEL)	Story Force (k) (Fi, Diaphragm Forces)	Diaphragm Force (ASCE 7-16 MIN)	Multiplier	**Diaphragm Design Shear (k)**	Frame Length (ft)	Lineal Shear (plf)	LRFD Capacity (plf)	Weld Stud Capacity (k/Stud)	Design Check	Force Taken Out Within Frame (k)	Force Taken Out With Collectors (k)	Additional Collector Length (ft)	Revised LRFD Shear (plf)	Design Recheck	Number of Studs on Beam Required	Stud Spacing (inches on center)	Collector Design Load (Ω_o = 2.5), 25% increase per 12.3.3.4 removed	Collector Bar Area (in^2)	Number of Bars Required in Slab, 25% incease per 12.3.3.4 removed, includes overstrength increase per 12.10.2.1	
1	Y	17	96	604	6.26	**106**	28.666	3712	4805	9.1	**OK**	**138**	**0**	0	3712	**NO RECHECK REQ'D**	12	28	0	0.31	**0**	
3	Y	31	96	604	6.26	**194**	30	6467	4805	9.1	**NG**	**144**	**50**	11	4732	**ADD COLLECTOR**	22	16	100	0.44	**5**	
5	Y	32	96	604	6.26	**200**	30	6676	5583	9.1	**NG**	**167**	**33**	11	4885	**ADD COLLECTOR**	23	15	66	0.31	**4**	
6	Y	16	96	604	6.26	**100**	28.666	3493	4805	9.1	**OK**	**138**	**0**	0	3493	**NO RECHECK REQ'D**	12	28	0	0.31	**0**	
8	Y	7	96	604	6.26	**44**	15.666	2797	4805	9.1	**OK**	**75**	**0**	0	2797	**NO RECHECK REQ'D**	5	37	0	0.31	**0**	
10	Y	62	96	604	6.26	**388**	20.333	19084	4805	9.1	**NG**	**98**	**290**	90	3517	**ADD COLLECTOR**	43	5	581	0.44	**25**	206 kips into collector beams, 375 kips into #6 bars
2	X	29	95	604	6.35	**184**	15	12284	4805	9.1	**NG**	**72**	**112**	56	2595	**ADD COLLECTOR**	21	8	224	0.44	**10**	
4	X	33	95	604	6.35	**210**	30	6989	4805	9.1	**NG**	**144**	**66**	189	957	**ADD COLLECTOR**	24	15	131	0.44	**6**	
7	X	28	95	604	6.35	**178**	15.333	11602	4805	9.1	**NG**	**74**	**104**	123	1286	**ADD COLLECTOR**	20	9	208	0.44	**9**	
9	X	40	95	604	6.35	**254**	21	12102	4805	9.1	**NG**	**101**	**153**	54	3389	**ADD COLLECTOR**	28	9	306	0.44	**13**	259 kips into collector beams, 47 kips into #6 bars

Level 3 (COMPOSITE DECK)

Frame Number	Grid	Frame Shear (k) (RAMSTEEL)	Story Force (k) (Fi, Diaphragm Forces)	Diaphragm Force (ASCE 7-16 MIN)	Multiplier	**Diaphragm Design Shear (k)**	Frame Length (ft)	Lineal Shear (plf)	LRFD Capacity (plf)	Weld Stud Capacity (k/Stud)	Design Check	Force Taken Out Within Frame (k)	Force Taken Out With Collectors (k)	Additional Collector Length (ft)	Revised LRFD Shear (plf)	Design Recheck	Number of Studs on Beam Required	Stud Spacing (inches on center)	Collector Design Load (Ω_o = 2.5), 25% increase per 12.3.3.4 removed	Collector Bar Area (in^2)	Number of Bars Required in Slab, 25% incease per 12.3.3.4 removed, includes overstrength increase per 12.10.2.1
1	Y	54	193	705	3.66	**198**	28.666	6892	7527	9.1	**OK**	**216**	**0**	0	6892	**NO RECHECK REQ'D**	22	15	0	0.31	**0**
3	Y	51	193	705	3.66	**187**	30	6220	4805	9.1	**NG**	**144**	**42**	11	4551	**ADD COLLECTOR**	21	17	85	0.44	**4**
5	Y	70	193	705	3.66	**256**	30	8537	4805	9.1	**NG**	**144**	**112**	58	2910	**ADD COLLECTOR**	29	12	224	0.44	**10**
6	Y	15	193	705	3.66	**55**	28.666	1915	4805	9.1	**OK**	**138**	**0**	0	1915	**NO RECHECK REQ'D**	7	49	0	0.31	**0**
8	Y	10	193	705	3.66	**37**	15.666	2335	4805	9.1	**OK**	**75**	**0**	0	2335	**NO RECHECK REQ'D**	5	37	0	0.31	**0**
10	Y	61	193	705	3.66	**223**	20.333	10976	4805	9.1	**NG**	**98**	**125**	90	2023	**ADD COLLECTOR**	25	9	251	0.44	**11**
2	X	9	190	705	3.71	**33**	15	2223	4805	9.1	**OK**	**72**	**0**	56	470	**NO RECHECK REQ'D**	4	45	0	0.31	**0**
4	X	66	190	705	3.71	**245**	30	8152	4805	9.1	**NG**	**144**	**100**	189	1117	**ADD COLLECTOR**	27	13	201	0.44	**9**
7	X	34	190	705	3.71	**126**	15.333	8217	4805	9.1	**NG**	**74**	**52**	151	757	**ADD COLLECTOR**	14	13	105	0.44	**5**
9	X	65	190	705	3.71	**241**	21	11470	4805	9.1	**NG**	**101**	**140**	147	1434	**ADD COLLECTOR**	27	9	280	0.44	**12**

ROOF (1.5 METAL DECK)

Frame Number	Grid	Frame Shear (k) (RAMSTEEL)	Story Force (k) (Fi, Diaphragm Forces)	Diaphragm Force (ASCE 7-16 MIN)	Multiplier	**Diaphragm Design Shear (k)**	Frame Length (ft)	Lineal Shear (plf)	LRFD, Deck Capacity (plf)	Design Check	Force Taken Out Within Frame (k)	Force Taken Out With Collectors (k)	Additional Collector Length (ft)	Revised Allowable Shear (plf)	Design Recheck	Collector Design Load (Ω_o = 2.5), 25% increase per 12.3.3.4 removed
3	Y	54	205	470	2.29	**124**	30	4131	3243	**NG**	**97**	**27**	11	3022	**ADD COLLECTOR**	**53**
5	Y	52	205	470	2.29	**119**	30	3978	3243	**NG**	**97**	**22**	88	1011	**ADD COLLECTOR**	**44**
6	Y	61	205	470	2.29	**140**	28.666	4883	3243	**NG**	**93**	**47**	68	1448	**ADD COLLECTOR**	**94**
8	Y	22	205	470	2.29	**50**	15.666	3223	3243	**OK**	**51**	**0**	13	1761	**NO RECHECK REQ'D**	**0**
10	Y	94	205	470	2.29	**216**	20.333	10609	3243	**NG**	**66**	**150**	51	3024	**ADD COLLECTOR**	**299.53**
2	X	15	203	470	2.32	**35**	15	2319	3243	**OK**	**49**	**0**	20	994	**NO RECHECK REQ'D**	**0**
4	X	96	203	470	2.32	**223**	30	7422	3243	**NG**	**97**	**125**	189	1017	**ADD COLLECTOR**	**251**
7	X	53	203	470	2.32	**123**	15.333	8017	3243	**NG**	**50**	**73**	64	1550	**ADD COLLECTOR**	**146**
9	X	90	203	470	2.32	**209**	21	9940	3243	**NG**	**68**	**141**	111	1581	**ADD COLLECTOR**	**281**

36/7/4
8" punchlock
8'-0" framing spacing

18 ga PLB™-36 Grade 50 Roof Deck

Seismic Diaphragm Shear

For Both Ends Lapped Deck

VERCO DECKING, INC. A NUCOR COMPANY

5/8" Visible Dia. Arc Spot Weld Connections to Supports
36 / 7 / 4 Perpendicular Connection Pattern to Supports
PunchLok II Connection (VSC2) Sidelap Connections

A572 GR50 Support Member or Equivalent
0.188 ≤ Support Thickness (in.)
3 in. Minimum Deck End Bearing Length

Note: Support welds at interlocking sidelaps may be 3/8" x 1 1/4" arc seam welds in lieu of arc spot welds.

LRFD Design Seismic Diaphragm Shear Strength ΦSn (plf) — Generic 3 Span Condition

Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	4340	4317	4299	4286	3820	3018	2445	2021	1698
6	3853	3801	3765	3738	3718	3018	2445	2021	1698
8	3439	3465	3311	3350	3243	3018	2445	2021	1698
12	2841	2733	2659	2604	2562	2528	2445	2021	1698
18	2454	2414	2085	2109	2126	1926	1959	1987	1698
24	2001	2052	1754	1829	1625	1699	1546	1615	1493
36	2001	1648	1396	1528	1352	1205	1325	1209	1108

Average Connection Spacing to Supports at Parallel Chords & Collectors (in.)

Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	4	4	4	4	4	4	4	4	4
6	6	6	6	6	6	6	6	6	6
8	8	8	8	8	8	8	8	8	8
12	10	10	10	11	11	11	11	12	12
18	12	12	14	14	14	15	15	15	16
24	16	15	18	17	19	18	20	17	18
36	16	20	24	21	24	27	24	26	29

Seismic or Wind Diaphragm Shear Stiffness, G' (kip/in.) — Generic 3 Span Condition

Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	322	321	321	320	320	320	319	319	319
6	299	298	296	296	295	294	294	294	293
8	281	283	277	279	274	276	273	275	272
12	253	249	246	244	243	242	241	240	239
18	233	233	215	218	219	208	211	213	204
24	206	212	194	200	187	193	183	189	180
36	206	185	167	179	166	155	166	157	149

PRCNC20221036

18 ga PLB™-36 Grade 50 Roof Deck

Wind Diaphragm Shear

For Both Ends Lapped Deck

5/8" Visible Dia. Arc Spot Weld Connections to Supports
36 / 7 / 4 Perpendicular Connection Pattern to Supports
PunchLok II Connection (VSC2) Sidelap Connections
Note: Support welds at interlocking sidelaps may be 3/8" x 1 1/4" arc seam welds in lieu of arc spot welds.

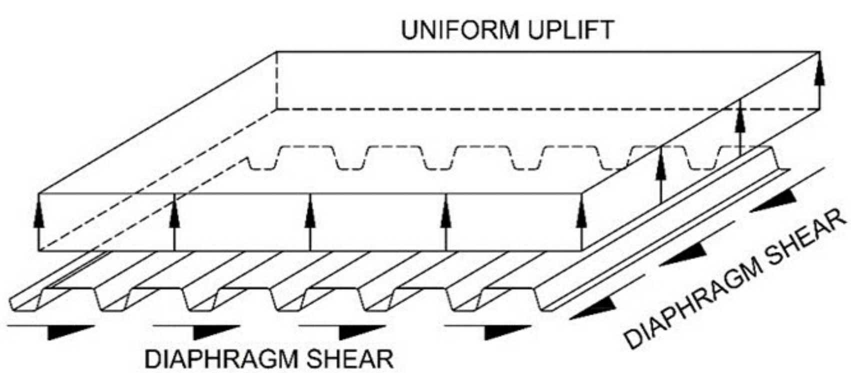
A572 GR50 Support Member or Equivalent
0.188 ≤ Support Thickness (in.)
3 in. Minimum Deck End Bearing Length

LRFD Design Wind Diaphragm Shear Strength ΦSn (plf) Generic 3 Span Condition

Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	5917	5887	5862	4989	3820	3018	2445	2021	1698
6	5254	5183	5134	4989	3820	3018	2445	2021	1698
8	4689	4725	4516	4569	3820	3018	2445	2021	1698
12	3874	3727	3625	3550	3493	3018	2445	2021	1698
18	3346	3291	2843	2875	2899	2626	2445	2021	1698
24	2729	2798	2392	2494	2216	2317	2108	2021	1698
36	2729	2247	1904	2084	1843	1644	1807	1648	1511

Average Connection Spacing to Supports at Parallel Chords & Collectors (in.)

Sidelap Connection Spacing (in.)	Span 4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"
4	4	4	4	4	4	4	4	4	4
6	6	6	6	6	6	6	6	6	6
8	8	8	8	8	8	8	8	8	8
12	10	10	10	11	11	12	12	12	12
18	12	12	14	14	14	15	15	18	18
24	16	15	18	17	19	18	20	19	24
36	16	20	24	21	24	27	24	26	29



Tables generated using V1.0.3 of calculator based on AISI S310-16. Date: 6/7/2022

PRCNC20221036

18.12.9 *Shear strength*

18.12.9.1 V_n of diaphragms shall not exceed:

$$V_n = A_{cv}\left(2\lambda\sqrt{f_c'}+\rho_t f_y\right) \qquad (18.12.9.1)$$

For cast-in-place topping slab diaphragms on precast floor or roof members, A_{cv} shall be calculated using only

R18.12.9 *Shear strength*—The shear strength requirements for diaphragms are similar to those for slender structural walls and are based on the shear provisions for beams. The term A_{cv} refers to the gross area of the diaphragm, but may not exceed the thickness times the width of the diaphragm. This corresponds to the gross area of the effective deep beam that forms the diaphragm. Distributed slab reinforcement ρ_t used to calculate shear strength of a

CODE

the thickness of topping slab for noncomposite topping slab diaphragms and the combined thickness of cast-in-place and precast elements for composite topping slab diaphragms. For composite topping slab diaphragms, the value of f_c' used to calculate V_n shall not exceed the lesser of f_c' for the precast members and f_c' for the topping slab.

COMMENTARY

diaphragm in Eq. (18.12.9.1) is positioned perpendicular to the diaphragm flexural reinforcement. Provision 18.12.9.2 limits the maximum shear strength of the diaphragm.

In addition to satisfying 18.12.9.1 and 18.12.9.2, cast-in-place topping slab diaphragms must also satisfy 18.12.9.3 and 18.12.9.4. Cast-in-place topping slabs on a precast floor

CODE

21.2.4 For structures that rely on elements in (a), (b), or (c) to resist earthquake effects E, the value of ϕ for shear shall be modified in accordance with 21.2.4.1 through 21.2.4.3:

(a) Special moment frames
(b) Special structural walls
(c) Intermediate precast structural walls in structures assigned to Seismic Design Category D, E, or F

21.2.4.1 For any member designed to resist E, ϕ for shear shall be 0.60 if the nominal shear strength of the member is less than the shear corresponding to the development of the nominal moment strength of the member. The nominal moment strength shall be calculated considering the most critical factored axial loads and including E.

COMMENTARY

R21.2.4.1 This provision addresses shear-controlled members, such as low-rise walls, portions of walls between openings, or diaphragms, for which nominal shear strength is less than the shear corresponding to development of nominal flexural strength for the pertinent loading conditions.

6x6 W2.9xW2.9, As = 0.058 in2 /ft
reinforcing ratio = 0.058 / (3" * 12") = .0016

Vs = 3" * 12" * (2 * sqrt(4000psi) + (.0016 * 60,000psi))
Vs = 8009 lb/ft
phi * Vs = 0.6 * 8009 lb/ft
phi * Vs = 4805 lb/ft

#3 @ 16" oc EA WAY, As = 0.11 in2
reinforcing ratio = 0.11 / (3" * 16") = .0022

Vs = 3" * 12" * (2 * sqrt(4000psi) + (.0022 * 60,000psi))
Vs = 8009 lb/ft
phi * Vs = 0.6 * 9305 lb/ft
phi * Vs = 5583 lb/ft

#4 @ 18" oc EA WAY, As = 0.2 in2
reinforcing ratio = 0.2 / (3" * 18") = .0037

Vs = 3" * 12" * (2 * sqrt(4000psi) + (.0037 * 60,000psi))
Vs = 12545 lb/ft
phi * Vs = 0.6 * 12545 lb/ft
phi * Vs = 7527 lb/ft

PRCNC20221036

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Lateral Load Resisting System -

Horizontal Elements - Chords

PRCNC20221036

BEAM END CONNECTIONS

1. BEAMS MARKED WITH (c) ARE SEISMIC COLLECTORS. THESE BEAMS ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.

TYPICAL BEAM/GIRDER TO COLUMN:	TYPICAL BEAM/GIRDER BOLTED CONNECTION:	TYPICAL COLLECTOR CONNECTION AT COLUMNS:	TYPICAL COLLECTOR CONNECTION AT BEAMS:
11 / S026	25 / S026	14 / S026	4 / S026

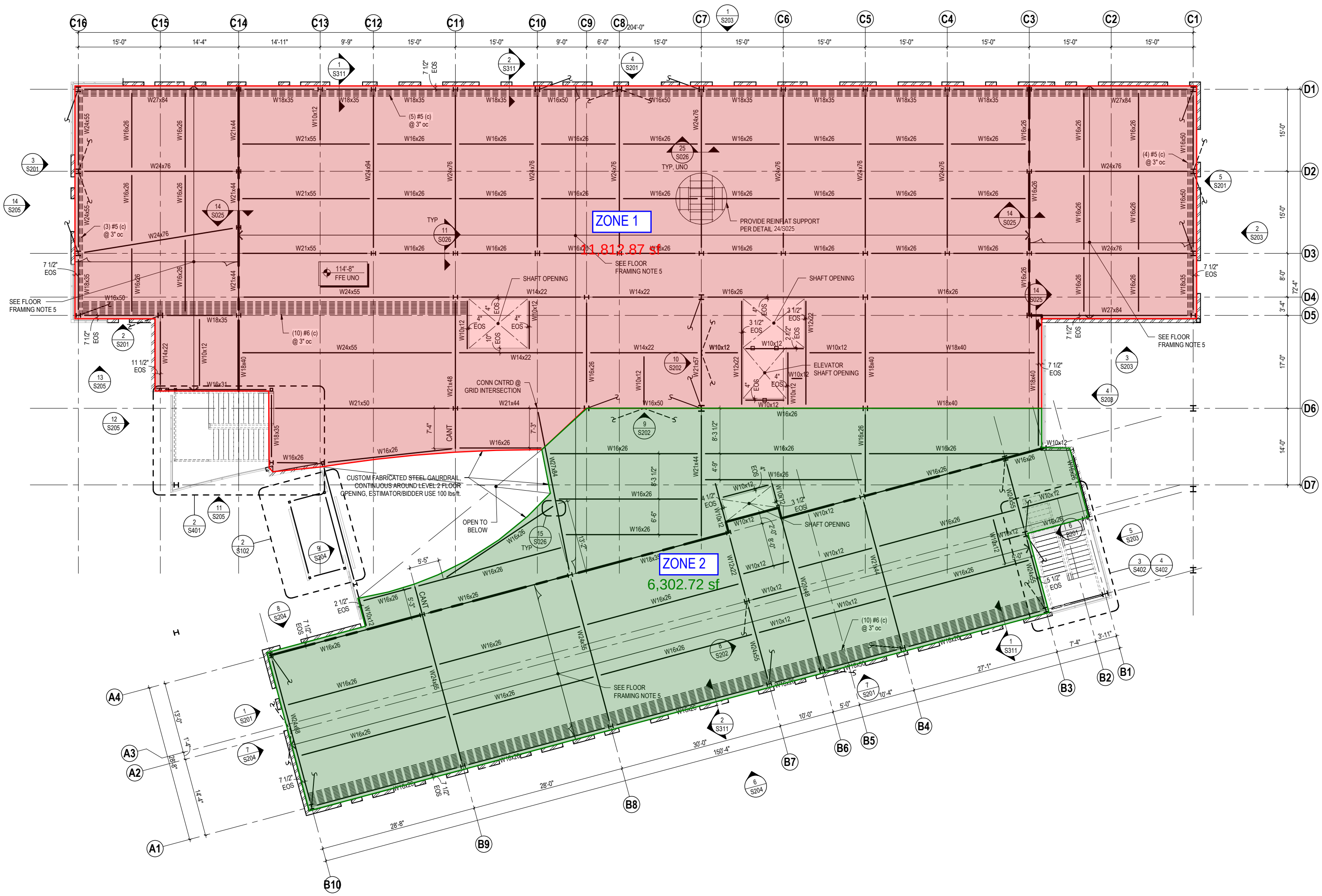
KEY FRAMING NOTES

DESIGNATES CHANGE IN FLOOR OR ROOF DECK DIRECTION, SEE PLAN FOR SPAN DIRECTION

DESIGNATES MECHANICAL, ELECTRICAL, AND/OR PLUMBING EQUIPMENT. COORDINATE SIZE AND LOCATION WITH MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER. PROVIDE HOUSEKEEPING PAD AS REQUIRED BY MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER.

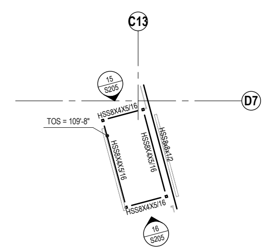
FLOOR FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. 3" CONCRETE TOPPING OVER 2" COMPOSITE 18 GAGE METAL DECK w/ 6x6 W2.9xW2.9 WELDED WIRE FABRIC REINFORCING, UNLESS NOTED OTHERWISE. SEE DETAILS 1/S025 AND 24/S025.
6. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
7. COORDINATE SIZES AND LOCATIONS OF FLOOR AND ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAILS 9/S025 AND 10/S025 FOR OPENINGS IN COMPOSITE FLOOR DECK. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
8. INDICATES EXTENTS OF RECESSED CONCRETE SLABS. 1/2" RECESS UNO ON PLAN
9. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
10. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
11. STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
12. LOCALIZED SLOPE TO DRAIN. PROVIDE MAXIMUM 2% SLOPE TO DRAIN WITHIN 1'-0" RADIUS AROUND DRAIN
13. REFER TO SHEET S501 FOR SNOW DRIFT LOADING. DESIGN JOISTS FOR ADDITIONAL LOAD COMBINATIONS INCLUDING DRIFTED SNOW LOADS IN ADDITION TO DISTRIBUTED SNOW LOAD



LEVEL 2 - FRAMING PLAN

SCALE: 1/8" = 1'-0"



2 FRAMING PLAN - VESTIBULE 1

SCALE: 1/8" = 1'-0"

integrus ARCHITECTURE

117 SOUTH MAIN STREET, SUITE 100, SEATTLE, WA. 98104
TELEPHONE: (206)628-3137 FAX: (206)628-3138

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/03/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

LEVEL 2 FRAMING PLAN

S102

PROGRESS SET

BEAM END CONNECTIONS

1. BEAMS MARKED WITH (c) ARE SEISMIC COLLECTORS. THESE BEAMS ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.

TYPICAL BEAM/GIRDER TO COLUMN:	TYPICAL BEAM/GIRDER BOLTED CONNECTION:	TYPICAL COLLECTOR CONNECTION AT COLUMNS:	TYPICAL COLLECTOR CONNECTION AT BEAMS:
11/S026	25/S026	14/S026	4/S026

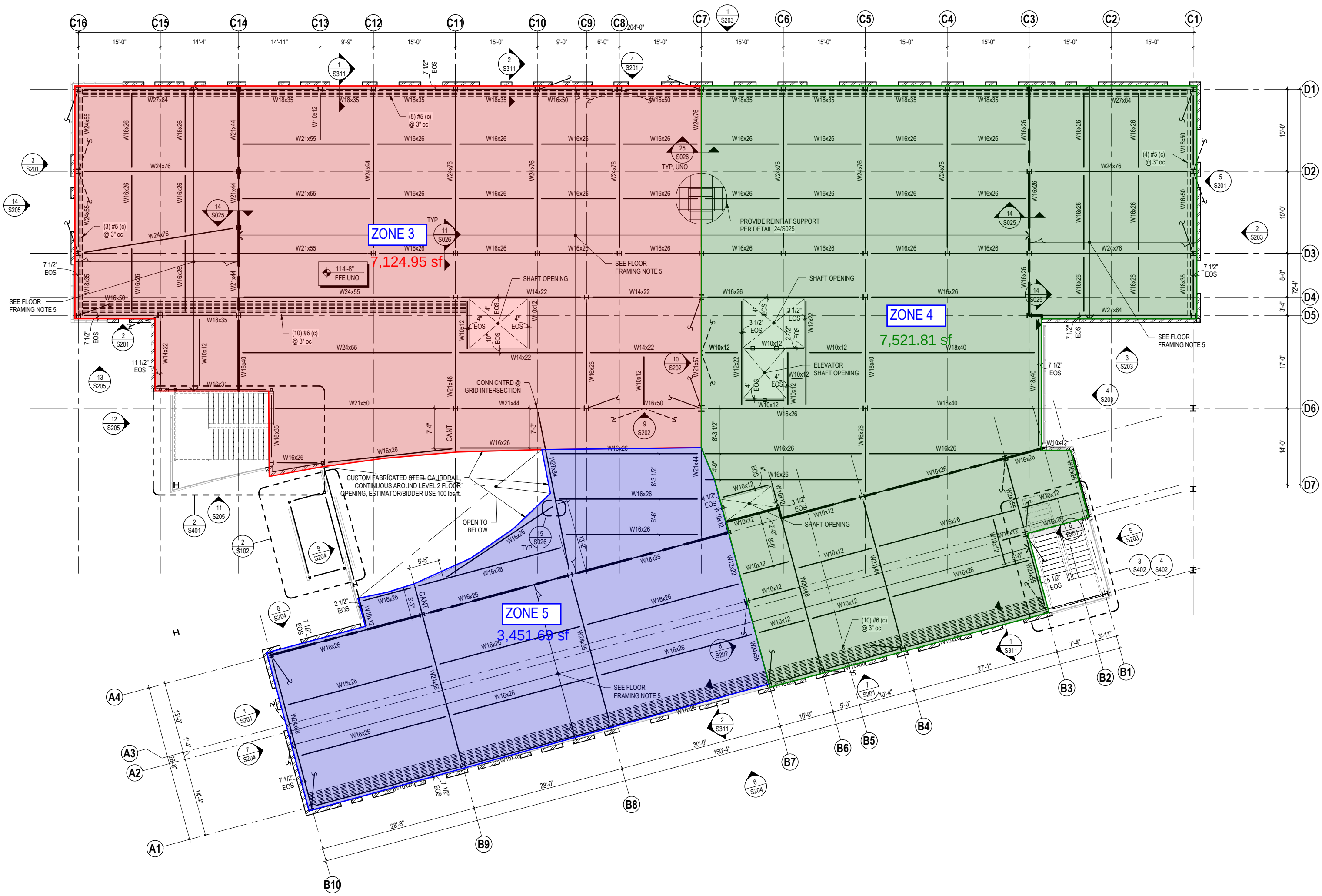
KEY FRAMING NOTES

DESIGNATES CHANGE IN FLOOR OR ROOF DECK DIRECTION, SEE PLAN FOR SPAN DIRECTION

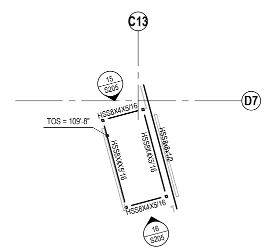
DESIGNATES MECHANICAL, ELECTRICAL, AND/OR PLUMBING EQUIPMENT. COORDINATE SIZE AND LOCATION WITH MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER. PROVIDE HOUSEKEEPING PAD AS REQUIRED BY MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER.

FLOOR FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. 3" CONCRETE TOPPING OVER 2" COMPOSITE 18 GAGE METAL DECK w/ 6x6 W2.9xW2.9 WELDED WIRE FABRIC REINFORCING, UNLESS NOTED OTHERWISE. SEE DETAILS 1/S025 AND 24/S025.
6. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
7. COORDINATE SIZES AND LOCATIONS OF FLOOR AND ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAILS 9/S025 AND 10/S025 FOR OPENINGS IN COMPOSITE FLOOR DECK. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
8. INDICATES EXTENTS OF RECESSED CONCRETE SLABS. 1/2" RECESS UNO ON PLAN
9. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
10. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
11. STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
12. LOCALIZED SLOPE TO DRAIN. PROVIDE MAXIMUM 2% SLOPE TO DRAIN WITHIN 1'-0" RADIUS AROUND DRAIN
13. REFER TO SHEET S501 FOR SNOW DRIFT LOADING. DESIGN JOISTS FOR ADDITIONAL LOAD COMBINATIONS INCLUDING DRIFTED SNOW LOADS IN ADDITION TO DISTRIBUTED SNOW LOAD



LEVEL 2 - FRAMING PLAN
SCALE: 1/8" = 1'-0"



2 FRAMING PLAN - VESTIBULE 1
SCALE: 1/8" = 1'-0"

integrus ARCHITECTURE
117 SOUTH MAIN STREET, SUITE 100, SEATTLE, WA. 98104
TELEPHONE: (206)628-3137 FAX: (206)628-3138

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/03/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

LEVEL 2 FRAMING PLAN

S102

PROGRESS SET

BEAM END CONNECTIONS

1. BEAMS MARKED WITH (c) ARE SEISMIC COLLECTORS. THESE BEAMS ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.

TYPICAL BEAM/GIRDER TO COLUMN:	TYPICAL BEAM/GIRDER BOLTED CONNECTION:	TYPICAL COLLECTOR CONNECTION AT COLUMNS:	TYPICAL COLLECTOR CONNECTION AT BEAMS:
11 / S026	25 / S026	14 / S026	4 / S026

KEY FRAMING NOTES

DESIGNATES CHANGE IN FLOOR OR ROOF DECK DIRECTION, SEE PLAN FOR SPAN DIRECTION

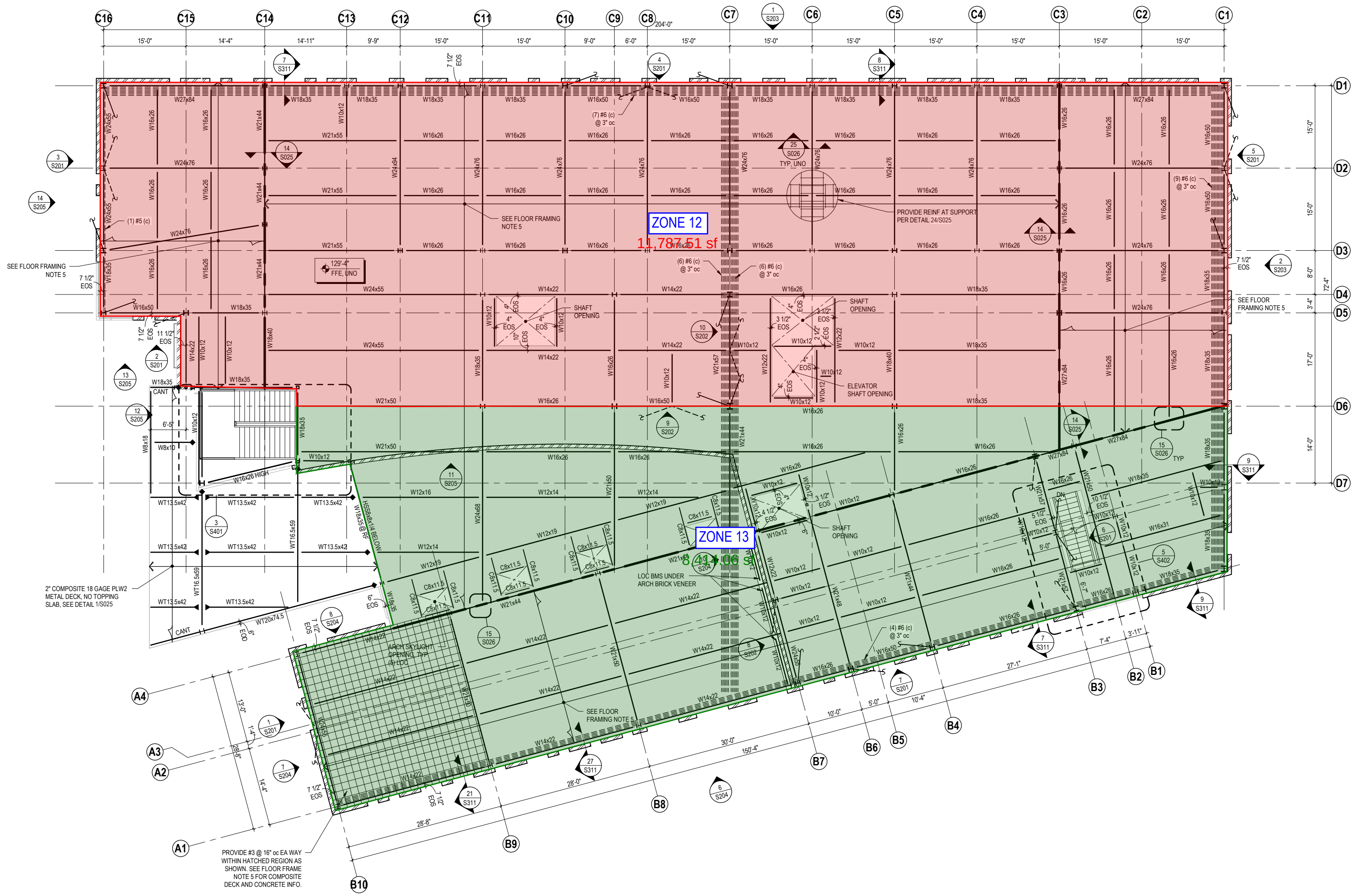
DESIGNATES MECHANICAL, ELECTRICAL, AND/OR PLUMBING EQUIPMENT. COORDINATE SIZE AND LOCATION WITH MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER. PROVIDE HOUSEKEEPING PAD AS REQUIRED BY MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER.

FLOOR FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. 3" CONCRETE TOPPING OVER 2" COMPOSITE 18 GAGE METAL DECK w/ 6x6 W2.9xW2.9 WELDED WIRE FABRIC REINFORCING, UNLESS NOTED OTHERWISE. SEE DETAILS 1/S025 AND 24/S025.
6. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
7. COORDINATE SIZES AND LOCATIONS OF FLOOR AND ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAILS 9/S025 AND 10/S025 FOR OPENINGS IN COMPOSITE FLOOR DECK. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
8. INDICATES EXTENTS OF RECESSED CONCRETE SLABS. 1/2" RECESS UNO ON PLAN
9. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
10. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
11. STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
12. LOCALIZED SLOPE TO DRAIN. PROVIDE MAXIMUM 2% SLOPE TO DRAIN WITHIN 1'-0" RADIUS AROUND DRAIN
13. REFER TO SHEET S501 FOR SNOW DRIFT LOADING. DESIGN JOISTS FOR ADDITIONAL LOAD COMBINATIONS INCLUDING DRIFTED SNOW LOADS IN ADDITION TO DISTRIBUTED SNOW LOAD

ROOF FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
6. COORDINATE SIZES AND LOCATIONS OF ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
   STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
7. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
8. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
9. EQUIPMENT SHALL NOT BE SUPPORTED FROM ROOF DECK. EQUIPMENT CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUPPLEMENTAL SUPPORT SPANNING BETWEEN PRIMARY STRUCTURAL MEMBERS FOR SUPPORT OF EQUIPMENT
10. REFER TO SHEET S501 FOR SNOW DRIFT LOADING



LEVEL 3 - FRAMING PLAN / LOW ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

integrus ARCHITECTURE

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/03/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

LEVEL 3 FRAMING PLAN / LOW ROOF FRAMING PLAN

S103

PROGRESS SET

BEAM END CONNECTIONS

1. BEAMS MARKED WITH (c) ARE SEISMIC COLLECTORS. THESE BEAMS ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.

TYPICAL BEAM/GIRDER TO COLUMN:	TYPICAL BEAM/GIRDER BOLTED CONNECTION:	TYPICAL COLLECTOR CONNECTION AT COLUMNS:	TYPICAL COLLECTOR CONNECTION AT BEAMS:
11 / S026	25 / S026	14 / S026	4 / S026

KEY FRAMING NOTES

DESIGNATES CHANGE IN FLOOR OR ROOF DECK DIRECTION, SEE PLAN FOR SPAN DIRECTION

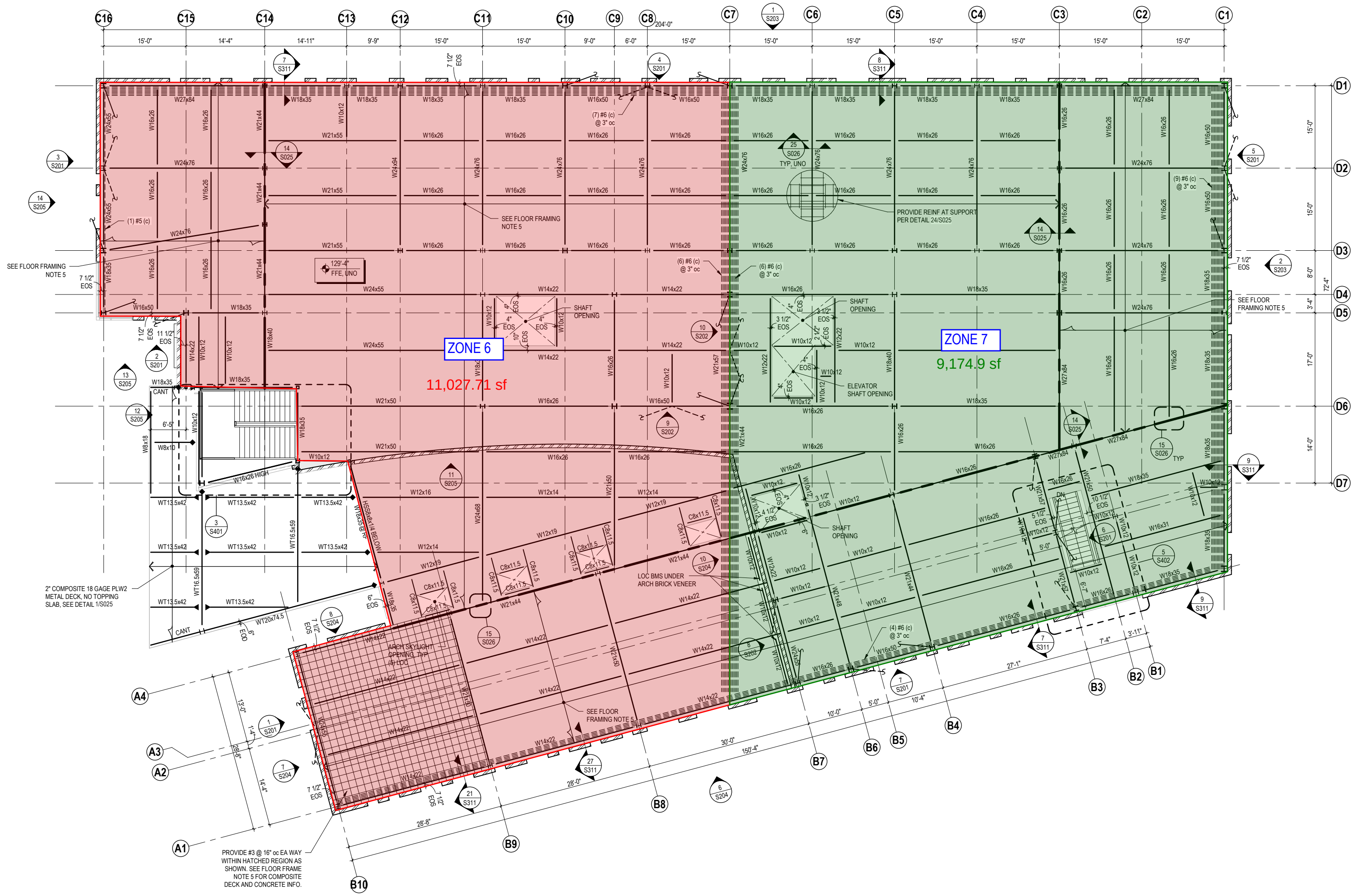
DESIGNATES MECHANICAL, ELECTRICAL, AND/OR PLUMBING EQUIPMENT. COORDINATE SIZE AND LOCATION WITH MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER. PROVIDE HOUSEKEEPING PAD AS REQUIRED BY MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER.

FLOOR FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. 3" CONCRETE TOPPING OVER 2" COMPOSITE 18 GAGE METAL DECK w/ 6x6 W2.9xW2.9 WELDED WIRE FABRIC REINFORCING, UNLESS NOTED OTHERWISE. SEE DETAILS 1/S025 AND 24/S025.
6. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
7. COORDINATE SIZES AND LOCATIONS OF FLOOR AND ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAILS 9/S025 AND 10/S025 FOR OPENINGS IN COMPOSITE FLOOR DECK. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
8. INDICATES EXTENTS OF RECESSED CONCRETE SLABS. 1/2" RECESS UNO ON PLAN
9. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
10. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
11. STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
12. LOCALIZED SLOPE TO DRAIN. PROVIDE MAXIMUM 2% SLOPE TO DRAIN WITHIN 1'-0" RADIUS AROUND DRAIN
13. REFER TO SHEET S501 FOR SNOW DRIFT LOADING. DESIGN JOISTS FOR ADDITIONAL LOAD COMBINATIONS INCLUDING DRIFTED SNOW LOADS IN ADDITION TO DISTRIBUTED SNOW LOAD

ROOF FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
6. COORDINATE SIZES AND LOCATIONS OF ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
   STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
7. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
8. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
9. EQUIPMENT SHALL NOT BE SUPPORTED FROM ROOF DECK. EQUIPMENT CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUPPLEMENTAL SUPPORT SPANNING BETWEEN PRIMARY STRUCTURAL MEMBERS FOR SUPPORT OF EQUIPMENT
10. REFER TO SHEET S501 FOR SNOW DRIFT LOADING



LEVEL 3 - FRAMING PLAN / LOW ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

integrus ARCHITECTURE

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/03/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

LEVEL 3 FRAMING PLAN / LOW ROOF FRAMING PLAN

S103

PROGRESS SET

BEAM END CONNECTIONS

1. BEAMS MARKED WITH (c) ARE SEISMIC COLLECTORS. THESE BEAMS ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.

TYPICAL BEAM/GIRDER TO COLUMN:	TYPICAL BEAM/GIRDER BOLTED CONNECTION:	TYPICAL COLLECTOR CONNECTION AT COLUMNS:	TYPICAL COLLECTOR CONNECTION AT BEAMS:
11 / S026	25 / S026	14 / S026	4 / S026

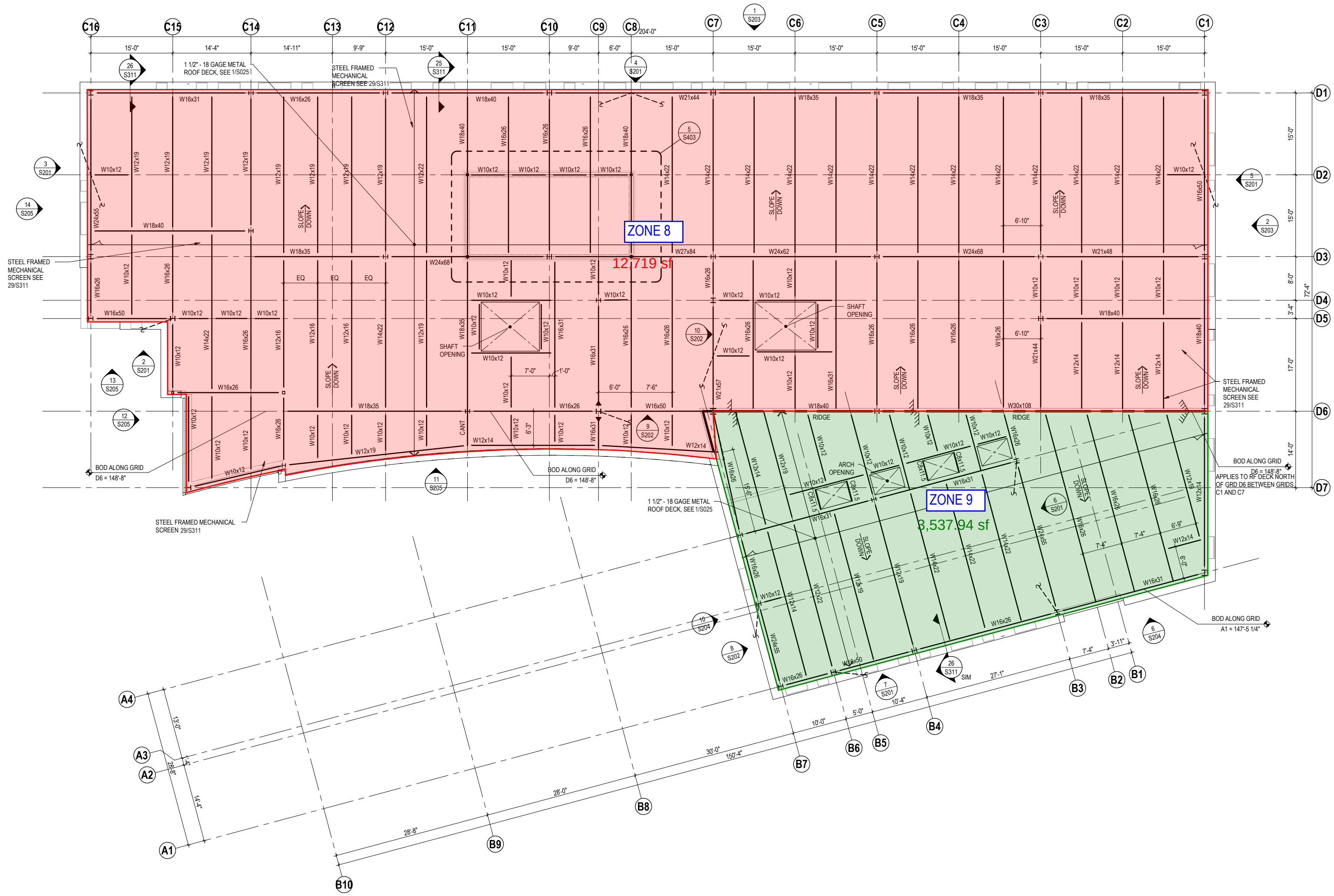
KEY FRAMING NOTES

DESIGNATES CHANGE IN FLOOR OR ROOF DECK DIRECTION, SEE PLAN FOR SPAN DIRECTION

DESIGNATES MECHANICAL, ELECTRICAL, AND/OR PLUMBING EQUIPMENT. COORDINATE SIZE AND LOCATION WITH MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER. PROVIDE HOUSEKEEPING PAD AS REQUIRED BY MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER.

ROOF FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
6. COORDINATE SIZES AND LOCATIONS OF ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
   STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
7. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
8. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
9. EQUIPMENT SHALL NOT BE SUPPORTED FROM ROOF DECK. EQUIPMENT CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUPPLEMENTAL SUPPORT SPANNING BETWEEN PRIMARY STRUCTURAL MEMBERS FOR SUPPORT OF EQUIPMENT
10. REFER TO SHEET S501 FOR SNOW DRIFT LOADING



ROOF FRAMING PLAN
SCALE: 1/8" = 1'-0"

integrus
ARCHITECTURE

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/03/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

ROOF FRAMING PLAN

S104

PROGRESS SET

BEAM END CONNECTIONS

1. BEAMS MARKED WITH (c) ARE SEISMIC COLLECTORS. THESE BEAMS ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.

TYPICAL BEAM/GIRDER TO COLUMN:	TYPICAL BEAM/GIRDER BOLTED CONNECTION:	TYPICAL COLLECTOR CONNECTION AT COLUMNS:	TYPICAL COLLECTOR CONNECTION AT BEAMS:
11 / S026	25 / S026	14 / S026	4 / S026

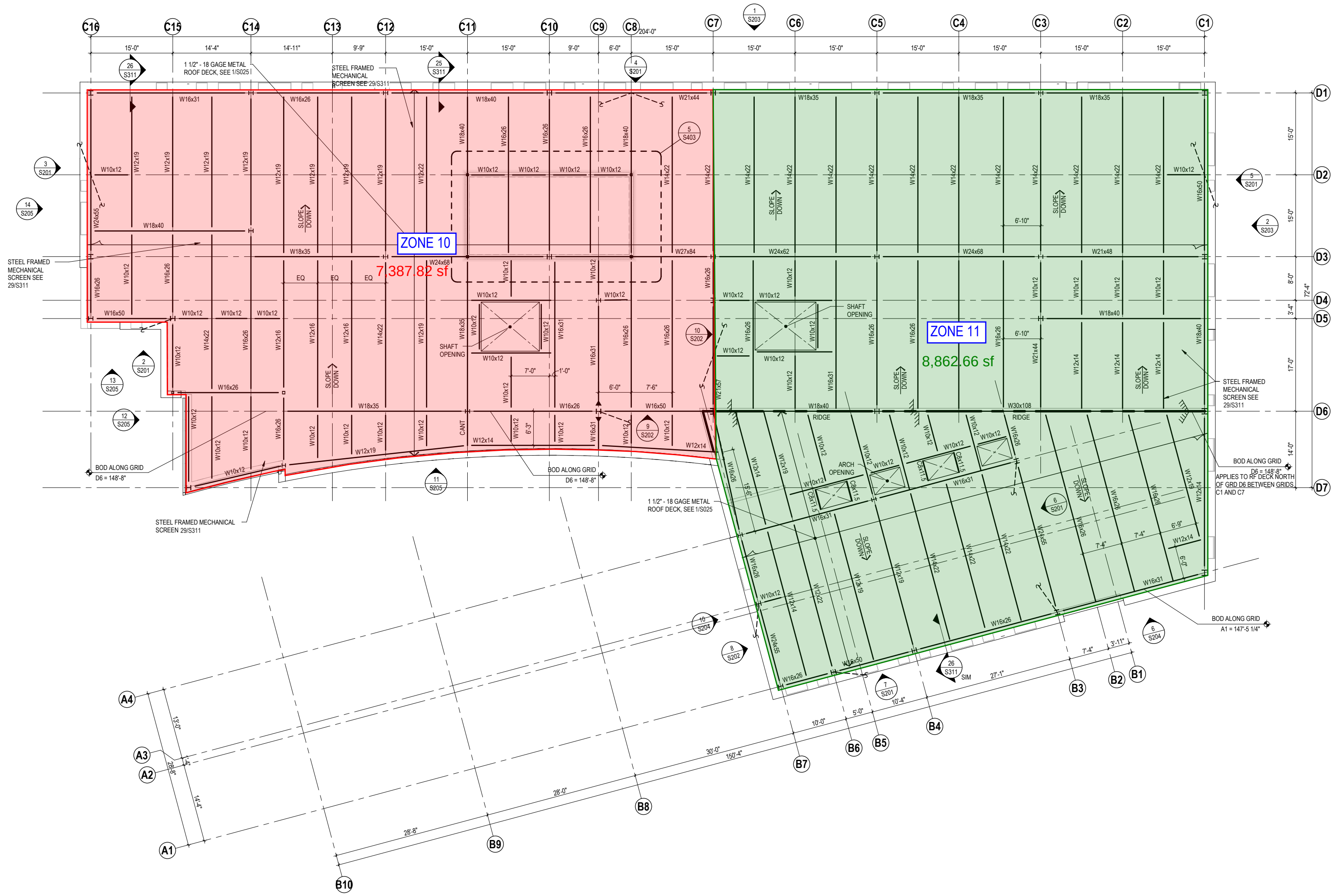
KEY FRAMING NOTES

DESIGNATES CHANGE IN FLOOR OR ROOF DECK DIRECTION, SEE PLAN FOR SPAN DIRECTION

DESIGNATES MECHANICAL, ELECTRICAL, AND/OR PLUMBING EQUIPMENT. COORDINATE SIZE AND LOCATION WITH MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER. PROVIDE HOUSEKEEPING PAD AS REQUIRED BY MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER.

ROOF FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
6. COORDINATE SIZES AND LOCATIONS OF ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
   STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
7. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
8. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
9. EQUIPMENT SHALL NOT BE SUPPORTED FROM ROOF DECK. EQUIPMENT CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUPPLEMENTAL SUPPORT SPANNING BETWEEN PRIMARY STRUCTURAL MEMBERS FOR SUPPORT OF EQUIPMENT
10. REFER TO SHEET S501 FOR SNOW DRIFT LOADING



ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

integrus ARCHITECTURE

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/03/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

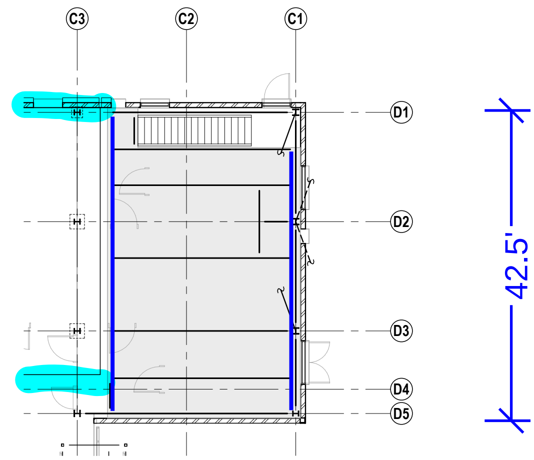
#	Date	Description

ROOF FRAMING PLAN

S104

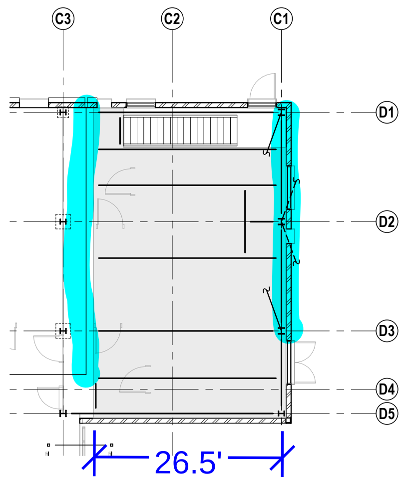
PROGRESS SET

Mezzanine Chords, X - direction



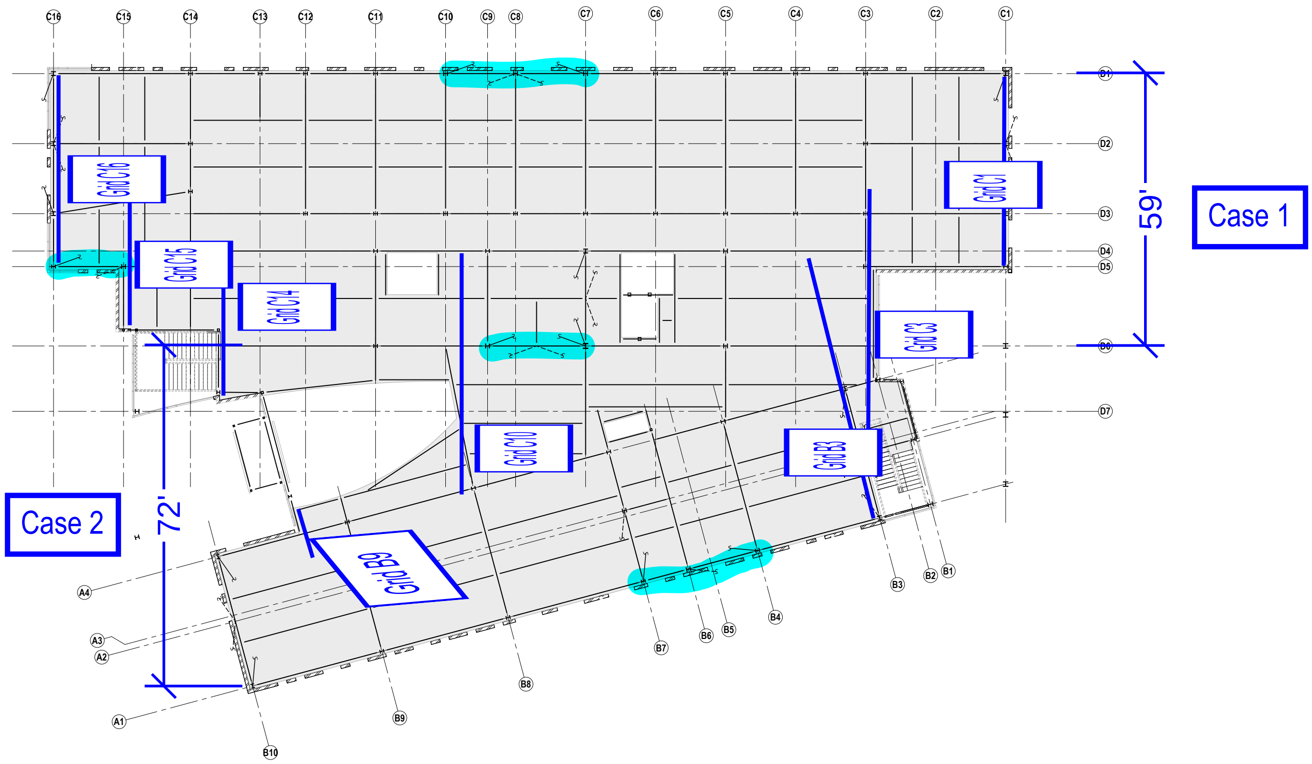
PRCNC20221036

Mezzanine Chords, Y - direction

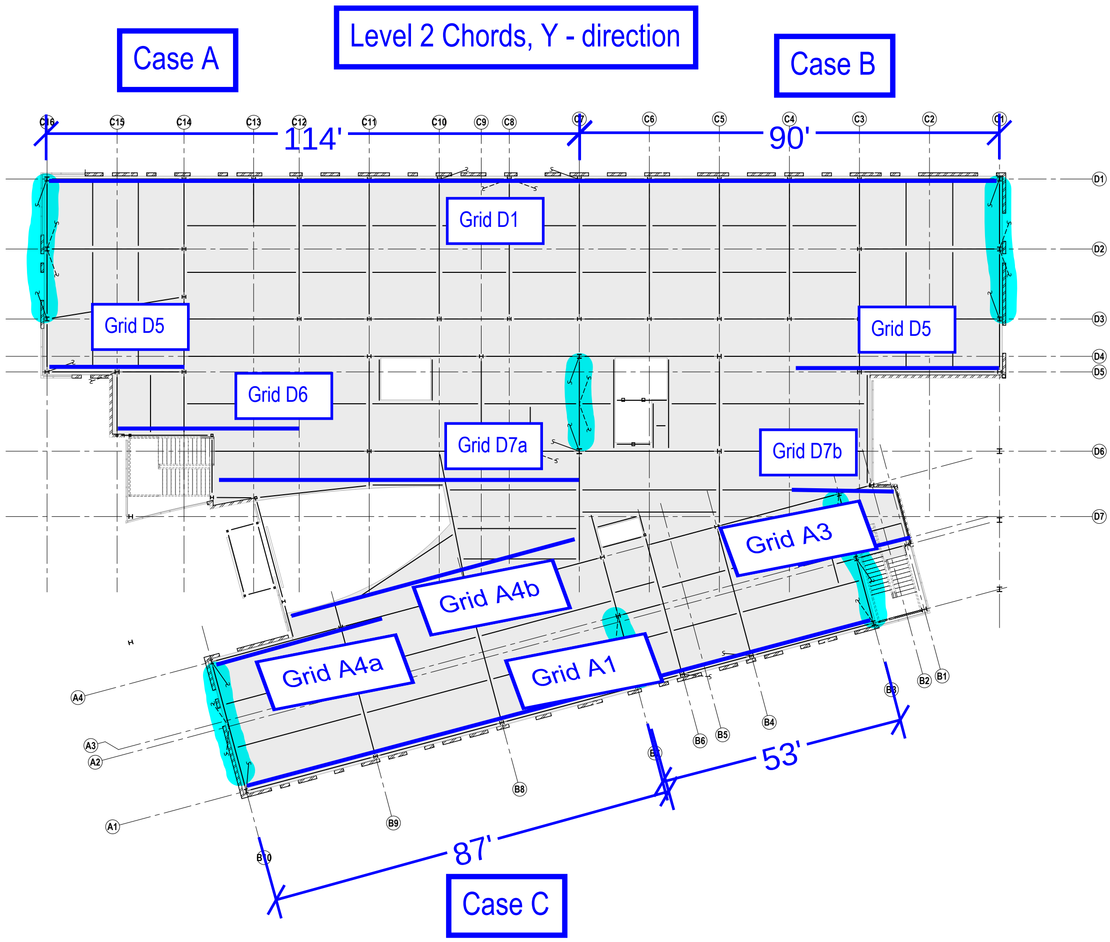


PRCNC20221036

Level 2 Chords, X - direction

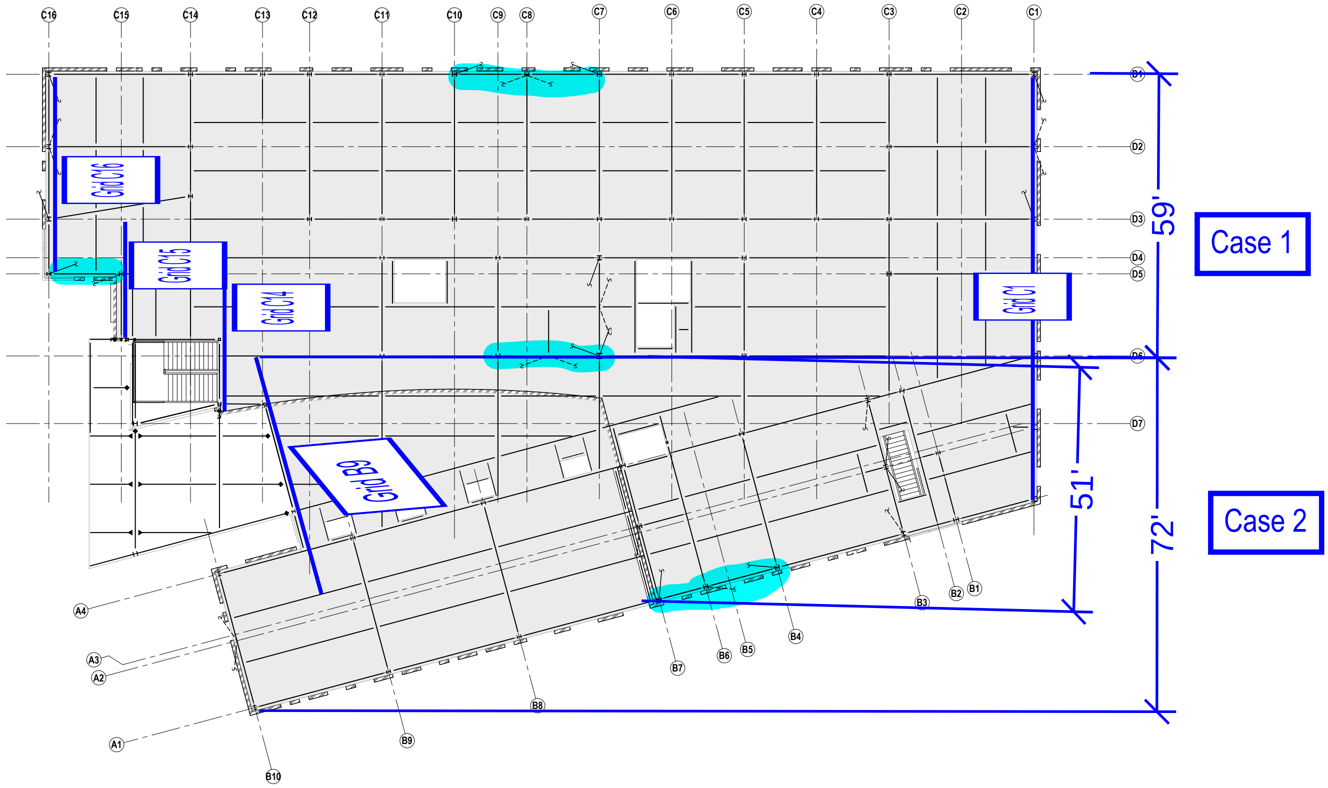


PRCNC20221036

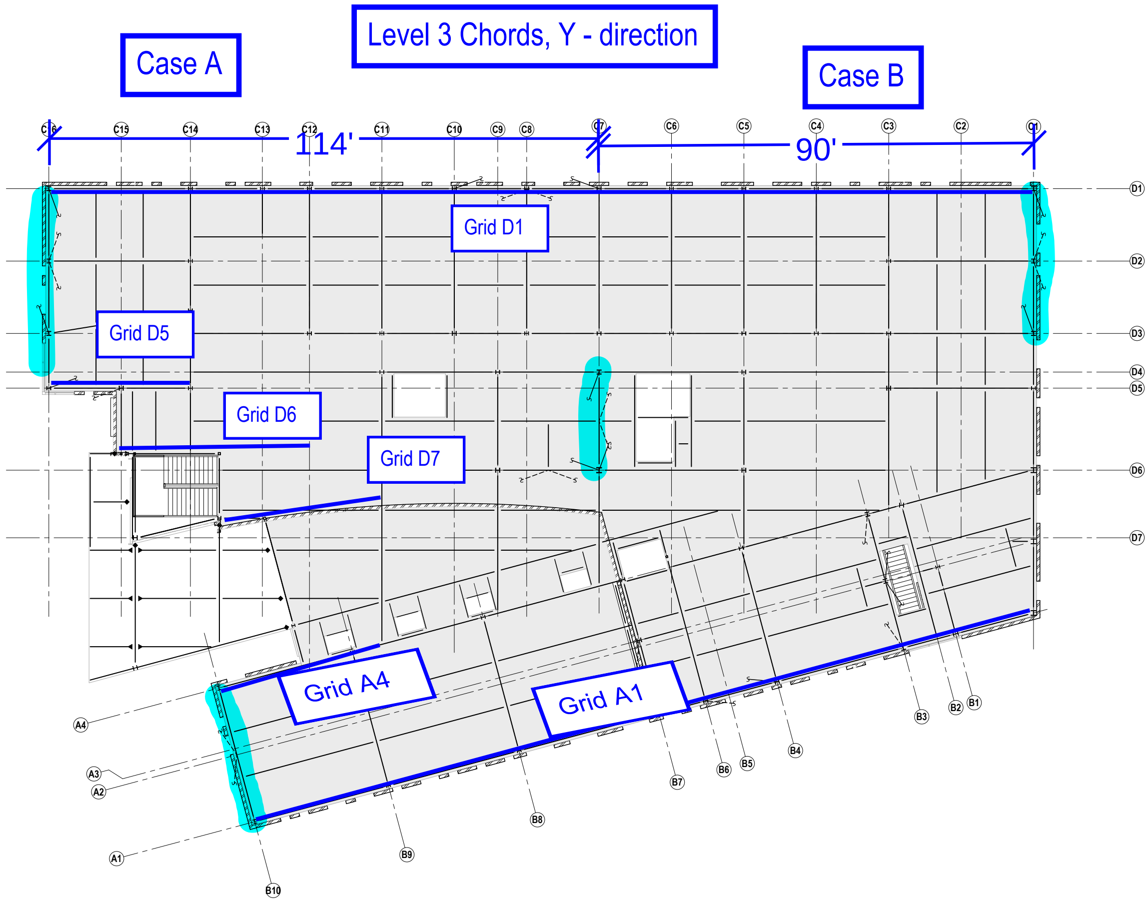


PRCNC20221036

Level 3 Chords, X - direction

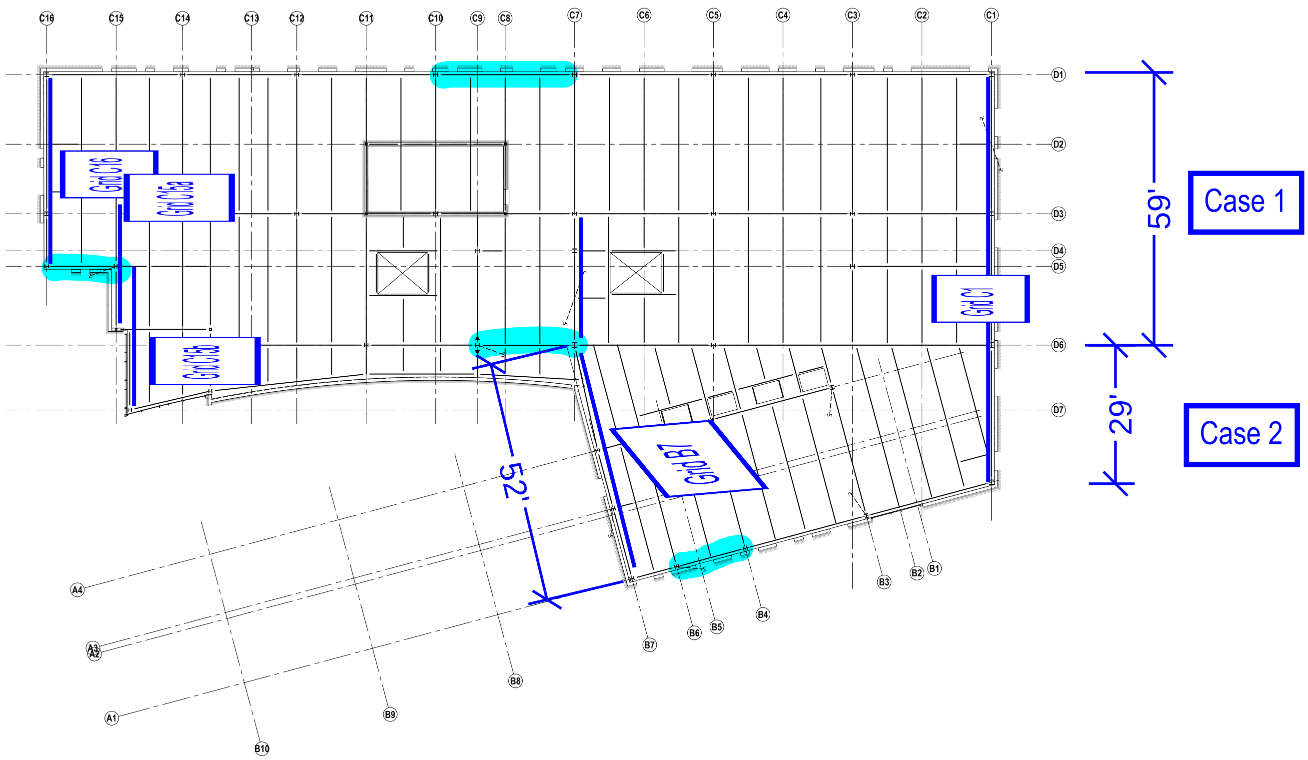


PRCNC20221036

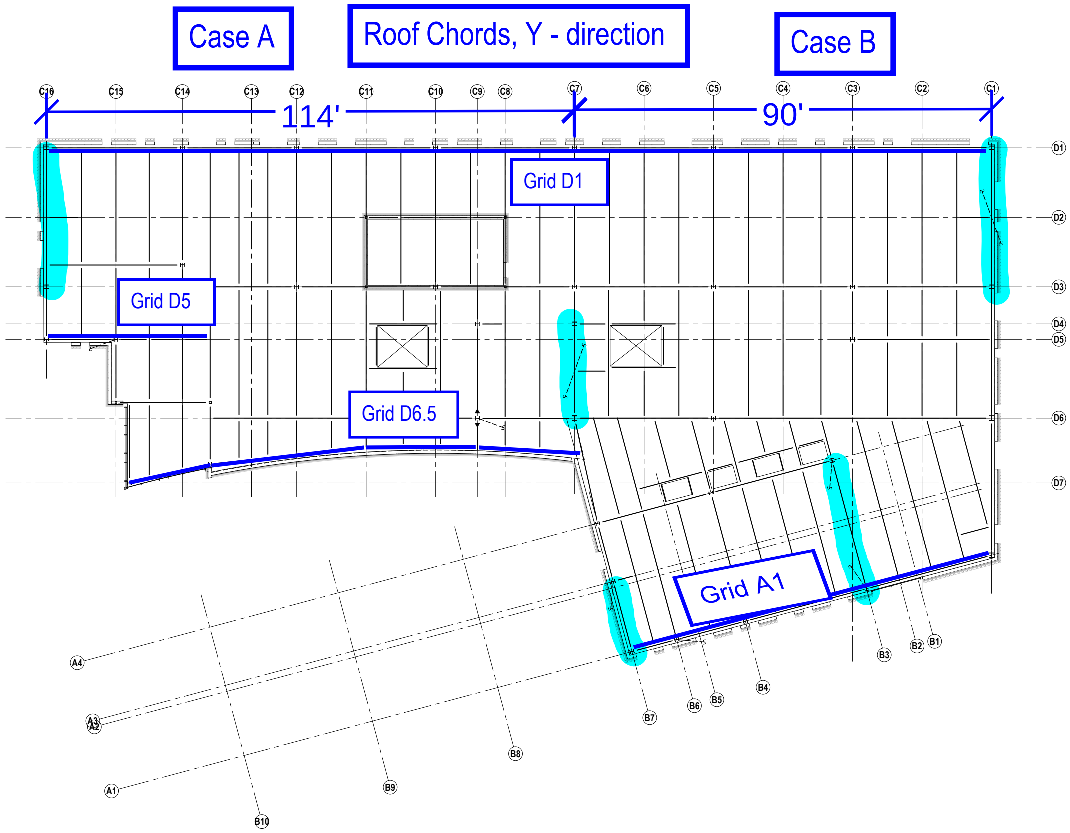


PRCNC20221036

Roof Chords, X - direction



PRCNC20221036



PRCNC20221036

Level	Story Force (k)	Area (SF)	Zone 1 Area (SF)	Zone 2 Area (SF)	Zone 3 Area (SF)	Zone 4 Area (SF)	Zone 5 Area (SF)	Zone 6 Area (SF)	Zone 7 Area (SF)	Zone 8 Area (SF)	Zone 9 Area (SF)	Zone 10 Area (SF)	Zone 11 Area (SF)	Zone 12 Area (SF)	Zone 13 Area (SF)
Mezzanine	75	1126	-	-	-	-	-	-	-	-	-	-	-	-	-
Level 2	604	18116	11813.00	6303	7125	7522.00	3452	-	-	-	-	-	-	-	-
Level 3	705	20203	-	-	-	-	-	11028	9175	-	-	-	-	11788	8415
Roof	470	16257	-	-	-	-	-	-	-	12719	3538	7388	8863	-	-

Mezzanine

Chord	Load Case	Direction	Zone	Zone Area	Zone Story Force	Zone Width	Load (k/ft)	Length (ft)	Depth (ft)	Moment (k-ft)	Chord Force (k)	Bar Area (in^2)	Redundancy, if required (rho)	Minimum Required Bars	Diaphragm Capacity (plf)	Minimum Bar extension into diaphragm (ft) at reentrant corners
Grid C1+ C3	-	X	-	1126	75	42.5	1.76	42.5	26.5	398	15	0.31	1.3	2	4805	5
Grid D1 + D5	-	Y	-	1126	75	26.5	2.83	26.5	42.5	248	6	0.31	1.3	1	4805	2

Level 2

Chord	Load Case	Direction	Zone	Zone Area	Zone Story Force	Zone Width	Load (k/ft)	Length (ft)	Depth (ft)	Moment (k-ft)	Chord Force (k)	Bar Area (in^2)	Redundancy, if required (rho)	Minimum Required Bars	Diaphragm Capacity (plf)	Minimum Bar extension into diaphragm (ft) at reentrant corners	Notes
Grid C16	Case 1	X	1	11813.00	394	59	6.68	59	204	2905	14	0.31	1.3	2	4805	4	Collector Bars work at Grid D16
Grid C15 + C3	Case 1	X	1	11813.00	394	59	6.68	59	161	2905	18	0.31	1.3	2	4805	5	
Grid 14	Case 1	X	1	11813.00	394	59	6.68	59	140	2905	21	0.31	1.3	2	4805	6	
Grid B9	Case 2	X	2	6303.00	210	34	6.18	72	127	4005	32	0.31	1.3	3	4805	9	
Grid C10 + C3 + B3	Case 2	X	2	6303.00	210	34	6.18	72	91	4005	44	0.31	1.3	4	4805	12	
Grid D1 +D7a	Case A	Y	3	7125.00	238	114	2.08	114	67	3385	51	0.31	1.3	4	4805	11	Collector Bars work at Grid D1
Grid D6	Case A	Y	3	7125.00	238	114	2.08	114	54	3385	63	0.31	1.3	5	4805	14	
Grid D5	Case A	Y	3	7125.00	238	114	2.08	114	41	3385	83	0.31	1.3	7	4805	18	Collector Bars work at Grid D5
Grid D7b	Case B	Y	4	7522.00	251	90	2.79	90	65	2821	43	0.31	1.3	4	4805	10	
Grid D5	Case B	Y	4	7522.00	251	90	2.79	90	42	2508	60	0.31	1.3	5	4805	13	Moment Calculated at location of reentrant corner, 30'
Grid A3	Case B	Y	4	7522.00	251	90	2.79	90	81	2821	35	0.31	1.3	3	4805	8	
Grid D1 + A1	Case B	Y	4	7522.00	251	90	2.79	90	95	2821	30	0.31	1.3	3	4805	7	Collector Bars work at Grid D1 + A1
Grid D7a +A1	Case C	Y	5	3452.00	115	87	1.32	87	52	1252	24	0.31	1.3	2	4805	6	Chord Bars from D1 + D7a work
Grid A4b	Case C	Y	5	3452.00	115	87	1.32	87	33	1252	38	0.31	1.3	3	4805	8	
Grid A4a	Case C	Y	5	3452.00	115	88	1.31	87	29	1237	43	0.31	1.3	4	4805	9	

Level 3

Chord	Load Case	Direction	Zone	Zone Area	Zone Story Force	Zone Width	Load (k/ft)	Length (ft)	Depth (ft)	Moment (k-ft)	Chord Force (k)	Bar Area (in^2)	Redundancy, if required (rho)	Minimum Required Bars	Diaphragm Capacity (plf)	Minimum Bar extension into diaphragm (ft) at reentrant corners	Notes
Grid C16 + C1	Case 1	X	11	11788.00	411	59	6.97	59	204	3034	15	0.31	1.3	2	4805	5	Collector Bars work at Grid C1
Grid C15	Case 1	X	11	11788.00	411	59	6.97	59	189	3034	16	0.31	1.3	2	4805	5	
Grid C14	Case 1	X	11	11788.00	411	59	6.97	59	168	3034	18	0.31	1.3	2	4805	5	
Grid B9 + C1	Case 2	X	12	8415.00	294	51	5.76	72	151	3731	25	0.31	1.3	2	4805	7	
Grid D1 + A1	Case A	Y	6	11028.00	385	114	3.38	114	112	5484	49	0.31	1.3	4	4805	14	Collector Bars work at Grid D1 +A1
Grid D5	Case A	Y	6	11028.00	385	114	3.38	114	41	2506	61	0.31	1.3	5	4805	17	Moment Calculated at location of reentrant corner, 15'
Grid D6	Case A	Y	6	11028.00	385	114	3.38	114	54	5484	102	0.44	1.3	6	4805	28	
Grid D7	Case A	Y	6	11028.00	385	114	3.38	114	68	5484	81	0.44	1.3	5	4805	22	
Grid A4	Case A	Y	6	11028.00	385	75	5.13	75	28	2730	97	0.44	1.3	6	4805	27	Moment Calculated at location of reentrant corner, 19'
Grid D1 +A1	Case B	Y	7	9175.00	320	90	3.56	90	88	3602	41	0.31	1.3	4	4805	12	Collector Bars work at Grid D1 +A1

Roof

Chord	Load Case	Direction	Zone	Zone Area	Zone Story Force	Zone Width	Load (k/ft)	Length (ft)	Depth (ft)	Moment (k-ft)	Chord Force (k)	Redundancy, if required (rho)	Design Chord Force (k)	Diaphragm Capacity (plf)	Minimum chord extension in diaphragm (ft) at reentrant corners	Notes
Grid C16 + C1	Case 1	X	8	12719.00	368	59	6.23	59	204	2712	13	1.3	17.3	3243	6	Collector Force controls design
Grid C15a	Case 1	X	8	12719.00	368	59	6.23	59	189	2712	14	1.3	18.7	3243	6	
Grid C15b	Case 1	X	8	12719.00	368	59	6.23	59	186	2712	15	1.3	19.0	3243	6	
Grid B7 + C1	Case 2	X	9	3538.00	102	29	3.53	52	80	1192	15	1.3	19.4	3243	6	Collector Force controls design at C1
Grid D1 + D6.5	Case A	Y	10	7388.00	214	114	1.87	114	64	3044	48	1.3	61.8	3243	20	Collector Force controls design at D1
Grid D5	Case A	Y	10	7388.00	214	114	1.87	114	41	1391	34	1.3	44.1	3243	14	Moment Calculated at location of reentrant corner, 15'
Grid D1 + A1	Case B	Y	11	8863.00	256	90	2.85	90	88	2883	33	1.3	42.6	3243	14	Collector Force controls design

Chord design compared to collector design. Final design was based on worst case.
See collector beam calculations for beam design and connection design

integrus
ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Lateral Load Resisting System -
Horizontal Elements - Collectors

PRCNC20221036

BEAM END CONNECTIONS

1. BEAMS MARKED WITH (c) ARE SEISMIC COLLECTORS. THESE BEAMS ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.

TYPICAL BEAM/GIRDER TO COLUMN:	TYPICAL BEAM/GIRDER BOLTED CONNECTION:	TYPICAL COLLECTOR CONNECTION AT COLUMNS:	TYPICAL COLLECTOR CONNECTION AT BEAMS:
11 / S026	25 / S026	14 / S026	4 / S026

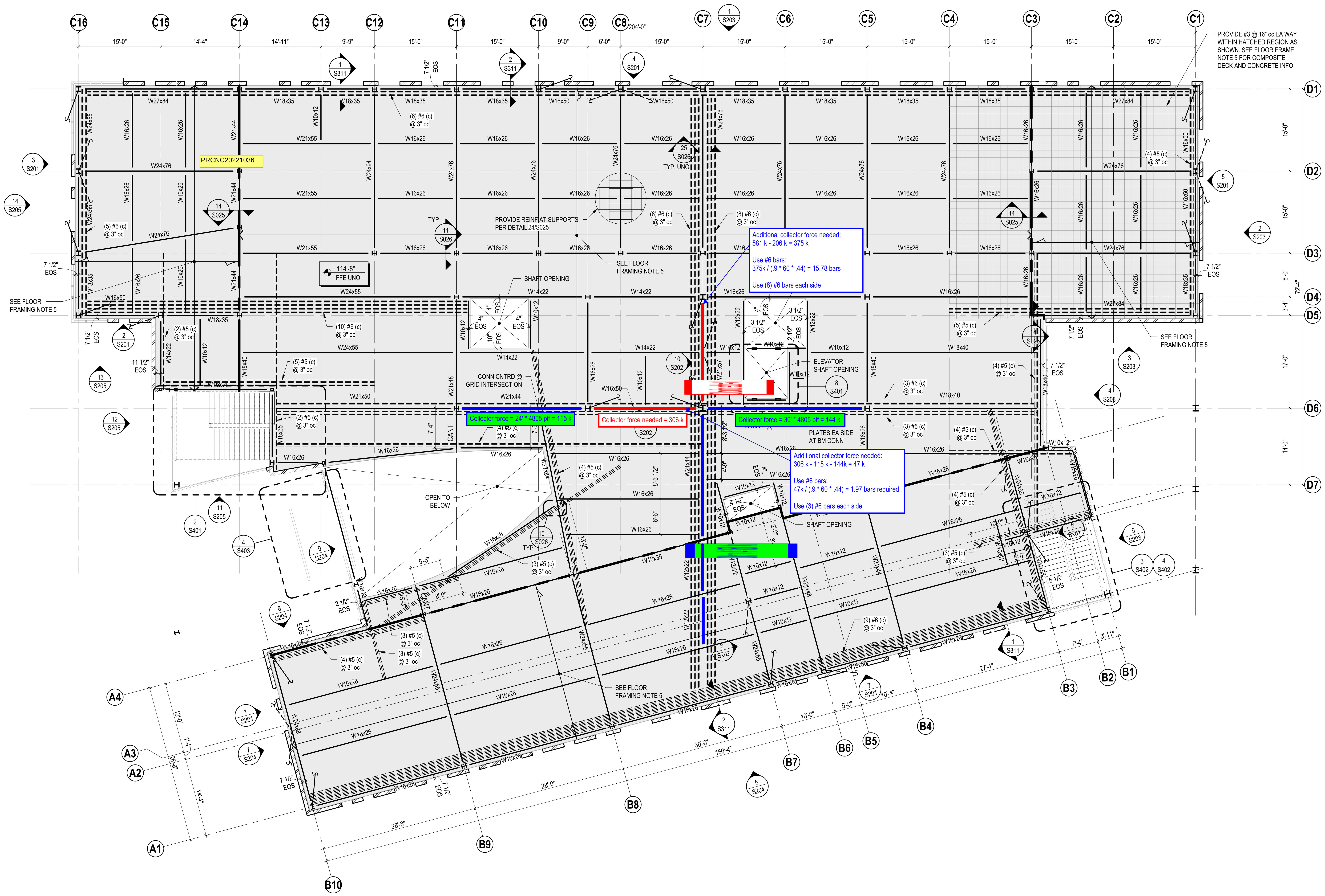
KEY FRAMING NOTES

DESIGNATES CHANGE IN FLOOR OR ROOF DECK DIRECTION, SEE PLAN FOR SPAN DIRECTION

DESIGNATES MECHANICAL, ELECTRICAL, AND/OR PLUMBING EQUIPMENT. COORDINATE SIZE AND LOCATION WITH MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER. PROVIDE HOUSEKEEPING PAD AS REQUIRED BY MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER.

FLOOR FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. 3" CONCRETE TOPPING OVER 2" COMPOSITE 18 GAGE METAL DECK w/ 6x6 W2.9xW2.9 WELDED WIRE FABRIC REINFORCING, UNLESS NOTED OTHERWISE. SEE DETAILS 1/S025 AND 24/S025.
6. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
7. COORDINATE SIZES AND LOCATIONS OF FLOOR AND ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAILS 9/S025 AND 10/S025 FOR OPENINGS IN COMPOSITE FLOOR DECK. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
8. INDICATES EXTENTS OF RECESSED CONCRETE SLABS. 1/2" RECESS UNO ON PLAN
9. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
10. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
11. STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
12. LOCALIZED SLOPE TO DRAIN. PROVIDE MAXIMUM 2% SLOPE TO DRAIN WITHIN 1'-0" RADIUS AROUND DRAIN
13. REFER TO SHEET S501 FOR SNOW DRIFT LOADING. DESIGN JOISTS FOR ADDITIONAL LOAD COMBINATIONS INCLUDING DRIFTED SNOW LOADS IN ADDITION TO DISTRIBUTED SNOW LOAD



LEVEL 2 - FRAMING PLAN

SCALE: 1/8" = 1'-0"

integrus ARCHITECTURE

117 SOUTH MAIN STREET, SUITE 100, SEATTLE, WA. 98104
TELEPHONE: (206)628-3137 FAX: (206)628-3138

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/10/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

LEVEL 2 FRAMING PLAN

S102

BUILDING PERMIT SET

BEAM END CONNECTIONS

1. BEAMS MARKED WITH (c) ARE SEISMIC COLLECTORS. THESE BEAMS ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.

TYPICAL BEAM/GIRDER TO COLUMN:	TYPICAL BEAM/GIRDER BOLTED CONNECTION:	TYPICAL COLLECTOR CONNECTION AT COLUMNS:	TYPICAL COLLECTOR CONNECTION AT BEAMS:
11 / S026	25 / S026	14 / S026	4 / S026

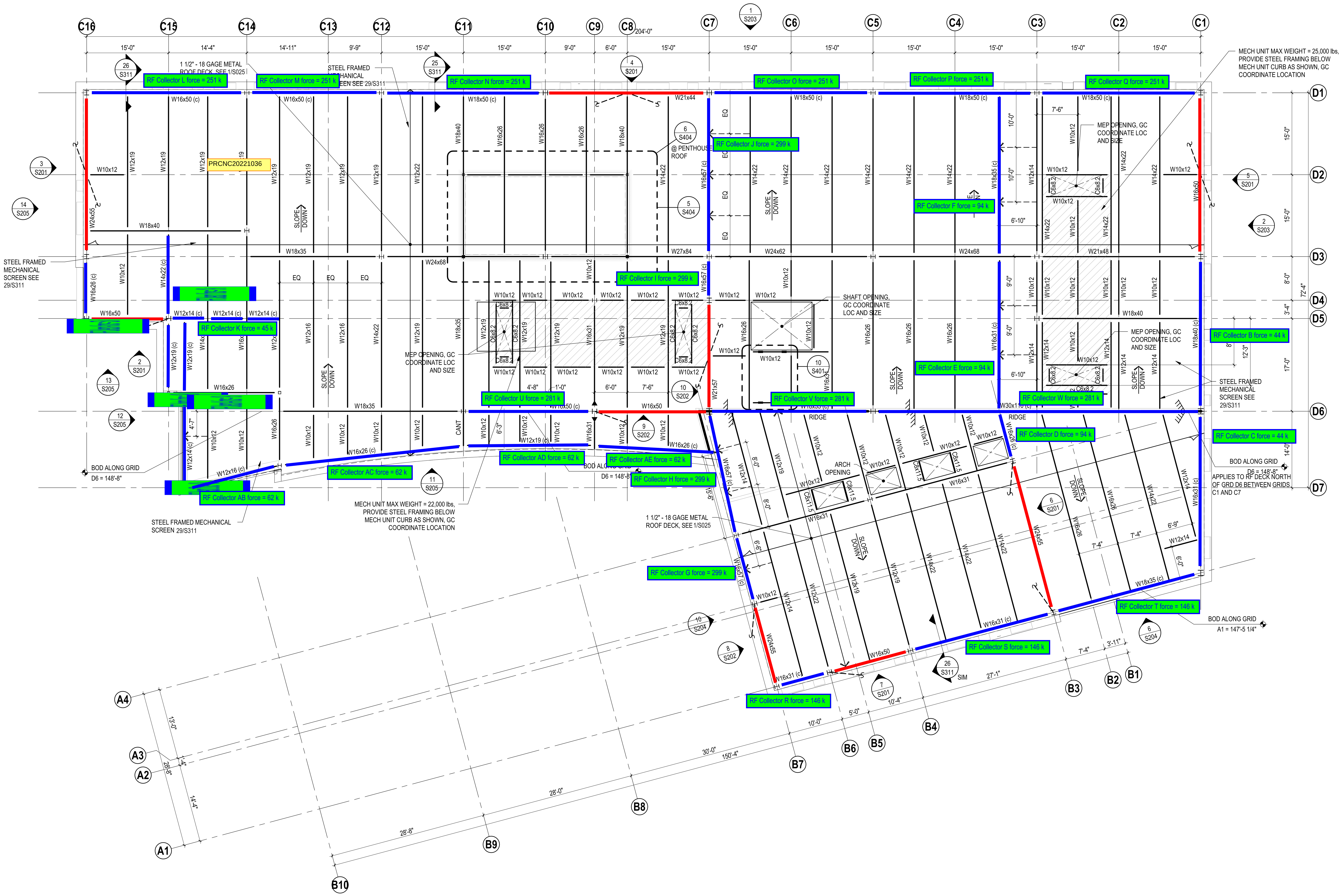
KEY FRAMING NOTES

DESIGNATES CHANGE IN FLOOR OR ROOF DECK DIRECTION, SEE PLAN FOR SPAN DIRECTION

DESIGNATES MECHANICAL, ELECTRICAL, AND/OR PLUMBING EQUIPMENT. COORDINATE SIZE AND LOCATION WITH MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER. PROVIDE HOUSEKEEPING PAD AS REQUIRED BY MEP DESIGN TEAM AND EQUIPMENT MANUFACTURER.

ROOF FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
6. COORDINATE SIZES AND LOCATIONS OF ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
   STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
7. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
8. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
9. EQUIPMENT SHALL NOT BE SUPPORTED FROM ROOF DECK. EQUIPMENT CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUPPLEMENTAL SUPPORT SPANNING BETWEEN PRIMARY STRUCTURAL MEMBERS FOR SUPPORT OF EQUIPMENT
10. REFER TO SHEET S501 FOR SNOW DRIFT LOADING



ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

integrus ARCHITECTURE

117 SOUTH MAIN STREET, SUITE 100, SEATTLE, WA. 98104
TELEPHONE: (206)628-3137 FAX: (206)628-3138

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/10/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

ROOF FRAMING PLAN

S104

BUILDING PERMIT SET

Steel collector/chord beams designed in Enercalc for biaxial bending.

Gravity loads on the beams were extracted from the RAM SS model to be include in the individual beam calculations.

Steel Column

DESCRIPTION: L2, Frame 9, East collector beam 30'

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W16x57**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 30.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 7.333 ft, 19.083 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 30.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 1,710.0 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 30.0 ft, Yecc = 8.20 in, E = 144.0 k
BENDING LOADS . . .
Lat. Uniform Load from 0.0-->7.333 ft creating Mx-x, D = 0.70, L = 0.80 k/ft
Lat. Uniform Load from 7.333-->19.166 ft creating Mx-x, D = 0.50, L = 0.60 k/ft
Lat. Uniform Load from 19.166-->30.0 ft creating Mx-x, D = 0.70, L = 0.80 k/ft
Lat. Point Load at 7.333 ft creating Mx-x, D = 2.20, L = 2.40 k
Lat. Point Load at 15.833 ft creating Mx-x, D = 0.80, L = 0.90 k
Lat. Point Load at 19.167 ft creating Mx-x, D = 3.20, L = 3.60 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.8829**	: 1
Load Combination	+1.20D+1.60L	
Location of max.above base	15.906	ft
At maximum location values are . . .		
Pu	2.052	k
0.9 * Pn	428.466	k
Mu-x	294.673	k-ft
0.9 * Mn-x :	334.682	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	70.875	k-ft
PASS Maximum Shear Stress Ratio =	**0.1789**	: 1
Load Combination	+1.20D+1.60L	
Location of max.above base	30.0	ft
At maximum location values are . . .		
Vu : Applied	37.857	k
Vn * Phi : Allowable	211.560	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	26.776	k
Bottom along Y-Y	26.591	k

Maximum Load Deflections . . .

Along Y-Y 1.550 in at 15.302 ft above base
for load combination : +D+L

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios Stress Ratio	Status	Location
+1.40D	0.407	PASS	15.91 ft	1.04	1.00	88.13	53.57	0.082	PASS	30.00 ft
+1.20D+1.60L	0.883	PASS	15.91 ft	1.04	1.00	88.13	53.57	0.179	PASS	30.00 ft
+1.20D+L	0.683	PASS	15.91 ft	1.04	1.00	88.13	53.57	0.138	PASS	30.00 ft
+1.20D	0.349	PASS	15.91 ft	1.04	1.00	88.13	53.57	0.071	PASS	30.00 ft
+0.90D	0.262	PASS	15.91 ft	1.04	1.00	88.13	53.57	0.053	PASS	30.00 ft
+1.20D+L+E	0.810	PASS	14.70 ft	1.04	1.00	88.13	53.57	0.154	PASS	30.00 ft
+0.90D+E	0.536	PASS	30.00 ft	1.47	1.00	81.88	53.57	0.069	PASS	30.00 ft

PRCNC20221036

Steel Column

DESCRIPTION: L2, Frame 9, East collector beam 30'

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only	1.710			12.374	12.459				
+D+L	1.710			26.591	26.776				
+D+0.750L	1.710			23.037	23.197				
+0.60D	1.026			7.424	7.476				
+D+0.70E	102.510			10.078	14.755				
+D+0.750L+0.5250E	77.310			21.315	24.919				
+0.60D+0.70E	101.826			5.128	9.772				
L Only				14.217	14.316				
E Only	144.000			-3.280	3.280				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	144.000			-3.280	3.280		-98.400		
"	Minimum				14.217	14.316				
Reaction, X-X Axis Base	Maximum	1.710			12.374	12.459				
"	Minimum	1.710			12.374	12.459				
Reaction, Y-Y Axis Base	Maximum	1.710			26.591	26.776				
"	Minimum	144.000			-3.280	3.280		-98.400		
Reaction, X-X Axis Top	Maximum	1.710			12.374	12.459				
"	Minimum	1.710			12.374	12.459				
Reaction, Y-Y Axis Top	Maximum	1.710			12.374	12.459				
"	Minimum	144.000			-3.280	3.280		-98.400		
Moment, X-X Axis Base	Maximum	1.710			12.374	12.459				
"	Minimum	1.710			12.374	12.459				
Moment, Y-Y Axis Base	Maximum	1.710			12.374	12.459				
"	Minimum	1.710			12.374	12.459				
Moment, X-X Axis Top	Maximum	1.710			12.374	12.459				
"	Minimum	144.000			-3.280	3.280		-98.400		
Moment, Y-Y Axis Top	Maximum	1.710			12.374	12.459				
"	Minimum	1.710			12.374	12.459				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.720	in	15.302	ft
+D+L	0.0000	in	0.000	ft	1.550	in	15.302	ft
+D+0.750L	0.0000	in	0.000	ft	1.343	in	15.302	ft
+0.60D	0.0000	in	0.000	ft	0.432	in	15.302	ft
+D+0.70E	0.0000	in	0.000	ft	0.416	in	13.893	ft
+D+0.750L+0.5250E	0.0000	in	0.000	ft	1.112	in	14.899	ft
+0.60D+0.70E	0.0000	in	0.000	ft	0.135	in	11.879	ft
L Only	0.0000	in	0.000	ft	0.830	in	15.302	ft
E Only	0.0000	in	0.000	ft	-0.450	in	17.517	ft

Steel Section Properties : W16x57

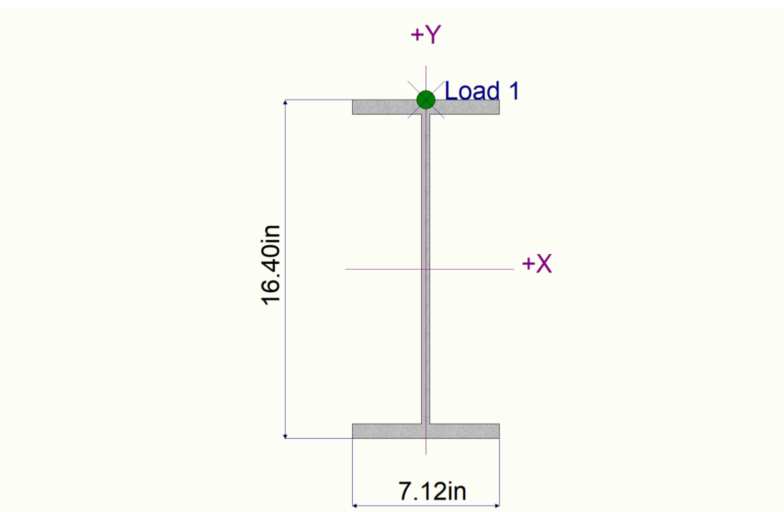
Steel Column

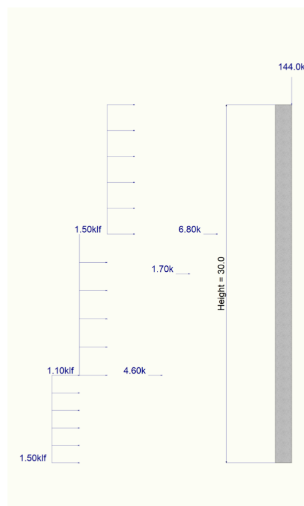
DESCRIPTION: L2, Frame 9, East collector beam 30'

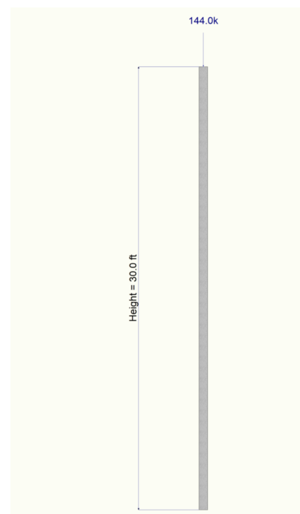
Steel Section Properties : W16x57

Depth	=	16.400	in	I xx	=	758.00	in^4	J	=	2.220	in^4
Web Thick	=	0.430	in	S xx	=	92.20	in^3	Cw	=	2,660.00	in^6
Flange Width	=	7.120	in	R xx	=	6.720	in				
Flange Thick	=	0.715	in	Zx	=	105.000	in^3				
Area	=	16.800	in^2	I yy	=	43.100	in^4				
Weight	=	57.000	plf	S yy	=	12.100	in^3	Wno	=	27.900	in^2
Kdesign	=	1.120	in	R yy	=	1.600	in	Sw	=	35.500	in^4
K1	=	0.875	in	Zy	=	18.900	in^3	Qf	=	18.800	in^3
rts	=	1.920	in					Qw	=	52.000	in^3
Ycg	=	0.000	in								

Sketches







PRCNC20221036

Steel Column

DESCRIPTION: L2, Frame 10, South Collector Beam 10'

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W12x40**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 10.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Unbraced Length for buckling ABOUT Y-Y Axis = 10.0 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 10.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 10.0 ft, Yecc = 5.950 in, E = 206.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10, L = 0.20 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.9394**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	9.933	ft
At maximum location values are . . .		
Pu	206.0	k
0.9 * Pn	398.017	k
Mu-x	-101.433	k-ft
0.9 * Mn-x :	213.750	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	63.0	k-ft
PASS Maximum Shear Stress Ratio =	**0.1131**	: 1
Load Combination	+1.401D+L+E	
Location of max.above base	10.0	ft
At maximum location values are . . .		
Vu : Applied	11.914	k
Vn * Phi : Allowable	105.315	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	10.214	k
Bottom along Y-Y	10.214	k

Maximum Load Deflections . . .

Along Y-Y -0.1283 in at 5.839 ft above base
for load combination : E Only

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.008	PASS	5.03 ft	1.67	1.00	61.86	23.39	0.007	PASS	0.00 ft
+1.20D+1.60L	0.026	PASS	4.97 ft	1.67	1.00	61.86	23.39	0.021	PASS	10.00 ft
+1.20D+L	0.019	PASS	4.97 ft	1.67	1.00	61.86	23.39	0.015	PASS	0.00 ft
+1.20D	0.007	PASS	5.03 ft	1.67	1.00	61.86	23.39	0.006	PASS	0.00 ft
+0.90D	0.005	PASS	4.97 ft	1.67	1.00	61.86	23.39	0.004	PASS	0.00 ft
+1.401D+L+E	0.939	PASS	9.93 ft	1.67	1.00	61.86	23.39	0.113	PASS	10.00 ft
+0.6994D+E	0.939	PASS	9.93 ft	1.67	1.00	61.86	23.39	0.100	PASS	10.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				0.500	0.500				
+D+L				1.500	1.500				
+D+0.750L				1.250	1.250				
+0.60D				0.300	0.300				
+D+0.70E	144.200			-6.650	7.650				
+D+0.750L+0.5250E	108.150			-4.112	6.612				
+0.60D+0.70E	144.200			-6.850	7.450				

PRCNC20221036

Steel Column

DESCRIPTION: L2, Frame 10, South Collector Beam 10'

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X @ Top	Y-Y Axis Reaction @ Base	Y-Y @ Top	Mx - End Moments k-ft @ Base	Mx @ Top	My - End Moments @ Base	My @ Top
L Only				1.000	1.000				
E Only	206.000			-10.214	10.214				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X @ Top	Y-Y Axis Reaction @ Base	Y-Y @ Top	Mx - End Moments k-ft @ Base	Mx @ Top	My - End Moments @ Base	My @ Top
Axial @ Base	Maximum	206.000			-10.214	10.214				
"	Minimum				0.500	0.500				
Reaction, X-X Axis Base	Maximum				0.500	0.500				
"	Minimum				0.500	0.500				
Reaction, Y-Y Axis Base	Maximum				1.500	1.500				
"	Minimum	206.000			-10.214	10.214				
Reaction, X-X Axis Top	Maximum				0.500	0.500				
"	Minimum				0.500	0.500				
Reaction, Y-Y Axis Top	Maximum				0.500	0.500				
"	Minimum	206.000			-10.214	10.214				
Moment, X-X Axis Base	Maximum				0.500	0.500				
"	Minimum				0.500	0.500				
Moment, Y-Y Axis Base	Maximum				0.500	0.500				
"	Minimum				0.500	0.500				
Moment, X-X Axis Top	Maximum				0.500	0.500				
"	Minimum				0.500	0.500				
Moment, Y-Y Axis Top	Maximum				0.500	0.500				
"	Minimum				0.500	0.500				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.003	in	5.034	ft
+D+L	0.0000	in	0.000	ft	0.008	in	5.034	ft
+D+0.750L	0.0000	in	0.000	ft	0.006	in	5.034	ft
+0.60D	0.0000	in	0.000	ft	0.002	in	5.034	ft
+D+0.70E	0.0000	in	0.000	ft	-0.087	in	5.839	ft
+D+0.750L+0.5250E	0.0000	in	0.000	ft	-0.061	in	5.906	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.088	in	5.839	ft
L Only	0.0000	in	0.000	ft	0.005	in	5.034	ft
E Only	0.0000	in	0.000	ft	-0.128	in	5.839	ft

Steel Section Properties : W12x40

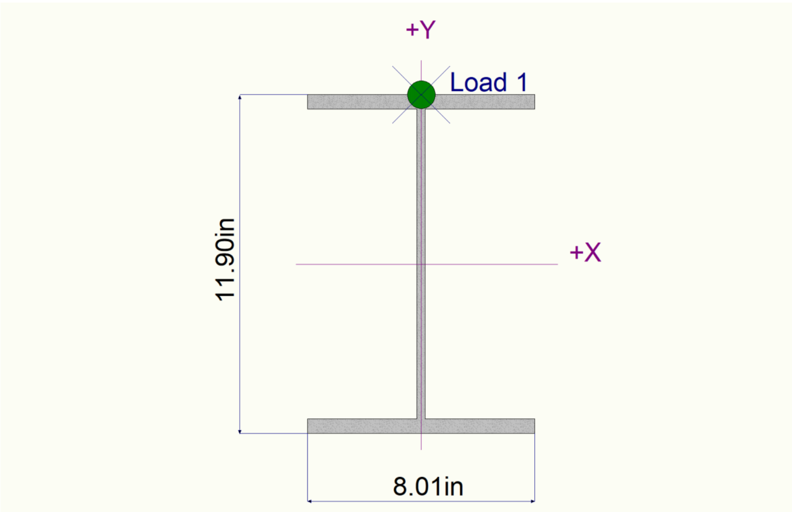
Depth	=	11.900	in	I xx	=	307.00	in^4	J	=	0.906	in^4
Web Thick	=	0.295	in	S xx	=	51.50	in^3	Cw	=	1,440.00	in^6
Flange Width	=	8.010	in	R xx	=	5.130	in				
Flange Thick	=	0.515	in	Zx	=	57.000	in^3				
Area	=	11.700	in^2	I yy	=	44.100	in^4				
Weight	=	40.000	plf	S yy	=	11.000	in^3	Wno	=	22.800	in^2
Kdesign	=	1.020	in	R yy	=	1.940	in	Sw	=	23.500	in^4
K1	=	0.875	in	Zy	=	16.800	in^3	Qf	=	11.300	in^3
rts	=	2.210	in					Qw	=	27.800	in^3
Ycg	=	0.000	in								

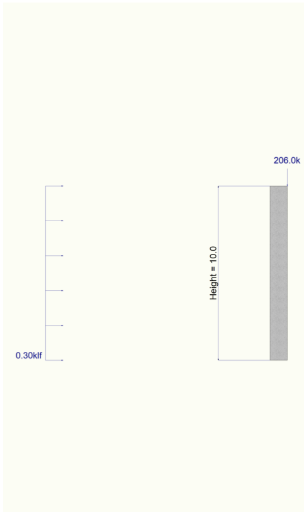
PRCNC20221036

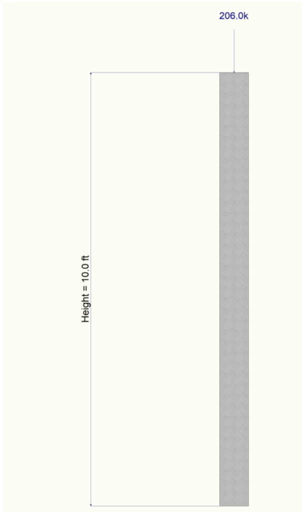
Steel Column

DESCRIPTION: L2, Frame 10, South Collector Beam 10'

Sketches







Steel Column

DESCRIPTION: RF Collector G, grid B7, braces required

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name :	**W18x55**	Overall Column Height	13.0 ft
Analysis Method :	Load Resistance Factor	Top & Bottom Fixity	Top & Bottom Pinned
Steel Stress Grade			
Fy : Steel Yield	50.0 ksi		
E : Elastic Bending Modulus	29,000.0 ksi		

Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 6.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 13.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 13.0 ft, Yecc = 9.050 in, E = 300.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.140, S = 0.10 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.9582**	: 1
Load Combination	+0.90D+E	
Location of max.above base	12.913	ft
At maximum location values are . . .		
Pu	300.0	k
0.9 * Pn	621.52	k
Mu-x	-224.661	k-ft
0.9 * Mn-x :	420.0	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	69.375	k-ft
PASS Maximum Shear Stress Ratio =	**0.08795**	: 1
Load Combination	+1.20D+0.20S+E	
Location of max.above base	13.0	ft
At maximum location values are . . .		
Vu : Applied	18.626	k
Vn * Phi : Allowable	211.770	k

Maximum Load Reactions . .

Top along X-X	0.0 k
Bottom along X-X	0.0 k
Top along Y-Y	17.404 k
Bottom along Y-Y	17.404 k

Maximum Load Deflections . . .

Along Y-Y -0.1656 in at 7.591 ft above base
for load combination : E Only

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.010	PASS	6.54 ft	1.29	1.00	46.71	21.05	0.006	PASS	0.00 ft
+1.20D	0.008	PASS	6.54 ft	1.29	1.00	46.71	21.05	0.005	PASS	0.00 ft
+1.20D+0.50S	0.011	PASS	6.46 ft	1.29	1.00	46.71	21.05	0.007	PASS	0.00 ft
+1.20D+1.60S	0.016	PASS	6.46 ft	1.29	1.00	46.71	21.05	0.010	PASS	0.00 ft
+0.90D	0.006	PASS	6.46 ft	1.29	1.00	46.71	21.05	0.004	PASS	0.00 ft
+1.20D+0.20S+E	0.958	PASS	12.91 ft	1.30	1.00	46.71	21.05	0.088	PASS	13.00 ft
+0.90D+E	0.958	PASS	12.91 ft	1.30	1.00	46.71	21.05	0.086	PASS	13.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				0.910	0.910				
+D+S				1.560	1.560				
+D+0.750S				1.398	1.398				
+0.60D				0.546	0.546				
+D+0.70E	210.000			-11.273	13.093				
+D+0.750S+0.5250E	157.500			-7.740	10.535				
+0.60D+0.70E	210.000			-11.637	12.729				

Steel Column

DESCRIPTION: RF Collector G, grid B7, braces required

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction	X-X Axis Reaction	k	Y-Y Axis Reaction		Mx - End Moments	k-ft	My - End Moments	
	@ Base	@ Base	@ Top	@ Base	@ Top	@ Base	@ Top	@ Base	@ Top
S Only				0.650	0.650				
E Only	300.000			-17.404	17.404				

Extreme Reactions

Item	Extreme Value	Axial Reaction	X-X Axis Reaction	k	Y-Y Axis Reaction		Mx - End Moments	k-ft	My - End Moments	
		@ Base	@ Base	@ Top	@ Base	@ Top	@ Base	@ Top	@ Base	@ Top
Axial @ Base	Maximum	300.000			-17.404	17.404				
"	Minimum				0.910	0.910				
Reaction, X-X Axis Base	Maximum				0.910	0.910				
"	Minimum				0.910	0.910				
Reaction, Y-Y Axis Base	Maximum				1.560	1.560				
"	Minimum	300.000			-17.404	17.404				
Reaction, X-X Axis Top	Maximum				0.910	0.910				
"	Minimum				0.910	0.910				
Reaction, Y-Y Axis Top	Maximum				0.910	0.910				
"	Minimum	300.000			-17.404	17.404				
Moment, X-X Axis Base	Maximum				0.910	0.910				
"	Minimum				0.910	0.910				
Moment, Y-Y Axis Base	Maximum				0.910	0.910				
"	Minimum				0.910	0.910				
Moment, X-X Axis Top	Maximum				0.910	0.910				
"	Minimum				0.910	0.910				
Moment, Y-Y Axis Top	Maximum				0.910	0.910				
"	Minimum				0.910	0.910				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.004	in	6.544	ft
+D+S	0.0000	in	0.000	ft	0.006	in	6.544	ft
+D+0.750S	0.0000	in	0.000	ft	0.005	in	6.544	ft
+0.60D	0.0000	in	0.000	ft	0.002	in	6.544	ft
+D+0.70E	0.0000	in	0.000	ft	-0.113	in	7.591	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	-0.082	in	7.591	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.114	in	7.591	ft
S Only	0.0000	in	0.000	ft	0.003	in	6.544	ft
E Only	0.0000	in	0.000	ft	-0.166	in	7.591	ft

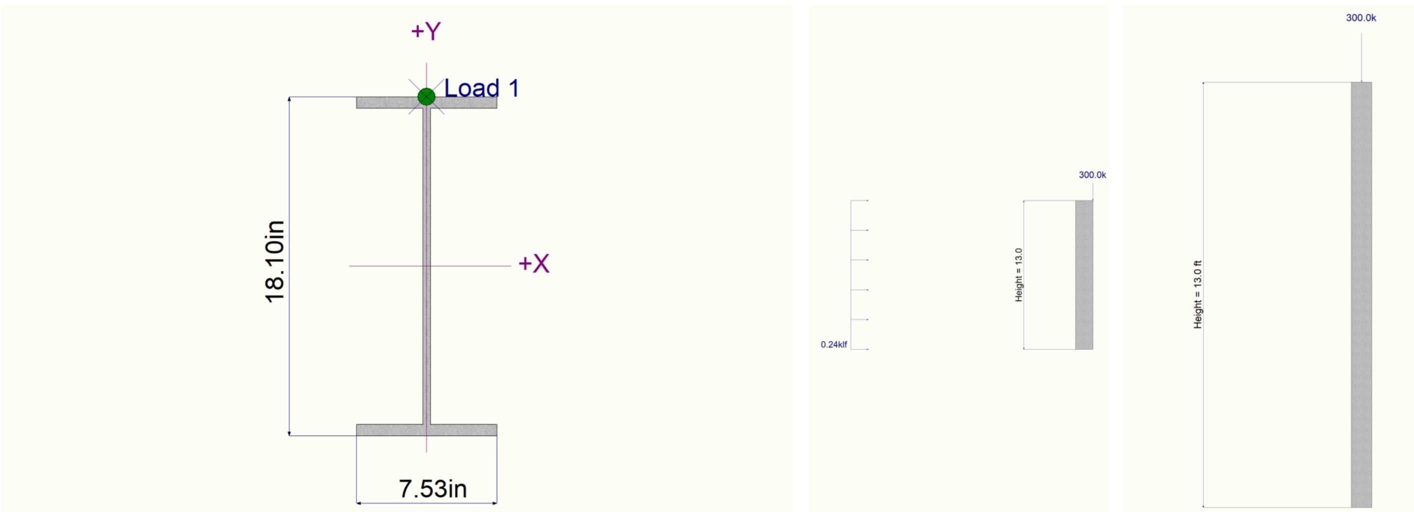
Steel Section Properties : W18x55

Depth	=	18.100	in	I xx	=	890.00	in^4	J	=	1.660	in^4
Web Thick	=	0.390	in	S xx	=	98.30	in^3	Cw	=	3,430.00	in^6
Flange Width	=	7.530	in	R xx	=	7.410	in				
Flange Thick	=	0.630	in	Zx	=	112.000	in^3				
Area	=	16.200	in^2	I yy	=	44.900	in^4				
Weight	=	55.000	plf	S yy	=	11.900	in^3	Wno	=	32.900	in^2
Kdesign	=	1.030	in	R yy	=	1.670	in	Sw	=	39.000	in^4
K1	=	0.813	in	Zy	=	18.500	in^3	Qf	=	19.600	in^3
rts	=	2.000	in					Qw	=	55.300	in^3
Ycg	=	0.000	in								

Steel Column

DESCRIPTION: RF Collector G, grid B7, braces required

Sketches



Steel Column

DESCRIPTION: RF Collector H, grid B7, braces required

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x55**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 23.250 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 8 ft, 16 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 23.250 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 23.250 ft, Yecc = 9.050 in, E = 300.0 k
BENDING LOADS . . .
Lat. Point Load at 8.0 ft creating Mx-x, D = 1.30, S = 1.0 k
Lat. Uniform Load from 0.0-->8.0 ft creating Mx-x, D = 0.230, S = 0.20 k/ft
Lat. Uniform Load from 8.0-->23.250 ft creating Mx-x, D = 0.130, S = 0.10 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.9807**	: 1
Load Combination	+0.90D+E	
Location of max.above base	23.250	ft
At maximum location values are . . .		
Pu	300.0	k
0.9 * Pn	597.79	k
Mu-x	-226.250	k-ft
0.9 * Mn-x :	420.0	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	69.375	k-ft
PASS Maximum Shear Stress Ratio =	**0.05938**	: 1
Load Combination	+1.20D+0.20S+E	
Location of max.above base	23.250	ft
At maximum location values are . . .		
Vu : Applied	12.575	k
Vn * Phi : Allowable	211.770	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	9.731	k
Bottom along Y-Y	9.731	k

Maximum Load Deflections . . .

Along Y-Y -0.5298 in at 13.576 ft above base
for load combination : E Only
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.056	PASS	8.11 ft	1.47	1.00	57.49	37.65	0.020	PASS	0.00 ft
+1.20D	0.048	PASS	8.11 ft	1.47	1.00	57.49	37.65	0.017	PASS	0.00 ft
+1.20D+0.50S	0.064	PASS	8.11 ft	1.47	1.00	57.49	37.65	0.023	PASS	0.00 ft
+1.20D+1.60S	0.099	PASS	8.11 ft	1.47	1.00	57.49	37.65	0.036	PASS	0.00 ft
+0.90D	0.036	PASS	8.11 ft	1.47	1.00	57.49	37.65	0.013	PASS	0.00 ft
+1.20D+0.20S+E	0.981	PASS	23.25 ft	1.53	1.00	52.10	37.65	0.059	PASS	23.25 ft
+0.90D+E	0.981	PASS	23.25 ft	1.53	1.00	52.10	37.65	0.055	PASS	23.25 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				3.026	2.096				
+D+S				5.507	3.740				
+D+0.750S				4.887	3.329				
+0.60D				1.816	1.258				
+D+0.70E	210.000			-3.786	8.908				

PRCNC20221036

Title Block Line 1
You can change this area
using the "Settings" menu item
and then using the "Printing &
Title Block" selection.
Title Block Line 6

Project Title:
Engineer:
Project ID:
Project Descr:

Printed: 28 JUN 2022, 8:44PM

Steel Column

s\Higher-Education\2021\2I33TT~Q\SEV10W~K\C7A4YC~F\3YDNAQ~Y\DSK1PP~K\Chords and Collectors.ec6

Lic. # : KW-06006560 **INTEGRUS ARCHITECTURE**

DESCRIPTION: RF Collector H, grid B7, braces required

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+0.750S+0.5250E	157.500			-0.222	8.438				
+0.60D+0.70E	210.000			-4.996	8.070				
S Only				2.481	1.644				
E Only	300.000			-9.731	9.731				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	300.000			-9.731	9.731		-226.250		
"	Minimum				3.026	2.096				
Reaction, X-X Axis Base	Maximum				3.026	2.096				
"	Minimum				3.026	2.096				
Reaction, Y-Y Axis Base	Maximum				5.507	3.740				
"	Minimum	300.000			-9.731	9.731		-226.250		
Reaction, X-X Axis Top	Maximum				3.026	2.096				
"	Minimum				3.026	2.096				
Reaction, Y-Y Axis Top	Maximum				3.026	2.096				
"	Minimum	300.000			-9.731	9.731		-226.250		
Moment, X-X Axis Base	Maximum				3.026	2.096				
"	Minimum				3.026	2.096				
Moment, Y-Y Axis Base	Maximum				3.026	2.096				
"	Minimum				3.026	2.096				
Moment, X-X Axis Top	Maximum				3.026	2.096				
"	Minimum	300.000			-9.731	9.731		-226.250		
Moment, Y-Y Axis Top	Maximum				3.026	2.096				
"	Minimum				3.026	2.096				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.060	in	11.235	ft
+D+S	0.0000	in	0.000	ft	0.108	in	11.235	ft
+D+0.750S	0.0000	in	0.000	ft	0.096	in	11.235	ft
+0.60D	0.0000	in	0.000	ft	0.036	in	11.235	ft
+D+0.70E	0.0000	in	0.000	ft	-0.314	in	13.888	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	-0.188	in	14.668	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.336	in	13.732	ft
S Only	0.0000	in	0.000	ft	0.048	in	11.235	ft
E Only	0.0000	in	0.000	ft	-0.530	in	13.576	ft

Steel Section Properties : W18x55

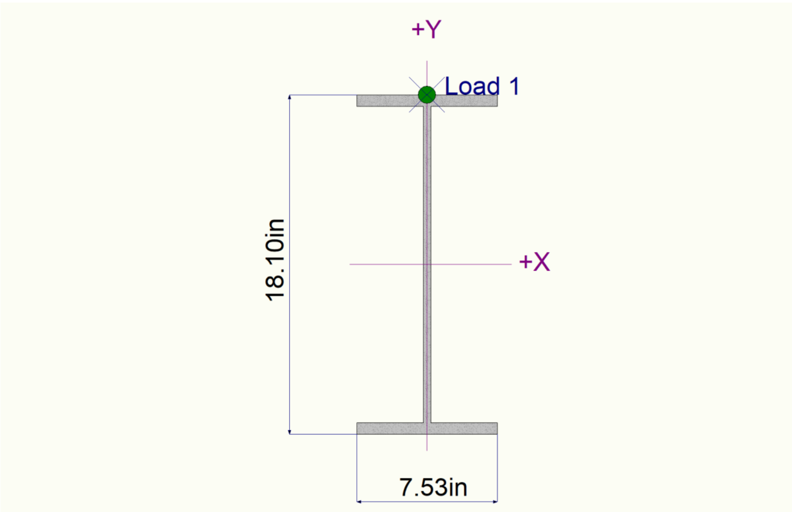
Depth	=	18.100	in	I xx	=	890.00	in^4	J	=	1.660	in^4
Web Thick	=	0.390	in	S xx	=	98.30	in^3	Cw	=	3,430.00	in^6
Flange Width	=	7.530	in	R xx	=	7.410	in				
Flange Thick	=	0.630	in	Zx	=	112.000	in^3				
Area	=	16.200	in^2	I yy	=	44.900	in^4				
Weight	=	55.000	plf	S yy	=	11.900	in^3	Wno	=	32.900	in^2
Kdesign	=	1.030	in	R yy	=	1.670	in	Sw	=	39.000	in^4
K1	=	0.813	in	Zy	=	18.500	in^3	Qf	=	19.600	in^3
rts	=	2.000	in					Qw	=	55.300	in^3
Ycg	=	0.000	in								

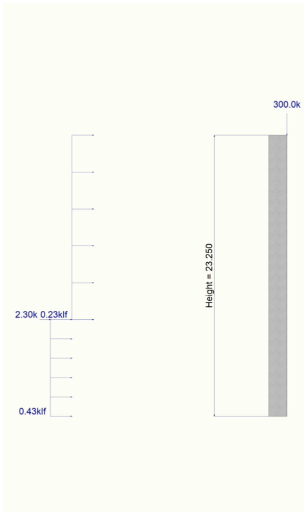
PRCNC20221036

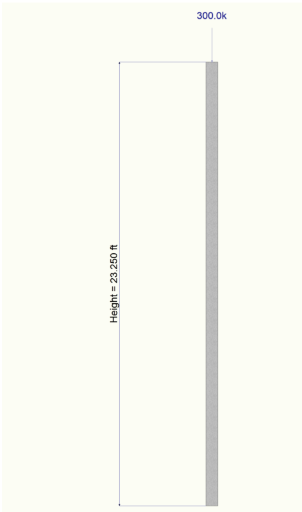
Steel Column

DESCRIPTION: RF Collector H, grid B7, braces required

Sketches







Steel Column

DESCRIPTION: RF Collector I, grid B7

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x55**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 8.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 4 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 8.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 8.0 ft, Yecc = 9.050 in, E = 300.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.230, S = 0.230 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS	Max. Axial+Bending Stress Ratio =	**0.9159**	: 1
	Load Combination	+1.20D+0.20S+E	
	Location of max.above base	8.0	ft
	At maximum location values are . . .		
	Pu	300.0	k
	0.9 * Pn	686.44	k
	Mu-x	-226.250	k-ft
	0.9 * Mn-x :	420.0	k-ft
	Mu-y	0.0	k-ft
	0.9 * Mn-y :	69.375	k-ft
PASS	Maximum Shear Stress Ratio =	**0.1396**	: 1
	Load Combination	+1.20D+0.20S+E	
	Location of max.above base	8.0	ft
	At maximum location values are . . .		
	Vu : Applied	29.569	k
	Vn * Phi : Allowable	211.770	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	28.281	k
Bottom along Y-Y	28.281	k

Maximum Load Deflections . . .

Along Y-Y -0.06273 in at 4.671 ft above base
for load combination : E Only

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.006	PASS	3.97 ft	1.29	1.00	28.74	12.96	0.006	PASS	0.00 ft
+1.20D	0.005	PASS	4.03 ft	1.29	1.00	28.68	12.96	0.005	PASS	0.00 ft
+1.20D+0.50S	0.007	PASS	3.97 ft	1.29	1.00	28.74	12.96	0.007	PASS	0.00 ft
+1.20D+1.60S	0.012	PASS	3.97 ft	1.29	1.00	28.74	12.96	0.012	PASS	0.00 ft
+0.90D	0.004	PASS	3.97 ft	1.29	1.00	28.74	12.96	0.004	PASS	0.00 ft
+1.20D+0.20S+E	0.916	PASS	8.00 ft	1.30	1.00	28.68	12.96	0.140	PASS	8.00 ft
+0.90D+E	0.916	PASS	8.00 ft	1.30	1.00	28.68	12.96	0.137	PASS	8.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments (k-ft) @ Base	@ Top	My - End Moments @ Base	@ Top
D Only				0.920	0.920				
+D+S				1.840	1.840				
+D+0.750S				1.610	1.610				
+0.60D				0.552	0.552				
+D+0.70E	210.000			-18.877	20.717				
+D+0.750S+0.5250E	157.500			-13.238	16.458				
+0.60D+0.70E	210.000			-19.245	20.349				

Steel Column

DESCRIPTION: RF Collector I, grid B7

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
S Only				0.920	0.920				
E Only	300.000			-28.281	28.281				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	300.000			-28.281	28.281		-226.250		
"	Minimum				0.920	0.920				
Reaction, X-X Axis Base	Maximum				0.920	0.920				
"	Minimum				0.920	0.920				
Reaction, Y-Y Axis Base	Maximum				1.840	1.840				
"	Minimum	300.000			-28.281	28.281		-226.250		
Reaction, X-X Axis Top	Maximum				0.920	0.920				
"	Minimum				0.920	0.920				
Reaction, Y-Y Axis Top	Maximum				0.920	0.920				
"	Minimum	300.000			-28.281	28.281		-226.250		
Moment, X-X Axis Base	Maximum				0.920	0.920				
"	Minimum				0.920	0.920				
Moment, Y-Y Axis Base	Maximum				0.920	0.920				
"	Minimum				0.920	0.920				
Moment, X-X Axis Top	Maximum				0.920	0.920				
"	Minimum	300.000			-28.281	28.281		-226.250		
Moment, Y-Y Axis Top	Maximum				0.920	0.920				
"	Minimum				0.920	0.920				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.001	in	4.027	ft
+D+S	0.0000	in	0.000	ft	0.002	in	4.027	ft
+D+0.750S	0.0000	in	0.000	ft	0.001	in	4.027	ft
+0.60D	0.0000	in	0.000	ft	0.000	in	4.027	ft
+D+0.70E	0.0000	in	0.000	ft	-0.043	in	4.671	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	-0.032	in	4.671	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.043	in	4.671	ft
S Only	0.0000	in	0.000	ft	0.001	in	4.027	ft
E Only	0.0000	in	0.000	ft	-0.063	in	4.671	ft

Steel Section Properties : W18x55

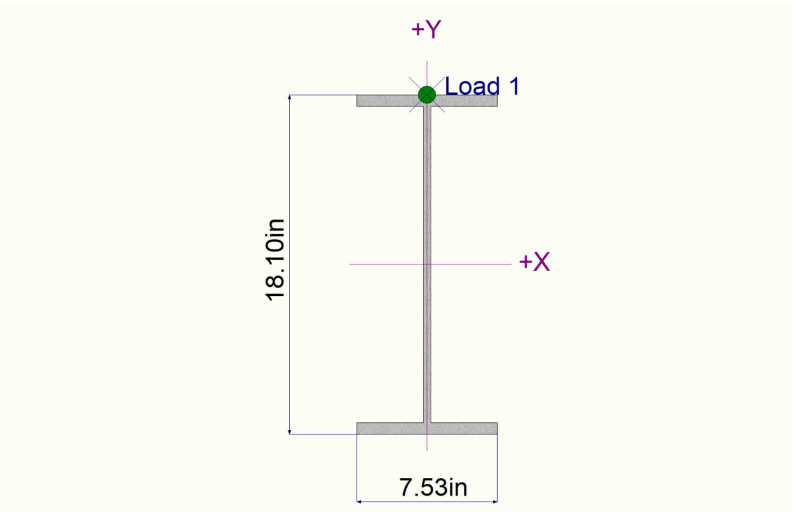
Depth	=	18.100	in	I xx	=	890.00	in^4	J	=	1.660	in^4
Web Thick	=	0.390	in	S xx	=	98.30	in^3	Cw	=	3,430.00	in^6
Flange Width	=	7.530	in	R xx	=	7.410	in				
Flange Thick	=	0.630	in	Zx	=	112.000	in^3				
Area	=	16.200	in^2	I yy	=	44.900	in^4				
Weight	=	55.000	plf	S yy	=	11.900	in^3	Wno	=	32.900	in^2
Kdesign	=	1.030	in	R yy	=	1.670	in	Sw	=	39.000	in^4
K1	=	0.813	in	Zy	=	18.500	in^3	Qf	=	19.600	in^3
rts	=	2.000	in					Qw	=	55.300	in^3
Ycg	=	0.000	in								

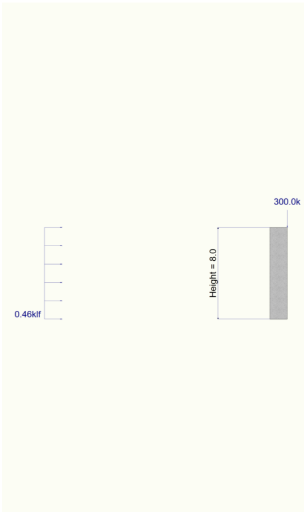
PRCNC20221036

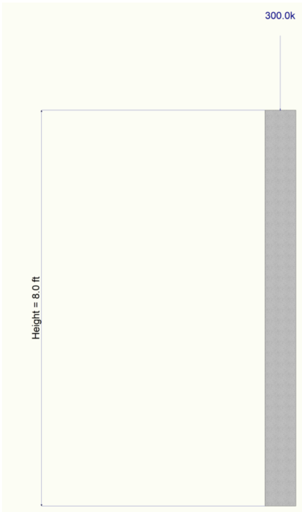
Steel Column

DESCRIPTION: RF Collector I, grid B7

Sketches







Steel Column

DESCRIPTION: RF Collector J, grid B7, braces required

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x55**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 30.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 7.5 ft, 15 ft, 22.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 30.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 30.0 ft, Yecc = 9.050 in, E = 300.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.910, S = 0.230 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.9877**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	30.0	ft
At maximum location values are . . .		
Pu	300.0	k
0.9 * Pn	589.52	k
Mu-x	-226.250	k-ft
0.9 * Mn-x :	420.0	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	69.375	k-ft
PASS Maximum Shear Stress Ratio =	**0.1291**	: 1
Load Combination	+1.401D+0.20S-E	
Location of max.above base	0.0	ft
At maximum location values are . . .		
Vu : Applied	27.350	k
Vn * Phi : Allowable	211.770	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	20.197	k
Bottom along Y-Y	20.197	k

Maximum Load Deflections . . .

Along Y-Y 1.258 in at 16.107 ft above base
for load combination : +D-0.70E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.341	PASS	14.90 ft	1.06	1.00	53.89	48.58	0.090	PASS	0.00 ft
+1.20D	0.292	PASS	14.90 ft	1.06	1.00	53.89	48.58	0.077	PASS	0.00 ft
+1.20D+0.50S	0.323	PASS	15.10 ft	1.06	1.00	53.89	48.58	0.085	PASS	0.00 ft
+1.20D+1.60S	0.391	PASS	14.90 ft	1.06	1.00	53.89	48.58	0.103	PASS	0.00 ft
+0.90D	0.219	PASS	14.90 ft	1.06	1.00	53.89	48.58	0.058	PASS	0.00 ft
+1.401D+0.20S+E	0.988	PASS	30.00 ft	1.50	1.00	53.89	48.58	0.129	PASS	30.00 ft
+1.401D+0.20S-E	0.091	PASS	20.74 ft	1.06	1.00	53.89	48.58	0.129	PASS	0.00 ft
+0.6994D+E	0.988	PASS	30.00 ft	1.50	1.00	53.89	48.58	0.081	PASS	30.00 ft
+0.6994D-E	0.030	PASS	30.00 ft	1.50	1.00	53.89	48.58	0.081	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments (k-ft) @ Base	@ Top	My - End Moments @ Base	@ Top
D Only				13.650	13.650				
+D+S				17.100	17.100				
+D+0.750S				16.238	16.237				
+0.60D				8.190	8.190				
+D+0.70E	210.000			8.371	18.929				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector J, grid B7, braces required

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
+D-0.70E	-210.000			18.929	8.371				
+D+0.750S+0.5250E	157.500			12.278	20.197				
+D+0.750S-0.5250E	-157.500			20.197	12.278				
+0.60D+0.70E	210.000			2.911	13.469				
+0.60D-0.70E	-210.000			13.469	2.911				
S Only				3.450	3.450				
E Only	300.000			-7.542	7.542				
E Only * -1.0	-300.000			7.542	-7.542				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	300.000			-7.542	7.542		-226.250		
"	Minimum	-300.000			7.542	-7.542		226.250		
Reaction, X-X Axis Base	Maximum				13.650	13.650				
"	Minimum				13.650	13.650				
Reaction, Y-Y Axis Base	Maximum	-157.500			20.197	12.278		118.781		
"	Minimum	300.000			-7.542	7.542		-226.250		
Reaction, X-X Axis Top	Maximum				13.650	13.650				
"	Minimum				13.650	13.650				
Reaction, Y-Y Axis Top	Maximum				13.650	13.650				
"	Minimum	-300.000			7.542	-7.542		226.250		
Moment, X-X Axis Base	Maximum				13.650	13.650				
"	Minimum				13.650	13.650				
Moment, Y-Y Axis Base	Maximum				13.650	13.650				
"	Minimum				13.650	13.650				
Moment, X-X Axis Top	Maximum	-300.000			7.542	-7.542		226.250		
"	Minimum	300.000			-7.542	7.542		-226.250		
Moment, Y-Y Axis Top	Maximum				13.650	13.650				
"	Minimum				13.650	13.650				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.650	in	15.101	ft
+D+S	0.0000	in	0.000	ft	0.814	in	15.101	ft
+D+0.750S	0.0000	in	0.000	ft	0.773	in	15.101	ft
+0.60D	0.0000	in	0.000	ft	0.390	in	15.101	ft
+D+0.70E	0.0000	in	0.000	ft	0.090	in	9.262	ft
+D-0.70E	0.0000	in	0.000	ft	1.258	in	16.107	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.333	in	12.886	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	1.228	in	15.906	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.256	in	20.738	ft
+0.60D-0.70E	0.0000	in	0.000	ft	1.001	in	16.510	ft
S Only	0.0000	in	0.000	ft	0.164	in	15.101	ft

Steel Section Properties : W18x55

PRCNC20221036

Title Block Line 1
You can change this area
using the "Settings" menu item
and then using the "Printing &
Title Block" selection.
Title Block Line 6

Project Title:
Engineer:
Project ID:
Project Descr:

Printed: 28 JUN 2022, 8:52PM

Steel Column

s\Higher-Education\2021\2I33TT~Q\SEV10W~K\C7A4YC~F\3YDNAQ~Y\DSK1PP~K\Chords and Collectors.ec6

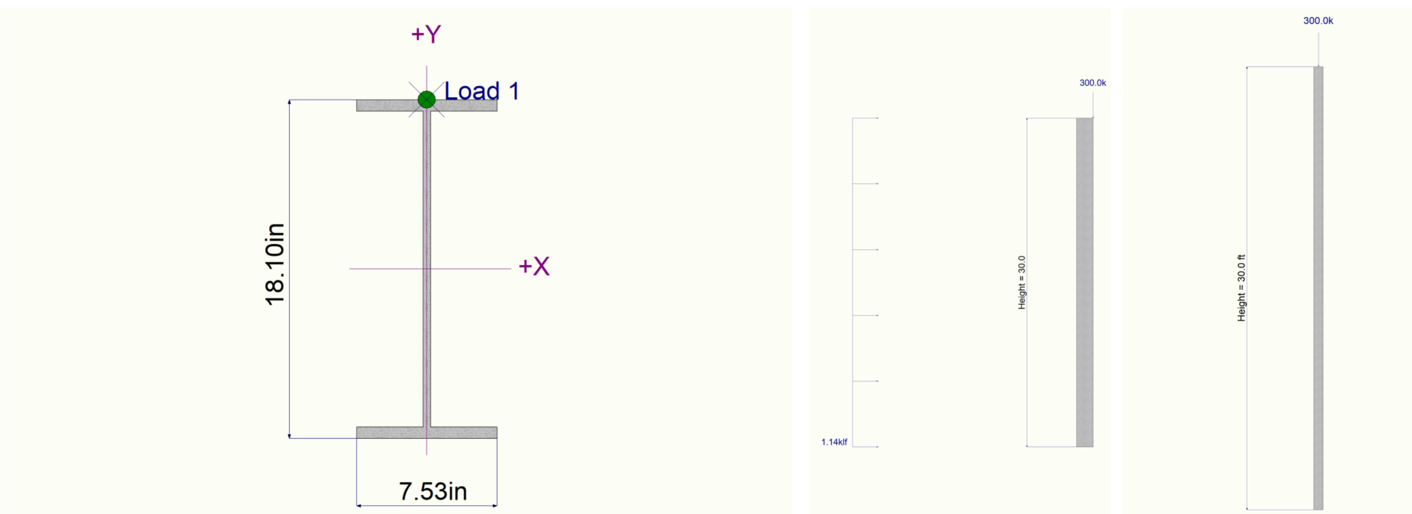
Lic. # : KW-06006560 **INTEGRUS ARCHITECTURE**

DESCRIPTION: RF Collector J, grid B7, braces required

Steel Section Properties : W18x55

Depth	=	18.100	in	I xx	=	890.00	in^4	J	=	1.660	in^4
Web Thick	=	0.390	in	S xx	=	98.30	in^3	Cw	=	3,430.00	in^6
Flange Width	=	7.530	in	R xx	=	7.410	in				
Flange Thick	=	0.630	in	Zx	=	112.000	in^3				
Area	=	16.200	in^2	I yy	=	44.900	in^4				
Weight	=	55.000	plf	S yy	=	11.900	in^3	Wno	=	32.900	in^2
Kdesign	=	1.030	in	R yy	=	1.670	in	Sw	=	39.000	in^4
K1	=	0.813	in	Zy	=	18.500	in^3	Qf	=	19.600	in^3
rts	=	2.000	in					Qw	=	55.300	in^3
Ycg	=	0.000	in								

Sketches



PRCNC20221036

Steel Column

DESCRIPTION: RF Collector L, grid D1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x50**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 29.333 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 7.5 ft, 15 ft, 22.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 29.333 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 29.333 ft, Yecc = 9.0 in, E = 251.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.060, S = 0.060 k/ft
Lat. Point Load at 7.50 ft creating Mx-x, D = 3.20, S = 2.90 k
Lat. Point Load at 15.0 ft creating Mx-x, D = 3.20, S = 2.90 k
Lat. Point Load at 22.167 ft creating Mx-x, D = 3.20, S = 2.90 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.8963**	: 1
Load Combination	+1.401D+0.20S+E	
Location of max.above base	29.333	ft
At maximum location values are . . .		
Pu	251.0	k
0.9 * Pn	552.22	k
Mu-x	-188.250	k-ft
0.9 * Mn-x :	378.750	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	62.250	k-ft
PASS Maximum Shear Stress Ratio =	**0.08103**	: 1
Load Combination	+1.401D+0.20S+E	
Location of max.above base	29.333	ft
At maximum location values are . . .		
Vu : Applied	15.534	k
Vn * Phi : Allowable	191.70	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	13.094	k
Bottom along Y-Y	12.849	k

Maximum Load Deflections . . .

Along Y-Y 0.9847 in at 15.749 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.197	PASS	14.96 ft	1.10	1.00	54.55	47.70	0.042	PASS	29.33 ft
+1.20D	0.169	PASS	14.96 ft	1.10	1.00	54.55	47.70	0.036	PASS	29.33 ft
+1.20D+0.50S	0.233	PASS	14.96 ft	1.10	1.00	54.55	47.70	0.050	PASS	29.33 ft
+1.20D+1.60S	0.375	PASS	14.96 ft	1.10	1.00	54.55	47.70	0.080	PASS	29.33 ft
+0.90D	0.127	PASS	14.96 ft	1.10	1.00	54.55	47.70	0.027	PASS	29.33 ft
+1.401D+0.20S+E	0.896	PASS	29.33 ft	1.63	1.00	49.69	47.70	0.081	PASS	29.33 ft
+1.401D+0.20S-E	0.024	PASS	22.84 ft	1.63	1.00	49.69	47.70	0.080	PASS	0.00 ft
+0.6994D+E	0.896	PASS	29.33 ft	1.63	1.00	49.69	47.70	0.054	PASS	29.33 ft
+0.6994D-E	0.013	PASS	29.33 ft	1.63	1.00	49.69	47.70	0.054	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				5.607	5.753				

Steel Column

DESCRIPTION: RF Collector L, grid D1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+S				10.771	11.049				
+D+0.750S				9.480	9.725				
+0.60D				3.364	3.452				
+D+0.70E	175.700			1.115	10.245				
+D-0.70E	-175.700			10.100	1.260				
+D+0.750S+0.5250E	131.775			6.111	13.094				
+D+0.750S-0.5250E	-131.775			12.849	6.356				
+0.60D+0.70E	175.700			-1.128	7.944				
+0.60D-0.70E	-175.700			7.857	-1.041				
S Only				5.164	5.296				
E Only	251.000			-6.418	6.418				
E Only * -1.0	-251.000			6.418	-6.418				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	251.000			-6.418	6.418		-188.250		
"	Minimum	-251.000			6.418	-6.418		188.250		
Reaction, X-X Axis Base	Maximum				5.607	5.753				
"	Minimum				5.607	5.753				
Reaction, Y-Y Axis Base	Maximum	-131.775			12.849	6.356		98.831		
"	Minimum	251.000			-6.418	6.418		-188.250		
Reaction, X-X Axis Top	Maximum				5.607	5.753				
"	Minimum				5.607	5.753				
Reaction, Y-Y Axis Top	Maximum				5.607	5.753				
"	Minimum	-175.700			7.857	-1.041		131.775		
Moment, X-X Axis Base	Maximum				5.607	5.753				
"	Minimum				5.607	5.753				
Moment, Y-Y Axis Base	Maximum				5.607	5.753				
"	Minimum				5.607	5.753				
Moment, X-X Axis Top	Maximum	-251.000			6.418	-6.418		188.250		
"	Minimum	251.000			-6.418	6.418		-188.250		
Moment, Y-Y Axis Top	Maximum				5.607	5.753				
"	Minimum				5.607	5.753				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.344	in	14.765	ft
+D+S	0.0000	in	0.000	ft	0.660	in	14.765	ft
+D+0.750S	0.0000	in	0.000	ft	0.581	in	14.765	ft
+0.60D	0.0000	in	0.000	ft	0.207	in	14.765	ft
+D+0.70E	0.0000	in	0.000	ft	-0.227	in	20.277	ft
+D-0.70E	0.0000	in	0.000	ft	0.885	in	16.143	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.194	in	11.812	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.985	in	15.749	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.349	in	18.505	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.749	in	16.340	ft
S Only	0.0000	in	0.000	ft	0.316	in	14.765	ft

Steel Section Properties : W18x50

PRCNC20221036

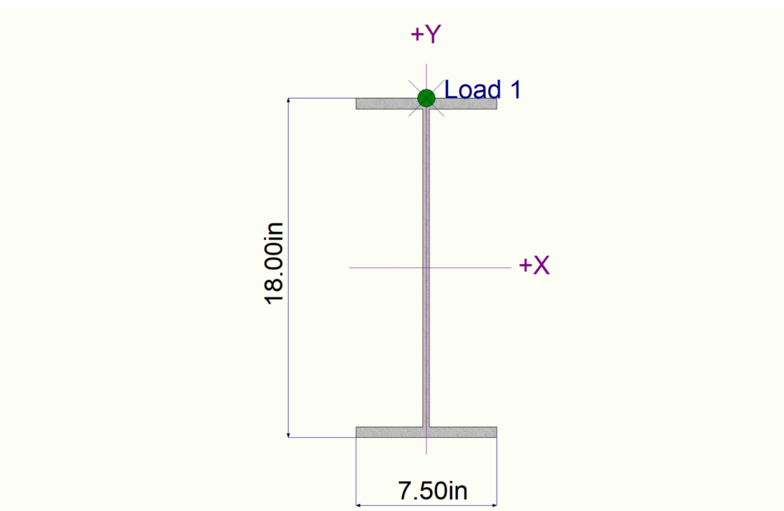
Steel Column

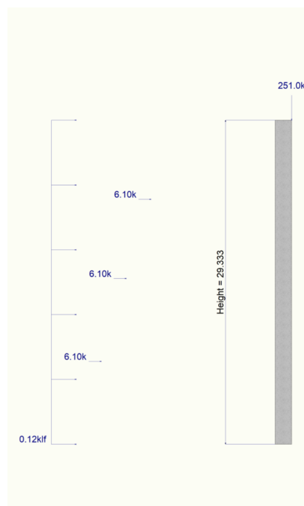
DESCRIPTION: RF Collector L, grid D1

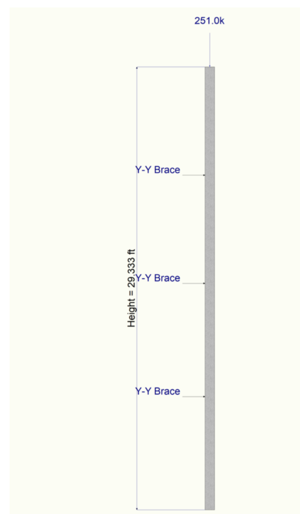
Steel Section Properties : W18x50

Depth	=	18.000	in	I xx	=	800.00	in^4	J	=	1.240	in^4
Web Thick	=	0.355	in	S xx	=	88.90	in^3	Cw	=	3,040.00	in^6
Flange Width	=	7.500	in	R xx	=	7.380	in				
Flange Thick	=	0.570	in	Zx	=	101.000	in^3				
Area	=	14.700	in^2	I yy	=	40.100	in^4				
Weight	=	50.000	plf	S yy	=	10.700	in^3	Wno	=	32.700	in^2
Kdesign	=	0.972	in	R yy	=	1.650	in	Sw	=	34.900	in^4
K1	=	0.813	in	Zy	=	16.600	in^3	Qf	=	17.700	in^3
rts	=	1.980	in					Qw	=	49.900	in^3
Ycg	=	0.000	in								

Sketches







PRCNC20221036

Steel Column

DESCRIPTION: RF Collector M, grid D1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x50**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 24.666 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 6 ft, 12.25 ft, 18.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 24.666 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 24.666 ft, Yecc = 9.0 in, E = 251.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.060, S = 0.060 k/ft
Lat. Point Load at 6.0 ft creating Mx-x, D = 3.20, S = 2.80 k
Lat. Point Load at 12.250 ft creating Mx-x, D = 3.20, S = 2.80 k
Lat. Point Load at 18.50 ft creating Mx-x, D = 3.20, S = 2.90 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8769** : 1
Load Combination +0.6994D+E
Location of max.above base 24.50 ft
At maximum location values are . . .
Pu 251.0 k
0.9 * Pn 571.05 k
Mu-x -186.349 k-ft
0.9 * Mn-x : 378.750 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 62.250 k-ft

PASS Maximum Shear Stress Ratio = **0.08573** : 1
Load Combination +1.401D+0.20S-E
Location of max.above base 0.0 ft
At maximum location values are . . .
Vu : Applied 16.435 k
Vn * Phi : Allowable 191.70 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 13.254 k
Bottom along Y-Y 13.324 k

Maximum Load Deflections . . .
Along Y-Y 0.6192 in at 13.243 ft above base
for load combination : +D+0.750S-0.5250E
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.162	PASS	12.25 ft	1.11	1.00	45.45	40.11	0.041	PASS	0.00 ft
+1.20D	0.139	PASS	12.25 ft	1.11	1.00	45.45	40.11	0.035	PASS	0.00 ft
+1.20D+0.50S	0.190	PASS	12.25 ft	1.11	1.00	45.45	40.11	0.048	PASS	0.00 ft
+1.20D+1.60S	0.304	PASS	12.25 ft	1.11	1.00	45.45	40.11	0.077	PASS	0.00 ft
+0.90D	0.104	PASS	12.25 ft	1.11	1.00	45.45	40.11	0.026	PASS	0.00 ft
+1.401D+0.20S+E	0.875	PASS	24.50 ft	1.62	1.00	44.84	40.11	0.085	PASS	24.67 ft
+1.401D+0.20S-E	0.013	PASS	18.71 ft	1.62	1.00	44.84	40.11	0.086	PASS	0.00 ft
+0.6994D+E	0.877	PASS	24.50 ft	1.62	1.00	44.84	40.11	0.060	PASS	24.67 ft
+0.6994D-E	0.001	PASS	24.50 ft	1.62	1.00	44.84	40.11	0.060	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				5.572	5.508				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector M, grid D1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+S				10.566	10.494				
+D+0.750S				9.317	9.248				
+0.60D				3.343	3.305				
+D+0.70E	175.700			0.230	10.850				
+D-0.70E	-175.700			10.915	0.165				
+D+0.750S+0.5250E	131.775			5.310	13.254				
+D+0.750S-0.5250E	-131.775			13.324	5.241				
+0.60D+0.70E	175.700			-1.999	8.647				
+0.60D-0.70E	-175.700			8.686	-2.038				
S Only				4.993	4.987				
E Only	251.000			-7.632	7.632				
E Only * -1.0	-251.000			7.632	-7.632				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	251.000			-7.632	7.632				
"	Minimum	-251.000			7.632	-7.632				
Reaction, X-X Axis Base	Maximum				5.572	5.508				
"	Minimum				5.572	5.508				
Reaction, Y-Y Axis Base	Maximum	-131.775			13.324	5.241				
"	Minimum	251.000			-7.632	7.632				
Reaction, X-X Axis Top	Maximum				5.572	5.508				
"	Minimum				5.572	5.508				
Reaction, Y-Y Axis Top	Maximum				5.572	5.508				
"	Minimum	-175.700			8.686	-2.038				
Moment, X-X Axis Base	Maximum				5.572	5.508				
"	Minimum				5.572	5.508				
Moment, Y-Y Axis Base	Maximum				5.572	5.508				
"	Minimum				5.572	5.508				
Moment, X-X Axis Top	Maximum				5.572	5.508				
"	Minimum				5.572	5.508				
Moment, Y-Y Axis Top	Maximum				5.572	5.508				
"	Minimum				5.572	5.508				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.199	in	12.416	ft
+D+S	0.0000	in	0.000	ft	0.378	in	12.416	ft
+D+0.750S	0.0000	in	0.000	ft	0.334	in	12.416	ft
+0.60D	0.0000	in	0.000	ft	0.120	in	12.416	ft
+D+0.70E	0.0000	in	0.000	ft	-0.199	in	16.223	ft
+D-0.70E	0.0000	in	0.000	ft	0.582	in	13.575	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.066	in	8.443	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.619	in	13.243	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.272	in	15.230	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.503	in	13.906	ft
S Only	0.0000	in	0.000	ft	0.179	in	12.416	ft

Steel Section Properties : W18x50

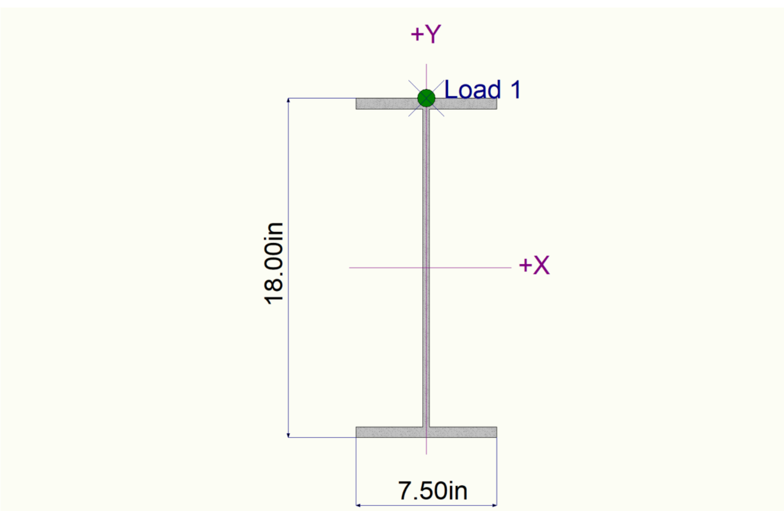
Steel Column

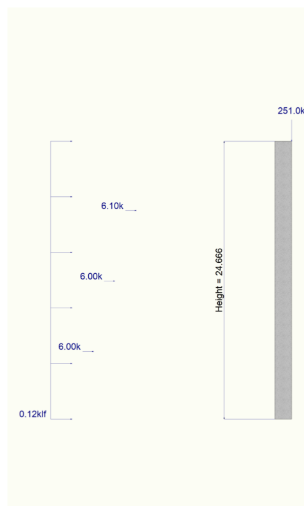
DESCRIPTION: RF Collector M, grid D1

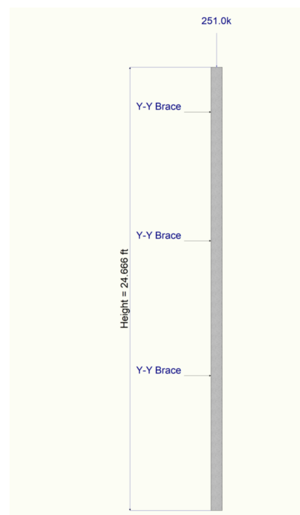
Steel Section Properties : W18x50

Depth	=	18.000	in	I xx	=	800.00	in^4	J	=	1.240	in^4
Web Thick	=	0.355	in	S xx	=	88.90	in^3	Cw	=	3,040.00	in^6
Flange Width	=	7.500	in	R xx	=	7.380	in				
Flange Thick	=	0.570	in	Zx	=	101.000	in^3				
Area	=	14.700	in^2	I yy	=	40.100	in^4				
Weight	=	50.000	plf	S yy	=	10.700	in^3	Wno	=	32.700	in^2
Kdesign	=	0.972	in	R yy	=	1.650	in	Sw	=	34.900	in^4
K1	=	0.813	in	Zy	=	16.600	in^3	Qf	=	17.700	in^3
rts	=	1.980	in					Qw	=	49.900	in^3
Ycg	=	0.000	in								

Sketches







Steel Column

DESCRIPTION: RF Collector N, grid D1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x50**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 30.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 7.5 ft, 15 ft, 22.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 30.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 30.0 ft, Yecc = 9.0 in, E = 251.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10 k/ft
Lat. Point Load at 7.50 ft creating Mx-x, D = 3.820, S = 3.40 k
Lat. Point Load at 15.0 ft creating Mx-x, D = 11.110, S = 5.10 k
Lat. Point Load at 22.50 ft creating Mx-x, D = 8.20, S = 3.40 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9135** : 1
Load Combination +0.6994D+E
Location of max.above base 30.0 ft
At maximum location values are . . .
Pu 251.0 k
0.9 * Pn 532.17 k
Mu-x -188.250 k-ft
0.9 * Mn-x : 378.750 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 62.250 k-ft

PASS Maximum Shear Stress Ratio = **0.1424** : 1
Load Combination +1.401D+0.20S+E
Location of max.above base 30.0 ft
At maximum location values are . . .
Vu : Applied 27.298 k
Vn * Phi : Allowable 191.70 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 21.917 k
Bottom along Y-Y 19.727 k

Maximum Load Deflections . . .
Along Y-Y 1.631 in at 15.705 ft above base
for load combination : +D+0.750S-0.5250E
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.515	PASS	15.10 ft	1.17	1.00	54.55	48.78	0.103	PASS	30.00 ft
+1.20D	0.441	PASS	15.10 ft	1.17	1.00	54.55	48.78	0.089	PASS	30.00 ft
+1.20D+0.50S	0.525	PASS	15.10 ft	1.17	1.00	54.55	48.78	0.104	PASS	30.00 ft
+1.20D+1.60S	0.709	PASS	15.10 ft	1.17	1.00	54.55	48.78	0.138	PASS	30.00 ft
+0.90D	0.331	PASS	15.10 ft	1.17	1.00	54.55	48.78	0.066	PASS	30.00 ft
+1.401D+0.20S+E	0.913	PASS	30.00 ft	1.63	1.00	54.55	48.78	0.142	PASS	30.00 ft
+1.401D+0.20S-E	0.238	PASS	15.10 ft	1.17	1.00	54.55	48.78	0.126	PASS	0.00 ft
+0.6994D+E	0.913	PASS	30.00 ft	1.63	1.00	54.55	48.78	0.084	PASS	30.00 ft
+0.6994D-E	0.030	PASS	30.00 ft	1.63	1.00	54.55	48.78	0.076	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				11.970	14.160				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector N, grid D1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+S				17.920	20.110				
+D+0.750S				16.433	18.623				
+0.60D				7.182	8.496				
+D+0.70E	175.700			7.578	18.553				
+D-0.70E	-175.700			16.363	9.767				
+D+0.750S+0.5250E	131.775			13.138	21.917				
+D+0.750S-0.5250E	-131.775			19.727	15.328				
+0.60D+0.70E	175.700			2.790	12.889				
+0.60D-0.70E	-175.700			11.575	4.104				
S Only				5.950	5.950				
E Only	251.000			-6.275	6.275				
E Only * -1.0	-251.000			6.275	-6.275				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	251.000			-6.275	6.275		-188.250		
"	Minimum	-251.000			6.275	-6.275		188.250		
Reaction, X-X Axis Base	Maximum				11.970	14.160				
"	Minimum				11.970	14.160				
Reaction, Y-Y Axis Base	Maximum	-131.775			19.727	15.328		98.831		
"	Minimum	251.000			-6.275	6.275		-188.250		
Reaction, X-X Axis Top	Maximum				11.970	14.160				
"	Minimum				11.970	14.160				
Reaction, Y-Y Axis Top	Maximum				11.970	14.160				
"	Minimum	-251.000			6.275	-6.275		188.250		
Moment, X-X Axis Base	Maximum				11.970	14.160				
"	Minimum				11.970	14.160				
Moment, Y-Y Axis Base	Maximum				11.970	14.160				
"	Minimum				11.970	14.160				
Moment, X-X Axis Top	Maximum	-251.000			6.275	-6.275		188.250		
"	Minimum	251.000			-6.275	6.275		-188.250		
Moment, Y-Y Axis Top	Maximum				11.970	14.160				
"	Minimum				11.970	14.160				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.900	in	15.302	ft
+D+S	0.0000	in	0.000	ft	1.313	in	15.302	ft
+D+0.750S	0.0000	in	0.000	ft	1.210	in	15.302	ft
+0.60D	0.0000	in	0.000	ft	0.540	in	15.302	ft
+D+0.70E	0.0000	in	0.000	ft	0.352	in	13.289	ft
+D-0.70E	0.0000	in	0.000	ft	1.463	in	16.107	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.794	in	14.497	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	1.631	in	15.705	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.104	in	24.161	ft
+0.60D-0.70E	0.0000	in	0.000	ft	1.105	in	16.309	ft
S Only	0.0000	in	0.000	ft	0.414	in	15.101	ft

Steel Section Properties : W18x50

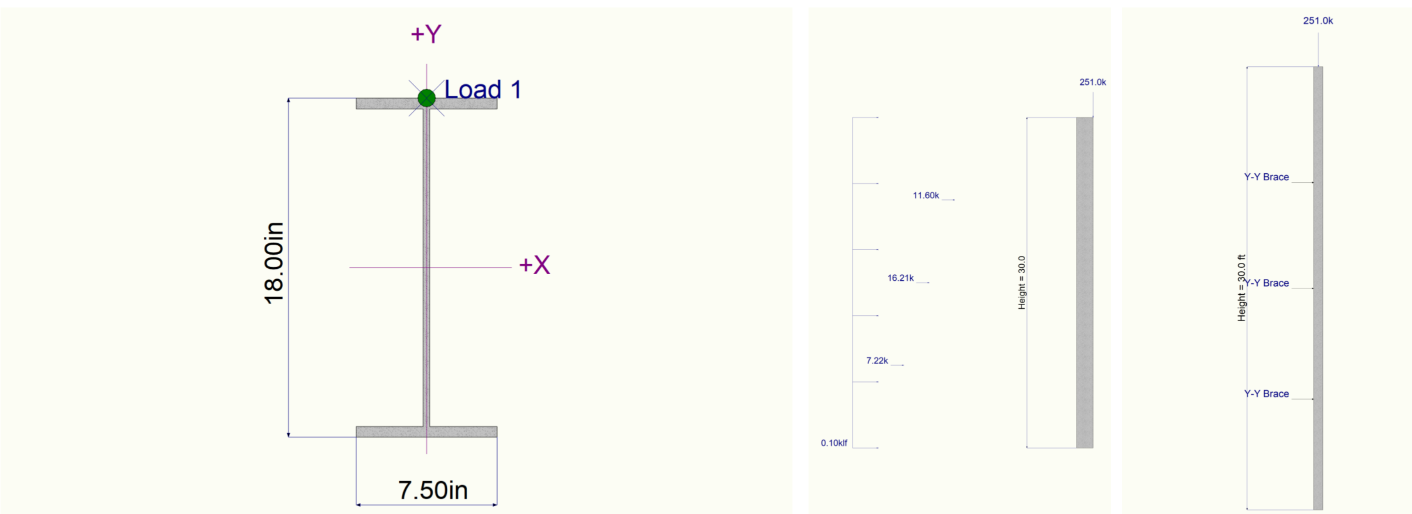
Steel Column

DESCRIPTION: RF Collector N, grid D1

Steel Section Properties : W18x50

Depth	=	18.000	in	I xx	=	800.00	in^4	J	=	1.240	in^4
Web Thick	=	0.355	in	S xx	=	88.90	in^3	Cw	=	3,040.00	in^6
Flange Width	=	7.500	in	R xx	=	7.380	in				
Flange Thick	=	0.570	in	Zx	=	101.000	in^3				
Area	=	14.700	in^2	I yy	=	40.100	in^4				
Weight	=	50.000	plf	S yy	=	10.700	in^3	Wno	=	32.700	in^2
Kdesign	=	0.972	in	R yy	=	1.650	in	Sw	=	34.900	in^4
K1	=	0.813	in	Zy	=	16.600	in^3	Qf	=	17.700	in^3
rts	=	1.980	in					Qw	=	49.900	in^3
Ycg	=	0.000	in								

Sketches



Steel Column

DESCRIPTION: RF Collector O, grid D1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x50**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 30.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 7.5 ft, 15 ft, 22.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 30.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 30.0 ft, Yecc = 9.0 in, E = 251.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10 k/ft
Lat. Point Load at 7.50 ft creating Mx-x, D = 6.30, S = 3.40 k
Lat. Point Load at 15.0 ft creating Mx-x, D = 6.30, S = 3.40 k
Lat. Point Load at 22.50 ft creating Mx-x, D = 6.30, S = 3.40 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9135** : 1
Load Combination +0.6994D+E
Location of max.above base 30.0 ft
At maximum location values are . . .
Pu 251.0 k
0.9 * Pn 532.17 k
Mu-x -188.250 k-ft
0.9 * Mn-x : 378.750 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 62.250 k-ft

PASS Maximum Shear Stress Ratio = **0.1181** : 1
Load Combination +1.401D+0.20S-E
Location of max.above base 0.0 ft
At maximum location values are . . .
Vu : Applied 22.632 k
Vn * Phi : Allowable 191.70 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 18.069 k
Bottom along Y-Y 18.069 k

Maximum Load Deflections . . .
Along Y-Y 1.390 in at 15.705 ft above base
for load combination : +D+0.750S-0.5250E
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.390	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.080	PASS	0.00 ft
+1.20D	0.334	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.069	PASS	0.00 ft
+1.20D+0.50S	0.401	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.082	PASS	0.00 ft
+1.20D+1.60S	0.549	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.111	PASS	0.00 ft
+0.90D	0.251	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.051	PASS	0.00 ft
+1.401D+0.20S+E	0.913	PASS	30.00 ft	1.62	1.00	54.55	48.78	0.118	PASS	30.00 ft
+1.401D+0.20S-E	0.138	PASS	22.35 ft	1.10	1.00	54.55	48.78	0.118	PASS	0.00 ft
+0.6994D+E	0.913	PASS	30.00 ft	1.62	1.00	54.55	48.78	0.073	PASS	30.00 ft
+0.6994D-E	0.030	PASS	30.00 ft	1.62	1.00	54.55	48.78	0.073	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				10.950	10.950				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector O, grid D1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+S				16.050	16.050				
+D+0.750S				14.775	14.775				
+0.60D				6.570	6.570				
+D+0.70E	175.700			6.558	15.343				
+D-0.70E	-175.700			15.343	6.557				
+D+0.750S+0.5250E	131.775			11.481	18.069				
+D+0.750S-0.5250E	-131.775			18.069	11.481				
+0.60D+0.70E	175.700			2.178	10.963				
+0.60D-0.70E	-175.700			10.963	2.178				
S Only				5.100	5.100				
E Only	251.000			-6.275	6.275				
E Only * -1.0	-251.000			6.275	-6.275				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	251.000			-6.275	6.275		-188.250		
"	Minimum	-251.000			6.275	-6.275		188.250		
Reaction, X-X Axis Base	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				
Reaction, Y-Y Axis Base	Maximum	-131.775			18.069	11.481		98.831		
"	Minimum	251.000			-6.275	6.275		-188.250		
Reaction, X-X Axis Top	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				
Reaction, Y-Y Axis Top	Maximum				10.950	10.950				
"	Minimum	-251.000			6.275	-6.275		188.250		
Moment, X-X Axis Base	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				
Moment, Y-Y Axis Base	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				
Moment, X-X Axis Top	Maximum	-251.000			6.275	-6.275		188.250		
"	Minimum	251.000			-6.275	6.275		-188.250		
Moment, Y-Y Axis Top	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.713	in	15.101	ft
+D+S	0.0000	in	0.000	ft	1.055	in	15.101	ft
+D+0.750S	0.0000	in	0.000	ft	0.969	in	15.101	ft
+0.60D	0.0000	in	0.000	ft	0.428	in	15.101	ft
+D+0.70E	0.0000	in	0.000	ft	0.180	in	11.275	ft
+D-0.70E	0.0000	in	0.000	ft	1.276	in	16.107	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.558	in	13.691	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	1.390	in	15.705	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.184	in	21.946	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.993	in	16.309	ft
S Only	0.0000	in	0.000	ft	0.342	in	15.101	ft

Steel Section Properties : W18x50

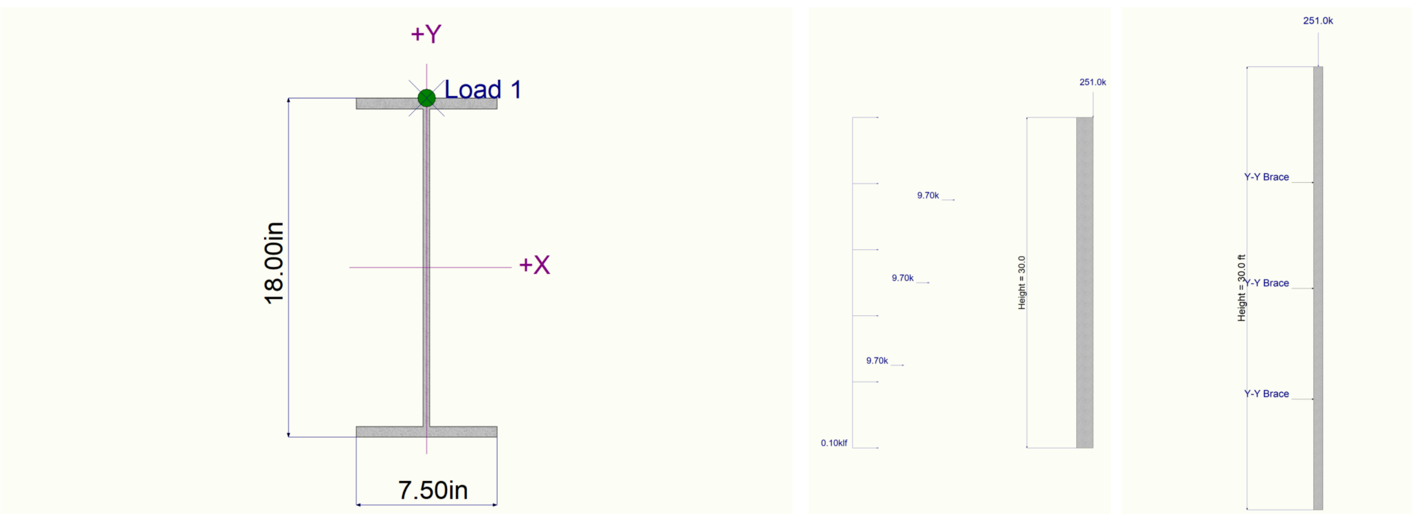
Steel Column

DESCRIPTION: RF Collector O, grid D1

Steel Section Properties : W18x50

Depth	=	18.000	in	I xx	=	800.00	in^4	J	=	1.240	in^4
Web Thick	=	0.355	in	S xx	=	88.90	in^3	Cw	=	3,040.00	in^6
Flange Width	=	7.500	in	R xx	=	7.380	in				
Flange Thick	=	0.570	in	Zx	=	101.000	in^3				
Area	=	14.700	in^2	I yy	=	40.100	in^4				
Weight	=	50.000	plf	S yy	=	10.700	in^3	Wno	=	32.700	in^2
Kdesign	=	0.972	in	R yy	=	1.650	in	Sw	=	34.900	in^4
K1	=	0.813	in	Zy	=	16.600	in^3	Qf	=	17.700	in^3
rts	=	1.980	in					Qw	=	49.900	in^3
Ycg	=	0.000	in								

Sketches



Steel Column

DESCRIPTION: RF Collector P, grid D1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x50**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 30.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 7.5 ft, 15 ft, 22.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 30.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 30.0 ft, Yecc = 9.0 in, E = 251.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10 k/ft
Lat. Point Load at 7.50 ft creating Mx-x, D = 6.30, S = 3.40 k
Lat. Point Load at 15.0 ft creating Mx-x, D = 6.30, S = 3.40 k
Lat. Point Load at 22.50 ft creating Mx-x, D = 6.30, S = 3.40 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9135** : 1
Load Combination +0.6994D+E
Location of max.above base 30.0 ft
At maximum location values are . . .
Pu 251.0 k
0.9 * Pn 532.17 k
Mu-x -188.250 k-ft
0.9 * Mn-x : 378.750 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 62.250 k-ft

PASS Maximum Shear Stress Ratio = **0.1181** : 1
Load Combination +1.401D+0.20S-E
Location of max.above base 0.0 ft
At maximum location values are . . .
Vu : Applied 22.632 k
Vn * Phi : Allowable 191.70 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 18.069 k
Bottom along Y-Y 18.069 k

Maximum Load Deflections . . .
Along Y-Y 1.390 in at 15.705 ft above base
for load combination : +D+0.750S-0.5250E
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.390	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.080	PASS	0.00 ft
+1.20D	0.334	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.069	PASS	0.00 ft
+1.20D+0.50S	0.401	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.082	PASS	0.00 ft
+1.20D+1.60S	0.549	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.111	PASS	0.00 ft
+0.90D	0.251	PASS	14.90 ft	1.10	1.00	54.55	48.78	0.051	PASS	0.00 ft
+1.401D+0.20S+E	0.913	PASS	30.00 ft	1.62	1.00	54.55	48.78	0.118	PASS	30.00 ft
+1.401D+0.20S-E	0.138	PASS	22.35 ft	1.10	1.00	54.55	48.78	0.118	PASS	0.00 ft
+0.6994D+E	0.913	PASS	30.00 ft	1.62	1.00	54.55	48.78	0.073	PASS	30.00 ft
+0.6994D-E	0.030	PASS	30.00 ft	1.62	1.00	54.55	48.78	0.073	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				10.950	10.950				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector P, grid D1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+S				16.050	16.050				
+D+0.750S				14.775	14.775				
+0.60D				6.570	6.570				
+D+0.70E	175.700			6.558	15.343				
+D-0.70E	-175.700			15.343	6.557				
+D+0.750S+0.5250E	131.775			11.481	18.069				
+D+0.750S-0.5250E	-131.775			18.069	11.481				
+0.60D+0.70E	175.700			2.178	10.963				
+0.60D-0.70E	-175.700			10.963	2.178				
S Only				5.100	5.100				
E Only	251.000			-6.275	6.275				
E Only * -1.0	-251.000			6.275	-6.275				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	251.000			-6.275	6.275		-188.250		
"	Minimum	-251.000			6.275	-6.275		188.250		
Reaction, X-X Axis Base	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				
Reaction, Y-Y Axis Base	Maximum	-131.775			18.069	11.481		98.831		
"	Minimum	251.000			-6.275	6.275		-188.250		
Reaction, X-X Axis Top	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				
Reaction, Y-Y Axis Top	Maximum				10.950	10.950				
"	Minimum	-251.000			6.275	-6.275		188.250		
Moment, X-X Axis Base	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				
Moment, Y-Y Axis Base	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				
Moment, X-X Axis Top	Maximum	-251.000			6.275	-6.275		188.250		
"	Minimum	251.000			-6.275	6.275		-188.250		
Moment, Y-Y Axis Top	Maximum				10.950	10.950				
"	Minimum				10.950	10.950				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.713	in	15.101	ft
+D+S	0.0000	in	0.000	ft	1.055	in	15.101	ft
+D+0.750S	0.0000	in	0.000	ft	0.969	in	15.101	ft
+0.60D	0.0000	in	0.000	ft	0.428	in	15.101	ft
+D+0.70E	0.0000	in	0.000	ft	0.180	in	11.275	ft
+D-0.70E	0.0000	in	0.000	ft	1.276	in	16.107	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.558	in	13.691	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	1.390	in	15.705	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.184	in	21.946	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.993	in	16.309	ft
S Only	0.0000	in	0.000	ft	0.342	in	15.101	ft

Steel Section Properties : W18x50

Title Block Line 1
You can change this area
using the "Settings" menu item
and then using the "Printing &
Title Block" selection.
Title Block Line 6

Project Title:
Engineer:
Project ID:
Project Descr:

Printed: 15 JUN 2022, 4:28PM

Steel Column

s\Higher-Education\2021\2I33TT~Q\SEV10W~K\C7A4YC~F\3YDNAQ~Y\DSK1PP~K\Chords and Collectors.ec6

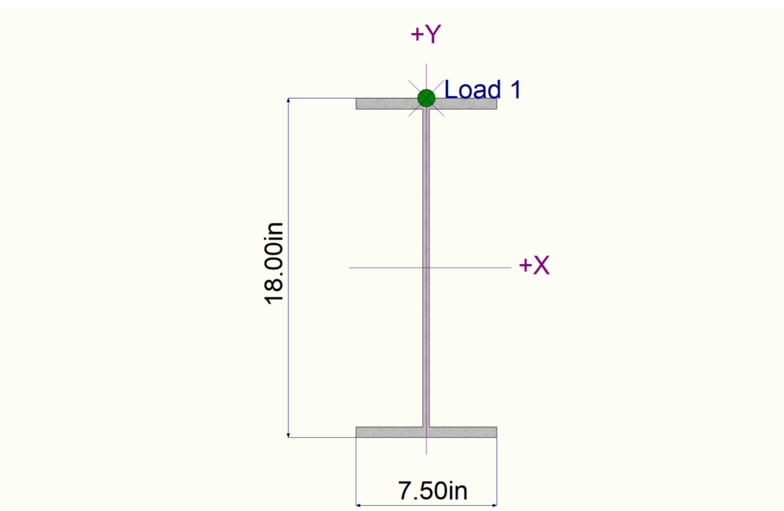
Lic. # : KW-06006560 **INTEGRUS ARCHITECTURE**

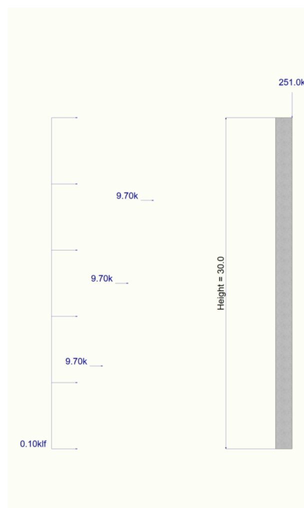
DESCRIPTION: RF Collector P, grid D1

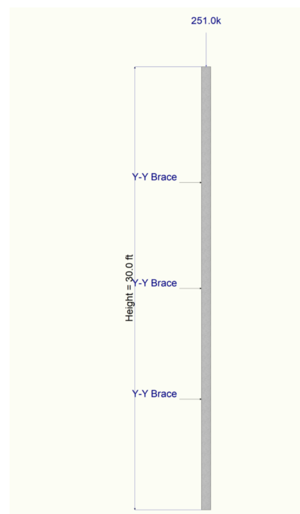
Steel Section Properties : W18x50

Depth	=	18.000	in	I xx	=	800.00	in^4	J	=	1.240	in^4
Web Thick	=	0.355	in	S xx	=	88.90	in^3	Cw	=	3,040.00	in^6
Flange Width	=	7.500	in	R xx	=	7.380	in				
Flange Thick	=	0.570	in	Zx	=	101.000	in^3				
Area	=	14.700	in^2	I yy	=	40.100	in^4				
Weight	=	50.000	plf	S yy	=	10.700	in^3	Wno	=	32.700	in^2
Kdesign	=	0.972	in	R yy	=	1.650	in	Sw	=	34.900	in^4
K1	=	0.813	in	Zy	=	16.600	in^3	Qf	=	17.700	in^3
rts	=	1.980	in					Qw	=	49.900	in^3
Ycg	=	0.000	in								

Sketches







PRCNC20221036

Steel Column

DESCRIPTION: RF Collector Q, grid D1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x50**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 30.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 7.5 ft, 15 ft, 22.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 30.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 30.0 ft, Yecc = 9.0 in, E = 251.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10 k/ft
Lat. Point Load at 7.50 ft creating Mx-x, D = 6.30, S = 3.40 k
Lat. Point Load at 15.0 ft creating Mx-x, D = 5.10, S = 3.40 k
Lat. Point Load at 22.50 ft creating Mx-x, D = 3.90, S = 3.40 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9135** : 1
Load Combination +0.6994D+E
Location of max.above base 30.0 ft
At maximum location values are . . .
Pu 251.0 k
0.9 * Pn 532.17 k
Mu-x -188.250 k-ft
0.9 * Mn-x : 378.750 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 62.250 k-ft

PASS Maximum Shear Stress Ratio = **0.1093** : 1
Load Combination +1.401D+0.20S-E
Location of max.above base 0.0 ft
At maximum location values are . . .
Vu : Applied 20.951 k
Vn * Phi : Allowable 191.70 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 15.669 k
Bottom along Y-Y 16.869 k

Maximum Load Deflections . . .
Along Y-Y 1.269 in at 15.705 ft above base
for load combination : +D+0.750S-0.5250E
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.324	PASS	14.90 ft	1.08	1.00	54.55	48.78	0.071	PASS	0.00 ft
+1.20D	0.277	PASS	14.90 ft	1.08	1.00	54.55	48.78	0.061	PASS	0.00 ft
+1.20D+0.50S	0.344	PASS	14.90 ft	1.08	1.00	54.55	48.78	0.074	PASS	0.00 ft
+1.20D+1.60S	0.492	PASS	14.90 ft	1.08	1.00	54.55	48.78	0.104	PASS	0.00 ft
+0.90D	0.208	PASS	14.90 ft	1.08	1.00	54.55	48.78	0.046	PASS	0.00 ft
+1.401D+0.20S+E	0.913	PASS	30.00 ft	1.62	1.00	54.55	48.78	0.101	PASS	30.00 ft
+1.401D+0.20S-E	0.079	PASS	22.35 ft	1.13	1.00	54.55	48.78	0.109	PASS	0.00 ft
+0.6994D+E	0.913	PASS	30.00 ft	1.62	1.00	54.55	48.78	0.064	PASS	30.00 ft
+0.6994D-E	0.030	PASS	30.00 ft	1.62	1.00	54.55	48.78	0.068	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				9.750	8.550				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector Q, grid D1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+S				14.850	13.650				
+D+0.750S				13.575	12.375				
+0.60D				5.850	5.130				
+D+0.70E	175.700			5.358	12.943				
+D-0.70E	-175.700			14.143	4.157				
+D+0.750S+0.5250E	131.775			10.281	15.669				
+D+0.750S-0.5250E	-131.775			16.869	9.081				
+0.60D+0.70E	175.700			1.458	9.522				
+0.60D-0.70E	-175.700			10.243	0.737				
S Only				5.100	5.100				
E Only	251.000			-6.275	6.275				
E Only * -1.0	-251.000			6.275	-6.275				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	251.000			-6.275	6.275		-188.250		
"	Minimum	-251.000			6.275	-6.275		188.250		
Reaction, X-X Axis Base	Maximum				9.750	8.550				
"	Minimum				9.750	8.550				
Reaction, Y-Y Axis Base	Maximum	-131.775			16.869	9.081		98.831		
"	Minimum	251.000			-6.275	6.275		-188.250		
Reaction, X-X Axis Top	Maximum				9.750	8.550				
"	Minimum				9.750	8.550				
Reaction, Y-Y Axis Top	Maximum				9.750	8.550				
"	Minimum	-251.000			6.275	-6.275		188.250		
Moment, X-X Axis Base	Maximum				9.750	8.550				
"	Minimum				9.750	8.550				
Moment, Y-Y Axis Base	Maximum				9.750	8.550				
"	Minimum				9.750	8.550				
Moment, X-X Axis Top	Maximum	-251.000			6.275	-6.275		188.250		
"	Minimum	251.000			-6.275	6.275		-188.250		
Moment, Y-Y Axis Top	Maximum				9.750	8.550				
"	Minimum				9.750	8.550				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.593	in	14.899	ft
+D+S	0.0000	in	0.000	ft	0.934	in	14.899	ft
+D+0.750S	0.0000	in	0.000	ft	0.849	in	14.899	ft
+0.60D	0.0000	in	0.000	ft	0.356	in	14.899	ft
+D+0.70E	0.0000	in	0.000	ft	-0.084	in	24.966	ft
+D-0.70E	0.0000	in	0.000	ft	1.155	in	16.107	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.441	in	13.289	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	1.269	in	15.705	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.245	in	20.738	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.920	in	16.309	ft
S Only	0.0000	in	0.000	ft	0.342	in	15.101	ft

Steel Section Properties : W18x50

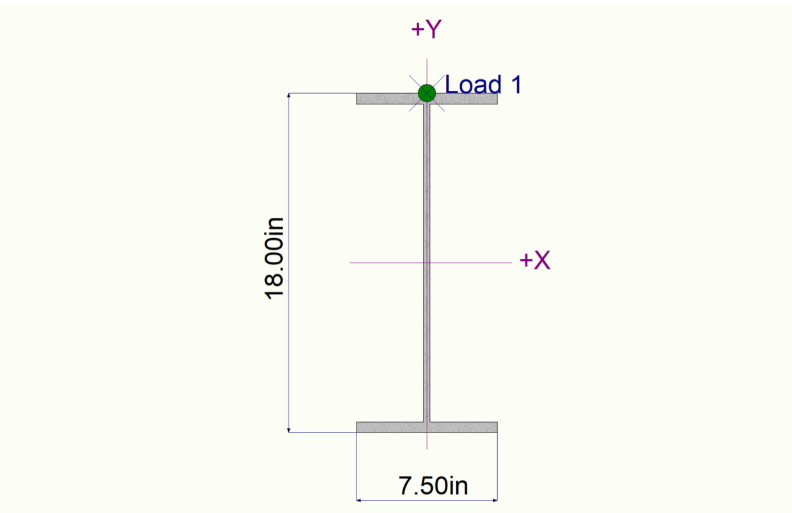
Steel Column

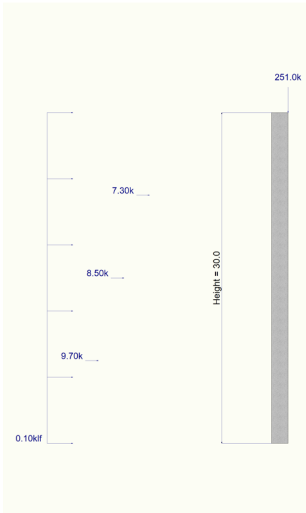
DESCRIPTION: RF Collector Q, grid D1

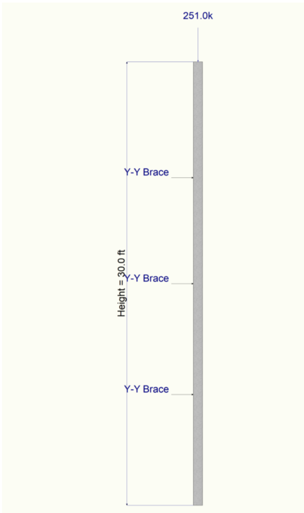
Steel Section Properties : W18x50

Depth	=	18.000	in	I xx	=	800.00	in^4	J	=	1.240	in^4
Web Thick	=	0.355	in	S xx	=	88.90	in^3	Cw	=	3,040.00	in^6
Flange Width	=	7.500	in	R xx	=	7.380	in				
Flange Thick	=	0.570	in	Zx	=	101.000	in^3				
Area	=	14.700	in^2	I yy	=	40.100	in^4				
Weight	=	50.000	plf	S yy	=	10.700	in^3	Wno	=	32.700	in^2
Kdesign	=	0.972	in	R yy	=	1.650	in	Sw	=	34.900	in^4
K1	=	0.813	in	Zy	=	16.600	in^3	Qf	=	17.700	in^3
rts	=	1.980	in					Qw	=	49.900	in^3
Ycg	=	0.000	in								

Sketches







Steel Column

DESCRIPTION: RF Collector R, grid A1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W16x31**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 10 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 10 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 10.0 ft, Yecc = 7.950 in, E = 146.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10 k/ft
Lat. Point Load at 5.0 ft creating Mx-x, D = 2.50, S = 2.20 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8518** : 1
Load Combination +0.6994D+E
Location of max.above base 9.933 ft
At maximum location values are . . .
Pu 146.0 k
0.9 * Pn 339.197 k
Mu-x -95.994 k-ft
0.9 * Mn-x : 202.50 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 26.363 k-ft

PASS Maximum Shear Stress Ratio = **0.09410** : 1
Load Combination +1.401D+0.20S+E
Location of max.above base 10.0 ft
At maximum location values are . . .
Vu : Applied 12.344 k
Vn * Phi : Allowable 131.175 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 9.673 k
Bottom along Y-Y 9.673 k

Maximum Load Deflections . . .
Along Y-Y 0.07978 in at 5.705 ft above base
for load combination : +D-0.70E
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.052	PASS	5.03 ft	1.57	1.00	51.28	18.72	0.019	PASS	10.00 ft
+1.20D	0.044	PASS	5.03 ft	1.57	1.00	51.28	18.72	0.016	PASS	10.00 ft
+1.20D+0.50S	0.058	PASS	5.03 ft	1.57	1.00	51.28	18.72	0.020	PASS	0.00 ft
+1.20D+1.60S	0.087	PASS	5.03 ft	1.57	1.00	51.28	18.72	0.029	PASS	0.00 ft
+0.90D	0.033	PASS	5.03 ft	1.57	1.00	51.28	18.72	0.012	PASS	0.00 ft
+1.401D+0.20S+E	0.851	PASS	9.93 ft	1.58	1.00	51.20	18.72	0.094	PASS	10.00 ft
+1.401D+0.20S-E	0.000	PASS	10.00 ft	1.58	1.00	51.20	18.72	0.094	PASS	0.00 ft
+0.6994D+E	0.852	PASS	9.93 ft	1.58	1.00	51.20	18.72	0.083	PASS	10.00 ft
+0.6994D-E	0.000	PASS	10.00 ft	1.58	1.00	51.20	18.72	0.083	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments (k-ft) @ Base	@ Top	My - End Moments @ Base	@ Top
D Only				1.750	1.750				
+D+S				2.850	2.850				
+D+0.750S				2.575	2.575				
+0.60D				1.050	1.050				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector R, grid A1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+0.70E	102.200			-5.021	8.521				
+D-0.70E	-102.200			8.521	-5.021				
+D+0.750S+0.5250E	76.650			-2.503	7.653				
+D+0.750S-0.5250E	-76.650			7.653	-2.503				
+0.60D+0.70E	102.200			-5.721	7.821				
+0.60D-0.70E	-102.200			7.821	-5.721				
S Only				1.100	1.100				
E Only	146.000			-9.673	9.673				
E Only * -1.0	-146.000			9.673	-9.673				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	146.000			-9.673	9.673				
"	Minimum	-146.000			9.673	-9.673				
Reaction, X-X Axis Base	Maximum				1.750	1.750				
"	Minimum				1.750	1.750				
Reaction, Y-Y Axis Base	Maximum	-146.000			9.673	-9.673				
"	Minimum	146.000			-9.673	9.673				
Reaction, X-X Axis Top	Maximum				1.750	1.750				
"	Minimum				1.750	1.750				
Reaction, Y-Y Axis Top	Maximum				1.750	1.750				
"	Minimum	-102.200			8.521	-5.021				
Moment, X-X Axis Base	Maximum				1.750	1.750				
"	Minimum				1.750	1.750				
Moment, Y-Y Axis Base	Maximum				1.750	1.750				
"	Minimum				1.750	1.750				
Moment, X-X Axis Top	Maximum				1.750	1.750				
"	Minimum				1.750	1.750				
Moment, Y-Y Axis Top	Maximum				1.750	1.750				
"	Minimum				1.750	1.750				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.010	in	5.034	ft
+D+S	0.0000	in	0.000	ft	0.018	in	5.034	ft
+D+0.750S	0.0000	in	0.000	ft	0.016	in	5.034	ft
+0.60D	0.0000	in	0.000	ft	0.006	in	5.034	ft
+D+0.70E	0.0000	in	0.000	ft	-0.060	in	5.973	ft
+D-0.70E	0.0000	in	0.000	ft	0.080	in	5.705	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	-0.037	in	6.242	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.068	in	5.570	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.064	in	5.906	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.076	in	5.705	ft
S Only	0.0000	in	0.000	ft	0.007	in	5.034	ft

Steel Section Properties : W16x31

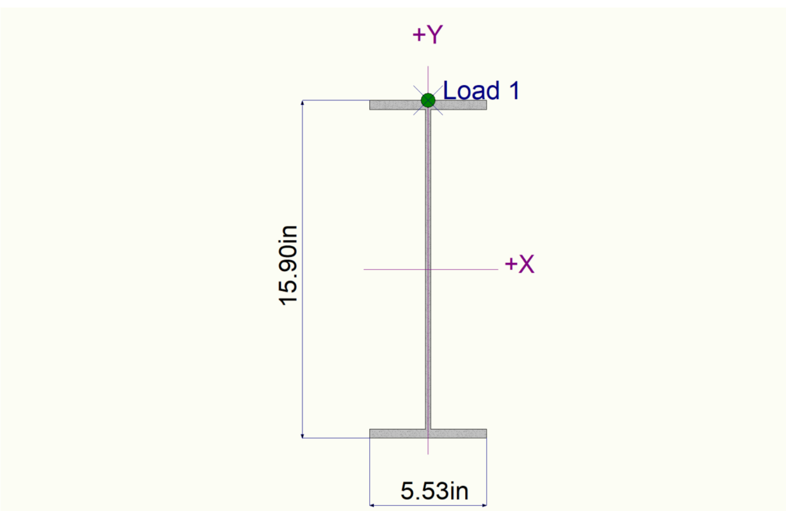
Steel Column

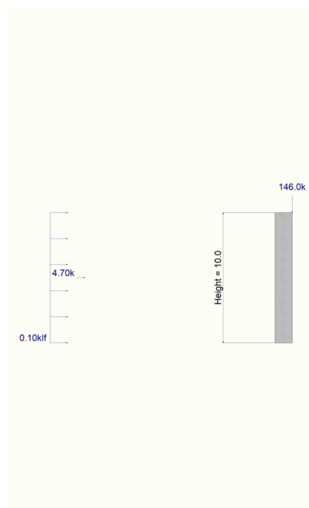
DESCRIPTION: RF Collector R, grid A1

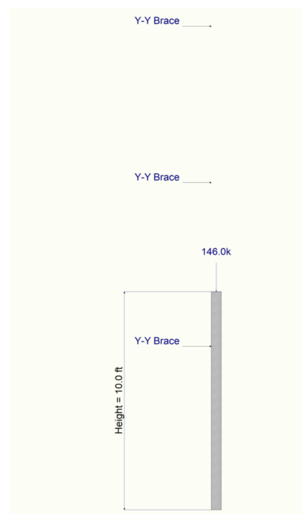
Steel Section Properties : W16x31

Depth	=	15.900	in	I xx	=	375.00	in^4	J	=	0.461	in^4
Web Thick	=	0.275	in	S xx	=	47.20	in^3	Cw	=	739.00	in^6
Flange Width	=	5.530	in	R xx	=	6.410	in				
Flange Thick	=	0.440	in	Zx	=	54.000	in^3				
Area	=	9.130	in^2	I yy	=	12.400	in^4				
Weight	=	31.000	plf	S yy	=	4.490	in^3	Wno	=	21.400	in^2
Kdesign	=	0.842	in	R yy	=	1.170	in	Sw	=	13.000	in^4
K1	=	0.750	in	Zy	=	7.030	in^3	Qf	=	8.940	in^3
rts	=	1.420	in					Qw	=	26.600	in^3
Ycg	=	0.000	in								

Sketches







Steel Column

DESCRIPTION: RF Collector S, grid A1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W16x31**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 27.083 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 6.77 ft, 13.5 ft, 20.3 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 27.083 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 27.083 ft, Yecc = 7.950 in, E = 146.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10 k/ft
Lat. Point Load at 6.770 ft creating Mx-x, D = 3.40, S = 3.0 k
Lat. Point Load at 13.50 ft creating Mx-x, D = 3.40, S = 3.0 k
Lat. Point Load at 20.30 ft creating Mx-x, D = 3.40, S = 3.0 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.9244**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	26.901	ft
At maximum location values are . . .		
Pu	146.0	k
0.9 * Pn	288.40	k
Mu-x	-95.257	k-ft
0.9 * Mn-x :	202.50	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	26.363	k-ft
PASS Maximum Shear Stress Ratio =	**0.1141**	: 1
Load Combination	+1.20D+1.60S	
Location of max.above base	0.0	ft
At maximum location values are . . .		
Vu : Applied	14.963	k
Vn * Phi : Allowable	131.175	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	11.693	k
Bottom along Y-Y	11.716	k

Maximum Load Deflections . . .

Along Y-Y 1.380 in at 14.178 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.399	PASS	13.63 ft	1.10	1.00	69.74	50.70	0.069	PASS	0.00 ft
+1.20D	0.342	PASS	13.63 ft	1.10	1.00	69.74	50.70	0.059	PASS	0.00 ft
+1.20D+0.50S	0.447	PASS	13.63 ft	1.10	1.00	69.74	50.70	0.076	PASS	0.00 ft
+1.20D+1.60S	0.678	PASS	13.63 ft	1.10	1.00	69.74	50.70	0.114	PASS	0.00 ft
+0.90D	0.257	PASS	13.63 ft	1.10	1.00	69.74	50.70	0.044	PASS	0.00 ft
+1.401D+0.20S+E	0.920	PASS	26.90 ft	1.61	1.00	69.57	50.70	0.103	PASS	27.08 ft
+1.401D+0.20S-E	0.123	PASS	19.99 ft	1.10	1.00	69.74	50.70	0.103	PASS	0.00 ft
+0.6994D+E	0.924	PASS	26.90 ft	1.61	1.00	69.57	50.70	0.062	PASS	27.08 ft
+0.6994D-E	0.000	PASS	27.08 ft	1.61	1.00	69.57	50.70	0.062	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				6.461	6.447				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector S, grid A1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+S				10.967	10.941				
+D+0.750S				9.841	9.818				
+0.60D				3.877	3.868				
+D+0.70E	102.200			3.961	8.947				
+D-0.70E	-102.200			8.961	3.947				
+D+0.750S+0.5250E	76.650			7.966	11.693				
+D+0.750S-0.5250E	-76.650			11.716	7.943				
+0.60D+0.70E	102.200			1.377	6.368				
+0.60D-0.70E	-102.200			6.377	1.368				
S Only				4.506	4.494				
E Only	146.000			-3.571	3.571				
E Only * -1.0	-146.000			3.571	-3.571				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	146.000			-3.571	3.571				
"	Minimum	-146.000			3.571	-3.571				
Reaction, X-X Axis Base	Maximum				6.461	6.447				
"	Minimum				6.461	6.447				
Reaction, Y-Y Axis Base	Maximum	-76.650			11.716	7.943				
"	Minimum	146.000			-3.571	3.571				
Reaction, X-X Axis Top	Maximum				6.461	6.447				
"	Minimum				6.461	6.447				
Reaction, Y-Y Axis Top	Maximum				6.461	6.447				
"	Minimum	-146.000			3.571	-3.571				
Moment, X-X Axis Base	Maximum				6.461	6.447				
"	Minimum				6.461	6.447				
Moment, Y-Y Axis Base	Maximum				6.461	6.447				
"	Minimum				6.461	6.447				
Moment, X-X Axis Top	Maximum				6.461	6.447				
"	Minimum				6.461	6.447				
Moment, Y-Y Axis Top	Maximum				6.461	6.447				
"	Minimum				6.461	6.447				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.649	in	13.632	ft
+D+S	0.0000	in	0.000	ft	1.123	in	13.632	ft
+D+0.750S	0.0000	in	0.000	ft	1.005	in	13.632	ft
+0.60D	0.0000	in	0.000	ft	0.390	in	13.632	ft
+D+0.70E	0.0000	in	0.000	ft	0.173	in	10.179	ft
+D-0.70E	0.0000	in	0.000	ft	1.152	in	14.541	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.636	in	12.724	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	1.380	in	14.178	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.158	in	19.994	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.894	in	14.723	ft
S Only	0.0000	in	0.000	ft	0.474	in	13.632	ft

Steel Section Properties : W16x31

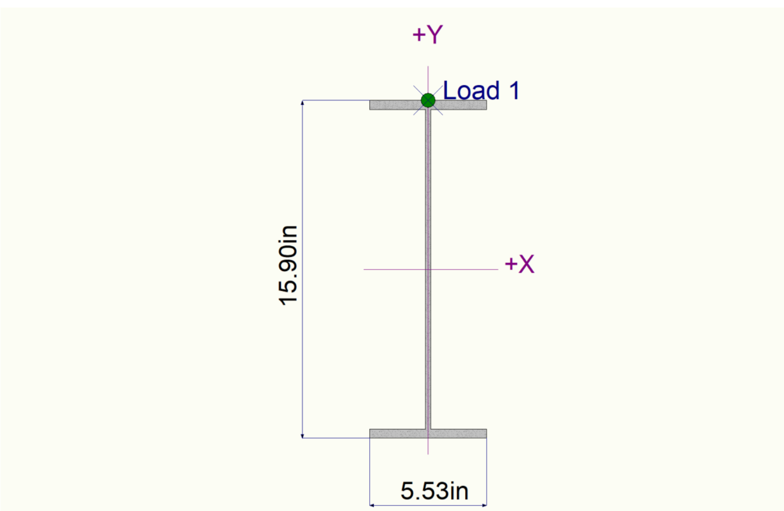
Steel Column

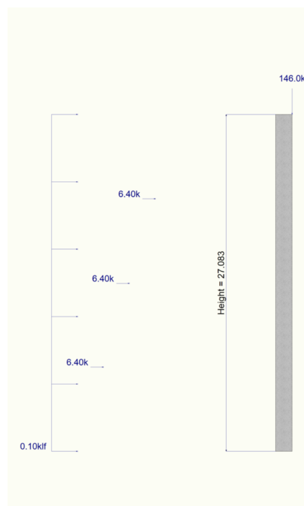
DESCRIPTION: RF Collector S, grid A1

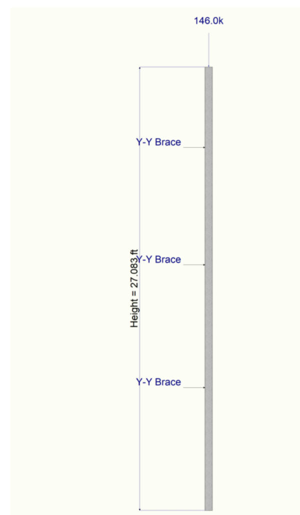
Steel Section Properties : W16x31

Depth	=	15.900	in	I xx	=	375.00	in^4	J	=	0.461	in^4
Web Thick	=	0.275	in	S xx	=	47.20	in^3	Cw	=	739.00	in^6
Flange Width	=	5.530	in	R xx	=	6.410	in				
Flange Thick	=	0.440	in	Zx	=	54.000	in^3				
Area	=	9.130	in^2	I yy	=	12.400	in^4				
Weight	=	31.000	plf	S yy	=	4.490	in^3	Wno	=	21.400	in^2
Kdesign	=	0.842	in	R yy	=	1.170	in	Sw	=	13.000	in^4
K1	=	0.750	in	Zy	=	7.030	in^3	Qf	=	8.940	in^3
rts	=	1.420	in					Qw	=	26.600	in^3
Ycg	=	0.000	in								

Sketches







PRCNC20221036

Steel Column

DESCRIPTION: RF Collector T, grid A1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x35**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 28 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 7.333 ft, 14.666 ft, 22 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 28 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 28.0 ft, Yecc = 8.850 in, E = 146.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10 k/ft
Lat. Point Load at 7.333 ft creating Mx-x, D = 4.60, S = 4.0 k
Lat. Point Load at 14.666 ft creating Mx-x, D = 4.40, S = 3.80 k
Lat. Point Load at 22.0 ft creating Mx-x, D = 4.10, S = 3.60 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.7838**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	27.812	ft
At maximum location values are . . .		
Pu	146.0	k
0.9 * Pn	359.295	k
Mu-x	-105.885	k-ft
0.9 * Mn-x :	249.375	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	30.225	k-ft
PASS Maximum Shear Stress Ratio =	**0.1202**	: 1
Load Combination	+1.20D+1.60S	
Location of max.above base	28.0	ft
At maximum location values are . . .		
Vu : Applied	19.143	k
Vn * Phi : Allowable	159.30	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	14.550	k
Bottom along Y-Y	13.938	k

Maximum Load Deflections . . .

Along Y-Y 1.328 in at 14.658 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.421	PASS	14.66 ft	1.09	1.00	72.13	47.73	0.071	PASS	28.00 ft
+1.20D	0.361	PASS	14.66 ft	1.09	1.00	72.13	47.73	0.061	PASS	28.00 ft
+1.20D+0.50S	0.474	PASS	14.66 ft	1.09	1.00	72.13	47.73	0.080	PASS	28.00 ft
+1.20D+1.60S	0.721	PASS	14.66 ft	1.09	1.00	72.13	47.73	0.120	PASS	28.00 ft
+0.90D	0.271	PASS	14.66 ft	1.09	1.00	72.13	47.73	0.046	PASS	28.00 ft
+1.401D+0.20S+E	0.779	PASS	27.81 ft	1.62	1.00	59.02	47.73	0.103	PASS	28.00 ft
+1.401D+0.20S-E	0.171	PASS	14.66 ft	1.09	1.00	72.13	47.73	0.099	PASS	0.00 ft
+0.6994D+E	0.784	PASS	27.81 ft	1.62	1.00	59.02	47.73	0.060	PASS	28.00 ft
+0.6994D-E	0.000	PASS	28.00 ft	1.62	1.00	59.02	47.73	0.058	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				7.769	8.131				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector T, grid A1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+S				13.303	13.997				
+D+0.750S				11.919	12.531				
+0.60D				4.662	4.878				
+D+0.70E	102.200			5.077	10.823				
+D-0.70E	-102.200			10.461	5.439				
+D+0.750S+0.5250E	76.650			9.900	14.550				
+D+0.750S-0.5250E	-76.650			13.938	10.512				
+0.60D+0.70E	102.200			1.970	7.570				
+0.60D-0.70E	-102.200			7.353	2.187				
S Only				5.533	5.867				
E Only	146.000			-3.846	3.846				
E Only * -1.0	-146.000			3.846	-3.846				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	146.000			-3.846	3.846				
"	Minimum	-146.000			3.846	-3.846				
Reaction, X-X Axis Base	Maximum				7.769	8.131				
"	Minimum				7.769	8.131				
Reaction, Y-Y Axis Base	Maximum	-76.650			13.938	10.512				
"	Minimum	146.000			-3.846	3.846				
Reaction, X-X Axis Top	Maximum				7.769	8.131				
"	Minimum				7.769	8.131				
Reaction, Y-Y Axis Top	Maximum				7.769	8.131				
"	Minimum	-146.000			3.846	-3.846				
Moment, X-X Axis Base	Maximum				7.769	8.131				
"	Minimum				7.769	8.131				
Moment, Y-Y Axis Base	Maximum				7.769	8.131				
"	Minimum				7.769	8.131				
Moment, X-X Axis Top	Maximum				7.769	8.131				
"	Minimum				7.769	8.131				
Moment, Y-Y Axis Top	Maximum				7.769	8.131				
"	Minimum				7.769	8.131				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.642	in	14.094	ft
+D+S	0.0000	in	0.000	ft	1.118	in	14.094	ft
+D+0.750S	0.0000	in	0.000	ft	0.999	in	14.094	ft
+0.60D	0.0000	in	0.000	ft	0.385	in	14.094	ft
+D+0.70E	0.0000	in	0.000	ft	0.221	in	11.275	ft
+D-0.70E	0.0000	in	0.000	ft	1.082	in	14.846	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.676	in	13.342	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	1.328	in	14.658	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.107	in	21.611	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.826	in	15.221	ft
S Only	0.0000	in	0.000	ft	0.476	in	14.094	ft

Steel Section Properties : W18x35

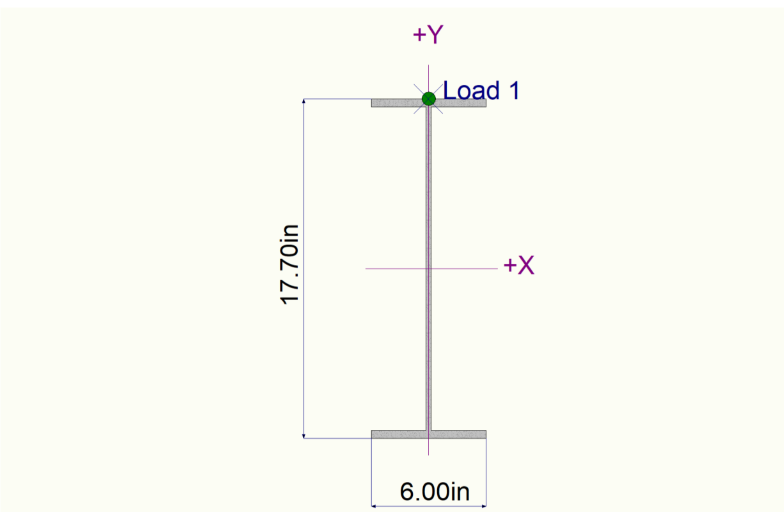
Steel Column

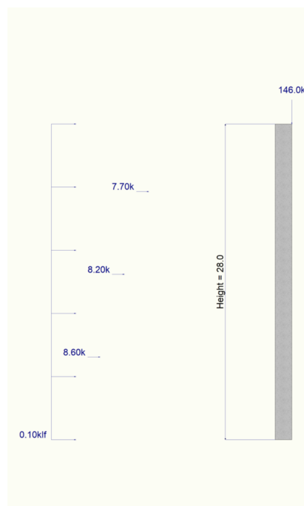
DESCRIPTION: RF Collector T, grid A1

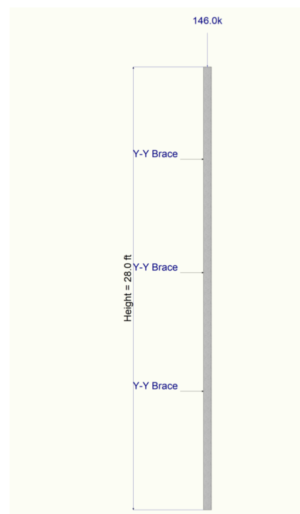
Steel Section Properties : W18x35

Depth	=	17.700	in	I xx	=	510.00	in^4	J	=	0.506	in^4
Web Thick	=	0.300	in	S xx	=	57.60	in^3	Cw	=	1,140.00	in^6
Flange Width	=	6.000	in	R xx	=	7.040	in				
Flange Thick	=	0.425	in	Zx	=	66.500	in^3				
Area	=	10.300	in^2	I yy	=	15.300	in^4				
Weight	=	35.000	plf	S yy	=	5.120	in^3	Wno	=	25.900	in^2
Kdesign	=	0.827	in	R yy	=	1.220	in	Sw	=	16.500	in^4
K1	=	0.750	in	Zy	=	8.060	in^3	Qf	=	10.500	in^3
rts	=	1.510	in					Qw	=	32.700	in^3
Ycg	=	0.000	in								

Sketches







PRCNC20221036

Steel Column

DESCRIPTION: RF Collector U, grid D6

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x55**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 21.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 8 ft, 16 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 21.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 21.0 ft, Yecc = 9.050 in, E = 281.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.050 k/ft
Lat. Point Load at 8.0 ft creating Mx-x, D = 3.50, S = 2.10 k
Lat. Point Load at 16.0 ft creating Mx-x, D = 13.40, S = 4.60 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.8721**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	21.0	ft
At maximum location values are . . .		
Pu	281.0	k
0.9 * Pn	663.34	k
Mu-x	-211.921	k-ft
0.9 * Mn-x :	420.0	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	69.375	k-ft
PASS Maximum Shear Stress Ratio =	**0.1315**	: 1
Load Combination	+1.401D+0.20S+E	
Location of max.above base	21.0	ft
At maximum location values are . . .		
Vu : Applied	27.855	k
Vn * Phi : Allowable	211.770	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	20.594	k
Bottom along Y-Y	12.977	k

Maximum Load Deflections . . .

Along Y-Y 0.4493 in at 11.839 ft above base
for load combination : +D-0.70E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios Stress Ratio	Status	Location
+1.40D	0.199	PASS	15.93 ft	1.10	1.00	57.49	34.01	0.080	PASS	21.00 ft
+1.20D	0.170	PASS	15.93 ft	1.10	1.00	57.49	34.01	0.068	PASS	21.00 ft
+1.20D+0.50S	0.196	PASS	15.93 ft	1.10	1.00	57.49	34.01	0.079	PASS	21.00 ft
+1.20D+1.60S	0.252	PASS	15.93 ft	1.10	1.00	57.49	34.01	0.101	PASS	21.00 ft
+0.90D	0.128	PASS	15.93 ft	1.10	1.00	57.49	34.01	0.051	PASS	21.00 ft
+1.401D+0.20S+E	0.872	PASS	21.00 ft	1.63	1.00	35.93	34.01	0.132	PASS	21.00 ft
+1.401D+0.20S-E	0.101	PASS	16.21 ft	1.63	1.00	35.93	34.01	0.089	PASS	0.00 ft
+0.6994D+E	0.872	PASS	21.00 ft	1.63	1.00	35.93	34.01	0.088	PASS	21.00 ft
+0.6994D-E	0.025	PASS	21.00 ft	1.63	1.00	35.93	34.01	0.067	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				5.882	12.068				
+D+S				8.277	16.373				
+D+0.750S				7.679	15.296				

Steel Column

DESCRIPTION: RF Collector U, grid D6

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
+0.60D				3.529	7.241				
+D+0.70E	196.700			-1.182	19.132				
+D-0.70E	-196.700			12.946	5.004				
+D+0.750S+0.5250E	147.525			2.381	20.594				
+D+0.750S-0.5250E	-147.525			12.977	9.998				
+0.60D+0.70E	196.700			-3.535	14.305				
+0.60D-0.70E	-196.700			10.593	0.177				
S Only				2.395	4.305				
E Only	281.000			-10.091	10.091				
E Only * -1.0	-281.000			10.091	-10.091				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	281.000			-10.091	10.091		-211.921		
"	Minimum	-281.000			10.091	-10.091		211.921		
Reaction, X-X Axis Base	Maximum				5.882	12.068				
"	Minimum				5.882	12.068				
Reaction, Y-Y Axis Base	Maximum	-147.525			12.977	9.998		111.258		
"	Minimum	281.000			-10.091	10.091		-211.921		
Reaction, X-X Axis Top	Maximum				5.882	12.068				
"	Minimum				5.882	12.068				
Reaction, Y-Y Axis Top	Maximum				5.882	12.068				
"	Minimum	-281.000			10.091	-10.091		211.921		
Moment, X-X Axis Base	Maximum				5.882	12.068				
"	Minimum				5.882	12.068				
Moment, Y-Y Axis Base	Maximum				5.882	12.068				
"	Minimum				5.882	12.068				
Moment, X-X Axis Top	Maximum	-281.000			10.091	-10.091		211.921		
"	Minimum	281.000			-10.091	10.091		-211.921		
Moment, Y-Y Axis Top	Maximum				5.882	12.068				
"	Minimum				5.882	12.068				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.167	in	11.275	ft
+D+S	0.0000	in	0.000	ft	0.232	in	11.134	ft
+D+0.750S	0.0000	in	0.000	ft	0.216	in	11.275	ft
+0.60D	0.0000	in	0.000	ft	0.100	in	11.275	ft
+D+0.70E	0.0000	in	0.000	ft	-0.120	in	13.530	ft
+D-0.70E	0.0000	in	0.000	ft	0.449	in	11.839	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	-0.021	in	18.040	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.427	in	11.698	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.185	in	12.685	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.383	in	11.980	ft
S Only	0.0000	in	0.000	ft	0.065	in	10.993	ft

Steel Section Properties : W18x55

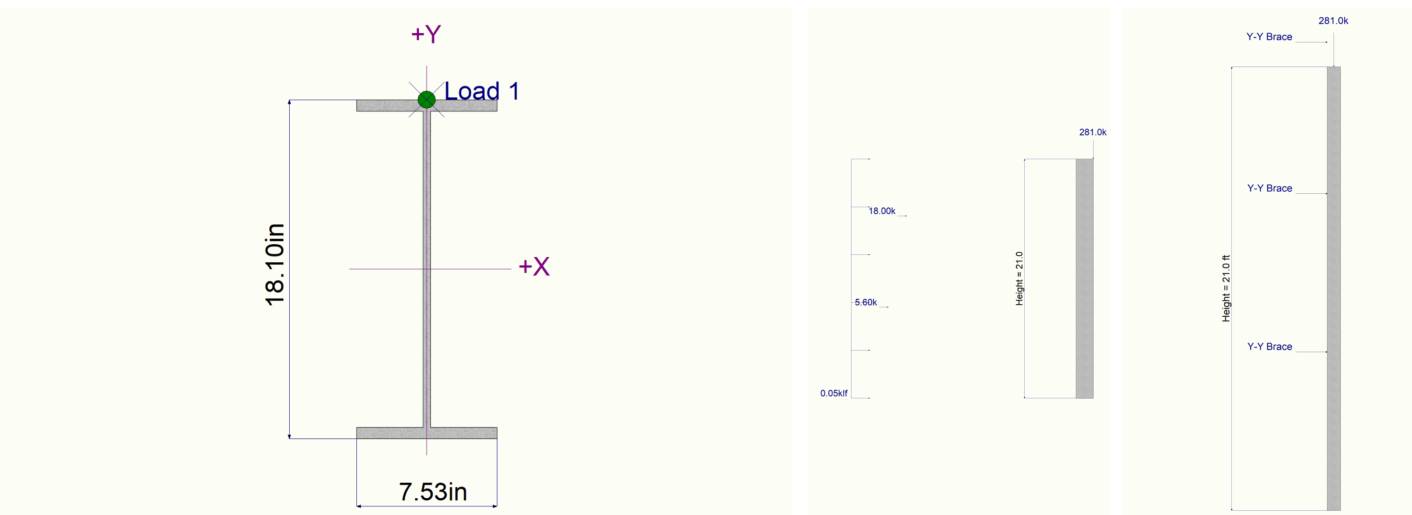
Steel Column

DESCRIPTION: RF Collector U, grid D6

Steel Section Properties : W18x55

Depth	=	18.100	in	I xx	=	890.00	in^4	J	=	1.660	in^4
Web Thick	=	0.390	in	S xx	=	98.30	in^3	Cw	=	3,430.00	in^6
Flange Width	=	7.530	in	R xx	=	7.410	in				
Flange Thick	=	0.630	in	Zx	=	112.000	in^3				
Area	=	16.200	in^2	I yy	=	44.900	in^4				
Weight	=	55.000	plf	S yy	=	11.900	in^3	Wno	=	32.900	in^2
Kdesign	=	1.030	in	R yy	=	1.670	in	Sw	=	39.000	in^4
K1	=	0.813	in	Zy	=	18.500	in^3	Qf	=	19.600	in^3
rts	=	2.000	in					Qw	=	55.300	in^3
Ycg	=	0.000	in								

Sketches



Steel Column

DESCRIPTION: RF Collector V, grid D6

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x55**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 30 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 7.333 ft, 15 ft, 22.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 30 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 30.0 ft, Yecc = 9.050 in, E = 281.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.070, S = 0.030 k/ft
Lat. Point Load at 4.0 ft creating Mx-x, D = 1.70, S = 1.50 k
Lat. Point Load at 7.333 ft creating Mx-x, D = 10.90, S = 3.40 k
Lat. Point Load at 9.250 ft creating Mx-x, D = 2.40, S = 2.10 k
Lat. Point Load at 15.0 ft creating Mx-x, D = 2.50, S = 1.30 k
Lat. Point Load at 17.170 ft creating Mx-x, D = 1.70, S = 1.50 k
Lat. Point Load at 22.50 ft creating Mx-x, D = 12.20, S = 3.70 k
Lat. Point Load at 25.10 ft creating Mx-x, D = 2.20, S = 2.0 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9252** : 1
Load Combination +0.6994D+E
Location of max.above base 30.0 ft
At maximum location values are . . .
Pu 281.0 k
0.9 * Pn 589.52 k
Mu-x -211.921 k-ft
0.9 * Mn-x : 420.0 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 69.375 k-ft

PASS Maximum Shear Stress Ratio = **0.1637** : 1
Load Combination +1.20D+1.60S
Location of max.above base 0.0 ft
At maximum location values are . . .
Vu : Applied 34.670 k
Vn * Phi : Allowable 211.770 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 27.667 k
Bottom along Y-Y 27.750 k

Maximum Load Deflections . . .
Along Y-Y 1.696 in at 15.705 ft above base
for load combination : +D+0.750S-0.5250E
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.486	PASS	15.30 ft	1.04	1.00	53.89	48.58	0.118	PASS	30.00 ft
+1.20D	0.417	PASS	15.30 ft	1.04	1.00	53.89	48.58	0.101	PASS	30.00 ft
+1.20D+0.50S	0.497	PASS	15.30 ft	1.04	1.00	53.89	48.58	0.121	PASS	0.00 ft
+1.20D+1.60S	0.675	PASS	15.30 ft	1.04	1.00	53.89	48.58	0.164	PASS	0.00 ft
+0.90D	0.312	PASS	15.30 ft	1.04	1.00	53.89	48.58	0.076	PASS	30.00 ft
+1.401D+0.20S+E	0.925	PASS	30.00 ft	1.59	1.00	53.89	48.58	0.159	PASS	30.00 ft
+1.401D+0.20S-E	0.272	PASS	22.35 ft	1.04	1.00	53.89	48.58	0.159	PASS	0.00 ft
+0.6994D+E	0.925	PASS	30.00 ft	1.59	1.00	53.89	48.58	0.092	PASS	30.00 ft
+0.6994D-E	0.057	PASS	22.55 ft	1.04	1.00	53.89	48.58	0.092	PASS	0.00 ft

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector V, grid D6

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				17.805	17.895				
+D+S				26.120	25.980				
+D+0.750S				24.041	23.959				
+0.60D				10.683	10.737				
+D+0.70E	196.700			12.861	22.839				
+D-0.70E	-196.700			22.750	12.950				
+D+0.750S+0.5250E	147.525			20.333	27.667				
+D+0.750S-0.5250E	-147.525			27.750	20.250				
+0.60D+0.70E	196.700			5.738	15.682				
+0.60D-0.70E	-196.700			15.628	5.792				
S Only				8.315	8.085				
E Only	281.000			-7.064	7.064				
E Only * -1.0	-281.000			7.064	-7.064				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	281.000			-7.064	7.064		-211.921		
"	Minimum	-281.000			7.064	-7.064		211.921		
Reaction, X-X Axis Base	Maximum				17.805	17.895				
"	Minimum				17.805	17.895				
Reaction, Y-Y Axis Base	Maximum	-147.525			27.750	20.250		111.258		
"	Minimum	281.000			-7.064	7.064		-211.921		
Reaction, X-X Axis Top	Maximum				17.805	17.895				
"	Minimum				17.805	17.895				
Reaction, Y-Y Axis Top	Maximum				17.805	17.895				
"	Minimum	-281.000			7.064	-7.064		211.921		
Moment, X-X Axis Base	Maximum				17.805	17.895				
"	Minimum				17.805	17.895				
Moment, Y-Y Axis Base	Maximum				17.805	17.895				
"	Minimum				17.805	17.895				
Moment, X-X Axis Top	Maximum	-281.000			7.064	-7.064		211.921		
"	Minimum	281.000			-7.064	7.064		-211.921		
Moment, Y-Y Axis Top	Maximum				17.805	17.895				
"	Minimum				17.805	17.895				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.946	in	15.101	ft
+D+S	0.0000	in	0.000	ft	1.379	in	15.101	ft
+D+0.750S	0.0000	in	0.000	ft	1.271	in	15.101	ft
+0.60D	0.0000	in	0.000	ft	0.568	in	15.101	ft
+D+0.70E	0.0000	in	0.000	ft	0.398	in	12.685	ft
+D-0.70E	0.0000	in	0.000	ft	1.515	in	15.906	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.853	in	14.094	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	1.696	in	15.705	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.090	in	24.564	ft
+0.60D-0.70E	0.0000	in	0.000	ft	1.139	in	16.309	ft
S Only	0.0000	in	0.000	ft	0.433	in	15.101	ft

Steel Section Properties : W18x55

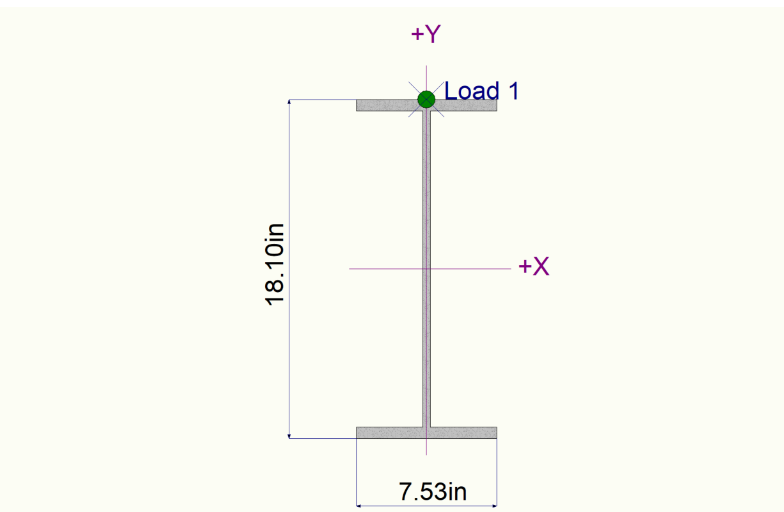
Steel Column

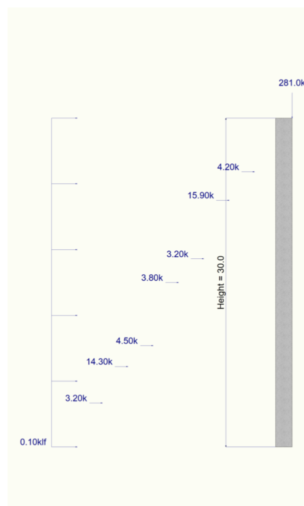
DESCRIPTION: RF Collector V, grid D6

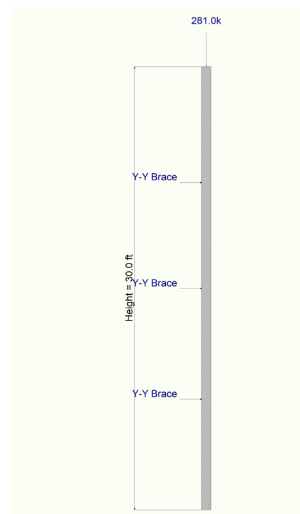
Steel Section Properties : W18x55

Depth	=	18.100	in	I xx	=	890.00	in^4	J	=	1.660	in^4
Web Thick	=	0.390	in	S xx	=	98.30	in^3	Cw	=	3,430.00	in^6
Flange Width	=	7.530	in	R xx	=	7.410	in				
Flange Thick	=	0.630	in	Zx	=	112.000	in^3				
Area	=	16.200	in^2	I yy	=	44.900	in^4				
Weight	=	55.000	plf	S yy	=	11.900	in^3	Wno	=	32.900	in^2
Kdesign	=	1.030	in	R yy	=	1.670	in	Sw	=	39.000	in^4
K1	=	0.813	in	Zy	=	18.500	in^3	Qf	=	19.600	in^3
rts	=	2.000	in					Qw	=	55.300	in^3
Ycg	=	0.000	in								

Sketches







Steel Column

DESCRIPTION: RF Collector W, grid D6

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name :	**W30x116**	Overall Column Height	60 ft
Analysis Method :	Load Resistance Factor	Top & Bottom Fixity	Top & Bottom Pinned
Steel Stress Grade			
Fy : Steel Yield	50.0 ksi		
E : Elastic Bending Modulus	29,000.0 ksi		

Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Unbraced Length for buckling ABOUT Y-Y Axis = 9 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 60 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 60.0 ft, Yecc = 15.0 in, E = 281.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.20, S = 0.030 k/ft
Lat. Point Load at 2.20 ft creating Mx-x, D = 1.70, S = 1.50 k
Lat. Point Load at 7.50 ft creating Mx-x, D = 10.20, S = 3.190 k
Lat. Point Load at 9.250 ft creating Mx-x, D = 0.8260, S = 0.750 k
Lat. Point Load at 15.0 ft creating Mx-x, D = 10.640, S = 3.330 k
Lat. Point Load at 16.20 ft creating Mx-x, D = 1.350, S = 1.20 k
Lat. Point Load at 23.20 ft creating Mx-x, D = 11.120, S = 4.0 k
Lat. Point Load at 30.0 ft creating Mx-x, D = 9.40, S = 5.70 k
Lat. Point Load at 37.50 ft creating Mx-x, D = 9.40, S = 5.60 k
Lat. Point Load at 45.0 ft creating Mx-x, D = 7.50, S = 5.30 k
Lat. Point Load at 52.50 ft creating Mx-x, D = 4.430, S = 4.0 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.9243**	: 1
Load Combination	+1.20D+1.60S	
Location of max.above base	29.799	ft
At maximum location values are . . .		
Pu	0.0	k
0.9 * Pn	1,182.83	k
Mu-x	1,310.23	k-ft
0.9 * Mn-x :	1,417.50	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	184.50	k-ft
PASS Maximum Shear Stress Ratio =	**0.1609**	: 1
Load Combination	+1.20D+1.60S	
Location of max.above base	0.0	ft
At maximum location values are . . .		
Vu : Applied	81.837	k
Vn * Phi : Allowable	508.50	k

Maximum Load Reactions . .

Top along X-X	0.0 k
Bottom along X-X	0.0 k
Top along Y-Y	52.863 k
Bottom along Y-Y	62.073 k

Maximum Load Deflections . . .

Along Y-Y 4.598 in at 30.604 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.665	PASS	29.80 ft	1.14	1.00	49.32	60.00	0.120	PASS	0.00 ft
+1.20D	0.570	PASS	29.80 ft	1.14	1.00	49.32	60.00	0.103	PASS	0.00 ft
+1.20D+0.50S	0.680	PASS	29.80 ft	1.14	1.00	49.32	60.00	0.121	PASS	0.00 ft
+1.20D+1.60S	0.924	PASS	29.80 ft	1.14	1.00	49.32	60.00	0.161	PASS	0.00 ft
+0.90D	0.427	PASS	29.80 ft	1.14	1.00	49.32	60.00	0.077	PASS	0.00 ft
+1.401D+0.20S+E	0.765	PASS	23.36 ft	1.14	1.00	49.32	60.00	0.116	PASS	0.00 ft
+1.401D+0.20S-E	0.503	PASS	30.20 ft	1.14	1.00	49.32	60.00	0.139	PASS	0.00 ft

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector W, grid D6

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+0.6994D+E	0.458	PASS	60.00 ft	1.14	1.00	49.32	60.00	0.059	PASS	60.00 ft
+0.6994D-E	0.169	PASS	34.23 ft	1.14	1.00	49.32	60.00	0.072	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base	k @ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments @ Base	k-ft @ Top	My - End Moments @ Base	@ Top
D Only				43.701	34.865				
+D+S				62.073	52.863				
+D+0.750S				57.480	48.363				
+0.60D				26.221	20.919				
+D+0.70E	196.700			39.603	38.963				
+D-0.70E	-196.700			47.799	30.767				
+D+0.750S+0.5250E	147.525			54.407	51.437				
+D+0.750S-0.5250E	-147.525			60.554	45.290				
+0.60D+0.70E	196.700			22.123	25.017				
+0.60D-0.70E	-196.700			30.318	16.821				
S Only				18.372	17.998				
E Only	281.000			-5.854	5.854				
E Only * -1.0	-281.000			5.854	-5.854				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	k @ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments @ Base	k-ft @ Top	My - End Moments @ Base	@ Top
Axial @ Base	Maximum	281.000			-5.854	5.854		-351.250		
"	Minimum	-281.000			5.854	-5.854		351.250		
Reaction, X-X Axis Base	Maximum				43.701	34.865				
"	Minimum				43.701	34.865				
Reaction, Y-Y Axis Base	Maximum				62.073	52.863				
"	Minimum	281.000			-5.854	5.854		-351.250		
Reaction, X-X Axis Top	Maximum				43.701	34.865				
"	Minimum				43.701	34.865				
Reaction, Y-Y Axis Top	Maximum				43.701	34.865				
"	Minimum	-281.000			5.854	-5.854		351.250		
Moment, X-X Axis Base	Maximum				43.701	34.865				
"	Minimum				43.701	34.865				
Moment, Y-Y Axis Base	Maximum				43.701	34.865				
"	Minimum				43.701	34.865				
Moment, X-X Axis Top	Maximum	-281.000			5.854	-5.854		351.250		
"	Minimum	281.000			-5.854	5.854		-351.250		
Moment, Y-Y Axis Top	Maximum				43.701	34.865				
"	Minimum				43.701	34.865				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	3.036	in	29.799	ft
+D+S	0.0000	in	0.000	ft	4.444	in	29.799	ft
+D+0.750S	0.0000	in	0.000	ft	4.092	in	29.799	ft
+0.60D	0.0000	in	0.000	ft	1.822	in	29.799	ft
+D+0.70E	0.0000	in	0.000	ft	2.370	in	28.591	ft
+D-0.70E	0.0000	in	0.000	ft	3.711	in	30.604	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	3.589	in	29.396	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	4.598	in	30.604	ft
+0.60D+0.70E	0.0000	in	0.000	ft	1.160	in	27.383	ft
+0.60D-0.70E	0.0000	in	0.000	ft	2.498	in	31.007	ft
S Only	0.0000	in	0.000	ft	1.408	in	30.201	ft

Steel Section Properties : W30x116

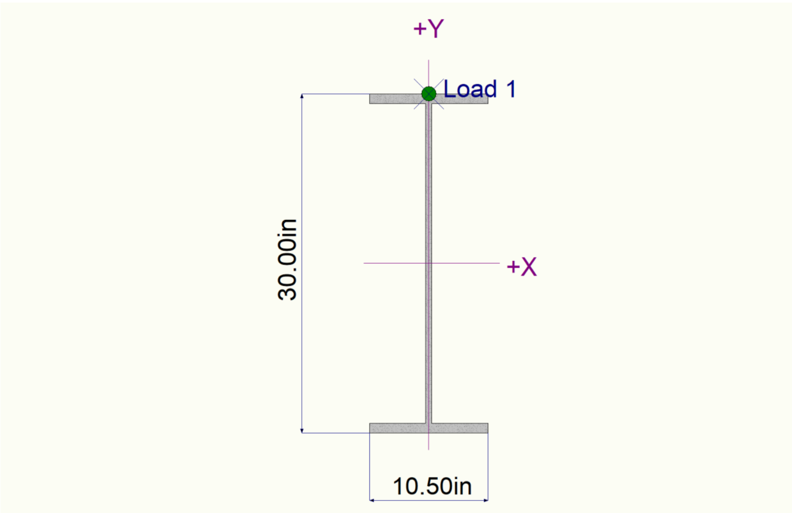
Steel Column

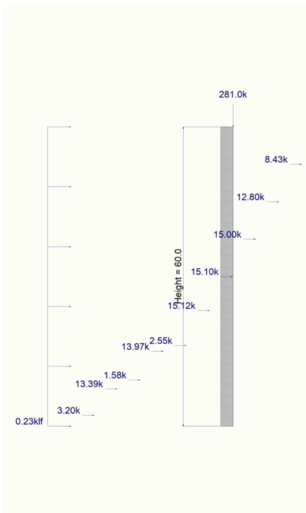
DESCRIPTION: RF Collector W, grid D6

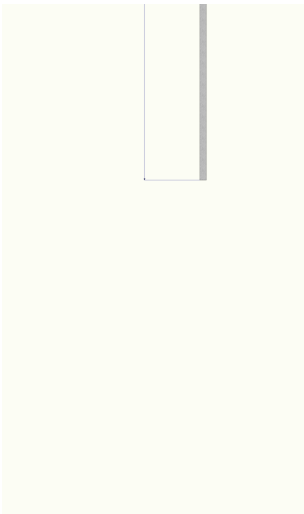
Steel Section Properties : W30x116

Depth	=	30.000	in	I xx	=	4,930.00	in^4	J	=	6.430	in^4
Web Thick	=	0.565	in	S xx	=	329.00	in^3	Cw	=	34900.00	in^6
Flange Width	=	10.500	in	R xx	=	12.000	in				
Flange Thick	=	0.850	in	Zx	=	378.000	in^3				
Area	=	34.200	in^2	I yy	=	164.000	in^4				
Weight	=	116.000	plf	S yy	=	31.300	in^3	Wno	=	76.500	in^2
Kdesign	=	1.500	in	R yy	=	2.190	in	Sw	=	171.000	in^4
K1	=	1.125	in	Zy	=	49.200	in^3	Qf	=	61.500	in^3
rts	=	2.700	in					Qw	=	187.000	in^3
Ycg	=	0.000	in								

Sketches







PRCNC20221036

Steel Column

DESCRIPTION: RF Collector X, grid C15a

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W12x19**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 13.6 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Unbraced Length for buckling ABOUT Y-Y Axis = 13.6 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 13.6 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 13.60 ft, Yecc = 6.10 in, E = 19.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.20, S = 0.20 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.8826**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	13.60	ft
At maximum location values are . . .		
Pu	19.0	k
0.9 * Pn	31.923	k
Mu-x	-9.658	k-ft
0.9 * Mn-x :	29.869	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	11.175	k-ft
PASS Maximum Shear Stress Ratio =	**0.04427**	: 1
Load Combination	+1.20D+1.60S	
Location of max.above base	0.0	ft
At maximum location values are . . .		
Vu : Applied	3.808	k
Vn * Phi : Allowable	86.010	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	2.753	k
Bottom along Y-Y	2.753	k

Maximum Load Deflections . . .

Along Y-Y 0.09952 in at 7.119 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.217	PASS	6.75 ft	1.07	1.00	198.54	33.86	0.022	PASS	0.00 ft
+1.20D	0.186	PASS	6.85 ft	1.07	1.00	198.54	33.86	0.019	PASS	0.00 ft
+1.20D+0.50S	0.263	PASS	6.75 ft	1.07	1.00	198.54	33.86	0.027	PASS	0.00 ft
+1.20D+1.60S	0.433	PASS	6.85 ft	1.07	1.00	198.54	33.86	0.044	PASS	0.00 ft
+0.90D	0.139	PASS	6.75 ft	1.07	1.00	198.54	33.86	0.014	PASS	0.00 ft
+1.401D+0.20S+E	0.883	PASS	13.60 ft	1.07	1.00	198.54	33.86	0.034	PASS	13.60 ft
+1.401D+0.20S-E	0.308	PASS	13.60 ft	1.07	1.00	198.54	33.86	0.034	PASS	0.00 ft
+0.6994D+E	0.883	PASS	13.60 ft	1.07	1.00	198.54	33.86	0.019	PASS	13.60 ft
+0.6994D-E	0.308	PASS	13.60 ft	1.07	1.00	198.54	33.86	0.019	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X @ Top	Y-Y Axis Reaction @ Base	Y-Y @ Top	Mx - End Moments (k-ft) @ Base	Mx @ Top	My - End Moments @ Base	My @ Top
D Only				1.360	1.360				
+D+S				2.720	2.720				
+D+0.750S				2.380	2.380				
+0.60D				0.816	0.816				
+D+0.70E	13.300			0.863	1.857				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector X, grid C15a

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top	k	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments @ Base	Mx - End Moments @ Top	k-ft	My - End Moments @ Base	My - End Moments @ Top
+D-0.70E	-13.300				1.857	0.863					
+D+0.750S+0.5250E	9.975				2.007	2.753					
+D+0.750S-0.5250E	-9.975				2.753	2.007					
+0.60D+0.70E	13.300				0.319	1.313					
+0.60D-0.70E	-13.300				1.313	0.319					
S Only					1.360	1.360					
E Only	19.000				-0.710	0.710					
E Only * -1.0	-19.000				0.710	-0.710					

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction (k) @ Base	Y-Y Axis Reaction (k) @ Top	Mx - End Moments @ Base	Mx - End Moments @ Top	My - End Moments (k-ft) @ Base	My - End Moments (k-ft) @ Top
Axial @ Base	Maximum	19.000			-0.710	0.710		-9.658		
"	Minimum	-19.000			0.710	-0.710		9.658		
Reaction, X-X Axis Base	Maximum				1.360	1.360				
"	Minimum				1.360	1.360				
Reaction, Y-Y Axis Base	Maximum	-9.975			2.753	2.007		5.071		
"	Minimum	19.000			-0.710	0.710		-9.658		
Reaction, X-X Axis Top	Maximum				1.360	1.360				
"	Minimum				1.360	1.360				
Reaction, Y-Y Axis Top	Maximum				1.360	1.360				
"	Minimum	-19.000			0.710	-0.710		9.658		
Moment, X-X Axis Base	Maximum				1.360	1.360				
"	Minimum				1.360	1.360				
Moment, Y-Y Axis Base	Maximum				1.360	1.360				
"	Minimum				1.360	1.360				
Moment, X-X Axis Top	Maximum	-19.000			0.710	-0.710		9.658		
"	Minimum	19.000			-0.710	0.710		-9.658		
Moment, Y-Y Axis Top	Maximum				1.360	1.360				
"	Minimum				1.360	1.360				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.041	in	6.846	ft
+D+S	0.0000	in	0.000	ft	0.083	in	6.846	ft
+D+0.750S	0.0000	in	0.000	ft	0.072	in	6.846	ft
+0.60D	0.0000	in	0.000	ft	0.025	in	6.846	ft
+D+0.70E	0.0000	in	0.000	ft	0.007	in	4.472	ft
+D-0.70E	0.0000	in	0.000	ft	0.078	in	7.302	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.045	in	6.298	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.100	in	7.119	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.014	in	9.584	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.061	in	7.485	ft
S Only	0.0000	in	0.000	ft	0.041	in	6.846	ft

Steel Section Properties : W12x19

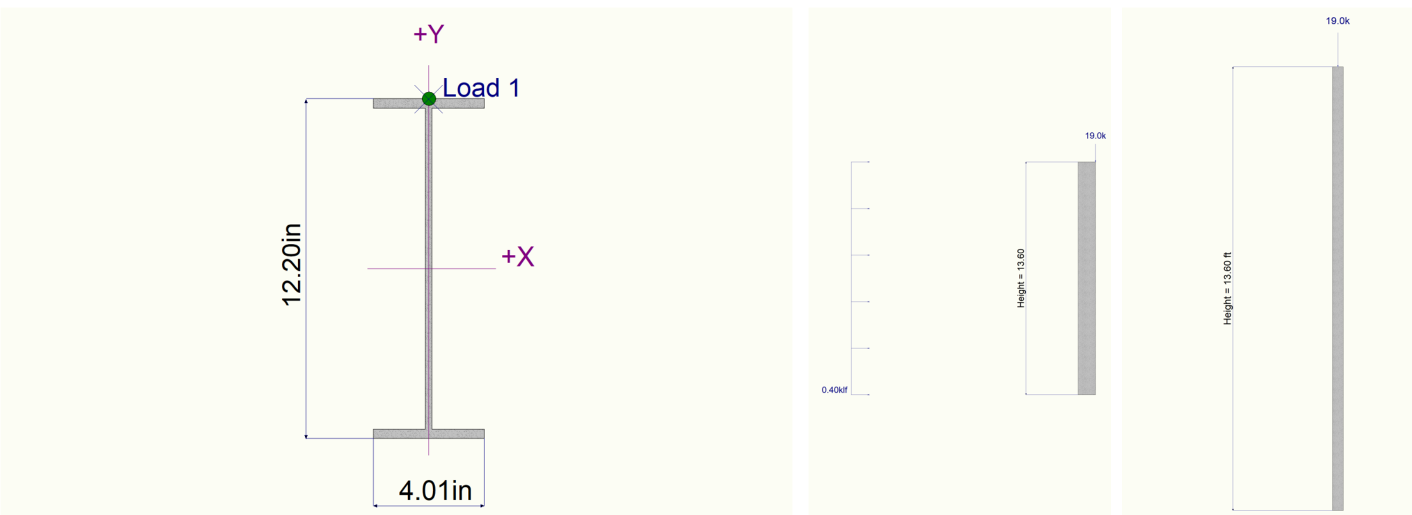
Steel Column

DESCRIPTION: RF Collector X, grid C15a

Steel Section Properties : W12x19

Depth	=	12.200	in	I xx	=	130.00	in^4	J	=	0.180	in^4
Web Thick	=	0.235	in	S xx	=	21.30	in^3	Cw	=	131.00	in^6
Flange Width	=	4.010	in	R xx	=	4.820	in				
Flange Thick	=	0.350	in	Zx	=	24.700	in^3				
Area	=	5.570	in^2	I yy	=	3.760	in^4				
Weight	=	19.000	plf	S yy	=	1.880	in^3	Wno	=	11.900	in^2
Kdesign	=	0.650	in	R yy	=	0.822	in	Sw	=	4.170	in^4
K1	=	0.563	in	Zy	=	2.980	in^3	Qf	=	3.910	in^3
rts	=	1.020	in					Qw	=	12.200	in^3
Ycg	=	0.000	in								

Sketches



Steel Column

DESCRIPTION: RF Collector Y, grid C15a

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name :	**W14x22**	Overall Column Height	16.083 ft
Analysis Method :	Load Resistance Factor	Top & Bottom Fixity	Top & Bottom Pinned
Steel Stress Grade			
Fy : Steel Yield	50.0 ksi		
E : Elastic Bending Modulus	29,000.0 ksi		

Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Unbraced Length for buckling ABOUT Y-Y Axis = 16.083 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 16.083 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 16.083 ft, Yecc = 6.850 in, E = 19.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.260, S = 0.220 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.6706** : 1

Load Combination	+0.6994D+E
Location of max.above base	15.975 ft
At maximum location values are . . .	
Pu	19.0 k
0.9 * Pn	42.575 k
Mu-x	-10.616 k-ft
0.9 * Mn-x :	42.074 k-ft
Mu-y	0.0 k-ft
0.9 * Mn-y :	16.463 k-ft

PASS Maximum Shear Stress Ratio = **0.05649** : 1

Load Combination	+1.20D+1.60S
Location of max.above base	0.0 ft
At maximum location values are . . .	
Vu : Applied	5.340 k
Vn * Phi : Allowable	94.530 k

Maximum Load Reactions . .

Top along X-X	0.0 k
Bottom along X-X	0.0 k
Top along Y-Y	3.860 k
Bottom along Y-Y	3.860 k

Maximum Load Deflections . . .

Along Y-Y 0.140 in at 8.311 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.280	PASS	7.99 ft	1.11	1.00	185.57	34.84	0.031	PASS	0.00 ft
+1.20D	0.240	PASS	8.10 ft	1.11	1.00	185.57	34.84	0.027	PASS	0.00 ft
+1.20D+0.50S	0.324	PASS	7.99 ft	1.11	1.00	185.57	34.84	0.036	PASS	16.08 ft
+1.20D+1.60S	0.510	PASS	7.99 ft	1.11	1.00	185.57	34.84	0.056	PASS	0.00 ft
+0.90D	0.180	PASS	7.99 ft	1.11	1.00	185.57	34.84	0.020	PASS	0.00 ft
+1.401D+0.20S+E	0.666	PASS	15.98 ft	1.11	1.00	185.57	34.84	0.042	PASS	16.08 ft
+1.401D+0.20S-E	0.000	PASS	16.08 ft	1.11	1.00	185.57	34.84	0.042	PASS	0.00 ft
+0.6994D+E	0.671	PASS	15.98 ft	1.11	1.00	185.57	34.84	0.023	PASS	16.08 ft
+0.6994D-E	0.000	PASS	16.08 ft	1.11	1.00	185.57	34.84	0.023	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				2.091	2.091				
+D+S				3.860	3.860				
+D+0.750S				3.418	3.418				
+0.60D				1.254	1.254				
+D+0.70E	13.300			1.619	2.563				

PRCNC20221036

Title Block Line 1
You can change this area
using the "Settings" menu item
and then using the "Printing &
Title Block" selection.
Title Block Line 6

Project Title:
Engineer:
Project ID:
Project Descr:

Printed: 15 JUN 2022, 6:29PM

Steel Column

s\Higher-Education\2021\2I33TT~Q\SEV10W~K\C7A4YC~F\3YDNAQ~Y\DSK1PP~K\Chords and Collectors.ec6

Lic. # : KW-06006560 INTEGRUS ARCHITECTURE

DESCRIPTION: RF Collector Y, grid C15a

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
+D-0.70E	-13.300			2.563	1.619				
+D+0.750S+0.5250E	9.975			3.064	3.772				
+D+0.750S-0.5250E	-9.975			3.772	3.064				
+0.60D+0.70E	13.300			0.782	1.727				
+0.60D-0.70E	-13.300			1.727	0.782				
S Only				1.769	1.769				
E Only	19.000			-0.674	0.674				
E Only * -1.0	-19.000			0.674	-0.674				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	19.000			-0.674	0.674				
"	Minimum	-19.000			0.674	-0.674				
Reaction, X-X Axis Base	Maximum				2.091	2.091				
"	Minimum				2.091	2.091				
Reaction, Y-Y Axis Base	Maximum				3.860	3.860				
"	Minimum	19.000			-0.674	0.674				
Reaction, X-X Axis Top	Maximum				2.091	2.091				
"	Minimum				2.091	2.091				
Reaction, Y-Y Axis Top	Maximum				2.091	2.091				
"	Minimum	-19.000			0.674	-0.674				
Moment, X-X Axis Base	Maximum				2.091	2.091				
"	Minimum				2.091	2.091				
Moment, Y-Y Axis Base	Maximum				2.091	2.091				
"	Minimum				2.091	2.091				
Moment, X-X Axis Top	Maximum				2.091	2.091				
"	Minimum				2.091	2.091				
Moment, Y-Y Axis Top	Maximum				2.091	2.091				
"	Minimum				2.091	2.091				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.069	in	8.095	ft
+D+S	0.0000	in	0.000	ft	0.127	in	8.095	ft
+D+0.750S	0.0000	in	0.000	ft	0.112	in	8.095	ft
+0.60D	0.0000	in	0.000	ft	0.041	in	8.095	ft
+D+0.70E	0.0000	in	0.000	ft	0.032	in	7.016	ft
+D-0.70E	0.0000	in	0.000	ft	0.106	in	8.527	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.084	in	7.772	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.140	in	8.311	ft
+0.60D+0.70E	0.0000	in	0.000	ft	0.006	in	5.181	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.079	in	8.635	ft
S Only	0.0000	in	0.000	ft	0.058	in	8.095	ft

Steel Section Properties : W14x22

PRCNC20221036

Title Block Line 1
You can change this area
using the "Settings" menu item
and then using the "Printing &
Title Block" selection.
Title Block Line 6

Project Title:
Engineer:
Project ID:
Project Descr:

Printed: 15 JUN 2022, 6:29PM

Steel Column

s\Higher-Education\2021\2I33TT~Q\SEV10W~K\C7A4YC~F\3YDNAQ~Y\DSK1PP~K\Chords and Collectors.ec6

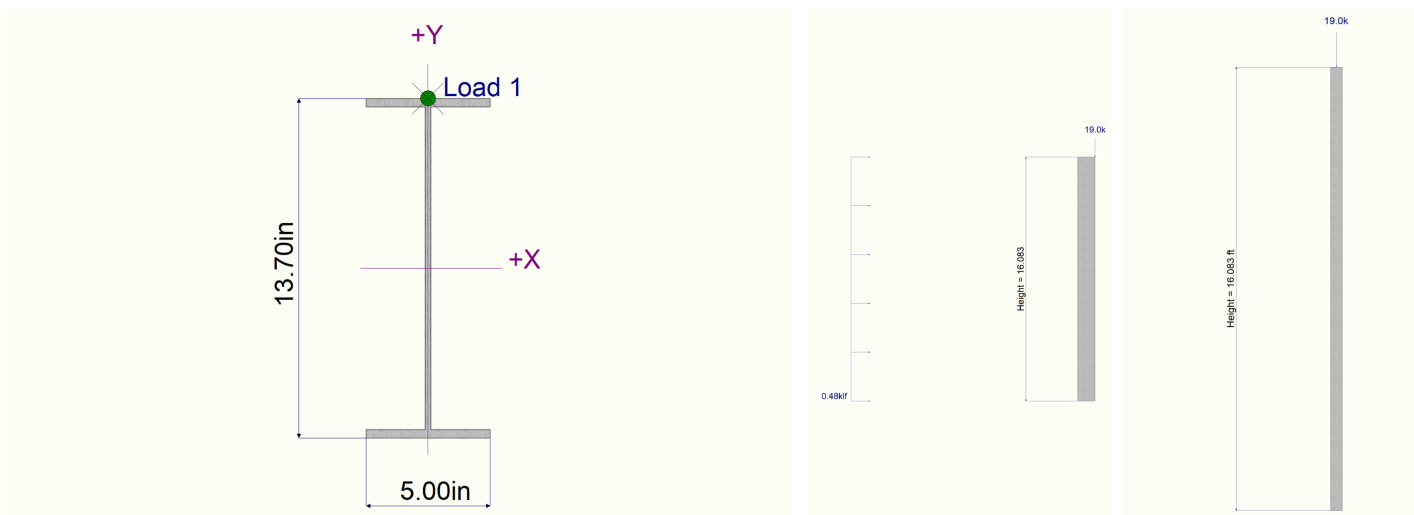
Lic. # : KW-06006560 **INTEGRUS ARCHITECTURE**

DESCRIPTION: RF Collector Y, grid C15a

Steel Section Properties : W14x22

Depth	=	13.700	in	I xx	=	199.00	in^4	J	=	0.208	in^4
Web Thick	=	0.230	in	S xx	=	29.00	in^3	Cw	=	314.00	in^6
Flange Width	=	5.000	in	R xx	=	5.540	in				
Flange Thick	=	0.335	in	Zx	=	33.200	in^3				
Area	=	6.490	in^2	I yy	=	7.000	in^4				
Weight	=	22.000	plf	S yy	=	2.800	in^3	Wno	=	16.700	in^2
Kdesign	=	0.735	in	R yy	=	1.040	in	Sw	=	7.000	in^4
K1	=	0.750	in	Zy	=	4.390	in^3	Qf	=	5.340	in^3
rts	=	1.270	in					Qw	=	16.100	in^3
Ycg	=	0.000	in								

Sketches



PRCNC20221036

Steel Column

DESCRIPTION: RF Collector Z, grid C15b, requires bracing

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W12x14**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 17.5 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 8 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 17.5 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 17.50 ft, Yecc = 5.950 in, E = 19.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10, S = 0.10 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.7018**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	17.383	ft
At maximum location values are . . .		
Pu	19.0	k
0.9 * Pn	41.075	k
Mu-x	-9.286	k-ft
0.9 * Mn-x :	34.498	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	7.125	k-ft
PASS Maximum Shear Stress Ratio =	**0.03813**	: 1
Load Combination	+1.20D+1.60S	
Location of max.above base	0.0	ft
At maximum location values are . . .		
Vu : Applied	2.450	k
Vn * Phi : Allowable	64.260	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	1.814	k
Bottom along Y-Y	1.814	k

Maximum Load Deflections . . .

Along Y-Y 0.210 in at 9.161 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.155	PASS	8.69 ft	1.26	1.00	151.26	45.45	0.019	PASS	0.00 ft
+1.20D	0.133	PASS	8.69 ft	1.26	1.00	151.26	45.45	0.016	PASS	0.00 ft
+1.20D+0.50S	0.189	PASS	8.69 ft	1.26	1.00	151.26	45.45	0.023	PASS	0.00 ft
+1.20D+1.60S	0.311	PASS	8.69 ft	1.26	1.00	151.26	45.45	0.038	PASS	0.00 ft
+0.90D	0.100	PASS	8.69 ft	1.26	1.00	151.26	45.45	0.012	PASS	17.50 ft
+1.401D+0.20S+E	0.699	PASS	17.38 ft	1.26	1.00	151.26	45.45	0.030	PASS	17.50 ft
+1.401D+0.20S-E	0.000	PASS	17.50 ft	1.26	1.00	151.26	45.45	0.030	PASS	0.00 ft
+0.6994D+E	0.702	PASS	17.38 ft	1.26	1.00	151.26	45.45	0.018	PASS	17.50 ft
+0.6994D-E	0.000	PASS	17.50 ft	1.26	1.00	151.26	45.45	0.018	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				0.875	0.875				
+D+S				1.750	1.750				
+D+0.750S				1.531	1.531				
+0.60D				0.525	0.525				
+D+0.70E	13.300			0.498	1.252				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector Z, grid C15b, requires bracing

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top (k)	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments @ Base	Mx - End Moments @ Top (k-ft)	My - End Moments @ Base	My - End Moments @ Top
+D-0.70E	-13.300			1.252	0.498				
+D+0.750S+0.5250E	9.975			1.249	1.814				
+D+0.750S-0.5250E	-9.975			1.814	1.249				
+0.60D+0.70E	13.300			0.148	0.902				
+0.60D-0.70E	-13.300			0.902	0.148				
S Only				0.875	0.875				
E Only	19.000			-0.538	0.538				
E Only * -1.0	-19.000			0.538	-0.538				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top (k)	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments @ Base	Mx - End Moments @ Top (k-ft)	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	19.000			-0.538	0.538				
"	Minimum	-19.000			0.538	-0.538				
Reaction, X-X Axis Base	Maximum				0.875	0.875				
"	Minimum				0.875	0.875				
Reaction, Y-Y Axis Base	Maximum	-9.975			1.814	1.249				
"	Minimum	19.000			-0.538	0.538				
Reaction, X-X Axis Top	Maximum				0.875	0.875				
"	Minimum				0.875	0.875				
Reaction, Y-Y Axis Top	Maximum				0.875	0.875				
"	Minimum	-19.000			0.538	-0.538				
Moment, X-X Axis Base	Maximum				0.875	0.875				
"	Minimum				0.875	0.875				
Moment, Y-Y Axis Base	Maximum				0.875	0.875				
"	Minimum				0.875	0.875				
Moment, X-X Axis Top	Maximum				0.875	0.875				
"	Minimum				0.875	0.875				
Moment, Y-Y Axis Top	Maximum				0.875	0.875				
"	Minimum				0.875	0.875				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.083	in	8.809	ft
+D+S	0.0000	in	0.000	ft	0.166	in	8.809	ft
+D+0.750S	0.0000	in	0.000	ft	0.145	in	8.809	ft
+0.60D	0.0000	in	0.000	ft	0.050	in	8.809	ft
+D+0.70E	0.0000	in	0.000	ft	-0.016	in	14.094	ft
+D-0.70E	0.0000	in	0.000	ft	0.170	in	9.513	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.082	in	7.987	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.210	in	9.161	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.041	in	11.745	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.137	in	9.631	ft
S Only	0.0000	in	0.000	ft	0.083	in	8.809	ft

Steel Section Properties : W12x14

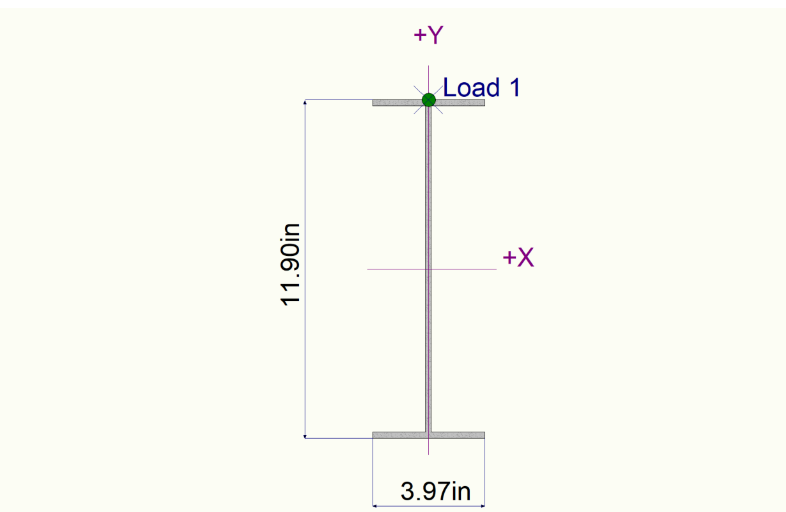
Steel Column

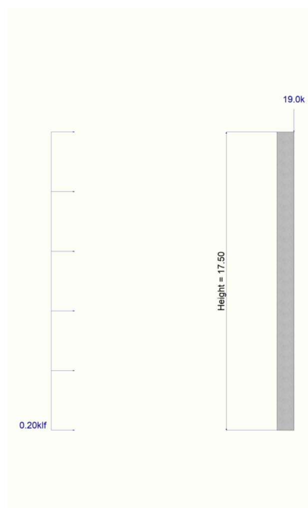
DESCRIPTION: RF Collector Z, grid C15b, requires bracing

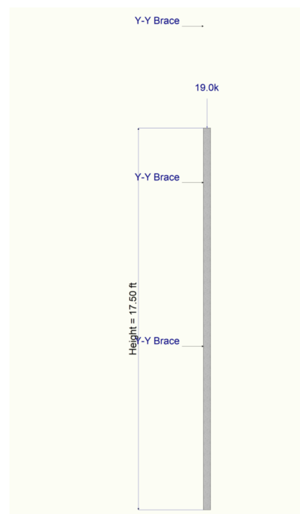
Steel Section Properties : W12x14

Depth	=	11.900	in	I xx	=	88.60	in^4	J	=	0.070	in^4
Web Thick	=	0.200	in	S xx	=	14.90	in^3	Cw	=	80.40	in^6
Flange Width	=	3.970	in	R xx	=	4.620	in				
Flange Thick	=	0.225	in	Zx	=	17.400	in^3				
Area	=	4.160	in^2	I yy	=	2.360	in^4				
Weight	=	14.000	plf	S yy	=	1.190	in^3	Wno	=	11.600	in^2
Kdesign	=	0.525	in	R yy	=	0.753	in	Sw	=	2.590	in^4
K1	=	0.563	in	Zy	=	1.900	in^3	Qf	=	2.480	in^3
rts	=	0.961	in					Qw	=	8.490	in^3
Ycg	=	0.000	in								

Sketches







PRCNC20221036

Steel Column

DESCRIPTION: RF Collector AA, grid C15b

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W12x19**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 13.6 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Unbraced Length for buckling ABOUT Y-Y Axis = 13.6 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 13.6 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 13.60 ft, Yecc = 6.10 in, E = 19.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10, S = 0.10 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8518** : 1
Load Combination +0.6994D+E
Location of max.above base 13.60 ft
At maximum location values are . . .
Pu 19.0 k
0.9 * Pn 31.923 k
Mu-x -9.658 k-ft
0.9 * Mn-x : 33.460 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 11.175 k-ft

PASS Maximum Shear Stress Ratio = **0.02214** : 1
Load Combination +1.20D+1.60S
Location of max.above base 0.0 ft
At maximum location values are . . .
Vu : Applied 1.904 k
Vn * Phi : Allowable 86.010 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 1.563 k
Bottom along Y-Y 1.563 k

Maximum Load Deflections . . .
Along Y-Y 0.06351 in at 7.302 ft above base
for load combination : +D+0.750S-0.5250E
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.097	PASS	6.75 ft	1.20	1.00	198.54	33.86	0.011	PASS	0.00 ft
+1.20D	0.083	PASS	6.85 ft	1.20	1.00	198.54	33.86	0.009	PASS	0.00 ft
+1.20D+0.50S	0.117	PASS	6.75 ft	1.20	1.00	198.54	33.86	0.013	PASS	0.00 ft
+1.20D+1.60S	0.193	PASS	6.85 ft	1.20	1.00	198.54	33.86	0.022	PASS	0.00 ft
+0.90D	0.062	PASS	6.75 ft	1.20	1.00	198.54	33.86	0.007	PASS	0.00 ft
+1.401D+0.20S+E	0.852	PASS	13.60 ft	1.20	1.00	198.54	33.86	0.021	PASS	13.60 ft
+1.401D+0.20S-E	0.339	PASS	13.60 ft	1.20	1.00	198.54	33.86	0.021	PASS	0.00 ft
+0.6994D+E	0.852	PASS	13.60 ft	1.20	1.00	198.54	33.86	0.014	PASS	13.60 ft
+0.6994D-E	0.339	PASS	13.60 ft	1.20	1.00	198.54	33.86	0.014	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X @ Top	Y-Y Axis Reaction @ Base	Y-Y @ Top	Mx - End Moments (k-ft) @ Base	Mx @ Top	My - End Moments @ Base	My @ Top
D Only				0.680	0.680				
+D+S				1.360	1.360				
+D+0.750S				1.190	1.190				
+0.60D				0.408	0.408				
+D+0.70E	13.300			0.183	1.177				

Steel Column

DESCRIPTION: RF Collector AA, grid C15b

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
+D-0.70E	-13.300			1.177	0.183				
+D+0.750S+0.5250E	9.975			0.817	1.563				
+D+0.750S-0.5250E	-9.975			1.563	0.817				
+0.60D+0.70E	13.300			-0.089	0.905				
+0.60D-0.70E	-13.300			0.905	-0.089				
S Only				0.680	0.680				
E Only	19.000			-0.710	0.710				
E Only * -1.0	-19.000			0.710	-0.710				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	19.000			-0.710	0.710		-9.658		
"	Minimum	-19.000			0.710	-0.710		9.658		
Reaction, X-X Axis Base	Maximum				0.680	0.680				
"	Minimum				0.680	0.680				
Reaction, Y-Y Axis Base	Maximum	-9.975			1.563	0.817		5.071		
"	Minimum	19.000			-0.710	0.710		-9.658		
Reaction, X-X Axis Top	Maximum				0.680	0.680				
"	Minimum				0.680	0.680				
Reaction, Y-Y Axis Top	Maximum				0.680	0.680				
"	Minimum	-13.300			0.905	-0.089		6.761		
Moment, X-X Axis Base	Maximum				0.680	0.680				
"	Minimum				0.680	0.680				
Moment, Y-Y Axis Base	Maximum				0.680	0.680				
"	Minimum				0.680	0.680				
Moment, X-X Axis Top	Maximum	-19.000			0.710	-0.710		9.658		
"	Minimum	19.000			-0.710	0.710		-9.658		
Moment, Y-Y Axis Top	Maximum				0.680	0.680				
"	Minimum				0.680	0.680				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.021	in	6.846	ft
+D+S	0.0000	in	0.000	ft	0.041	in	6.846	ft
+D+0.750S	0.0000	in	0.000	ft	0.036	in	6.846	ft
+0.60D	0.0000	in	0.000	ft	0.012	in	6.846	ft
+D+0.70E	0.0000	in	0.000	ft	-0.018	in	9.128	ft
+D-0.70E	0.0000	in	0.000	ft	0.057	in	7.485	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.010	in	5.203	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.064	in	7.302	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.025	in	8.397	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.049	in	7.576	ft
S Only	0.0000	in	0.000	ft	0.021	in	6.846	ft

Steel Section Properties : W12x19

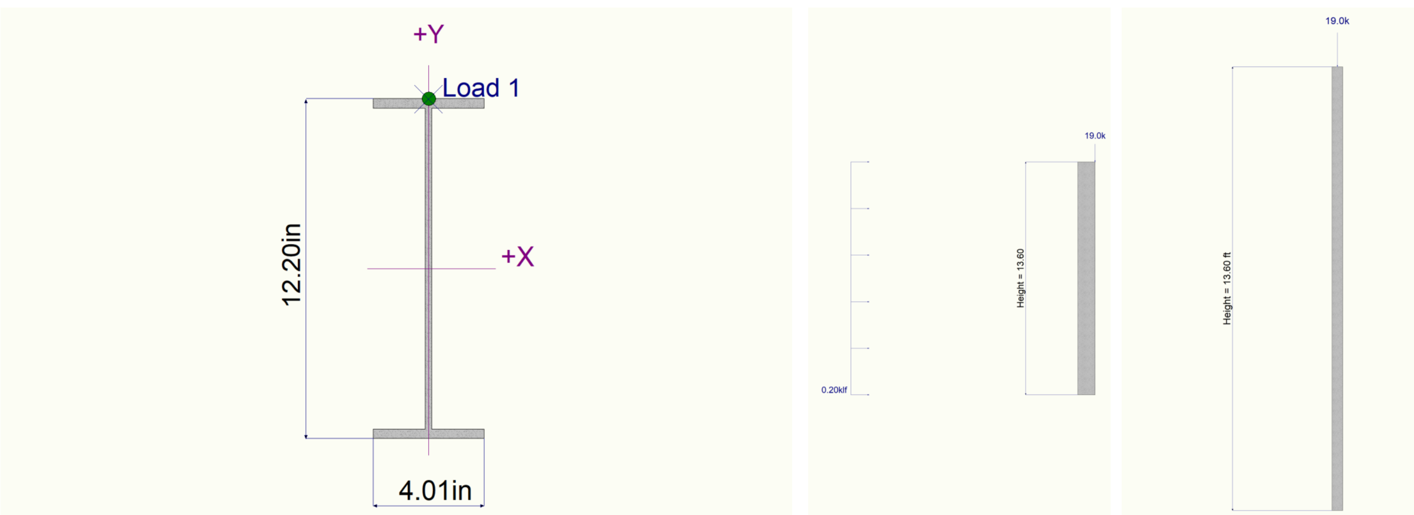
Steel Column

DESCRIPTION: RF Collector AA, grid C15b

Steel Section Properties : W12x19

Depth	=	12.200	in	I xx	=	130.00	in^4	J	=	0.180	in^4
Web Thick	=	0.235	in	S xx	=	21.30	in^3	Cw	=	131.00	in^6
Flange Width	=	4.010	in	R xx	=	4.820	in				
Flange Thick	=	0.350	in	Zx	=	24.700	in^3				
Area	=	5.570	in^2	I yy	=	3.760	in^4				
Weight	=	19.000	plf	S yy	=	1.880	in^3	Wno	=	11.900	in^2
Kdesign	=	0.650	in	R yy	=	0.822	in	Sw	=	4.170	in^4
K1	=	0.563	in	Zy	=	2.980	in^3	Qf	=	3.910	in^3
rts	=	1.020	in					Qw	=	12.200	in^3
Ycg	=	0.000	in								

Sketches



PRCNC20221036

Steel Column

DESCRIPTION: RF Collector AB, grid D6.5

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W12x16**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 18 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 4.5 ft, 11.75 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 18 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 18.0 ft, Yecc = 6.0 in, E = 62.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10, S = 0.10 k/ft
Lat. Point Load at 4.50 ft creating Mx-x, D = 1.50, S = 1.40 k
Lat. Point Load at 11.750 ft creating Mx-x, D = 1.60, S = 1.40 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.9430**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	17.879	ft
At maximum location values are . . .		
Pu	62.0	k
0.9 * Pn	106.489	k
Mu-x	-30.596	k-ft
0.9 * Mn-x :	75.375	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	8.460	k-ft
PASS Maximum Shear Stress Ratio =	**0.08831**	: 1
Load Combination	+1.20D+1.60S	
Location of max.above base	0.0	ft
At maximum location values are . . .		
Vu : Applied	6.994	k
Vn * Phi : Allowable	79.20	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	4.847	k
Bottom along Y-Y	5.312	k

Maximum Load Deflections . . .

Along Y-Y 0.6229 in at 9.423 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.347	PASS	10.75 ft	1.03	1.00	112.55	46.25	0.046	PASS	0.00 ft
+1.20D	0.297	PASS	10.75 ft	1.03	1.00	112.55	46.25	0.039	PASS	0.00 ft
+1.20D+0.50S	0.412	PASS	10.63 ft	1.03	1.00	112.55	46.25	0.054	PASS	0.00 ft
+1.20D+1.60S	0.664	PASS	10.51 ft	1.03	1.00	112.55	46.25	0.088	PASS	0.00 ft
+0.90D	0.223	PASS	10.75 ft	1.03	1.00	112.55	46.25	0.029	PASS	0.00 ft
+1.401D+0.20S+E	0.940	PASS	17.88 ft	1.58	1.00	97.02	46.25	0.068	PASS	18.00 ft
+1.401D+0.20S-E	0.000	PASS	18.00 ft	1.58	1.00	97.02	46.25	0.074	PASS	0.00 ft
+0.6994D+E	0.943	PASS	17.88 ft	1.58	1.00	97.02	46.25	0.042	PASS	18.00 ft
+0.6994D-E	0.000	PASS	18.00 ft	1.58	1.00	97.02	46.25	0.045	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				2.581	2.319				
+D+S				5.017	4.483				
+D+0.750S				4.408	3.942				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector AB, grid D6.5

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
+0.60D				1.548	1.392				
+D+0.70E	43.400			1.375	3.525				
+D-0.70E	-43.400			3.786	1.114				
+D+0.750S+0.5250E	32.550			3.503	4.847				
+D+0.750S-0.5250E	-32.550			5.312	3.038				
+0.60D+0.70E	43.400			0.343	2.597				
+0.60D-0.70E	-43.400			2.754	0.186				
S Only				2.436	2.164				
E Only	62.000			-1.722	1.722				
E Only * -1.0	-62.000			1.722	-1.722				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	62.000			-1.722	1.722				
"	Minimum	-62.000			1.722	-1.722				
Reaction, X-X Axis Base	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Reaction, Y-Y Axis Base	Maximum	-32.550			5.312	3.038				
"	Minimum	62.000			-1.722	1.722				
Reaction, X-X Axis Top	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Reaction, Y-Y Axis Top	Maximum				2.581	2.319				
"	Minimum	-62.000			1.722	-1.722				
Moment, X-X Axis Base	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Moment, Y-Y Axis Base	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Moment, X-X Axis Top	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Moment, Y-Y Axis Top	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.253	in	9.060	ft
+D+S	0.0000	in	0.000	ft	0.488	in	9.060	ft
+D+0.750S	0.0000	in	0.000	ft	0.429	in	9.060	ft
+0.60D	0.0000	in	0.000	ft	0.152	in	9.060	ft
+D+0.70E	0.0000	in	0.000	ft	-0.047	in	14.617	ft
+D-0.70E	0.0000	in	0.000	ft	0.512	in	9.785	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.240	in	8.094	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.623	in	9.423	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.121	in	12.201	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.412	in	9.906	ft
S Only	0.0000	in	0.000	ft	0.235	in	9.060	ft

Steel Section Properties : W12x16

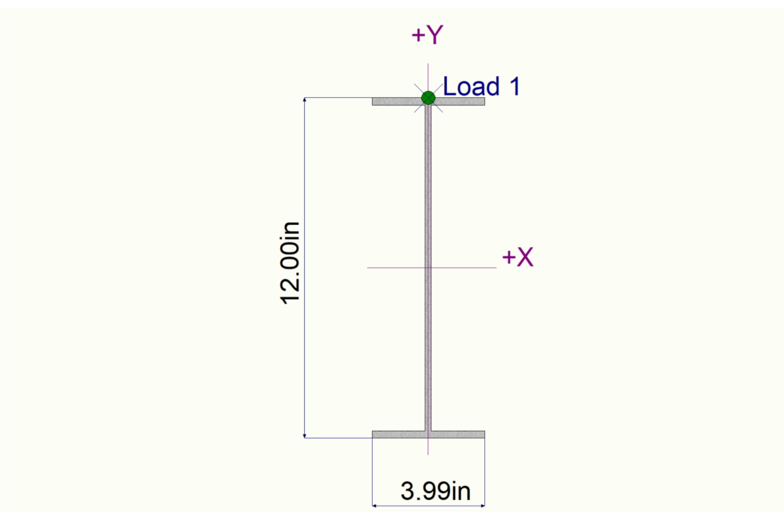
Steel Column

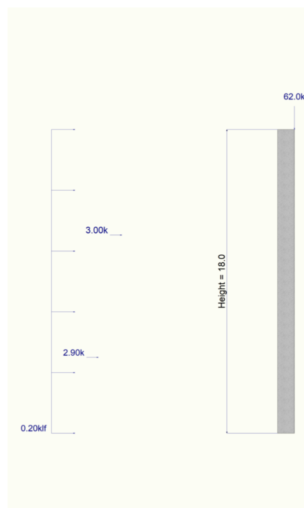
DESCRIPTION: RF Collector AB, grid D6.5

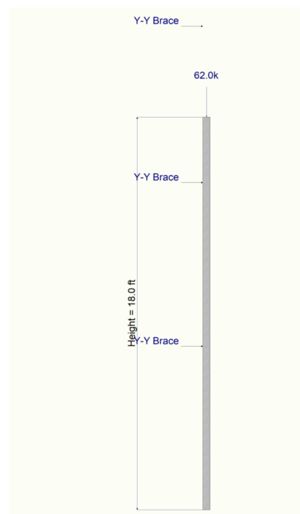
Steel Section Properties : W12x16

Depth	=	12.000 in	I xx	=	103.00 in^4	J	=	0.103 in^4
Web Thick	=	0.220 in	S xx	=	17.10 in^3	Cw	=	96.90 in^6
Flange Width	=	3.990 in	R xx	=	4.670 in			
Flange Thick	=	0.265 in	Zx	=	20.100 in^3			
Area	=	4.710 in^2	I yy	=	2.820 in^4			
Weight	=	16.000 plf	S yy	=	1.410 in^3	Wno	=	11.700 in^2
Kdesign	=	0.565 in	R yy	=	0.773 in	Sw	=	3.090 in^4
K1	=	0.563 in	Zy	=	2.260 in^3	Qf	=	2.930 in^3
rts	=	0.983 in				Qw	=	9.820 in^3
Ycg	=	0.000 in						

Sketches







PRCNC20221036

Title Block Line 1
You can change this area
using the "Settings" menu item
and then using the "Printing &
Title Block" selection.
Title Block Line 6

Project Title:
Engineer:
Project ID:
Project Descr:

Printed: 15 JUN 2022, 6:52PM

Steel Column

s\Higher-Education\2021\2I33TT~Q\SEV10W~K\C7A4YC~F\3YDNAQ~Y\DSK1PP~K\Chords and Collectors.ec6

Lic. # : KW-06006560 INTEGRUS ARCHITECTURE

DESCRIPTION: RF Collector AB, grid D6.5

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : W12x16
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 18 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 4.5 ft, 11.75 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 18 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 18.0 ft, Yecc = 6.0 in, E = 62.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10, S = 0.10 k/ft
Lat. Point Load at 4.50 ft creating Mx-x, D = 1.50, S = 1.40 k
Lat. Point Load at 11.750 ft creating Mx-x, D = 1.60, S = 1.40 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9430** : 1

Load Combination	+0.6994D+E	
Location of max.above base	17.879	ft
At maximum location values are . . .		
Pu	62.0	k
0.9 * Pn	106.489	k
Mu-x	-30.596	k-ft
0.9 * Mn-x :	75.375	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	8.460	k-ft

PASS Maximum Shear Stress Ratio = **0.08831** : 1

Load Combination	+1.20D+1.60S	
Location of max.above base	0.0	ft
At maximum location values are . . .		
Vu : Applied	6.994	k
Vn * Phi : Allowable	79.20	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	4.847	k
Bottom along Y-Y	5.312	k

Maximum Load Deflections . . .

Along Y-Y 0.6229 in at 9.423 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.347	PASS	10.75 ft	1.03	1.00	112.55	46.25	0.046	PASS	0.00 ft
+1.20D	0.297	PASS	10.75 ft	1.03	1.00	112.55	46.25	0.039	PASS	0.00 ft
+1.20D+0.50S	0.412	PASS	10.63 ft	1.03	1.00	112.55	46.25	0.054	PASS	0.00 ft
+1.20D+1.60S	0.664	PASS	10.51 ft	1.03	1.00	112.55	46.25	0.088	PASS	0.00 ft
+0.90D	0.223	PASS	10.75 ft	1.03	1.00	112.55	46.25	0.029	PASS	0.00 ft
+1.401D+0.20S+E	0.940	PASS	17.88 ft	1.58	1.00	97.02	46.25	0.068	PASS	18.00 ft
+1.401D+0.20S-E	0.000	PASS	18.00 ft	1.58	1.00	97.02	46.25	0.074	PASS	0.00 ft
+0.6994D+E	0.943	PASS	17.88 ft	1.58	1.00	97.02	46.25	0.042	PASS	18.00 ft
+0.6994D-E	0.000	PASS	18.00 ft	1.58	1.00	97.02	46.25	0.045	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				2.581	2.319				
+D+S				5.017	4.483				
+D+0.750S				4.408	3.942				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector AB, grid D6.5

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top (k)	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments @ Base	Mx - End Moments @ Top (k-ft)	My - End Moments @ Base	My - End Moments @ Top
+0.60D				1.548	1.392				
+D+0.70E	43.400			1.375	3.525				
+D-0.70E	-43.400			3.786	1.114				
+D+0.750S+0.5250E	32.550			3.503	4.847				
+D+0.750S-0.5250E	-32.550			5.312	3.038				
+0.60D+0.70E	43.400			0.343	2.597				
+0.60D-0.70E	-43.400			2.754	0.186				
S Only				2.436	2.164				
E Only	62.000			-1.722	1.722				
E Only * -1.0	-62.000			1.722	-1.722				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top (k)	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments @ Base	Mx - End Moments @ Top (k-ft)	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	62.000			-1.722	1.722				
"	Minimum	-62.000			1.722	-1.722				
Reaction, X-X Axis Base	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Reaction, Y-Y Axis Base	Maximum	-32.550			5.312	3.038				
"	Minimum	62.000			-1.722	1.722				
Reaction, X-X Axis Top	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Reaction, Y-Y Axis Top	Maximum				2.581	2.319				
"	Minimum	-62.000			1.722	-1.722				
Moment, X-X Axis Base	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Moment, Y-Y Axis Base	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Moment, X-X Axis Top	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				
Moment, Y-Y Axis Top	Maximum				2.581	2.319				
"	Minimum				2.581	2.319				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.253	in	9.060	ft
+D+S	0.0000	in	0.000	ft	0.488	in	9.060	ft
+D+0.750S	0.0000	in	0.000	ft	0.429	in	9.060	ft
+0.60D	0.0000	in	0.000	ft	0.152	in	9.060	ft
+D+0.70E	0.0000	in	0.000	ft	-0.047	in	14.617	ft
+D-0.70E	0.0000	in	0.000	ft	0.512	in	9.785	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.240	in	8.094	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.623	in	9.423	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.121	in	12.201	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.412	in	9.906	ft
S Only	0.0000	in	0.000	ft	0.235	in	9.060	ft

Steel Section Properties : W12x16

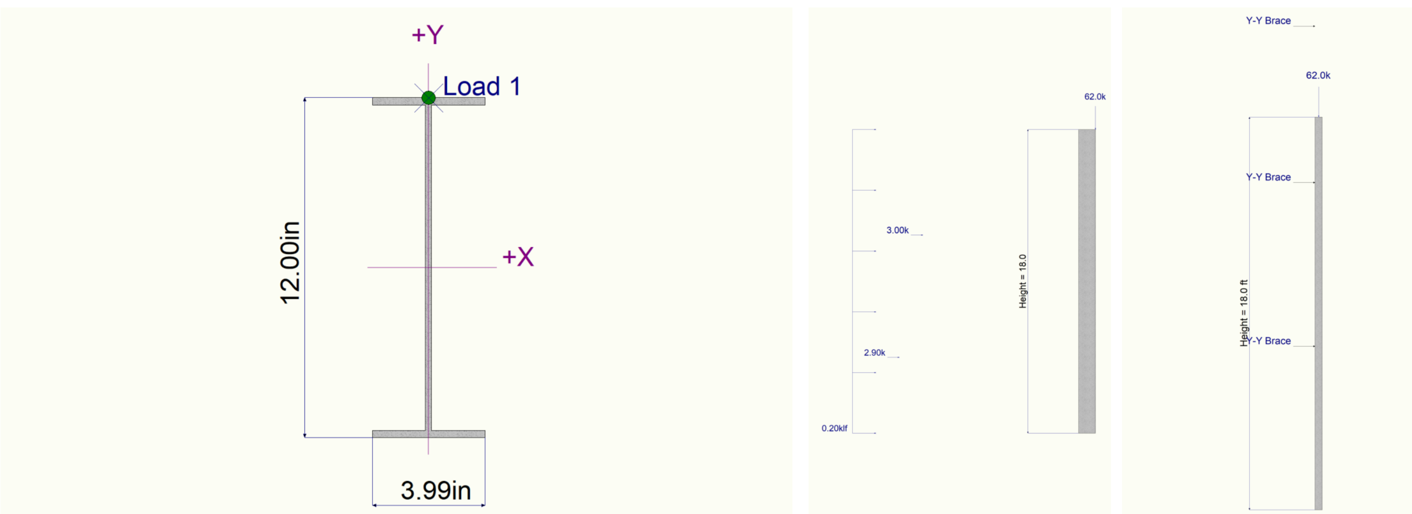
Steel Column

DESCRIPTION: RF Collector AB, grid D6.5

Steel Section Properties : W12x16

Depth	=	12.000	in	I xx	=	103.00	in^4	J	=	0.103	in^4
Web Thick	=	0.220	in	S xx	=	17.10	in^3	Cw	=	96.90	in^6
Flange Width	=	3.990	in	R xx	=	4.670	in				
Flange Thick	=	0.265	in	Zx	=	20.100	in^3				
Area	=	4.710	in^2	I yy	=	2.820	in^4				
Weight	=	16.000	plf	S yy	=	1.410	in^3	Wno	=	11.700	in^2
Kdesign	=	0.565	in	R yy	=	0.773	in	Sw	=	3.090	in^4
K1	=	0.563	in	Zy	=	2.260	in^3	Qf	=	2.930	in^3
rts	=	0.983	in					Qw	=	9.820	in^3
Ycg	=	0.000	in								

Sketches



Steel Column

DESCRIPTION: RF Collector AC, grid D6.5

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name :	**W16x26**	Overall Column Height	34 ft
Analysis Method :	Load Resistance Factor	Top & Bottom Fixity	Top & Bottom Pinned
Steel Stress Grade			
Fy : Steel Yield	50.0 ksi		
E : Elastic Bending Modulus	29,000.0 ksi		

Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 6.25 ft, 12.5 ft, 18.75 ft, 26.33 ft, K =
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 34 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 34.0 ft, Yecc = 7.850 in, E = 62.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10, S = 0.10 k/ft
Lat. Point Load at 6.250 ft creating Mx-x, D = 0.920, S = 0.840 k
Lat. Point Load at 12.50 ft creating Mx-x, D = 0.850, S = 0.770 k
Lat. Point Load at 18.750 ft creating Mx-x, D = 0.840, S = 0.770 k
Lat. Point Load at 26.330 ft creating Mx-x, D = 0.820, S = 0.760 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.6496** : 1

Load Combination	+1.20D+1.60S
Location of max.above base	18.940 ft
At maximum location values are . . .	
Pu	0.0 k
0.9 * Pn	213.368 k
Mu-x	87.183 k-ft
0.9 * Mn-x :	134.218 k-ft
Mu-y	0.0 k-ft
0.9 * Mn-y :	20.550 k-ft

PASS Maximum Shear Stress Ratio = **0.09137** : 1

Load Combination	+1.20D+1.60S
Location of max.above base	0.0 ft
At maximum location values are . . .	
Vu : Applied	9.683 k
Vn * Phi : Allowable	105.975 k

Maximum Load Reactions . .

Top along X-X	0.0 k
Bottom along X-X	0.0 k
Top along Y-Y	6.431 k
Bottom along Y-Y	6.939 k

Maximum Load Deflections . . .

Along Y-Y 1.635 in at 17.570 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.334	PASS	18.94 ft	1.01	1.00	81.21	65.18	0.047	PASS	0.00 ft
+1.20D	0.286	PASS	18.94 ft	1.01	1.00	81.21	65.18	0.040	PASS	0.00 ft
+1.20D+0.50S	0.400	PASS	18.94 ft	1.01	1.00	81.21	65.18	0.056	PASS	0.00 ft
+1.20D+1.60S	0.650	PASS	18.94 ft	1.01	1.00	81.21	65.18	0.091	PASS	0.00 ft
+0.90D	0.215	PASS	18.94 ft	1.01	1.00	81.21	65.18	0.030	PASS	0.00 ft
+1.401D+0.20S+E	0.511	PASS	34.00 ft	1.58	1.00	82.18	65.18	0.061	PASS	34.00 ft
+1.401D+0.20S-E	0.198	PASS	18.71 ft	1.01	1.00	66.96	65.18	0.065	PASS	0.00 ft
+0.6994D+E	0.511	PASS	34.00 ft	1.58	1.00	82.18	65.18	0.033	PASS	34.00 ft
+0.6994D-E	0.076	PASS	34.00 ft	1.58	1.00	82.18	65.18	0.035	PASS	0.00 ft

Steel Column

DESCRIPTION: RF Collector AC, grid D6.5

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				3.550	3.280				
+D+S				6.939	6.431				
+D+0.750S				6.092	5.643				
+0.60D				2.130	1.968				
+D+0.70E	43.400			2.715	4.115				
+D-0.70E	-43.400			4.385	2.445				
+D+0.750S+0.5250E	32.550			5.466	6.269				
+D+0.750S-0.5250E	-32.550			6.718	5.017				
+0.60D+0.70E	43.400			1.295	2.803				
+0.60D-0.70E	-43.400			2.965	1.133				
S Only				3.389	3.151				
E Only	62.000			-1.193	1.193				
E Only * -1.0	-62.000			1.193	-1.193				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction k @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	62.000			-1.193	1.193		-40.558		
"	Minimum	-62.000			1.193	-1.193		40.558		
Reaction, X-X Axis Base	Maximum				3.550	3.280				
"	Minimum				3.550	3.280				
Reaction, Y-Y Axis Base	Maximum				6.939	6.431				
"	Minimum	62.000			-1.193	1.193		-40.558		
Reaction, X-X Axis Top	Maximum				3.550	3.280				
"	Minimum				3.550	3.280				
Reaction, Y-Y Axis Top	Maximum				3.550	3.280				
"	Minimum	-62.000			1.193	-1.193		40.558		
Moment, X-X Axis Base	Maximum				3.550	3.280				
"	Minimum				3.550	3.280				
Moment, Y-Y Axis Base	Maximum				3.550	3.280				
"	Minimum				3.550	3.280				
Moment, X-X Axis Top	Maximum	-62.000			1.193	-1.193		40.558		
"	Minimum	62.000			-1.193	1.193		-40.558		
Moment, Y-Y Axis Top	Maximum				3.550	3.280				
"	Minimum				3.550	3.280				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.774	in	17.114	ft
+D+S	0.0000	in	0.000	ft	1.511	in	17.114	ft
+D+0.750S	0.0000	in	0.000	ft	1.327	in	17.114	ft
+0.60D	0.0000	in	0.000	ft	0.464	in	17.114	ft
+D+0.70E	0.0000	in	0.000	ft	0.374	in	14.832	ft
+D-0.70E	0.0000	in	0.000	ft	1.186	in	17.799	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	1.022	in	16.430	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	1.635	in	17.570	ft
+0.60D+0.70E	0.0000	in	0.000	ft	0.082	in	11.181	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.878	in	18.255	ft
S Only	0.0000	in	0.000	ft	0.738	in	17.114	ft

Steel Section Properties : W16x26

PRCNC20221036

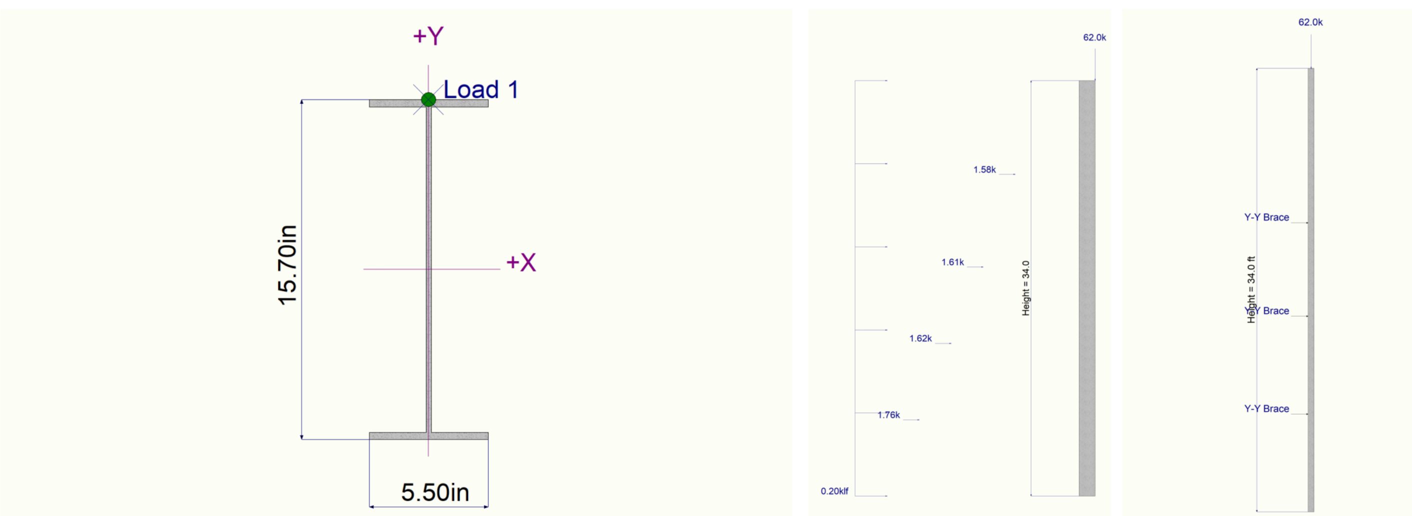
Steel Column

DESCRIPTION: RF Collector AC, grid D6.5

Steel Section Properties : W16x26

Depth	=	15.700	in	I xx	=	301.00	in^4	J	=	0.262	in^4
Web Thick	=	0.250	in	S xx	=	38.40	in^3	Cw	=	565.00	in^6
Flange Width	=	5.500	in	R xx	=	6.260	in				
Flange Thick	=	0.345	in	Zx	=	44.200	in^3				
Area	=	7.680	in^2	I yy	=	9.590	in^4				
Weight	=	26.000	plf	S yy	=	3.490	in^3	Wno	=	21.100	in^2
Kdesign	=	0.747	in	R yy	=	1.120	in	Sw	=	10.000	in^4
K1	=	0.750	in	Zy	=	5.480	in^3	Qf	=	6.950	in^3
rts	=	1.380	in					Qw	=	21.600	in^3
Ycg	=	0.000	in								

Sketches



PRCNC20221036

Steel Column

DESCRIPTION: RF Collector AD, grid D6.5

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W12x19**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 24.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 8 ft, 16 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 24.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 24.0 ft, Yecc = 6.10 in, E = 62.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10, S = 0.10 k/ft
Lat. Point Load at 8.0 ft creating Mx-x, D = 0.820, S = 0.750 k
Lat. Point Load at 16.0 ft creating Mx-x, D = 0.820, S = 0.750 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.9718**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	23.839	ft
At maximum location values are . . .		
Pu	62.0	k
0.9 * Pn	92.256	k
Mu-x	-31.078	k-ft
0.9 * Mn-x :	92.152	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	11.175	k-ft
PASS Maximum Shear Stress Ratio =	**0.06446**	: 1
Load Combination	+1.20D+1.60S	
Location of max.above base	24.0	ft
At maximum location values are . . .		
Vu : Applied	5.544	k
Vn * Phi : Allowable	86.010	k

Maximum Load Reactions . .

Top along X-X	0.0 k
Bottom along X-X	0.0 k
Top along Y-Y	4.172 k
Bottom along Y-Y	4.172 k

Maximum Load Deflections . . .

Along Y-Y 0.9419 in at 12.564 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios Stress Ratio	Status	Location
+1.40D	0.319	PASS	12.08 ft	1.01	1.00	116.79	59.75	0.033	PASS	0.00 ft
+1.20D	0.274	PASS	11.92 ft	1.01	1.00	116.79	59.75	0.028	PASS	0.00 ft
+1.20D+0.50S	0.383	PASS	11.92 ft	1.01	1.00	116.79	59.75	0.040	PASS	24.00 ft
+1.20D+1.60S	0.624	PASS	12.08 ft	1.01	1.00	116.79	59.75	0.064	PASS	24.00 ft
+0.90D	0.205	PASS	11.92 ft	1.01	1.00	116.79	59.75	0.021	PASS	24.00 ft
+1.401D+0.20S+E	0.969	PASS	23.84 ft	1.54	1.00	116.79	59.75	0.053	PASS	24.00 ft
+1.401D+0.20S-E	0.000	PASS	24.00 ft	1.54	1.00	116.79	59.75	0.053	PASS	0.00 ft
+0.6994D+E	0.972	PASS	23.84 ft	1.54	1.00	116.79	59.75	0.032	PASS	24.00 ft
+0.6994D-E	0.000	PASS	24.00 ft	1.54	1.00	116.79	59.75	0.032	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				2.020	2.020				
+D+S				3.970	3.970				
+D+0.750S				3.483	3.483				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector AD, grid D6.5

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments k-ft @ Base	@ Top	My - End Moments @ Base	@ Top
+0.60D				1.212	1.212				
+D+0.70E	43.400			1.101	2.939				
+D-0.70E	-43.400			2.939	1.101				
+D+0.750S+0.5250E	32.550			2.793	4.172				
+D+0.750S-0.5250E	-32.550			4.172	2.793				
+0.60D+0.70E	43.400			0.293	2.131				
+0.60D-0.70E	-43.400			2.131	0.293				
S Only				1.950	1.950				
E Only	62.000			-1.313	1.313				
E Only * -1.0	-62.000			1.313	-1.313				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments k-ft @ Base	@ Top	My - End Moments @ Base	@ Top
Axial @ Base	Maximum	62.000			-1.313	1.313				
"	Minimum	-62.000			1.313	-1.313				
Reaction, X-X Axis Base	Maximum				2.020	2.020				
"	Minimum				2.020	2.020				
Reaction, Y-Y Axis Base	Maximum	-32.550			4.172	2.793				
"	Minimum	62.000			-1.313	1.313				
Reaction, X-X Axis Top	Maximum				2.020	2.020				
"	Minimum				2.020	2.020				
Reaction, Y-Y Axis Top	Maximum				2.020	2.020				
"	Minimum	-62.000			1.313	-1.313				
Moment, X-X Axis Base	Maximum				2.020	2.020				
"	Minimum				2.020	2.020				
Moment, Y-Y Axis Base	Maximum				2.020	2.020				
"	Minimum				2.020	2.020				
Moment, X-X Axis Top	Maximum				2.020	2.020				
"	Minimum				2.020	2.020				
Moment, Y-Y Axis Top	Maximum				2.020	2.020				
"	Minimum				2.020	2.020				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.387	in	12.081	ft
+D+S	0.0000	in	0.000	ft	0.757	in	12.081	ft
+D+0.750S	0.0000	in	0.000	ft	0.664	in	12.081	ft
+0.60D	0.0000	in	0.000	ft	0.232	in	12.081	ft
+D+0.70E	0.0000	in	0.000	ft	-0.054	in	19.973	ft
+D-0.70E	0.0000	in	0.000	ft	0.758	in	12.886	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.393	in	10.953	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.942	in	12.564	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.161	in	16.430	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.605	in	13.208	ft
S Only	0.0000	in	0.000	ft	0.371	in	12.081	ft

Steel Section Properties : W12x19

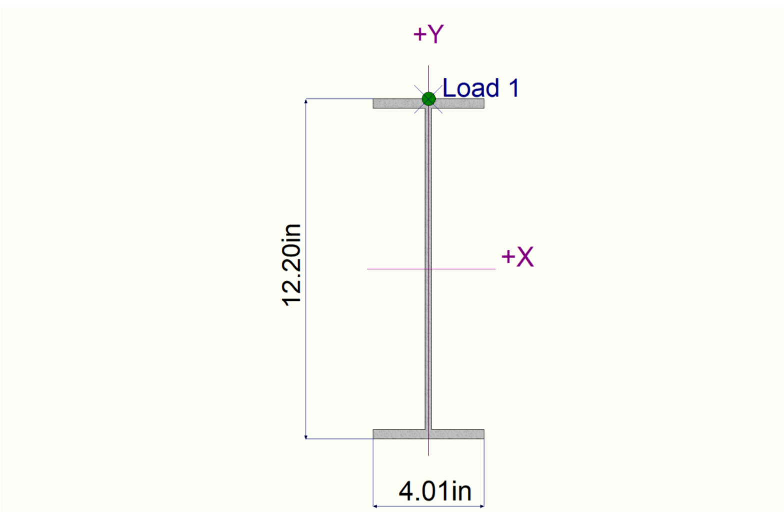
Steel Column

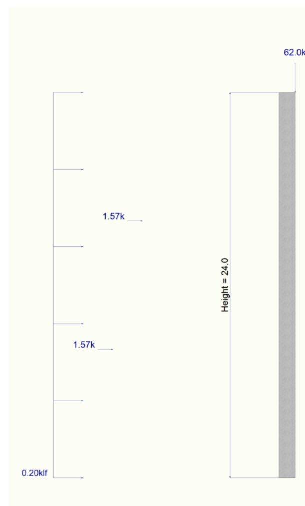
DESCRIPTION: RF Collector AD, grid D6.5

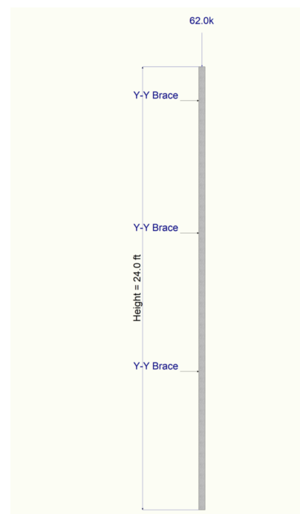
Steel Section Properties : W12x19

Depth	=	12.200	in	I xx	=	130.00	in^4	J	=	0.180	in^4
Web Thick	=	0.235	in	S xx	=	21.30	in^3	Cw	=	131.00	in^6
Flange Width	=	4.010	in	R xx	=	4.820	in				
Flange Thick	=	0.350	in	Zx	=	24.700	in^3				
Area	=	5.570	in^2	I yy	=	3.760	in^4				
Weight	=	19.000	plf	S yy	=	1.880	in^3	Wno	=	11.900	in^2
Kdesign	=	0.650	in	R yy	=	0.822	in	Sw	=	4.170	in^4
K1	=	0.563	in	Zy	=	2.980	in^3	Qf	=	3.910	in^3
rts	=	1.020	in					Qw	=	12.200	in^3
Ycg	=	0.000	in								

Sketches







PRCNC20221036

Steel Column

DESCRIPTION: RF Collector AE, grid D6.5

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W16x26**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 22.750 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 6 ft, 13.5 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 22.750 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 22.750 ft, Yecc = 7.850 in, E = 62.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.10, S = 0.10 k/ft
Lat. Point Load at 6.0 ft creating Mx-x, D = 0.720, S = 0.660 k
Lat. Point Load at 13.50 ft creating Mx-x, D = 0.90, S = 0.820 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	**0.5829**	: 1
Load Combination	+0.6994D+E	
Location of max.above base	22.597	ft
At maximum location values are . . .		
Pu	62.0	k
0.9 * Pn	168.529	k
Mu-x	-40.088	k-ft
0.9 * Mn-x :	165.750	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	20.550	k-ft
PASS Maximum Shear Stress Ratio =	**0.05257**	: 1
Load Combination	+1.20D+1.60S	
Location of max.above base	0.0	ft
At maximum location values are . . .		
Vu : Applied	5.571	k
Vn * Phi : Allowable	105.975	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	4.146	k
Bottom along Y-Y	4.437	k

Maximum Load Deflections . . .

Along Y-Y 0.3744 in at 12.062 ft above base
for load combination : +D+0.750S-0.5250E

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.130	PASS	13.13 ft	1.04	1.00	80.36	43.61	0.027	PASS	0.00 ft
+1.20D	0.111	PASS	13.13 ft	1.04	1.00	80.36	43.61	0.023	PASS	0.00 ft
+1.20D+0.50S	0.155	PASS	13.13 ft	1.04	1.00	80.36	43.61	0.032	PASS	0.00 ft
+1.20D+1.60S	0.253	PASS	12.98 ft	1.04	1.00	80.36	43.61	0.053	PASS	0.00 ft
+0.90D	0.083	PASS	13.13 ft	1.04	1.00	80.36	43.61	0.017	PASS	0.00 ft
+1.401D+0.20S+E	0.582	PASS	22.60 ft	1.53	1.00	99.11	43.61	0.045	PASS	22.75 ft
+1.401D+0.20S-E	0.000	PASS	22.75 ft	1.53	1.00	99.11	43.61	0.047	PASS	0.00 ft
+0.6994D+E	0.583	PASS	22.60 ft	1.53	1.00	99.11	43.61	0.029	PASS	22.75 ft
+0.6994D-E	0.000	PASS	22.75 ft	1.53	1.00	99.11	43.61	0.030	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments (k-ft) @ Base	@ Top	My - End Moments @ Base	@ Top
D Only				2.034	1.861				
+D+S				3.990	3.660				
+D+0.750S				3.501	3.210				

PRCNC20221036

Steel Column

DESCRIPTION: RF Collector AE, grid D6.5

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
+0.60D				1.220	1.117				
+D+0.70E	43.400			0.786	3.109				
+D-0.70E	-43.400			3.281	0.614				
+D+0.750S+0.5250E	32.550			2.565	4.146				
+D+0.750S-0.5250E	-32.550			4.437	2.274				
+0.60D+0.70E	43.400			-0.028	2.365				
+0.60D-0.70E	-43.400			2.468	-0.131				
S Only				1.957	1.798				
E Only	62.000			-1.783	1.783				
E Only * -1.0	-62.000			1.783	-1.783				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	62.000			-1.783	1.783				
"	Minimum	-62.000			1.783	-1.783				
Reaction, X-X Axis Base	Maximum				2.034	1.861				
"	Minimum				2.034	1.861				
Reaction, Y-Y Axis Base	Maximum	-32.550			4.437	2.274				
"	Minimum	62.000			-1.783	1.783				
Reaction, X-X Axis Top	Maximum				2.034	1.861				
"	Minimum				2.034	1.861				
Reaction, Y-Y Axis Top	Maximum				2.034	1.861				
"	Minimum	-43.400			2.468	-0.131				
Moment, X-X Axis Base	Maximum				2.034	1.861				
"	Minimum				2.034	1.861				
Moment, Y-Y Axis Base	Maximum				2.034	1.861				
"	Minimum				2.034	1.861				
Moment, X-X Axis Top	Maximum				2.034	1.861				
"	Minimum				2.034	1.861				
Moment, Y-Y Axis Top	Maximum				2.034	1.861				
"	Minimum				2.034	1.861				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.137	in	11.451	ft
+D+S	0.0000	in	0.000	ft	0.268	in	11.451	ft
+D+0.750S	0.0000	in	0.000	ft	0.236	in	11.451	ft
+0.60D	0.0000	in	0.000	ft	0.082	in	11.451	ft
+D+0.70E	0.0000	in	0.000	ft	-0.064	in	16.490	ft
+D-0.70E	0.0000	in	0.000	ft	0.323	in	12.367	ft
+D+0.750S+0.5250E	0.0000	in	0.000	ft	0.102	in	9.772	ft
+D+0.750S-0.5250E	0.0000	in	0.000	ft	0.374	in	12.062	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.110	in	14.658	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.269	in	12.673	ft
S Only	0.0000	in	0.000	ft	0.131	in	11.451	ft

Steel Section Properties : W16x26

Level 2 Frame 9 collector to the west

Pr/Pc > 0.2, Use AISC equation H1-1a

Mux from Enercalc = 258.5 k*ft
Phi*Mnx from RAM = 705 k*ft

Pu from Enercalc = 115 k
Phi*Mn from Enercalc = 202.8 k

No bending in y-direction

AISC equation H1-1a, combined loading:
(115 / 202.8) + (8/9)*(258.5 / 705) = 0.89 < 1.0   Design, including composite action in bending is OK

Title Block Line 1
You can change this area
using the "Settings" menu item
and then using the "Printing &
Title Block" selection.
Title Block Line 6

Project Title:
Engineer:
Project ID:
Project Descr:

Printed: 28 JUN 2022, 6:43PM

Steel Column

s\Higher-Education\2021\2I33TT~Q\SEV10W~K\C7A4YC~F\3YDNAQ~Y\DSK1PP~K\Chords and Collectors.ec6 .
Software copyright ENERCALC, INC. 1983-2019, Build:12.19.11.30 .

Lic. # : KW-06006560 **INTEGRUS ARCHITECTURE**

DESCRIPTION: L2, Frame 9, West collector beam 24'

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W24x55**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 24.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 15 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 24.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 24.0 ft, Yecc = 11.80 in, E = 115.0 k
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, D = 0.70, L = 0.710 k/ft
Lat. Point Load at 15.0 ft creating Mx-x, D = 16.60, L = 16.20 k

Worst case axial loading 1.0E and W24x55 axial capacity braced in y-direction at perpendicular beam, no bracing in x direction

DESIGN SUMMARY

Bending & Shear Check Results

FAIL Max. Axial+Bending Stress Ratio =	**1.198**	: 1
Load Combination	+1.401D+L+E	
Location of max.above base	14.980	ft
At maximum location values are . . .		
Pu	115.0	k
0.9 * Pn	202.824	k
Mu-x	265.231	k-ft
0.9 * Mn-x :	373.884	k-ft
Mu-y	0.0	k-ft
0.9 * Mn-y :	49.80	k-ft
PASS Maximum Shear Stress Ratio =	**0.2080**	: 1
Load Combination	+1.20D+1.60L	
Location of max.above base	24.0	ft
At maximum location values are . . .		
Vu : Applied	52.362	k
Vn * Phi : Allowable	251.694	k

Maximum Load Reactions . .

Top along X-X	0.0	k
Bottom along X-X	0.0	k
Top along Y-Y	37.420	k
Bottom along Y-Y	29.220	k

Maximum Load Deflections . . .
Along Y-Y 0.6726 in at 12.725 ft above base
for load combination : +D+0.750L-0.5250E
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Worst case Moment

This bending capacity does not include composite action, Use bending capacity from RAM

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.526	PASS	14.98 ft	1.43	1.00	134.33	31.61	0.104	PASS	24.00 ft
+1.20D+1.60L	1.046	FAIL !	14.98 ft	1.43	1.00	134.33	31.61	0.208	PASS	24.00 ft
+1.20D+L	0.823	PASS	14.98 ft	1.43	1.00	134.33	31.61	0.164	PASS	24.00 ft
+1.20D	0.451	PASS	14.98 ft	1.43	1.00	134.33	31.61	0.090	PASS	24.00 ft
+0.90D	0.338	PASS	14.98 ft	1.43	1.00	134.33	31.61	0.067	PASS	24.00 ft
+1.401D+L+E	1.198	FAIL !	14.98 ft	1.43	1.00	134.33	31.61	0.197	PASS	24.00 ft
+1.401D+L-E	0.459	PASS	15.14 ft	1.43	1.00	80.60	31.61	0.160	PASS	24.00 ft
+0.6994D+E	0.641	PASS	11.28 ft	1.43	1.00	134.33	31.61	0.071	PASS	24.00 ft
+0.6994D-E	0.000	PASS	24.00 ft	1.56	1.00	80.60	31.61	0.059	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
D Only				14.625	18.775				
+D+L				29.220	37.420				
+D+0.750L				25.571	32.759				
+0.60D				8.775	11.265				

Enercalc module does not considered composite action of beam with floor slab. Interaction equation check separately using Composite beam capacity from RAM.

PRCNC20221036

Steel Column

DESCRIPTION: L2, Frame 9, West collector beam 24'

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+0.70E	80.500			11.327	22.073				
+D-0.70E	-80.500			17.923	15.477				
+D+0.750L+0.5250E	60.375			23.098	35.232				
+D+0.750L-0.5250E	-60.375			28.045	30.285				
+0.60D+0.70E	80.500			5.477	14.563				
+0.60D-0.70E	-80.500			12.073	7.967				
L Only				14.595	18.645				
E Only	115.000			-4.712	4.712				
E Only * -1.0	-115.000			4.712	-4.712				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	115.000			-4.712	4.712				
"	Minimum	-115.000			4.712	-4.712				
Reaction, X-X Axis Base	Maximum				14.625	18.775				
"	Minimum				14.625	18.775				
Reaction, Y-Y Axis Base	Maximum				29.220	37.420				
"	Minimum	115.000			-4.712	4.712				
Reaction, X-X Axis Top	Maximum				14.625	18.775				
"	Minimum				14.625	18.775				
Reaction, Y-Y Axis Top	Maximum				14.625	18.775				
"	Minimum	-115.000			4.712	-4.712				
Moment, X-X Axis Base	Maximum				14.625	18.775				
"	Minimum				14.625	18.775				
Moment, Y-Y Axis Base	Maximum				14.625	18.775				
"	Minimum				14.625	18.775				
Moment, X-X Axis Top	Maximum				14.625	18.775				
"	Minimum				14.625	18.775				
Moment, Y-Y Axis Top	Maximum				14.625	18.775				
"	Minimum				14.625	18.775				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.330	in	12.564	ft
+D+L	0.0000	in	0.000	ft	0.658	in	12.564	ft
+D+0.750L	0.0000	in	0.000	ft	0.576	in	12.564	ft
+0.60D	0.0000	in	0.000	ft	0.198	in	12.564	ft
+D+0.70E	0.0000	in	0.000	ft	0.203	in	11.919	ft
+D-0.70E	0.0000	in	0.000	ft	0.459	in	12.886	ft
+D+0.750L+0.5250E	0.0000	in	0.000	ft	0.480	in	12.403	ft
+D+0.750L-0.5250E	0.0000	in	0.000	ft	0.673	in	12.725	ft
+0.60D+0.70E	0.0000	in	0.000	ft	0.072	in	10.953	ft
+0.60D-0.70E	0.0000	in	0.000	ft	0.327	in	13.047	ft
L Only	0.0000	in	0.000	ft	0.328	in	12.564	ft

Steel Section Properties : W24x55

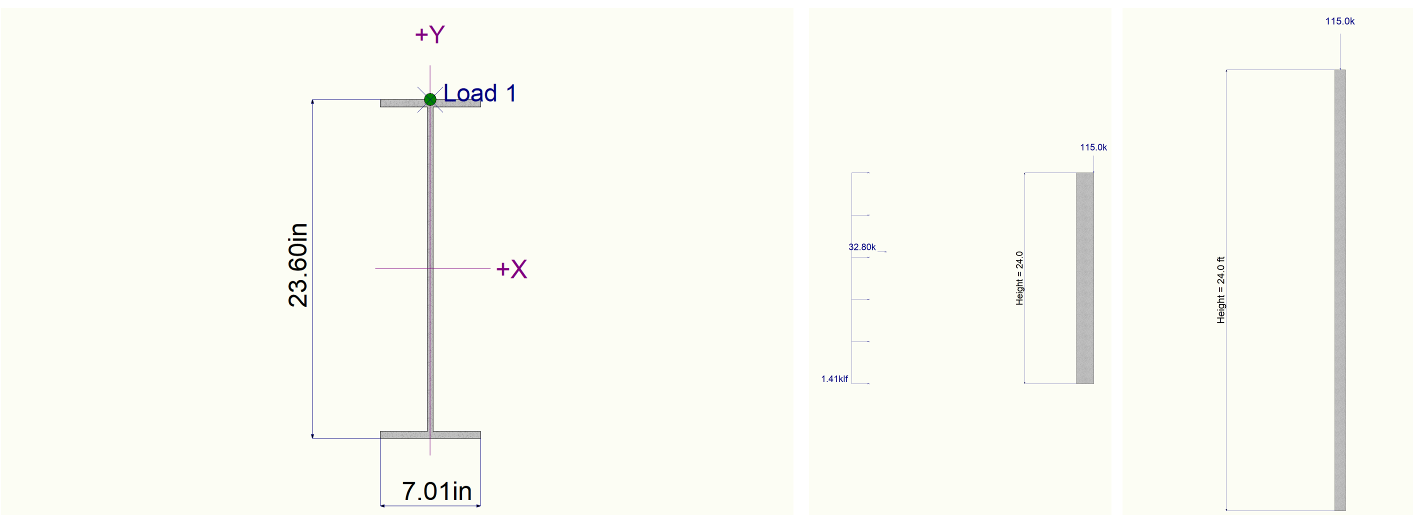
Steel Column

DESCRIPTION: L2, Frame 9, West collector beam 24'

Steel Section Properties : W24x55

Depth	=	23.600	in	I xx	=	1,350.00	in^4	J	=	1.180	in^4
Web Thick	=	0.395	in	S xx	=	114.00	in^3	Cw	=	3,870.00	in^6
Flange Width	=	7.010	in	R xx	=	9.110	in				
Flange Thick	=	0.505	in	Zx	=	134.000	in^3				
Area	=	16.200	in^2	I yy	=	29.100	in^4				
Weight	=	55.000	plf	S yy	=	8.300	in^3	Wno	=	40.500	in^2
Kdesign	=	1.010	in	R yy	=	1.340	in	Sw	=	35.800	in^4
K1	=	1.000	in	Zy	=	13.300	in^3	Qf	=	19.300	in^3
rts	=	1.720	in					Qw	=	66.100	in^3
Ycg	=	0.000	in								

Sketches



PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22 06/21/22 08:30:11
Building Code: IBC Steel Code: AISC 360-16 LRFD

Floor Type: Level 2 **Beam Number = 99**

SPAN INFORMATION (ft): I-End (110.92,118.17) J-End (134.92,118.17)

Beam Size (User Selected) = W24X55 Fy = 50.0 ksi
Total Beam Length (ft) = 24.00

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	perpendicular	perpendicular
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	72.00	Y bar(in)	=	21.60
Mnf (kip-ft)	=	1014.19	Mn (kip-ft)	=	784.03
C (kips)	=	191.25	PNA (in)	=	16.64
Ieff (in4)	=	2605.83	Itr (in4)	=	3810.91
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Rg Stud Red. Factor Rg[1] = 1.00 Rg[2] = 0.85
Rp Stud Red. Factor Rp[1] = 0.60 Rp[2] = 0.60
Stud Capacity (kips) Qn[1] = 17.2 Qn[2] = 14.6
# of studs: Max = 48 Partial = 32 Actual = 32
Number of Stud Rows = 2 Percent of Full Composite Action = 26.04

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
15.000	16.54	14.85	21.11	23.3	0.00	0.00	0.0	0.00	Snow	0.00	5.28

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.346	0.305	0.508	23.3%	Red	0.000	0.127
	24.000	0.346	0.305	0.508			0.000	0.127
2	0.000	0.249	0.220	0.367	23.3%	Red	0.000	0.092
	15.000	0.247	0.218	0.363			0.000	0.091
3	15.000	0.000	0.000	0.000	23.3%	Red	0.000	0.000
	16.629	0.282	0.249	0.415			0.000	0.104
4	16.629	0.282	0.249	0.415	23.3%	Red	0.000	0.104
	24.000	0.282	0.249	0.415			0.000	0.104
5	0.000	0.055	0.055	0.000	---	NonR	0.000	0.000
	24.000	0.055	0.055	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 51.07 kips 0.90Vn = 251.69 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	217.6	15.0	0.0	1.00	0.90	502.50
	Init DL	1.4DL	171.2	15.0	---	---		

PRCNC20221036

Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

06/21/22 08:30:11
Steel Code: AISC 360-16 LRFD

Span	Cond	LoadCombo	Mu	@	Lb	Cb	Phi	Phi*Mn
	Max +	1.2DL+1.6LL	$\boxed{381.0}$	15.0	---	---	0.90	$\boxed{705.63}$
Controlling		1.2DL+1.6LL	381.0	15.0	---	---	0.90	705.63

Post Composite Beam Capacity

Not controlling load combination, No EQ loads, use Enercalc Max Moment

REACTIONS (kips):

	Left	**Right**
Initial reaction	17.09	22.27
DL reaction	13.97	18.22
Max +LL reaction	14.07	18.25
Max +total reaction (factored)	39.28	51.07

DEFLECTIONS:

								Ratio
Initial load (in)	at 12.48 ft	=	-0.283	L/D	=	1017		
Live load (in)	at 12.48 ft	=	-0.163	L/D	=	1761	> 360	0.20
Post Comp load (in)	at 12.48 ft	=	-0.181	L/D	=	1595	> 240	0.15
Net Total load (in)	at 12.48 ft	=	-0.464	L/D	=	621	> 240	0.39

PRCNC20221036

Level 2 Frame 10 South collector #1

Note: EQ collector load is not part of the worst case load combination, Enercalc module is unable to design collector beam utilizing composite action. Worst case load combo = 1.2D + 1.6L

Mux from Enercalc = 367 k*ft
Phi*Mnx from RAM = 519.9 k*ft

367 / 519.9 = 0.71 < 1.0

Design, including composite action in bending is OK

PRCNC20221036

Steel Column

DESCRIPTION: L2, Frame 10, South Collector Beam 24'

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W21x44**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 24.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Lu for buckling ABOUT Y-Y Axis: 1 ft, 7.5 ft, 11 ft, 15.75 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 24.0 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
Axial Load at 24.0 ft, Yecc = 10.350 in, E = 206.0 k
BENDING LOADS . . .
Lat. Point Load at 1.0 ft creating Mx-x, D = 4.60, L = 4.60 k
Lat. Point Load at 7.50 ft creating Mx-x, D = 7.10, L = 7.40 k
Lat. Point Load at 11.0 ft creating Mx-x, D = 6.40, L = 6.50 k
Lat. Point Load at 15.750 ft creating Mx-x, D = 15.30, L = 16.0 k

EQ collector axial load is not part of the controlling load case. Enercalc module is not able to analysis the beam including composite action of the floor slab.

DESIGN SUMMARY

Bending & Shear Check Results

FAIL Max. Axial+Bending Stress Ratio = **1.030** : 1
Load Combination +1.20D+1.60L
Location of max.above base 11.275 ft
At maximum location values are . . .
Pu 0.0 k
0.9 * Pn 503.70 k
Mu-x 363.619 k-ft
0.9 * Mn-x : 353.074 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 38.220 k-ft

PASS Maximum Shear Stress Ratio = **0.2358** : 1
Load Combination +1.20D+1.60L
Location of max.above base 0.0 ft
At maximum location values are . . .
Vu : Applied 51.245 k
Vn * Phi : Allowable 217.350 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 31.368 k
Bottom along Y-Y 36.532 k

Maximum Load Deflections . . .
Along Y-Y 1.089 in at 12.242 ft above base
for load combination : +D+L
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Worst case Moment

This bending capacity does not include composite action, Use bending capacity from RAM.

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.505	PASS	11.28 ft	1.00	1.00	45.24	35.73	0.116	PASS	0.00 ft
+1.20D+1.60L	1.030	FAIL !	11.28 ft	1.00	1.00	45.24	35.73	0.236	PASS	0.00 ft
+1.20D+L	0.806	PASS	11.28 ft	1.00	1.00	45.24	35.73	0.185	PASS	0.00 ft
+1.20D	0.433	PASS	11.28 ft	1.00	1.00	45.24	35.73	0.099	PASS	0.00 ft
+0.90D	0.324	PASS	11.28 ft	1.00	1.00	45.24	35.73	0.075	PASS	0.00 ft
+1.401D+L+E	1.011	FAIL !	15.95 ft	1.65	1.00	78.57	35.73	0.207	PASS	15.79 ft
+0.6994D+E	0.987	PASS	23.84 ft	1.65	1.00	78.57	35.73	0.084	PASS	15.79 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments (k-ft) @ Base	@ Top	My - End Moments @ Base	@ Top
D Only				18.016	15.384				
+D+L				36.532	31.368				
+D+0.750L				31.903	27.372				

Steel Column

DESCRIPTION: L2, Frame 10, South Collector Beam 24'

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
+0.60D				10.809	9.231				
+D+0.70E	144.200			12.833	20.567				
+D+0.750L+0.5250E	108.150			28.016	31.259				
+0.60D+0.70E	144.200			5.627	14.413				
L Only				18.517	15.983				
E Only	206.000			-7.403	7.403				

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction (k) @ Base	X-X Axis Reaction (k) @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments (k-ft) @ Base	Mx - End Moments (k-ft) @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	206.000			-7.403	7.403				
"	Minimum				18.016	15.384				
Reaction, X-X Axis Base	Maximum				18.016	15.384				
"	Minimum				18.016	15.384				
Reaction, Y-Y Axis Base	Maximum				36.532	31.368				
"	Minimum	206.000			-7.403	7.403				
Reaction, X-X Axis Top	Maximum				18.016	15.384				
"	Minimum				18.016	15.384				
Reaction, Y-Y Axis Top	Maximum				18.016	15.384				
"	Minimum	206.000			-7.403	7.403				
Moment, X-X Axis Base	Maximum				18.016	15.384				
"	Minimum				18.016	15.384				
Moment, Y-Y Axis Base	Maximum				18.016	15.384				
"	Minimum				18.016	15.384				
Moment, X-X Axis Top	Maximum				18.016	15.384				
"	Minimum				18.016	15.384				
Moment, Y-Y Axis Top	Maximum				18.016	15.384				
"	Minimum				18.016	15.384				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.535	in	12.242	ft
+D+L	0.0000	in	0.000	ft	1.089	in	12.242	ft
+D+0.750L	0.0000	in	0.000	ft	0.950	in	12.242	ft
+0.60D	0.0000	in	0.000	ft	0.321	in	12.242	ft
+D+0.70E	0.0000	in	0.000	ft	0.221	in	10.470	ft
+D+0.750L+0.5250E	0.0000	in	0.000	ft	0.711	in	11.758	ft
+0.60D+0.70E	0.0000	in	0.000	ft	-0.055	in	19.651	ft
L Only	0.0000	in	0.000	ft	0.554	in	12.242	ft
E Only	0.0000	in	0.000	ft	-0.468	in	14.013	ft

Steel Section Properties : W21x44

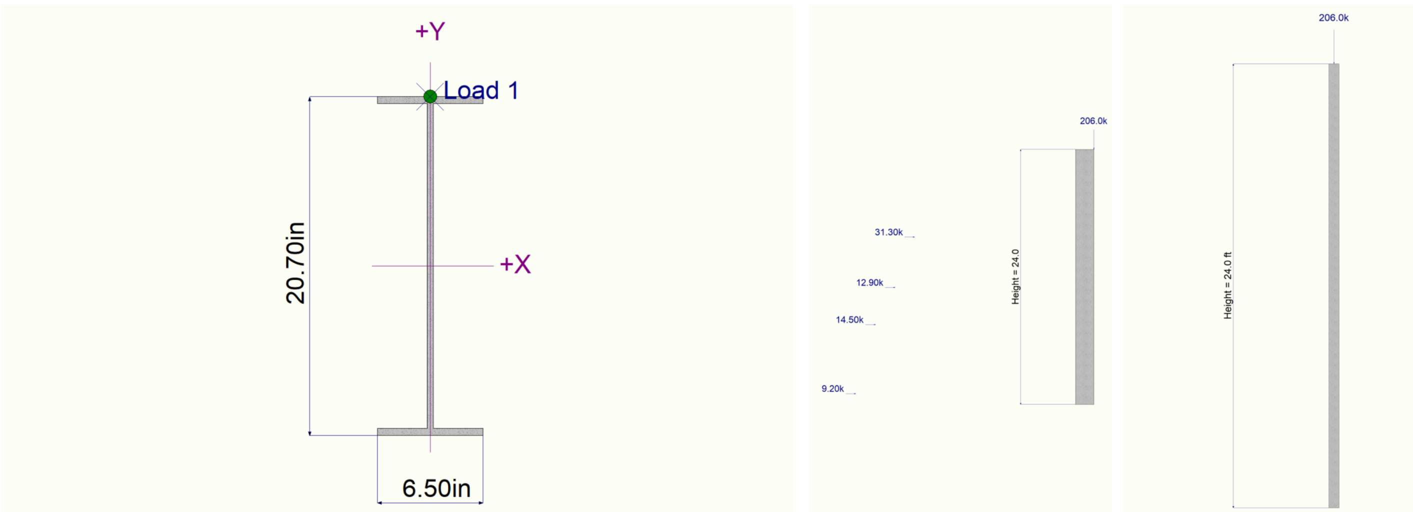
Depth	=	20.700 in	I xx	=	843.00 in^4	J	=	0.770 in^4
Web Thick	=	0.350 in	S xx	=	81.60 in^3	Cw	=	2,110.00 in^6
Flange Width	=	6.500 in	R xx	=	8.060 in			
Flange Thick	=	0.450 in	Zx	=	95.400 in^3			
Area	=	13.000 in^2	I yy	=	20.700 in^4			
Weight	=	44.000 plf	S yy	=	6.370 in^3	Wno	=	32.900 in^2
Kdesign	=	0.950 in	R yy	=	1.260 in	Sw	=	24.100 in^4
K1	=	0.813 in	Zy	=	10.200 in^3	Qf	=	14.000 in^3
rts	=	1.600 in				Qw	=	46.800 in^3
Ycg	=	0.000 in						

PRCNC20221036

Steel Column

DESCRIPTION: L2, Frame 10, South Collector Beam 24'

Sketches



Gravity Beam Design

RAM Steel 17.03.00.285
DataBase: Pierce College - 6.14.22 06/21/22 13:10:00
Building Code: IBC Steel Code: AISC 360-16 LRFD

Floor Type: Level 2 **Beam Number = 143**

SPAN INFORMATION (ft): I-End (155.92,94.13) J-End (155.92,118.17)

Beam Size (User Selected) = W21X44 Fy = 50.0 ksi
Total Beam Length (ft) = 24.03

COMPOSITE PROPERTIES (Not Shored):

	Left	Right
Deck Label	3 on 2	3 on 2
Concrete thickness (in)	3.00	3.00
Unit weight concrete (pcf)	150.00	150.00
f'c (ksi)	4.00	4.00
Decking Orientation	parallel	parallel
Decking type	VERCO W2 Formlok	VERCO W2 Formlok

beff (in)	=	50.30	Y bar(in)	=	18.77
Mnf (kip-ft)	=	711.78	Mn (kip-ft)	=	577.73
C (kips)	=	172.30	PNA (in)	=	15.27
Ieff (in4)	=	1734.56	Itr (in4)	=	2381.50
Stud length (in)	=	4.00	Stud diam (in)	=	0.75

Stud Capacity (kips) Qn = 21.5 Rg = 1.00 Rp = 0.75
# of studs: Full = 70 Partial = 23 Actual = 23
Number of Stud Rows = 1 Percent of Full Composite Action = 32.17

POINT LOADS (kips):

Dist	DL	CDL	RedLL	Red%	NonRL L	StorLL	Red%	RoofLL	Red%	PartL	CLL
0.951	4.54	4.04	6.19	25.7	0.00	0.00	0.0	0.00	Snow	0.00	1.55
7.451	7.07	6.28	9.89	25.7	0.00	0.00	0.0	0.00	Snow	0.00	2.47
10.992	6.33	5.63	8.74	25.7	0.00	0.00	0.0	0.00	Snow	0.00	2.18
15.742	6.94	6.15	9.78	25.7	0.00	0.00	0.0	0.00	Snow	0.00	2.45
15.742	8.36	7.42	11.76	25.7	0.00	0.00	0.0	0.00	Snow	0.00	2.94

LINE LOADS (k/ft):

Load	Dist	DL	CDL	LL	Red%	Type	PartL	CLL
1	0.000	0.044	0.044	0.000	---	NonR	0.000	0.000
	24.033	0.044	0.044	0.000			0.000	0.000

SHEAR (Ultimate): Max Vu (1.2DL+1.6LL) = 51.80 kips 1.00Vn = 217.35 kips

MOMENTS (Ultimate):

Span	Cond	LoadCombo	Mu kip-ft	@ ft	Lb ft	Cb	Phi	Phi*Mn kip-ft
Center	PreCmp+	1.2DL+1.6LL	209.7	13.1	4.8	1.00	0.90	352.86
	Init DL	1.4DL	162.0	12.2	---	---		
	Max +	1.2DL+1.6LL	$\boxed{366.5}$	15.1	---	---	0.90	$\boxed{519.96}$
Controlling		1.2DL+1.6LL	366.5	15.1	---	---	0.90	519.96

REACTIONS (kips):

Post Composite Beam Capacity

controlling load combinat...

PRCNC20221036

Gravity Beam Design

	Left	Right
Initial reaction	22.72	19.46
DL reaction	18.48	15.82
Max +LL reaction	18.52	15.90
Max +total reaction (factored)	51.80	44.42

DEFLECTIONS:

										Ratio
Initial load (in)	at	12.14 ft	=	-0.483	L/D	=	597			
Live load (in)	at	12.14 ft	=	-0.267	L/D	=	1081	>	360	0.33
Post Comp load (in)	at	12.14 ft	=	-0.295	L/D	=	976	>	240	0.25
Net Total load (in)	at	12.14 ft	=	-0.779	L/D	=	370	>	240	0.65

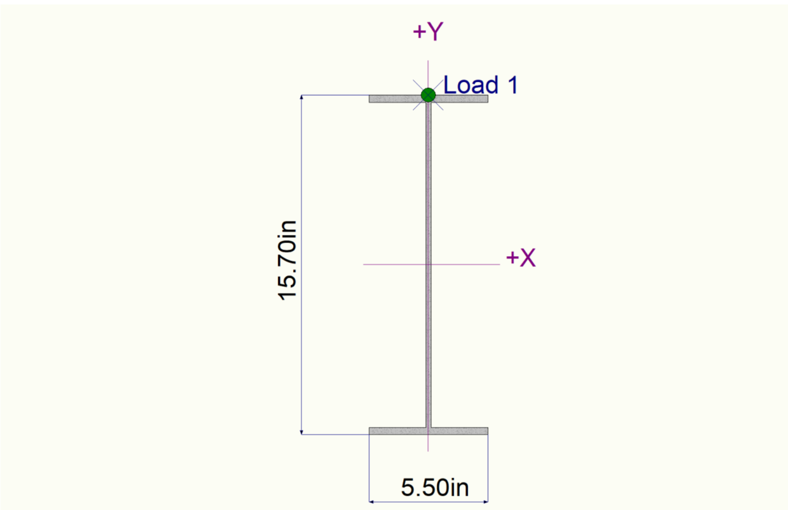
Steel Column

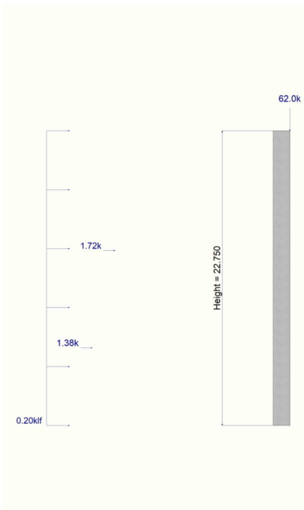
DESCRIPTION: RF Collector AE, grid D6.5

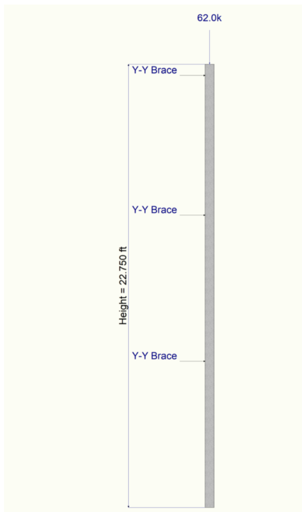
Steel Section Properties : W16x26

Depth	=	15.700	in	I xx	=	301.00	in^4	J	=	0.262	in^4
Web Thick	=	0.250	in	S xx	=	38.40	in^3	Cw	=	565.00	in^6
Flange Width	=	5.500	in	R xx	=	6.260	in				
Flange Thick	=	0.345	in	Zx	=	44.200	in^3				
Area	=	7.680	in^2	I yy	=	9.590	in^4				
Weight	=	26.000	plf	S yy	=	3.490	in^3	Wno	=	21.100	in^2
Kdesign	=	0.747	in	R yy	=	1.120	in	Sw	=	10.000	in^4
K1	=	0.750	in	Zy	=	5.480	in^3	Qf	=	6.950	in^3
rts	=	1.380	in					Qw	=	21.600	in^3
Ycg	=	0.000	in								

Sketches

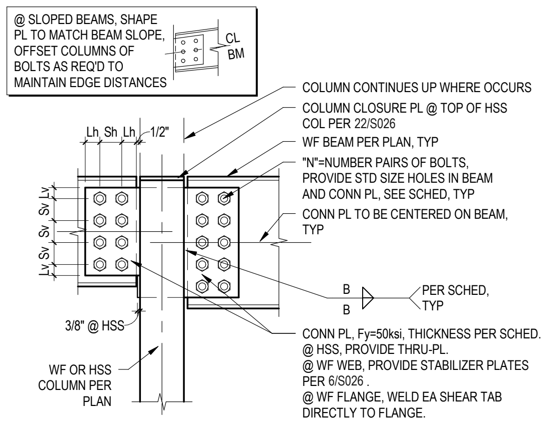






PRCNC20221036

Collector/Chord Bolted connection designed per details 7/S027, 13/S027, and 19/S027



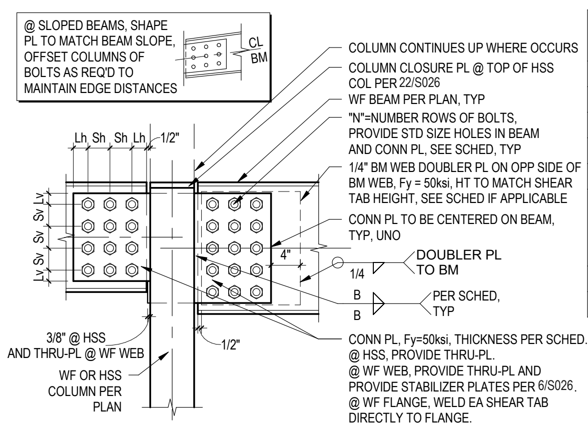
MEMBER	PL THICKNESS	BOLT Ø (IN)	"N"	Lh (IN)	Sh (IN)	Lv (IN)	Sv (IN)	WELD SIZE "B"
W8, W10	1/2"	3/4	2	2	3	1-1/2	3	5/16
W12	1/2"	3/4	3	2	3	1-1/2	3	5/16
W14	1/2"	3/4	3	2	3	1-1/2	3	5/16
W16	1/2"	3/4	4	2	3	1-1/2	3	5/16
W18	1/2"	3/4	5	2	3	1-1/2	3	5/16
W21-W24	1/2"	3/4	6	2	3	1-1/2	3	5/16
W27	1/2"	3/4	7	2	3	1-1/2	3	5/16
W30	3/4"	1	8	2	3	1-1/2	3	1/2

NOTES:

1. THIS DETAIL APLLIES TO ALL BEAMS INDICATE AS (c) ON PLAN.
2. WHERE COLLECTOR BEAMS FRAME INTO MULTIPLE SIDES, OR WHERE COLLECTOR BEAMS FRAME IN ONE DIRECTION AND GIRDERS FRAME IN THE PERPENDICULAR DIRECTION, PROVIDE CRUCIFORM SHAPE PER 17/S026 , UNO.
3. AT HSS THRU PL, WHERE THICKNESS & WELD DIFFER DUE TO DIFFERENT BEAM SIZES, USE THE LARGER OF THE TWO.

7 DRAG CONNECTION AT BEAM/COLUMN

SCALE: 1" = 1'-0"



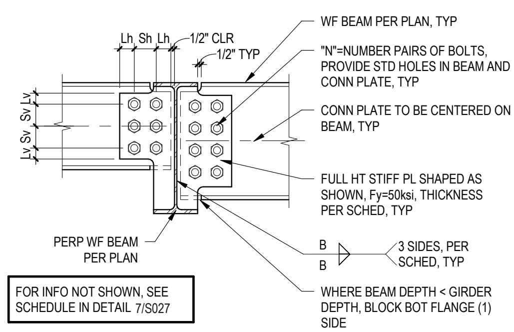
MEMBER	PL THICKNESS	BOLT Ø (IN)	"N"	Lh (IN)	Sh (IN)	Lv (IN)	Sv (IN)	WELD SIZE "B"	BM WEB DOUBLER PL
W12x40 (c)*	1"	1	3	2	3	1-1/2	3	5/8	YES
W14	1"	1	3	2	3	1-1/2	3	3/8	NO
W16	1"	1	4	2	3	1-1/2	3	3/8	NO
W18	1"	1	5	2	3	1-1/2	3	3/8	NO
W18x50 (c)*	1"	7/8	5	2	3	1-1/2	3	3/8	NO
W18x55 (c)* ALONG GRIDS B7 & C7 @ RF	1"	1	5	4	3	1-1/2	3	5/8	NO
W18x55 (c)*	1"	1	5	3	3	1-1/2	3	5/8	NO
W21-W24	1"	1	6 NOTE 4	2	3	1-1/2	3	5/8	NO

NOTES:

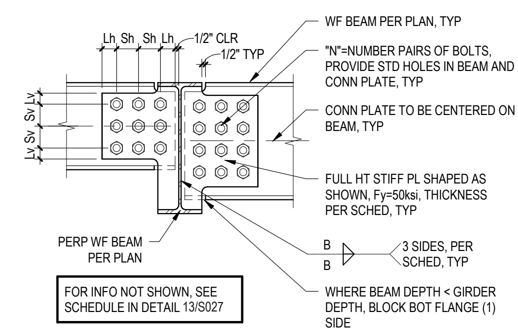
1. THIS DETAIL APLLIES TO ALL BEAMS INDICATE AS (c)* ON PLAN.
2. WHERE COLLECTOR BEAMS FRAME INTO MULTIPLE SIDES, OR WHERE COLLECTOR BEAMS FRAME IN ONE DIRECTION AND GIRDERS FRAME IN THE PERPENDICULAR DIRECTION, PROVIDE CRUCIFORM SHAPE PER 17/S026 , UNO.
3. AT THRU PL's, WHERE THICKNESS & WELD DIFFER DUE TO DIFFERENT BEAM SIZES, USE THE LARGER OF THE TWO.
4. WHERE (C)* BEAM FRAME INTO PERPENDICULAR BEAM WITH LESS DEPTH, NUMBER OF ROWS OF BOLTS TO BE BASED ON PERPENDICULAR BEAM SIZE. BOLT GROUP SHALL BE CENTERED ON PERPENDICULAR BEAM.

13 DRAG CONNECTION AT BEAM/COLUMN

SCALE: 1" = 1'-0"



A @ (2) VERTICAL COLUMNS OF BOLTS



B @ (3) VERTICAL COLUMNS OF BOLTS

19 DRAG CONN AT BEAM/BEAM

SCALE: 1" = 1'-0"

PRCNC20221036

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector A

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	22	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	55.00	55.09	86.67
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	55.00	55.02	88.54

Member Parameters

Beam Shape	W16X26						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
7.68	15.7	0.25	5.5	0.345	50	65	1.06

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
5.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W10X49	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.34	0.56	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	2.06	OK	36.88	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	2.06	OK	36.88	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	2.06	OK	36.88	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	55.09	86.67	3.08	4.86	OK	87.00	AISC Table 7-7, 75 degree angle
Connection e_x	9	in		(0.9-0.2SDS)D+(ρ/Ω)E	55.02	88.54	3.07	4.86	OK	87.00	AISC Table 7-7, 75 degree angle

Beam Checks

				Check
Shear Yielding of Beam web				Check
ΦR_n	117.8	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	345.6	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.72	in	Table D3.1	
U	0.759			
A_n	6.81	in^2		Check
ΦR_n	251.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	1.59	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	103.59	kips		Check
ΦR_n	131.63	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.75			
e_x	9.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	1.57		Table 8-4	
$C_{gravity+seismic}$	2.52		Table 8-4	Check
$\Phi R_{n\_gravity}$	70.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	113.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	122.4	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	119.3	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	183.6	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	198.9	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.092		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.1		EQ10-5	OK

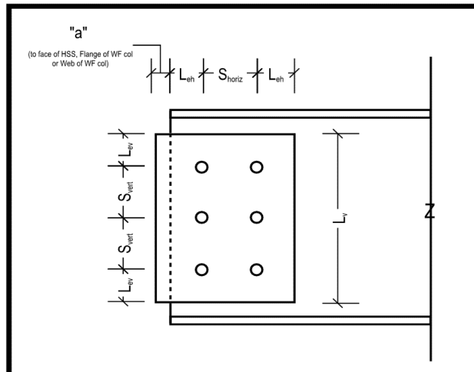
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

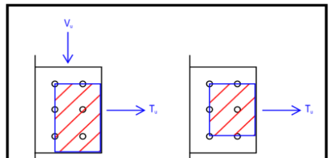
Plate Checks

Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	125.7	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	11	ft		
M_{tu}	2.10	k-in	EQ 10-8a	Check
ΦR_n	43.6	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.492		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	50.4	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	62.35			
F_e	73.62	ksi	EQ E3-4	Check
ΦR_n	203.2	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.271			Check
Combined	0.112		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	50.4	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.265			Check
Combined	0.121		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0560			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	50.4	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.112			OK

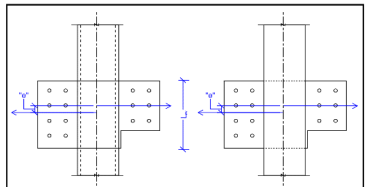


General Connection layout



L-Shaped Block Shear (check combined)

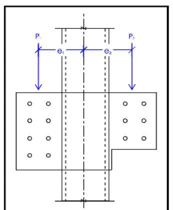
U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector B

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	9	0	1.4D	12.6	0	12.60	0.00
Live	0	0	1.2D+1.6L+0.5S	14.8	0	14.80	0.00
Snow	8	0	1.2D+1.6S+L	23.6	0	23.60	0.00
Earthquake	0	18	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	14.21	45.00	47.19	72.48
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	6.29	45.00	45.44	82.04

Member Parameters

Beam Shape	W18X40						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
11.8	17.9	0.315	6.02	0.525	50	65	1.19

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	5	1.5	3	15	0.5	50	65
						OK plate will fit			

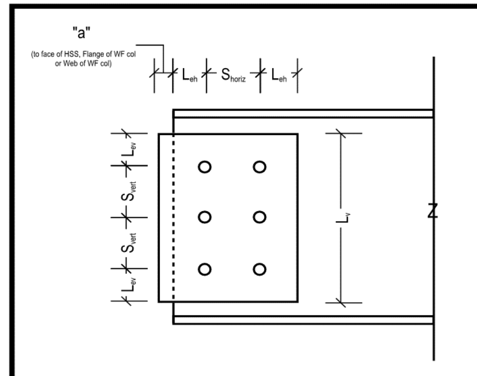
Attaching Column/Beam	WF	W10X68	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.47	0.77	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	27.64	kips/bolt	EQJ3-6a	1.4D	12.60	0.00	0.70	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	14.80	0.00	0.83	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	27.64	kips/bolt	EQJ3-6a	1.2D+1.6S+L	23.60	0.00	1.32	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	47.19	72.48	2.64	8.50	OK	152.16	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	45.44	82.04	2.54	8.50	OK	152.16	AISC Table 7-7, 75 degree angle



General Connection layout

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	169.2	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	531.0	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.85	in	Table D3.1	
U	0.715			
A_n	10.42	in^2		Check
ΦR_n	363.4	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	3.15	in^2		
A_{nv}	2.32	in^2		
A_{nt}	2.68	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	94.5	kips		
$0.6F_uA_{nv}$	90.60	kips		
$U_{bs}F_uA_{nt}$	174.04	kips		Check
ΦR_n	198.48	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Flange			
a	0.27			
e_x	4.00	in		
l	15	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	3.09		Table 8-4	
$C_{gravity+seismic}$	4.57		Table 8-4	Check
$\Phi R_{n\_gravity}$	173.8	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	257.1	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	346.5	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	337.8	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	519.75	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	563.1	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.012		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

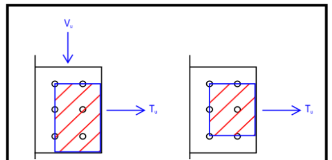
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

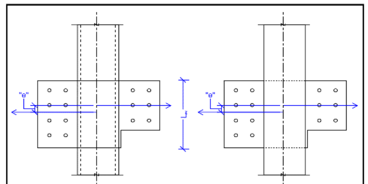
Max Plate Thickness				
C'	38.7	in	Table 7-7	
M_{max}	1026.3	k-in	EQ 10-4	Check
t_{max}	0.547	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1413.7	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	28.333	ft		
M_{tu}	9.62	k-in	EQ 10-8a	Check
ΦR_n	50.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.206		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	94.4	k-in		Check
ΦM_n	1265.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	337.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	225	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.133			Check
Combined	0.031		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	5.313		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	259.0	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	20.15	in^3	Sect 9	
M_u	94.4	k-in		Check
ΦM_n	982.52	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	5.31			Check
ΦR_n	155.39	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.174			Check
Combined	0.057		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	6.75	in^2		
A_{nv}	4.78	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	202.50	kips		
$0.6F_uA_{nv}$	186.47	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	184.79	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	4.78	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	310.78	kips		Check
ΦR_n	287.02	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0409			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	4.25	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	276.25	kips		Check
ΦR_n	315.05	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	94.4	k-in		Check
ΦM_n	1265.6	k-in		OK
Combined	0.031			OK



L-Shaped Block Shear (check combined)

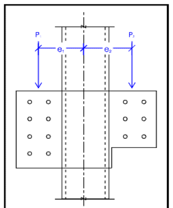
U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth



HSS Column Connection Checks

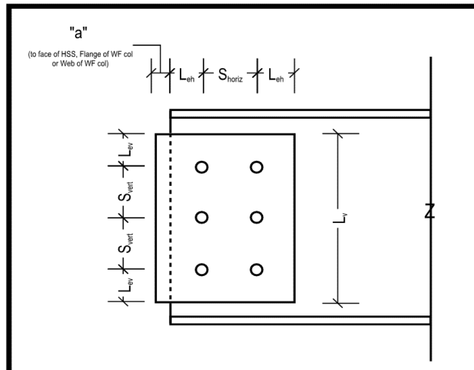
Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector C

Load Paremeters								
Sds	1.003							
Rho/Omega	2.5							
Live Load EQ LC Factor	1							
	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	4	0	1.4D	5.6	0	5.60	0.00
Live	0	0	1.2D+1.6L+0.5S	6.8	0	6.80	0.00
Snow	4	0	1.2D+1.6S+L	11.2	0	11.20	0.00
Earthquake	0	18	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	6.40	45.00	45.45	81.90
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	2.80	45.00	45.09	86.44

Member Parameters									
Beam Shape	W16X31								
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)		
9.13	15.9	0.275	5.53	0.44	50	65	1.13		
Plate Shape	*Note this spread sheet is only set up for (2) vertical columns of bolts*								
"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			
Attaching Column/Beam	WF	W12X65							
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)						
0.39	0.605	50	65						



General Connection layout

Bolt Parameters	
Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks											
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Bearing Beam Web ΦRn	24.13	kips/bolt	EQJ3-6a	1.4D	5.60	0.00	0.31	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	6.80	0.00	0.38	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	24.13	kips/bolt	EQJ3-6a	1.2D+1.6S+L	11.20	0.00	0.63	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	45.45	81.90	2.54	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	45.09	86.44	2.52	6.67	OK	119.40	AISC Table 7-7, 75 degree angle

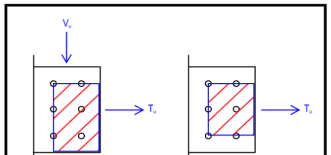
Beam Checks				
Shear Yielding of Beam web				Check
ΦR_n	131.2	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	410.9	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.78	in	Table D3.1	
U	0.740			
A_n	8.17	in^2		Check
ΦR_n	294.7	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.75	in^2		
A_{nv}	2.03	in^2		
A_{nt}	1.75	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	82.5	kips		
$0.6F_uA_{nv}$	79.10	kips		
$U_{bs}F_uA_{nt}$	113.95	kips		Check
ΦR_n	144.79	kips	EQ J4-5	OK

WF Column-Connection Checks				
Weld to column-WF				
Conn to web or flange	Flange			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$\Phi R_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	217.8	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	212.4	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	326.7	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	353.9	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.022		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

HSS Column-Connection Checks				
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

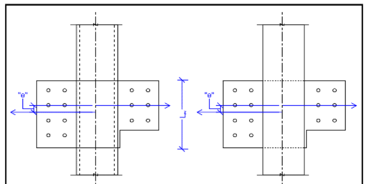
Plate Checks				
Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	29.666	ft		
M_{tu}	4.34	k-in	EQ 10-8a	Check
ΦR_n	42.2	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	44.8	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.167			Check
Combined	0.023		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	44.8	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.217			Check
Combined	0.091		EQ 10-5 & H1-1	OK

Plate Checks (continued)				
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0419			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	45	k-in		
M_{u_total}	89.8	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.042			OK



L-Shaped Block Shear (check combined)

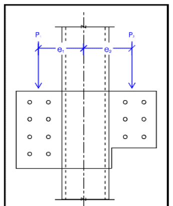
U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

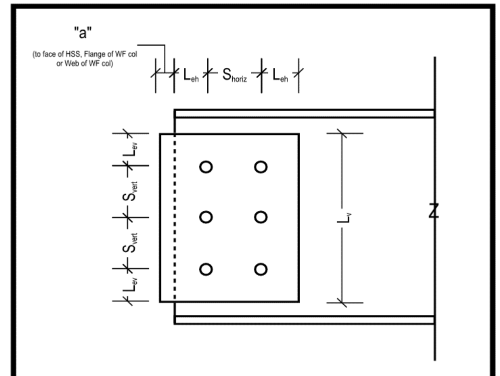
RF Collector D

Load Parameters

Sds	1.003							
Rho/Omega	2.5							
Live Load EQ LC Factor	1							
	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	38	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	95.00	95.05	88.07
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	95.00	95.01	89.16

Member Parameters

Beam Shape	W16X26								
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)		
7.68	15.7	0.25	5.5	0.345	50	65	1.06		
Plate Shape	*Note this spread sheet is only set up for (2) vertical columns of bolts*								
"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			
Attaching Column/Beam	WF	W10X68							
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)						
0.47	0.77	50	65						



General Connection layout

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	$ΦR_n$	
Bolt Bearing Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	95.05	88.07	5.31	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	95.01	89.16	5.31	6.67	OK	119.40	AISC Table 7-7, 75 degree angle

Beam Checks

Shear Yielding of Beam web				Check
$ΦR_n$	117.8	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
$ΦR_n$	345.6	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.72	in	Table D3.1	
U	0.759			
A_n	6.81	in^2		Check
$ΦR_n$	251.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	1.59	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	103.59	kips		Check
$ΦR_n$	131.63	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Flange			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$ΦR_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$ΦR_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
$ΦR_n$	277.2	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
$ΦR_n$	270.3	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
$ΦR_n$	415.8	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
$ΦR_n$	450.5	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.053		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

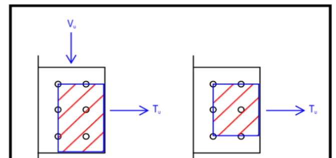
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
$ΦR_n$	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
$ΦR_n$	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
$ΦR_n$	DNA	kips	EQ J4-4	DNA

Plate Checks

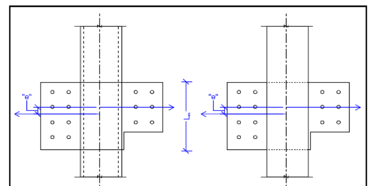
Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
$ΦR_n$	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	9	ft		
M_{tu}	2.10	k-in	EQ 10-8a	Check
$ΦR_n$	43.6	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
$ΦM_n$	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
$ΦR_n$	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
$ΦR_n$	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/ΦR_{n\_AXIAL}$	0.352			Check
Combined	0.145		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
$ΦR_n$	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	22.4	k-in		Check
$ΦM_n$	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
$ΦR_n$	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/ΦR_{n\_T\text{-}Rupt}$	0.459			Check
Combined	0.246		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
$ΦR_n$	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
$ΦR_n$	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
$ΦR_n$	0.1644			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
$ΦR_n$	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No		*note check on deeper beam only*	
Is a check required?	Yes			
"e"	3.0	in		
$M_{u\_additional}$	285	k-in		
M_{u_total}	307.4	k-in		Check
$ΦM_n$	810.0	k-in		OK
Combined	0.536			OK



L-Shaped Block Shear (check combined)

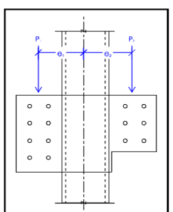
U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector E

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	16	0	1.4D	22.4	0	22.40	0.00
Live	0	0	1.2D+1.6L+0.5S	21.7	0	21.70	0.00
Snow	5	0	1.2D+1.6S+L	27.2	0	27.20	0.00
Earthquake	0	38	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	23.41	95.00	97.84	76.16
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	11.19	95.00	95.66	83.28

Member Parameters

Beam Shape	W16X31								
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)		
9.13	15.9	0.275	5.53	0.44	50	65	1.13		
Plate Shape	*Note this spread sheet is only set up for (2) vertical columns of bolts*								
"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			
Attaching Column/Beam	WF	W24X68							
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)						
0.415	0.585	50	65						

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	22.40	0.00	1.25	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	24.13	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	21.70	0.00	1.21	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	27.20	0.00	1.52	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	24.13	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	97.84	76.16	5.47	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	95.66	83.28	5.34	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	131.2	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	410.9	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.78	in	Table D3.1	
U	0.740			
A_n	8.17	in^2		Check
ΦR_n	294.7	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.75	in^2		
A_{nv}	2.03	in^2		
A_{nt}	1.75	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	82.5	kips		
$0.6F_uA_{nv}$	79.10	kips		
$U_{bs}F_uA_{nt}$	113.95	kips		Check
ΦR_n	144.79	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$\Phi R_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	149.4	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	145.7	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	224.1	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	242.8	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.213		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.2		EQ10-5	OK

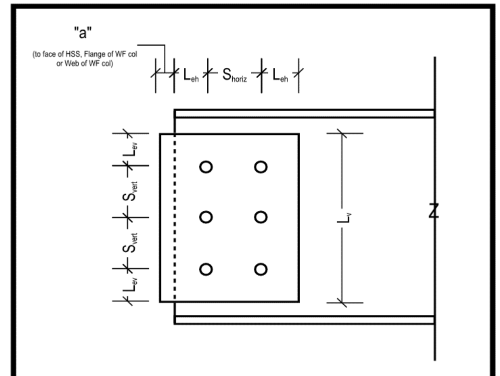
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

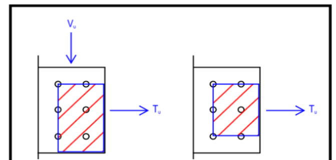
Plate Checks

Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	28.333	ft		
M_{tu}	10.54	k-in	EQ 10-8a	Check
ΦR_n	38.2	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	108.8	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.352			Check
Combined	0.259		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	108.8	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.459			Check
Combined	0.445		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.1944			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	95	k-in		
M_{u_total}	203.8	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.387			OK

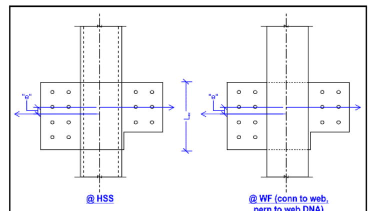


General Connection layout

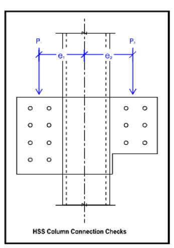


L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth



Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector F

Load Parameters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	14	0	1.4D	19.6	0	19.60	0.00
Live	0	0	1.2D+1.6L+0.5S	19.8	0	19.80	0.00
Snow	6	0	1.2D+1.6S+L	26.4	0	26.40	0.00
Earthquake	0	38	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	20.81	95.00	97.25	77.65
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	9.79	95.00	95.50	84.12

Member Parameters

Beam Shape	W18X35						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
10.3	17.7	0.3	6	0.425	50	65	1.13

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	5	1.5	3	15	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W24X68	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.415	0.585	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	19.60	0.00	1.09	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	26.33	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	19.80	0.00	1.11	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	26.40	0.00	1.47	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	26.33	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(p/Ω)E+L+0.2S	97.25	77.65	5.43	8.50	OK	152.16	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(p/Ω)E	95.50	84.12	5.34	8.50	OK	152.16	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	159.3	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	463.5	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.79	in	Table D3.1	
U	0.736			
A_e	8.99	in^2		Check
ΦR_n	322.7	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	3.00	in^2		
A_{nv}	2.21	in^2		
A_{nt}	2.55	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	90	kips		
$0.6F_uA_{nv}$	86.29	kips		
$U_{bs}F_uA_{nt}$	165.75	kips		Check
ΦR_n	189.03	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.27			
e_x	4.00	in		
l	15	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	3.09		Table 8-4	
$C_{gravity+seismic}$	4.57		Table 8-4	Check
$\Phi R_{n\_gravity}$	173.8	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	257.1	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	186.75	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	182.1	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	280.125	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	303.5	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.135		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.1		EQ10-5	OK

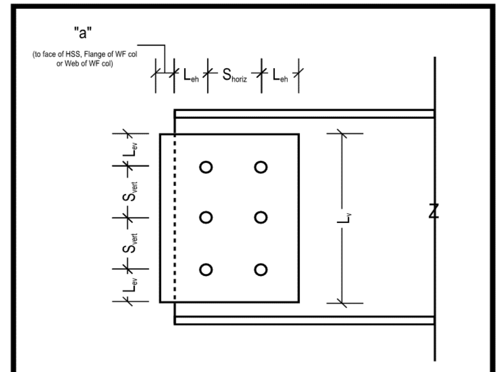
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

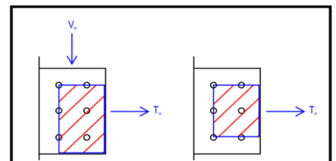
Plate Checks

Max Plate Thickness				
C'	38.7	in	Table 7-7	
M_{max}	1026.3	k-in	EQ 10-4	Check
t_{max}	0.547	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1413.7	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	30	ft		
M_{ta}	10.56	k-in	EQ 10-8a	Check
ΦR_n	49.7	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.206		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	105.6	k-in		Check
ΦM_n	1265.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	337.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	225	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.281			Check
Combined	0.147		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	5.313		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	259.0	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	20.15	in^3	Sect 9	
M_u	105.6	k-in		Check
ΦM_n	982.52	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	5.31			Check
ΦR_n	155.39	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.367			Check
Combined	0.254		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	6.75	in^2		
A_{nv}	4.78	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	202.50	kips		
$0.6F_uA_{nv}$	186.47	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	184.79	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	4.78	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	310.78	kips		Check
ΦR_n	287.02	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.1300			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	4.25	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	276.25	kips		Check
ΦR_n	315.05	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	95	k-in		
M_{u_total}	200.6	k-in		Check
ΦM_n	1265.6	k-in		OK
Combined	0.207			OK

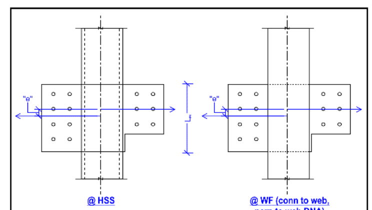


General Connection layout



L-Shaped Block Shear (check combined)

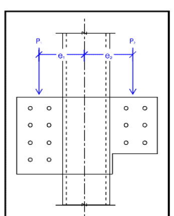
U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector K

Load Parameters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	18	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	45.00	45.11	85.93
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	45.00	45.02	88.22

Member Parameters

Beam Shape	W12X14						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
4.16	11.9	0.2	3.97	0.225	50	65	0.75

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

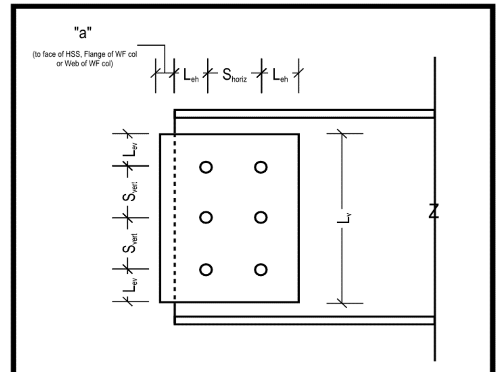
Attaching Column/Beam	WF	W14X22	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.23	0.335	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	2.80	0.00	0.16	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	17.55	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.32	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	17.55	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	45.11	85.93	2.57	4.90	OK	86.00	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	45.02	88.22	2.57	4.90	OK	86.00	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									



General Connection layout

Beam Checks

				Check
Shear Yielding of Beam web				Check
ΦR_n	71.4	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	187.2	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.46	in	Table D3.1	
U	0.846			
A_n	3.64	in^2		Check
ΦR_n	149.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.00	in^2		
A_{nv}	1.48	in^2		
A_{nt}	0.85	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	60	kips		
$0.6F_uA_{nv}$	57.53	kips		
$U_{bs}F_uA_{nt}$	55.25	kips		Check
ΦR_n	84.58	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	62.1	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	60.5	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	93.15	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	100.9	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.242		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.2		EQ10-5	OK

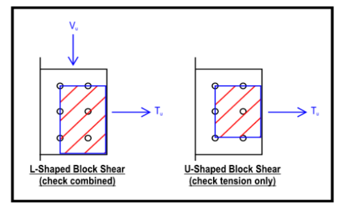
HSS Column-Connection Checks

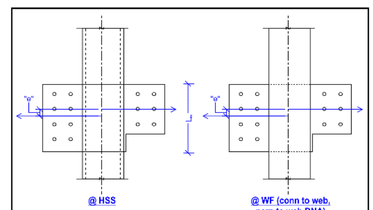
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

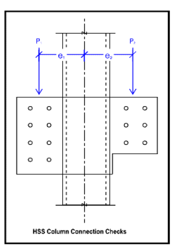
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	7	ft		
M_{tu}	1.96	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.222			Check
Combined	0.075		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.290			Check
Combined	0.127		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0623			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No		*note check on deeper beam only*	
Is a check required?	Yes			
"e"	3.0	in		
$M_{u\_additional}$	135	k-in		
M_{u_total}	157.4	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.324			OK





Differing Beam Depth



Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector X

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	7	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	17.50	17.79	79.63
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	17.50	17.56	85.43

Member Parameters

Beam Shape	W12X19						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
5.57	12.2	0.235	4.01	0.35	50	65	0.88

Plate Shape *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	Rect_HSS	HSS5X5X5/16	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.291	0.291	46	58

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	17.79	79.63	0.99	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	17.56	85.43	0.98	4.90	OK	87.71	AISC Table 7-7, 75 degree angle

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	86.0	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	250.7	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.54	in	Table D3.1	
U	0.820			
A_n	4.95	in^2		Check
ΦR_n	198.0	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.35	in^2		
A_{nv}	1.73	in^2		
A_{nt}	1.00	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	70.5	kips		
$0.6F_uA_{nv}$	67.59	kips		
$U_{bs}F_uA_{nt}$	64.92	kips		Check
ΦR_n	99.38	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	DNA			
e_x	DNA	in		
l	DNA	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	DNA	kips	Equation inTable 8-4	DNA
$\Phi R_{n\_gravity+seismic}$	DNA	kips	Equation inTable 8-4	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA
Column Base Material - Tensile Yielding				Check
ΦR_n	DNA	kips	EQ J4-1	DNA
Column Base Material - Tensile Rupture				Check
ΦR_n	DNA	kips	EQ J4-2	DNA
Column Base Material - Yielding Combined				Check
Combined	DNA		EQ 10-5	DNA
Column Base Material - Rupture Combined				Check
Combined	DNA		EQ10-5	DNA

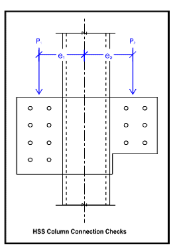
HSS Column-Connection Checks

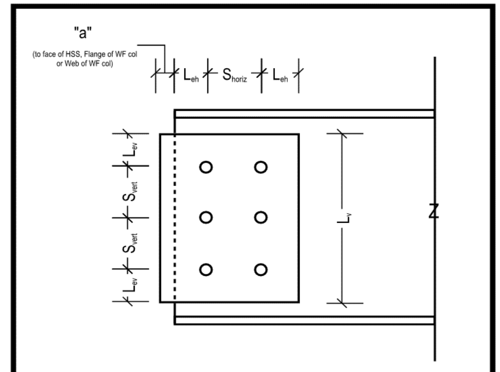
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	8.5	kips		
V_{u_moment}	11.3	kips		
V_{u_total}	28.3	kips		
Weld D	5	/16		Check
ΦR_n	62.6	kips	EQ 8-2a	OK
Column Base Material - Shear Yielding				Check
ΦR_n	157.1	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	153.2	kips	EQ J4-4	OK

Plate Checks

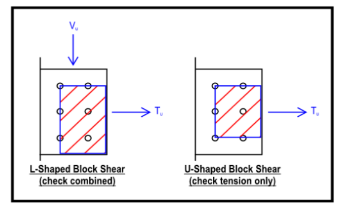
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	14	ft		
M_{tu}	2.06	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.086			Check
Combined	0.010		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.113			Check
Combined	0.018		EQ 10-5 & H1-1	OK

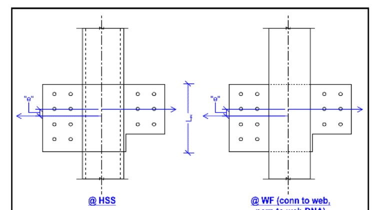
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0112			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	17.5	k-in		
M_{u_total}	39.9	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.019			OK





General Connection layout





Differing Beam Depth

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector Y

Load Parameters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	7	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	17.50	17.79	79.63
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	17.50	17.56	85.43

Member Parameters

Beam Shape: W14X22

A (in²)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
6.49	13.7	0.23	5	0.335	50	65	1.06

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_p (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

Attaching Column/Beam: WF W10X77

t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.53	0.87	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in²)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	2.80	0.00	0.16	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	20.18	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	20.18	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(p/Ω)E+L+0.2S	17.79	79.63	0.99	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(p/Ω)E	17.56	85.43	0.98	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

				Check
Shear Yielding of Beam web				Check
ΦR_n	94.5	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	292.1	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.69	in	Table D3.1	
U	0.771			
A_e	5.89	in²		Check
ΦR_n	221.2	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.30	in²		
A_{nv}	1.70	in²		
A_{nt}	0.98	in²		
U_{bs}	1.0			
$0.6F_yA_{gv}$	69	kips		
$0.6F_uA_{nv}$	66.15	kips		
$U_{bs}F_uA_{nt}$	63.54	kips		Check
ΦR_n	97.27	kips	EQ J4-5	OK

WF Column-Connection Checks

				Check
Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	143.1	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	139.5	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	214.65	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	232.5	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.008		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

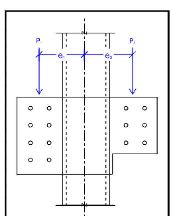
HSS Column-Connection Checks

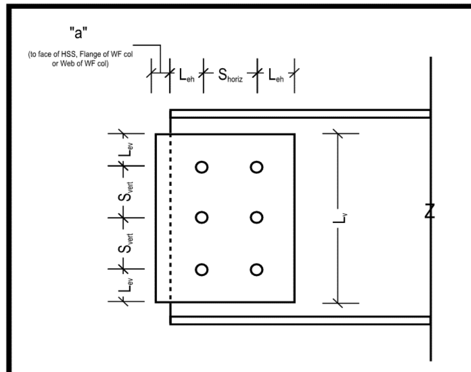
				Check
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

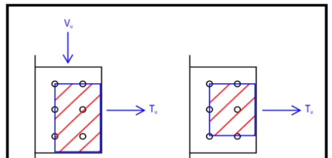
				Check
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	16	ft		
M_{ta}	2.04	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.086			Check
Combined	0.010		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in³	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.113			Check
Combined	0.018		EQ 10-5 & H1-1	OK

				Check
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in²		
A_{nv}	2.66	in²		
A_{nt}	1.84	in²		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in²		
A_{nv}	1.84	in²		
A_{nt}	2.66	in²		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0112			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in²		
A_{nv}	3.69	in²		
A_{nt}	2.13	in²		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	17.5	k-in		
M_{u_total}	39.9	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.019			OK



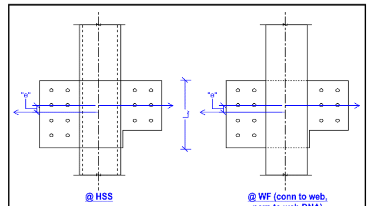


General Connection layout



L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector Z

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	7	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	17.50	17.79	79.63
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	17.50	17.56	85.43

Member Parameters

Beam Shape	W12X14						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
4.16	11.9	0.2	3.97	0.225	50	65	0.75

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W16X26	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.25	0.345	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	2.80	0.00	0.16	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	17.55	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.32	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	17.55	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	17.79	79.63	1.01	4.90	OK	86.00	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	17.56	85.43	1.00	4.90	OK	86.00	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

				Check
Shear Yielding of Beam web				Check
ΦR_n	71.4	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	187.2	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.46	in	Table D3.1	
U	0.846			
A_n	3.64	in^2		Check
ΦR_n	149.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.00	in^2		
A_{nv}	1.48	in^2		
A_{nt}	0.85	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	60	kips		
$0.6F_uA_{nv}$	57.53	kips		
$U_{bs}F_uA_{nt}$	55.25	kips		Check
ΦR_n	84.58	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	67.5	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	65.8	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	101.25	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	109.7	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.037		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

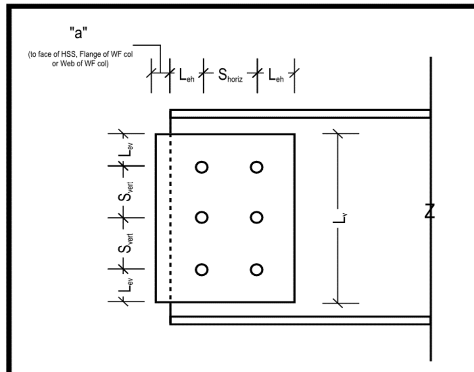
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

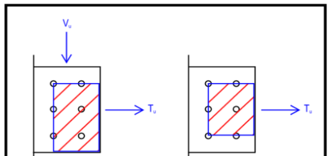
Plate Checks

Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	17.5	ft		
M_{tu}	1.96	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.086			Check
Combined	0.010		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.113			Check
Combined	0.018		EQ 10-5 & H1-1	OK

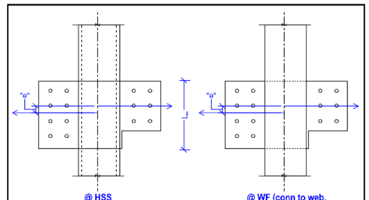
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0112			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.010			OK



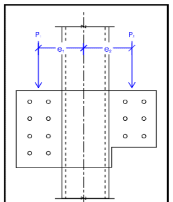
General Connection layout



L-Shaped Block Shear (check combined) U-Shaped Block Shear (check tension only)



Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector AA

Load Parameters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	7	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	17.50	17.79	79.63
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	17.50	17.56	85.43

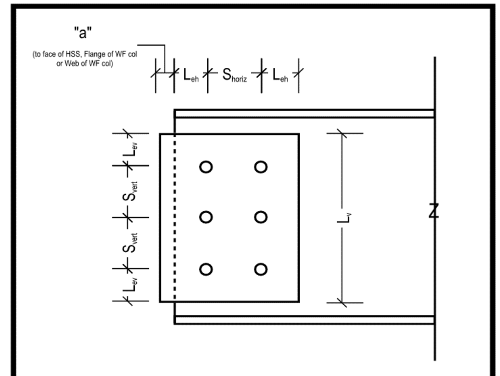
Member Parameters

Beam Shape	W12X19						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
5.57	12.2	0.235	4.01	0.35	50	65	0.88

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W16X26	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.25	0.345	50	65



General Connection layout

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	2.80	0.00	0.16	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	17.79	79.63	0.99	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	17.56	85.43	0.98	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

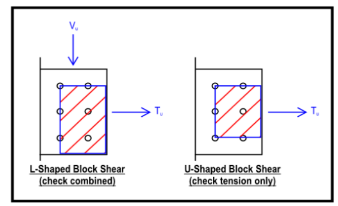
Beam Checks

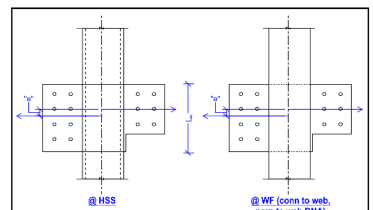
				Check
Shear Yielding of Beam web				Check
ΦR_n	86.0	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	250.7	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.54	in	Table D3.1	
U	0.820			
A_n	4.95	in^2		Check
ΦR_n	198.0	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.35	in^2		
A_{nv}	1.73	in^2		
A_{nt}	1.00	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	70.5	kips		
$0.6F_uA_{nv}$	67.59	kips		
$U_{bs}F_uA_{nt}$	64.92	kips		Check
ΦR_n	99.38	kips	EQ J4-5	OK

Plate Checks

				Check
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	14	ft		
M_{tu}	2.06	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.086			Check
Combined	0.010		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.113			Check
Combined	0.018		EQ 10-5 & H1-1	OK

				Check
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0112			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.010			OK





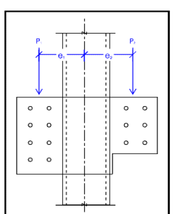
Differing Beam Depth

WF Column-Connection Checks

				Check
Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	67.5	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	65.8	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	101.25	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	109.7	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.037		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

HSS Column-Connection Checks

				Check
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector AB

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	3	0	1.4D	4.2	0	4.20	0.00
Live	0	0	1.2D+1.6L+0.5S	5.1	0	5.10	0.00
Snow	3	0	1.2D+1.6S+L	8.4	0	8.40	0.00
Earthquake	0	25	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	4.80	62.50	62.68	85.61
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	2.10	62.50	62.54	88.08

Member Parameters

Beam Shape	W12X16						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
4.71	12	0.22	3.99	0.265	50	65	0.81

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

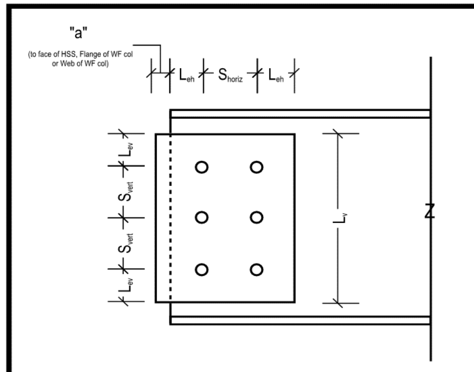
Attaching Column/Beam	WF	W16X26	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.25	0.345	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	4.20	0.00	0.23	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	19.31	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	5.10	0.00	0.28	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	8.40	0.00	0.47	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	19.31	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	62.68	85.61	3.50	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	62.54	88.08	3.49	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									



General Connection layout

Beam Checks

				Check
Shear Yielding of Beam web				Check
ΦR_n	79.2	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	212.0	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.48	in	Table D3.1	
U	0.838			
A_n	4.13	in^2		Check
ΦR_n	168.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.20	in^2		
A_{nv}	1.62	in^2		
A_{nt}	0.94	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	66	kips		
$0.6F_uA_{nv}$	63.28	kips		
$U_{bs}F_uA_{nt}$	60.78	kips		Check
ΦR_n	93.04	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	67.5	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	65.8	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	101.25	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	109.7	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.397		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.3		EQ10-5	OK

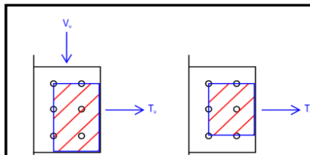
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

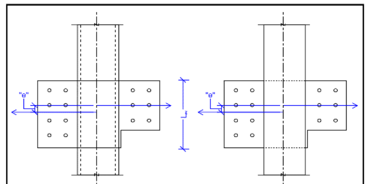
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	18	ft		
M_{tu}	3.02	k-in	EQ 10-8a	Check
ΦR_n	31.7	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	33.6	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.309			Check
Combined	0.150		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	33.6	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.402			Check
Combined	0.253		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.1208			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	33.6	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.150			OK



L-Shaped Block Shear (check combined)

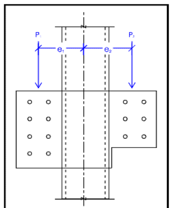
U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector AC

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	4	0	1.4D	5.6	0	5.60	0.00
Live	0	0	1.2D+1.6L+0.5S	6.3	0	6.30	0.00
Snow	3	0	1.2D+1.6S+L	9.6	0	9.60	0.00
Earthquake	0	25	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	6.20	62.50	62.81	84.33
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	2.80	62.50	62.56	87.44

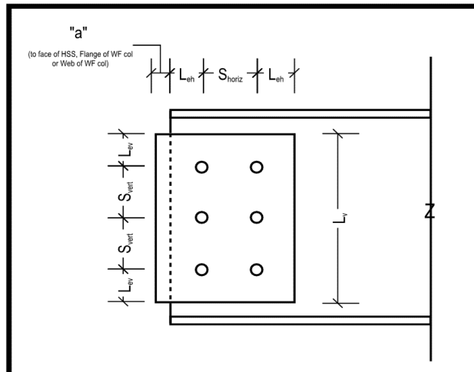
Member Parameters

Beam Shape	W16X26						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
7.68	15.7	0.25	5.5	0.345	50	65	1.06

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W18X35	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.3	0.425	50	65



General Connection layout

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.4D	5.60	0.00	0.31	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	6.30	0.00	0.35	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.2D+1.6S+L	9.60	0.00	0.54	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	62.81	84.33	3.51	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	62.56	87.44	3.49	6.67	OK	119.40	AISC Table 7-7, 75 degree angle

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	117.8	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	345.6	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.72	in	Table D3.1	
U	0.759			
A_n	6.81	in^2		Check
ΦR_n	251.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	1.59	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	103.59	kips		Check
ΦR_n	131.63	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$\Phi R_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	108	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	105.3	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	162	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	175.5	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.157		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.1		EQ10-5	OK

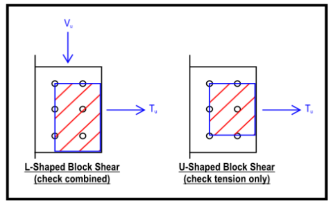
HSS Column-Connection Checks

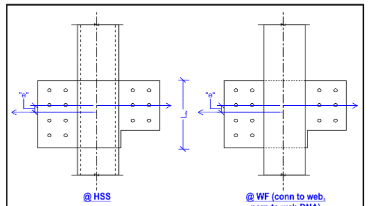
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

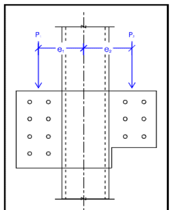
Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	34	ft		
M_{tu}	3.60	k-in	EQ 10-8a	Check
ΦR_n	42.6	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	38.4	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.231			Check
Combined	0.081		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	38.4	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.302			Check
Combined	0.137		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0745			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	2.0	in		
$M_{u\_additional}$	125	k-in		
M_{u_total}	163.4	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.191			OK





Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector AD

Load Parameters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	25	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	62.50	62.58	87.07
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	62.50	62.52	88.72

Member Parameters

Beam Shape	W12X19						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
5.57	12.2	0.235	4.01	0.35	50	65	0.88

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W16X31	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.275	0.44	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	$ΦR_n$	
Bolt Bearing Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	62.58	87.07	3.50	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	62.52	88.72	3.49	4.90	OK	87.71	AISC Table 7-7, 75 degree angle

Beam Checks

Shear Yielding of Beam web				Check
$ΦR_n$	86.0	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
$ΦR_n$	250.7	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.54	in	Table D3.1	
U	0.820			
A_n	4.95	in^2		Check
$ΦR_n$	198.0	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.35	in^2		
A_{nv}	1.73	in^2		
A_{nt}	1.00	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	70.5	kips		
$0.6F_uA_{nv}$	67.59	kips		
$U_{bs}F_uA_{nt}$	64.92	kips		Check
$ΦR_n$	99.38	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$ΦR_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$ΦR_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
$ΦR_n$	74.25	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
$ΦR_n$	72.4	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
$ΦR_n$	111.375	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
$ΦR_n$	120.7	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.321		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.3		EQ10-5	OK

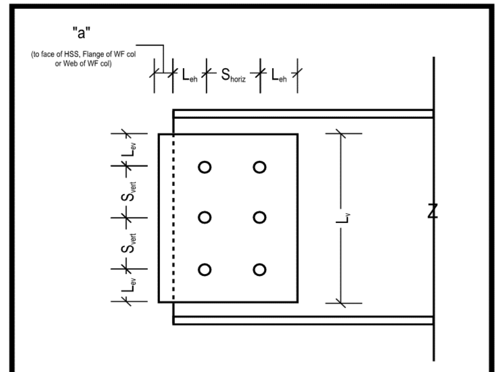
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
$ΦR_n$	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
$ΦR_n$	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
$ΦR_n$	DNA	kips	EQ J4-4	DNA

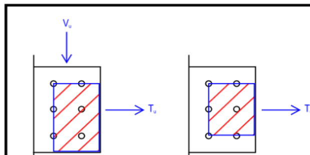
Plate Checks

Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
$ΦR_n$	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	24	ft		
M_{tu}	2.06	k-in	EQ 10-8a	Check
$ΦR_n$	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
$ΦM_n$	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
$ΦR_n$	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
$ΦR_n$	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/ΦR_{n\_AXIAL}$	0.309			Check
Combined	0.130		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
$ΦR_n$	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
$ΦM_n$	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
$ΦR_n$	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/ΦR_{n\_T\text{-}Rupt}$	0.402			Check
Combined	0.219		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
$ΦR_n$	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
$ΦR_n$	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
$ΦR_n$	0.1182			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
$ΦR_n$	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	22.4	k-in		Check
$ΦM_n$	455.6	k-in		OK
Combined	0.130			OK

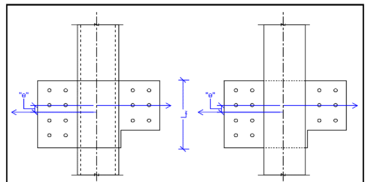


General Connection layout

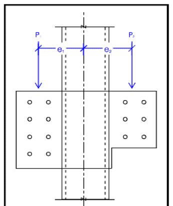


L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector AC

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	25	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	62.50	62.58	87.07
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	62.50	62.52	88.72

Member Parameters

Beam Shape	W16X26						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
7.68	15.7	0.25	5.5	0.345	50	65	1.06

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W16X31	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.275	0.44	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	62.58	87.07	3.50	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	62.52	88.72	3.49	6.67	OK	119.40	AISC Table 7-7, 75 degree angle

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	117.8	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	345.6	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.72	in	Table D3.1	
U	0.759			
A_n	6.81	in^2		Check
ΦR_n	251.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	1.59	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	103.59	kips		Check
ΦR_n	131.63	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$\Phi R_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	99	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	96.5	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	148.5	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	160.9	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.180		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.2		EQ10-5	OK

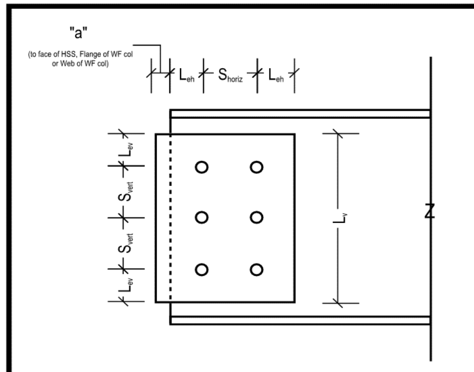
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

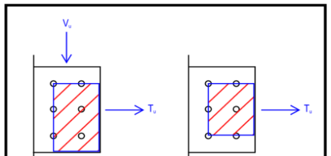
Plate Checks

Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	22.666	ft		
M_{tu}	2.10	k-in	EQ 10-8a	Check
ΦR_n	43.6	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.231			Check
Combined	0.068		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.302			Check
Combined	0.116		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0719			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	8.0	in		
$M_{u\_additional}$	500	k-in		
M_{u_total}	522.4	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.769			OK

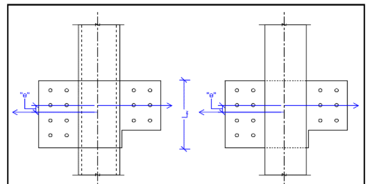


General Connection layout



L-Shaped Block Shear (check combined)

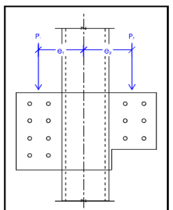
U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector W

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	50	0	1.4D	70	0	70.00	0.00
Live	0	0	1.2D+1.6L+0.5S	71.5	0	71.50	0.00
Snow	23	0	1.2D+1.6S+L	96.8	0	96.80	0.00
Earthquake	0	112.4	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	74.63	281.00	290.74	75.13
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	34.97	281.00	283.17	82.91

Member Parameters

Beam Shape	W30X116						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
34.2	30	0.565	10.5	0.85	50	65	1.75

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	8	1.5	3	24	0.75	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W10X60	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.42	0.68	50	65

Bolt Parameters

Bolt Diameter (in)	1
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.785
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	31.79	kips/bolt	EQJ3-1	1.4D	70.00	0.00	2.20	13.20	OK	419.66	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	64.04	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	71.50	0.00	2.25	13.20	OK	419.66	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	85.01	kips/bolt	EQJ3-6a	1.2D+1.6S+L	96.80	0.00	3.04	13.20	OK	419.66	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	48.55	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	290.74	75.13	9.14	14.10	OK	448.27	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	42.50	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	283.17	82.91	8.91	14.10	OK	448.27	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

				Check
Shear Yielding of Beam web				Check
ΦR_n	508.5	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	1539.0	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	1.45	in	Table D3.1	
U	0.516			
A_n	29.12	in^2		Check
ΦR_n	732.7	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	5.65	in^2		
A_{nv}	3.74	in^2		
A_{nt}	7.42	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	169.5	kips		
$0.6F_uA_{nv}$	145.98	kips		
$U_{bs}F_uA_{nt}$	482.02	kips		Check
ΦR_n	471.00	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Flange			
a	0.17			
e_x	4.00	in		
l	24	in		
Weld D	8	/16	*note recommended* ->	8/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	3.51		Table 8-4	
$C_{gravity+seismic}$	4.85		Table 8-4	Check
$\Phi R_{n\_gravity}$	505.4	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	698.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	489.6	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	477.4	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	734.4	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	795.6	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.185		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.2		EQ10-5	OK

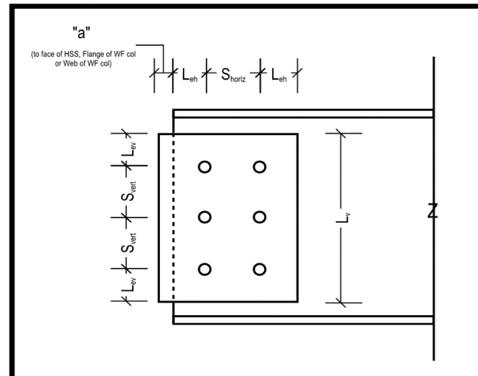
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

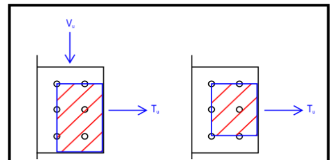
Plate Checks

Max Plate Thickness				
C'	93.1	in	Table 7-7	
M_{max}	4385.0	k-in	EQ 10-4	Check
t_{max}	0.914	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	7634.1	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	60	ft		
M_{tu}	63.65	k-in	EQ 10-8a	Check
ΦR_n	166.2	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.140		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	387.2	k-in		Check
ΦM_n	4860.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	13.86			
F_e	1490.72	ksi	EQ E3-4	Check
ΦR_n	810.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	540	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.347			Check
Combined	0.214		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	11.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	548.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	67.90	in^3	Sect 9	
M_u	387.2	k-in		Check
ΦM_n	3309.91	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	11.25			Check
ΦR_n	329.06	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.512			Check
Combined	0.483		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	16.88	in^2		
A_{nv}	10.55	in^2		
A_{nt}	2.48	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	506.25	kips		
$0.6F_uA_{nv}$	411.33	kips		
$U_{bs}F_uA_{nt}$	80.74	kips		Check
ΦR_n	369.05	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.48	in^2		
A_{nt}	10.55	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	96.89	kips		
$U_{bs}F_uA_{nt}$	685.55	kips		Check
ΦR_n	586.83	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.2981			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	7.50	in^2		
A_{nv}	4.97	in^2		
A_{nt}	9.84	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	225.00	kips		
$0.6F_uA_{nv}$	193.78	kips		
$U_{bs}F_uA_{nt}$	639.84	kips		Check
ΦR_n	625.22	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	8.0	in		
$M_{u\_additional}$	2248	k-in		
M_{u_total}	2635.2	k-in		Check
ΦM_n	4860.0	k-in		OK
Combined	0.823			OK

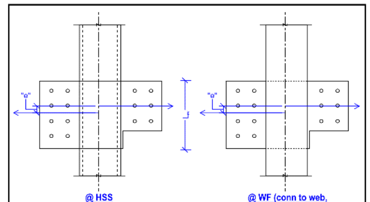


General Connection layout

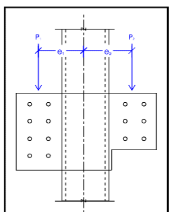


L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector A

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	22	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	55.00	55.09	86.67
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	55.00	55.02	88.54

Member Parameters

Beam Shape	W16X26						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
7.68	15.7	0.25	5.5	0.345	50	65	1.06

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
5.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W10X49	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.34	0.56	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	2.06	OK	36.88	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	2.06	OK	36.88	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	2.06	OK	36.88	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	55.09	86.67	3.08	4.86	OK	87.00	AISC Table 7-7, 75 degree angle
Connection e_x	9	in		(0.9-0.2SDS)D+(ρ/Ω)E	55.02	88.54	3.07	4.86	OK	87.00	AISC Table 7-7, 75 degree angle

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	117.8	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	345.6	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.72	in	Table D3.1	
U	0.759			
A_n	6.81	in^2		Check
ΦR_n	251.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	1.59	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	103.59	kips		Check
ΦR_n	131.63	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.75			
e_x	9.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	1.57		Table 8-4	
$C_{gravity+seismic}$	2.52		Table 8-4	Check
$\Phi R_{n\_gravity}$	70.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	113.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	122.4	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	119.3	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	183.6	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	198.9	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.092		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.1		EQ10-5	OK

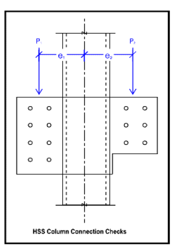
HSS Column-Connection Checks

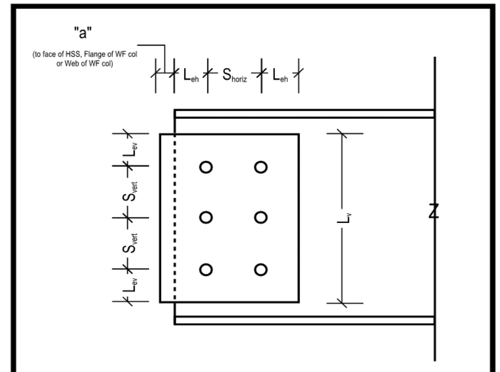
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

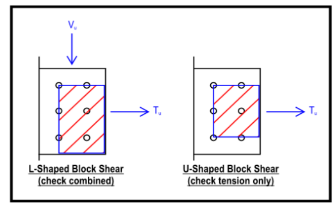
Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	125.7	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	11	ft		
M_{tu}	2.10	k-in	EQ 10-8a	Check
ΦR_n	43.6	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.492		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	50.4	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	62.35			
F_e	73.62	ksi	EQ E3-4	Check
ΦR_n	203.2	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.271			Check
Combined	0.112		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	50.4	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.265			Check
Combined	0.121		EQ 10-5 & H1-1	OK

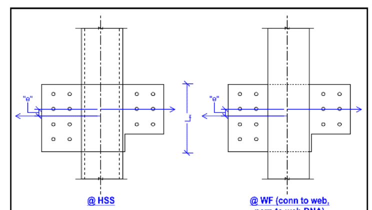
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0560			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	50.4	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.112			OK





General Connection layout





Differing Beam Depth

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector B

Load Parameters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	9	0	1.4D	12.6	0	12.60	0.00
Live	0	0	1.2D+1.6L+0.5S	14.8	0	14.80	0.00
Snow	8	0	1.2D+1.6S+L	23.6	0	23.60	0.00
Earthquake	0	18	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	14.21	45.00	47.19	72.48
			$(0.9\text{-}0.2S_{DS})D+(\rho/\Omega)E$	6.29	45.00	45.44	82.04

Member Parameters

Beam Shape	W18X40						
A (in²)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
11.8	17.9	0.315	6.02	0.525	50	65	1.19

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	5	1.5	3	15	0.5	50	65
						OK plate will fit			

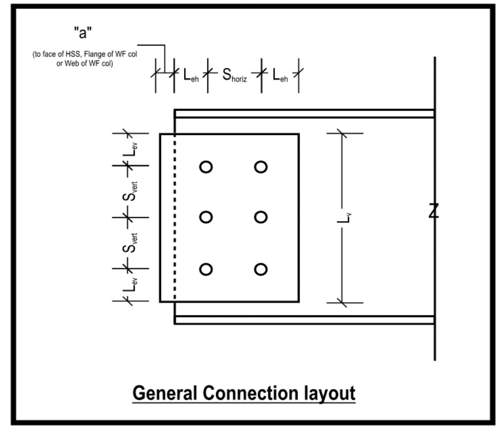
Attaching Column/Beam	WF	W10X68	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.47	0.77	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in²)	0.442
Beam Underrun (in)	0

Bolt Checks

Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	$ΦR_n$	
Bolt Bearing Beam Web ΦRn	27.64	kips/bolt	EQJ3-6a	1.4D	12.60	0.00	0.70	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	14.80	0.00	0.83	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	27.64	kips/bolt	EQJ3-6a	1.2D+1.6S+L	23.60	0.00	1.32	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	47.19	72.48	2.64	8.50	OK	152.16	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	45.44	82.04	2.54	8.50	OK	152.16	AISC Table 7-7, 75 degree angle



General Connection layout

Beam Checks

Shear Yielding of Beam web				Check
$ΦR_n$	169.2	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
$ΦR_n$	531.0	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.85	in	Table D3.1	
U	0.715			
A_e	10.42	in²		Check
$ΦR_n$	363.4	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	3.15	in²		
A_{nv}	2.32	in²		
A_{nt}	2.68	in²		
U_{bs}	1.0			
$0.6F_yA_{gv}$	94.5	kips		
$0.6F_uA_{nv}$	90.60	kips		
$U_{bs}F_uA_{nt}$	174.04	kips		Check
$ΦR_n$	198.48	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Flange			
a	0.27			
e_x	4.00	in		
l	15	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	3.09		Table 8-4	
$C_{gravity+seismic}$	4.57		Table 8-4	Check
$ΦR_{n\_gravity}$	173.8	kips	Equation inTable 8-4	OK
$ΦR_{n\_gravity+seismic}$	257.1	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
$ΦR_n$	346.5	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
$ΦR_n$	337.8	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
$ΦR_n$	519.75	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
$ΦR_n$	563.1	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.012		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

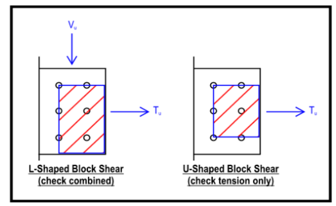
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
$ΦR_n$	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
$ΦR_n$	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
$ΦR_n$	DNA	kips	EQ J4-4	DNA

Plate Checks

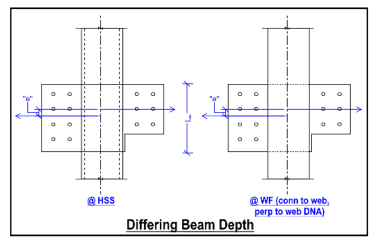
Max Plate Thickness				
C'	38.7	in	Table 7-7	
M_{max}	1026.3	k-in	EQ 10-4	Check
t_{max}	0.547	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
$ΦR_n$	1413.7	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	28.333	ft		
M_{tu}	9.62	k-in	EQ 10-8a	Check
$ΦR_n$	50.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.206		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	94.4	k-in		Check
$ΦM_n$	1265.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
$ΦR_n$	337.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
$ΦR_n$	225	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/ΦR_{n\_AXIAL}$	0.133			Check
Combined	0.031		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	5.313		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
$ΦR_n$	259.0	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	20.15	in³	Sect 9	
M_u	94.4	k-in		Check
$ΦM_n$	982.52	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	5.31			Check
$ΦR_n$	155.39	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/ΦR_{n\_T\text{-}Rupt}$	0.174			Check
Combined	0.057		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	6.75	in²		
A_{nv}	4.78	in²		
A_{nt}	1.84	in²		
U_{bs}	0.5			
$0.6F_yA_{gv}$	202.50	kips		
$0.6F_uA_{nv}$	186.47	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
$ΦR_n$	184.79	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in²		
A_{nv}	1.84	in²		
A_{nt}	4.78	in²		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	310.78	kips		Check
$ΦR_n$	287.02	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
$ΦR_n$	0.0409			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in²		
A_{nv}	3.69	in²		
A_{nt}	4.25	in²		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	276.25	kips		Check
$ΦR_n$	315.05	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	94.4	k-in		Check
$ΦM_n$	1265.6	k-in		OK
Combined	0.031			OK



L-Shaped Block Shear (check combined)

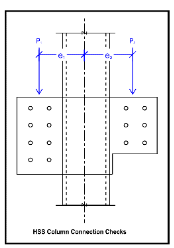
U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector C

Load Parameters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	4	0	1.4D	5.6	0	5.60	0.00
Live	0	0	1.2D+1.6L+0.5S	6.8	0	6.80	0.00
Snow	4	0	1.2D+1.6S+L	11.2	0	11.20	0.00
Earthquake	0	18	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	6.40	45.00	45.45	81.90
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	2.80	45.00	45.09	86.44

Member Parameters

Beam Shape	W16X31						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
9.13	15.9	0.275	5.53	0.44	50	65	1.13

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W12X65	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.39	0.605	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	5.60	0.00	0.31	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	24.13	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	6.80	0.00	0.38	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	11.20	0.00	0.63	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	24.13	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(p/Ω)E+L+0.2S	45.45	81.90	2.54	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(p/Ω)E	45.09	86.44	2.52	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

				Check
Shear Yielding of Beam web				Check
ΦR_n	131.2	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	410.9	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.78	in	Table D3.1	
U	0.740			
A_e	8.17	in^2		Check
ΦR_n	294.7	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.75	in^2		
A_{nv}	2.03	in^2		
A_{nt}	1.75	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	82.5	kips		
$0.6F_uA_{nv}$	79.10	kips		
$U_{bs}F_uA_{nt}$	113.95	kips		Check
ΦR_n	144.79	kips	EQ J4-5	OK

WF Column-Connection Checks

				Check
Weld to column-WF				
Conn to web or flange	Flange			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$\Phi R_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	217.8	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	212.4	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	326.7	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	353.9	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.022		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

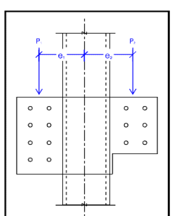
HSS Column-Connection Checks

				Check
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

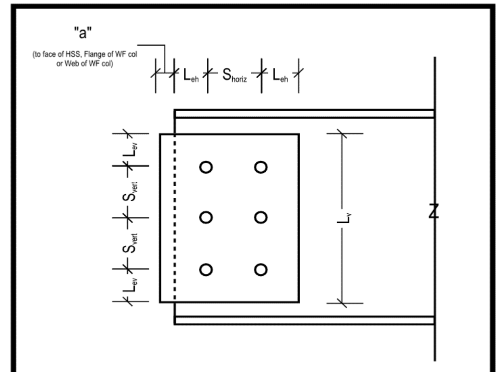
Plate Checks

				Check
Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	29.666	ft		
M_{ta}	4.34	k-in	EQ 10-8a	Check
ΦR_n	42.2	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	44.8	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				Check
$N_u/\Phi R_{n\_AXIAL}$	0.167			
Combined	0.023		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	44.8	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				Check
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.217			
Combined	0.091		EQ 10-5 & H1-1	OK

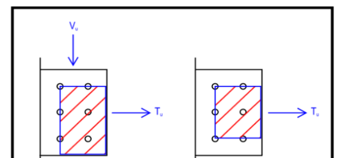
				Check
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0419			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differing Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	45	k-in		
M_{u_total}	89.8	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.042			OK



HSS Column Connection Checks

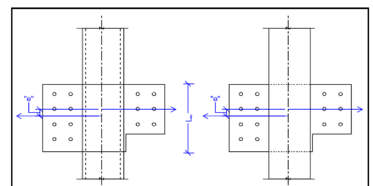


General Connection layout



L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector D

Load Paremeters

Sds	1.003						
Rho/Omega	2.5						
Live Load EQ LC Factor	1						
	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	38	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	95.00	95.05	88.07
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	95.00	95.01	89.16

Member Parameters

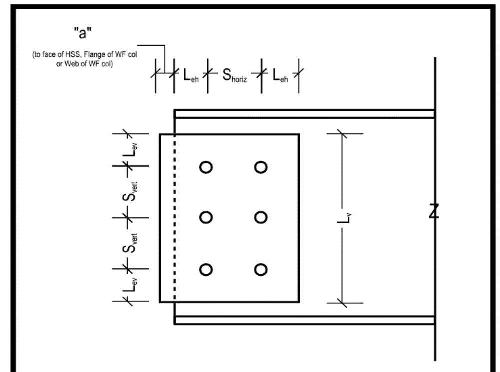
Beam Shape	W16X26								
A (in²)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)		
7.68	15.7	0.25	5.5	0.345	50	65	1.06		
Plate Shape	*Note this spread sheet is only set up for (2) vertical columns of bolts*								
"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			
Attaching Column/Beam	WF	W10X68							
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)						
0.47	0.77	50	65						

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in²)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	95.05	88.07	5.31	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	95.01	89.16	5.31	6.67	OK	119.40	AISC Table 7-7, 75 degree angle



General Connection layout

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	117.8	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	345.6	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.72	in	Table D3.1	
U	0.759			
A_n	6.81	in²		Check
ΦR_n	251.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.50	in²		
A_{nv}	1.84	in²		
A_{nt}	1.59	in²		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	103.59	kips		Check
ΦR_n	131.63	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Flange			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$\Phi R_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	277.2	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	270.3	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	415.8	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	450.5	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.053		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

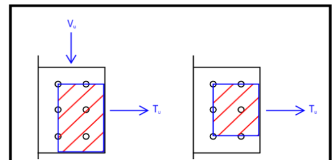
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

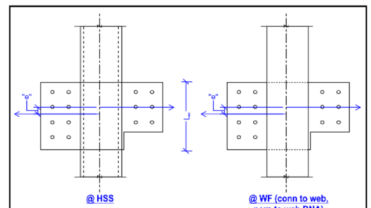
Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	9	ft		
M_{tu}	2.10	k-in	EQ 10-8a	Check
ΦR_n	43.6	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.352			Check
Combined	0.145		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in³	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.459			Check
Combined	0.246		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in²		
A_{nv}	3.72	in²		
A_{nt}	1.84	in²		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in²		
A_{nv}	1.84	in²		
A_{nt}	3.72	in²		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.1644			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in²		
A_{nv}	3.69	in²		
A_{nt}	3.19	in²		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No		*note check on deeper beam only*	
Is a check required?	Yes			
"e"	3.0	in		
$M_{u\_additional}$	285	k-in		
M_{u_total}	307.4	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.536			OK

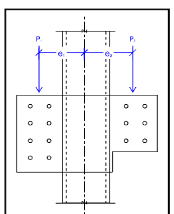


L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector E

Load Parameters

Sds	1.003						
Rho/Omega	2.5						
Live Load EQ LC Factor	1						
	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	16	0	1.4D	22.4	0	22.40	0.00
Live	0	0	1.2D+1.6L+0.5S	21.7	0	21.70	0.00
Snow	5	0	1.2D+1.6S+L	27.2	0	27.20	0.00
Earthquake	0	38	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	23.41	95.00	97.84	76.16
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	11.19	95.00	95.66	83.28

Member Parameters

Beam Shape	W16X31								
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)		
9.13	15.9	0.275	5.53	0.44	50	65	1.13		
Plate Shape	*Note this spread sheet is only set up for (2) vertical columns of bolts*								
"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			
Attaching Column/Beam	WF	W24X68							
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)						
0.415	0.585	50	65						

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	22.40	0.00	1.25	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	24.13	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	21.70	0.00	1.21	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	27.20	0.00	1.52	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	24.13	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	97.84	76.16	5.47	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	95.66	83.28	5.34	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	131.2	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	410.9	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.78	in	Table D3.1	
U	0.740			
A_n	8.17	in^2		Check
ΦR_n	294.7	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.75	in^2		
A_{nv}	2.03	in^2		
A_{nt}	1.75	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	82.5	kips		
$0.6F_uA_{nv}$	79.10	kips		
$U_{bs}F_uA_{nt}$	113.95	kips		Check
ΦR_n	144.79	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$\Phi R_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	149.4	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	145.7	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	224.1	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	242.8	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.213		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.2		EQ10-5	OK

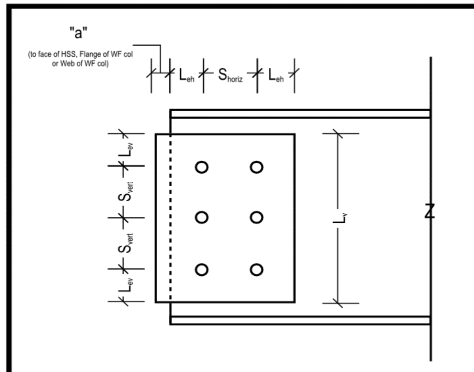
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

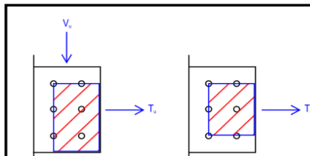
Plate Checks

Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	28.333	ft		
M_{tu}	10.54	k-in	EQ 10-8a	Check
ΦR_n	38.2	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	108.8	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.352			Check
Combined	0.259		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	108.8	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.459			Check
Combined	0.445		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.1944			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	95	k-in		
M_{u_total}	203.8	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.387			OK

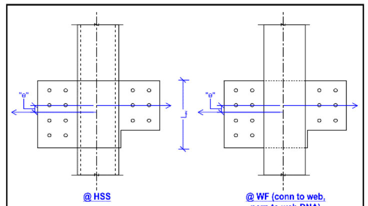


General Connection layout

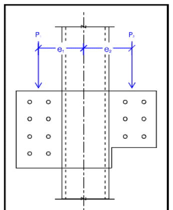


L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector F

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	14	0	1.4D	19.6	0	19.60	0.00
Live	0	0	1.2D+1.6L+0.5S	19.8	0	19.80	0.00
Snow	6	0	1.2D+1.6S+L	26.4	0	26.40	0.00
Earthquake	0	38	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	20.81	95.00	97.25	77.65
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	9.79	95.00	95.50	84.12

Member Parameters

Beam Shape	W18X35						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
10.3	17.7	0.3	6	0.425	50	65	1.13

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	5	1.5	3	15	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W24X68	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.415	0.585	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	19.60	0.00	1.09	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	26.33	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	19.80	0.00	1.11	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	26.40	0.00	1.47	6.84	OK	122.44	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	26.33	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	97.25	77.65	5.43	8.50	OK	152.16	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	95.50	84.12	5.34	8.50	OK	152.16	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	159.3	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	463.5	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.79	in	Table D3.1	
U	0.736			
A_n	8.99	in^2		Check
ΦR_n	322.7	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	3.00	in^2		
A_{nv}	2.21	in^2		
A_{nt}	2.55	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	90	kips		
$0.6F_uA_{nv}$	86.29	kips		
$U_{bs}F_uA_{nt}$	165.75	kips		Check
ΦR_n	189.03	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.27			
e_x	4.00	in		
l	15	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	3.09		Table 8-4	
$C_{gravity+seismic}$	4.57		Table 8-4	Check
$\Phi R_{n\_gravity}$	173.8	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	257.1	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	186.75	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	182.1	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	280.125	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	303.5	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.135		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.1		EQ10-5	OK

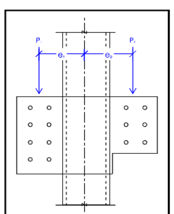
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

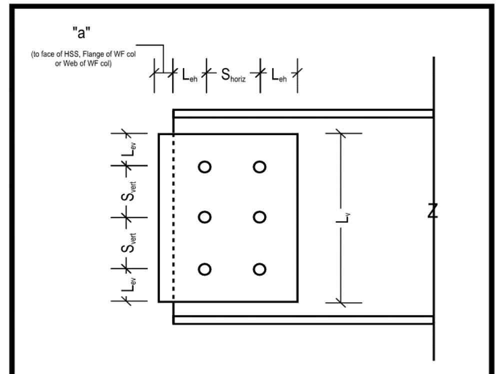
Plate Checks

Max Plate Thickness				
C'	38.7	in	Table 7-7	
M_{max}	1026.3	k-in	EQ 10-4	Check
t_{max}	0.547	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1413.7	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	30	ft		
M_{tu}	10.56	k-in	EQ 10-8a	Check
ΦR_n	49.7	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.206		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	105.6	k-in		Check
ΦM_n	1265.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	337.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	225	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.281			Check
Combined	0.147		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	5.313		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	259.0	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	20.15	in^3	Sect 9	
M_u	105.6	k-in		Check
ΦM_n	982.52	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	5.31			Check
ΦR_n	155.39	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.367			Check
Combined	0.254		EQ 10-5 & H1-1	OK

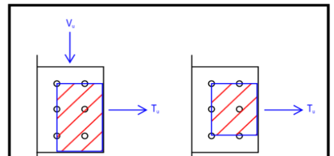
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	6.75	in^2		
A_{nv}	4.78	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	202.50	kips		
$0.6F_uA_{nv}$	186.47	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	184.79	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	4.78	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	310.78	kips		Check
ΦR_n	287.02	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.1300			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	4.25	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	276.25	kips		Check
ΦR_n	315.05	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	95	k-in		
M_{u_total}	200.6	k-in		Check
ΦM_n	1265.6	k-in		OK
Combined	0.207			OK



HSS Column Connection Checks

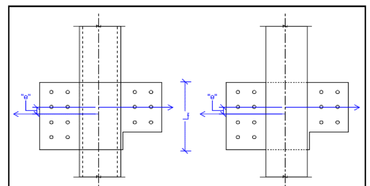


General Connection layout



L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector K

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	18	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	45.00	45.11	85.93
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	45.00	45.02	88.22

Member Parameters

Beam Shape	W12X14						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
4.16	11.9	0.2	3.97	0.225	50	65	0.75

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W14X22	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.23	0.335	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	17.55	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	17.55	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.32	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	45.11	85.93	2.57	4.90	OK	86.00	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	45.02	88.22	2.57	4.90	OK	86.00	AISC Table 7-7, 75 degree angle

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	71.4	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	187.2	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.46	in	Table D3.1	
U	0.846			
A_n	3.64	in^2		Check
ΦR_n	149.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.00	in^2		
A_{nv}	1.48	in^2		
A_{nt}	0.85	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	60	kips		
$0.6F_uA_{nv}$	57.53	kips		
$U_{bs}F_uA_{nt}$	55.25	kips		Check
ΦR_n	84.58	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	62.1	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	60.5	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	93.15	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	100.9	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.242		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.2		EQ10-5	OK

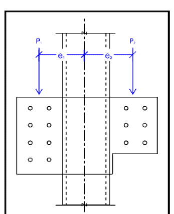
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

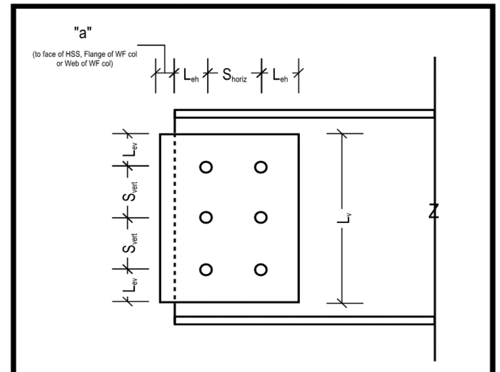
Plate Checks

Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	7	ft		
M_{tu}	1.96	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.222			Check
Combined	0.075		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.290			Check
Combined	0.127		EQ 10-5 & H1-1	OK

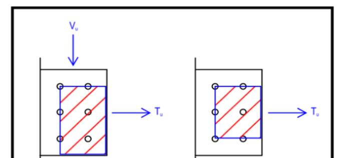
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0623			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	3.0	in		
$M_{u\_additional}$	135	k-in		
M_{u_total}	157.4	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.324			OK



HSS Column Connection Checks

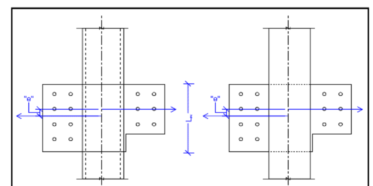


General Connection layout



L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

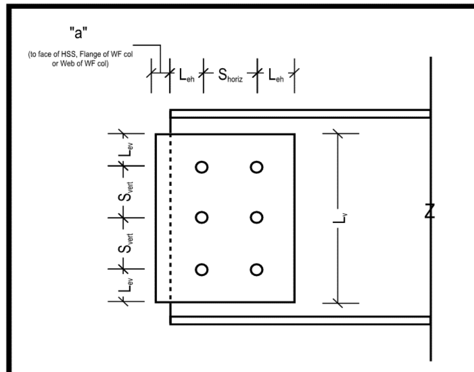
RF Collector X

Load Parameters

Sds	1.003							
Rho/Omega	2.5							
Live Load EQ LC Factor	1							
	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	7	(1.2+0.2S_{DS})D+(ρ/Ω)E+L+0.2S	3.20	17.50	17.79	79.63
			(0.9-0.2S_{DS})D+(ρ/Ω)E	1.40	17.50	17.56	85.43

Member Parameters

Beam Shape	W12X19									
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)			
5.57	12.2	0.235	4.01	0.35	50	65	0.88			
Plate Shape	*Note this spread sheet is only set up for (2) vertical columns of bolts*									
"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)	
0.5	2	3	3	1.5	3	9	0.5	50	65	
						OK plate will fit				
Attaching Column/Beam	Rect_HSS	HSS5X5X5/16								
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)							
0.291	0.291	46	58							



General Connection layout

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	$ΦR_n$	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	17.79	79.63	0.99	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	17.56	85.43	0.98	4.90	OK	87.71	AISC Table 7-7, 75 degree angle

Beam Checks

Shear Yielding of Beam web				Check
$ΦR_n$	86.0	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
$ΦR_n$	250.7	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.54	in	Table D3.1	
U	0.820			
A_e	4.95	in^2		Check
$ΦR_n$	198.0	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.35	in^2		
A_{nv}	1.73	in^2		
A_{nt}	1.00	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	70.5	kips		
$0.6F_uA_{nv}$	67.59	kips		
$U_{bs}F_uA_{nt}$	64.92	kips		Check
$ΦR_n$	99.38	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	DNA			
e_x	DNA	in		
l	DNA	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$ΦR_{n\_gravity}$	DNA	kips	Equation inTable 8-4	DNA
$ΦR_{n\_gravity+seismic}$	DNA	kips	Equation inTable 8-4	DNA
Column Base Material - Shear Yielding				Check
$ΦR_n$	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
$ΦR_n$	DNA	kips	EQ J4-4	DNA
Column Base Material - Tensile Yielding				Check
$ΦR_n$	DNA	kips	EQ J4-1	DNA
Column Base Material - Tensile Rupture				Check
$ΦR_n$	DNA	kips	EQ J4-2	DNA
Column Base Material - Yielding Combined				Check
Combined	DNA		EQ 10-5	DNA
Column Base Material - Rupture Combined				Check
Combined	DNA		EQ10-5	DNA

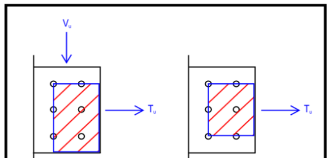
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	8.5	kips		
V_{u_moment}	11.3	kips		
V_{u_total}	28.3	kips		
Weld D	5	/16		Check
$ΦR_n$	62.6	kips	EQ 8-2a	OK
Column Base Material - Shear Yielding				Check
$ΦR_n$	157.1	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
$ΦR_n$	153.2	kips	EQ J4-4	OK

Plate Checks

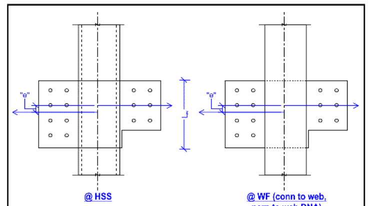
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
$ΦR_n$	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	14	ft		
M_{ta}	2.06	k-in	EQ 10-8a	Check
$ΦR_n$	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
$ΦM_n$	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
$ΦR_n$	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
$ΦR_n$	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/ΦR_{n\_AXIAL}$	0.086			Check
Combined	0.010		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
$ΦR_n$	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
$ΦM_n$	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
$ΦR_n$	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/ΦR_{n\_T\text{-}Rupt}$	0.113			Check
Combined	0.018		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
$ΦR_n$	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
$ΦR_n$	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
$ΦR_n$	0.0112			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
$ΦR_n$	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	17.5	k-in		
M_{u_total}	39.9	k-in		Check
$ΦM_n$	455.6	k-in		OK
Combined	0.019			OK

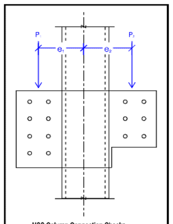


L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth



Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector Y

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	7	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	17.50	17.79	79.63
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	17.50	17.56	85.43

Member Parameters

Beam Shape	W14X22						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
6.49	13.7	0.23	5	0.335	50	65	1.06

Plate Shape *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W10X77	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.53	0.87	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	2.80	0.00	0.16	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	20.18	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	20.18	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	17.79	79.63	0.99	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	17.56	85.43	0.98	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	94.5	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	292.1	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.69	in	Table D3.1	
U	0.771			
A_n	5.89	in^2		Check
ΦR_n	221.2	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.30	in^2		
A_{nv}	1.70	in^2		
A_{nt}	0.98	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	69	kips		
$0.6F_uA_{nv}$	66.15	kips		
$U_{bs}F_uA_{nt}$	63.54	kips		Check
ΦR_n	97.27	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	143.1	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	139.5	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	214.65	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	232.5	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.008		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

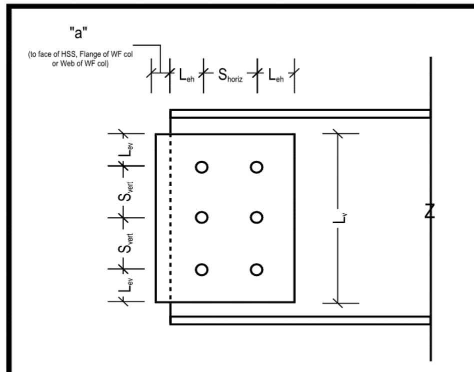
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

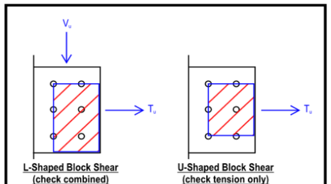
Plate Checks

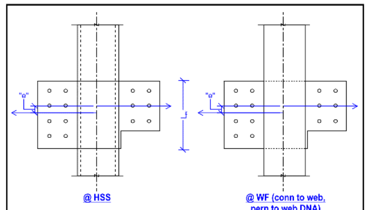
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	16	ft		
M_{tu}	2.04	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.086			Check
Combined	0.010		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.113			Check
Combined	0.018		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0112			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	1.0	in		
$M_{u\_additional}$	17.5	k-in		
M_{u_total}	39.9	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.019			OK

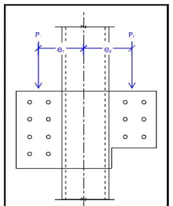


General Connection layout





Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector Z

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	7	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	17.50	17.79	79.63
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	17.50	17.56	85.43

Member Parameters

Beam Shape	W12X14						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
4.16	11.9	0.2	3.97	0.225	50	65	0.75

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W16X26	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.25	0.345	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	17.55	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	17.55	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.32	3.06	OK	53.70	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	17.79	79.63	1.01	4.90	OK	86.00	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(ρ/Ω)E	17.56	85.43	1.00	4.90	OK	86.00	AISC Table 7-7, 75 degree angle

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	71.4	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	187.2	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.46	in	Table D3.1	
U	0.846			
A_n	3.64	in^2		Check
ΦR_n	149.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.00	in^2		
A_{nv}	1.48	in^2		
A_{nt}	0.85	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	60	kips		
$0.6F_uA_{nv}$	57.53	kips		
$U_{bs}F_uA_{nt}$	55.25	kips		Check
ΦR_n	84.58	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	67.5	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	65.8	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	101.25	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	109.7	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.037		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

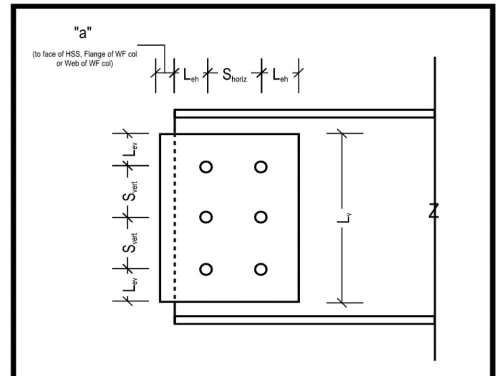
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

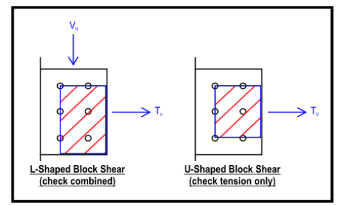
Plate Checks

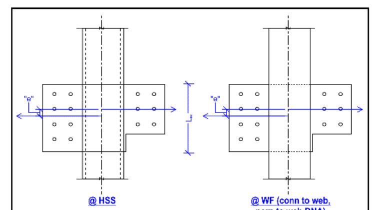
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	17.5	ft		
M_{tu}	1.96	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.086			Check
Combined	0.010		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.113			Check
Combined	0.018		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0112			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.010			OK

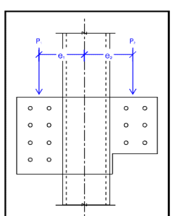


General Connection layout





Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector AA

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	7	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	17.50	17.79	79.63
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	17.50	17.56	85.43

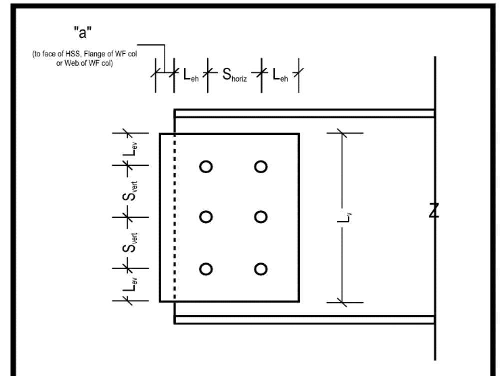
Member Parameters

Beam Shape	W12X19						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
5.57	12.2	0.235	4.01	0.35	50	65	0.88

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W16X26	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.25	0.345	50	65



General Connection layout

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1								
Bolt Bearing Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.4D	2.80	0.00	0.16	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(p/Ω)E+L+0.2S	17.79	79.63	0.99	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in		(0.9-0.2SDS)D+(p/Ω)E	17.56	85.43	0.98	4.90	OK	87.71	AISC Table 7-7, 75 degree angle

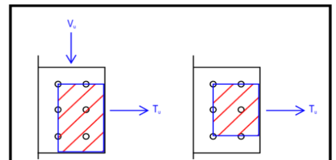
Beam Checks

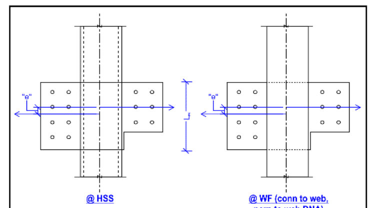
				Check
Shear Yielding of Beam web				Check
ΦR_n	86.0	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	250.7	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.54	in	Table D3.1	
U	0.820			
A_e	4.95	in^2		Check
ΦR_n	198.0	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.35	in^2		
A_{nv}	1.73	in^2		
A_{nt}	1.00	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	70.5	kips		
$0.6F_uA_{nv}$	67.59	kips		
$U_{bs}F_uA_{nt}$	64.92	kips		Check
ΦR_n	99.38	kips	EQ J4-5	OK

Plate Checks

				Check
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	14	ft		
M_{ta}	2.06	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.086			Check
Combined	0.010		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.113			Check
Combined	0.018		EQ 10-5 & H1-1	OK

				Check
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0112			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.010			OK





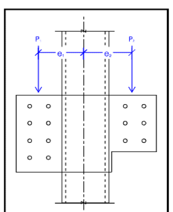
Differing Beam Depth

WF Column-Connection Checks

				Check
Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	67.5	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	65.8	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	101.25	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	109.7	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.037		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.0		EQ10-5	OK

HSS Column-Connection Checks

				Check
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector AB

Load Parameters

Sds	1.003							
Rho/Omega	2.5							
Live Load EQ LC Factor	1							
	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	3	0	1.4D	4.2	0	4.20	0.00
Live	0	0	1.2D+1.6L+0.5S	5.1	0	5.10	0.00
Snow	3	0	1.2D+1.6S+L	8.4	0	8.40	0.00
Earthquake	0	25	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	4.80	62.50	62.68	85.61
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	2.10	62.50	62.54	88.08

Member Parameters

Beam Shape	W12X16								
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)		
4.71	12	0.22	3.99	0.265	50	65	0.81		
Plate Shape	*Note this spread sheet is only set up for (2) vertical columns of bolts*								
"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			
Attaching Column/Beam	WF	W16X26							
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)						
0.25	0.345	50	65						

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	4.20	0.00	0.23	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	19.31	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	5.10	0.00	0.28	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	8.40	0.00	0.47	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	19.31	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	62.68	85.61	3.50	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	62.54	88.08	3.49	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	79.2	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	212.0	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.48	in	Table D3.1	
U	0.838			
A_n	4.13	in^2		Check
ΦR_n	168.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.20	in^2		
A_{nv}	1.62	in^2		
A_{nt}	0.94	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	66	kips		
$0.6F_uA_{nv}$	63.28	kips		
$U_{bs}F_uA_{nt}$	60.78	kips		Check
ΦR_n	93.04	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	67.5	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	65.8	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	101.25	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	109.7	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.397		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.3		EQ10-5	OK

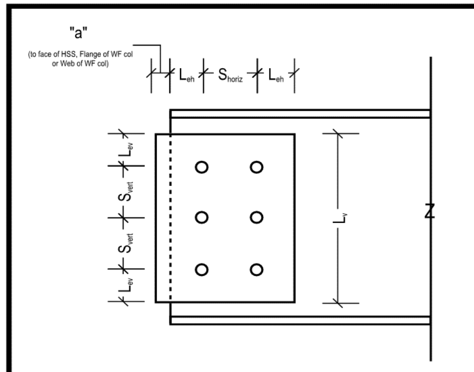
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

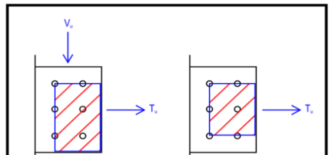
Plate Checks

Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	18	ft		
M_{tu}	3.02	k-in	EQ 10-8a	Check
ΦR_n	31.7	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	33.6	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.309			Check
Combined	0.150		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	33.6	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.402			Check
Combined	0.253		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.1208			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	33.6	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.150			OK

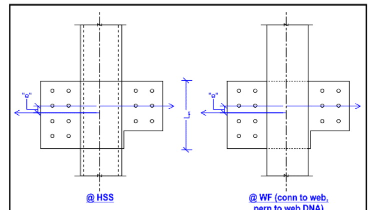


General Connection layout

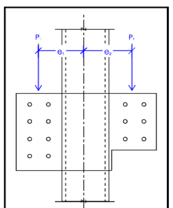


L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector AC

Load Paremeters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	4	0	1.4D	5.6	0	5.60	0.00
Live	0	0	1.2D+1.6L+0.5S	6.3	0	6.30	0.00
Snow	3	0	1.2D+1.6S+L	9.6	0	9.60	0.00
Earthquake	0	25	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	6.20	62.50	62.81	84.33
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	2.80	62.50	62.56	87.44

Member Parameters

Beam Shape	W16X26						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
7.68	15.7	0.25	5.5	0.345	50	65	1.06

Plate Shape *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W18X35	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.3	0.425	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	5.60	0.00	0.31	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	6.30	0.00	0.35	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	9.60	0.00	0.54	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	62.81	84.33	3.51	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	62.56	87.44	3.49	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	117.8	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	345.6	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.72	in	Table D3.1	
U	0.759			
A_n	6.81	in^2		Check
ΦR_n	251.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	1.59	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	103.59	kips		Check
ΦR_n	131.63	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$\Phi R_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	108	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	105.3	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	162	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	175.5	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.157		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.1		EQ10-5	OK

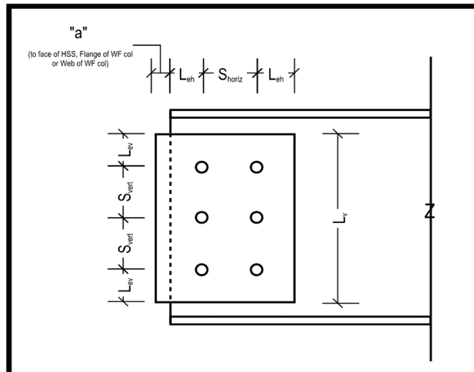
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

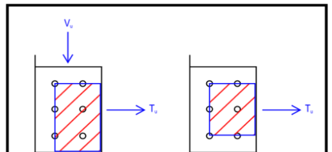
Plate Checks

Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	34	ft		
M_{tu}	3.60	k-in	EQ 10-8a	Check
ΦR_n	42.6	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	38.4	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.231			Check
Combined	0.081		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	38.4	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.302			Check
Combined	0.137		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0745			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	2.0	in		
$M_{u\_additional}$	125	k-in		
M_{u_total}	163.4	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.191			OK

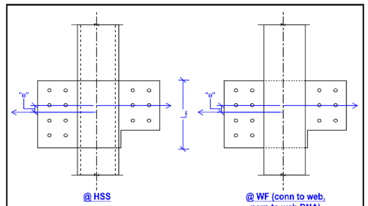


General Connection layout

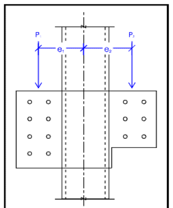


L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

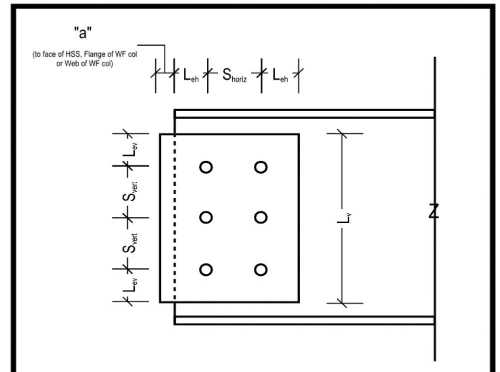
RF Collector AD

Load Paremeters

Sds	1.003						
Rho/Omega	2.5						
Live Load EQ LC Factor	1						
	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	25	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	62.50	62.58	87.07
			$(0.9\text{-}0.2S_{DS})D+(\rho/\Omega)E$	1.40	62.50	62.52	88.72

Member Parameters

Beam Shape	W12X19								
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)		
5.57	12.2	0.235	4.01	0.35	50	65	0.88		
Plate Shape	*Note this spread sheet is only set up for (2) vertical columns of bolts*								
"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	3	1.5	3	9	0.5	50	65
						OK plate will fit			
Attaching Column/Beam	WF	W16X31							
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)						
0.275	0.44	50	65						



General Connection layout

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	2.80	0.00	0.16	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	3.06	OK	54.78	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	20.62	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	62.58	87.07	3.50	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	62.52	88.72	3.49	4.90	OK	87.71	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	86.0	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	250.7	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.54	in	Table D3.1	
U	0.820			
A_n	4.95	in^2		Check
ΦR_n	198.0	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.35	in^2		
A_{nv}	1.73	in^2		
A_{nt}	1.00	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	70.5	kips		
$0.6F_uA_{nv}$	67.59	kips		
$U_{bs}F_uA_{nt}$	64.92	kips		Check
ΦR_n	99.38	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.44			
e_x	4.00	in		
l	9	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.30		Table 8-4	
$C_{gravity+seismic}$	4.09		Table 8-4	Check
$\Phi R_{n\_gravity}$	77.6	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	138.0	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	74.25	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	72.4	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	111.375	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	120.7	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.321		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.3		EQ10-5	OK

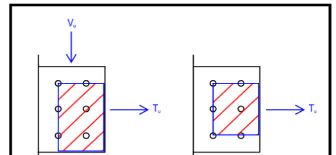
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

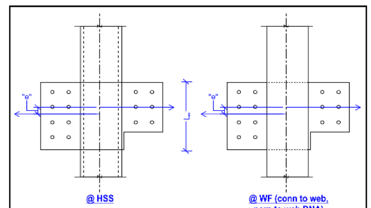
Max Plate Thickness				
C'	15.8	in	Table 7-7	
M_{max}	419.0	k-in	EQ 10-4	Check
t_{max}	0.621	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	848.2	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	24	ft		
M_{tu}	2.06	k-in	EQ 10-8a	Check
ΦR_n	32.4	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.199		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	202.5	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	135	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.309			Check
Combined	0.130		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	3.188		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	155.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	7.40	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	360.96	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	3.19			Check
ΦR_n	93.23	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.402			Check
Combined	0.219		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.66	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	103.59	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	122.64	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	2.66	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	172.66	kips		Check
ΦR_n	183.42	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.1182			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	2.13	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	138.13	kips		Check
ΦR_n	211.45	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	Yes	*note check on deeper beam only*		
Is a check required?	DNA			
"e"	0.0	in		
$M_{u\_additional}$	0	k-in		
M_{u_total}	22.4	k-in		Check
ΦM_n	455.6	k-in		OK
Combined	0.130			OK

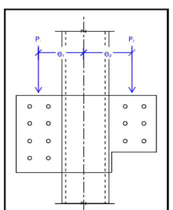


L-Shaped Block Shear (check combined)

U-Shaped Block Shear (check tension only)



Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector AC

Load Parameters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	2	0	1.4D	2.8	0	2.80	0.00
Live	0	0	1.2D+1.6L+0.5S	3.4	0	3.40	0.00
Snow	2	0	1.2D+1.6S+L	5.6	0	5.60	0.00
Earthquake	0	25	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	3.20	62.50	62.58	87.07
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	1.40	62.50	62.52	88.72

Member Parameters

Beam Shape	W16X26						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
7.68	15.7	0.25	5.5	0.345	50	65	1.06

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	4	1.5	3	12	0.5	50	65
						OK plate will fit			

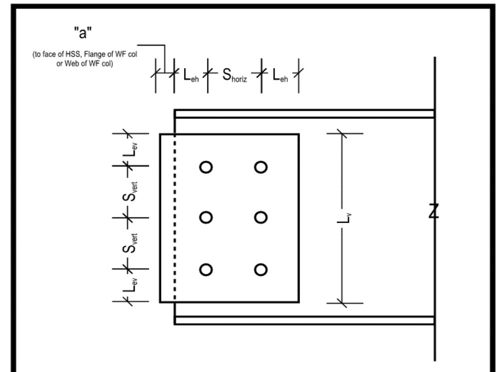
Attaching Column/Beam	WF	W16X31	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.275	0.44	50	65

Bolt Parameters

Bolt Diameter (in)	0.75
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.442
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	17.90	kips/bolt	EQJ3-1	1.4D	2.80	0.00	0.16	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	3.40	0.00	0.19	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	43.88	kips/bolt	EQJ3-6a	1.2D+1.6S+L	5.60	0.00	0.31	4.86	OK	87.00	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	21.94	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	62.58	87.07	3.50	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	31.99	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	62.52	88.72	3.49	6.67	OK	119.40	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									



General Connection layout

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	117.8	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	345.6	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	0.72	in	Table D3.1	
U	0.759			
A_n	6.81	in^2		Check
ΦR_n	251.9	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	1.59	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	103.59	kips		Check
ΦR_n	131.63	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Web			
a	0.33			
e_x	4.00	in		
l	12	in		
Weld D	5	/16	*note recommended* ->	5/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	2.66		Table 8-4	
$C_{gravity+seismic}$	4.32		Table 8-4	Check
$\Phi R_{n\_gravity}$	119.7	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	194.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	99	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	96.5	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	148.5	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	160.9	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.180		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.2		EQ10-5	OK

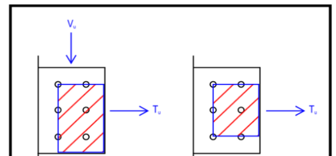
HSS Column-Connection Checks

Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

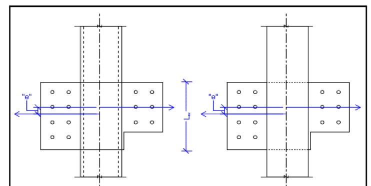
Max Plate Thickness				
C'	26.0	in	Table 7-7	
M_{max}	689.5	k-in	EQ 10-4	Check
t_{max}	0.575	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	1131.0	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	22.666	ft		
M_{tu}	2.10	k-in	EQ 10-8a	Check
ΦR_n	43.6	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.204		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	22.4	k-in		Check
ΦM_n	810.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	20.78			
F_e	662.54	ksi	EQ E3-4	Check
ΦR_n	270.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	180	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.231			Check
Combined	0.068		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	4.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	207.2	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	12.98	in^3	Sect 9	
M_u	22.4	k-in		Check
ΦM_n	632.89	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	4.25			Check
ΦR_n	124.31	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.302			Check
Combined	0.116		EQ 10-5 & H1-1	OK

Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	5.25	in^2		
A_{nv}	3.72	in^2		
A_{nt}	1.84	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	157.50	kips		
$0.6F_uA_{nv}$	145.03	kips		
$U_{bs}F_uA_{nt}$	59.92	kips		Check
ΦR_n	153.71	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	2.50	in^2		
A_{nv}	1.84	in^2		
A_{nt}	3.72	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	75.00	kips		
$0.6F_uA_{nv}$	71.91	kips		
$U_{bs}F_uA_{nt}$	241.72	kips		Check
ΦR_n	235.22	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.0719			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	5.00	in^2		
A_{nv}	3.69	in^2		
A_{nt}	3.19	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	150.00	kips		
$0.6F_uA_{nv}$	143.81	kips		
$U_{bs}F_uA_{nt}$	207.19	kips		Check
ΦR_n	263.25	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	8.0	in		
$M_{u\_additional}$	500	k-in		
M_{u_total}	522.4	k-in		Check
ΦM_n	810.0	k-in		OK
Combined	0.769			OK



L-Shaped Block Shear (check combined)

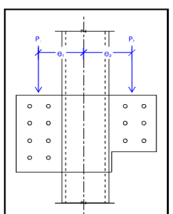
U-Shaped Block Shear (check tension only)



@ HSS

@ WF (conn to web, perp to web DNA)

Differing Beam Depth



HSS Column Connection Checks

Bolted Axial + Gravity Connection (Intended for collector connection design)

(2) Vertical Columns of Bolts only

RF Collector W

Load Parameters

Sds	1.003
Rho/Omega	2.5
Live Load EQ LC Factor	1

	Shear (k)	Tension (k)	Load Combinations	V_u (k)	P_u (k)	R_u (k)	Angle
Dead	50	0	1.4D	70	0	70.00	0.00
Live	0	0	1.2D+1.6L+0.5S	71.5	0	71.50	0.00
Snow	23	0	1.2D+1.6S+L	96.8	0	96.80	0.00
Earthquake	0	112.4	$(1.2+0.2S_{DS})D+(\rho/\Omega)E+L+0.2S$	74.63	281.00	290.74	75.13
			$(0.9-0.2S_{DS})D+(\rho/\Omega)E$	34.97	281.00	283.17	82.91

Member Parameters

Beam Shape	W30X116						
A (in^2)	d (in)	t_w (in)	b_f (in)	t_f (in)	F_y (ksi)	F_u (ksi)	k (in)
34.2	30	0.565	10.5	0.85	50	65	1.75

Plate Shape — *Note this spread sheet is only set up for (2) vertical columns of bolts*

"a" (in)	L_{eh} (in)	S_{horiz} (in)	$N_{vert\ rows}$	L_{ev} (in)	S_{vert} (in)	L_v (in)	t (in)	F_y (ksi)	F_u (ksi)
0.5	2	3	8	1.5	3	24	0.75	50	65
						OK plate will fit			

Attaching Column/Beam	WF	W10X60	
t_w (in)	t_f (in)	F_y (ksi)	F_u (ksi)
0.42	0.68	50	65

Bolt Parameters

Bolt Diameter (in)	1
Bolt Grade	A325-N
Bolt Strength (ksi)	54
Bolt Area (in^2)	0.785
Beam Underrun (in)	0

Bolt Checks

				Load Combinations	Ru (k)	Angle	$C_{required}$	$C_{provided}$	Check	ΦR_n	
Bolt Shear ΦRn	31.79	kips/bolt	EQJ3-1	1.4D	70.00	0.00	2.20	13.20	OK	419.66	AISC Table 7-7, 0 degree angle
Bolt Bearing Beam Web ΦRn	64.04	kips/bolt	EQJ3-6a	1.2D+1.6L+0.5S	71.50	0.00	2.25	13.20	OK	419.66	AISC Table 7-7, 0 degree angle
Bolt Bearing Shear Plate ΦRn	85.01	kips/bolt	EQJ3-6a	1.2D+1.6S+L	96.80	0.00	3.04	13.20	OK	419.66	AISC Table 7-7, 0 degree angle
Bolt Tearout Beam Web ΦRn	48.55	kips/bolt	EQJ3-6a	(1.2+0.2SDS)D+(ρ/Ω)E+L+0.2S	290.74	75.13	9.14	14.10	OK	448.27	AISC Table 7-7, 75 degree angle
Bolt Tearout Plate ΦRn	42.50	kips/bolt	EQJ3-6a	(0.9-0.2SDS)D+(ρ/Ω)E	283.17	82.91	8.91	14.10	OK	448.27	AISC Table 7-7, 75 degree angle
Connection e_x	4	in									

Beam Checks

Shear Yielding of Beam web				Check
ΦR_n	508.5	kips	EQ J4-3	OK
Tensile Yielding of Beam				Check
ΦR_n	1539.0	kips	EQ J4-1	OK
Tensile Rupture of Beam				
x_{bar}	1.45	in	Table D3.1	
U	0.516			
A_n	29.12	in^2		Check
ΦR_n	732.7	kips	EQ J4-2	OK
Block Shear of Beam Web				
A_{gv}	5.65	in^2		
A_{nv}	3.74	in^2		
A_{nt}	7.42	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	169.5	kips		
$0.6F_uA_{nv}$	145.98	kips		
$U_{bs}F_uA_{nt}$	482.02	kips		Check
ΦR_n	471.00	kips	EQ J4-5	OK

WF Column-Connection Checks

Weld to column-WF				
Conn to web or flange	Flange			
a	0.17			
e_x	4.00	in		
l	24	in		
Weld D	8	/16	*note recommended* ->	8/16
C_1	1.00		Table 8-4	
$C_{gravity\ only}$	3.51		Table 8-4	
$C_{gravity+seismic}$	4.85		Table 8-4	Check
$\Phi R_{n\_gravity}$	505.4	kips	Equation inTable 8-4	OK
$\Phi R_{n\_gravity+seismic}$	698.4	kips	Equation inTable 8-4	OK
Column Base Material - Shear Yielding				Check
ΦR_n	489.6	kips	EQ J4-3	OK
Column Base Material - Shear Rupture				Check
ΦR_n	477.4	kips	EQ J4-4	OK
Column Base Material - Tensile Yielding				Check
ΦR_n	734.4	kips	EQ J4-1	OK
Column Base Material - Tensile Rupture				Check
ΦR_n	795.6	kips	EQ J4-2	OK
Column Base Material - Yielding Combined				Check
Combined	0.185		EQ 10-5	OK
Column Base Material - Rupture Combined				Check
Combined	0.2		EQ10-5	OK

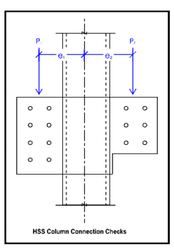
HSS Column-Connection Checks

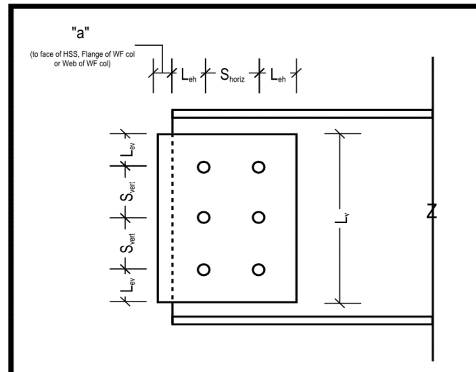
Weld to column-HSS				
P_1	17.00	kips		
e_1	4.00	in		
P_2	0.00	kips		
e_2	0.00	in		
Column Width	6.00	in		
V_{u_vert}	DNA	kips		
V_{u_moment}	DNA	kips		
V_{u_total}	DNA	kips		
Weld D	5	/16		Check
ΦR_n	DNA	kips	EQ 8-2a	DNA
Column Base Material - Shear Yielding				Check
ΦR_n	DNA	kips	EQ J4-3	DNA
Column Base Material - Shear Rupture				Check
ΦR_n	DNA	kips	EQ J4-4	DNA

Plate Checks

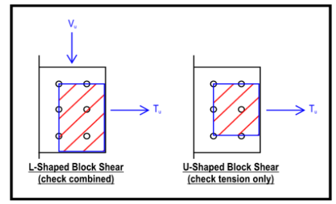
Max Plate Thickness				
C'	93.1	in	Table 7-7	
M_{max}	4385.0	k-in	EQ 10-4	Check
t_{max}	0.914	in	EQ 10-3	OK
Lateral-Torsional bucking of plate				Check
ΦR_n	7634.1	kips	EQ 10-6	OK
Plate Torsion due to lap eccentricity				
Slab Above?	No			
Beam span	60	ft		
M_{tu}	63.65	k-in	EQ 10-8a	Check
ΦR_n	166.2	k-in	EQ 10-7a	OK
Flexural Local Buckling Strength of Plate				
λ	0.140		EQ 9-18	
Q	1		EQ 9-15 to 9-17	
F_{cr}	50	ksi	EQ 9-14	
M_u	387.2	k-in		Check
ΦM_n	4860.0	k-in		OK
Axial Yielding Strength of Plate				
KL/r	13.86			
F_e	1490.72	ksi	EQ E3-4	Check
ΦR_n	810.0	kips	EQ J4-3 / E3-1	OK
Shear Yielding Strength of Plate				Check
ΦR_n	540	kips	EQ J4-3	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_AXIAL}$	0.347			Check
Combined	0.214		EQ 10-5 & H1-1	OK
Tensile Rupture Strength of Plate				
A_n	11.250		Sect B4.3	
U	1.0	Case 1	Table D3.1	Check
ΦR_n	548.4	kips	EQ J4-2	OK
Flexural Rupture Strength of Plate				
Z_{net}	67.90	in^3	Sect 9	
M_u	387.2	k-in		Check
ΦM_n	3309.91	k-in	EQ 9-4	OK
Shear Rupture Strength of Plate				
A_{nv}	11.25			Check
ΦR_n	329.06	kips	EQ J4-2	OK
Interaction of Axial, Flexure, and Shear Yielding in plate				
$N_u/\Phi R_{n\_T\text{-}Rupt}$	0.512			Check
Combined	0.483		EQ 10-5 & H1-1	OK

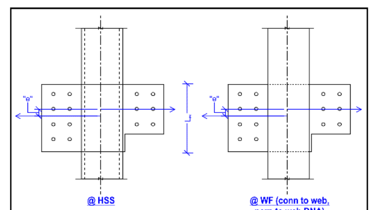
Block Shear - Plate for gravity (BSR = L Shaped)				
A_{gv}	16.88	in^2		
A_{nv}	10.55	in^2		
A_{nt}	2.48	in^2		
U_{bs}	0.5			
$0.6F_yA_{gv}$	506.25	kips		
$0.6F_uA_{nv}$	411.33	kips		
$U_{bs}F_uA_{nt}$	80.74	kips		Check
ΦR_n	369.05	kips	EQ J4-5	OK
Block Shear - Plate for tension (BSR = L Shaped)				
A_{gv}	3.75	in^2		
A_{nv}	2.48	in^2		
A_{nt}	10.55	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	112.50	kips		
$0.6F_uA_{nv}$	96.89	kips		
$U_{bs}F_uA_{nt}$	685.55	kips		Check
ΦR_n	586.83	kips	EQ J4-5	OK
Combined Vert & Axial Block Shear (BSR = L Shaped)				
ΦR_n	0.2981			
Block Shear - Plate for tension (BSR = U Shaped)				
A_{gv}	7.50	in^2		
A_{nv}	4.97	in^2		
A_{nt}	9.84	in^2		
U_{bs}	1.0			
$0.6F_yA_{gv}$	225.00	kips		
$0.6F_uA_{nv}$	193.78	kips		
$U_{bs}F_uA_{nt}$	639.84	kips		Check
ΦR_n	625.22	kips	EQ J4-5	OK
Differening Beam Depths - Check on deeper beam only				
Beam Depths the same?	No	*note check on deeper beam only*		
Is a check required?	Yes			
"e"	8.0	in		
$M_{u\_additional}$	2248	k-in		
M_{u_total}	2635.2	k-in		Check
ΦM_n	4860.0	k-in		OK
Combined	0.823			OK





General Connection layout





Differing Beam Depth

Pierce College Puyallup New STEM Building
22135.00

Lateral Load Resisting System -
Horizontal Elements - BRB Beams

PRCNC20221036

Corebrace Coordination Values used to determine the expected Strength of the BRB

CoreBrace (CB) Engineering Information
Project: Pierce College
Location: Puyallup, WA

Pinned Connection

Increment for Suggested Values --> 0.05 ±10% <-- Increment for Formatting

Model Correction Parameters

Location and Quantity						Frame and Brace Geometry									Stiffness										
CB-ID	EOR-ID	Line	Grids	Lvls		H_{WP}	W_{WP}	L_{wp}	θ_{CB}	F_{ysc_min}	F_{ysc_max}	A_{sc}	L_{ysc}	YLR	K_{eff}	K_{LWP}	KF	KF	EOR	CB	$L_{wp,Model}$	$L_{wp,Model}$	Model KF	$KF_{Corrected}$	K_{LWP}
#	#		#	#		in	in	in	rad	ksi	ksi	in^2	in	(L_{ysc}/L_{wp})	k/in	k/in	(K_{eff}/K_{LWP})	Sugg	KF	EOR	in	L_{wp}	Correction	KF_{CB}	K_{eff}
CB-2.00	BRB-2.00	B10	A2 to A4	Level 2	BF-1	177.5	172.0	247.2	0.801	38	46	2.00	141.2	0.57	350	235	1.49	1.50	1.29	1.16	-	-	-	-	0.67
CB-2.00	BRB-2.00	B10	A2 to A1	Level 2	BF-1	177.5	172.0	247.2	0.801	38	46	2.00	141.2	0.57	350	235	1.49	1.50	1.29	1.16	-	-	-	-	0.67
CB-3.00	BRB-3.00	B10	A2 to A4	Mezzanine	BF-1	164.0	172.0	237.7	0.762	38	46	3.00	143.3	0.60	508	366	1.39	1.40	1.31	1.06	-	-	-	-	0.72
CB-3.00	BRB-3.00	B10	A2 to A1	Mezzanine	BF-1	164.0	172.0	237.7	0.762	38	46	3.00	143.3	0.60	508	366	1.39	1.40	1.31	1.06	-	-	-	-	0.72
CB-2.50	BRB-2.50	D5	C15 to C16	Level 3	BF-2	236.0	180.0	296.8	0.919	38	46	2.50	202.7	0.68	318	244	1.30	1.30	1.29	1.01	-	-	-	-	0.77
CB-3.00	BRB-3.00	D5	C15 to C16	Level 2	BF-2	176.0	180.0	251.7	0.774	38	46	3.00	151.2	0.60	484	346	1.40	1.40	1.35	1.04	-	-	-	-	0.71
CB-4.00	BRB-4.00	D5	C15 to C16	Mezzanine	BF-2	168.0	180.0	246.2	0.751	38	46	4.00	171.2	0.70	614	471	1.30	1.30	1.33	0.98	-	-	-	-	0.77
CB-2.00	BRB-2.00	C16	D2 to D1	Level 3	BF-3	236.0	180.0	296.8	0.919	38	46	2.00	203.2	0.68	256	195	1.31	1.30	1.26	1.04	-	-	-	-	0.76
CB-2.00	BRB-2.00	C16	D2 to D3	Level 3	BF-3	236.0	180.0	296.8	0.919	38	46	2.00	203.2	0.68	256	195	1.31	1.30	1.26	1.04	-	-	-	-	0.76
CB-3.00	BRB-3.00	C16	D2 to D1	Level 2	BF-3	176.0	180.0	251.7	0.774	38	46	3.00	151.2	0.60	484	346	1.40	1.40	1.35	1.04	-	-	-	-	0.71
CB-3.00	BRB-3.00	C16	D2 to D3	Level 2	BF-3	176.0	180.0	251.7	0.774	38	46	3.00	151.2	0.60	484	346	1.40	1.40	1.35	1.04	-	-	-	-	0.71
CB-4.00	BRB-4.00	C16	D2 to D1	Mezzanine	BF-3	168.0	180.0	246.2	0.751	38	46	4.00	171.2	0.70	614	471	1.30	1.30	1.33	0.98	-	-	-	-	0.77
CB-4.00	BRB-4.00	C16	D2 to D3	Mezzanine	BF-3	168.0	180.0	246.2	0.751	38	46	4.00	171.2	0.70	614	471	1.30	1.30	1.33	0.98	-	-	-	-	0.77
CB-3.50	BRB-3.50	D1	C8 to C7	Level 3	BF-4	236.0	180.0	296.8	0.919	38	45	3.50	201.3	0.68	442	342	1.29	1.30	1.28	1.01	-	-	-	-	0.77
CB-3.50	BRB-3.50	D1	C8 to C10	Level 3	BF-4	236.0	180.0	296.8	0.919	38	45	3.50	201.3	0.68	442	342	1.29	1.30	1.28	1.01	-	-	-	-	0.77
CB-6.00	BRB-6.00	D1	C8 to C7	Level 2	BF-4	176.0	180.0	251.7	0.774	38	46	6.00	159.0	0.63	977	691	1.41	1.40	1.42	1.00	-	-	-	-	0.71
CB-6.00	BRB-6.00	D1	C8 to C10	Level 2	BF-4	176.0	180.0	251.7	0.774	38	46	6.00	159.0	0.63	977	691	1.41	1.40	1.42	1.00	-	-	-	-	0.71
CB-7.00	BRB-7.00	D1	C8 to C7	Mezzanine	BF-4	168.0	180.0	246.2	0.751	38	46	7.00	164.3	0.67	1102	824	1.34	1.35	1.37	0.98	-	-	-	-	0.75
CB-7.00	BRB-7.00	D1	C8 to C10	Mezzanine	BF-4	168.0	180.0	246.2	0.751	38	46	7.00	164.3	0.67	1102	824	1.34	1.35	1.37	0.98	-	-	-	-	0.75
CB-2.00	BRB-2.00	C1	D2 to D3	Level 3	BF-5	236.0	180.0	296.8	0.919	38	46	2.00	203.2	0.68	256	195	1.31	1.30	1.26	1.04	-	-	-	-	0.76
CB-2.00	BRB-2.00	C1	D2 to D1	Level 3	BF-5	236.0	180.0	296.8	0.919	38	46	2.00	203.2	0.68	256	195	1.31	1.30	1.26	1.04	-	-	-	-	0.76
CB-3.50	BRB-3.50	C1	D2 to D3	Level 2	BF-5	176.0	180.0	251.7	0.774	38	45	3.50	151.0	0.60	564	403	1.40	1.40	1.37	1.02	-	-	-	-	0.71
CB-3.50	BRB-3.50	C1	D2 to D1	Level 2	BF-5	176.0	180.0	251.7	0.774	38	45	3.50	151.0	0.60	564	403	1.40	1.40	1.37	1.02	-	-	-	-	0.71
CB-4.00	BRB-4.00	C1	D2 to D3	Mezzanine	BF-5	170.0	180.0	247.6	0.757	38	46	4.00	161.1	0.65	644	469	1.37	1.35	1.38	1.00	-	-	-	-	0.73
CB-4.00	BRB-4.00	C1	D2 to D1	Mezzanine	BF-5	170.0	180.0	247.6	0.757	38	46	4.00	161.1	0.65	644	469	1.37	1.35	1.38	1.00	-	-	-	-	0.73
CB-4.50	BRB-4.50	C1	D2 to D3	Level 1	BF-5	118.0	180.0	215.2	0.580	38	46	4.50	130.8	0.61	865	606	1.43	1.45	1.41	1.01	-	-	-	-	0.70
CB-4.50	BRB-4.50	C1	D2 to D1	Level 1	BF-5	118.0	180.0	215.2	0.580	38	46	4.50	130.8	0.61	865	606	1.43	1.45	1.41	1.01	-	-	-	-	0.70
CB-2.50	BRB-2.50	B3	A1 to A2	Level 3	BF-6	236.0	172.0	292.0	0.941	38	46	2.50	198.3	0.68	324	248	1.31	1.30	1.25	1.04	-	-	-	-	0.77
CB-2.50	BRB-2.50	B3	A4 to A2	Level 3	BF-6	236.0	172.0	292.0	0.941	38	46	2.50	198.3	0.68	324	248	1.31	1.30	1.25	1.04	-	-	-	-	0.77
CB-3.00	BRB-3.00	B3	A1 to A2	Level 2	BF-6	176.0	172.0	246.1	0.797	38	46	3.00	146.5	0.60	497	354	1.41	1.40	1.35	1.04	-	-	-	-	0.71
CB-3.00	BRB-3.00	B3	A4 to A2	Level 2	BF-6	176.0	172.0	246.1	0.797	38	46	3.00	146.5	0.60	497	354	1.41	1.40	1.35	1.04	-	-	-	-	0.71
CB-3.50	BRB-3.50	B3	A1 to A2	Mezzanine	BF-6	168.0	172.0	240.4	0.774	38	45	3.50	151.1	0.63	567	422	1.34	1.35	1.30	1.03	-	-	-	-	0.74
CB-3.50	BRB-3.50	B3	A4 to A2	Mezzanine	BF-6	168.0	172.0	240.4	0.774	38	45	3.50	151.1	0.63	567	422	1.34	1.35	1.30	1.03	-	-	-	-	0.74
CB-3.50	BRB-3.50	A1	B6 to B4	Level 3	BF-7	236.0	184.0	299.3	0.909	38	45	3.50	203.5	0.68	438	339	1.29	1.30	1.27	1.02	-	-	-	-	0.77
CB-4.00	BRB-4.00	A1	B6 to B4	Level 2	BF-7	176.0	184.0	254.6	0.763	38	46	4.00	168.4	0.66	619	456	1.36	1.35	1.37	0.99	-	-	-	-	0.74
CB-6.00	BRB-6.00	A1	B6 to B4	Mezzanine	BF-7	168.0	184.0	249.2	0.740	38	46	6.00	166.6	0.67	942	698	1.35	1.35	1.38	0.98	-	-	-	-	0.74
CB-2.00	BRB-2.00	B7	A3 to A1	Level 3	BF-8	236.0	188.0	301.7	0.898	38	46	2.00	207.5	0.69	251	192	1.31	1.30	1.25	1.04	-	-	-	-	0.77
CB-2.50	BRB-2.50	B7	A3 to A1	Level 2	BF-8	176.0	188.0	257.5	0.752	38	46	2.50	157.3	0.61	396	282	1.41	1.40	1.37	1.03	-	-	-	-	0.71
CB-3.00	BRB-3.00	B7	A3 to A1	Mezzanine	BF-8	168.0	188.0	252.1	0.729	38	46	3.00	161.4	0.64	460	345	1.33	1.35	1.27	1.05	-	-	-	-	0.75
CB-5.50	BRB-5.50	D6	C9 to C7	Level 3	BF-9	236.0	252.0	345.3	0.753	38	46	5.50	254.2	0.74	577	462	1.25	1.25	1.27	0.98	-	-	-	-	0.80
CB-7.00	BRB-7.00	D6	C9 to CL	Level 2	BF-9	176.0	126.0	216.5	0.949	38	46	7.00	130.4	0.60	1346	938	1.44	1.45	1.49	0.96	-	-	-	-	0.70
CB-7.00	BRB-7.00	D6	CL to C7	Level 2	BF-9	176.0	126.0	216.5	0.949	38	46	7.00	130.4	0.60	1346	938	1.44	1.45	1.45	0.99	-	-	-	-	0.70
CB-8.50	BRB-8.50	D6	C9 to CL	Mezzanine	BF-9	168.0	126.0	210.0	0.927	38	46	8.50	124.0	0.59	1690	1174	1.44	1.45	1.51	0.95	-	-	-	-	0.69
CB-8.50	BRB-8.50	D6	CL to C7	Mezzanine	BF-9	168.0	126.0	210.0	0.927	38	46	8.50	122.7	0.58	1704	1174	1.45	1.45	1.43	1.02	-	-	-	-	0.69
CB-4.50	BRB-4.50	C7	D6 to CL	Level 3	BF-10	236.0	122.0	265.7	1.094	38	46	4.50	183.2	0.69	643	491	1.31	1.30	1.39	0.94	-	-	-	-	0.76
CB-4.50	BRB-4.50	C7	CL to D4	Level 3	BF-10	236.0	122.0	265.7	1.094	38	46	4.50	186.2	0.70	635	491	1.29	1.30	1.37	0.94	-	-	-	-	0.77
CB-5.50	BRB-5.50	C7	D6 to CL	Level 2	BF-10	176.0	122.0	214.1	0.965	38	46	5.50	130.9	0.61	1048	745	1.41	1.40	1.52	0.93	-	-	-	-	0.71
CB-5.50	BRB-5.50	C7	CL to D4	Level 2	BF-10	176.0	122.0	214.1	0.965	38	46	5.50	130.9	0.61	1048	745	1.41	1.40	1.50	0.94	-	-	-	-	0.71
CB-8.00	BRB-8.00	C7	D6 to CL	Mezzanine	BF-10	168.0	122.0	207.6	0.943	38	46	8.00	118.6	0.57	1656	1117	1.48	1.50	1.56	0.95	-	-	-	-	0.67
CB-8.00	BRB-8.00	C7	CL to D4	Mezzanine	BF-10	168.0	122.0	207.6	0.943	38	46	8.00	121.0	0.58	1632	1117	1.46	1.45	1.54	0.95	-	-	-	-	0.68

Shade Changes: FALSE

Min --> 1.25
Max --> 1.50

6.00

Table of Symbols

A_{sc} = Cross sectional area of core at yield section
β = Maximum cpmressive force to Tension force ratio
ω = Maximum Tension force to yield force ratio
H_{wp} = Height between frame workpoints
W_{wp} = Width between frame workpoints

L_{wp} = Length of resulting diagonal
K_{eff} = Effective CB stiffness from WP to WP incl elastic regions
K_{LWP} = CB stiffness using Asc from WP to WP
Δ_{by} = Deformation of CB at first yield
C_d = Deflection amplification factor

Δ_b = Amplified Deformation of CB at Expected Drift (Δby x Cd)
$\Delta_{b1\%}$ = Deformation of CB at 1% Story Drift
Δ_m = Expected Deformation
β = Compression Str Adjustment Factor
ω = Strain Hardening Adjustment Factor

F

Corebrace Coordination Values used to determine the expected Strength of the BRB

Strain & Elongation											Yield & Adj Brace Strength														Location and Quantity					
ϕ_{BRB}	Δ_{by} in	C_d	SSD %	Δ_{bCd} in	Δ_{bSSD} in	$\Delta_{b,max}$ in	Req'd Stroke (in)	Provided Stroke (in)	ε at $2x\Delta_{bCd}$	ε at $2x\Delta_{bSSD}$	P_{y_min} kips	R_{y_eff}	P_{y_max} kips	β	EOR β	CB EOR	ω	EOR ω	CB EOR	βω	EOR βω	CB EOR	P_{uc} kips	P_{ut} kips	CB-ID #	EOR-ID #	Line	Grids #	Lvls #	
0.90	0.17	5.0	1.00%	0.83	1.24	1.24	1.24	3.00	1.18%	1.75%	76	1.21	92	1.23	1.12	1.10	1.38	1.29	1.07	1.70	1.44	1.17	156	127	CB-2.00	BRB-2.00	B10	A2 to A4	Level 2	BF-1
0.90	0.17	5.0	1.00%	0.83	1.24	1.24	1.24	3.00	1.18%	1.75%	76	1.21	92	1.23	1.12	1.10	1.38	1.29	1.07	1.70	1.44	1.17	156	127	CB-2.00	BRB-2.00	B10	A2 to A1	Level 2	BF-1
0.90	0.17	5.0	1.00%	0.85	1.19	1.19	1.19	3.00	1.18%	1.66%	114	1.20	137	1.22	1.12	1.09	1.37	1.30	1.05	1.67	1.46	1.15	228	187	CB-3.00	BRB-3.00	B10	A2 to A4	Mezzanine	BF-1
0.90	0.17	5.0	1.00%	0.85	1.19	1.19	1.19	3.00	1.18%	1.66%	114	1.20	137	1.22	1.12	1.09	1.37	1.30	1.05	1.67	1.46	1.15	228	187	CB-3.00	BRB-3.00	B10	A2 to A1	Mezzanine	BF-1
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	1.44	3.00	1.18%	1.42%	95	1.21	115	1.19	1.12	1.06	1.34	1.29	1.04	1.59	1.44	1.10	183	154	CB-2.50	BRB-2.50	D5	C15 to C16	Level 3	BF-2
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	1.26	3.00	1.18%	1.67%	114	1.20	137	1.22	1.12	1.09	1.37	1.31	1.05	1.67	1.47	1.14	228	187	CB-3.00	BRB-3.00	D5	C15 to C16	Level 2	BF-2
0.90	0.20	5.0	1.00%	1.01	1.23	1.23	1.23	3.00	1.18%	1.44%	152	1.21	184	1.17	1.12	1.04	1.31	1.31	1.00	1.53	1.47	1.04	282	241	CB-4.00	BRB-4.00	D5	C15 to C16	Mezzanine	BF-2
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	1.44	3.00	1.18%	1.41%	76	1.21	92	1.19	1.11	1.07	1.34	1.27	1.06	1.59	1.41	1.13	147	123	CB-2.00	BRB-2.00	C16	D2 to D1	Level 3	BF-3
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	1.44	3.00	1.18%	1.41%	76	1.21	92	1.19	1.11	1.07	1.34	1.27	1.06	1.59	1.41	1.13	147	123	CB-2.00	BRB-2.00	C16	D2 to D3	Level 3	BF-3
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	1.26	3.00	1.18%	1.67%	114	1.20	137	1.22	1.12	1.09	1.37	1.31	1.05	1.67	1.47	1.14	228	187	CB-3.00	BRB-3.00	C16	D2 to D1	Level 2	BF-3
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	1.26	3.00	1.18%	1.67%	114	1.20	137	1.22	1.12	1.09	1.37	1.31	1.05	1.67	1.47	1.14	228	187	CB-3.00	BRB-3.00	C16	D2 to D3	Level 2	BF-3
0.90	0.20	5.0	1.00%	1.01	1.23	1.23	1.23	3.00	1.18%	1.44%	152	1.21	184	1.17	1.12	1.04	1.31	1.31	1.00	1.53	1.47	1.04	282	241	CB-4.00	BRB-4.00	C16	D2 to D1	Mezzanine	BF-3
0.90	0.20	5.0	1.00%	1.01	1.23	1.23	1.23	3.00	1.18%	1.44%	152	1.21	184	1.17	1.12	1.04	1.31	1.31	1.00	1.53	1.47	1.04	282	241	CB-4.00	BRB-4.00	C16	D2 to D3	Mezzanine	BF-3
0.90	0.24	5.0	1.00%	1.19	1.44	1.44	1.44	3.00	1.18%	1.43%	133	1.18	158	1.19	1.11	1.07	1.34	1.27	1.06	1.59	1.41	1.13	251	211	CB-3.50	BRB-3.50	D1	C8 to C7	Level 3	BF-4
0.90	0.24	5.0	1.00%	1.19	1.44	1.44	1.44	3.00	1.18%	1.43%	133	1.18	158	1.19	1.11	1.07	1.34	1.27	1.06	1.59	1.41	1.13	251	211	CB-3.50	BRB-3.50	D1	C8 to C10	Level 3	BF-4
0.90	0.19	5.0	1.00%	0.94	1.26	1.26	1.26	3.00	1.18%	1.59%	228	1.21	276	1.14	1.13	1.01	1.35	1.33	1.02	1.54	1.50	1.02	425	373	CB-6.00	BRB-6.00	D1	C8 to C7	Level 2	BF-4
0.90	0.19	5.0	1.00%	0.94	1.26	1.26	1.26	3.00	1.18%	1.59%	228	1.21	276	1.14	1.13	1.01	1.35	1.33	1.02	1.54	1.50	1.02	425	373	CB-6.00	BRB-6.00	D1	C8 to C10	Level 2	BF-4
0.90	0.19	5.0	1.00%	0.97	1.23	1.23	1.23	3.00	1.18%	1.50%	266	1.21	322	1.14	1.13	1.01	1.33	1.32	1.01	1.52	1.49	1.02	488	428	CB-7.00	BRB-7.00	D1	C8 to C7	Mezzanine	BF-4
0.90	0.19	5.0	1.00%	0.97	1.23	1.23	1.23	3.00	1.18%	1.50%	266	1.21	322	1.14	1.13	1.01	1.33	1.32	1.01	1.52	1.49	1.02	488	428	CB-7.00	BRB-7.00	D1	C8 to C10	Mezzanine	BF-4
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	1.44	3.00	1.18%	1.41%	76	1.21	92	1.19	1.11	1.07	1.34	1.27	1.06	1.59	1.41	1.13	147	123	CB-2.00	BRB-2.00	C1	D2 to D3	Level 3	BF-5
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	1.44	3.00	1.18%	1.41%	76	1.21	92	1.19	1.11	1.07	1.34	1.27	1.06	1.59	1.41	1.13	147	123	CB-2.00	BRB-2.00	C1	D2 to D1	Level 3	BF-5
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	1.26	3.00	1.18%	1.67%	133	1.18	158	1.22	1.12	1.09	1.37	1.31	1.05	1.67	1.47	1.14	263	216	CB-3.50	BRB-3.50	C1	D2 to D3	Level 2	BF-5
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	1.26	3.00	1.18%	1.67%	133	1.18	158	1.22	1.12	1.09	1.37	1.31	1.05	1.67	1.47	1.14	263	216	CB-3.50	BRB-3.50	C1	D2 to D1	Level 2	BF-5
0.90	0.19	5.0	1.00%	0.95	1.24	1.24	1.24	3.00	1.18%	1.54%	152	1.21	184	1.18	1.13	1.04	1.34	1.32	1.02	1.58	1.49	1.06	291	247	CB-4.00	BRB-4.00	C1	D2 to D3	Mezzanine	BF-5
0.90	0.19	5.0	1.00%	0.95	1.24	1.24	1.24	3.00	1.18%	1.54%	152	1.21	184	1.18	1.13	1.04	1.34	1.32	1.02	1.58	1.49	1.06	291	247	CB-4.00	BRB-4.00	C1	D2 to D1	Mezzanine	BF-5
0.90	0.15	5.0	1.00%	0.77	0.99	0.99	0.99	3.00	1.18%	1.51%	171	1.21	207	1.17	1.12	1.04	1.33	1.31	1.02	1.56	1.47	1.06	322	275	CB-4.50	BRB-4.50	C1	D2 to D3	Level 1	BF-5
0.90	0.15	5.0	1.00%	0.77	0.99	0.99	0.99	3.00	1.18%	1.51%	171	1.21	207	1.17	1.12	1.04	1.33	1.31	1.02	1.56	1.47	1.06	322	275	CB-4.50	BRB-4.50	C1	D2 to D1	Level 1	BF-5
0.90	0.23	5.0	1.00%	1.17	1.40	1.40	1.40	3.00	1.18%	1.41%	95	1.21	115	1.19	1.11	1.07	1.34	1.28	1.05	1.59	1.42	1.12	183	154	CB-2.50	BRB-2.50	B3	A1 to A2	Level 3	BF-6
0.90	0.23	5.0	1.00%	1.17	1.40	1.40	1.40	3.00	1.18%	1.41%	95	1.21	115	1.19	1.11	1.07	1.34	1.28	1.05	1.59	1.42	1.12	183	154	CB-2.50	BRB-2.50	B3	A4 to A2	Level 3	BF-6
0.90	0.17	5.0	1.00%	0.86	1.23	1.23	1.23	3.00	1.18%	1.68%	114	1.20	137	1.22	1.13	1.08	1.37	1.32	1.04	1.67	1.49	1.12	228	187	CB-3.00	BRB-3.00	B3	A1 to A2	Level 2	BF-6
0.90	0.17	5.0	1.00%	0.86	1.23	1.23	1.23	3.00	1.18%	1.68%	114	1.20	137	1.22	1.13	1.08	1.37	1.32	1.04	1.67	1.49	1.12	228	187	CB-3.00	BRB-3.00	B3	A4 to A2	Level 2	BF-6
0.90	0.18	5.0	1.00%	0.89	1.20	1.20	1.20	3.00	1.18%	1.59%	133	1.18	158	1.21	1.12	1.08	1.36	1.29	1.05	1.65	1.44	1.14	259	214	CB-3.50	BRB-3.50	B3	A1 to A2	Mezzanine	BF-6
0.90	0.18	5.0	1.00%	0.89	1.20	1.20	1.20	3.00	1.18%	1.59%	133	1.18	158	1.21	1.12	1.08	1.36	1.29	1.05	1.65	1.44	1.14	259	214	CB-3.50	BRB-3.50	B3	A4 to A2	Mezzanine	BF-6
0.90	0.24	5.0	1.00%	1.20	1.46	1.46	1.46	3.00	1.18%	1.43%	133	1.18	158	1.19	1.11	1.07	1.35	1.27	1.06	1.61	1.41	1.14	253	213	CB-3.50	BRB-3.50	A1	B6 to B4	Level 3	BF-7
0.90	0.20	5.0	1.00%	0.99	1.27	1.27	1.27	3.00	1.18%	1.51%	152	1.21	184	1.17	1.12	1.04	1.33	1.32	1.01	1.56	1.48	1.05	286	245	CB-4.00	BRB-4.00	A1	B6 to B4	Level 2	BF-7
0.90	0.20	5.0	1.00%	0.98	1.24	1.24	1.24	3.00	1.18%	1.49%	228	1.21	276	1.14	1.13	1.01	1.33	1.32	1.01	1.52	1.49	1.02	418	367	CB-6.00	BRB-6.00	A1	B6 to B4	Mezzanine	BF-7
0.90	0.24	5.0	1.00%	1.22	1.48	1.48	1.48	3.00	1.18%	1.42%	76	1.21	92	1.19	1.11	1.07	1.34	1.27	1.06	1.59	1.41	1.13	147	123	CB-2.00	BRB-2.00	B7	A3 to A1	Level 3	BF-8
0.90	0.19	5.0	1.00%	0.93	1.29	1.29	1.29	3.00	1.18%	1.64%	95	1.21	115	1.21	1.13	1.07	1.37	1.34	1.02	1.66	1.51	1.09	191	158	CB-2.50	BRB-2.50	B7	A3 to A1	Level 2	BF-8
0.90	0.19	5.0	1.00%	0.95	1.26	1.26	1.26	3.00	1.18%	1.56%	114	1.20	137	1.20	1.11	1.08	1.36	1.29	1.05	1.63	1.43	1.14	223	186	CB-3.00	BRB-3.00	B7	A3 to A1	Mezzanine	BF-8
0.90	0.30	5.0	1.00%	1.50	1.73	1.73	1.73	3.00	1.18%	1.36%	209	1.21	253	1.16	1.11	1.05	1.30	1.28	1.02	1.51	1.42	1.06	382	329	CB-5.50	BRB-5.50	D6	C9 to C7	Level 3	BF-9
0.90	0.15	5.0	1.00%	0.77	1.03	1.03	1.03	3.00	1.18%	1.58%	266	1.21	322	1.14	1.14	1.00	1.35	1.34	1.01	1.54	1.53	1.01	496	435	CB-7.00	BRB-7.00	D6	C9 to CL	Level 2	BF-9
0.90	0.15	5.0	1.00%	0.77	1.03	1.03	1.03	3.00	1.18%	1.58%	266	1.21	322	1.14	1.13	1.01	1.35	1.33	1.02	1.54	1.50	1.02	496	435	CB-7.00	BRB-7.00	D6	CL to C7	Level 2	BF-9
0.90	0.15	5.0	1.00%	0.73	1.01	1.01	1.01	3.00	1.18%	1.63%	323	1.21	391	1.14	1.14	1.00	1.36	1.36	1.00	1.55	1.55	1.00	606	532	CB-8.50	BRB-8.50	D6	C9 to CL	Mezzanine	BF-9
0.90	0.14	5.0	1.00%	0.72	1.01	1.01	1.01	3.00	1.18%	1.65%	323	1.21	391	1.14	1.13	1.01	1.36	1.33	1.02	1.55	1.50	1.03	606	532	CB-8.50	BRB-8.50	D6	CL to C7	Mezzanine	BF-9
0.90	0.22	5.0	1.00%	1.08	1.09	1.09	1.09	3.00	1.18%	1.19%	171	1.21	207	1.15	1.10	1.05	1.26	1.26	1.00	1.45	1.39	1.05	300	261	CB-4.50	BRB-4.50	C7	D6 to CL	Level 3	BF-10
0.90	0.22	5.0	1.00%	1.10	1.09	1.10	1.10	3.00	1.18%	1.17%	171	1.21	207	1.15	1.10	1.05	1.25	1.25	1.00	1.44	1.38	1.05	298	259	CB-4.50	BRB-4.50	C7	CL to D4	Level 3	BF-10
0.90	0.15	5.0	1.00%	0.77	1.01	1.01	1.01	3.00	1.18%	1.54%	209	1.21	253	1.18	1.14	1.04	1.34	1.34	1.00	1.58	1.53	1.04	400	339	CB-5.50	BRB-5.50	C7	D6 to CL	Level 2	BF-10
0.90	0.15	5.0	1.00%	0.77	1.01	1.01	1.01	3.00	1.18%	1.54%	209	1.21	253	1.18	1.13	1.04	1.34	1.34	1.00	1.58	1.51	1.04	400	339	CB-5.50	BRB-5.50	C7	CL to D4	Level 2	BF-10
0.90	0.14	5.0	1.00%	0.70	0.99	0.99	0.99	3.00	1.18%	1.67%	304	1.21	368	1.14	1.15	0.99	1.36	1.37	0.99	1.55	1.58	0.98	571	500	CB-8.00	BRB-8.00	C7	D6 to CL	Mezzanine	BF-10
0.90	0.14	5.0	1.00%	0.71	0.99	0.99	0.99	3.00	1.18%	1.64%	304	1.21	368	1.14	1.14	1.00	1.36	1.36	1.00	1.55	1.55	1.00	571	500	CB-8.00	BRB-8.00	C7	CL to D4	Mezzanine	BF-10
													Max -->	1.23	1.15	1.10	1.38	1.37	1.07	1.70	1.58	1.17								

<-- No. Steps in Rounded KF Range

P_{y_min} = Minimum CB Yield Strength based on F_{y_min} x A_{sc}
R_{y_eff} = F_{y_max}/F_{y_min} (allowable range verified by coupon tests)
P_{y_max} = Max CB Yield Strength based on F_{y_max} x A_{sc} (or P_{y_min}*R_{y_eff})
Req'd Stroke = Required Stroke at Each End of CB
Provided Stroke = Provided Stroke at Each End of CB

P_{uc} = Adjusted Brace Strength in compression: $\beta\omega A_{sc}F_{y,max}$ (or $\beta\omega P_{y,max}$)
P_{ut} = Adjusted Brace Strength in tension: $\omega A_{sc}F_{y,max}$ (or $\omega P_{y,max}$)
P_{ub} = Potential unblanced load on beam at V or Chev configuration
(assumed same size brace)

$P_{uc,h}$ = Horizontal component of compressive a
$P_{uc,v}$ = Vertical component of compressive adj
$P_{ut,h}$ = Horizontal component of tensile adjuste
$P_{ut,v}$ = Vertical component of tensile adjusted I
$Pd_{,h}$ = Horizontal component of demand on br

Corebrace Coordination Values used to determine the expected Strength of the BRB

These are the beam reactions (Rub) and Connection Capacities (Vconn) we are assuming for now. Please confirm or provide more accurate values.

Component Forces: P_{ub} kips	$P_{uc,h}$ kips	$P_{uc,v}$ kips	$P_{ut,h}$ kips	$P_{ut,v}$ kips	Assumed Bm Rxn and Conn Capacity: $R_{ub,b}$ kips	$V_{Conn,b}$[1] kips	$R_{ub,t}$ kips	$V_{Conn,t}$[1] kips	Shear Demand Capacity Ratios: Bottom Bm	Bottom Col	Top Bm	Top Col	Casing: HSS Type	Profile	Approx Size	h_{HSS} in	w_{HSS} in	t_{HSS} in	Location and Quantity: CB-ID #	EOR-ID #	Line	Grids #	Lvls #	
21	109	112	88	91	30	189	-	-	0.44	0.38	0.53	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	B10	A2 to A4	Level 2	BF-1
21	109	112	88	91	30	189	-	-	0.44	0.38	0.53	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	B10	A2 to A1	Level 2	BF-1
28	165	157	135	129	30	0	-	-	-	-	0.65	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B10	A2 to A4	Mezzanine	BF-1
28	165	157	135	129	30	0	-	-	-	-	0.65	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B10	A2 to A1	Mezzanine	BF-1
23	111	146	93	123	30	139	30	139	0.61	0.50	0.73	0.40	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.50	BRB-2.50	D5	C15 to C16	Level 3	BF-2
29	163	160	134	131	30	139	30	139	0.67	0.57	0.79	0.44	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	D5	C15 to C16	Level 2	BF-2
28	206	192	176	164	30	0	30	139	-	0.79	0.91	0.53	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	D5	C15 to C16	Mezzanine	BF-2
19	89	117	75	98	30	139	-	-	0.53	0.42	0.54	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	C16	D2 to D1	Level 3	BF-3
19	89	117	75	98	30	139	-	-	0.53	0.42	0.54	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	C16	D2 to D3	Level 3	BF-3
29	163	160	134	131	30	139	30	139	0.67	0.58	0.79	0.69	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	C16	D2 to D1	Level 2	BF-3
29	163	160	134	131	30	139	30	139	0.67	0.58	0.79	0.69	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	C16	D2 to D3	Level 2	BF-3
28	206	192	176	164	30	0	30	139	-	0.80	0.92	0.83	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	C16	D2 to D1	Mezzanine	BF-3
28	206	192	176	164	30	0	30	139	-	0.80	0.92	0.83	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	C16	D2 to D3	Mezzanine	BF-3
32	152	200	128	168	30	139	-	-	0.78	0.51	0.89	-	t	□	t8x8x0.3125	8	8.00	0.3125	CB-3.50	BRB-3.50	D1	C8 to C7	Level 3	BF-4
32	152	200	128	168	30	139	-	-	0.78	0.51	0.89	-	t	□	t8x8x0.3125	8	8.00	0.3125	CB-3.50	BRB-3.50	D1	C8 to C10	Level 3	BF-4
36	304	297	266	260	30	139	30	139	1.04	0.73	1.24	0.86	t	□	t10x10x0.25	10	10.00	0.2500	CB-6.00	BRB-6.00	D1	C8 to C7	Level 2	BF-4
36	304	297	266	260	30	139	30	139	1.04	0.73	1.24	0.86	t	□	t10x10x0.25	10	10.00	0.2500	CB-6.00	BRB-6.00	D1	C8 to C10	Level 2	BF-4
41	357	333	313	292	30	0	30	139	-	1.00	1.38	0.96	t	□	t12x12x0.25	12	12.00	0.2500	CB-7.00	BRB-7.00	D1	C8 to C7	Mezzanine	BF-4
41	357	333	313	292	30	0	30	139	-	1.00	1.38	0.96	t	□	t12x12x0.25	12	12.00	0.2500	CB-7.00	BRB-7.00	D1	C8 to C10	Mezzanine	BF-4
19	89	117	75	98	30	139	-	-	0.53	0.34	0.54	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	C1	D2 to D3	Level 3	BF-5
19	89	117	75	98	30	139	-	-	0.53	0.39	0.54	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	C1	D2 to D1	Level 3	BF-5
33	188	184	154	151	30	139	30	139	0.75	0.54	0.89	0.73	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.50	BRB-3.50	C1	D2 to D3	Level 2	BF-5
33	188	184	154	151	30	139	30	139	0.75	0.62	0.89	0.73	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.50	BRB-3.50	C1	D2 to D1	Level 2	BF-5
30	212	200	179	169	30	139	30	139	0.80	0.59	0.94	0.79	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	C1	D2 to D3	Mezzanine	BF-5
30	212	200	179	169	30	139	30	139	0.80	0.66	0.94	0.79	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	C1	D2 to D1	Mezzanine	BF-5
26	269	177	230	151	30	0	30	139	-	0.72	0.87	0.71	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.50	BRB-4.50	C1	D2 to D3	Level 1	BF-5
26	269	177	230	151	30	0	30	139	-	0.77	0.87	0.71	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.50	BRB-4.50	C1	D2 to D1	Level 1	BF-5
24	108	148	91	125	-	-	30	139	0.52	-	0.79	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.50	BRB-2.50	B3	A1 to A2	Level 3	BF-6
24	108	148	91	125	-	-	30	139	0.52	-	0.79	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.50	BRB-2.50	B3	A4 to A2	Level 3	BF-6
29	159	163	131	134	30	139	30	139	0.72	-	0.84	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B3	A1 to A2	Level 2	BF-6
29	159	163	131	134	30	139	30	139	0.72	-	0.84	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B3	A4 to A2	Level 2	BF-6
31	185	181	153	150	30	0	30	139	-	-	0.92	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.50	BRB-3.50	B3	A1 to A2	Mezzanine	BF-6
31	185	181	153	150	30	0	30	139	-	-	0.92	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.50	BRB-3.50	B3	A4 to A2	Mezzanine	BF-6
32	156	200	131	168	30	139	30	139	0.78	0.57	0.92	0.54	t	□	t8x8x0.3125	8	8.00	0.3125	CB-3.50	BRB-3.50	A1	B6 to B4	Level 3	BF-7
29	207	198	177	169	30	139	30	139	0.79	0.58	0.93	0.54	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	A1	B6 to B4	Level 2	BF-7
35	309	282	271	248	30	0	30	139	-	0.95	1.19	0.73	t	□	t10x10x0.25	10	10.00	0.2500	CB-6.00	BRB-6.00	A1	B6 to B4	Mezzanine	BF-7
18	91	115	77	96	30	139	30	139	0.56	-	0.65	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	B7	A3 to A1	Level 3	BF-8
23	139	130	115	108	30	139	30	139	0.62	-	0.72	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.50	BRB-2.50	B7	A3 to A1	Level 2	BF-8
25	166	148	138	124	30	0	30	139	-	-	0.78	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B7	A3 to A1	Mezzanine	BF-8
36	278	261	240	225	30	139	30	139	1.01	-	1.13	0.60	t	□	t10x10x0.3125	10	10.00	0.3125	CB-5.50	BRB-5.50	D6	C9 to C7	Level 3	BF-9
49	288	403	253	353	30	139	-	-	1.30	0.73	1.58	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-7.00	BRB-7.00	D6	C9 to CL	Level 2	BF-9
49	288	403	253	353	30	139	-	-	1.40	-	1.58	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-7.00	BRB-7.00	D6	CL to C7	Level 2	BF-9
60	364	485	319	425	30	0	-	-	-	0.89	1.80	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-8.50	BRB-8.50	D6	C9 to CL	Mezzanine	BF-9
60	364	485	319	425	30	0	-	-	-	-	1.80	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-8.50	BRB-8.50	D6	CL to C7	Mezzanine	BF-9
35	138	266	120	232	30	139	-	-	0.78	0.30	1.02	-	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.50	BRB-4.50	C7	D6 to CL	Level 3	BF-10
34	137	264	119	230	30	139	-	-	0.86	0.51	1.01	-	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.50	BRB-4.50	C7	CL to D4	Level 3	BF-10
50	228	329	193	279	30	139	-	-	1.07	0.45	1.30	-	t	□	t10x10x0.25	10	10.00	0.2500	CB-5.50	BRB-5.50	C7	D6 to CL	Level 2	BF-10
50	228	329	193	279	30	139	-	-	1.10	0.69	1.30	-	t	□	t10x10x0.25	10	10.00	0.2500	CB-5.50	BRB-5.50	C7	CL to D4	Level 2	BF-10
57	335	462	294	405	30	0	-	-	-	0.78	1.70	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-8.00	BRB-8.00	C7	D6 to CL	Mezzanine	BF-10
57	335	462	294	405	30	0	-	-	-	0.90	1.70	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-8.00	BRB-8.00	C7	CL to D4	Mezzanine	BF-10

adjusted brace strength
usted brace strength
ed brace strength
brace strength
ace

The Above Reactions and Capacities to be Verified by EOR

Note 1: The full shear capacity of the beam web should be developed in the connection whenever possible.

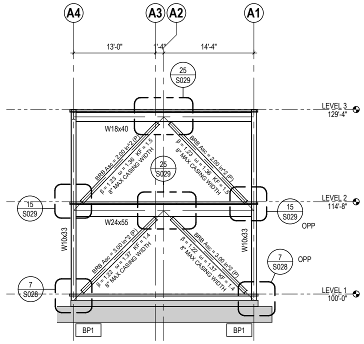
$R_{ub,b}$ = Assumed beam rxn (w/out BRB Rxn) at beam at bott of BRB
$V_{Conn,b}$ = Assumed bm-to-col conn shear capacity at beam at bott of BRB
$R_{ub,t}$ = Assumed beam rxn (w/out BRB Rxn) at beam at top of BRB
$V_{Conn,t}$ = Assumed bm-to-col conn shear capacity at beam at top of BRB

Shear Demand Capacity Checks

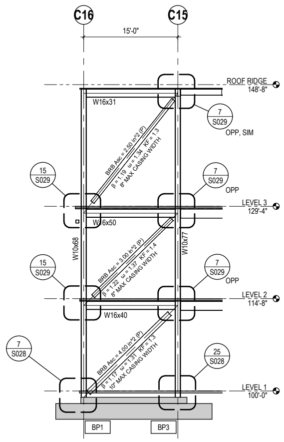
Note 1: These checks help eliminate doubler plates on bms and cols.

Bm = Check of BRB rxn at beam (V_{ub}) from braces on both sides of column + assumed beam rxn (R_{ub}) against full beam shear capacity (ϕV_{nb}). Locatons in RED should consider beam with higher shear capacity.

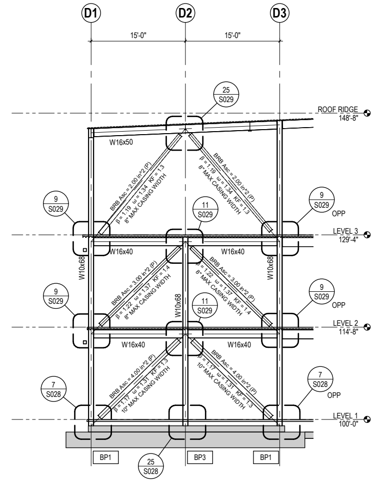
Col = Similar to Bm check but considers H_{uc} & no Bm rxn.



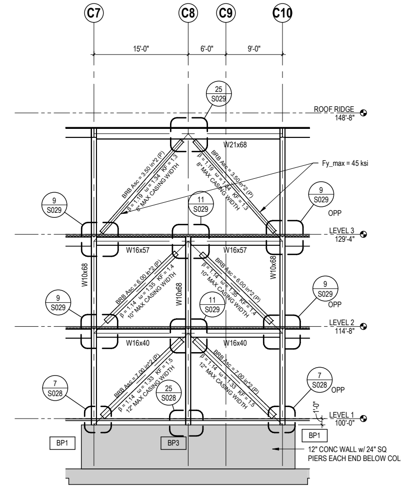
1 BRACE FRAME ELEVATION - GRID B9
SCALE: 1/8" = 1'-0"



2 BRACE FRAME ELEVATION - GRID D5
SCALE: 1/8" = 1'-0"



3 BRACE FRAME ELEVATION - GRID C16
SCALE: 1/8" = 1'-0"

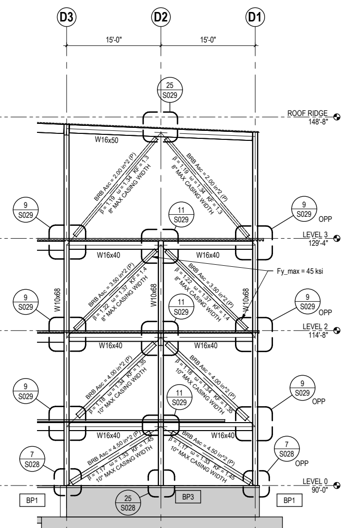


4 BRACE FRAME ELEVATION - GRID D1
SCALE: 1/8" = 1'-0"

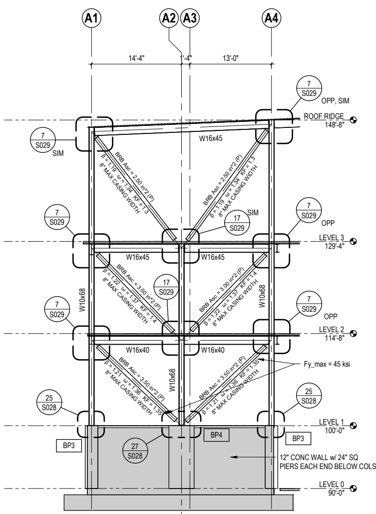
BUCKLING-RESTRAINED BRACED FRAME NOTES

1. Fy_min FOR ALL BUCKLING-RESTRAINED BRACES = 38 ksi
2. Fy_max FOR ALL BUCKLING-RESTRAINED BRACES = 46 ksi, UNLESS NOTED OTHERWISE ON ELEVATIONS
3. Asc = STEEL CORE AREA
   (P) = PINNED BRACE END CONNECTIONS

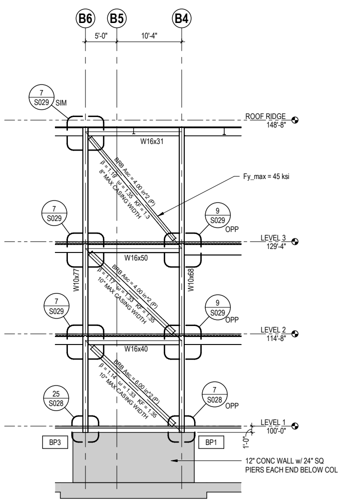
5. BPx CALLED OUT ON BUCKLING-RESTRAINED BRACE FRAME ELEVATIONS INDICATES A COLUMN BASE PLATE ID. SEE DETAILS 7/S028, 25/S028, AND 27/S028 FOR BASE PLATE SCHEDULE AND ADDITIONAL INFORMATION.
7. SEE 18/S028 FOR BRACED FRAME PROTECTED ZONE INFORMATION.
8. SEE SHEETS S028 AND S029 FOR TYPICAL BRB DETAILS.



5 BRACE FRAME ELEVATION - GRID C1
SCALE: 1/8" = 1'-0"



6 BRACE FRAME ELEVATION - GRID B2
SCALE: 1/8" = 1'-0"



7 BRACE FRAME ELEVATION - GRID A1
SCALE: 1/8" = 1'-0"

integrus ARCHITECTURE

PIERCE COLLEGE PUYALLUP
NEW STEM BUILDING
1601 39th AVE SE
Puyallup, WA 98374

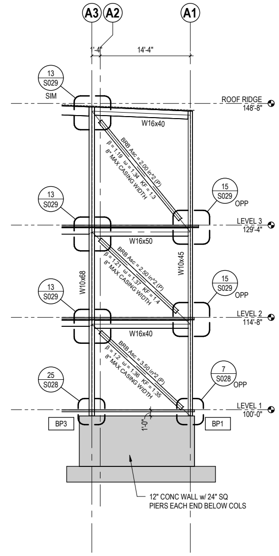
Date:	06/30/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

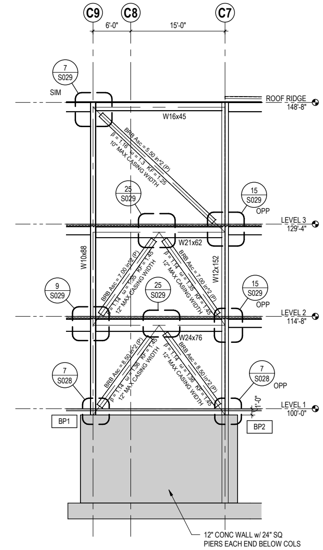
BRACE FRAME ELEVATIONS

S201



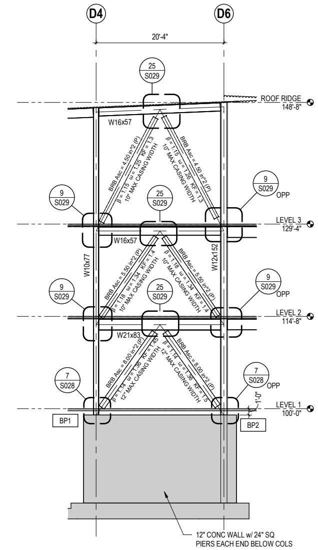
8 BRACE FRAME ELEVATION - GRID B5

SCALE: 1/8" = 1'-0"



9 BRACE FRAME ELEVATION - GRID D7

SCALE: 1/8" = 1'-0"



10 BRACE FRAME ELEVATION - GRID C4

SCALE: 1/8" = 1'-0"

BUCKLING-RESTRAINED BRACED FRAME NOTES

1. Fy_min FOR ALL BUCKLING-RESTRAINED BRACES = 38 ksi
2. Fy_max FOR ALL BUCKLING-RESTRAINED BRACES = 46 ksi, UNLESS NOTED OTHERWISE ON ELEVATIONS
3. Asc = STEEL CORE AREA
   (P) = PINNED BRACE END CONNECTIONS

5. BPx CALLED OUT ON BUCKLING-RESTRAINED BRACE FRAME ELEVATIONS INDICATES A COLUMN BASE PLATE ID. SEE DETAILS 7/S028, 25/S028 , AND 27/S028 FOR BASE PLATE SCHEDULE AND ADDITIONAL INFORMATION.
7. SEE 18/S028 FOR BRACED FRAME PROTECTED ZONE INFORMATION.
8. SEE SHEETS S028 AND S029 FOR TYPICAL BRB DETAILS.

integrus ARCHITECTURE

117 SOUTH MAIN STREET, SUITE 100, SEATTLE, WA 98104
TELEPHONE (206)628-3137 FAX (206)628-3138

PIERCE COLLEGE PUYALLUP
NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/30/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

BRACE FRAME ELEVATIONS

S202

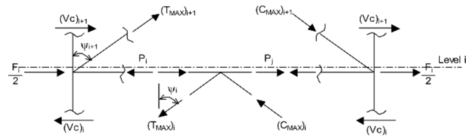
BUILDING PERMIT SET

integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Chevron Brace Beams only



$$F_i := TMAX_i \cdot \sin(\psi_i) + CMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1}) - CMAX_{i+1} \cdot \sin(\psi_{i+1})$$

$$P_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_j := P_i - TMAX_i \cdot \sin(\psi_i) - CMAX_i \cdot \sin(\psi_i)$$

$$P_u := \max(P_i, P_j)$$

Brace Frame #	BF-1				
Fymax	46	ksi	Beam E =	29000000.00	psi
Overall Frame Width	28.666	ft	Beam Fy =	50	ksi
Sds	1.003		E/Fy =	580	

Brace Information

Level	A (in^2)	β	ω	ψ (degrees)	Tmax (kips)	Cmax (kips)	Roof slope to horiz (degrees)
Roof	0	0	0	0	0.0	0.0	0
Level 3	2	1.23	1.36	43.9	125.1	153.9	
Level 2	3	1.22	1.37	45.1	189.1	230.7	

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	Unbalanced Vert ld on bm (Py) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	0.0	0.0	0.0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Level 3	96.7	96.7	20.7	216	150	23.5	16.5	125.00	41.25	0.00	13.75	4.38	0.00
Level 2	138.7	158.6	29.4	316	125	34	14	104.17	119.38	0.00	11.67	12.50	0.00

Roof Beam

Live load factor: 1.0

Beam Design Combinations	Mu (k-ft)	Vu (k)	PuC (k)	PuT (k)	DCRs Bm 1	DCRs Bm 2
1.4 D	0.0	0.0	0	0	#N/A	#N/A
1.2 D + 1.6L+0.5S	0.0	0.0	0	0	#N/A	#N/A
1.2 D + L + 1.6S	0.0	0.0	0	0	#N/A	#N/A
1.4006 D + PEmh + 1.0L + 0.2S	0.0	0.0	0.0	0.0	#N/A	#N/A
0.6994 D + P_{Emh}	0.0	0.0	0.0	0.0	#N/A	#N/A
Negative Bending checks					0.000	0.000
					0.000	#N/A

Beam Options & Conn Design

	Bm 1		Bm 2	
ØMx =	#N/A	k-ft	#N/A	k-ft
ØcPn =	484	k	484	k
Bracing	1/2	pt	1/2	ft
$Lb_{provided}$	14.33	ft	14.33	ft
Lbmin =	#N/A	ft	#N/A	ft
	#N/A		#N/A	
DCR =	#N/A		#N/A	<-EQ J4-5
	#N/A		#N/A	

Tensile Yielding

Member	Area in^2	ØR$_n$ (k)	
0	#N/A	#N/A	#N/A
0	#N/A	#N/A	#N/A

^EQ J4-1^

Tensile Rupture
(U=0.7 & Ae=.85A)

A$_e$ (in^2)	ØR$_n$ (k)	
#N/A	#N/A	#N/A
#N/A	#N/A	#N/A

^EQ J4-2^

Level 3 Beam

Live load factor: 1.0

Beam Design Combinations	Mu (k-ft)	Vu (k)	PuC (k)	PuT (k)	DCRs Bm 1	DCRs Bm 2
1.4 D	175.0	19.3	0	0	0.6	0.6
1.2 D + 1.6L+0.5S	216.0	23.5	0	0	0.7	0.7
1.2 D + L + 1.6S	191.3	20.9	0	0	0.7	0.7
1.4006 D + PEmh + 1.0L + 0.2S	67.7	34.0	96.7	96.7	0.728	0.728
0.6994 D + P_{Emh}	-61.2	20.0	96.7	96.7	0.708	0.708
Negative Bending checks					0.595	0.595
					0.588	0.588

Beam Options & Conn Design

	Bm 1		Bm 2	
	W18x40		W18x40	
ØMx =	294	k-ft	294	k-ft
ØcPn =	185	k	185	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.55	ft	9.55	ft
Lbmin =	10.44	ft	10.44	ft
DCR =	0.7		0.7	<-EQ J4-5
	OK		OK	

Tensile Yielding

Member	Area in^2	ØR$_n$ (k)	
W18x40	11.8	531	OK
W18x40	11.8	531	OK

^EQ J4-1^

Tensile Rupture
(U=0.7 & Ae=.85A)

A$_e$ (in^2)	ØR$_n$ (k)	
10.03	342	OK
10.03	342	OK

^EQ J4-2^

Level 2 Beam

Live load factor: 1.0

Beam Design Combinations	Mu (k-ft)	Vu (k)	PuC (k)	PuT (k)	DCRs Bm 1	DCRs Bm 2
1.4 D	145.8	16.3	0	0	0.3	0.3
1.2 D + 1.6L+0.5S	316.0	34.0	0	0	0.6	0.6
1.2 D + L + 1.6S	244.4	26.5	0	0	0.5	0.5
1.4006 D + PEmh + 1.0L + 0.2S	54.9	43.5	138.7	158.6	0.761	0.761
0.6994 D + P_{Emh}	-137.6	22.8	138.7	158.6	0.907	0.907
Negative Bending checks					0.722	0.722
					0.809	0.809

Beam Options & Conn Design

	Bm 1		Bm 2	
	W24x55		W24x55	
ØMx =	502.5	k-ft	502.5	k-ft
ØcPn =	209	k	209	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.55	ft	9.55	ft
Lbmin =	11.01	ft	11.01	ft
DCR =	0.9		0.9	<-EQ J4-5
	OK		OK	

Tensile Yielding

Member	Area in^2	ØR$_n$ (k)	
W24x55	16.2	729	OK
W24x55	16.2	729	OK

^EQ J4-1^

Tensile Rupture
(U=0.7 & Ae=.85A)

A$_e$ (in^2)	ØR$_n$ (k)	
13.77	470	OK
13.77	470	OK

^EQ J4-2^

UPLIFT CAPACITIES

Level		Bm 1		Bm 2
Roof		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 3		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 2		W24x84		W24x84
	ØMx =	840	k-ft	840

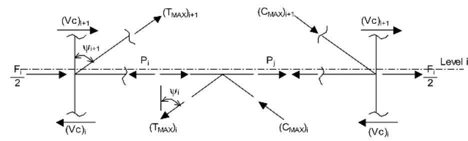
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Chevron Brace Beams only

Brace Frame #	BF-3 RF				
Fymax	46	ksi	Beam E =	29000000.00	psi
Overall Frame Width	30	ft	Beam Fy =	50	ksi
Sds	1.003		E/Fy =	580	



$$F_i := TMAX_i \cdot \sin(\psi_i) + CMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1}) - CMAX_{i+1} \cdot \sin(\psi_{i+1})$$

$$P_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_j := P_i - TMAX_i \cdot \sin(\psi_i) - CMAX_i \cdot \sin(\psi_i)$$

$$P_u := \max(P_i, P_j)$$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	2	1.19	1.34	39.2	123.3	146.7	2.4
Level 3	-	-	-	-	#VALUE!	#VALUE!	
Level 2	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	Unbalanced Vert ld on bm (Py) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	170.8	-0.1	18.2	115	57	25	12.5	47.50	0.00	36.25	10.42	0.00	7.81
Level 3	#VALUE!	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#####	#VALUE!	0.00
Level 2	#VALUE!	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#####	#VALUE!	0.00

Roof Beam

Live load factor: 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	66.5	14.6	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	75.1	16.4	0	0	0.2	0.2
1.2 D + L + 1.6S	115.0	25.0	0	0	0.3	0.3
1.4006 D + PEmh + 1.0L + 0.2S	-62.4	25.2	170.8	-0.1	0.662	0.662
0.6994 D + P_{Emh}	-102.9	16.4	170.8	-0.1	0.766	0.766
Negative Bending checks					0.567	0.567
					0.610	0.610

Beam Options & Conn Design

	W16x50		W16x50	
ØMx =	345	k-ft	345	k-ft
ØcPn =	341	k	341	k
Bracing	1/3	pt	1/3	ft
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	13.06	ft	13.06	ft
DCR =	0.8		0.8	
	OK		OK	

Tensile Yielding

Member	Area in²	$ØR_n$ (k)	
W16x50	14.7	662	OK
W16x50	14.7	662	OK

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in²)	$ØR_n$ (k)	
12.50	426	OK
12.50	426	OK

^EQ J4-2^

Level 3 Beam

Live load factor: 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Negative Bending checks					#VALUE!	#VALUE!
					#VALUE!	#VALUE!

Beam Options & Conn Design

	W18x40		W18x40	
ØMx =	294	k-ft	294	k-ft
ØcPn =	185	k	185	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	10.44	ft	10.44	ft
DCR =	#VALUE!		#VALUE!	
	#VALUE!		#VALUE!	

Tensile Yielding

Member	Area in²	$ØR_n$ (k)	
W18x40	11.8	531	######
W18x40	11.8	531	######

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in²)	$ØR_n$ (k)	
10.03	342	#VALUE!
10.03	342	#VALUE!

^EQ J4-2^

Level 2 Beam

Live load factor: 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Negative Bending checks					#VALUE!	#VALUE!
					#VALUE!	#VALUE!

Beam Options & Conn Design

	W24x55		W24x55	
ØMx =	502.5	k-ft	502.5	k-ft
ØcPn =	209	k	209	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	11.01	ft	11.01	ft
DCR =	#VALUE!		#VALUE!	
	#VALUE!		#VALUE!	

Tensile Yielding

Member	Area in²	$ØR_n$ (k)	
W24x55	16.2	729	######
W24x55	16.2	729	######

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in²)	$ØR_n$ (k)	
13.77	470	#VALUE!
13.77	470	#VALUE!

^EQ J4-2^

UPLIFT CAPACITIES

Roof		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 3		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 2		W24x84		W24x84
	ØMx =	840	k-ft	840

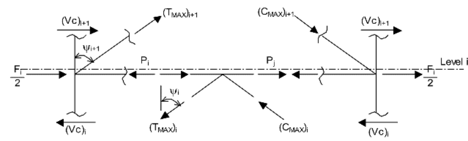
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Chevron Brace Beams only

Brace Frame #	BF-4 RF			
Fymax	45 ksi	Beam E =	29000000.00	psi
Overall Frame Width	30 ft	Beam Fy =	50	ksi
Sds	1.003	E/Fy =	580	



$$F_i := TMAX_i \cdot \sin(\psi_i) + CMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1}) - CMAX_{i+1} \cdot \sin(\psi_{i+1})$$

$$P_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_j := P_i - TMAX_i \cdot \sin(\psi_i) - CMAX_i \cdot \sin(\psi_i)$$

$$P_u := \max(P_i, P_j)$$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	3.5	1.19	1.34	41.5	211.1	251.1	0
Level 3	-	-	-	-	#VALUE!	#VALUE!	
Level 2	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	Unbalanced Vert ld on bm (Py) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	306.3	0.0	30.0	292	186	28	18.5	155.00	0.00	66.25	15.42	0.00	5.94
Level 3	#VALUE!	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#####	#VALUE!	0.00
Level 2	#VALUE!	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#####	#VALUE!	0.00

Live load factor 1.0

Roof Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	217.0	21.6	0	0	0.4	0.4
1.2 D + 1.6L+0.5S	219.1	21.5	0	0	0.4	0.4
1.2 D + L + 1.6S	292.0	28.0	0	0	0.5	0.5
1.4006 D + PEmh + 1.0L + 0.2S	5.1	37.8	306.3	0.0	0.738	0.738
0.6994 D + P_{Emh}	-116.8	25.8	306.3	0.0	0.904	0.904
			Negative Bending checks		0.736	0.736
					0.855	0.855

Beam Options & Conn Design	W21x68		W21x68	
ØMx =	600	k-ft	600	k-ft
ØcPn =	419	k	419	k
Bracing	1/4	pt	1/4	ft
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	14.79	ft	14.79	ft
DCR =	0.9		0.9	<-EQ J4-5
	OK		OK	

Tensile Yielding Member	Area in²	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in²)	$ØR_n$ (k)	
W21x68	20	900	OK	17.00	580	OK
W21x68	20	900	OK	17.00	580	OK
	^EQ J4-1^				^EQ J4-2^	

Live load factor 1.0

Level 3 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
			Negative Bending checks		#VALUE!	#VALUE!
					#VALUE!	#VALUE!

Beam Options & Conn Design	W18x40		W18x40	
ØMx =	294	k-ft	294	k-ft
ØcPn =	185	k	185	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	10.44	ft	10.44	ft
DCR =	#VALUE!		#VALUE!	<-EQ J4-5
	#VALUE!		#VALUE!	

Tensile Yielding Member	Area in²	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in²)	$ØR_n$ (k)	
W18x40	11.8	531	######	10.03	342	#VALUE!
W18x40	11.8	531	######	10.03	342	#VALUE!
	^EQ J4-1^				^EQ J4-2^	

Live load factor 1.0

Level 2 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
			Negative Bending checks		#VALUE!	#VALUE!
					#VALUE!	#VALUE!

Beam Options & Conn Design	W24x55		W24x55	
ØMx =	502.5	k-ft	502.5	k-ft
ØcPn =	209	k	209	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	11.01	ft	11.01	ft
DCR =	#VALUE!		#VALUE!	<-EQ J4-5
	#VALUE!		#VALUE!	

Tensile Yielding Member	Area in²	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in²)	$ØR_n$ (k)	
W24x55	16.2	729	######	13.77	470	#VALUE!
W24x55	16.2	729	######	13.77	470	#VALUE!
	^EQ J4-1^				^EQ J4-2^	

UPLIFT CAPACITIES

Level				
Roof		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 3		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 2		W24x84		W24x84
	ØMx =	840	k-ft	840

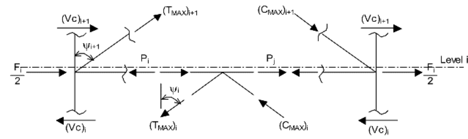
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Chevron Brace Beams only

Brace Frame #	BF-5 RF			
Fymax	46 ksi		Beam E =	29000000.00 psi
Overall Frame Width	30 ft		Beam Fy =	50 ksi
Sds	1.003		E/Fy =	580



$$F_i := TMAX_i \cdot \sin(\psi_i) + CMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1}) - CMAX_{i+1} \cdot \sin(\psi_{i+1})$$

$$P_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_j := P_i - TMAX_i \cdot \sin(\psi_i) - CMAX_i \cdot \sin(\psi_i)$$

$$P_u := \max(P_i, P_j)$$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	2	1.19	1.34	39.9	123.3	146.7	2.4
Level 3	-	-	-	-	#VALUE!	#VALUE!	
Level 2	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	Unbalanced Vert ld on bm (Py) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	173.3	-0.2	18.0	116	57	7	4	47.50	0.00	36.88	3.33	0.00	1.88
Level 3	#VALUE!	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#####	#VALUE!	0.00
Level 2	#VALUE!	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#####	#VALUE!	0.00

Live load factor 1.0

Roof Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	66.5	4.7	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	75.4	4.9	0	0	0.2	0.2
1.2 D + L + 1.6S	116.0	7.0	0	0	0.3	0.3
1.4006 D + PEmh + 1.0L + 0.2S	-60.9	14.0	173.3	-0.2	0.665	0.665
0.6994 D + P_{Emh}	-101.5	11.3	173.3	-0.2	0.770	0.770
Negative Bending checks					0.573	0.573
					0.616	0.616

Beam Options & Conn Design

	W16x50		W16x50	
ØMx =	345	k-ft	345	k-ft
ØcPn =	341	k	341	k
Bracing	1/3	pt	1/3	ft
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	13.06	ft	13.06	ft
DCR =	0.8		0.8	
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x50	14.7	662	OK
W16x50	14.7	662	OK

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
12.50	426	OK
12.50	426	OK

^EQ J4-2^

Live load factor 1.0

Level 3 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Negative Bending checks					#VALUE!	#VALUE!
					#VALUE!	#VALUE!

Beam Options & Conn Design

	W18x40		W18x40	
ØMx =	294	k-ft	294	k-ft
ØcPn =	185	k	185	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	10.44	ft	10.44	ft
DCR =	#VALUE!		#VALUE!	
	#VALUE!		#VALUE!	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W18x40	11.8	531	######
W18x40	11.8	531	######

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	#VALUE!
10.03	342	#VALUE!

^EQ J4-2^

Live load factor 1.0

Level 2 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Negative Bending checks					#VALUE!	#VALUE!
					#VALUE!	#VALUE!

Beam Options & Conn Design

	W24x55		W24x55	
ØMx =	502.5	k-ft	502.5	k-ft
ØcPn =	209	k	209	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	11.01	ft	11.01	ft
DCR =	#VALUE!		#VALUE!	
	#VALUE!		#VALUE!	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W24x55	16.2	729	######
W24x55	16.2	729	######

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
13.77	470	#VALUE!
13.77	470	#VALUE!

^EQ J4-2^

UPLIFT CAPACITIES

		W24x84		W24x84
Roof	ØMx =	840	k-ft	840
Level 3	ØMx =	840	k-ft	840
Level 2	ØMx =	840	k-ft	840

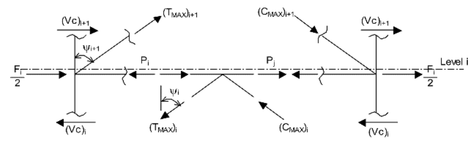
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Chevron Brace Beams only

Brace Frame #	BF-6 RF			
Fymax	46 ksi	Beam E =	29000000.00	psi
Overall Frame Width	30 ft	Beam Fy =	50	ksi
Sds	1.003	E/Fy =	580	



$$F_i := TMAX_i \cdot \sin(\psi_i) + CMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1}) - CMAX_{i+1} \cdot \sin(\psi_{i+1})$$

$$P_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_j := P_i - TMAX_i \cdot \sin(\psi_i) - CMAX_i \cdot \sin(\psi_i)$$

$$P_u := \max(P_i, P_j)$$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	2	1.19	1.34	39.9	123.3	146.7	2.4
Level 3	-	-	-	-	#VALUE!	#VALUE!	
Level 2	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

Level	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	Unbalanced Vert ld on bm (Py) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	173.3	-0.2	18.0	116	57	7	4	47.50	0.00	36.88	3.33	0.00	1.88
Level 3	#VALUE!	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#####	#VALUE!	0.00
Level 2	#VALUE!	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#####	#VALUE!	0.00

Live load factor 1.0

Roof Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	66.5	4.7	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	75.4	4.9	0	0	0.2	0.2
1.2 D + L + 1.6S	116.0	7.0	0	0	0.3	0.3
1.4006 D + PEmh + 1.0L + 0.2S	-60.9	14.0	173.3	-0.2	0.665	0.665
0.6994 D + P_{Emh}	-101.5	11.3	173.3	-0.2	0.770	0.770
Negative Bending checks					0.573	0.573
					0.616	0.616

Beam Options & Conn Design

	W16x50		W16x50	
ØMx =	345	k-ft	345	k-ft
ØcPn =	341	k	341	k
Bracing	1/3	pt	1/3	ft
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	13.06	ft	13.06	ft
DCR =	0.8		0.8	
	OK		OK	

Tensile Yielding

Member	Area in²	ØRₙ (k)	
W16x50	14.7	662	OK
W16x50	14.7	662	OK

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in²)	ØRₙ (k)	
12.50	426	OK
12.50	426	OK

^EQ J4-2^

Live load factor 1.0

Level 3 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Negative Bending checks					#VALUE!	#VALUE!
					#VALUE!	#VALUE!

Beam Options & Conn Design

	W18x40		W18x40	
ØMx =	294	k-ft	294	k-ft
ØcPn =	185	k	185	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	10.44	ft	10.44	ft
DCR =	#VALUE!		#VALUE!	
	#VALUE!		#VALUE!	

Tensile Yielding

Member	Area in²	ØRₙ (k)	
W18x40	11.8	531	######
W18x40	11.8	531	######

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in²)	ØRₙ (k)	
10.03	342	#VALUE!
10.03	342	#VALUE!

^EQ J4-2^

Live load factor 1.0

Level 2 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Negative Bending checks					#VALUE!	#VALUE!
					#VALUE!	#VALUE!

Beam Options & Conn Design

	W24x55		W24x55	
ØMx =	502.5	k-ft	502.5	k-ft
ØcPn =	209	k	209	k
Bracing	1/3	pt	1/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	11.01	ft	11.01	ft
DCR =	#VALUE!		#VALUE!	
	#VALUE!		#VALUE!	

Tensile Yielding

Member	Area in²	ØRₙ (k)	
W24x55	16.2	729	######
W24x55	16.2	729	######

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in²)	ØRₙ (k)	
13.77	470	#VALUE!
13.77	470	#VALUE!

^EQ J4-2^

UPLIFT CAPACITIES

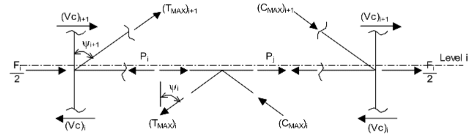
Level		Beam 1		Beam 2
Roof		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 3		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 2		W24x84		W24x84
	ØMx =	840	k-ft	840

integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Chevron Brace Beams only



$$F_i := TMAX_i \cdot \sin(\psi_i) + CMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1}) - CMAX_{i+1} \cdot \sin(\psi_{i+1})$$

$$P_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_j := P_i - TMAX_i \cdot \sin(\psi_i) - CMAX_i \cdot \sin(\psi_i)$$

$$P_u := \max(P_i, P_j)$$

Brace Frame #	BF-9 L2 + L3				
Fymax	46	ksi	Beam E =	29000000.00	psi
Overall Frame Width	21	ft	Beam Fy =	50	ksi
Sds	1.003		E/Fy =	580	

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	5.5	1.16	1.3	46.6	328.9	381.5	0
Level 3	7	1.14	1.35	35.4	434.7	495.6	
Level 2	8.5	1.14	1.36	36.4	531.8	606.2	

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	Unbalanced Vert ld on bm (Py) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	516.2	0.0	36.2	95	54	15	9	45.00	0.00	25.63	7.50	0.00	3.75
Level 3	250.3	288.6	49.6	127	46	25	9	38.33	50.63	0.00	7.50	10.00	0.00
Level 2	320.0	355.3	59.9	127	46	25	9	38.33	50.63	0.00	7.50	10.00	0.00

Live load factor 1.0

Not Used

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	63.0	10.5	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	66.8	10.9	0	0	0.2	0.2
1.2 D + L + 1.6S	95.0	15.0	0	0	0.3	0.3
1.4006 D + PEmh + 1.0L + 0.2S	-121.7	29.3	-	-	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	-158.4	23.3	-	-	#VALUE!	#VALUE!
Negative Bending checks					#VALUE!	#VALUE!
					#VALUE!	#VALUE!

Beam Options & Conn Design	W16x45		W16x45	
ØMx =	308.625	k-ft	308.625	k-ft
ØcPn =	326	k	326	k
Bracing	5/14	pt	5/14	ft
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	12.90	ft	12.90	ft
DCR =	#VALUE!		#VALUE!	
	#VALUE!		#VALUE!	

Tensile Yielding Member	Area in²	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in²)	$ØR_n$ (k)	
W16x45	13.3	599	OK	11.31	386	OK
W16x45	13.3	599	OK	11.31	386	OK
	^EQ J4-1^				^EQ J4-2^	
<-EQ J4-5						

Level 3 Beam

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	53.7	10.5	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	127.0	25.0	0	0	0.2	0.2
1.2 D + L + 1.6S	96.6	19.0	0	0	0.2	0.2
1.4006 D + PEmh + 1.0L + 0.2S	-156.1	45.3	250.3	288.6	0.818	0.818
0.6994 D + P_{Emh}	-233.6	30.0	250.3	288.6	0.946	0.946
Negative Bending checks					0.726	0.726
					0.808	0.808

Beam Options & Conn Design	W21x62		W21x62	
ØMx =	540	k-ft	540	k-ft
ØcPn =	446	k	446	k
Bracing	1/2	pt	1/3	pt
$Lb_{provided}$	10.50	ft	6.99	ft
Lbmin =	14.54	ft	14.54	ft
DCR =	0.9		0.9	
	OK		OK	

Tensile Yielding Member	Area in²	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in²)	$ØR_n$ (k)	
W21x62	18.3	824	OK	15.56	531	OK
W21x62	18.3	824	OK	15.56	531	OK
	^EQ J4-1^				^EQ J4-2^	
<-EQ J4-5						

Level 2 Beam

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	53.7	10.5	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	127.0	25.0	0	0	0.2	0.2
1.2 D + L + 1.6S	96.6	19.0	0	0	0.1	0.1
1.4006 D + PEmh + 1.0L + 0.2S	-210.3	50.5	320.0	355.3	0.814	0.814
0.6994 D + P_{Emh}	-287.8	35.2	320.0	355.3	0.905	0.905
Negative Bending checks					0.787	0.787
					0.869	0.869

Beam Options & Conn Design	W24x76		W24x76	
ØMx =	750	k-ft	750	k-ft
ØcPn =	567	k	567	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	10.50	ft	10.50	ft
Lbmin =	15.78	ft	15.78	ft
DCR =	0.9		0.9	
	OK		OK	

Tensile Yielding Member	Area in²	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in²)	$ØR_n$ (k)	
W24x76	22.4	1008	OK	19.04	650	OK
W24x76	22.4	1008	OK	19.04	650	OK
	^EQ J4-1^				^EQ J4-2^	
<-EQ J4-5						

UPLIFT CAPACITIES

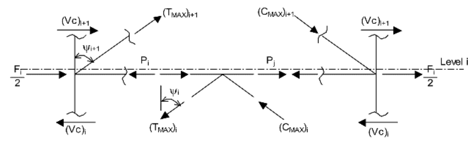
Roof		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 3		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 2		W24x84		W24x84
	ØMx =	840	k-ft	840

integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Chevron Brace Beams only



$F_i := TMAX_i \cdot \sin(\psi_i) + CMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1}) - CMAX_{i+1} \cdot \sin(\psi_{i+1})$

$P_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$

$P_j := P_i - TMAX_i \cdot \sin(\psi_i) - CMAX_i \cdot \sin(\psi_i)$

$P_u := \max(P_i, P_j)$

Brace Frame #	BF-10				
Fymax	46	ksi	Beam E =	29000000.00	psi
Overall Frame Width	20.333	ft	Beam Fy =	50	ksi
Sds	1.003		E/Fy =	580	

Brace Information

Level	A	β	ω	ψ	Tmax	Cmax	Roof slope to horiz
	in^2			degrees	kips	kips	degrees
Roof	4.5	1.15	1.26	27.8	260.8	299.9	2.4
Level 3	5.5	1.18	1.34	34.4	339.0	400.0	
Level 2	8	1.14	1.36	35.3	500.5	570.5	

Beam loading Information

	P_{Emh} Comp	P_{Emh} Tens	Unbalanced Vert ld on bm	M_{Total}	M_{dead}	V_{Total}	V_{dead}	M_{dead}	M_{live}	M_{snow}	V_{dead}	V_{live}	V_{snow}
	(P_i) kips	(P_j) kips	(Py) kips	k-ft	k-ft	k	k	k-ft	k-ft	k-ft	k	k	k
Roof	261.8	-0.2	34.6	69	53	13.5	10.5	44.17	0.00	10.00	8.75	0.00	1.88
Level 3	199.7	217.9	50.4	182	65	19	7	54.17	73.13	0.00	5.83	7.50	0.00
Level 2	292.2	326.7	57.2	182	65	19	7	54.17	73.13	0.00	5.83	7.50	0.00

Live load factor 1.0

Roof Beam

Beam Design Combinations		Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
		k-ft	k	k	k	Bm 1	Bm 2
1.4	D	61.8	12.3	0	0	0.2	0.2
1.2	D + 1.6L+0.5S	58.0	11.4	0	0	0.1	0.1
1.2	D + L + 1.6S	69.0	13.5	0	0	0.2	0.2
1.4006	D + PEmh + 1.0L + 0.2S	-112.1	29.9	261.8	-0.2	0.794	0.794
0.6994	D + P_{Emh}	-145.0	23.4	261.8	-0.2	0.868	0.868
				Negative Bending checks		0.659	0.659
						0.694	0.694

Beam Options & Conn Design	W16x57+		W16x57+	
ØMx =	393.75	k-ft	393.75	k-ft
ØcPn =	484	k	484	k
Bracing	1/2	pt	1/2	ft
$Lb_{provided}$	10.17	ft	10.17	ft
Lbmin =	13.15	ft	13.15	ft
DCR =	0.9		0.9	
	OK		OK	

Tensile Yielding Member	Area in^2	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in^2)	$ØR_n$ (k)	
W16x57+	16.8	756	OK	14.28	487	OK
W16x57+	16.8	756	OK	14.28	487	OK
	^EQ J4-1^				^EQ J4-2^	
<-EQ J4-5						

Live load factor 1.0

Level 3 Beam

Beam Design Combinations		Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
		k-ft	k	k	k	Bm 1	Bm 2
1.4	D	75.8	8.2	0	0	0.2	0.2
1.2	D + 1.6L+0.5S	182.0	19.0	0	0	0.5	0.5
1.2	D + L + 1.6S	138.1	14.5	0	0	0.4	0.4
1.4006	D + PEmh + 1.0L + 0.2S	-107.0	40.8	199.7	217.9	0.654	0.654
0.6994	D + P_{Emh}	-218.1	29.3	199.7	217.9	0.905	0.905
				Negative Bending checks		0.526	0.526
						0.643	0.643

Beam Options & Conn Design	W16x57+		W16x57+	
ØMx =	393.75	k-ft	393.75	k-ft
ØcPn =	484	k	484	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	10.17	ft	10.17	ft
Lbmin =	13.15	ft	13.15	ft
DCR =	0.9		0.9	
	OK		OK	

Tensile Yielding Member	Area in^2	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in^2)	$ØR_n$ (k)	
W16x57+	16.8	756	OK	14.28	487	OK
W16x57+	16.8	756	OK	14.28	487	OK
	^EQ J4-1^				^EQ J4-2^	
<-EQ J4-5						

Live load factor 1.0

Level 2 Beam

Beam Design Combinations		Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
		k-ft	k	k	k	Bm 1	Bm 2
1.4	D	75.8	8.2	0	0	0.1	0.1
1.2	D + 1.6L+0.5S	182.0	19.0	0	0	0.2	0.2
1.2	D + L + 1.6S	138.1	14.5	0	0	0.2	0.2
1.4006	D + PEmh + 1.0L + 0.2S	-141.7	44.3	292.2	326.7	0.588	0.588
0.6994	D + P_{Emh}	-252.8	32.7	292.2	326.7	0.722	0.722
				Negative Bending checks		0.566	0.566
						0.684	0.684

Beam Options & Conn Design	W21x83		W21x83	
ØMx =	735	k-ft	735	k-ft
ØcPn =	702	k	702	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	10.17	ft	10.17	ft
Lbmin =	15.04	ft	15.04	ft
DCR =	0.7		0.7	
	OK		OK	

Tensile Yielding Member	Area in^2	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in^2)	$ØR_n$ (k)	
W21x83	24.3	1094	OK	20.66	705	OK
W21x83	24.3	1094	OK	20.66	705	OK
	^EQ J4-1^				^EQ J4-2^	
<-EQ J4-5						

UPLIFT CAPACITIES

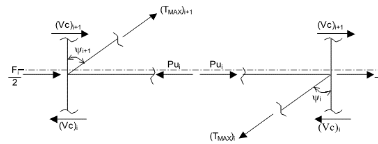
Level		Beam 1		Beam 2
Roof		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 3		W24x84		W24x84
	ØMx =	840	k-ft	840
Level 2		W24x84		W24x84
	ØMx =	840	k-ft	840

integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Diagonal Brace Beams only



$F_i := TMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1})$

$Pu_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$

$P_u := Pu_i$

Brace Frame #	BF-2				
Fymax	46	ksi	Beam E =	29000000.00	psi
Frame Width	15	ft	Beam Fy =	50	ksi
Sds	1.003		E/Fy =	580	

Brace Information

Level	A	β	ω	ψ	Tmax	Cmax	Roof slope to horiz
	in^2			degrees	kips	kips	degrees
Roof	2.5	1.19	1.34	38.2	154.1	183.4	0
Level 3	3	1.22	1.37	45.7	189.1	230.7	
Level 2	4	1.17	1.31	45.8	241.0	282.0	
-	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

	P_{Emh} Comp	P_{Emh} Tens	M_{Total}	M_{dead}	V_{Total}	V_{dead}	M_{dead}	M_{live}	M_{snow}	V_{dead}	V_{live}	V_{snow}
	(P_i) kips	(P_j) kips	k-ft	k-ft	k	k	k-ft	k-ft	k-ft	k	k	k
Roof	95.3	113.4	23.5	12	4	2	10.00	0.00	7.19	1.67	0.00	1.25
Level 3	230.6	278.5	99	60	24	16	50.00	24.38	0.00	13.33	5.00	0.00
Level 2	154.1	183.6	59	22	12	4.5	18.33	23.13	0.00	3.75	4.69	0.00
-	#VALUE!	#VALUE!	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00

Roof Beam

Live load factor: 1.0

Beam Design Combinations	Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
	k-ft	k	k	k	Bm 1	Bm 2
1.4 D	14.0	2.3	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	15.6	2.6	0	0	0.1	0.1
1.2 D + L + 1.6S	23.5	4.0	0	0	0.1	0.1
1.4006 D + PEmh + 1.0L + 0.2S	15.4	2.6	95.3	113.4	0.535	0.535
0.6994 D + P_{Emh}	7.0	1.2	95.3	113.4	0.498	0.498

Beam Options & Conn Design

	W16x31		W16x31	
ØMx =	202.5	k-ft	202.5	k-ft
ØcPn =	204	k	204	k
Bracing	1/2	pt	1/2	ft
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.5		0.5	<-EQ J4-5
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x31	9.31	419	OK
W16x31	9.31	419	OK
	^EQ J4-1^		

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
7.91	270	OK
7.91	270	OK
^EQ J4-2^		

Level 3 Beam

Live load factor: 1.0

Beam Design Combinations	Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
	k-ft	k	k	k	Bm 1	Bm 2
1.4 D	70.0	18.7	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	99.0	24.0	0	0	0.3	0.3
1.2 D + L + 1.6S	84.4	21.0	0	0	0.2	0.2
1.4006 D + PEmh + 1.0L + 0.2S	94.4	23.7	230.6	278.5	0.772	0.772
0.6994 D + P_{Emh}	35.0	9.3	230.6	278.5	0.619	0.619

Beam Options & Conn Design

	W16x50		W16x50	
ØMx =	345	k-ft	345	k-ft
ØcPn =	436	k	436	k
Bracing	2/3	pt	2/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.8		0.77	<-EQ J4-5
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x50	14.7	662	OK
W16x50	14.7	662	OK
	^EQ J4-1^		

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
12.50	426	OK
12.50	426	OK
^EQ J4-2^		

Level 2 Beam

Live load factor: 1.0

Beam Design Combinations	Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
	k-ft	k	k	k	Bm 1	Bm 2
1.4 D	25.7	5.3	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	59.0	12.0	0	0	0.2	0.2
1.2 D + L + 1.6S	45.1	9.2	0	0	0.2	0.2
1.4006 D + PEmh + 1.0L + 0.2S	48.8	9.9	154.1	183.6	0.627	0.627
0.6994 D + P_{Emh}	12.8	2.6	154.1	183.6	0.510	0.510

Beam Options & Conn Design

	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	2/3	pt	2/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.6		0.6	<-EQ J4-5
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	OK
W16x40	11.8	531	OK
	^EQ J4-1^		

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	OK
10.03	342	OK
^EQ J4-2^		

Not Used

Live load factor: 1.0

Beam Design Combinations	Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
	k-ft	k	k	k	Bm 1	Bm 2
1.4 D	0.0	0.0	0	0	0.0	0.0
1.2 D + 1.6L+0.5S	0.0	0.0	0	0	0.0	0.0
1.2 D + L + 1.6S	0.0	0.0	0	0	0.0	0.0
1.4006 D + PEmh + 1.0L + 0.2S	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	W16x40		W12x50	
ØMx =	273.75	k-ft	269.63	k-ft
ØcPn =	178	k	325	k
Bracing	1	pt	1	pt
$Lb_{provided}$	15.00	ft	15.00	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	<-EQ J4-5
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	######
W12x50	14.6	657	######
	^EQ J4-1^		

Tensile Rupture (U=0.7 & Ae=.85A)

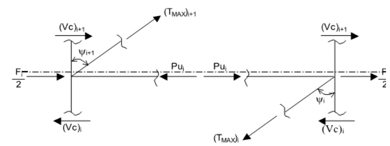
A_e (in^2)	$ØR_n$ (k)	
10.03	342	#VALUE!
12.41	423	#VALUE!
^EQ J4-2^		

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Diagonal Brace Beams only

Brace Frame #	BF-3 L2 + L3		
Fymax	46 ksi	Beam E =	29000000.00 psi
Frame Width	15 ft	Beam Fy =	50 ksi
Sds	1.003	E/Fy =	580



$$F_i := TMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1})$$

$$Pu_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_u := Pu_i$$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	2	1.19	1.34	39.9	123.3	146.7	2.4
Level 3	3	1.22	1.37	45.6	189.1	230.7	
Level 2	4	1.17	1.31	45.8	241.0	282.0	
-	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

Level	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	79.1	94.2	-	-	-	-	#VALUE!	0.00	#VALUE!	#VALUE!	0.00	######
Level 3	214.2	258.9	84	57	23	15.5	47.50	16.88	0.00	12.92	4.69	0.00
Level 2	153.9	183.5	40	15	11	4	12.50	15.63	0.00	3.33	4.38	0.00
-	#VALUE!	#VALUE!	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00

Roof Beam

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	79.1	94.2	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	79.1	94.2	#VALUE!	#VALUE!

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x50		W16x50	
ØMx =	345	k-ft	345	k-ft
ØcPn =	341	k	341	k
Bracing	1	pt	1	ft
$Lb_{provided}$	15.00	ft	15.00	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x50	14.7	662	OK
W16x50	14.7	662	OK

^EQ J4-1^
<-EQ J4-5

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
12.50	426	OK
12.50	426	OK

^EQ J4-2^

Level 3 Beam

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	66.5	18.1	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	84.0	23.0	0	0	0.3	0.3
1.2 D + L + 1.6S	73.9	20.2	0	0	0.3	0.3
1.4006 D + PEmh + 1.0L + 0.2S	83.4	22.8	214.2	258.9	0.922	0.922
0.6994 D + P_{Emh}	33.2	9.0	214.2	258.9	0.759	0.759

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.9		0.92	
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	OK
W16x40	11.8	531	OK

^EQ J4-1^
<-EQ J4-5

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	OK
10.03	342	OK

^EQ J4-2^

Level 2 Beam

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	17.5	4.7	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	40.0	11.0	0	0	0.1	0.1
1.2 D + L + 1.6S	30.6	8.4	0	0	0.1	0.1
1.4006 D + PEmh + 1.0L + 0.2S	33.1	9.0	153.9	183.5	0.575	0.575
0.6994 D + P_{Emh}	8.7	2.3	153.9	183.5	0.496	0.496

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.6		0.6	
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	OK
W16x40	11.8	531	OK

^EQ J4-1^
<-EQ J4-5

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	OK
10.03	342	OK

^EQ J4-2^

Not Used

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	0.0	0.0	0	0	0.0	0.0
1.2 D + 1.6L+0.5S	0.0	0.0	0	0	0.0	0.0
1.2 D + L + 1.6S	0.0	0.0	0	0	0.0	0.0
1.4006 D + PEmh + 1.0L + 0.2S	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W12x50	
ØMx =	273.75	k-ft	269.63	k-ft
ØcPn =	178	k	325	k
Bracing	1	pt	1	pt
$Lb_{provided}$	15.00	ft	15.00	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	######
W12x50	14.6	657	######

^EQ J4-1^
<-EQ J4-5

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	#VALUE!
12.41	423	#VALUE!

^EQ J4-2^

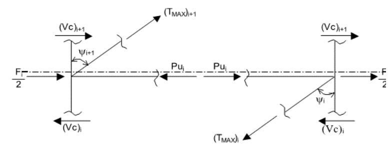
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Diagonal Brace Beams only

Brace Frame #	BF-4 L2 + L3			
Fymax	46 ksi		Beam E =	29000000.00 psi
Frame Width	15 ft		Beam Fy =	50 ksi
Sds	1.003		E/Fy =	580



$F_i := TMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1})$

$Pu_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$

$P_u := Pu_i$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	3.5	1.19	1.34	41.2	215.7	256.7	0
Level 3	6	1.14	1.35	45.7	372.6	424.8	
Level 2	7	1.17	1.33	45.8	428.3	501.1	
-	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	142.1	169.1	-	-	-	-	#VALUE!	0.00	#VALUE!	#VALUE!	0.00	######
Level 3	408.8	473.1	85	57	23	15.5	47.50	17.50	0.00	12.92	4.69	0.00
Level 2	286.8	331.6	41	15	11	4	12.50	16.25	0.00	3.33	4.38	0.00
-	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#VALUE!	####	0.00

Live load factor 1.0

Roof Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	142.1	169.1	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	142.1	169.1	#VALUE!	#VALUE!

Beam Options & Conn Design

	Bm 1		Bm 2	
	W21x68		W21x68	
ØMx =	600	k-ft	600	k-ft
ØcPn =	419	k	419	k
Bracing	1/4	pt	1/4	ft
$Lb_{provided}$	3.75	ft	3.75	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	<-EQ J4-5
	#VALUE!		######	

Tensile Yielding / **Tensile Rupture** (U=0.7 & Ae=.85A)

Member	Area in^2	$ØR_n$ (k)		A_e (in^2)	$ØR_n$ (k)	
W21x68	20	900	OK	17.00	580	OK
W21x68	20	900	OK	17.00	580	OK
		^EQ J4-1^			^EQ J4-2^	

Live load factor 1.0

Level 3 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	66.5	18.1	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	85.0	23.0	0	0	0.2	0.2
1.2 D + L + 1.6S	74.5	20.2	0	0	0.2	0.2
1.4006 D + PEmh + 1.0L + 0.2S	84.0	22.8	408.8	473.1	0.955	0.955
0.6994 D + P_{Emh}	33.2	9.0	408.8	473.1	0.840	0.840

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x57+		W16x57+	
ØMx =	393.75	k-ft	393.75	k-ft
ØcPn =	534	k	534	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	1.0		0.96	<-EQ J4-5
	OK		OK	

Tensile Yielding / **Tensile Rupture** (U=0.7 & Ae=.85A)

Member	Area in^2	$ØR_n$ (k)		A_e (in^2)	$ØR_n$ (k)	
W16x57+	16.8	756	OK	14.28	487	OK
W16x57+	16.8	756	OK	14.28	487	OK
		^EQ J4-1^			^EQ J4-2^	

Live load factor 1.0

Level 2 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	17.5	4.7	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	41.0	11.0	0	0	0.1	0.1
1.2 D + L + 1.6S	31.3	8.4	0	0	0.1	0.1
1.4006 D + PEmh + 1.0L + 0.2S	33.8	9.0	286.8	331.6	0.981	0.981
0.6994 D + P_{Emh}	8.7	2.3	286.8	331.6	0.900	0.900

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	1.0		1.0	<-EQ J4-5
	OK		OK	

Tensile Yielding / **Tensile Rupture** (U=0.7 & Ae=.85A)

Member	Area in^2	$ØR_n$ (k)		A_e (in^2)	$ØR_n$ (k)	
W16x40	11.8	531	OK	10.03	342	OK
W16x40	11.8	531	OK	10.03	342	OK
		^EQ J4-1^			^EQ J4-2^	

Live load factor 1.0

Not Used

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W12x50	
ØMx =	273.75	k-ft	269.63	k-ft
ØcPn =	178	k	325	k
Bracing	1	pt	1	pt
$Lb_{provided}$	15.00	ft	15.00	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	<-EQ J4-5
	#VALUE!		######	

Tensile Yielding / **Tensile Rupture** (U=0.7 & Ae=.85A)

Member	Area in^2	$ØR_n$ (k)		A_e (in^2)	$ØR_n$ (k)	
W16x40	11.8	531	######	10.03	342	#VALUE!
W12x50	14.6	657	######	12.41	423	#VALUE!
		^EQ J4-1^			^EQ J4-2^	

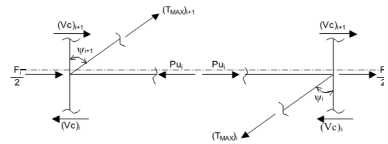
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Diagonal Brace Beams only

Brace Frame #	BF-5 Mezz + L2 + L3				
Fymax	46	ksi	Beam E =	29000000.00	psi
Frame Width	15	ft	Beam Fy =	50	ksi
Sds	1.003		E/Fy =	580	



$$F_i := TMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1})$$

$$Pu_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_u := Pu_i$$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	2	1.19	1.34	39.9	123.3	146.7	2.4
Level 3	3.5	1.22	1.37	45.6	215.8	263.2	
Level 2	4	1.18	1.34	46.6	246.6	290.9	
-	4.5	1.17	1.33	55.3	275.3	322.1	

Level 3 Only
Fymax 45 ksi

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	79.1	94.2	-	-	-	-	#VALUE!	0.00	#VALUE!	#VALUE!	0.00	######
Level 3	233.2	282.2	85	57	23	15.5	47.50	17.50	0.00	12.92	4.69	0.00
Level 2	166.7	199.7	41	15	11	4	12.50	16.25	0.00	3.33	4.38	0.00
Mezzanine	202.7	238.1	109	81	23	17	67.50	17.50	0.00	14.17	3.75	0.00

Live load factor 1.0

Roof Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	79.1	94.2	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	79.1	94.2	#VALUE!	#VALUE!

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x50		W16x50	
ØMx =	345	k-ft	345	k-ft
ØcPn =	341	k	341	k
Bracing	1/3	pt	1/3	ft
$Lb_{provided}$	5.00	ft	5.00	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	
	#VALUE!		######	

<-EQ J4-5

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x50	14.7	662	OK
W16x50	14.7	662	OK

^EQ J4-1^

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
12.50	426	OK
12.50	426	OK

^EQ J4-2^

Live load factor 1.0

Level 3 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	66.5	18.1	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	85.0	23.0	0	0	0.3	0.3
1.2 D + L + 1.6S	74.5	20.2	0	0	0.3	0.3
1.4006 D + PEmh + 1.0L + 0.2S	84.0	22.8	233.2	282.2	0.982	0.982
0.6994 D + P_{Emh}	33.2	9.0	233.2	282.2	0.817	0.817

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	1.0		0.98	
	OK		OK	

<-EQ J4-5

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	OK
W16x40	11.8	531	OK

^EQ J4-1^

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	OK
10.03	342	OK

^EQ J4-2^

Live load factor 1.0

Level 2 Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	17.5	4.7	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	41.0	11.0	0	0	0.1	0.1
1.2 D + L + 1.6S	31.3	8.4	0	0	0.1	0.1
1.4006 D + PEmh + 1.0L + 0.2S	33.8	9.0	166.7	199.7	0.616	0.616
0.6994 D + P_{Emh}	8.7	2.3	166.7	199.7	0.535	0.535

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.6		0.6	
	OK		OK	

<-EQ J4-5

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	OK
W16x40	11.8	531	OK

^EQ J4-1^

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	OK
10.03	342	OK

^EQ J4-2^

Live load factor 1.0

Mezzanine

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	94.5	19.8	0	0	0.3	0.3
1.2 D + 1.6L+0.5S	109.0	23.0	0	0	0.4	0.4
1.2 D + L + 1.6S	98.5	20.8	0	0	0.4	0.4
1.4006 D + PEmh + 1.0L + 0.2S	112.0	23.6	202.7	238.1	0.980	0.980
0.6994 D + P_{Emh}	47.2	9.9	202.7	238.1	0.770	0.770

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	2/3	pt	2/3	pt
$Lb_{provided}$	9.99	ft	9.99	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	1.0		1.0	
	OK		OK	

<-EQ J4-5

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	OK
W16x40	11.8	531	OK

^EQ J4-1^

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	OK
10.03	342	OK

^EQ J4-2^

integrus ARCHITECTURE

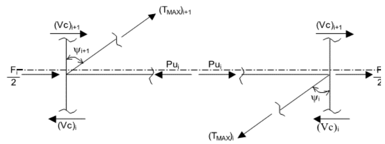
Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135

Designer: AM

Beam design - Diagonal Brace Beams only

Brace Frame #	BF-5 RF			
Fymax	46 ksi	Beam E =	29000000.00	psi
Frame Width	28.666 ft	Beam Fy =	50	ksi
Sds	1.003	E/Fy =	580	



$F_i := TMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1})$

$Pu_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$

$P_u := Pu_i$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	2.5	1.19	1.34	37.7	154.1	183.4	2.4
Level 3	-	-	-	-	#VALUE!	#VALUE!	
Level 2	-	-	-	-	#VALUE!	#VALUE!	
-	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	94.3	112.2	68	34	10	5	28.33	0.00	21.25	4.17	0.00	3.13
Level 3	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#VALUE!	####	0.00
Level 2	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#VALUE!	####	0.00
-	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#VALUE!	####	0.00

Live load factor 1.0

Beam Design Combinations	Roof Beam Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	Bm 2
1.4 D	39.7	5.8	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	44.6	6.6	0	0	0.1	0.1
1.2 D + L + 1.6S	68.0	10.0	0	0	0.2	0.2
1.4006 D + PEmh + 1.0L + 0.2S	43.9	6.5	94.3	112.2	0.461	0.461
0.6994 D + P_{Emh}	19.8	2.9	94.3	112.2	0.392	0.392

Beam Options & Conn Design

	W16x45		W16x45	
ØMx =	308.625	k-ft	308.63	k-ft
ØcPn =	282	k	282	k
Bracing	1/3	pt	1/3	ft
$Lb_{provided}$	9.55	ft	9.55	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.5		0.5	
	OK		OK	

Tensile Yielding

Member	Area in^2	ØRn (k)	
W16x45	13.3	599	OK
W16x45	13.3	599	OK

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

Ae (in^2)	ØRn (k)	
11.31	386	OK
11.31	386	OK

^EQ J4-2^

Live load factor 1.0

Beam Design Combinations	Not Used Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	14.33	ft	14.33	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	ØRn (k)	
W16x40	11.8	531	######
W16x40	11.8	531	######

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

Ae (in^2)	ØRn (k)	
10.03	342	#VALUE!
10.03	342	#VALUE!

^EQ J4-2^

Live load factor 1.0

Beam Design Combinations	Not Used Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	14.33	ft	14.33	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	ØRn (k)	
W16x40	11.8	531	######
W16x40	11.8	531	######

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

Ae (in^2)	ØRn (k)	
10.03	342	#VALUE!
10.03	342	#VALUE!

^EQ J4-2^

Live load factor 1.0

Beam Design Combinations	Not Used Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1	pt	1	pt
$Lb_{provided}$	28.67	ft	28.67	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	ØRn (k)	
W16x40	11.8	531	######
W16x40	11.8	531	######

^EQ J4-1^

<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

Ae (in^2)	ØRn (k)	
10.03	342	#VALUE!
10.03	342	#VALUE!

^EQ J4-2^

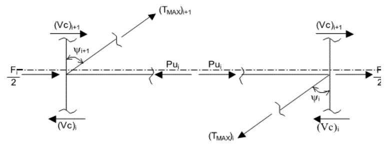
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Diagonal Brace Beams only

Brace Frame #	BF-5 L2 +L3			
Fymax	46	ksi	Beam E =	29000000.00 psi
Frame Width	14.333	ft	Beam Fy =	50 ksi
Sds	1.003		E/Fy =	580



$$F_i := TMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1})$$

$$Pu_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_u := Pu_i$$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	2.5	1.19	1.34	37.7	154.1	183.4	2.4
Level 3	3	1.22	1.37	44.3	189.1	230.7	
Level 2	3.5	1.21	1.36	44.5	214.2	259.2	
-	-	-	-	-	#VALUE!	#VALUE!	

Level 2 Only
Fymax 45 ksi

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	94.3	112.2	68	34	10	5	28.33	0.00	21.25	4.17	0.00	3.13
Level 3	226.3	273.2	131	43	28	10	35.83	55.00	0.00	8.33	11.25	0.00
Level 2	141.1	171.4	132	47	28	10	39.17	53.13	0.00	8.33	11.25	0.00
-	#VALUE!	#VALUE!	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00

Roof Beam

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	39.7	5.8	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	44.6	6.6	0	0	0.1	0.1
1.2 D + L + 1.6S	68.0	10.0	0	0	0.2	0.2
1.4006 D + PEmh + 1.0L + 0.2S	43.9	6.5	94.3	112.2	0.461	0.461
0.6994 D + P_{Emh}	19.8	2.9	94.3	112.2	0.392	0.392

Beam Options & Conn Design

	W16x45		W16x45	
ØMx =	308.625	k-ft	308.63	k-ft
ØcPn =	282	k	282	k
Bracing	1/3	pt	1/3	ft
$Lb_{provided}$	4.77	ft	4.77	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.5		0.5	<-EQ J4-5
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x45	13.3	599	OK
W16x45	13.3	599	OK

^EQ J4-1^

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
11.31	386	OK
11.31	386	OK

^EQ J4-2^

Level 3 Beam

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	50.2	11.7	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	131.0	28.0	0	0	0.4	0.4
1.2 D + L + 1.6S	98.0	21.3	0	0	0.3	0.3
1.4006 D + PEmh + 1.0L + 0.2S	105.2	22.9	226.3	273.2	0.974	0.974
0.6994 D + P_{Emh}	25.1	5.8	226.3	273.2	0.744	0.744

Beam Options & Conn Design

	W16x45		W16x45	
ØMx =	308.625	k-ft	308.63	k-ft
ØcPn =	337	k	337	k
Bracing	37/59	pt	37/59	pt
$Lb_{provided}$	8.99	ft	8.99	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	1.0		0.97	<-EQ J4-5
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x45	13.3	599	OK
W16x45	13.3	599	OK

^EQ J4-1^

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
11.31	386	OK
11.31	386	OK

^EQ J4-2^

Level 2 Beam

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	54.8	11.7	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	132.0	28.0	0	0	0.5	0.5
1.2 D + L + 1.6S	100.1	21.3	0	0	0.4	0.4
1.4006 D + PEmh + 1.0L + 0.2S	108.0	22.9	141.1	171.4	0.769	0.769
0.6994 D + P_{Emh}	27.4	5.8	141.1	171.4	0.508	0.508

Beam Options & Conn Design

	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	337	k	337	k
Bracing	37/59	pt	37/59	pt
$Lb_{provided}$	8.99	ft	8.99	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.8		0.8	<-EQ J4-5
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	OK
W16x40	11.8	531	OK

^EQ J4-1^

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	OK
10.03	342	OK

^EQ J4-2^

Not Used

Live load factor 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	0.0	0.0	0	0	0.0	0.0
1.2 D + 1.6L+0.5S	0.0	0.0	0	0	0.0	0.0
1.2 D + L + 1.6S	0.0	0.0	0	0	0.0	0.0
1.4006 D + PEmh + 1.0L + 0.2S	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1	pt	1	pt
$Lb_{provided}$	14.33	ft	14.33	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	<-EQ J4-5
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	######
W16x40	11.8	531	######

^EQ J4-1^

Tensile Rupture (U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	#VALUE!
10.03	342	#VALUE!

^EQ J4-2^

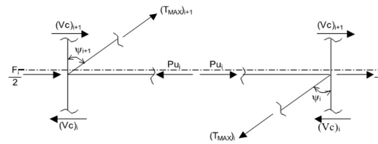
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Diagonal Brace Beams only

Brace Frame #	BF-7			
Fymax	46 ksi	Beam E =	29000000.00	psi
Frame Width	15.333 ft	Beam Fy =	50	ksi
Sds	1.003	E/Fy =	580	



$F_i := TMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1})$

$Pu_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$

$P_u := Pu_i$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees	At Roof only	
Roof	4	1.19	1.35	39.5	248.4	295.6	0	Fymax	45 ksi
Level 3	4	1.17	1.33	46.3	244.7	286.3			
Level 2	6	1.14	1.33	46.5	367.1	418.5			
-	-	-	-	-	#VALUE!	#VALUE!			

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	158.0	188.0	41	20	6	3	16.67	0.00	13.13	2.50	0.00	1.88
Level 3	334.9	395.0	87	59	23	15.5	49.17	17.50	0.00	12.92	4.69	0.00
Level 2	221.6	255.3	41	15.5	11	4	12.92	15.94	0.00	3.33	4.38	0.00
-	#VALUE!	#VALUE!	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00

Roof Beam

Live load factor: 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	23.3	3.5	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	26.6	3.9	0	0	0.1	0.1
1.2 D + L + 1.6S	41.0	6.0	0	0	0.2	0.2
1.4006 D + PEmh + 1.0L + 0.2S	26.0	3.9	158.0	188.0	0.900	0.900
0.6994 D + P_{Emh}	11.7	1.7	158.0	188.0	0.837	0.837

Beam Options & Conn Design	W16x31		W16x31	
ØMx =	202.5	k-ft	202.5	k-ft
ØcPn =	201	k	201	k
Bracing	1/2	pt	1/2	ft
$Lb_{provided}$	7.67	ft	7.67	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.9		0.9	<-EQ J4-5
	OK		OK	

Tensile Yielding Member	Area in^2	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in^2)	$ØR_n$ (k)	
W16x31	9.31	419	OK	7.91	270	OK
W16x31	9.31	419	OK	7.91	270	OK
	^EQ J4-1^			^EQ J4-2^		

Level 3 Beam

Live load factor: 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	68.8	18.1	0	0	0.2	0.2
1.2 D + 1.6L+0.5S	87.0	23.0	0	0	0.3	0.3
1.2 D + L + 1.6S	76.5	20.2	0	0	0.2	0.2
1.4006 D + PEmh + 1.0L + 0.2S	86.4	22.8	334.9	395.0	0.980	0.980
0.6994 D + P_{Emh}	34.4	9.0	334.9	395.0	0.846	0.846

Beam Options & Conn Design	W16x50		W16x50	
ØMx =	345	k-ft	345	k-ft
ØcPn =	442	k	442	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	7.67	ft	7.67	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	1.0		0.98	<-EQ J4-5
	OK		OK	

Tensile Yielding Member	Area in^2	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in^2)	$ØR_n$ (k)	
W16x50	14.7	662	OK	12.50	426	OK
W16x50	14.7	662	OK	12.50	426	OK
	^EQ J4-1^			^EQ J4-2^		

Level 2 Beam

Live load factor: 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	18.1	4.7	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	41.0	11.0	0	0	0.1	0.1
1.2 D + L + 1.6S	31.4	8.4	0	0	0.1	0.1
1.4006 D + PEmh + 1.0L + 0.2S	34.0	9.0	221.6	255.3	0.792	0.792
0.6994 D + P_{Emh}	9.0	2.3	221.6	255.3	0.711	0.711

Beam Options & Conn Design	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	325	k	325	k
Bracing	1/2	pt	1/2	pt
$Lb_{provided}$	7.67	ft	7.67	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.8		0.8	<-EQ J4-5
	OK		OK	

Tensile Yielding Member	Area in^2	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in^2)	$ØR_n$ (k)	
W16x40	11.8	531	OK	10.03	342	OK
W16x40	11.8	531	OK	10.03	342	OK
	^EQ J4-1^			^EQ J4-2^		

Not Used

Live load factor: 1.0

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	0.0	0.0	0	0	0.0	0.0
1.2 D + 1.6L+0.5S	0.0	0.0	0	0	0.0	0.0
1.2 D + L + 1.6S	0.0	0.0	0	0	0.0	0.0
1.4006 D + PEmh + 1.0L + 0.2S	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design	W16x40		W12x50	
ØMx =	273.75	k-ft	269.63	k-ft
ØcPn =	178	k	325	k
Bracing	1	pt	1	pt
$Lb_{provided}$	15.33	ft	15.33	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	<-EQ J4-5
	#VALUE!		######	

Tensile Yielding Member	Area in^2	$ØR_n$ (k)		Tensile Rupture (U=0.7 & Ae=.85A) A_e (in^2)	$ØR_n$ (k)	
W16x40	11.8	531	######	10.03	342	#VALUE!
W12x50	14.6	657	######	12.41	423	#VALUE!
	^EQ J4-1^			^EQ J4-2^		

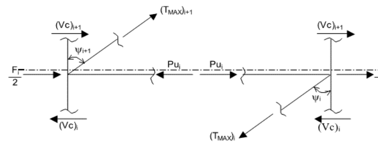
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Diagonal Brace Beams only

Brace Frame #	BF-8				
Fymax	46	ksi	Beam E =	29000000.00	psi
Frame Width	15.666	ft	Beam Fy =	50	ksi
Sds	1.003		E/Fy =	580	



$$F_i := TMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1})$$

$$Pu_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_u := Pu_i$$

Brace Information

Level	A	β	ω	ψ	Tmax	Cmax	Roof slope to horiz
	in^2			degrees	kips	kips	degrees
Roof	2	1.19	1.34	39.2	123.3	146.7	2.4
Level 3	2.5	1.21	1.37	46.9	157.6	190.6	
Level 2	3.5	1.2	1.36	47.1	219.0	262.8	
-	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

	P_{Emh} Comp	P_{Emh} Tens	M_{Total}	M_{dead}	V_{Total}	V_{dead}	M_{dead}	M_{live}	M_{snow}	V_{dead}	V_{live}	V_{snow}
	(P_i) kips	(P_j) kips	k-ft	k-ft	k	k	k-ft	k-ft	k-ft	k	k	k
Roof	78.0	92.8	10.5	6	3	2	5.00	0.00	2.81	1.67	0.00	0.63
Level 3	193.0	231.9	168	119	28	20	99.17	30.63	0.00	16.67	5.00	0.00
Level 2	137.7	165.8	169	60	28	10	50.00	68.13	0.00	8.33	11.25	0.00
-	#VALUE!	#VALUE!	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00

Roof Beam

Live load factor: 1.0

Beam Design Combinations	Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
	k-ft	k	k	k	Bm 1	Bm 2
1.4 D	7.0	2.3	0	0	0.0	0.0
1.2 D + 1.6L+0.5S	7.4	2.3	0	0	0.0	0.0
1.2 D + L + 1.6S	10.5	3.0	0	0	0.0	0.0
1.4006 D + PEmh + 1.0L + 0.2S	7.6	2.5	78.0	92.8	0.446	0.446
0.6994 D + P_{Emh}	3.5	1.2	78.0	92.8	0.433	0.433

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	185	k	185	k
Bracing	1	pt	1	ft
$Lb_{provided}$	15.67	ft	15.67	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.4		0.4	<-EQ J4-5
	OK		OK	

Tensile Yielding / **Tensile Rupture (U=0.7 & Ae=.85A)**

Member	Area in^2	$ØR_n$ (k)		A_e (in^2)	$ØR_n$ (k)	
W16x40	11.8	531	OK	10.03	342	OK
W16x40	11.8	531	OK	10.03	342	OK
	^EQ J4-1^			^EQ J4-2^		

Level 3 Beam

Live load factor: 1.0

Beam Design Combinations	Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
	k-ft	k	k	k	Bm 1	Bm 2
1.4 D	138.8	23.3	0	0	0.4	0.4
1.2 D + 1.6L+0.5S	168.0	28.0	0	0	0.5	0.5
1.2 D + L + 1.6S	149.6	25.0	0	0	0.4	0.4
1.4006 D + PEmh + 1.0L + 0.2S	169.5	28.3	193.0	231.9	0.877	0.877
0.6994 D + P_{Emh}	69.4	11.7	193.0	231.9	0.619	0.619

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x50		W16x50	
ØMx =	345	k-ft	345	k-ft
ØcPn =	438	k	438	k
Bracing	20/33	pt	20/33	pt
$Lb_{provided}$	9.49	ft	9.49	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.9		0.88	<-EQ J4-5
	OK		OK	

Tensile Yielding / **Tensile Rupture (U=0.7 & Ae=.85A)**

Member	Area in^2	$ØR_n$ (k)		A_e (in^2)	$ØR_n$ (k)	
W16x50	14.7	662	OK	12.50	426	OK
W16x50	14.7	662	OK	12.50	426	OK
	^EQ J4-1^			^EQ J4-2^		

Level 2 Beam

Live load factor: 1.0

Beam Design Combinations	Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
	k-ft	k	k	k	Bm 1	Bm 2
1.4 D	70.0	11.7	0	0	0.3	0.3
1.2 D + 1.6L+0.5S	169.0	28.0	0	0	0.6	0.6
1.2 D + L + 1.6S	128.1	21.3	0	0	0.5	0.5
1.4006 D + PEmh + 1.0L + 0.2S	138.2	22.9	137.7	165.8	0.878	0.878
0.6994 D + P_{Emh}	35.0	5.8	137.7	165.8	0.543	0.543

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	321	k	321	k
Bracing	20/33	pt	20/33	pt
$Lb_{provided}$	9.49	ft	9.49	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.9		0.9	<-EQ J4-5
	OK		OK	

Tensile Yielding / **Tensile Rupture (U=0.7 & Ae=.85A)**

Member	Area in^2	$ØR_n$ (k)		A_e (in^2)	$ØR_n$ (k)	
W16x40	11.8	531	OK	10.03	342	OK
W16x40	11.8	531	OK	10.03	342	OK
	^EQ J4-1^			^EQ J4-2^		

Not Used

Live load factor: 1.0

Beam Design Combinations	Mu	Vu	PuC	PuT	DCRs Bm 1	DCRs Bm 2
	k-ft	k	k	k	Bm 1	Bm 2
1.4 D	0.0	0.0	0	0	0.0	0.0
1.2 D + 1.6L+0.5S	0.0	0.0	0	0	0.0	0.0
1.2 D + L + 1.6S	0.0	0.0	0	0	0.0	0.0
1.4006 D + PEmh + 1.0L + 0.2S	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	0.0	0.0	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	Bm 1		Bm 2	
	W16x40		W12x50	
ØMx =	273.75	k-ft	269.63	k-ft
ØcPn =	178	k	325	k
Bracing	1	pt	1	pt
$Lb_{provided}$	15.67	ft	15.67	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	<-EQ J4-5
	#VALUE!		######	

Tensile Yielding / **Tensile Rupture (U=0.7 & Ae=.85A)**

Member	Area in^2	$ØR_n$ (k)		A_e (in^2)	$ØR_n$ (k)	
W16x40	11.8	531	######	10.03	342	#VALUE!
W12x50	14.6	657	######	12.41	423	#VALUE!
	^EQ J4-1^			^EQ J4-2^		

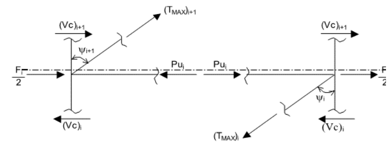
integrus ARCHITECTURE

Design of BRBF Beams & their Connections at Inverted-V Brace Frames
per AISC 341-10 Chapter F4

Project Name: Pierce College
Project Number: 22135
Designer: AM

Beam design - Diagonal Brace Beams only

Brace Frame #	BF-9 RF				
Fymax	46	ksi	Beam E =	29000000.00	psi
Frame Width	21	ft	Beam Fy =	50	ksi
Sds	1.003		E/Fy =	580	



$$F_i := TMAX_i \cdot \sin(\psi_i) - TMAX_{i+1} \sin(\psi_{i+1})$$

$$Pu_i := TMAX_{i+1} \cdot \sin(\psi_{i+1}) + \frac{F_i}{2}$$

$$P_u := Pu_i$$

Brace Information

Level	A in^2	β	ω	ψ degrees	Tmax kips	Cmax kips	Roof slope to horiz degrees
Roof	5.5	1.16	1.3	46.6	328.9	381.5	0
Level 3	-	-	-	-	#VALUE!	#VALUE!	
Level 2	-	-	-	-	#VALUE!	#VALUE!	
-	-	-	-	-	#VALUE!	#VALUE!	

Beam loading Information

	P_{Emh} Comp (P_i) kips	P_{Emh} Tens (P_j) kips	M_{Total} k-ft	M_{dead} k-ft	V_{Total} k	V_{dead} k	M_{dead} k-ft	M_{live} k-ft	M_{snow} k-ft	V_{dead} k	V_{live} k	V_{snow} k
Roof	239.0	277.2	68	34	10	5	28.33	0.00	21.25	4.17	0.00	3.13
Level 3	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#VALUE!	####	0.00
Level 2	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#VALUE!	####	0.00
-	#VALUE!	#VALUE!	-	-	-	-	#VALUE!	#VALUE!	0.00	#VALUE!	####	0.00

Live load factor 1.0

Roof Beam

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	39.7	5.8	0	0	0.1	0.1
1.2 D + 1.6L+0.5S	44.6	6.6	0	0	0.1	0.1
1.2 D + L + 1.6S	68.0	10.0	0	0	0.2	0.2
1.4006 D + PEmh + 1.0L + 0.2S	43.9	6.5	239.0	277.2	0.860	0.860
0.6994 D + P_{Emh}	19.8	2.9	239.0	277.2	0.790	0.790

Beam Options & Conn Design

	W16x45		W16x45	
ØMx =	308.625	k-ft	308.63	k-ft
ØcPn =	326	k	326	k
Bracing	5/14	pt	5/14	ft
$Lb_{provided}$	7.50	ft	7.50	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	0.9		0.9	
	OK		OK	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x45	13.3	599	OK
W16x45	13.3	599	OK

^EQ J4-1^
<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
11.31	386	OK
11.31	386	OK

^EQ J4-2^

Live load factor 1.0

Not Used

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	W16x45		W16x45	
ØMx =	308.625	k-ft	308.63	k-ft
ØcPn =	337	k	337	k
Bracing	37/59	pt	37/59	pt
$Lb_{provided}$	13.17	ft	13.17	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x45	13.3	599	######
W16x45	13.3	599	######

^EQ J4-1^
<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
11.31	386	#VALUE!
11.31	386	#VALUE!

^EQ J4-2^

Live load factor 1.0

Not Used

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	337	k	337	k
Bracing	37/59	pt	37/59	pt
$Lb_{provided}$	13.17	ft	13.17	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	######
W16x40	11.8	531	######

^EQ J4-1^
<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	#VALUE!
10.03	342	#VALUE!

^EQ J4-2^

Live load factor 1.0

Not Used

Beam Design Combinations	Mu k-ft	Vu k	PuC k	PuT k	DCRs Bm 1	DCRs Bm 2
1.4 D	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + 1.6L+0.5S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.2 D + L + 1.6S	#VALUE!	#VALUE!	0	0	#VALUE!	#VALUE!
1.4006 D + PEmh + 1.0L + 0.2S	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.6994 D + P_{Emh}	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Beam Options & Conn Design

	W16x40		W16x40	
ØMx =	273.75	k-ft	273.75	k-ft
ØcPn =	329	k	329	k
Bracing	1	pt	1	pt
$Lb_{provided}$	21.00	ft	21.00	ft
Lbmin =	DNA	ft	DNA	ft
DCR =	#VALUE!		######	
	#VALUE!		######	

Tensile Yielding

Member	Area in^2	$ØR_n$ (k)	
W16x40	11.8	531	######
W16x40	11.8	531	######

^EQ J4-1^
<-EQ J4-5

Tensile Rupture
(U=0.7 & Ae=.85A)

A_e (in^2)	$ØR_n$ (k)	
10.03	342	#VALUE!
10.03	342	#VALUE!

^EQ J4-2^

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

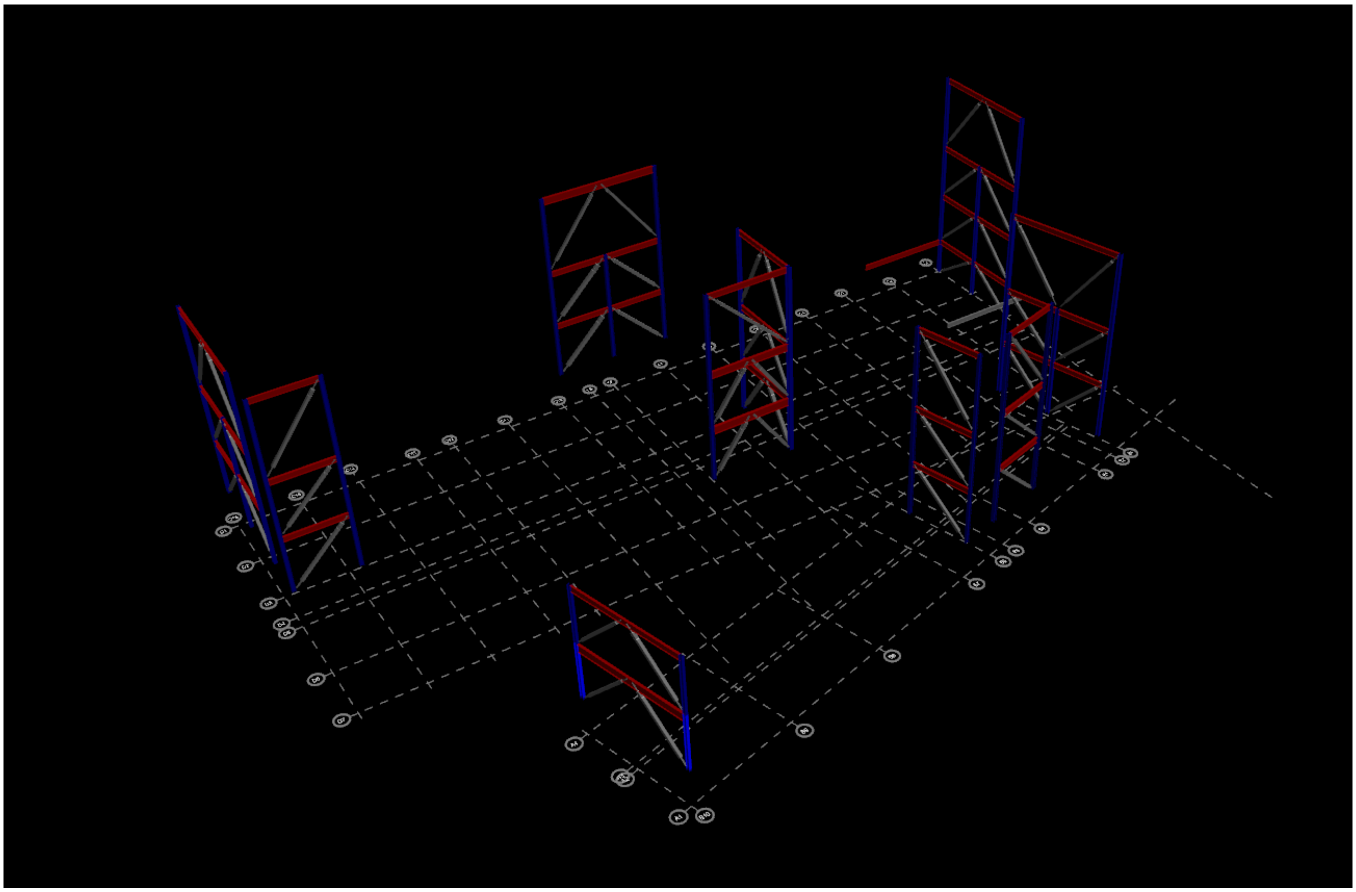
Lateral Load Resisting System -

Vertical Elements - Columns

PRCNC20221036

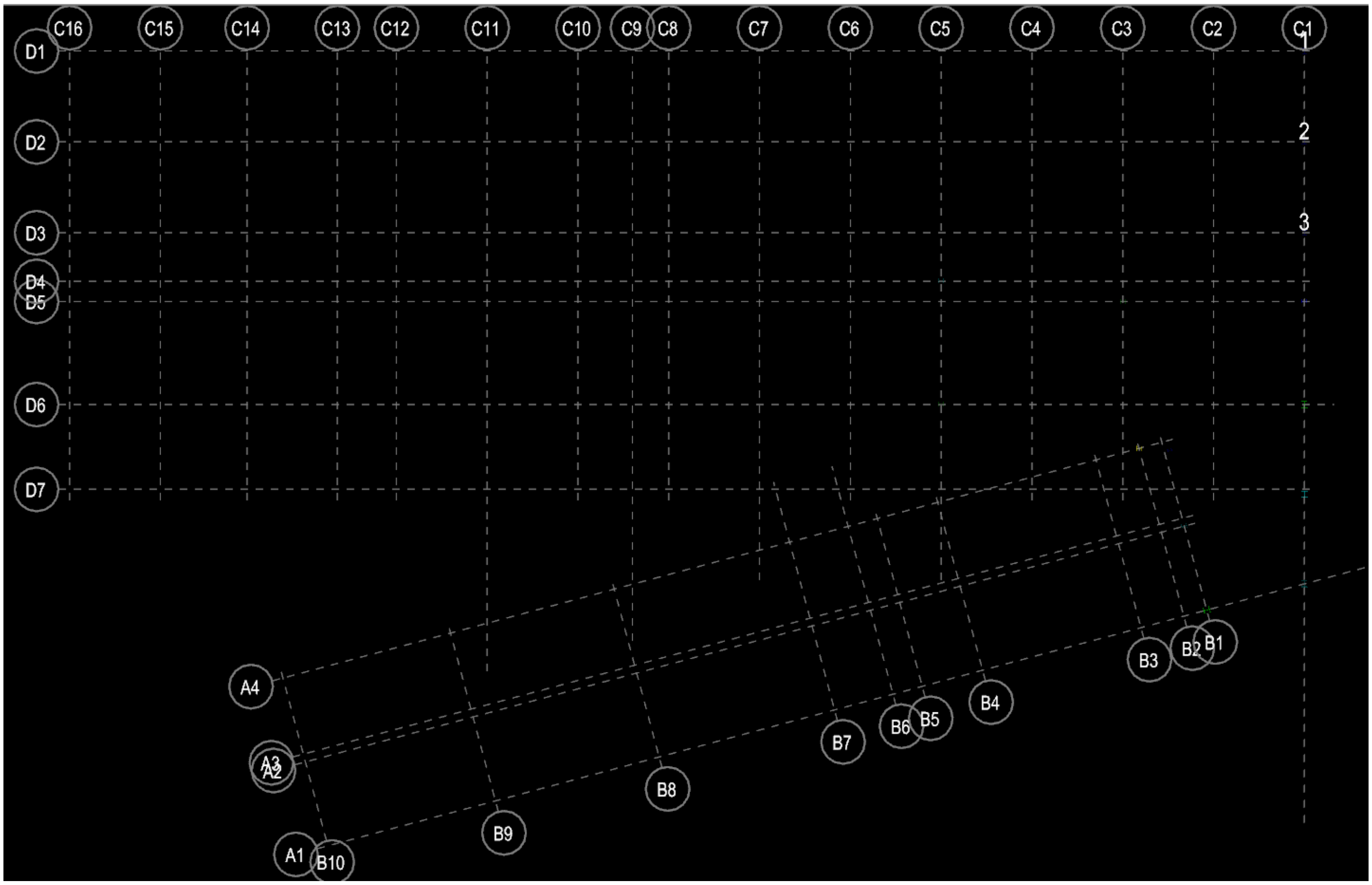
Lateral Column Design - RAM SS

BRB Design Include



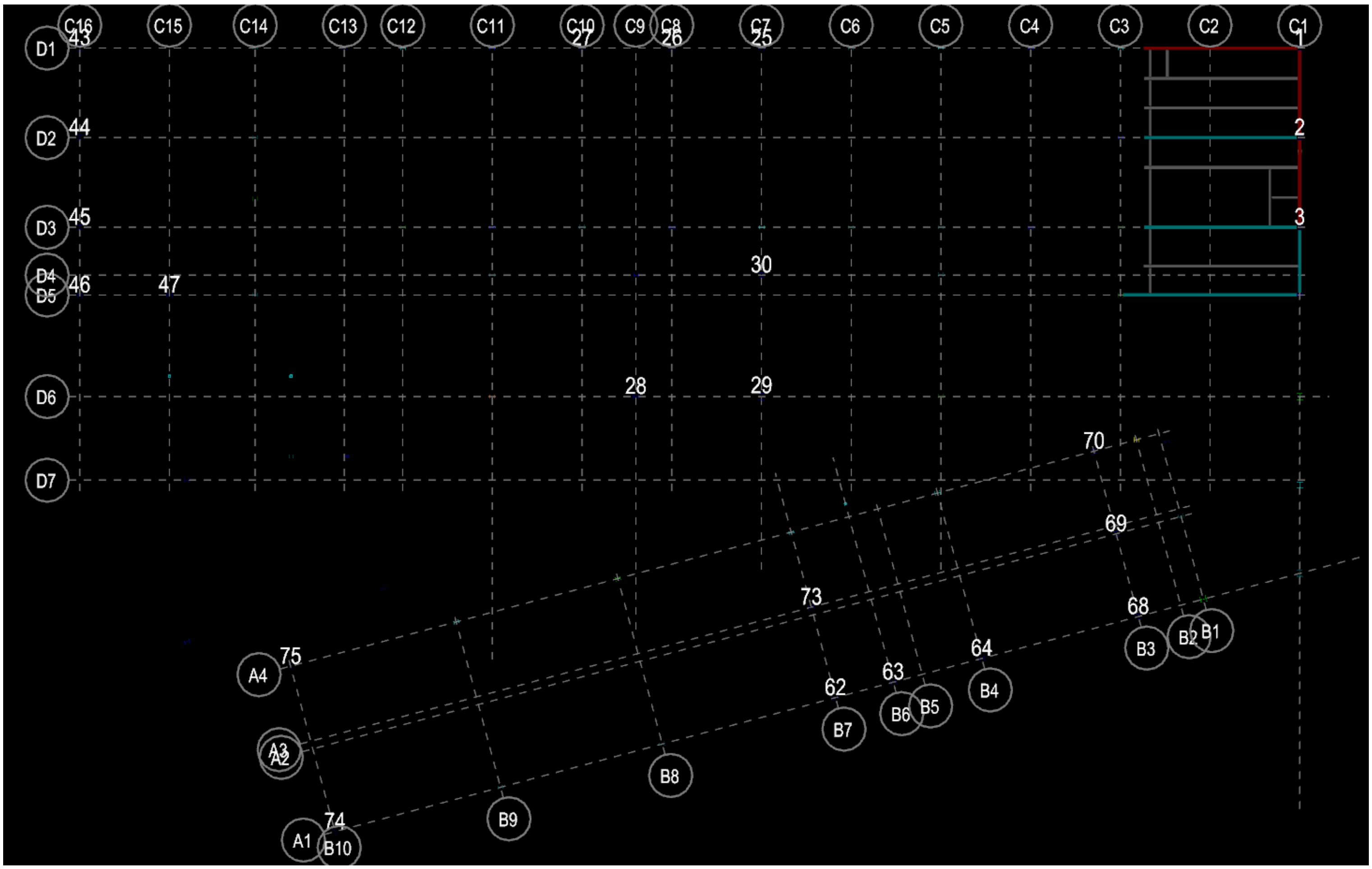
PRCNC20221036

Lateral Column Numbers - Level 1



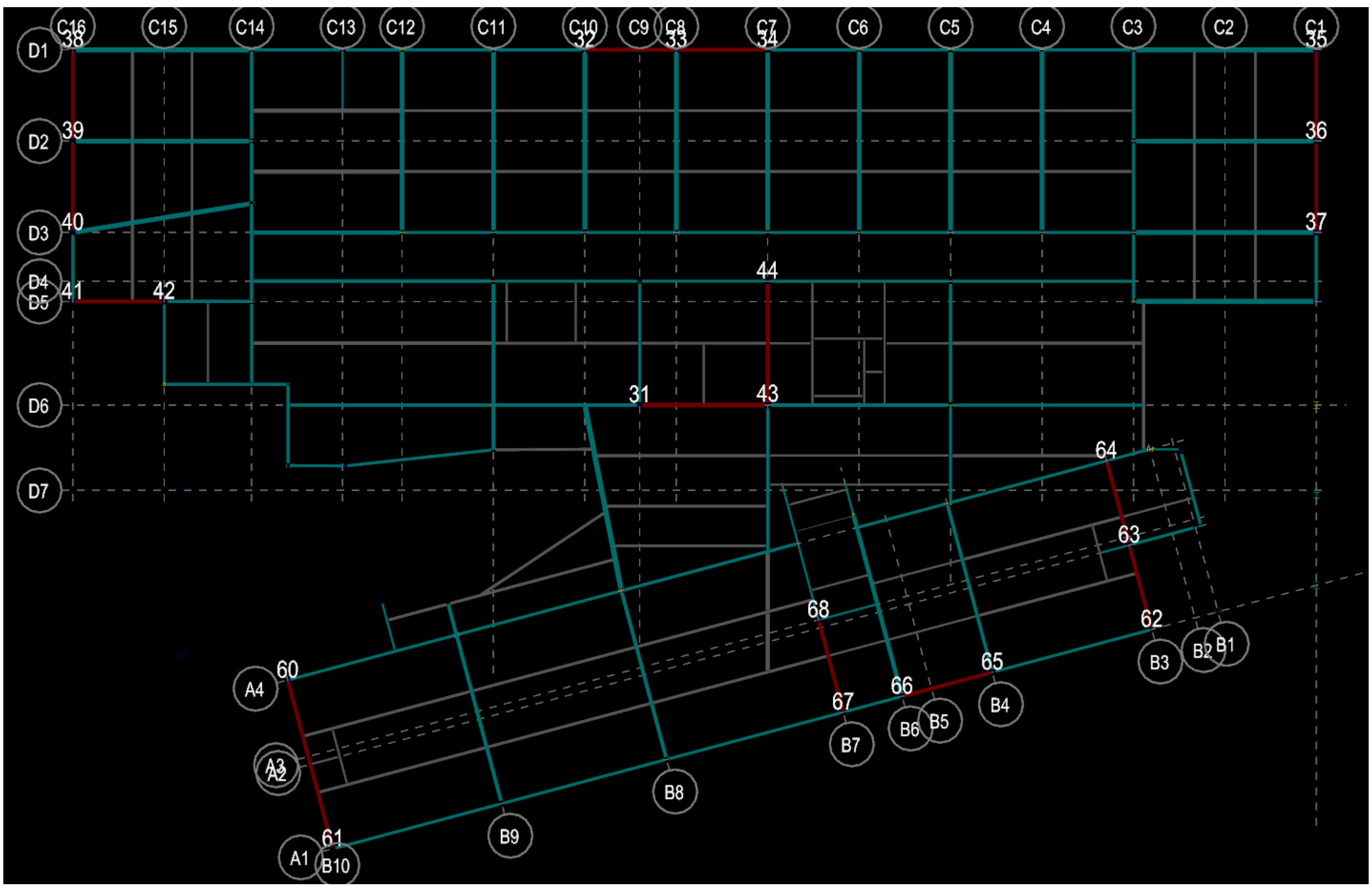
PRCNC20221036

Lateral Column Numbers - Mezzanine



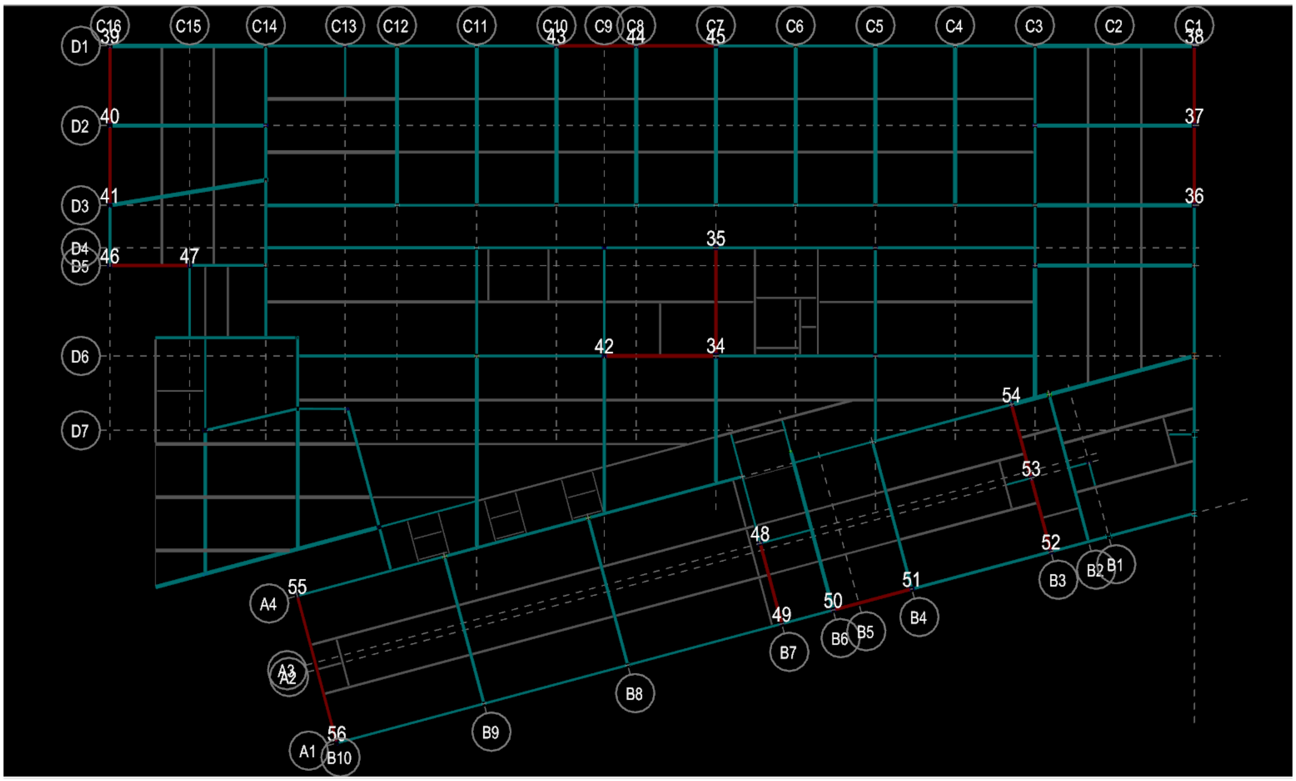
PRCNC20221036

Lateral Column Numbers - Level 2



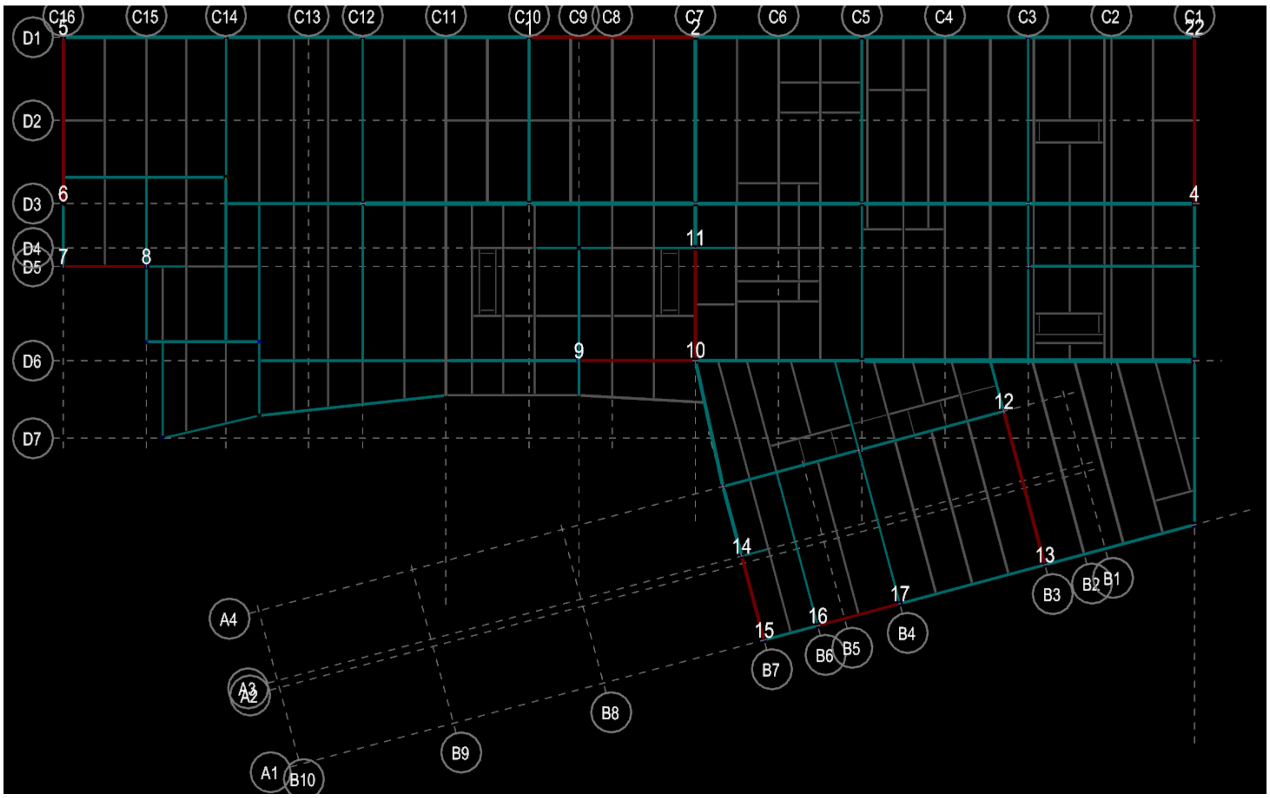
PRCNC20221036

Lateral Column Numbers - Level 3



PRCNC20221036

Lateral Column Numbers - Roof



PRCNC20221036

Corebrace Coordination Values used to determine the expected Strength of the BRB

CoreBrace (CB) Engineering Information
Project: Pierce College
Location: Puyallup, WA

Pinned Connection

Increment for Suggested Values --> 0.05 ±10% <-- Increment for Formatting

Model Correction Parameters

Location and Quantity						Frame and Brace Geometry									Stiffness										
CB-ID #	EOR-ID #	Line	Grids #	Lvls #		H_{WP} in	W_{WP} in	L_{wp} in	θ_{CB} rad	F_{ysc_min} ksi	F_{ysc_max} ksi	A_{sc} in^2	L_{ysc} in	YLR (L_{ysc}/L_{wp})	K_{eff} k/in	K_{LWP} k/in	KF (K_{eff}/K_{LWP})	KF Sugg	EOR KF	CB / EOR	$L_{wp,Model}$ in	$L_{wp,Model}$ / L_{wp}	Model KF Correction	$KF_{Corrected}$ / KF_{CB}	K_{LWP} / K_{eff}
CB-2.00	BRB-2.00	B10	A2 to A4	Level 2	BF-1	177.5	172.0	247.2	0.801	38	46	2.00	141.2	0.57	350	235	1.49	1.50	1.29	1.16	-	-	-	-	0.67
CB-2.00	BRB-2.00	B10	A2 to A1	Level 2	BF-1	177.5	172.0	247.2	0.801	38	46	2.00	141.2	0.57	350	235	1.49	1.50	1.29	1.16	-	-	-	-	0.67
CB-3.00	BRB-3.00	B10	A2 to A4	Mezzanine	BF-1	164.0	172.0	237.7	0.762	38	46	3.00	143.3	0.60	508	366	1.39	1.40	1.31	1.06	-	-	-	-	0.72
CB-3.00	BRB-3.00	B10	A2 to A1	Mezzanine	BF-1	164.0	172.0	237.7	0.762	38	46	3.00	143.3	0.60	508	366	1.39	1.40	1.31	1.06	-	-	-	-	0.72
CB-2.50	BRB-2.50	D5	C15 to C16	Level 3	BF-2	236.0	180.0	296.8	0.919	38	46	2.50	202.7	0.68	318	244	1.30	1.30	1.29	1.01	-	-	-	-	0.77
CB-3.00	BRB-3.00	D5	C15 to C16	Level 2	BF-2	176.0	180.0	251.7	0.774	38	46	3.00	151.2	0.60	484	346	1.40	1.40	1.35	1.04	-	-	-	-	0.71
CB-4.00	BRB-4.00	D5	C15 to C16	Mezzanine	BF-2	168.0	180.0	246.2	0.751	38	46	4.00	171.2	0.70	614	471	1.30	1.30	1.33	0.98	-	-	-	-	0.77
CB-2.00	BRB-2.00	C16	D2 to D1	Level 3	BF-3	236.0	180.0	296.8	0.919	38	46	2.00	203.2	0.68	256	195	1.31	1.30	1.26	1.04	-	-	-	-	0.76
CB-2.00	BRB-2.00	C16	D2 to D3	Level 3	BF-3	236.0	180.0	296.8	0.919	38	46	2.00	203.2	0.68	256	195	1.31	1.30	1.26	1.04	-	-	-	-	0.76
CB-3.00	BRB-3.00	C16	D2 to D1	Level 2	BF-3	176.0	180.0	251.7	0.774	38	46	3.00	151.2	0.60	484	346	1.40	1.40	1.35	1.04	-	-	-	-	0.71
CB-3.00	BRB-3.00	C16	D2 to D3	Level 2	BF-3	176.0	180.0	251.7	0.774	38	46	3.00	151.2	0.60	484	346	1.40	1.40	1.35	1.04	-	-	-	-	0.71
CB-4.00	BRB-4.00	C16	D2 to D1	Mezzanine	BF-3	168.0	180.0	246.2	0.751	38	46	4.00	171.2	0.70	614	471	1.30	1.30	1.33	0.98	-	-	-	-	0.77
CB-4.00	BRB-4.00	C16	D2 to D3	Mezzanine	BF-3	168.0	180.0	246.2	0.751	38	46	4.00	171.2	0.70	614	471	1.30	1.30	1.33	0.98	-	-	-	-	0.77
CB-3.50	BRB-3.50	D1	C8 to C7	Level 3	BF-4	236.0	180.0	296.8	0.919	38	45	3.50	201.3	0.68	442	342	1.29	1.30	1.28	1.01	-	-	-	-	0.77
CB-3.50	BRB-3.50	D1	C8 to C10	Level 3	BF-4	236.0	180.0	296.8	0.919	38	45	3.50	201.3	0.68	442	342	1.29	1.30	1.28	1.01	-	-	-	-	0.77
CB-6.00	BRB-6.00	D1	C8 to C7	Level 2	BF-4	176.0	180.0	251.7	0.774	38	46	6.00	159.0	0.63	977	691	1.41	1.40	1.42	1.00	-	-	-	-	0.71
CB-6.00	BRB-6.00	D1	C8 to C10	Level 2	BF-4	176.0	180.0	251.7	0.774	38	46	6.00	159.0	0.63	977	691	1.41	1.40	1.42	1.00	-	-	-	-	0.71
CB-7.00	BRB-7.00	D1	C8 to C7	Mezzanine	BF-4	168.0	180.0	246.2	0.751	38	46	7.00	164.3	0.67	1102	824	1.34	1.35	1.37	0.98	-	-	-	-	0.75
CB-7.00	BRB-7.00	D1	C8 to C10	Mezzanine	BF-4	168.0	180.0	246.2	0.751	38	46	7.00	164.3	0.67	1102	824	1.34	1.35	1.37	0.98	-	-	-	-	0.75
CB-2.00	BRB-2.00	C1	D2 to D3	Level 3	BF-5	236.0	180.0	296.8	0.919	38	46	2.00	203.2	0.68	256	195	1.31	1.30	1.26	1.04	-	-	-	-	0.76
CB-2.00	BRB-2.00	C1	D2 to D1	Level 3	BF-5	236.0	180.0	296.8	0.919	38	46	2.00	203.2	0.68	256	195	1.31	1.30	1.26	1.04	-	-	-	-	0.76
CB-3.50	BRB-3.50	C1	D2 to D3	Level 2	BF-5	176.0	180.0	251.7	0.774	38	45	3.50	151.0	0.60	564	403	1.40	1.40	1.37	1.02	-	-	-	-	0.71
CB-3.50	BRB-3.50	C1	D2 to D1	Level 2	BF-5	176.0	180.0	251.7	0.774	38	45	3.50	151.0	0.60	564	403	1.40	1.40	1.37	1.02	-	-	-	-	0.71
CB-4.00	BRB-4.00	C1	D2 to D3	Mezzanine	BF-5	170.0	180.0	247.6	0.757	38	46	4.00	161.1	0.65	644	469	1.37	1.35	1.38	1.00	-	-	-	-	0.73
CB-4.00	BRB-4.00	C1	D2 to D1	Mezzanine	BF-5	170.0	180.0	247.6	0.757	38	46	4.00	161.1	0.65	644	469	1.37	1.35	1.38	1.00	-	-	-	-	0.73
CB-4.50	BRB-4.50	C1	D2 to D3	Level 1	BF-5	118.0	180.0	215.2	0.580	38	46	4.50	130.8	0.61	865	606	1.43	1.45	1.41	1.01	-	-	-	-	0.70
CB-4.50	BRB-4.50	C1	D2 to D1	Level 1	BF-5	118.0	180.0	215.2	0.580	38	46	4.50	130.8	0.61	865	606	1.43	1.45	1.41	1.01	-	-	-	-	0.70
CB-2.50	BRB-2.50	B3	A1 to A2	Level 3	BF-6	236.0	172.0	292.0	0.941	38	46	2.50	198.3	0.68	324	248	1.31	1.30	1.25	1.04	-	-	-	-	0.77
CB-2.50	BRB-2.50	B3	A4 to A2	Level 3	BF-6	236.0	172.0	292.0	0.941	38	46	2.50	198.3	0.68	324	248	1.31	1.30	1.25	1.04	-	-	-	-	0.77
CB-3.00	BRB-3.00	B3	A1 to A2	Level 2	BF-6	176.0	172.0	246.1	0.797	38	46	3.00	146.5	0.60	497	354	1.41	1.40	1.35	1.04	-	-	-	-	0.71
CB-3.00	BRB-3.00	B3	A4 to A2	Level 2	BF-6	176.0	172.0	246.1	0.797	38	46	3.00	146.5	0.60	497	354	1.41	1.40	1.35	1.04	-	-	-	-	0.71
CB-3.50	BRB-3.50	B3	A1 to A2	Mezzanine	BF-6	168.0	172.0	240.4	0.774	38	45	3.50	151.1	0.63	567	422	1.34	1.35	1.30	1.03	-	-	-	-	0.74
CB-3.50	BRB-3.50	B3	A4 to A2	Mezzanine	BF-6	168.0	172.0	240.4	0.774	38	45	3.50	151.1	0.63	567	422	1.34	1.35	1.30	1.03	-	-	-	-	0.74
CB-3.50	BRB-3.50	A1	B6 to B4	Level 3	BF-7	236.0	184.0	299.3	0.909	38	45	3.50	203.5	0.68	438	339	1.29	1.30	1.27	1.02	-	-	-	-	0.77
CB-4.00	BRB-4.00	A1	B6 to B4	Level 2	BF-7	176.0	184.0	254.6	0.763	38	46	4.00	168.4	0.66	619	456	1.36	1.35	1.37	0.99	-	-	-	-	0.74
CB-6.00	BRB-6.00	A1	B6 to B4	Mezzanine	BF-7	168.0	184.0	249.2	0.740	38	46	6.00	166.6	0.67	942	698	1.35	1.35	1.38	0.98	-	-	-	-	0.74
CB-2.00	BRB-2.00	B7	A3 to A1	Level 3	BF-8	236.0	188.0	301.7	0.898	38	46	2.00	207.5	0.69	251	192	1.31	1.30	1.25	1.04	-	-	-	-	0.77
CB-2.50	BRB-2.50	B7	A3 to A1	Level 2	BF-8	176.0	188.0	257.5	0.752	38	46	2.50	157.3	0.61	396	282	1.41	1.40	1.37	1.03	-	-	-	-	0.71
CB-3.00	BRB-3.00	B7	A3 to A1	Mezzanine	BF-8	168.0	188.0	252.1	0.729	38	46	3.00	161.4	0.64	460	345	1.33	1.35	1.27	1.05	-	-	-	-	0.75
CB-5.50	BRB-5.50	D6	C9 to C7	Level 3	BF-9	236.0	252.0	345.3	0.753	38	46	5.50	254.2	0.74	577	462	1.25	1.25	1.27	0.98	-	-	-	-	0.80
CB-7.00	BRB-7.00	D6	C9 to CL	Level 2	BF-9	176.0	126.0	216.5	0.949	38	46	7.00	130.4	0.60	1346	938	1.44	1.45	1.49	0.96	-	-	-	-	0.70
CB-7.00	BRB-7.00	D6	CL to C7	Level 2	BF-9	176.0	126.0	216.5	0.949	38	46	7.00	130.4	0.60	1346	938	1.44	1.45	1.45	0.99	-	-	-	-	0.70
CB-8.50	BRB-8.50	D6	C9 to CL	Mezzanine	BF-9	168.0	126.0	210.0	0.927	38	46	8.50	124.0	0.59	1690	1174	1.44	1.45	1.51	0.95	-	-	-	-	0.69
CB-8.50	BRB-8.50	D6	CL to C7	Mezzanine	BF-9	168.0	126.0	210.0	0.927	38	46	8.50	122.7	0.58	1704	1174	1.45	1.45	1.43	1.02	-	-	-	-	0.69
CB-4.50	BRB-4.50	C7	D6 to CL	Level 3	BF-10	236.0	122.0	265.7	1.094	38	46	4.50	183.2	0.69	643	491	1.31	1.30	1.39	0.94	-	-	-	-	0.76
CB-4.50	BRB-4.50	C7	CL to D4	Level 3	BF-10	236.0	122.0	265.7	1.094	38	46	4.50	186.2	0.70	635	491	1.29	1.30	1.37	0.94	-	-	-	-	0.77
CB-5.50	BRB-5.50	C7	D6 to CL	Level 2	BF-10	176.0	122.0	214.1	0.965	38	46	5.50	130.9	0.61	1048	745	1.41	1.40	1.52	0.93	-	-	-	-	0.71
CB-5.50	BRB-5.50	C7	CL to D4	Level 2	BF-10	176.0	122.0	214.1	0.965	38	46	5.50	130.9	0.61	1048	745	1.41	1.40	1.50	0.94	-	-	-	-	0.71
CB-8.00	BRB-8.00	C7	D6 to CL	Mezzanine	BF-10	168.0	122.0	207.6	0.943	38	46	8.00	118.6	0.57	1656	1117	1.48	1.50	1.56	0.95	-	-	-	-	0.67
CB-8.00	BRB-8.00	C7	CL to D4	Mezzanine	BF-10	168.0	122.0	207.6	0.943	38	46	8.00	121.0	0.58	1632	1117	1.46	1.45	1.54	0.95	-	-	-	-	0.68

Shade Changes: FALSE

Min --> 1.25
Max --> 1.50

6.00

Table of Symbols

A_{sc} = Cross sectional area of core at yield section
β = Maximum cpmressive force to Tension force ratio
ω = Maximum Tension force to yield force ratio
H_{wp} = Height between frame workpoints
W_{wp} = Width between frame workpoints

L_{wp} = Length of resulting diagonal
K_{eff} = Effective CB stiffness from WP to WP incl elastic regions
K_{LWP} = CB stiffness using Asc from WP to WP
Δ_{by} = Deformation of CB at first yield
C_d = Deflection amplification factor

Δ_b = Amplified Deformation of CB at Expected Drift (Δby x Cd)
$\Delta_{b1\%}$ = Deformation of CB at 1% Story Drift
Δ_m = Expected Deformation
β = Compression Str Adjustment Factor
ω = Strain Hardening Adjustment Factor

F

Corebrace Coordination Values used to determine the expected Strength of the BRB

Strain & Elongation											Yield & Adj Brace Strength														Location and Quantity					
ϕ_{BRB}	Δ_{by} in	C_d	SSD %	Δ_{bCd} in	Δ_{bSSD} in	$\Delta_{b,max}$ in	Req'd Stroke (in)	Provided Stroke (in)	ε at $2x\Delta_{bCd}$	ε at $2x\Delta_{bSSD}$	P_{y_min} kips	R_{y_eff}	P_{y_max} kips	β	EOR β	CB EOR	ω	EOR ω	CB EOR	βω	EOR βω	CB EOR	P_{uc} kips	P_{ut} kips	CB-ID #	EOR-ID #	Line	Grids #	Lvls #	
0.90	0.17	5.0	1.00%	0.83	1.24	1.24	**1.24**	**3.00**	1.18%	1.75%	76	1.21	92	**1.23**	1.12	*1.10*	**1.38**	1.29	*1.07*	**1.70**	1.44	*1.17*	156	127	CB-2.00	BRB-2.00	B10	A2 to A4	Level 2	BF-1
0.90	0.17	5.0	1.00%	0.83	1.24	1.24	**1.24**	**3.00**	1.18%	1.75%	76	1.21	92	**1.23**	1.12	*1.10*	**1.38**	1.29	*1.07*	**1.70**	1.44	*1.17*	156	127	CB-2.00	BRB-2.00	B10	A2 to A1	Level 2	BF-1
0.90	0.17	5.0	1.00%	0.85	1.19	1.19	**1.19**	**3.00**	1.18%	1.66%	114	1.20	137	**1.22**	1.12	*1.09*	**1.37**	1.30	*1.05*	**1.67**	1.46	*1.15*	228	187	CB-3.00	BRB-3.00	B10	A2 to A4	Mezzanine	BF-1
0.90	0.17	5.0	1.00%	0.85	1.19	1.19	**1.19**	**3.00**	1.18%	1.66%	114	1.20	137	**1.22**	1.12	*1.09*	**1.37**	1.30	*1.05*	**1.67**	1.46	*1.15*	228	187	CB-3.00	BRB-3.00	B10	A2 to A1	Mezzanine	BF-1
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	**1.44**	**3.00**	1.18%	1.42%	95	1.21	115	**1.19**	1.12	*1.06*	**1.34**	1.29	*1.04*	**1.59**	1.44	*1.10*	183	154	CB-2.50	BRB-2.50	D5	C15 to C16	Level 3	BF-2
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	**1.26**	**3.00**	1.18%	1.67%	114	1.20	137	**1.22**	1.12	*1.09*	**1.37**	1.31	*1.05*	**1.67**	1.47	*1.14*	228	187	CB-3.00	BRB-3.00	D5	C15 to C16	Level 2	BF-2
0.90	0.20	5.0	1.00%	1.01	1.23	1.23	**1.23**	**3.00**	1.18%	1.44%	152	1.21	184	**1.17**	1.12	*1.04*	**1.31**	1.31	*1.00*	**1.53**	1.47	*1.04*	282	241	CB-4.00	BRB-4.00	D5	C15 to C16	Mezzanine	BF-2
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	**1.44**	**3.00**	1.18%	1.41%	76	1.21	92	**1.19**	1.11	*1.07*	**1.34**	1.27	*1.06*	**1.59**	1.41	*1.13*	147	123	CB-2.00	BRB-2.00	C16	D2 to D1	Level 3	BF-3
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	**1.44**	**3.00**	1.18%	1.41%	76	1.21	92	**1.19**	1.11	*1.07*	**1.34**	1.27	*1.06*	**1.59**	1.41	*1.13*	147	123	CB-2.00	BRB-2.00	C16	D2 to D3	Level 3	BF-3
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	**1.26**	**3.00**	1.18%	1.67%	114	1.20	137	**1.22**	1.12	*1.09*	**1.37**	1.31	*1.05*	**1.67**	1.47	*1.14*	228	187	CB-3.00	BRB-3.00	C16	D2 to D1	Level 2	BF-3
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	**1.26**	**3.00**	1.18%	1.67%	114	1.20	137	**1.22**	1.12	*1.09*	**1.37**	1.31	*1.05*	**1.67**	1.47	*1.14*	228	187	CB-3.00	BRB-3.00	C16	D2 to D3	Level 2	BF-3
0.90	0.20	5.0	1.00%	1.01	1.23	1.23	**1.23**	**3.00**	1.18%	1.44%	152	1.21	184	**1.17**	1.12	*1.04*	**1.31**	1.31	*1.00*	**1.53**	1.47	*1.04*	282	241	CB-4.00	BRB-4.00	C16	D2 to D1	Mezzanine	BF-3
0.90	0.20	5.0	1.00%	1.01	1.23	1.23	**1.23**	**3.00**	1.18%	1.44%	152	1.21	184	**1.17**	1.12	*1.04*	**1.31**	1.31	*1.00*	**1.53**	1.47	*1.04*	282	241	CB-4.00	BRB-4.00	C16	D2 to D3	Mezzanine	BF-3
0.90	0.24	5.0	1.00%	1.19	1.44	1.44	**1.44**	**3.00**	1.18%	1.43%	133	1.18	158	**1.19**	1.11	*1.07*	**1.34**	1.27	*1.06*	**1.59**	1.41	*1.13*	251	211	CB-3.50	BRB-3.50	D1	C8 to C7	Level 3	BF-4
0.90	0.24	5.0	1.00%	1.19	1.44	1.44	**1.44**	**3.00**	1.18%	1.43%	133	1.18	158	**1.19**	1.11	*1.07*	**1.34**	1.27	*1.06*	**1.59**	1.41	*1.13*	251	211	CB-3.50	BRB-3.50	D1	C8 to C10	Level 3	BF-4
0.90	0.19	5.0	1.00%	0.94	1.26	1.26	**1.26**	**3.00**	1.18%	1.59%	228	1.21	276	**1.14**	1.13	*1.01*	**1.35**	1.33	*1.02*	**1.54**	1.50	*1.02*	425	373	CB-6.00	BRB-6.00	D1	C8 to C7	Level 2	BF-4
0.90	0.19	5.0	1.00%	0.94	1.26	1.26	**1.26**	**3.00**	1.18%	1.59%	228	1.21	276	**1.14**	1.13	*1.01*	**1.35**	1.33	*1.02*	**1.54**	1.50	*1.02*	425	373	CB-6.00	BRB-6.00	D1	C8 to C10	Level 2	BF-4
0.90	0.19	5.0	1.00%	0.97	1.23	1.23	**1.23**	**3.00**	1.18%	1.50%	266	1.21	322	**1.14**	1.13	*1.01*	**1.33**	1.32	*1.01*	**1.52**	1.49	*1.02*	488	428	CB-7.00	BRB-7.00	D1	C8 to C7	Mezzanine	BF-4
0.90	0.19	5.0	1.00%	0.97	1.23	1.23	**1.23**	**3.00**	1.18%	1.50%	266	1.21	322	**1.14**	1.13	*1.01*	**1.33**	1.32	*1.01*	**1.52**	1.49	*1.02*	488	428	CB-7.00	BRB-7.00	D1	C8 to C10	Mezzanine	BF-4
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	**1.44**	**3.00**	1.18%	1.41%	76	1.21	92	**1.19**	1.11	*1.07*	**1.34**	1.27	*1.06*	**1.59**	1.41	*1.13*	147	123	CB-2.00	BRB-2.00	C1	D2 to D3	Level 3	BF-5
0.90	0.24	5.0	1.00%	1.20	1.44	1.44	**1.44**	**3.00**	1.18%	1.41%	76	1.21	92	**1.19**	1.11	*1.07*	**1.34**	1.27	*1.06*	**1.59**	1.41	*1.13*	147	123	CB-2.00	BRB-2.00	C1	D2 to D1	Level 3	BF-5
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	**1.26**	**3.00**	1.18%	1.67%	133	1.18	158	**1.22**	1.12	*1.09*	**1.37**	1.31	*1.05*	**1.67**	1.47	*1.14*	263	216	CB-3.50	BRB-3.50	C1	D2 to D3	Level 2	BF-5
0.90	0.18	5.0	1.00%	0.89	1.26	1.26	**1.26**	**3.00**	1.18%	1.67%	133	1.18	158	**1.22**	1.12	*1.09*	**1.37**	1.31	*1.05*	**1.67**	1.47	*1.14*	263	216	CB-3.50	BRB-3.50	C1	D2 to D1	Level 2	BF-5
0.90	0.19	5.0	1.00%	0.95	1.24	1.24	**1.24**	**3.00**	1.18%	1.54%	152	1.21	184	**1.18**	1.13	*1.04*	**1.34**	1.32	*1.02*	**1.58**	1.49	*1.06*	291	247	CB-4.00	BRB-4.00	C1	D2 to D3	Mezzanine	BF-5
0.90	0.19	5.0	1.00%	0.95	1.24	1.24	**1.24**	**3.00**	1.18%	1.54%	152	1.21	184	**1.18**	1.13	*1.04*	**1.34**	1.32	*1.02*	**1.58**	1.49	*1.06*	291	247	CB-4.00	BRB-4.00	C1	D2 to D1	Mezzanine	BF-5
0.90	0.15	5.0	1.00%	0.77	0.99	0.99	**0.99**	**3.00**	1.18%	1.51%	171	1.21	207	**1.17**	1.12	*1.04*	**1.33**	1.31	*1.02*	**1.56**	1.47	*1.06*	322	275	CB-4.50	BRB-4.50	C1	D2 to D3	Level 1	BF-5
0.90	0.15	5.0	1.00%	0.77	0.99	0.99	**0.99**	**3.00**	1.18%	1.51%	171	1.21	207	**1.17**	1.12	*1.04*	**1.33**	1.31	*1.02*	**1.56**	1.47	*1.06*	322	275	CB-4.50	BRB-4.50	C1	D2 to D1	Level 1	BF-5
0.90	0.23	5.0	1.00%	1.17	1.40	1.40	**1.40**	**3.00**	1.18%	1.41%	95	1.21	115	**1.19**	1.11	*1.07*	**1.34**	1.28	*1.05*	**1.59**	1.42	*1.12*	183	154	CB-2.50	BRB-2.50	B3	A1 to A2	Level 3	BF-6
0.90	0.23	5.0	1.00%	1.17	1.40	1.40	**1.40**	**3.00**	1.18%	1.41%	95	1.21	115	**1.19**	1.11	*1.07*	**1.34**	1.28	*1.05*	**1.59**	1.42	*1.12*	183	154	CB-2.50	BRB-2.50	B3	A4 to A2	Level 3	BF-6
0.90	0.17	5.0	1.00%	0.86	1.23	1.23	**1.23**	**3.00**	1.18%	1.68%	114	1.20	137	**1.22**	1.13	*1.08*	**1.37**	1.32	*1.04*	**1.67**	1.49	*1.12*	228	187	CB-3.00	BRB-3.00	B3	A1 to A2	Level 2	BF-6
0.90	0.17	5.0	1.00%	0.86	1.23	1.23	**1.23**	**3.00**	1.18%	1.68%	114	1.20	137	**1.22**	1.13	*1.08*	**1.37**	1.32	*1.04*	**1.67**	1.49	*1.12*	228	187	CB-3.00	BRB-3.00	B3	A4 to A2	Level 2	BF-6
0.90	0.18	5.0	1.00%	0.89	1.20	1.20	**1.20**	**3.00**	1.18%	1.59%	133	1.18	158	**1.21**	1.12	*1.08*	**1.36**	1.29	*1.05*	**1.65**	1.44	*1.14*	259	214	CB-3.50	BRB-3.50	B3	A1 to A2	Mezzanine	BF-6
0.90	0.18	5.0	1.00%	0.89	1.20	1.20	**1.20**	**3.00**	1.18%	1.59%	133	1.18	158	**1.21**	1.12	*1.08*	**1.36**	1.29	*1.05*	**1.65**	1.44	*1.14*	259	214	CB-3.50	BRB-3.50	B3	A4 to A2	Mezzanine	BF-6
0.90	0.24	5.0	1.00%	1.20	1.46	1.46	**1.46**	**3.00**	1.18%	1.43%	133	1.18	158	**1.19**	1.11	*1.07*	**1.35**	1.27	*1.06*	**1.61**	1.41	*1.14*	253	213	CB-3.50	BRB-3.50	A1	B6 to B4	Level 3	BF-7
0.90	0.20	5.0	1.00%	0.99	1.27	1.27	**1.27**	**3.00**	1.18%	1.51%	152	1.21	184	**1.17**	1.12	*1.04*	**1.33**	1.32	*1.01*	**1.56**	1.48	*1.05*	286	245	CB-4.00	BRB-4.00	A1	B6 to B4	Level 2	BF-7
0.90	0.20	5.0	1.00%	0.98	1.24	1.24	**1.24**	**3.00**	1.18%	1.49%	228	1.21	276	**1.14**	1.13	*1.01*	**1.33**	1.32	*1.01*	**1.52**	1.49	*1.02*	418	367	CB-6.00	BRB-6.00	A1	B6 to B4	Mezzanine	BF-7
0.90	0.24	5.0	1.00%	1.22	1.48	1.48	**1.48**	**3.00**	1.18%	1.42%	76	1.21	92	**1.19**	1.11	*1.07*	**1.34**	1.27	*1.06*	**1.59**	1.41	*1.13*	147	123	CB-2.00	BRB-2.00	B7	A3 to A1	Level 3	BF-8
0.90	0.19	5.0	1.00%	0.93	1.29	1.29	**1.29**	**3.00**	1.18%	1.64%	95	1.21	115	**1.21**	1.13	*1.07*	**1.37**	1.34	*1.02*	**1.66**	1.51	*1.09*	191	158	CB-2.50	BRB-2.50	B7	A3 to A1	Level 2	BF-8
0.90	0.19	5.0	1.00%	0.95	1.26	1.26	**1.26**	**3.00**	1.18%	1.56%	114	1.20	137	**1.20**	1.11	*1.08*	**1.36**	1.29	*1.05*	**1.63**	1.43	*1.14*	223	186	CB-3.00	BRB-3.00	B7	A3 to A1	Mezzanine	BF-8
0.90	0.30	5.0	1.00%	1.50	1.73	1.73	**1.73**	**3.00**	1.18%	1.36%	209	1.21	253	**1.16**	1.11	*1.05*	**1.30**	1.28	*1.02*	**1.51**	1.42	*1.06*	382	329	CB-5.50	BRB-5.50	D6	C9 to C7	Level 3	BF-9
0.90	0.15	5.0	1.00%	0.77	1.03	1.03	**1.03**	**3.00**	1.18%	1.58%	266	1.21	322	**1.14**	1.14	*1.00*	**1.35**	1.34	*1.01*	**1.54**	1.53	*1.01*	496	435	CB-7.00	BRB-7.00	D6	C9 to CL	Level 2	BF-9
0.90	0.15	5.0	1.00%	0.77	1.03	1.03	**1.03**	**3.00**	1.18%	1.58%	266	1.21	322	**1.14**	1.13	*1.01*	**1.35**	1.33	*1.02*	**1.54**	1.50	*1.02*	496	435	CB-7.00	BRB-7.00	D6	CL to C7	Level 2	BF-9
0.90	0.15	5.0	1.00%	0.73	1.01	1.01	**1.01**	**3.00**	1.18%	1.63%	323	1.21	391	**1.14**	1.14	*1.00*	**1.36**	1.36	*1.00*	**1.55**	1.55	*1.00*	606	532	CB-8.50	BRB-8.50	D6	C9 to CL	Mezzanine	BF-9
0.90	0.14	5.0	1.00%	0.72	1.01	1.01	**1.01**	**3.00**	1.18%	1.65%	323	1.21	391	**1.14**	1.13	*1.01*	**1.36**	1.33	*1.02*	**1.55**	1.50	*1.03*	606	532	CB-8.50	BRB-8.50	D6	CL to C7	Mezzanine	BF-9
0.90	0.22	5.0	1.00%	1.08	1.09	1.09	**1.09**	**3.00**	1.18%	1.19%	171	1.21	207	**1.15**	1.10	*1.05*	**1.26**	1.26	*1.00*	**1.45**	1.39	*1.05*	300	261	CB-4.50	BRB-4.50	C7	D6 to CL	Level 3	BF-10
0.90	0.22	5.0	1.00%	1.10	1.09	1.10	**1.10**	**3.00**	1.18%	1.17%	171	1.21	207	**1.15**	1.10	*1.05*	**1.25**	1.25	*1.00*	**1.44**	1.38	*1.05*	298	259	CB-4.50	BRB-4.50	C7	CL to D4	Level 3	BF-10
0.90	0.15	5.0	1.00%	0.77	1.01	1.01	**1.01**	**3.00**	1.18%	1.54%	209	1.21	253	**1.18**	1.14	*1.04*	**1.34**	1.34	*1.00*	**1.58**	1.53	*1.04*	400	339	CB-5.50	BRB-5.50	C7	D6 to CL	Level 2	BF-10
0.90	0.15	5.0	1.00%	0.77	1.01	1.01	**1.01**	**3.00**	1.18%	1.54%	209	1.21	253	**1.18**	1.13	*1.04*	**1.34**	1.34	*1.00*	**1.58**	1.51	*1.04*	400	339	CB-5.50	BRB-5.50	C7	CL to D4	Level 2	BF-10
0.90	0.14	5.0	1.00%	0.70	0.99	0.99	**0.99**	**3.00**	1.18%	1.67%	304	1.21	368	**1.14**	1.15	*0.99*	**1.36**	1.37	*0.99*	**1.55**	1.58	*0.98*	571	500	CB-8.00	BRB-8.00	C7	D6 to CL	Mezzanine	BF-10
0.90	0.14	5.0	1.00%	0.71	0.99	0.99	**0.99**	**3.00**	1.18%	1.64%	304	1.21	368	**1.14**	1.14	*1.00*	**1.36**	1.36	*1.00*	**1.55**	1.55	*1.00*	571	500	CB-8.00	BRB-8.00	C7	CL to D4	Mezzanine	BF-10
													Max -->	**1.23**	1.15	*1.10*	**1.38**	1.37	*1.07*	**1.70**	1.58	*1.17*								

<-- No. Steps in Rounded KF Range

P_{y_min} = Minimum CB Yield Strength based on F_{y_min} x A_{sc}
R_{y_eff} = F_{y_max}/F_{y_min} (allowable range verified by coupon tests)
P_{y_max} = Max CB Yield Strength based on F_{y_max} x A_{sc} (or P_{y_min}*R_{y_eff})
Req'd Stroke = Required Stroke at Each End of CB
Provided Stroke = Provided Stroke at Each End of CB

P_{uc} = Adjusted Brace Strength in compression: $\beta\omega A_{sc}F_{y,max}$ (or $\beta\omega P_{y,max}$)
P_{ut} = Adjusted Brace Strength in tension: $\omega A_{sc}F_{y,max}$ (or $\omega P_{y,max}$)
P_{ub} = Potential unblanced load on beam at V or Chev configuration (assumed same size brace)

$P_{uc,h}$ = Horizontal component of compressive a
$P_{uc,v}$ = Vertical component of compressive adju
$P_{ut,h}$ = Horizontal component of tensile adjuste
$P_{ut,v}$ = Vertical component of tensile adjusted b
$Pd_{,h}$ = Horizontal component of demand on br

Corebrace Coordination Values used to determine the expected Strength of the BRB

These are the beam reactions (Rub) and Connection Capacities (Vconn) we are assuming for now. Please confirm or provide more accurate values.

COREBRACE
SUPERIOR SEISMIC PERFORMANCE

Component Forces					Assumed Bm Rxn and Conn Capacity				Shear Demand Capacity Ratios				Casing						Location and Quantity					
P_{ub}	$P_{uc,h}$	$P_{uc,v}$	$P_{ut,h}$	$P_{ut,v}$	$R_{ub,b}$	$V_{Conn,b}$[1]	$R_{ub,t}$	$V_{Conn,t}$[1]	Bottom		Top		HSS	Profile	Approx	h_{HSS}	w_{HSS}	t_{HSS}	CB-ID	EOR-ID	Line	Grids	Lvls	
kips	kips	kips	kips	kips	kips	kips	kips	kips	Bm	Col	Bm	Col	Type		Size	in	in	in	#	#		#	#	
21	109	112	88	91	30	189	-	-	0.44	0.38	0.53	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	B10	A2 to A4	Level 2	BF-1
21	109	112	88	91	30	189	-	-	0.44	0.38	0.53	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	B10	A2 to A1	Level 2	BF-1
28	165	157	135	129	30	0	-	-	-	-	0.65	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B10	A2 to A4	Mezzanine	BF-1
28	165	157	135	129	30	0	-	-	-	-	0.65	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B10	A2 to A1	Mezzanine	BF-1
23	111	146	93	123	30	139	30	139	0.61	0.50	0.73	0.40	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.50	BRB-2.50	D5	C15 to C16	Level 3	BF-2
29	163	160	134	131	30	139	30	139	0.67	0.57	0.79	0.44	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	D5	C15 to C16	Level 2	BF-2
28	206	192	176	164	30	0	30	139	-	0.79	0.91	0.53	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	D5	C15 to C16	Mezzanine	BF-2
19	89	117	75	98	30	139	-	-	0.53	0.42	0.54	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	C16	D2 to D1	Level 3	BF-3
19	89	117	75	98	30	139	-	-	0.53	0.42	0.54	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	C16	D2 to D3	Level 3	BF-3
29	163	160	134	131	30	139	30	139	0.67	0.58	0.79	0.69	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	C16	D2 to D1	Level 2	BF-3
29	163	160	134	131	30	139	30	139	0.67	0.58	0.79	0.69	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	C16	D2 to D3	Level 2	BF-3
28	206	192	176	164	30	0	30	139	-	0.80	0.92	0.83	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	C16	D2 to D1	Mezzanine	BF-3
28	206	192	176	164	30	0	30	139	-	0.80	0.92	0.83	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	C16	D2 to D3	Mezzanine	BF-3
32	152	200	128	168	30	139	-	-	0.78	0.51	0.89	-	t	□	t8x8x0.3125	8	8.00	0.3125	CB-3.50	BRB-3.50	D1	C8 to C7	Level 3	BF-4
32	152	200	128	168	30	139	-	-	0.78	0.51	0.89	-	t	□	t8x8x0.3125	8	8.00	0.3125	CB-3.50	BRB-3.50	D1	C8 to C10	Level 3	BF-4
36	304	297	266	260	30	139	30	139	1.04	0.73	1.24	0.86	t	□	t10x10x0.25	10	10.00	0.2500	CB-6.00	BRB-6.00	D1	C8 to C7	Level 2	BF-4
36	304	297	266	260	30	139	30	139	1.04	0.73	1.24	0.86	t	□	t10x10x0.25	10	10.00	0.2500	CB-6.00	BRB-6.00	D1	C8 to C10	Level 2	BF-4
41	357	333	313	292	30	0	30	139	-	1.00	1.38	0.96	t	□	t12x12x0.25	12	12.00	0.2500	CB-7.00	BRB-7.00	D1	C8 to C7	Mezzanine	BF-4
41	357	333	313	292	30	0	30	139	-	1.00	1.38	0.96	t	□	t12x12x0.25	12	12.00	0.2500	CB-7.00	BRB-7.00	D1	C8 to C10	Mezzanine	BF-4
19	89	117	75	98	30	139	-	-	0.53	0.34	0.54	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	C1	D2 to D3	Level 3	BF-5
19	89	117	75	98	30	139	-	-	0.53	0.39	0.54	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	C1	D2 to D1	Level 3	BF-5
33	188	184	154	151	30	139	30	139	0.75	0.54	0.89	0.73	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.50	BRB-3.50	C1	D2 to D3	Level 2	BF-5
33	188	184	154	151	30	139	30	139	0.75	0.62	0.89	0.73	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.50	BRB-3.50	C1	D2 to D1	Level 2	BF-5
30	212	200	179	169	30	139	30	139	0.80	0.59	0.94	0.79	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	C1	D2 to D3	Mezzanine	BF-5
30	212	200	179	169	30	139	30	139	0.80	0.66	0.94	0.79	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	C1	D2 to D1	Mezzanine	BF-5
26	269	177	230	151	30	0	30	139	-	0.72	0.87	0.71	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.50	BRB-4.50	C1	D2 to D3	Level 1	BF-5
26	269	177	230	151	30	0	30	139	-	0.77	0.87	0.71	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.50	BRB-4.50	C1	D2 to D1	Level 1	BF-5
24	108	148	91	125	-	-	30	139	0.52	-	0.79	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.50	BRB-2.50	B3	A1 to A2	Level 3	BF-6
24	108	148	91	125	-	-	30	139	0.52	-	0.79	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.50	BRB-2.50	B3	A4 to A2	Level 3	BF-6
29	159	163	131	134	30	139	30	139	0.72	-	0.84	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B3	A1 to A2	Level 2	BF-6
29	159	163	131	134	30	139	30	139	0.72	-	0.84	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B3	A4 to A2	Level 2	BF-6
31	185	181	153	150	30	0	30	139	-	-	0.92	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.50	BRB-3.50	B3	A1 to A2	Mezzanine	BF-6
31	185	181	153	150	30	0	30	139	-	-	0.92	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.50	BRB-3.50	B3	A4 to A2	Mezzanine	BF-6
32	156	200	131	168	30	139	30	139	0.78	0.57	0.92	0.54	t	□	t8x8x0.3125	8	8.00	0.3125	CB-3.50	BRB-3.50	A1	B6 to B4	Level 3	BF-7
29	207	198	177	169	30	139	30	139	0.79	0.58	0.93	0.54	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.00	BRB-4.00	A1	B6 to B4	Level 2	BF-7
35	309	282	271	248	30	0	30	139	-	0.95	1.19	0.73	t	□	t10x10x0.25	10	10.00	0.2500	CB-6.00	BRB-6.00	A1	B6 to B4	Mezzanine	BF-7
18	91	115	77	96	30	139	30	139	0.56	-	0.65	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.00	BRB-2.00	B7	A3 to A1	Level 3	BF-8
23	139	130	115	108	30	139	30	139	0.62	-	0.72	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-2.50	BRB-2.50	B7	A3 to A1	Level 2	BF-8
25	166	148	138	124	30	0	30	139	-	-	0.78	-	t	□	t8x8x0.25	8	8.00	0.2500	CB-3.00	BRB-3.00	B7	A3 to A1	Mezzanine	BF-8
36	278	261	240	225	30	139	30	139	1.01	-	1.13	0.60	t	□	t10x10x0.3125	10	10.00	0.3125	CB-5.50	BRB-5.50	D6	C9 to C7	Level 3	BF-9
49	288	403	253	353	30	139	-	-	1.30	0.73	1.58	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-7.00	BRB-7.00	D6	C9 to CL	Level 2	BF-9
49	288	403	253	353	30	139	-	-	1.40	-	1.58	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-7.00	BRB-7.00	D6	CL to C7	Level 2	BF-9
60	364	485	319	425	30	0	-	-	-	0.89	1.80	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-8.50	BRB-8.50	D6	C9 to CL	Mezzanine	BF-9
60	364	485	319	425	30	0	-	-	-	-	1.80	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-8.50	BRB-8.50	D6	CL to C7	Mezzanine	BF-9
35	138	266	120	232	30	139	-	-	0.78	0.30	1.02	-	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.50	BRB-4.50	C7	D6 to CL	Level 3	BF-10
34	137	264	119	230	30	139	-	-	0.86	0.51	1.01	-	t	□	t10x10x0.25	10	10.00	0.2500	CB-4.50	BRB-4.50	C7	CL to D4	Level 3	BF-10
50	228	329	193	279	30	139	-	-	1.07	0.45	1.30	-	t	□	t10x10x0.25	10	10.00	0.2500	CB-5.50	BRB-5.50	C7	D6 to CL	Level 2	BF-10
50	228	329	193	279	30	139	-	-	1.10	0.69	1.30	-	t	□	t10x10x0.25	10	10.00	0.2500	CB-5.50	BRB-5.50	C7	CL to D4	Level 2	BF-10
57	335	462	294	405	30	0	-	-	-	0.78	1.70	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-8.00	BRB-8.00	C7	D6 to CL	Mezzanine	BF-10
57	335	462	294	405	30	0	-	-	-	0.90	1.70	-	t	□	t12x12x0.25	12	12.00	0.2500	CB-8.00	BRB-8.00	C7	CL to D4	Mezzanine	BF-10

adjusted brace strength
usted brace strength
ed brace strength
brace strength
ace

The Above Reactions and Capacities to be Verified by EOR

Note 1: The full shear capacity of the beam web should be developed in the connection whenever possible.

$R_{ub,b}$ = Assumed beam rxn (w/out BRB Rxn) at beam at bott of BRB

$V_{Conn,b}$ = Assumed bm-to-col conn shear capacity at beam at bott of BRB

$R_{ub,t}$ = Assumed beam rxn (w/out BRB Rxn) at beam at top of BRB

$V_{Conn,t}$ = Assumed bm-to-col conn shear capacity at beam at top of BRB

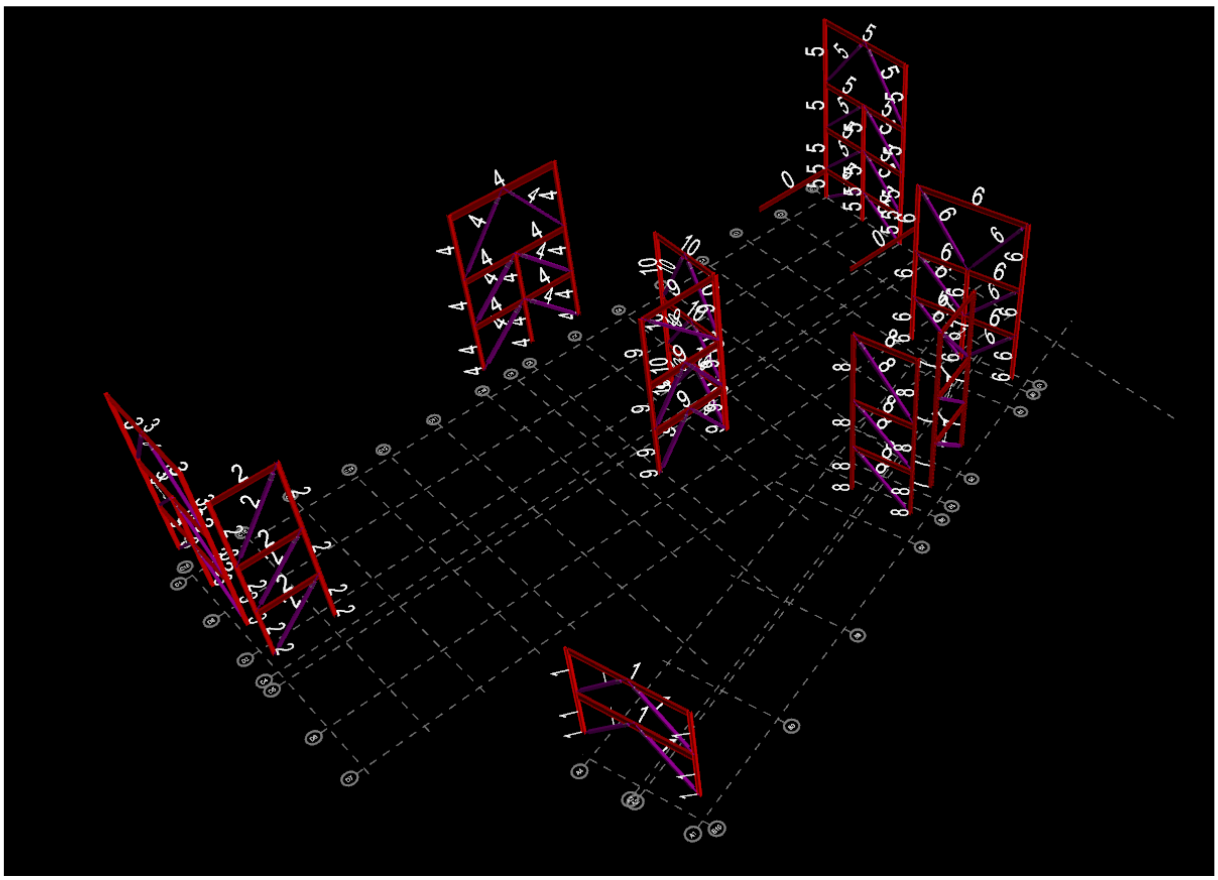
Shear Demand Capacity Checks

Note 1: These checks help eliminate doubler plates on bms and cols.

Bm = Check of BRB rxn at beam (V_{ub}) from braces on both sides of column + assumed beam rxn (R_{ub}) against full beam shear capacity (ϕV_{nb}). Locatons in RED should consider beam with higher shear capacity.

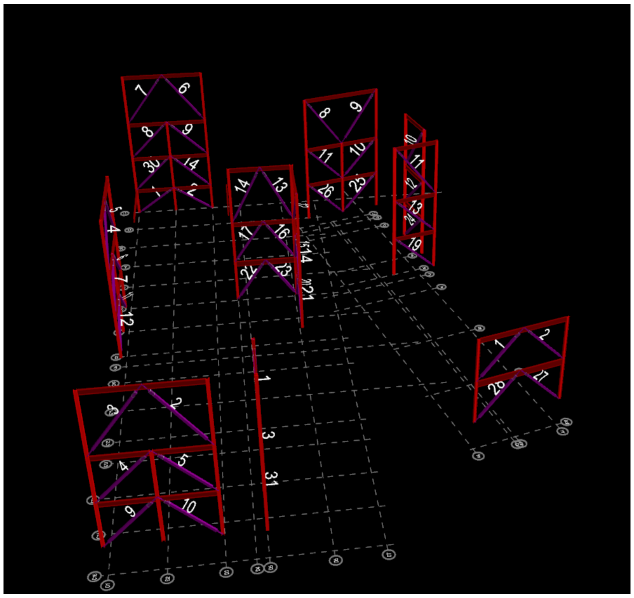
Col = Similar to Bm check but considers H_{uc} & no Bm rxn.

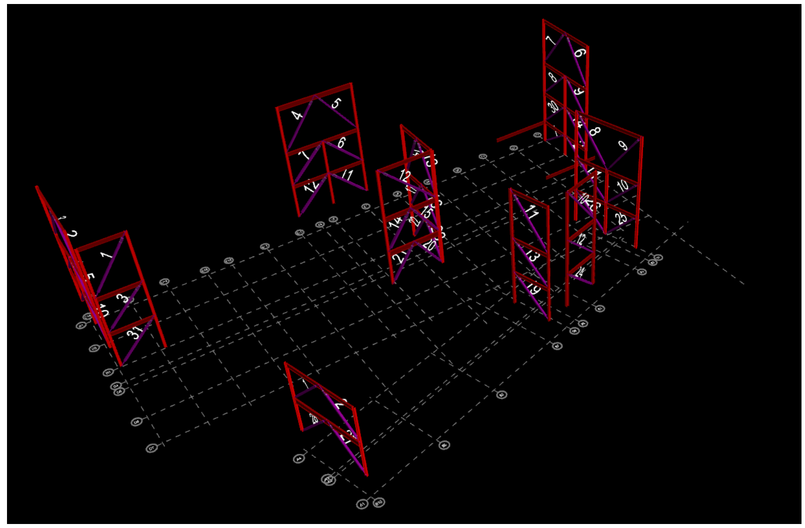
RAM SS Frame Numbers

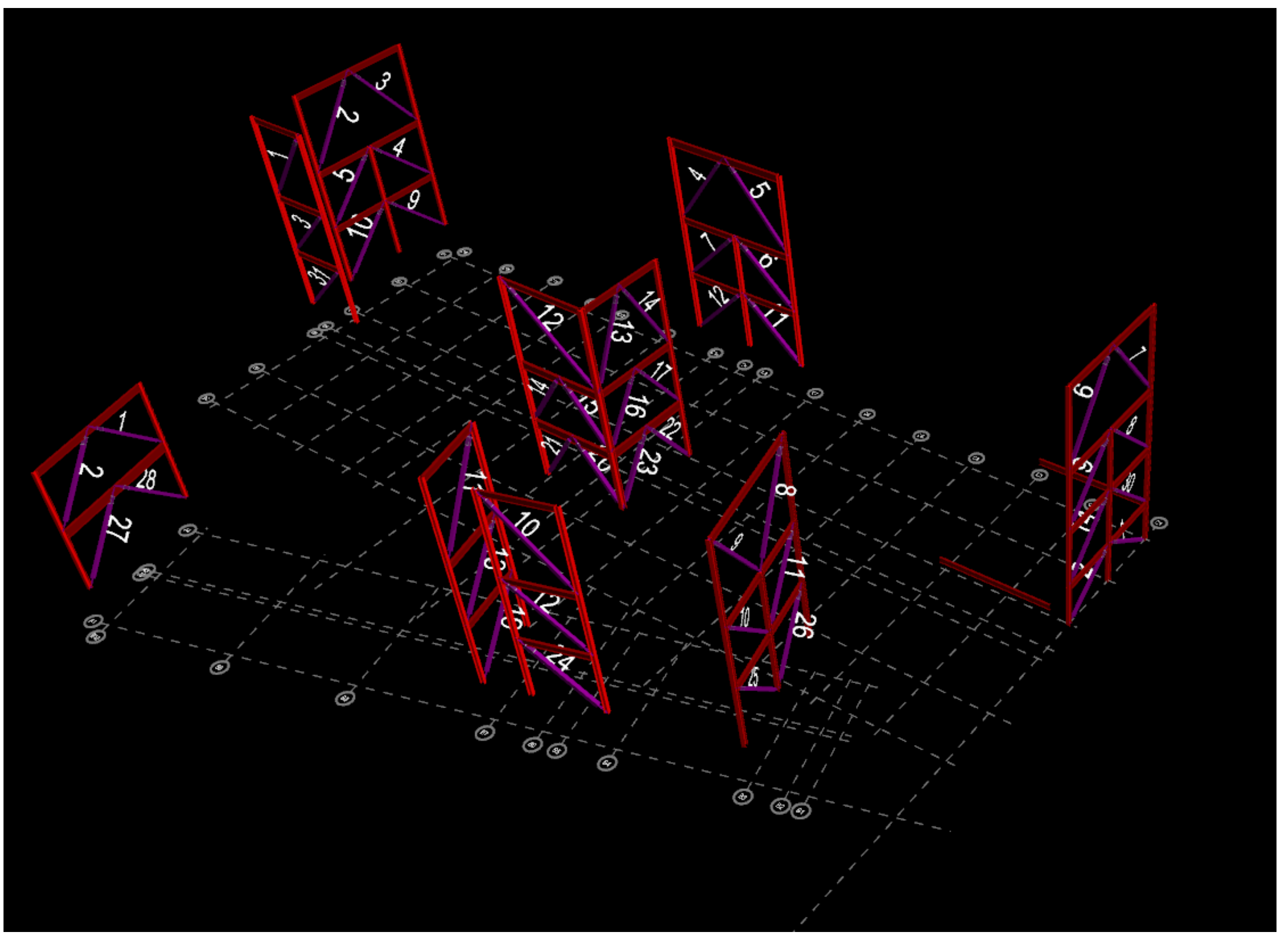


PRCNC20221036

RAM SS BRB Numbers







PRCNC20221036

Seismic Provisions Member Code Check

Column Parameters

Story: Level 3 Frame No: 1 Member No: 55
Fy (ksi): 50.00 Size: W10X33
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.
D1.4a(a) – Ecl based on Adjusted Brace Strength:
Compression: Max Pu (kip) = 31.43 --- Combination: 1.401 D + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.13 OK
Tension: No tension on column
Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn6	31.53	239.59	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn6	31.53
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 31.53 ϕPy (kip) = 436.95

Flange b/tf =	9.15	Limit =	9.18	OK
Web h/tw =	27.10	Limit =	70.98	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	323.33	116.67

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3 | Frame No: 1 | Member No: 56
Fy (ksi): 50.00 | Size: W10X33
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 30.52 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.13 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	30.63	239.59	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	30.63
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 30.63 ϕPy (kip) = 436.95

Flange b/tf =	9.15	Limit =	9.18	OK
Web h/tw =	27.10	Limit =	71.55	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	323.33	116.67

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 3 Frame No: 1 Member No: 1
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_2.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.23 ω = 1.38
Cmax = βωRyPyscmax = 156.16 kip
Tmax = ωRyPyscmax = 126.96 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.23 ω = 1.38
Cmax = βωRyPyscmax = 156.16 kip
Tmax = ωRyPyscmax = 126.96 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn8
Pu (kip) = 55.19 ϕFyscAsc (kip) = 68.40 Pu/ϕFyscAsc = 0.81

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 68.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =22.80 <= Pysc <= 1.2Pysc =91.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.961 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.540%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.473 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.390%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 156.16

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 3 Frame No: 1 Member No: 2
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_2.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.23 ω = 1.38
Cmax = βωRyPyscmax = 156.16 kip
Tmax = ωRyPyscmax = 126.96 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.23 ω = 1.38
Cmax = βωRyPyscmax = 156.16 kip
Tmax = ωRyPyscmax = 126.96 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn8
Pu (kip) = 55.18 ϕFyscAsc (kip) = 68.40 Pu/ϕFyscAsc = 0.81

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 68.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =22.80 <= Pysc <= 1.2Pysc =91.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.961 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.540%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.473 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.390%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 156.16

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 Frame No: 1 Member No: 60
Fy (ksi): 50.00 Size: W10X33
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 167.35 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 101.24
Max Pu/ϕPn = 0.70 OK

Tension: Max Pu (kip) = 73.63 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -101.24
Max Pu/ϕPn = 0.17 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn8	142.19	239.59	OK
Tension:	0.699 D - 2.500 Dyn8	48.47	436.95	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	167.35
Tension:	0.699 D + 1.000 Ecl	73.63

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 167.35 ϕPy (kip) = 436.95

Flange b/tf =	9.15	Limit =	9.18	OK
Web h/tw =	27.10	Limit =	51.45	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	323.33	116.67

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 Frame No: 1 Member No: 61
Fy (ksi): 50.00 Size: W10X33
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 165.63 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 101.24
Max Pu/ϕPn = 0.69 OK

Tension: Max Pu (kip) = 74.38 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -101.24
Max Pu/ϕPn = 0.17 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	140.48	239.59	OK
Tension:	0.699 D + 2.500 Dyn8	49.23	436.95	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	165.63
Tension:	0.699 D + 1.000 Ecl	74.38

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 165.63 ϕPy (kip) = 436.95

Flange b/tf =	9.15	Limit =	9.18	OK
Web h/tw =	27.10	Limit =	51.57	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	323.33	116.67

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 2 Frame No: 1 Member No: 27
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_3.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn8
Pu (kip) = 72.06 ϕFyscAsc (kip) = 102.60 Pu/ϕFyscAsc = 0.70
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 102.60
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =34.20 <= Pysc <= 1.2Pysc =136.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.896 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.527%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.473 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.455%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 230.65
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 2 Frame No: 1 Member No: 28
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_3.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn8
Pu (kip) = 72.07 ϕFyscAsc (kip) = 102.60 Pu/ϕFyscAsc = 0.70

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 102.60
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =34.20 <= Pysc <= 1.2Pysc =136.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.896 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.527%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.473 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.455%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 230.65

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Mezzanine   Frame No: 1   Member No: 74
Fy (ksi): 50.00   Size: W10X33
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 165.66 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 101.24
Max Pu/ϕPn = 0.69 OK

Tension: Max Pu (kip) = 74.37 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -101.24
Max Pu/ϕPn = 0.17 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	140.50	239.59	OK
Tension:	0.699 D + 2.500 Dyn8	49.22	436.95	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	165.66
Tension:	0.699 D + 1.000 Ecl	74.37

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 165.66   ϕPy (kip) = 436.95

Flange b/tf =	9.15	Limit =	9.18	OK
Web h/tw =	27.10	Limit =	51.57	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine Frame No: 1 Member No: 75
Fy (ksi): 50.00 Size: W10X33
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 167.37 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 101.24
Max Pu/ϕPn = 0.70 OK

Tension: Max Pu (kip) = 73.62 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -101.24
Max Pu/ϕPn = 0.17 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn8	142.21	239.59	OK
Tension:	0.699 D - 2.500 Dyn8	48.46	436.95	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	167.37
Tension:	0.699 D + 1.000 Ecl	73.62

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 167.37 ϕPy (kip) = 436.95

Flange b/tf =	9.15	Limit =	9.18	OK
Web h/tw =	27.10	Limit =	51.45	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof Frame No: 2 Member No: 7
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 5.60 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.01 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	5.60	489.12	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	5.60
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 5.60 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	89.20	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Roof   Frame No: 2   Member No: 8
Fy (ksi): 50.00   Size: W10X77
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 131.99 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 122.53
Max Pu/ϕPn = 0.24 OK

Tension: Max Pu (kip) = 141.46 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -145.81
Max Pu/ϕPn = 0.14 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp + 2.500 Dyn5	115.99	560.46	OK
Tension:	0.699 D - 2.500 Dyn5	102.18	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	131.99
Tension:	0.699 D + 1.000 Ecl	141.46

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 131.99   ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	58.97	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	813.33	382.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Roof   Frame No: 2   Member No: 1
Fymin (ksi): 38.00   Fymax (ksi): 46.00   Size: CoreBRB_2.50   Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19   ω = 1.34
Cmax = βωRyPyscmax = 183.38 kip
Tmax = ωRyPyscmax = 154.10 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19   ω = 1.34
Cmax = βωRyPyscmax = 183.38 kip
Tmax = ωRyPyscmax = 154.10 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn5
Pu (kip) = 69.67   ϕFyscAsc (kip) = 85.50   Pu/ϕFyscAsc = 0.81

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 85.50
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =28.50 <= Pysc <= 1.2Pysc =114.00

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.350 in
Load Case: Dyn5   Modal Force X   Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.661%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.886 in
Load Case: Dyn5   Modal Force X   Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.414%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 183.38

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3 Frame No: 2 Member No: 46
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 185.32 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 145.81
Max Pu/ϕPn = 0.29 OK

Tension: Max Pu (kip) = 104.59 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -122.53
Max Pu/ϕPn = 0.12 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn5	146.18	639.72	OK
Tension:	0.699 D + 2.500 Dyn5	88.73	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	185.32
Tension:	0.699 D + 1.000 Ecl	104.59

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 185.32 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	56.67	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3 Frame No: 2 Member No: 47
Fy (ksi): 50.00 Size: W10X77
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 306.04 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 254.70
Max Pu/ϕPn = 0.42 OK

Tension: Max Pu (kip) = 285.47 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -307.06
Max Pu/ϕPn = 0.28 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	236.43	731.56	OK
Tension:	0.699 D - 2.500 Dyn5	163.50	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	306.04
Tension:	0.699 D + 1.000 Ecl	285.47

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 306.04 ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	53.92	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	813.33	382.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 3 Frame No: 2 Member No: 3
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_3.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn5
Pu (kip) = 70.19 ϕFyscAsc (kip) = 102.60 Pu/ϕFyscAsc = 0.68

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 102.60
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =34.20 <= Pysc <= 1.2Pysc =136.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.893 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.528%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.497%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 230.65

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 Frame No: 2 Member No: 41
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 357.26 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 307.06
Max Pu/ϕPn = 0.56 OK

Tension: Max Pu (kip) = 232.87 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -254.70
Max Pu/ϕPn = 0.26 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn5	235.60	639.72	OK
Tension:	0.699 D + 2.500 Dyn5	163.57	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	357.26
Tension:	0.699 D + 1.000 Ecl	232.87

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 357.26 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	50.98	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 | Frame No: 2 | Member No: 42
Fy (ksi): 50.00 | Size: W10X77
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 495.83 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 423.22
Max Pu/ϕPn = 0.68 OK

Tension: Max Pu (kip) = 474.01 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -504.23
Max Pu/ϕPn = 0.46 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	367.23	731.56	OK
Tension:	0.699 D - 2.500 Dyn5	264.41	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	495.83
Tension:	0.699 D + 1.000 Ecl	474.01

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 495.83 ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	48.42	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	813.33	382.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 2 Frame No: 2 Member No: 31
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_4.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17 ω = 1.31
Cmax = βωRyPyscmax = 282.02 kip
Tmax = ωRyPyscmax = 241.04 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17 ω = 1.31
Cmax = βωRyPyscmax = 282.02 kip
Tmax = ωRyPyscmax = 241.04 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn5
Pu (kip) = 95.02 ϕFyscAsc (kip) = 136.80 Pu/ϕFyscAsc = 0.69

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 136.80
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =45.60 <= Pysc <= 1.2Pysc =182.40

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.976 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.566%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.467%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 282.02

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Mezzanine Frame No: 2 Member No: 46
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 357.31 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 307.06
Max Pu/ϕPn = 0.56 OK

Tension: Max Pu (kip) = 232.84 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -254.70
Max Pu/ϕPn = 0.26 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn5	235.65	639.72	OK
Tension:	0.699 D + 2.500 Dyn5	163.54	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	357.31
Tension:	0.699 D + 1.000 Ecl	232.84

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 357.31 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	50.98	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Mezzanine   Frame No: 2   Member No: 47
Fy (ksi): 50.00   Size: W10X77
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 495.88 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 423.22
Max Pu/ϕPn = 0.68 OK

Tension: Max Pu (kip) = 473.99 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -504.23
Max Pu/ϕPn = 0.46 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	367.28	731.56	OK
Tension:	0.699 D - 2.500 Dyn5	264.38	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	495.88
Tension:	0.699 D + 1.000 Ecl	473.99

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 495.88   ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	48.42	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof Frame No: 3 Member No: 5
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 17.54 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.04 OK

Tension: Max Pu (kip) = 1.30 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -9.31
Max Pu/ϕPn = 0.00 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	17.60	489.12	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	17.60
Tension:	0.699 D + 1.000 Ecl	1.30

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 17.60 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	85.50	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Roof Frame No: 3 Member No: 6
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 19.21 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.04 OK

Tension: Max Pu (kip) = 0.59 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -9.31
Max Pu/ϕPn = 0.00 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	19.28	489.12	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	19.28
Tension:	0.699 D + 1.000 Ecl	0.59

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 19.28 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	84.98	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Roof Frame No: 3 Member No: 2
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_2.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn8
Pu (kip) = 59.83 ϕFyscAsc (kip) = 68.40 Pu/ϕFyscAsc = 0.87

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 68.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =22.80 <= Pysc <= 1.2Pysc =91.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.449 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.655%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.886 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.305%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 146.70

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Roof Frame No: 3 Member No: 3
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_2.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn8
Pu (kip) = 59.81 ϕFyscAsc (kip) = 68.40 Pu/ϕFyscAsc = 0.87

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 68.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =22.80 <= Pysc <= 1.2Pysc =91.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.449 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.655%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.886 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.305%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 146.70

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3 | Frame No: 3 | Member No: 39
Fy (ksi): 50.00 | Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 185.79 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 107.33
Max Pu/ϕPn = 0.29 OK

Tension: Max Pu (kip) = 72.27 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -107.33
Max Pu/ϕPn = 0.08 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn8	170.09	639.72	OK
Tension:	0.699 D - 2.500 Dyn8	56.57	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	185.79
Tension:	0.699 D + 1.000 Ecl	72.27

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 185.79 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	56.65	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 Frame No: 3 Member No: 40
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 60.95 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.10 OK

Tension: Max Pu (kip) = 3.33 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -29.08
Max Pu/ϕPn = 0.00 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	62.95	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	62.95
Tension:	0.699 D + 1.000 Ecl	3.33

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 62.95 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	71.50	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 Frame No: 3 Member No: 41
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 181.75 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 107.33
Max Pu/ϕPn = 0.28 OK

Tension: Max Pu (kip) = 75.47 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -107.33
Max Pu/ϕPn = 0.08 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	165.87	639.72	OK
Tension:	0.699 D + 2.500 Dyn8	59.58	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	181.75
Tension:	0.699 D + 1.000 Ecl	75.47

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 181.75 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	56.79	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 3 Frame No: 3 Member No: 4
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_3.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn8
Pu (kip) = 88.15 ϕFyscAsc (kip) = 102.60 Pu/ϕFyscAsc = 0.86
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 102.60
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =34.20 <= Pysc <= 1.2Pysc =136.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.121 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.663%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.495%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 230.65
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 3 Frame No: 3 Member No: 5

Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_3.00 Connection Type: PINNED

Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37

Cmax = βωRyPyscmax = 230.65 kip

Tmax = ωRyPyscmax = 189.06 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37

Cmax = βωRyPyscmax = 230.65 kip

Tmax = ωRyPyscmax = 189.06 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK

Gravity Load Cases Excluded from Analyis

Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn8

Pu (kip) = 88.02 ϕFyscAsc (kip) = 102.60 Pu/ϕFyscAsc = 0.86

F4.5b(3) Conformance Demonstration

K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 102.60

K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =34.20 <= Pysc <= 1.2Pysc =136.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.120 in

Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E

Required core strain at 2x Design Story Drift: 0.662%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in

Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E

Required core strain at 2% Design Story Drift: 1.495%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength

Strength of the bracing connection : Cmax (kip) = 230.65

F4.6c(2) --- Gusset Plates

Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 Frame No: 3 Member No: 38
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 366.37 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 268.59
Max Pu/ϕPn = 0.57 OK

Tension: Max Pu (kip) = 196.53 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -239.51
Max Pu/ϕPn = 0.22 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn8	284.83	639.72	OK
Tension:	0.699 D - 2.500 Dyn8	144.07	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	366.37
Tension:	0.699 D + 1.000 Ecl	196.53

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 366.37 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	50.68	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 Frame No: 3 Member No: 39
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 91.66 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.14 OK

Tension: Max Pu (kip) = 19.32 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -57.73
Max Pu/ϕPn = 0.02 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	93.36	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	93.36
Tension:	0.699 D + 1.000 Ecl	19.32

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 93.36 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	62.11	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 Frame No: 3 Member No: 40
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 371.55 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 268.59
Max Pu/ϕPn = 0.58 OK

Tension: Max Pu (kip) = 195.91 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -239.51
Max Pu/ϕPn = 0.22 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	289.59	639.72	OK
Tension:	0.699 D + 2.500 Dyn8	143.03	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	371.55
Tension:	0.699 D + 1.000 Ecl	195.91

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 371.55 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	50.51	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 2 Frame No: 3 Member No: 9
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_4.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17 ω = 1.31
Cmax = βωRyPyscmax = 282.02 kip
Tmax = ωRyPyscmax = 241.04 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17 ω = 1.31
Cmax = βωRyPyscmax = 282.02 kip
Tmax = ωRyPyscmax = 241.04 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn8
Pu (kip) = 117.10 ϕFyscAsc (kip) = 136.80 Pu/ϕFyscAsc = 0.86

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 136.80
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =45.60 <= Pysc <= 1.2Pysc =182.40

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.203 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.698%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.467%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 282.02

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 2 Frame No: 3 Member No: 10
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_4.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17 ω = 1.31
Cmax = βωRyPyscmax = 282.02 kip
Tmax = ωRyPyscmax = 241.04 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17 ω = 1.31
Cmax = βωRyPyscmax = 282.02 kip
Tmax = ωRyPyscmax = 241.04 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn8
Pu (kip) = 117.20 ϕFyscAsc (kip) = 136.80 Pu/ϕFyscAsc = 0.86

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 136.80
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =45.60 <= Pysc <= 1.2Pysc =182.40

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.204 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.698%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.467%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 282.02

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Mezzanine   Frame No: 3   Member No: 43
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 366.42 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 268.59
Max Pu/ϕPn = 0.57 OK

Tension: Max Pu (kip) = 196.51 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -239.51
Max Pu/ϕPn = 0.22 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn8	284.87	639.72	OK
Tension:	0.699 D - 2.500 Dyn8	144.04	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	366.42
Tension:	0.699 D + 1.000 Ecl	196.51

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 366.42   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	50.68	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine   Frame No: 3   Member No: 44
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 91.71 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.14 OK

Tension: Max Pu (kip) = 19.29 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -57.73
Max Pu/ϕPn = 0.02 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	93.41	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	93.41
Tension:	0.699 D + 1.000 Ecl	19.29

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 93.41   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	62.10	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Mezzanine   Frame No: 3   Member No: 45
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 371.60 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 268.59
Max Pu/ϕPn = 0.58 OK

Tension: Max Pu (kip) = 195.88 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -239.51
Max Pu/ϕPn = 0.22 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	289.64	639.72	OK
Tension:	0.699 D + 2.500 Dyn8	143.00	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	371.60
Tension:	0.699 D + 1.000 Ecl	195.88

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 371.60   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	50.51	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof   Frame No: 4   Member No: 1
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 56.62 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.12 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	56.69	489.12	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	56.69
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 56.69   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	73.43	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Roof Frame No: 4 Member No: 2
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 39.97 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.08 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	40.03	489.12	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	40.03
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 40.03 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	78.57	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Roof Frame No: 4 Member No: 4
Fymin (ksi): 38.00 Fymax (ksi): 45.00 Size: CoreBRB_3.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 251.15 kip
Tmax = ωRyPyscmax = 211.05 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 251.15 kip
Tmax = ωRyPyscmax = 211.05 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn5
Pu (kip) = 102.64 ϕFyscAsc (kip) = 119.70 Pu/ϕFyscAsc = 0.86

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 119.70
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =39.90 <= Pysc <= 1.2Pysc =159.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.421 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.665%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.886 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.350%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 251.15

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Roof Frame No: 4 Member No: 5
Fymin (ksi): 38.00 Fymax (ksi): 45.00 Size: CoreBRB_3.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 251.15 kip
Tmax = ωRyPyscmax = 211.05 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 251.15 kip
Tmax = ωRyPyscmax = 211.05 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn5
Pu (kip) = 102.61 ϕFyscAsc (kip) = 119.70 Pu/ϕFyscAsc = 0.86

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 119.70
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =39.90 <= Pysc <= 1.2Pysc =159.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.420 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.664%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.886 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.350%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 251.15

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 Frame No: 4 Member No: 43
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 303.03 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 183.75
Max Pu/ϕPn = 0.47 OK

Tension: Max Pu (kip) = 130.89 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -183.75
Max Pu/ϕPn = 0.15 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn5	276.19	639.72	OK
Tension:	0.699 D + 2.500 Dyn5	104.05	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	303.03
Tension:	0.699 D + 1.000 Ecl	130.89

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 303.03 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	52.77	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 | Frame No: 4 | Member No: 44
Fy (ksi): 50.00 | Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 65.58 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.10 OK

Tension: Max Pu (kip) = 9.77 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -36.47
Max Pu/ϕPn = 0.01 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	67.38	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	67.38
Tension:	0.699 D + 1.000 Ecl	9.77

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 67.38 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	70.13	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 Frame No: 4 Member No: 45
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 290.40 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 183.75
Max Pu/ϕPn = 0.45 OK

Tension: Max Pu (kip) = 138.99 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -183.75
Max Pu/ϕPn = 0.16 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	263.55	639.72	OK
Tension:	0.699 D - 2.500 Dyn5	112.14	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	290.40
Tension:	0.699 D + 1.000 Ecl	138.99

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 290.40 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	53.19	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 3 Frame No: 4 Member No: 6
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_6.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.35
Cmax = βωRyPyscmax = 424.76 kip
Tmax = ωRyPyscmax = 372.60 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.35
Cmax = βωRyPyscmax = 424.76 kip
Tmax = ωRyPyscmax = 372.60 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn5
Pu (kip) = 155.64 ϕFyscAsc (kip) = 205.20 Pu/ϕFyscAsc = 0.76
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 205.20
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =68.40 <= Pysc <= 1.2Pysc =273.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.990 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.616%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.575%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 424.76
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 3 Frame No: 4 Member No: 7
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_6.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.35
Cmax = βωRyPyscmax = 424.76 kip
Tmax = ωRyPyscmax = 372.60 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.35
Cmax = βωRyPyscmax = 424.76 kip
Tmax = ωRyPyscmax = 372.60 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn5
Pu (kip) = 156.11 ϕFyscAsc (kip) = 205.20 Pu/ϕFyscAsc = 0.76
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 205.20
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =68.40 <= Pysc <= 1.2Pysc =273.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.993 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.618%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.575%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 424.76
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 | Frame No: 4 | Member No: 32
Fy (ksi): 50.00 | Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 632.41 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 480.71
Max Pu/ϕPn = 0.99 OK

Tension: Max Pu (kip) = 378.01 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -444.24
Max Pu/ϕPn = 0.42 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn5	497.99	639.72	OK
Tension:	0.699 D + 2.500 Dyn5	280.05	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	632.41
Tension:	0.699 D + 1.000 Ecl	378.01

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 632.41 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	41.88	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 Frame No: 4 Member No: 33
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 98.48 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.15 OK

Tension: Max Pu (kip) = 38.24 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -78.39
Max Pu/ϕPn = 0.04 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	99.82	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	99.82
Tension:	0.699 D + 1.000 Ecl	38.24

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 99.82 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	60.12	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 | Frame No: 4 | Member No: 34
Fy (ksi): 50.00 | Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 623.24 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 480.71
Max Pu/ϕPn = 0.97 OK

Tension: Max Pu (kip) = 386.11 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -444.24
Max Pu/ϕPn = 0.43 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	488.21	639.72	OK
Tension:	0.699 D - 2.500 Dyn5	287.54	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	623.24
Tension:	0.699 D + 1.000 Ecl	386.11

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 623.24 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	42.18	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 2 Frame No: 4 Member No: 11
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_7.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.33
Cmax = βωRyPyscmax = 488.22 kip
Tmax = ωRyPyscmax = 428.26 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.33
Cmax = βωRyPyscmax = 488.22 kip
Tmax = ωRyPyscmax = 428.26 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn5
Pu (kip) = 188.43 ϕFyscAsc (kip) = 239.40 Pu/ϕFyscAsc = 0.79

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 239.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =79.80 <= Pysc <= 1.2Pysc =319.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.065 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.644%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.529%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 488.22

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 2 Frame No: 4 Member No: 12
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_7.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.33
Cmax = βωRyPyscmax = 488.22 kip
Tmax = ωRyPyscmax = 428.26 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.33
Cmax = βωRyPyscmax = 488.22 kip
Tmax = ωRyPyscmax = 428.26 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn5
Pu (kip) = 188.26 ϕFyscAsc (kip) = 239.40 Pu/ϕFyscAsc = 0.79

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 239.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =79.80 <= Pysc <= 1.2Pysc =319.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.064 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.643%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.529%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 488.22

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Mezzanine   Frame No: 4   Member No: 25
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 623.29 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 480.71
Max Pu/ϕPn = 0.97 OK

Tension: Max Pu (kip) = 386.09 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -444.24
Max Pu/ϕPn = 0.43 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn5	488.25	639.72	OK
Tension:	0.699 D - 2.500 Dyn5	287.52	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	623.29
Tension:	0.699 D + 1.000 Ecl	386.09

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 623.29   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	42.18	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Seismic Provisions Member Code Check

Column Parameters

Story: Mezzanine   Frame No: 4   Member No: 26
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 98.52 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.15 OK

Tension: Max Pu (kip) = 38.21 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -78.39
Max Pu/ϕPn = 0.04 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	99.87	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	99.87
Tension:	0.699 D + 1.000 Ecl	38.21

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 99.87   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	60.10	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine   Frame No: 4   Member No: 27
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 632.46 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 480.71
Max Pu/ϕPn = 0.99 OK

Tension: Max Pu (kip) = 377.98 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -444.24
Max Pu/ϕPn = 0.42 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn5	498.04	639.72	OK
Tension:	0.699 D + 2.500 Dyn5	280.03	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	632.46
Tension:	0.699 D + 1.000 Ecl	377.98

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 632.46   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	41.88	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof   Frame No: 5   Member No: 4
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 34.70 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.07 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn7	34.76	489.12	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn7	34.76
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 34.76   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	80.20	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Roof   Frame No: 5   Member No: 22
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 18.55 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.04 OK

Tension: Max Pu (kip) = 0.77 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -9.31
Max Pu/ϕPn = 0.00 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn7	18.61	489.12	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn7	18.61
Tension:	0.699 D + 1.000 Ecl	0.77

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 18.61   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	85.19	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Roof Frame No: 5 Member No: 6
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_2.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 53.14 ϕFyscAsc (kip) = 68.40 Pu/ϕFyscAsc = 0.78
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 68.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =22.80 <= Pysc <= 1.2Pysc =91.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.287 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.582%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.886 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.305%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 146.70
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Roof   Frame No: 5   Member No: 7
Fymin (ksi): 38.00   Fymax (ksi): 46.00   Size: CoreBRB_2.00   Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19   ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19   ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 53.18   ϕFyscAsc (kip) = 68.40   Pu/ϕFyscAsc = 0.78
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 68.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =22.80 <= Pysc <= 1.2Pysc =91.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.288 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.583%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.886 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.305%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 146.70
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3   Frame No: 5   Member No: 36
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 197.69 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 107.33
Max Pu/ϕPn = 0.31 OK

Tension: Max Pu (kip) = 68.05 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -107.33
Max Pu/ϕPn = 0.08 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	171.61	639.72	OK
Tension:	0.699 D + 2.500 Dyn7	41.97	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	197.69
Tension:	0.699 D + 1.000 Ecl	68.05

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 197.69   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	56.26	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 Frame No: 5 Member No: 37
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 62.86 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.10 OK

Tension: Max Pu (kip) = 6.68 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -33.19
Max Pu/ϕPn = 0.01 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	63.72	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	63.72
Tension:	0.699 D + 1.000 Ecl	6.68

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 63.72 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	71.26	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3 | Frame No: 5 | Member No: 38
Fy (ksi): 50.00 | Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 187.82 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 107.33
Max Pu/ϕPn = 0.29 OK

Tension: Max Pu (kip) = 71.27 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -107.33
Max Pu/ϕPn = 0.08 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	161.92	639.72	OK
Tension:	0.699 D - 2.500 Dyn7	45.37	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	187.82
Tension:	0.699 D + 1.000 Ecl	71.27

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 187.82 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	56.59	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 3 Frame No: 5 Member No: 8
Fymin (ksi): 38.00 Fymax (ksi): 45.00 Size: CoreBRB_3.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 263.25 kip
Tmax = ωRyPyscmax = 215.78 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 263.25 kip
Tmax = ωRyPyscmax = 215.78 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 90.35 ϕFyscAsc (kip) = 119.70 Pu/ϕFyscAsc = 0.75

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 119.70
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =39.90 <= Pysc <= 1.2Pysc =159.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.985 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.582%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.495%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 263.25

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 3 Frame No: 5 Member No: 9
Fymin (ksi): 38.00 Fymax (ksi): 45.00 Size: CoreBRB_3.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 263.25 kip
Tmax = ωRyPyscmax = 215.78 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = βωRyPyscmax = 263.25 kip
Tmax = ωRyPyscmax = 215.78 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 90.35 ϕFyscAsc (kip) = 119.70 Pu/ϕFyscAsc = 0.75

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 119.70
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =39.90 <= Pysc <= 1.2Pysc =159.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.985 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.582%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.529 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.495%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 263.25

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 Frame No: 5 Member No: 35
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 391.54 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 291.37
Max Pu/ϕPn = 0.60 OK

Tension: Max Pu (kip) = 214.05 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -258.19
Max Pu/ϕPn = 0.24 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	296.25	654.30	OK
Tension:	0.699 D - 2.500 Dyn7	151.96	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	391.54
Tension:	0.699 D + 1.000 Ecl	214.05

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 391.54 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	49.85	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 Frame No: 5 Member No: 36
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 95.43 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.15 OK

Tension: Max Pu (kip) = 23.71 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -63.66
Max Pu/ϕPn = 0.03 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	99.04	654.30	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	99.04
Tension:	0.699 D + 1.000 Ecl	23.71

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 99.04 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	60.36	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 Frame No: 5 Member No: 37
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 410.70 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 291.37
Max Pu/ϕPn = 0.63 OK

Tension: Max Pu (kip) = 206.98 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -258.19
Max Pu/ϕPn = 0.23 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	315.20	654.30	OK
Tension:	0.699 D + 2.500 Dyn7	144.67	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	410.70
Tension:	0.699 D + 1.000 Ecl	206.98

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 410.70 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	49.21	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 2 Frame No: 5 Member No: 14
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_4.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.18 ω = 1.34
Cmax = βωRyPyscmax = 290.94 kip
Tmax = ωRyPyscmax = 246.56 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.18 ω = 1.34
Cmax = βωRyPyscmax = 290.94 kip
Tmax = ωRyPyscmax = 246.56 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 94.21 ϕFyscAsc (kip) = 136.80 Pu/ϕFyscAsc = 0.69

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 136.80
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =45.60 <= Pysc <= 1.2Pysc =182.40

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.917 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.562%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.483 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.523%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 290.94

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 2 Frame No: 5 Member No: 30
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_4.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.18 ω = 1.34
Cmax = βωRyPyscmax = 290.94 kip
Tmax = ωRyPyscmax = 246.56 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.18 ω = 1.34
Cmax = βωRyPyscmax = 290.94 kip
Tmax = ωRyPyscmax = 246.56 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 91.47 ϕFyscAsc (kip) = 136.80 Pu/ϕFyscAsc = 0.67
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 136.80
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =45.60 <= Pysc <= 1.2Pysc =182.40

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.890 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.546%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.483 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.523%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 290.94
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Mezzanine   Frame No: 5   Member No: 1
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 604.01 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 491.14
Max Pu/ϕPn = 0.80 OK

Tension: Max Pu (kip) = 377.08 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -427.48
Max Pu/ϕPn = 0.42 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	424.60	753.70	OK
Tension:	0.699 D - 2.500 Dyn7	261.32	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	604.01
Tension:	0.699 D + 1.000 Ecl	377.08

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 604.01   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	42.82	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine Frame No: 5 Member No: 2
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 151.24 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.20 OK

Tension: Max Pu (kip) = 22.98 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -90.50
Max Pu/ϕPn = 0.03 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	154.49	753.70	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	154.49
Tension:	0.699 D + 1.000 Ecl	22.98

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 154.49 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	57.69	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine Frame No: 5 Member No: 3
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 687.61 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 491.14
Max Pu/ϕPn = 0.91 OK

Tension: Max Pu (kip) = 338.69 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -427.48
Max Pu/ϕPn = 0.38 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	511.37	753.70	OK
Tension:	0.699 D + 2.500 Dyn7	226.12	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	687.61
Tension:	0.699 D + 1.000 Ecl	338.69

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 687.61 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	40.05	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Mezzanine   Frame No: 5   Member No: 1
Fymin (ksi): 38.00   Fymax (ksi): 46.00   Size: CoreBRB_4.50   Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17   ω = 1.33
Cmax = βωRyPyscmax = 322.11 kip
Tmax = ωRyPyscmax = 275.31 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17   ω = 1.33
Cmax = βωRyPyscmax = 322.11 kip
Tmax = ωRyPyscmax = 275.31 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 71.30   ϕFyscAsc (kip) = 153.90   Pu/ϕFyscAsc = 0.46

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 153.90
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =51.30 <= Pysc <= 1.2Pysc =205.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.509 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.369%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.069 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.498%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 322.11

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Mezzanine Frame No: 5 Member No: 2
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_4.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17 ω = 1.33
Cmax = βωRyPyscmax = 322.11 kip
Tmax = ωRyPyscmax = 275.31 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17 ω = 1.33
Cmax = βωRyPyscmax = 322.11 kip
Tmax = ωRyPyscmax = 275.31 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 70.97 ϕFyscAsc (kip) = 153.90 Pu/ϕFyscAsc = 0.46

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 153.90
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =51.30 <= Pysc <= 1.2Pysc =205.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.507 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.367%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.069 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.498%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 322.11

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 1 | Frame No: 5 | Member No: 1
Fy (ksi): 50.00 | Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 604.96 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 491.14
Max Pu/ϕPn = 0.80 OK

Tension: Max Pu (kip) = 376.60 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -427.48
Max Pu/ϕPn = 0.42 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	425.55	753.70	OK
Tension:	0.699 D - 2.500 Dyn7	260.85	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	604.96
Tension:	0.699 D + 1.000 Ecl	376.60

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 604.96 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	42.79	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 1 Frame No: 5 Member No: 2
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 152.19 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.20 OK

Tension: Max Pu (kip) = 22.51 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -90.50
Max Pu/ϕPn = 0.03 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	155.43	753.70	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	155.43
Tension:	0.699 D + 1.000 Ecl	22.51

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 155.43 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	57.66	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 1   Frame No: 5   Member No: 3
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 688.55 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 491.14
Max Pu/ϕPn = 0.91 OK

Tension: Max Pu (kip) = 338.22 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -427.48
Max Pu/ϕPn = 0.38 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	512.32	753.70	OK
Tension:	0.699 D + 2.500 Dyn7	225.64	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	688.55
Tension:	0.699 D + 1.000 Ecl	338.22

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 688.55   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	40.02	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof Frame No: 6 Member No: 12
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 144.70 --- Combination: 1.401 D + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 124.53
Max Pu/ϕPn = 0.30 OK

Tension: Max Pu (kip) = 139.08 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -148.20
Max Pu/ϕPn = 0.16 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp + 2.500 Dyn7	119.32	489.12	OK
Tension:	0.699 D - 2.500 Dyn7	90.03	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp + 1.000 Ecl	144.70
Tension:	0.699 D + 1.000 Ecl	139.08

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 144.70 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	58.01	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof   Frame No: 6   Member No: 13
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 152.60 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 124.53
Max Pu/ϕPn = 0.31 OK

Tension: Max Pu (kip) = 135.52 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -148.20
Max Pu/ϕPn = 0.15 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	**Pu(kip)**	**ϕPn(kip)**	**Result**
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	125.67	489.12	OK
Tension:	0.699 D + 2.500 Dyn7	84.93	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	**Force(kip)**
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	152.60
Tension:	0.699 D + 1.000 Ecl	135.52

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 152.60   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	57.75	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	**Minor**
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Roof   Frame No: 6   Member No: 8
Fymin (ksi): 38.00   Fymax (ksi): 46.00   Size: CoreBRB_2.50   Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19   ω = 1.34
Cmax = βωRyPyscmax = 183.38 kip
Tmax = ωRyPyscmax = 154.10 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19   ω = 1.34
Cmax = βωRyPyscmax = 183.38 kip
Tmax = ωRyPyscmax = 154.10 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 63.80   ϕFyscAsc (kip) = 85.50   Pu/ϕFyscAsc = 0.75

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 85.50
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =28.50 <= Pysc <= 1.2Pysc =114.00

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.216 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.587%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.805 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.354%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 183.38
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Roof Frame No: 6 Member No: 9
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_2.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 183.38 kip
Tmax = ωRyPyscmax = 154.10 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.34
Cmax = βωRyPyscmax = 183.38 kip
Tmax = ωRyPyscmax = 154.10 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 62.80 ϕFyscAsc (kip) = 85.50 Pu/ϕFyscAsc = 0.73

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 85.50
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =28.50 <= Pysc <= 1.2Pysc =114.00

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.197 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.578%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.805 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.354%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 183.38

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3 Frame No: 6 Member No: 52
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 364.74 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 259.75
Max Pu/ϕPn = 0.57 OK

Tension: Max Pu (kip) = 271.31 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -313.16
Max Pu/ϕPn = 0.30 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	289.56	639.72	OK
Tension:	0.699 D + 2.500 Dyn7	142.72	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	364.74
Tension:	0.699 D + 1.000 Ecl	271.31

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 364.74 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	50.73	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 Frame No: 6 Member No: 53
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 57.95 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 23.66
Max Pu/ϕPn = 0.09 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	35.83	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	57.95
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 57.95 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	73.04	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Seismic Provisions Member Code Check

Column Parameters

Story: Level 3 Frame No: 6 Member No: 54
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 332.08 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 259.75
Max Pu/ϕPn = 0.52 OK

Tension: Max Pu (kip) = 285.83 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -313.16
Max Pu/ϕPn = 0.32 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	257.93	639.72	OK
Tension:	0.699 D - 2.500 Dyn7	158.27	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	332.08
Tension:	0.699 D + 1.000 Ecl	285.83

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 332.08 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	51.81	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 3   Frame No: 6   Member No: 10
Fymin (ksi): 38.00   Fymax (ksi): 46.00   Size: CoreBRB_3.00   Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22   ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22   ω = 1.37
Cmax = βωRyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 72.66   ϕFyscAsc (kip) = 102.60   Pu/ϕFyscAsc = 0.71

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 102.60
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =34.20 <= Pysc <= 1.2Pysc =136.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.903 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.550%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.473 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.505%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 230.65

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 3 Frame No: 6 Member No: 11
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_3.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = $\beta\omega$RyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.22 ω = 1.37
Cmax = $\beta\omega$RyPyscmax = 230.65 kip
Tmax = ωRyPyscmax = 189.06 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 73.45 ϕFyscAsc (kip) = 102.60 Pu/ϕFyscAsc = 0.72
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 102.60
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =34.20 <= Pysc <= 1.2Pysc =136.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.913 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.556%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.473 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.505%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 230.65
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 Frame No: 6 Member No: 62
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 543.94 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 412.94
Max Pu/ϕPn = 0.85 OK

Tension: Max Pu (kip) = 446.34 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -498.52
Max Pu/ϕPn = 0.50 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	**Pu(kip)**	**ϕPn(kip)**	**Result**
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	421.94	639.72	OK
Tension:	0.699 D + 2.500 Dyn7	238.76	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	**Force(kip)**
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	543.94
Tension:	0.699 D + 1.000 Ecl	446.34

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 543.94 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	44.81	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	**Minor**
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 Frame No: 6 Member No: 63
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 138.50 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 53.41
Max Pu/ϕPn = 0.22 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	86.78	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	138.50
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 138.50 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	58.22	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 Frame No: 6 Member No: 64
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 520.68 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 412.94
Max Pu/ϕPn = 0.81 OK

Tension: Max Pu (kip) = 456.65 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -498.52
Max Pu/ϕPn = 0.51 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	402.68	639.72	OK
Tension:	0.699 D - 2.500 Dyn7	253.07	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	520.68
Tension:	0.699 D + 1.000 Ecl	456.65

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 520.68 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	45.57	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Seismic Provisions Member Code Check

Brace Parameters

Story: Level 2 Frame No: 6 Member No: 25
Fymin (ksi): 38.00 Fymax (ksi): 45.00 Size: CoreBRB_3.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.21 ω = 1.36
Cmax = βωRyPyscmax = 259.18 kip
Tmax = ωRyPyscmax = 214.20 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.21 ω = 1.36
Cmax = βωRyPyscmax = 259.18 kip
Tmax = ωRyPyscmax = 214.20 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 88.24 ϕFyscAsc (kip) = 119.70 Pu/ϕFyscAsc = 0.74

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 119.70
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =39.90 <= Pysc <= 1.2Pysc =159.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.975 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.556%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.473 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.411%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 259.18

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 2 Frame No: 6 Member No: 26
Fymin (ksi): 38.00 Fymax (ksi): 45.00 Size: CoreBRB_3.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.21 ω = 1.36
Cmax = βωRyPyscmax = 259.18 kip
Tmax = ωRyPyscmax = 214.20 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.21 ω = 1.36
Cmax = βωRyPyscmax = 259.18 kip
Tmax = ωRyPyscmax = 214.20 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 91.29 ϕFyscAsc (kip) = 119.70 Pu/ϕFyscAsc = 0.76

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 119.70
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =39.90 <= Pysc <= 1.2Pysc =159.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.009 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.576%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.473 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.411%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 259.18

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine   Frame No: 6   Member No: 68
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 543.98 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 412.94
Max Pu/ϕPn = 0.85 OK

Tension: Max Pu (kip) = 446.32 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -498.52
Max Pu/ϕPn = 0.50 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	421.98	639.72	OK
Tension:	0.699 D + 2.500 Dyn7	238.74	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	543.98
Tension:	0.699 D + 1.000 Ecl	446.32

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 543.98   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	44.80	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine Frame No: 6 Member No: 69
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 138.55 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 53.41
Max Pu/ϕPn = 0.22 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	86.82	639.72	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	138.55
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 138.55 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	58.21	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Seismic Provisions Member Code Check

Column Parameters

Story: Mezzanine   Frame No: 6   Member No: 70
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 520.73 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 412.94
Max Pu/ϕPn = 0.81 OK

Tension: Max Pu (kip) = 456.63 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -498.52
Max Pu/ϕPn = 0.51 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	402.73	639.72	OK
Tension:	0.699 D - 2.500 Dyn7	253.05	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	520.73
Tension:	0.699 D + 1.000 Ecl	456.63

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 520.73   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	45.57	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof Frame No: 7 Member No: 16
Fy (ksi): 50.00 Size: W10X77
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 204.64 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 191.64
Max Pu/ϕPn = 0.37 OK

Tension: Max Pu (kip) = 222.12 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -228.05
Max Pu/ϕPn = 0.22 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn6	195.02	560.46	OK
Tension:	0.699 D + 2.500 Dyn6	176.09	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	204.64
Tension:	0.699 D + 1.000 Ecl	222.12

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 204.64 ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	56.86	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	813.33	382.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Roof   Frame No: 7   Member No: 17
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 20.00 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.04 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	20.00	489.12	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	20.00
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 20.00   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	84.76	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Roof Frame No: 7 Member No: 10
Fymin (ksi): 38.00 Fymax (ksi): 45.00 Size: CoreBRB_4.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.35
Cmax = βωRyPyscmax = 289.17 kip
Tmax = ωRyPyscmax = 243.00 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19 ω = 1.35
Cmax = βωRyPyscmax = 289.17 kip
Tmax = ωRyPyscmax = 243.00 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn6
Pu (kip) = 120.02 ϕFyscAsc (kip) = 136.80 Pu/ϕFyscAsc = 0.88

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 136.80
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =45.60 <= Pysc <= 1.2Pysc =182.40

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.466 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2x Design Story Drift: 0.671%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.925 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2% Design Story Drift: 1.339%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 289.17

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3 | Frame No: 7 | Member No: 50
Fy (ksi): 50.00 | Size: W10X77
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 428.30 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 360.79
Max Pu/ϕPn = 0.59 OK

Tension: Max Pu (kip) = 397.30 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -425.96
Max Pu/ϕPn = 0.39 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn6	366.83	731.56	OK
Tension:	0.699 D + 2.500 Dyn6	270.66	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	428.30
Tension:	0.699 D + 1.000 Ecl	397.30

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 428.30 ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	50.38	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	813.33	382.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3 Frame No: 7 Member No: 51
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 331.52 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 228.05
Max Pu/ϕPn = 0.52 OK

Tension: Max Pu (kip) = 146.89 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -191.64
Max Pu/ϕPn = 0.16 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn6	285.49	639.72	OK
Tension:	0.699 D - 2.500 Dyn6	137.26	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	331.52
Tension:	0.699 D + 1.000 Ecl	146.89

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 331.52 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	51.83	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 3   Frame No: 7   Member No: 12
Fymin (ksi): 38.00   Fymax (ksi): 46.00   Size: CoreBRB_4.00   Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17   ω = 1.33
Cmax = βωRyPyscmax = 286.32 kip
Tmax = ωRyPyscmax = 244.72 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.17   ω = 1.33
Cmax = βωRyPyscmax = 286.32 kip
Tmax = ωRyPyscmax = 244.72 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.200 Sp + 1.300 Dyn6
Pu (kip) = 110.03   ϕFyscAsc (kip) = 136.80   Pu/ϕFyscAsc = 0.80

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 136.80
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =45.60 <= Pysc <= 1.2Pysc =182.40

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.101 in
Load Case: Dyn6   Modal Force X   Dyn_ASCE716_CQC_X_-E
Required core strain at 2x Design Story Drift: 0.647%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.555 in
Load Case: Dyn6   Modal Force X   Dyn_ASCE716_CQC_X_-E
Required core strain at 2% Design Story Drift: 1.502%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 286.32

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 Frame No: 7 Member No: 65
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 570.84 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 425.96
Max Pu/ϕPn = 0.89 OK

Tension: Max Pu (kip) = 298.92 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -360.79
Max Pu/ϕPn = 0.33 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn6	444.93	639.72	OK
Tension:	0.699 D - 2.500 Dyn6	238.17	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	570.84
Tension:	0.699 D + 1.000 Ecl	298.92

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 570.84 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	43.92	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 | Frame No: 7 | Member No: 66
Fy (ksi): 50.00 | Size: W10X77
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 710.43 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 614.53
Max Pu/ϕPn = 0.97 OK

Tension: Max Pu (kip) = 674.94 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -715.22
Max Pu/ϕPn = 0.66 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn6	581.60	731.56	OK
Tension:	0.699 D + 2.500 Dyn6	445.43	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	710.43
Tension:	0.699 D + 1.000 Ecl	674.94

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 710.43 ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	42.20	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	813.33	382.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Seismic Provisions Member Code Check

Brace Parameters

Story: Level 2 Frame No: 7 Member No: 24
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_6.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.33
Cmax = $\beta\omega$RyPyscmax = 418.47 kip
Tmax = ωRyPyscmax = 367.08 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.33
Cmax = $\beta\omega$RyPyscmax = 418.47 kip
Tmax = ωRyPyscmax = 367.08 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn6
Pu (kip) = 167.71 ϕFyscAsc (kip) = 205.20 Pu/ϕFyscAsc = 0.82
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 205.20
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =68.40 <= Pysc <= 1.2Pysc =273.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.119 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2x Design Story Drift: 0.665%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.555 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2% Design Story Drift: 1.518%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 418.47
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Mezzanine   Frame No: 7   Member No: 63
Fy (ksi): 50.00   Size: W10X77
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 710.48 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 614.53
Max Pu/ϕPn = 0.97 OK

Tension: Max Pu (kip) = 674.91 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -715.22
Max Pu/ϕPn = 0.66 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn6	581.66	731.56	OK
Tension:	0.699 D + 2.500 Dyn6	445.40	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	710.48
Tension:	0.699 D + 1.000 Ecl	674.91

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 710.48   ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	42.20	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine   Frame No: 7   Member No: 64
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 570.89 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 425.96
Max Pu/ϕPn = 0.89 OK

Tension: Max Pu (kip) = 298.90 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -360.79
Max Pu/ϕPn = 0.33 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn6	444.97	639.72	OK
Tension:	0.699 D - 2.500 Dyn6	238.15	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	570.89
Tension:	0.699 D + 1.000 Ecl	298.90

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 570.89   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	43.91	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof | Frame No: 8 | Member No: 14
Fy (ksi): 50.00 | Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 101.69 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 96.42
Max Pu/ϕPn = 0.21 OK

Tension: Max Pu (kip) = 112.25 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -114.75
Max Pu/ϕPn = 0.13 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp + 2.500 Dyn7	72.42	489.12	OK
Tension:	0.699 D - 2.500 Dyn7	64.66	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	101.69
Tension:	0.699 D + 1.000 Ecl	112.25

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 101.69 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	59.54	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Roof   Frame No: 8   Member No: 15
Fy (ksi): 50.00   Size: W10X45
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 5.37 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.02 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	5.37	216.60	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn8	5.37
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 5.37   ϕPy (kip) = 598.50

Flange b/tf =	6.47	Limit =	9.18	OK
Web h/tw =	22.46	Limit =	88.45	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	457.50	169.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Roof   Frame No: 8   Member No: 11
Fymin (ksi): 38.00   Fymax (ksi): 46.00   Size: CoreBRB_2.00   Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19   ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.19   ω = 1.34
Cmax = βωRyPyscmax = 146.70 kip
Tmax = ωRyPyscmax = 123.28 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 44.64   ϕFyscAsc (kip) = 68.40   Pu/ϕFyscAsc = 0.65

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 68.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =22.80 <= Pysc <= 1.2Pysc =91.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.099 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.483%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.963 in
Load Case: Dyn7   Modal Force Y   Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.303%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 146.70

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 3   Frame No: 8   Member No: 48
Fy (ksi): 50.00   Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 267.24 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 204.10
Max Pu/ϕPn = 0.42 OK

Tension: Max Pu (kip) = 215.99 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -245.03
Max Pu/ϕPn = 0.24 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	180.76	639.72	OK
Tension:	0.699 D - 2.500 Dyn7	88.57	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	267.24
Tension:	0.699 D + 1.000 Ecl	215.99

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 267.24   ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	53.96	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 | Frame No: 8 | Member No: 49
Fy (ksi): 50.00 | Size: W10X45
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 168.02 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 114.75
Max Pu/ϕPn = 0.49 OK

Tension: Max Pu (kip) = 71.55 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -96.42
Max Pu/ϕPn = 0.12 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	120.67	340.47	OK
Tension:	0.699 D + 2.500 Dyn7	42.52	598.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	168.02
Tension:	0.699 D + 1.000 Ecl	71.55

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 168.02 ϕPy (kip) = 598.50

Flange b/tf =	6.47	Limit =	9.18	OK
Web h/tw =	22.46	Limit =	54.48	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	457.50	169.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 3 Frame No: 8 Member No: 13
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_2.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.21 ω = 1.37
Cmax = βωRyPyscmax = 190.64 kip
Tmax = ωRyPyscmax = 157.55 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.21 ω = 1.37
Cmax = βωRyPyscmax = 190.64 kip
Tmax = ωRyPyscmax = 157.55 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 50.21 ϕFyscAsc (kip) = 85.50 Pu/ϕFyscAsc = 0.59

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 85.50
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =28.50 <= Pysc <= 1.2Pysc =114.00

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.784 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.487%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.581 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.604%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 190.64

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 Frame No: 8 Member No: 67
Fy (ksi): 50.00 Size: W10X45
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 324.89 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 245.03
Max Pu/ϕPn = 0.95 OK

Tension: Max Pu (kip) = 169.43 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -204.10
Max Pu/ϕPn = 0.28 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	197.96	340.47	OK
Tension:	0.699 D + 2.500 Dyn7	83.43	598.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	324.89
Tension:	0.699 D + 1.000 Ecl	169.43

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 324.89 ϕPy (kip) = 598.50

Flange b/tf =	6.47	Limit =	9.18	OK
Web h/tw =	22.46	Limit =	46.72	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	457.50	169.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 Frame No: 8 Member No: 68
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 431.93 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 332.36
Max Pu/ϕPn = 0.68 OK

Tension: Max Pu (kip) = 355.50 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -398.95
Max Pu/ϕPn = 0.40 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	286.37	639.72	OK
Tension:	0.699 D - 2.500 Dyn7	143.36	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	431.93
Tension:	0.699 D + 1.000 Ecl	355.50

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 431.93 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	48.51	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	710.83	334.17

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 2 Frame No: 8 Member No: 19
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_3.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.20 ω = 1.36
Cmax = βωRyPyscmax = 225.22 kip
Tmax = ωRyPyscmax = 187.68 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.20 ω = 1.36
Cmax = βωRyPyscmax = 225.22 kip
Tmax = ωRyPyscmax = 187.68 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 65.25 ϕFyscAsc (kip) = 102.60 Pu/ϕFyscAsc = 0.64

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 102.60
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =34.20 <= Pysc <= 1.2Pysc =136.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.880 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.474%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.581 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.390%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 225.22

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine   Frame No: 8   Member No: 62
Fy (ksi): 50.00   Size: W10X45
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.
D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 324.93 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 245.03
Max Pu/ϕPn = 0.95 OK

Tension: Max Pu (kip) = 169.42 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -204.10
Max Pu/ϕPn = 0.28 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn7	198.00	340.47	OK
Tension:	0.699 D + 2.500 Dyn7	83.42	598.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	324.93
Tension:	0.699 D + 1.000 Ecl	169.42

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 324.93   ϕPy (kip) = 598.50

Flange b/tf =	6.47	Limit =	9.18	OK
Web h/tw =	22.46	Limit =	46.72	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine Frame No: 8 Member No: 73
Fy (ksi): 50.00 Size: W10X68
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 431.98 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 332.36
Max Pu/ϕPn = 0.68 OK

Tension: Max Pu (kip) = 355.48 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -398.95
Max Pu/ϕPn = 0.40 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	286.42	639.72	OK
Tension:	0.699 D - 2.500 Dyn7	143.33	895.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	431.98
Tension:	0.699 D + 1.000 Ecl	355.48

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 431.98 ϕPy (kip) = 895.50

Flange b/tf =	6.56	Limit =	9.18	OK
Web h/tw =	16.72	Limit =	48.51	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof   Frame No: 9   Member No: 9
Fy (ksi): 50.00   Size: W10X88
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 263.12 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 224.82
Max Pu/ϕPn = 0.41 OK

Tension: Max Pu (kip) = 243.10 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -260.79
Max Pu/ϕPn = 0.21 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp - 2.500 Dyn5	241.07	647.58	OK
Tension:	0.699 D + 2.500 Dyn5	185.08	1170.00	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	263.12
Tension:	0.699 D + 1.000 Ecl	243.10

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 263.12   ϕPy (kip) = 1170.00

Flange b/tf =	5.20	Limit =	9.18	OK
Web h/tw =	12.93	Limit =	56.14	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	941.67	442.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Roof   Frame No: 9   Member No: 10
Fy (ksi): 50.00   Size: W12X152
Frame Type: Buckling Restrained Braced Frame

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 44.34 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 0.00
Max Pu/ϕPn = 0.03 OK

Tension: No tension on column

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.200 Sp + 2.500 Dyn8	44.36	1347.06	OK
Tension:	No tension on column			

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.200 Sp + 2.500 Dyn8	44.36
Tension:	No tension on column	

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 44.36   ϕPy (kip) = 2011.50

Flange b/tf =	4.46	Limit =	9.18	OK
Web h/tw =	11.15	Limit =	84.83	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	2025.00	925.00

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Roof Frame No: 9 Member No: 12
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_5.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.16 ω = 1.30
Cmax = βωRyPyscmax = 381.52 kip
Tmax = ωRyPyscmax = 328.90 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.16 ω = 1.30
Cmax = βωRyPyscmax = 381.52 kip
Tmax = ωRyPyscmax = 328.90 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn5
Pu (kip) = 154.26 ϕFyscAsc (kip) = 188.10 Pu/ϕFyscAsc = 0.82
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 188.10
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =62.70 <= Pysc <= 1.2Pysc =250.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.644 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2x Design Story Drift: 0.651%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 3.460 in
Load Case: Dyn5 Modal Force X Dyn_ASCE716_CQC_X_+E
Required core strain at 2% Design Story Drift: 1.371%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 381.52
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 Frame No: 9 Member No: 34
Fy (ksi): 50.00 Size: W12X152
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 384.10 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 260.79
Max Pu/ϕPn = 0.24 OK

Tension: Max Pu (kip) = 196.86 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -249.99
Max Pu/ϕPn = 0.10 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn8	368.44	1609.44	OK
Tension:	0.699 D + 2.500 Dyn8	192.01	2011.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	384.10
Tension:	0.699 D + 1.000 Ecl	196.86

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 384.10 ϕPy (kip) = 2011.50

Flange b/tf =	4.46	Limit =	9.18	OK
Web h/tw =	11.15	Limit =	57.14	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	2025.00	925.00

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 Frame No: 9 Member No: 42
Fy (ksi): 50.00 Size: W10X88
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 322.95 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 200.08
Max Pu/ϕPn = 0.38 OK

Tension: Max Pu (kip) = 232.16 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -285.54
Max Pu/ϕPn = 0.20 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn5	324.95	842.00	OK
Tension:	0.699 D + 2.500 Dyn5	148.70	1170.00	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn5	324.95
Tension:	0.699 D + 1.000 Ecl	232.16

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 324.95 ϕPy (kip) = 1170.00

Flange b/tf =	5.20	Limit =	9.18	OK
Web h/tw =	12.93	Limit =	54.57	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	941.67	442.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 3 Frame No: 9 Member No: 14
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_7.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.35
Cmax = βωRyPyscmax = 495.56 kip
Tmax = ωRyPyscmax = 434.70 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.35
Cmax = βωRyPyscmax = 495.56 kip
Tmax = ωRyPyscmax = 434.70 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn6
Pu (kip) = 187.21 ϕFyscAsc (kip) = 239.40 Pu/ϕFyscAsc = 0.78

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 239.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =79.80 <= Pysc <= 1.2Pysc =319.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.847 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2x Design Story Drift: 0.684%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.068 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2% Design Story Drift: 1.670%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 495.56

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 3 Frame No: 9 Member No: 15
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_7.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.35
Cmax = βωRyPyscmax = 495.56 kip
Tmax = ωRyPyscmax = 434.70 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.35
Cmax = βωRyPyscmax = 495.56 kip
Tmax = ωRyPyscmax = 434.70 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn6
Pu (kip) = 186.62 ϕFyscAsc (kip) = 239.40 Pu/ϕFyscAsc = 0.78
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 239.40
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =79.80 <= Pysc <= 1.2Pysc =319.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.844 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2x Design Story Drift: 0.682%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.068 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2% Design Story Drift: 1.670%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 495.56
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Level 2 Frame No: 9 Member No: 31
Fy (ksi): 50.00 Size: W10X88
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 785.14 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 603.02
Max Pu/ϕPn = 0.93 OK

Tension: Max Pu (kip) = 560.48 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -638.99
Max Pu/ϕPn = 0.48 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn6	643.55	842.00	OK
Tension:	0.699 D + 2.500 Dyn6	382.92	1170.00	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	785.14
Tension:	0.699 D + 1.000 Ecl	560.48

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 785.14 ϕPy (kip) = 1170.00

Flange b/tf =	5.20	Limit =	9.18	OK
Web h/tw =	12.93	Limit =	42.92	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	941.67	442.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 2 Frame No: 9 Member No: 43
Fy (ksi): 50.00 Size: W12X152
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 857.99 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 663.74
Max Pu/ϕPn = 0.53 OK

Tension: Max Pu (kip) = 494.98 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -578.28
Max Pu/ϕPn = 0.25 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn6	615.17	1609.44	OK
Tension:	0.699 D - 2.500 Dyn6	337.63	2011.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	857.99
Tension:	0.699 D + 1.000 Ecl	494.98

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 857.99 ϕPy (kip) = 2011.50

Flange b/tf =	4.46	Limit =	9.18	OK
Web h/tw =	11.15	Limit =	50.16	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	2025.00	925.00

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 2 Frame No: 9 Member No: 20
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_8.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.36
Cmax = βωRyPyscmax = 606.21 kip
Tmax = ωRyPyscmax = 531.76 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.36
Cmax = βωRyPyscmax = 606.21 kip
Tmax = ωRyPyscmax = 531.76 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn6
Pu (kip) = 232.78 ϕFyscAsc (kip) = 290.70 Pu/ϕFyscAsc = 0.80

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 290.70
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =96.90 <= Pysc <= 1.2Pysc =387.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.868 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2x Design Story Drift: 0.681%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.068 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2% Design Story Drift: 1.624%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 606.21

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 2 Frame No: 9 Member No: 21
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_8.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.36
Cmax = βωRyPyscmax = 606.21 kip
Tmax = ωRyPyscmax = 531.76 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.36
Cmax = βωRyPyscmax = 606.21 kip
Tmax = ωRyPyscmax = 531.76 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn6
Pu (kip) = 235.04 ϕFyscAsc (kip) = 290.70 Pu/ϕFyscAsc = 0.81

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 290.70
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =96.90 <= Pysc <= 1.2Pysc =387.60

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.876 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2x Design Story Drift: 0.742%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.068 in
Load Case: Dyn6 Modal Force X Dyn_ASCE716_CQC_X_-E
Required core strain at 2% Design Story Drift: 1.752%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 606.21

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Column Parameters

Story: Mezzanine   Frame No: 9   Member No: 28
Fy (ksi): 50.00   Size: W10X88
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 785.20 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 603.02
Max Pu/ϕPn = 0.93 OK

Tension: Max Pu (kip) = 560.45 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -638.99
Max Pu/ϕPn = 0.48 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp - 2.500 Dyn6	643.61	842.00	OK
Tension:	0.699 D + 2.500 Dyn6	382.89	1170.00	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	785.20
Tension:	0.699 D + 1.000 Ecl	560.45

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 785.20   ϕPy (kip) = 1170.00

Flange b/tf =	5.20	Limit =	9.18	OK
Web h/tw =	12.93	Limit =	42.92	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Mezzanine Frame No: 9 Member No: 29
Fy (ksi): 50.00 Size: W12X152
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 858.09 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 663.74
Max Pu/ϕPn = 0.53 OK

Tension: Max Pu (kip) = 494.93 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -578.28
Max Pu/ϕPn = 0.25 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn6	615.28	1609.44	OK
Tension:	0.699 D - 2.500 Dyn6	337.57	2011.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	858.09
Tension:	0.699 D + 1.000 Ecl	494.93

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 858.09 ϕPy (kip) = 2011.50

Flange b/tf =	4.46	Limit =	9.18	OK
Web h/tw =	11.15	Limit =	50.16	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Roof Frame No: 10 Member No: 13
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_4.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.15 ω = 1.26
Cmax = βωRyPyscmax = 299.94 kip
Tmax = ωRyPyscmax = 260.82 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.15 ω = 1.26
Cmax = βωRyPyscmax = 299.94 kip
Tmax = ωRyPyscmax = 260.82 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn8
Pu (kip) = 109.45 ϕFyscAsc (kip) = 153.90 Pu/ϕFyscAsc = 0.71

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 153.90
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =51.30 <= Pysc <= 1.2Pysc =205.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.055 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.609%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.200 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.270%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 299.94
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Roof Frame No: 10 Member No: 14
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_4.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.15 ω = 1.25
Cmax = βωRyPyscmax = 297.56 kip
Tmax = ωRyPyscmax = 258.75 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.15 ω = 1.25
Cmax = βωRyPyscmax = 297.56 kip
Tmax = ωRyPyscmax = 258.75 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.200 Sp + 1.300 Dyn8
Pu (kip) = 109.47 ϕFyscAsc (kip) = 153.90 Pu/ϕFyscAsc = 0.71

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 153.90
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =51.30 <= Pysc <= 1.2Pysc =205.20

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 1.055 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2x Design Story Drift: 0.597%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.200 in
Load Case: Dyn8 Modal Force Y Dyn_ASCE716_CQC_Y_-E
Required core strain at 2% Design Story Drift: 1.246%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 297.56

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Column Parameters

Story: Level 3 Frame No: 10 Member No: 35
Fy (ksi): 50.00 Size: W10X77
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 303.54 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 246.04
Max Pu/ϕPn = 0.41 OK

Tension: Max Pu (kip) = 222.93 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -246.17
Max Pu/ϕPn = 0.22 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn8	243.78	731.56	OK
Tension:	0.699 D - 2.500 Dyn8	163.03	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	303.54
Tension:	0.699 D + 1.000 Ecl	222.93

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 303.54 ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	54.00	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

	Major	Minor
ΣMpc (kip-ft)	813.33	382.50

Column Splice Shear Force Required ΣMpc / H
Where ΣMpc is the sum of column plastic strengths above and below splice.
See code for more information on the Required Shear Strength

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Brace Parameters

Story: Level 3 Frame No: 10 Member No: 16
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_5.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.18 ω = 1.34
Cmax = βωRyPyscmax = 400.04 kip
Tmax = ωRyPyscmax = 339.02 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.18 ω = 1.34
Cmax = βωRyPyscmax = 400.04 kip
Tmax = ωRyPyscmax = 339.02 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 126.12 ϕFyscAsc (kip) = 188.10 Pu/ϕFyscAsc = 0.67
F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 188.10
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =62.70 <= Pysc <= 1.2Pysc =250.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.744 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.598%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.025 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.626%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 400.04
F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 3 Frame No: 10 Member No: 17
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_5.50 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.18 ω = 1.34
Cmax = βωRyPyscmax = 400.04 kip
Tmax = ωRyPyscmax = 339.02 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.18 ω = 1.34
Cmax = βωRyPyscmax = 400.04 kip
Tmax = ωRyPyscmax = 339.02 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 126.50 ϕFyscAsc (kip) = 188.10 Pu/ϕFyscAsc = 0.67

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 188.10
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =62.70 <= Pysc <= 1.2Pysc =250.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.747 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.587%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.025 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.592%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 400.04

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 2 Frame No: 10 Member No: 22
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_8.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.36
Cmax = βωRyPyscmax = 570.55 kip
Tmax = ωRyPyscmax = 500.48 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.36
Cmax = βωRyPyscmax = 570.55 kip
Tmax = ωRyPyscmax = 500.48 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK
Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.300 Dyn7
Pu (kip) = 197.84 ϕFyscAsc (kip) = 273.60 Pu/ϕFyscAsc = 0.72

F4.5b(3) Conformance Demonstration
K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 273.60
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =91.20 <= Pysc <= 1.2Pysc =364.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.775 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.666%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.025 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.739%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength
Strength of the bracing connection : Cmax (kip) = 570.55

F4.6c(2) --- Gusset Plates
Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Brace Parameters

Story: Level 2 Frame No: 10 Member No: 23
Fymin (ksi): 38.00 Fymax (ksi): 46.00 Size: CoreBRB_8.00 Connection Type: PINNED
Frame Type: Buckling Restrained Braced Frame - Chevron

F4.2 Basis of Design --- OK

F4.2a Adjusted Brace Strength

β and ω Factors at 2x Design Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.36
Cmax = βωRyPyscmax = 570.55 kip
Tmax = ωRyPyscmax = 500.48 kip

β and ω Factors at 2% Story Drift

Ry = 1.0 for CoreBrace Braces. User Assigned β = 1.14 ω = 1.36
Cmax = βωRyPyscmax = 570.55 kip
Tmax = ωRyPyscmax = 500.48 kip

F4.5 Bracing Members

F4.5b(2) Available Strength - Steel Core --- OK

Gravity Load Cases Excluded from Analyis
Load Combination: 1.401 D + 0.500 Lp + 0.200 Sp - 1.300 Dyn7
Pu (kip) = 196.41 ϕFyscAsc (kip) = 273.60 Pu/ϕFyscAsc = 0.72

F4.5b(3) Conformance Demonstration

K3.2(b) Subassemblage Test: Test with minimum Pysc_s >= 0.9Pysc (kip) = 273.60
K3.3c(b) Brace Test: Test with core yield capacity within 0.3Pysc =91.20 <= Pysc <= 1.2Pysc =364.80

2x Design Story Drift

K3.4c Required Elongation at 2 times design story drift (2Δbm): 0.744 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2x Design Story Drift: 0.654%

2% Story Drift

K3.4c Required Elongation at 2% story drift: 2.025 in
Load Case: Dyn7 Modal Force Y Dyn_ASCE716_CQC_Y_+E
Required core strain at 2% Design Story Drift: 1.781%

F4.6 Diagonal Brace Connections

F4.6c(1) --- Required Strength

Strength of the bracing connection : Cmax (kip) = 570.55

F4.6c(2) --- Gusset Plates

Lateral bracing shall be consistent with that used in testing.

Verify brace properties with the brace manufacturer prior to finalizing structural design.

Seismic Provisions Member Code Check

Column Parameters

Story: Mezzanine   Frame No: 10   Member No: 30
Fy (ksi): 50.00   Size: W10X77
Frame Type: Buckling Restrained Braced Frame - Chevron

D1.4a Required Strength --- OK

Max of Adj. Brace Strength and Amp. Seismic Forces with Ωo Criteria Applied.

D1.4a(a) – Ecl based on Adjusted Brace Strength:

Compression: Max Pu (kip) = 673.12 --- Combination: 1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl
Ecl (kips) = 574.81
Max Pu/ϕPn = 0.92 OK

Tension: Max Pu (kip) = 484.43 --- Combination: 0.699 D + 1.000 Ecl
Ecl (kips) = -524.80
Max Pu/ϕPn = 0.47 OK

Exception (2) of F4.3 was not checked.

D1.4a(b) – E amplified by Ωo:

	Load Combination	Pu(kip)	ϕPn(kip)	Result
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 2.500 Dyn7	433.65	731.56	OK
Tension:	0.699 D - 2.500 Dyn7	294.98	1021.50	OK

D2.5b Column Splices - Required Strength

Design strength of column splices must meet or exceed the following forces:

	Load Combination	Force(kip)
Compression:	1.401 D + 0.500 Lp + 0.200 Sp + 1.000 Ecl	673.12
Tension:	0.699 D + 1.000 Ecl	484.43

Ecl - Capacity limited seismic load from adjusted brace strengths in compression or in tension.
Required shear for column splice is max result from D2.5b and D2.5c
Refer to AISC 341 section D2.5b for additional detailing requirements.

F4.5a Basic Requirements (D1.1 Moderately Ductile) --- OK

For calculation of web limit: Pu (kip) = 673.12   ϕPy (kip) = 1021.50

Flange b/tf =	5.86	Limit =	9.18	OK
Web h/tw =	14.83	Limit =	43.28	OK

F4.6d Column Splices (D2.5c Required Shear Strength)

Column is at the lowest story. No column splice required

Verify brace properties with the brace manufacturer prior to finalizing structural design.

PRCNC20221036

Lateral Column Baseplate Design for Tension and Compression

Lateral Column Anchor Bolt Design

Pierce College

BASE PLATE THICKNESS - (EQ expected from BRB or AMPLIFIED BY OMEGA)

										Column Properties		Base Plate Properties									
Braced Frame	Grid Location	Column Size	Ftg Width (ft)	DL (k)	LL (k)	SL (k)	EQ (k) comp	P_u (k) uplift	P_u (k) comp	d (in)	b (in)	N (in), strong	B (in), weak	F_y (ksi)	m (in)	n (in)	n' (in)	λ	λn' (in)	t_{min} (in)	Thickness (in)
BF1	A4	W10x33	4	40	19	7	274	196	350	9.73	7.96	20	20	50	5.38	6.82	2.20	1	2.20	1.34	**1 1/2**
BF1	A1	W10x33	4	40	19	7	274	196	350	9.73	7.96	20	20	50	5.38	6.82	2.20	1	2.20	1.34	**1 1/2**
BF2	C16	W10x68	4	32	13	2	502	399	560	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	1.49	**1 1/2**
BF2	C15	W10x77	4	44	23	4	421	471	506	10.6	10.2	20	20	50	4.97	5.92	2.60	1	2.60	1.40	**1 1/2**
BF3	D1	W10X68	4	63	28	9	471	351	589	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	1.52	**1 3/4**
BF3	D2	W10X68	4	55	30	0	0	0	114	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	0.67	**3/4**
BF3	D3	W10X68	4	63	28	9	471	351	589	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	1.52	**1 3/4**
BF4	C7	W10x68	2	90	47	15	826	655	1002	10.4	10.1	23	23	50	6.56	7.46	2.56	1	2.56	2.16	**2 1/4**
BF4	C8	W10x68	2	58	37	0	0	0	129	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	0.71	**3/4**
BF4	C10	W10x68	2	96	33	15	826	650	996	10.4	10.1	23	23	50	6.56	7.46	2.56	1	2.56	2.16	**2 1/4**
BF5	D3	W10x68	2	118	32	14	680	489	880	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	1.86	**2**
BF5	D2	W10x68	2	84	32	0	0	0	152	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	0.77	**1**
BF5	D1	W10x68	2	74	22	8	680	520	807	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	1.78	**2**
BF6	A1	W10x68	2	69	47	14	410	447	556	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	1.48	**1 1/2**
BF6	A2	W10x68	2	47	43	0	0	0	125	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	0.70	**3/4**
BF6	A4	W10x68	2	60	44	10	410	453	540	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	1.46	**1 1/2**
BF7	B6	W10x77	2	58	29	6	610	669	721	10.6	10.2	23	23	50	6.47	7.42	2.60	1	2.60	1.83	**2**
BF7	B4	W10X68	2	89	39	10	710	547	876	10.4	10.1	23	23	50	6.56	7.46	2.56	1	2.56	2.02	**2 1/4**
BF8	A3	W10x68	2	63	23	8	352	379	465	10.4	10.1	20	20	50	5.06	5.96	2.56	1	2.56	1.35	**1 1/2**
BF8	A1	W10X45	2	50	19	6	423	317	513	10.1	8.02	20	20	50	5.20	6.79	2.25	1	2.25	1.62	**1 3/4**
BF9	C9	W10X88	2.666	112	43	20	1118	966	1322	10.8	10.3	24	24	50	6.87	7.88	2.64	1	2.64	2.52	**2 3/4**
BF9	C7	W12x136	2.666	126	48	18	2213	1838	2441	13.4	12.4	32	32	50	9.64	11.04	3.22	1	3.22	3.59	**3 3/4**
BF10	D4	W10x77	2.666	62	34	3	1059	874	1180	10.6	10.2	24	24	50	6.97	7.92	2.60	1	2.60	2.39	**2 1/2**
BF10	D6	W12x136	2.666	126	48	18	2213	1838	2441	13.4	12.4	32	32	50	9.64	11.04	3.22	1	3.22	3.59	**3 3/4**

Lateral Column Baseplate Design for Tension and Compression

Lateral Column Anchor Bolt Design

Braced Frame	Required Base Plate Area (in^2)	Actual Base Plate Area (in^2)	Area Check	Bearing Area (in^2)	Bearing Strength (k)	Bearing Check
	BASE PLATE BEARING ON CONCRETE					
BF1	141	400	OK	2304	1989	OK
BF1	141	400	OK	2304	1989	OK
BF2	225	400	OK	2304	1989	OK
BF2	204	400	OK	2304	1989	OK
BF3	237	400	OK	2304	1989	OK
BF3	46	400	OK	2304	1989	OK
BF3	237	400	OK	2304	1989	OK
BF4	403	529	OK	576	1372	OK
BF4	52	400	OK	576	1193	OK
BF4	401	529	OK	576	1372	OK
BF5	354	400	OK	576	1193	OK
BF5	61	400	OK	576	1193	OK
BF5	325	400	OK	576	1193	OK
BF6	224	400	OK	576	1193	OK
BF6	50	400	OK	576	1193	OK
BF6	217	400	OK	576	1193	OK
BF7	290	529	OK	576	1372	OK
BF7	352	529	OK	576	1372	OK
BF8	187	400	OK	576	1193	OK
BF8	206	400	OK	576	1193	OK
BF9	532	576	OK	1023	1909	OK
BF9	982	1024	OK	1023	2545	OK
BF10	475	576	OK	1023	1909	OK
BF10	982	1024	OK	1023	2545	OK

BASE PLATE TENSION

Braced Frame	Grid Location	edge distance (in)	x (in)	$t_{required}$ (in)	$t_{required}$ (in)	Final BP thickness
BF1	A4	3	3.82	1.82	2	**2**
BF1	A1	3	3.82	1.82	2	**2**
BF2	C16	3	2.96	2.29	2 1/2	**2 1/2**
BF2	C15	3	2.92	2.47	2 1/2	**2 1/2**
BF3	D1	3	2.96	2.15	2 1/4	**2 1/4**
BF3	D2	3	2.96	0.00	3/4	**3/4**
BF3	D3	3	2.96	2.15	2 1/4	**2 1/4**
BF4	C7	4	3.46	2.96	3	**3**
BF4	C8	3	2.96	0.00	3/4	**3/4**
BF4	C10	4	3.46	2.95	3	**3**
BF5	D3	3	2.96	2.54	2 3/4	**2 3/4**
BF5	D2	3	2.96	0.00	3/4	**1**
BF5	D1	3	2.96	2.62	2 3/4	**2 3/4**
BF6	A1	3	2.96	2.43	2 1/2	**2 1/2**
BF6	A2	3	2.96	0.00	3/4	**3/4**
BF6	A4	3	2.96	2.44	2 1/2	**2 1/2**
BF7	B6	4	3.42	2.98	3	**3**
BF7	B4	4	3.46	2.71	2 3/4	**2 3/4**
BF8	A3	3	2.96	2.23	2 1/4	**2 1/4**
BF8	A1	3	3.79	2.31	2 1/2	**2 1/2**
BF9	C9	4	3.88	3.73	3 3/4	**3 3/4**
BF9	C7	8	3.04	3.94	4	**4**
BF10	D4	4	3.92	3.57	3 3/4	**3 3/4**
BF10	D6	8	3.04	3.94	4	**4**

Lateral Column Baseplate Design for Tension and Compression

Lateral Column Anchor Bolt Design

Anchor Bolt Design

Braced Frame	Grid Location	Uplift Demand (k)	AB Required (in^2)	Diameter (in)	AB Quantity	Grade	Tensile Strength (ksi)	AB Area (in^2)	phi	Capacity (k)	Check
BF1	A4	196	0.523	1	4	105	125	0.606	0.75	227	OK
BF1	A1	196	0.523	1	4	105	125	0.606	0.75	227	OK
BF2	C16	399	1.064	1.5	4	105	125	1.405	0.75	527	OK
BF2	C15	471	1.256	1.5	4	105	125	1.405	0.75	527	OK
BF3	D1	351	0.936	1.25	4	105	125	0.969	0.75	363	OK
BF3	D2	0	0.000	1	4	105	125	0.606	0.75	227	OK
BF3	D3	351	0.936	1.25	4	105	125	0.969	0.75	363	OK
BF4	C7	655	1.747	2	4	105	125	2.498	0.75	937	OK
BF4	C8	0	0.000	1	4	105	125	0.606	0.75	227	OK
BF4	C10	650	1.733	2	4	105	125	2.498	0.75	937	OK
BF5	D3	489	1.304	1.5	4	105	125	1.405	0.75	527	OK
BF5	D2	0	0.000	1	4	105	125	0.606	0.75	227	OK
BF5	D1	520	1.387	1.5	4	105	125	1.405	0.75	527	OK
BF6	A1	447	1.192	1.5	4	105	125	1.405	0.75	527	OK
BF6	A2	0	0.000	1	4	105	125	0.606	0.75	227	OK
BF6	A4	453	1.208	1.5	4	105	125	1.405	0.75	527	OK
BF7	B6	669	1.784	2	4	105	125	2.498	0.75	937	OK
BF7	B4	547	1.459	2	4	105	125	2.498	0.75	937	OK
BF8	A3	379	1.011	1.5	4	105	125	1.405	0.75	527	OK
BF8	A1	317	0.845	1.5	4	105	125	1.405	0.75	527	OK
BF9	C9	966	2.576	2.5	4	105	125	3.999	0.75	1500	OK
BF9	C7	1838	4.901	3	4	105	125	5.967	0.75	2238	OK
BF10	D4	874	2.331	2	4	105	125	2.498	0.75	937	OK
BF10	D6	1838	4.901	3	4	105	125	5.967	0.75	2238	OK

Lateral Column Baseplate Design for Tension and Compression

Lateral Column Anchor Bolt Design

Summary					
Braced Frame	Grid Location	Min Thickness	edge	X'	Min Diameter
BF1	A4	2	3	7	1
BF1	A1	2	3	7	1
BF2	C16	2 1/2	3	7	1.5
BF2	C15	2 1/2	3	7	1.5
BF3	D1	2 1/4	3	7	1.25
BF3	D2	3/4	3	7	1
BF3	D3	2 1/4	3	7	1.25
BF4	C7	3	4	7.5	2
BF4	C8	3/4	3	7	1
BF4	C10	3	4	7.5	2
BF5	D3	2 3/4	3	7	1.5
BF5	D2	1	3	7	1
BF5	D1	2 3/4	3	7	1.5
BF6	A1	2 1/2	3	7	1.5
BF6	A2	3/4	3	7	1
BF6	A4	2 1/2	3	7	1.5
BF7	B6	3	4	7.5	2
BF7	B4	2 3/4	4	7.5	2
BF8	A3	2 1/4	3	7	1.5
BF8	A1	2 1/2	3	7	1.5
BF9	C9	3 3/4	4	8	2.5
BF9	C7	4	8	8	3
BF10	D4	3 3/4	4	8	2
BF10	D6	4	8	8	3

Lateral Column Baseplate Design for Tension and Compression

Lateral Column Anchor Bolt Design

Design of baseplate shear lug, shear reinforcing, tension reinforcing, embedded washer plate with blowout, and anchor bolt pullout

PRCNC20221036

BF1 Column Anchorage

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	6	ft
Ftg Depth	2.5	ft
Bolt Diameter	1.5	in
No. of Bolts	4	
Loads		
RAM DL	40	k
RAM LL	19	k
RAM SL	7	k
RAM Uplift	70	k
RAM Shear	40	k
Reactions with Overstrength		
Factored Uplift	175	k
Factored Shear	100	k
Expected Forces		
Factored Compression	274	k
Factored Uplift	224	k
Factored Shear	163	k
Anchorage Design Forces		
EQ Compression	**274**	**k**
Uplift	**196**	**k**
Shear	**163**	**k**
Tension Reinforcement		
T_u	196	k
A_{s_req}	4.3	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**8**	
Embedded Plate Washer Flexural Strength		
Tension	196	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.25	in
w_u	3.4	ksi
M_u	2.6	k-in/in
CHECK	OK	
Anchor Bolt Pullout		
Washer Size	4.0	in
Tension per Bolt	49	k
N_{pn}	525	k
ϕN_{pn}	368	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	3	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	163	k
Shear Per Lug	163	k
Concrete Bearing		
f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	
Shear Lug Spacing		
C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	95	in
ϕV_n	778	k
CHECK	OK	
Shear Reinforcement		
T_u	163	k
A_{s_req}	4.5	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**6**	
Shear Lug Thickness		
M_u	980	k-in
Required Thickness	2.49	in
Thickness	3	in
CHECK	OK	
Shear Lug Weld to Base Plate		
No. of Welds	2	
f_v	5.8	k/in
f_t	23.3	k/in
R	24.1	k/in
θ	76.0	degrees
Factor	62.1	
Weld Size	**12/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.625	in
(a) l_{dh}	11.6	in
(b) l_{dh}	5	in
(c) l_{dh}	6	in
l_{dh}	**11.6**	**in**
Required Footing Depth to Develop Bar		
Rod Embed	18	in
U-Bar Dim from Rod	6	in
Total Horiz Dim of Cone	25.7	in
Dim from TOF to Cone	13.8	
Top Cover	2	in
Bar Length Above Cone	11.8	in
CHECK	OK	
Dim from Cone to Bottom of U-Bar	11.6	in
Bottom Cover	3	in
Minimum Required Footing Depth	**28.4**	**in**
CHECK	OK	

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	196	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE'	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	205.0	k
Width Group bolt ϕN_{sbg}	210.5	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	11	in
Assumed Length Single bolt N_{sb}	451.0	k
Assumed Length Group bolt ϕN_{sbg}	383	k
Sum ϕN_{sbg}	593.2	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	3	2	0	in^2
β	0	1.22	1.23	0	
ω	0	1.37	1.36	0	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	44.9	46.1	0	degress
BRB Expected Tension	0	189	125	0	k
BRB Expected Comp	0	231	154	0	k

BF2 Column Anchorage - C16 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	6	ft
Ftg Depth	2.5	ft
Bolt Diameter	1.5	in
No. of Bolts	4	

Loads

RAM DL	32	k
RAM LL	13	k
RAM SL	2	k
RAM Uplift	117	k
RAM Shear	52	k

Reactions with Overstrength

Factored Uplift	293	k
Factored Shear	130	k

Expected Forces

Factored Compression	502	k
Factored Uplift	421	k
Factored Shear	202	k

Anchorage Design Forces

EQ Compression	**502**	**k**
Uplift	**399**	**k**
Shear	**202**	**k**

Tension Reinforcement

T_u	399	k
A_{s_req}	8.9	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**15**	

Embedded Plate Washer Flexural Strength

Tension	399	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.25	in
w_u	6.8	ksi
M_u	5.3	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	4.0	in
Tension per Bolt	100	k
N_{pn}	525	k
ϕN_{pn}	368	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	3	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	202	k
Shear Per Lug	202	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	95	in
ϕV_n	778	k
CHECK	OK	

Shear Reinforcement

T_u	202	k
A_{s_req}	5.6	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**7**	

Shear Lug Thickness

M_u	1213	k-in
Required Thickness	2.78	in
Thickness	3	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	7.2	k/in
f_t	28.9	k/in
R	29.8	k/in
θ	76.0	degrees
Factor	62.1	
Weld Size	**15/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.625	in
(a) l_{dh}	11.6	in
(b) l_{dh}	5	in
(c) l_{dh}	6	in
l_{dh}	**11.6**	**in**

Required Footing Depth to Develop Bar

Rod Embed	20	in
U-Bar Dim from Rod	9	in
Total Horiz Dim of Cone	28.6	in
Dim from TOF to Cone	13.7	
Top Cover	2	in
Bar Length Above Cone	11.7	in
CHECK	OK	
Dim from Cone to Bottom of U-Bar	11.6	in
Bottom Cover	3	in
Minimum Required Footing Depth	**28.3**	**in**
CHECK	OK	

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	399	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE'	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	205.0	k
Width Group bolt ϕN_{sbg}	210.5	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	11	in
Assumed Length Single bolt N_{sb}	451.0	k
Assumed Length Group bolt ϕN_{sbg}	383	k
Sum ϕN_{sbg}	593.2	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	4	3	2.5	in^2
β	0	1.17	1.22	1.19	
ω	0	1.31	1.37	1.34	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	44.2	44.3	51.8	degress
BRB Expected Tension	0	241	189	154	k
BRB Expected Comp	0	282	231	183	k

BF2 Column Anchorage - C15 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2.5	ft
Bolt Diameter	1.5	in
No. of Bolts	4	

Loads

RAM DL	44	k
RAM LL	23	k
RAM SL	4	k
RAM Uplift	117	k
RAM Shear	0	k

Reactions with Overstrength

Factored Uplift	293	k
Factored Shear	0	k

Expected Forces

Factored Compression	421	k
Factored Uplift	502	k
Factored Shear	0	k

Anchorage Design Forces

EQ Compression	**421**	**k**
Uplift	**471**	**k**
Shear	**0**	**k**

Tension Reinforcement

T_u	471	k
A_{s_req}	10.5	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**18**	

Embedded Plate Washer Flexural Strength

Tension	471	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.25	in
w_u	8.1	ksi
M_u	6.3	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	4.0	in
Tension per Bolt	118	k
N_{pn}	525	k
ϕN_{pn}	368	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	1	in
Total Depth	6	in
Width	1	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	0	k
Shear Per Lug	0	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	2.0	in^2
$V_{brg,sl}$	10	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	97	in
ϕV_n	57	k
CHECK	OK	

Shear Reinforcement

T_u	0	k
A_{s_req}	0.0	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**0**	

Shear Lug Thickness

M_u	0	k-in
Required Thickness	0.00	in
Thickness	1	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	0.0	k/in
f_t	0.0	k/in
R	0.0	k/in
θ	#DIV/0!	degrees
Factor	#DIV/0!	
Weld Size	**#DIV/0!**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.625	in
(a) l_{dh}	11.6	in
(b) l_{dh}	5	in
(c) l_{dh}	6	in
$\mathbf{l_{dh}}$	**11.6**	**in**

Required Footing Depth to Develop Bar

Rod Embed	20	in
U-Bar Dim from Rod	9	in
Total Horiz Dim of Cone	28.6	in
Dim from TOF to Cone	13.7	
Top Cover	2	in
Bar Length Above Cone	11.7	in
CHECK	OK	
Dim from Cone to Bottom of U-Bar	11.6	in
Bottom Cover	3	in
Minimum Required Footing Depth	**28.3**	**in**
CHECK	OK	

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	471	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE'	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	205.0	k
Width Group bolt ϕN_{sbg}	210.5	k
Pier Assumed Length	30	in
Assumed Length C_{a1}	8	in
Assumed Length Single bolt N_{sb}	328.0	k
Assumed Length Group bolt ϕN_{sbg}	297	k
Sum ϕN_{sbg}	507.1	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	4	3	2.5	in^2
β	0	1.17	1.22	1.19	
ω	0	1.31	1.37	1.34	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	44.2	44.3	51.8	degress
BRB Expected Tension	0	241	189	154	k
BRB Expected Comp	0	282	231	183	k

BF3 Column Anchorage

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2.5	ft
Bolt Diameter	1.25	in
No. of Bolts	4	

Loads

RAM DL	63	k
RAM LL	28	k
RAM SL	9	k
RAM Uplift	134	k
RAM Shear	66	k

Reactions with Overstrength

Factored Uplift	335	k
Factored Shear	165	k

Expected Forces

Factored Compression	471	k
Factored Uplift	395	k
Factored Shear	202	k

Anchorage Design Forces

EQ Compression	**471**	**k**
Uplift	**351**	**k**
Shear	**202**	**k**

Tension Reinforcement

T_u	351	k
A_{s_req}	7.8	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**13**	

Embedded Plate Washer Flexural Strength

Tension	351	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	7	threads/in
$A_{se,N}$	0.97	in^2
A_{brg}	15.03	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.375	in
w_u	5.8	ksi
M_u	5.5	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	4.0	in
Tension per Bolt	88	k
N_{pn}	541	k
ϕN_{pn}	379	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	3	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	202	k
Shear Per Lug	202	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	95	in
ϕV_n	778	k
CHECK	OK	

Shear Reinforcement

T_u	202	k
A_{s_req}	5.6	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**7**	

Shear Lug Thickness

M_u	1213	k-in
Required Thickness	2.78	in
Thickness	3	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	7.2	k/in
f_t	28.9	k/in
R	29.8	k/in
θ	76.0	degrees
Factor	62.1	
Weld Size	**15/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.625	in
(a) l_{dh}	11.6	in
(b) l_{dh}	5	in
(c) l_{dh}	6	in
$\mathbf{l_{dh}}$	**11.6**	**in**

Required Footing Depth to Develop Bar

Rod Embed	20	in
U-Bar Dim from Rod	9	in
Total Horiz Dim of Cone	28.6	in
Dim from TOF to Cone	13.7	
Top Cover	2	in
Bar Length Above Cone	11.7	in
CHECK	OK	
Dim from Cone to Bottom of U-Bar	11.6	in
Bottom Cover	3	in
Minimum Required Footing Depth	**28.3**	**in**
CHECK	OK	

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	351	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	7	threads/in
$A_{se,N}$	0.97	in^2
A_{brg}	15.03	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE'	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	208.1	k
Width Group bolt ϕN_{sbg}	213.6	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	11	in
Assumed Length Single bolt N_{sb}	457.7	k
Assumed Length Group bolt ϕN_{sbg}	388	k
Sum ϕN_{sbg}	602.0	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	4	3	2	in^2
β	0	1.17	1.22	1.19	
ω	0	1.31	1.37	1.34	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	44.2	44.4	50.1	degress
BRB Expected Tension	0	241	189	123	k
BRB Expected Comp	0	282	231	147	k

BF4 Column Anchorage - C7 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	2	in
No. of Bolts	4	

Loads

RAM DL	90	k
RAM LL	47	k
RAM SL	15	k
RAM Uplift	230	k
RAM Shear	101	k

Reactions with Overstrength

Factored Uplift	575	k
Factored Shear	253	k

Expected Forces

Factored Compression	826	k
Factored Uplift	718	k
Factored Shear	350	k

Anchorage Design Forces

EQ Compression	**826**	**k**
Uplift	**655**	**k**
Shear	**350**	**k**

Tension Reinforcement

T_u	655	k
A_{s_req}	14.5	in^2
Rebar Size	#7	
No. of Legs	2	
Rebar Area	1.20	in^2
No. of U-Bars	**13**	

Embedded Plate Washer Flexural Strength

Tension	655	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	5	threads/in
$A_{se,N}$	2.50	in^2
A_{brg}	22.50	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.5	in
w_u	7.3	ksi
M_u	8.2	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	5.0	in
Tension per Bolt	164	k
N_{pn}	810	k
ϕN_{pn}	567	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	3.5	in
Total Depth	8	in
Width	16	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	350	k
Shear Per Lug	350	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	96.0	in^2
$V_{brg,sl}$	477	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	95	in
ϕV_n	885	k
CHECK	OK	

Shear Reinforcement

T_u	350	k
A_{s_req}	9.7	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**12**	

Shear Lug Thickness

M_u	2100	k-in
Required Thickness	3.42	in
Thickness	3.5	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	10.9	k/in
f_t	37.5	k/in
R	39.1	k/in
θ	73.7	degrees
Factor	61.8	
Weld Size	**1 4/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.875	in
(a) l_{dh}	19.2	in
(b) l_{dh}	7	in
(c) l_{dh}	6	in
l_{dh}	**19.2**	**in**

Required Footing Depth to Develop Bar

Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	19.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**22.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	655	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	5	threads/in
$A_{se,N}$	2.50	in^2
A_{brg}	22.50	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7.5	in
Baseplate "EDGE"	4	in
AB Spacing	15	in
Pier Width	30	in
Width C_{a1}	7.5	in
Width Single bolt N_{sb}	381.9	k
Width Group bolt ϕN_{sbg}	356.4	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	10.5	in
Assumed Length Single bolt N_{sb}	534.6	k
Assumed Length Group bolt ϕN_{sbg}	463	k
Sum ϕN_{sbg}	819.7	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	7	6	3.5	in^2
β	0	1.14	1.14	1.19	
ω	0	1.33	1.35	1.34	
Fymax	46	46	46	45	ksi
Angle From Horiz	0	44.2	44.3	48.8	degress
BRB Expected Tension	0	428	373	211	k
BRB Expected Comp	0	488	425	251	k

BF4 Column Anchorage - C10 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	2	in
No. of Bolts	4	

Loads

RAM DL	96	k
RAM LL	33	k
RAM SL	15	k
RAM Uplift	230	k
RAM Shear	101	k

Reactions with Overstrength

Factored Uplift	575	k
Factored Shear	253	k

Expected Forces

Factored Compression	826	k
Factored Uplift	718	k
Factored Shear	350	k

Anchorage Design Forces

EQ Compression	**826**	**k**
Uplift	**650**	**k**
Shear	**350**	**k**

Tension Reinforcement

T_u	650	k
A_{s_req}	14.5	in^2
Rebar Size	#7	
No. of Legs	2	
Rebar Area	1.20	in^2
No. of U-Bars	**13**	

Embedded Plate Washer Flexural Strength

Tension	650	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	5	threads/in
$A_{se,N}$	2.50	in^2
A_{brg}	22.50	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.5	in
w_u	7.2	ksi
M_u	8.1	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	5.0	in
Tension per Bolt	163	k
N_{pn}	810	k
ϕN_{pn}	567	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	3.5	in
Total Depth	8	in
Width	16	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	350	k
Shear Per Lug	350	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	96.0	in^2
$V_{brg,sl}$	477	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	95	in
ϕV_n	885	k
CHECK	OK	

Shear Reinforcement

T_u	350	k
A_{s_req}	9.7	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**12**	

Shear Lug Thickness

M_u	2100	k-in
Required Thickness	3.42	in
Thickness	3.5	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	10.9	k/in
f_t	37.5	k/in
R	39.1	k/in
θ	73.7	degrees
Factor	61.8	
Weld Size	**1 4/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.875	in
(a) l_{dh}	19.2	in
(b) l_{dh}	7	in
(c) l_{dh}	6	in
l_{dh}	**19.2**	**in**

Required Footing Depth to Develop Bar

Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	19.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**22.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	650	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	5	threads/in
$A_{se,N}$	2.50	in^2
A_{brg}	22.50	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7.5	in
Baseplate "EDGE"	4	in
AB Spacing	15	in
Pier Width	30	in
Width C_{a1}	7.5	in
Width Single bolt N_{sb}	381.9	k
Width Group bolt ϕN_{sbg}	356.4	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	10.5	in
Assumed Length Single bolt N_{sb}	534.6	k
Assumed Length Group bolt ϕN_{sbg}	463	k
Sum ϕN_{sbg}	819.7	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	7	6	3.5	in^2
β	0	1.14	1.14	1.19	
ω	0	1.33	1.35	1.34	
Fymax	46	46	46	45	ksi
Angle From Horiz	0	44.2	44.3	48.8	degress
BRB Expected Tension	0	428	373	211	k
BRB Expected Comp	0	488	425	251	k

BF5 Column Anchorage - D3 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	1.5	in
No. of Bolts	4	

Loads

RAM DL	118	k
RAM LL	32	k
RAM SL	14	k
RAM Uplift	155	k
RAM Shear	44	k

Reactions with Overstrength

Factored Uplift	388	k
Factored Shear	110	k

Expected Forces

Factored Compression	680	k
Factored Uplift	572	k
Factored Shear	265	k

Anchorage Design Forces

EQ Compression	**680**	**k**
Uplift	**489**	**k**
Shear	**265**	**k**

Tension Reinforcement

T_u	489	k
A_{s_req}	10.9	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**13**	

Embedded Plate Washer Flexural Strength

Tension	489	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.25	in
w_u	8.4	ksi
M_u	6.5	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	4.0	in
Tension per Bolt	122	k
N_{pn}	525	k
ϕN_{pn}	368	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	3.5	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	265	k
Shear Per Lug	265	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	95	in
ϕV_n	774	k
CHECK	OK	

Shear Reinforcement

T_u	265	k
A_{s_req}	7.4	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**9**	

Shear Lug Thickness

M_u	1589	k-in
Required Thickness	3.18	in
Thickness	3.5	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	9.5	k/in
f_t	32.4	k/in
R	33.8	k/in
θ	73.7	degrees
Factor	61.8	
Weld Size	**1 1/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.75	in
(a) l_{dh}	15.2	in
(b) l_{dh}	6	in
(c) l_{dh}	6	in
l_{dh}	**15.2**	**in**

Required Footing Depth to Develop Bar

Rod Embed	24	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	34.3	in	
Dim from TOF to Cone	17.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	15.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**18.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	489	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE"	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	205.0	k
Width Group bolt ϕN_{sbg}	210.5	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	11	in
Assumed Length Single bolt N_{sb}	451.0	k
Assumed Length Group bolt ϕN_{sbg}	383	k
Sum ϕN_{sbg}	593.2	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	4.5	4	3.5	2	in^2
β	1.17	1.18	1.22	1.19	
ω	1.33	1.34	1.37	1.34	
Fymax	46	46	45	46	ksi
Angle From Horiz	34.7	43.4	44.4	50.1	degress
BRB Expected Tension	275	247	216	123	k
BRB Expected Comp	322	291	263	147	k

BF5 Column Anchorage - D1 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'$_c$	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	1.5	in
No. of Bolts	4	

Loads

RAM DL	74	k
RAM LL	22	k
RAM SL	8	k
RAM Uplift	155	k
RAM Shear	44	k

Reactions with Overstrength

Factored Uplift	388	k
Factored Shear	110	k

Expected Forces

Factored Compression	680	k
Factored Uplift	572	k
Factored Shear	265	k

Anchorage Design Forces

EQ Compression	**680**	**k**
Uplift	**520**	**k**
Shear	**265**	**k**

Tension Reinforcement

T_u	520	k
A_{s_req}	11.6	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**14**	

Embedded Plate Washer Flexural Strength

Tension	520	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.25	in
w_u	8.9	ksi
M_u	7.0	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	4.0	in
Tension per Bolt	130	k
N_{pn}	525	k
ϕN_{pn}	368	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	3.5	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	265	k
Shear Per Lug	265	k

Concrete Bearing

f'$_c$	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	95	in
ϕV_n	774	k
CHECK	OK	

Shear Reinforcement

T_u	265	k
A_{s_req}	7.4	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**9**	

Shear Lug Thickness

M_u	1589	k-in
Required Thickness	3.18	in
Thickness	3.5	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	9.5	k/in
f_t	32.4	k/in
R	33.8	k/in
θ	73.7	degrees
Factor	61.8	
Weld Size	**1 1/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.75	in
(a) l_{dh}	15.2	in
(b) l_{dh}	6	in
(c) l_{dh}	6	in
l_{dh}	**15.2**	**in**

Required Footing Depth to Develop Bar

Rod Embed	24	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	34.3	in	
Dim from TOF to Cone	17.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	15.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**18.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	520	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE"	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	205.0	k
Width Group bolt ϕN_{sbg}	210.5	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	11	in
Assumed Length Single bolt N_{sb}	451.0	k
Assumed Length Group bolt ϕN_{sbg}	383	k
Sum ϕN_{sbg}	593.2	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	4.5	4	3.5	2	in^2
β	1.17	1.18	1.22	1.19	
ω	1.33	1.34	1.37	1.34	
Fymax	46	46	45	46	ksi
Angle From Horiz	34.7	43.4	44.4	50.1	degress
BRB Expected Tension	275	247	216	123	k
BRB Expected Comp	322	291	263	147	k

BF6 Column Anchorage - A1 Column

Properties		
Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	1.5	in
No. of Bolts	4	
Loads		
RAM DL	69	k
RAM LL	47	k
RAM SL	14	k
RAM Uplift	118	k
RAM Shear	0	k
Reactions with Overstrength		
Factored Uplift	295	k
Factored Shear	0	k
Expected Forces		
Factored Compression	410	k
Factored Uplift	495	k
Factored Shear	0	k
Anchorage Design Forces		
EQ Compression	**410**	**k**
Uplift	**447**	**k**
Shear	**0**	**k**
Tension Reinforcement		
T_u	447	k
A_{s_req}	9.9	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**12**	
Embedded Plate Washer Flexural Strength		
Tension	447	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	23.59	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.75	in
w_u	4.7	ksi
M_u	7.2	k-in/in
CHECK	OK	
Anchor Bolt Pullout		
Washer Size	5.0	in
Tension per Bolt	112	k
N_{pn}	849	k
ϕN_{pn}	595	k
CHECK	OK	

Shear Lug Design		
No. of Lugs	1	
Thickness	1	in
Total Depth	6	in
Width	1	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	0	k
Shear Per Lug	0	k
Concrete Bearing		
f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	2.0	in^2
$V_{brg,sl}$	10	k
CHECK	OK	
Shear Lug Spacing		
C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	97	in
ϕV_n	57	k
CHECK	OK	
Shear Reinforcement		
T_u	0	k
A_{s_req}	0.0	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**0**	
Shear Lug Thickness		
M_u	0	k-in
Required Thickness	0.00	in
Thickness	1	in
CHECK	OK	
Shear Lug Weld to Base Plate		
No. of Welds	2	
f_v	0.0	k/in
f_t	0.0	k/in
R	0.0	k/in
θ	#DIV/0!	degrees
Factor	#DIV/0!	
Weld Size	**#DIV/0!**	**in**

Tension Reinforcement Development Length			
ACI 318-19 Section 25.4.3.1			
F_y	60	ksi	
ψ_e	1		
ψ_r	1.6		
ψ_o	1		
ψ_c	0.9		
d_b	0.75	in	
(a) l_{dh}	15.2	in	
(b) l_{dh}	6	in	
(c) l_{dh}	6	in	
l_{dh}	**15.2**	**in**	
Required Footing Depth to Develop Bar			
Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	15.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**18.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4			
Tension	447	k	
Thickness	1	in	
Dimension	5	in	
Washer Area	25	in^2	
n_t	6	threads/in	
$A_{se,N}$	1.41	in^2	
A_{brg}	23.59	in^2	
ϕ	0.7		
Lambda	1		
Baseplate 'X'	7	in	
Baseplate "EDGE'	3	in	
AB Spacing	14	in	
Pier Width	24	in	
Width C_{a1}	5	in	
Width Single bolt N_{sb}	260.7	k	
Width Group bolt ϕN_{sbg}	267.6	k	
Pier Assumed Length	36	in	
Assumed Length C_{a1}	11	in	
Assumed Length Single bolt N_{sb}	573.5	k	
Assumed Length Group bolt ϕN_{sbg}	487	k	
Sum ϕN_{sbg}	535.3	k	2 * minimum blowout
CHECK	OK		

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	3.5	3	2.5	in^2
β	0	1.21	1.22	1.19	
ω	0	1.36	1.37	1.34	
Fymax	0	45	46	46	ksi
Angle From Horiz	0	45.5	45.7	52.3	degress
BRB Expected Tension	0	214	189	154	k
BRB Expected Comp	0	259	231	183	k

BF6 Column Anchorage - A2 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'$_c$	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	1	in
No. of Bolts	4	

Loads

RAM DL	47	k
RAM LL	43	k
RAM SL	0	k
RAM Uplift	0	k
RAM Shear	98	k

Reactions with Overstrength

Factored Uplift	0	k
Factored Shear	245	k

Expected Forces

Factored Compression	0	k
Factored Uplift	0	k
Factored Shear	332	k

Anchorage Design Forces

EQ Compression	**0**	**k**
Uplift	**0**	**k**
Shear	**332**	**k**

Tension Reinforcement

T_u	0	k
A_{s_req}	0.0	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**0**	

Embedded Plate Washer Flexural Strength

Tension	0	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	8	threads/in
$A_{se,N}$	0.61	in^2
A_{brg}	15.39	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.5	in
w_u	0.0	ksi
M_u	0.0	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	4.0	in
Tension per Bolt	0	k
N_{pn}	554	k
ϕN_{pn}	388	k
CHECK	OK	

Shear Lug Design

No. of Lugs	2	
Thickness	3.5	in
Total Depth	8	in
Width	18	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	332	k
Shear Per Lug	166	k

Concrete Bearing

f'$_c$	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	108.0	in^2
$V_{brg,sl}$	537	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	95	in
ϕV_n	995	k
CHECK	OK	

Shear Reinforcement

T_u	332	k
A_{s_req}	9.2	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**11**	

Shear Lug Thickness

M_u	995	k-in
Required Thickness	2.22	in
Thickness	3.5	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	4.6	k/in
f_t	15.8	k/in
R	16.5	k/in
θ	73.7	degrees
Factor	61.8	
Weld Size	**9/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.625	in
(a) l_{dh}	11.6	in
(b) l_{dh}	5	in
(c) l_{dh}	6	in
l_{dh}	**11.6**	**in**

Required Footing Depth to Develop Bar

Rod Embed	2	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	2.9	in	
Dim from TOF to Cone	-4.3		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	11.6	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**14.6**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	0	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	8	threads/in
$A_{se,N}$	0.61	in^2
A_{brg}	15.39	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE'	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	210.6	k
Width Group bolt ϕN_{sbg}	216.2	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	11	in
Assumed Length Single bolt N_{sb}	463.2	k
Assumed Length Group bolt ϕN_{sbg}	393	k
Sum ϕN_{sbg}	609.2	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	3.5	3	2.5	in^2
β	0	1.21	1.22	1.19	
ω	0	1.36	1.37	1.34	
Fymax	0	45	46	46	ksi
Angle From Horiz	0	45.5	45.7	52.3	degress
BRB Expected Tension	0	214	189	154	k
BRB Expected Comp	0	259	231	183	k

BF6 Column Anchorage - A4 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	1.5	in
No. of Bolts	4	

Loads

RAM DL	60	k
RAM LL	44	k
RAM SL	10	k
RAM Uplift	119	k
RAM Shear	0	k

Reactions with Overstrength

Factored Uplift	298	k
Factored Shear	0	k

Expected Forces

Factored Compression	410	k
Factored Uplift	495	k
Factored Shear	0	k

Anchorage Design Forces

EQ Compression	**410**	**k**
Uplift	**453**	**k**
Shear	**0**	**k**

Tension Reinforcement

T_u	453	k
A_{s_req}	10.1	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**12**	

Embedded Plate Washer Flexural Strength

Tension	453	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	23.59	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.75	in
w_u	4.8	ksi
M_u	7.4	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	5.0	in
Tension per Bolt	113	k
N_{pn}	849	k
ϕN_{pn}	595	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	1	in
Total Depth	6	in
Width	1	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	0	k
Shear Per Lug	0	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	2.0	in^2
$V_{brg,sl}$	10	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	97	in
ϕV_n	57	k
CHECK	OK	

Shear Reinforcement

T_u	0	k
A_{s_req}	0.0	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**0**	

Shear Lug Thickness

M_u	0	k-in
Required Thickness	0.00	in
Thickness	1	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	0.0	k/in
f_t	0.0	k/in
R	0.0	k/in
θ	#DIV/0!	degrees
Factor	#DIV/0!	
Weld Size	**#DIV/0!**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi	
ψ_e	1		
ψ_r	1.6		
ψ_o	1		
ψ_c	0.9		
d_b	0.75	in	
(a) l_{dh}	15.2	in	
(b) l_{dh}	6	in	
(c) l_{dh}	6	in	
l_{dh}	**15.2**	**in**	

Required Footing Depth to Develop Bar

Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	15.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**18.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	453	k	
Thickness	1	in	
Dimension	5	in	
Washer Area	25	in^2	
n_t	6	threads/in	
$A_{se,N}$	1.41	in^2	
A_{brg}	23.59	in^2	
ϕ	0.7		
Lambda	1		
Baseplate 'X'	7	in	
Baseplate "EDGE'	3	in	
AB Spacing	14	in	
Pier Width	24	in	
Width C_{a1}	5	in	
Width Single bolt N_{sb}	260.7	k	
Width Group bolt ϕN_{sbg}	267.6	k	
Pier Assumed Length	24	in	
Assumed Length C_{a1}	5	in	
Assumed Length Single bolt N_{sb}	260.7	k	
Assumed Length Group bolt ϕN_{sbg}	268	k	
Sum ϕN_{sbg}	535.3	k	2 * minimum blowout
CHECK	OK		

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	3.5	3	2.5	in^2
β	0	1.21	1.22	1.19	
ω	0	1.36	1.37	1.34	
Fymax	0	45	46	46	ksi
Angle From Horiz	0	45.5	45.7	52.3	degress
BRB Expected Tension	0	214	189	154	k
BRB Expected Comp	0	259	231	183	k

BF7 Column Anchorage - B6 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	2	in
No. of Bolts	4	

Loads

RAM DL	58	k
RAM LL	29	k
RAM SL	6	k
RAM Uplift	192	k
RAM Shear	0	k

Reactions with Overstrength

Factored Uplift	480	k
Factored Shear	0	k

Expected Forces

Factored Compression	610	k
Factored Uplift	710	k
Factored Shear	0	k

Anchorage Design Forces

EQ Compression	**610**	**k**
Uplift	**669**	**k**
Shear	**0**	**k**

Tension Reinforcement

T_u	669	k
A_{s_req}	14.9	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**17**	

Embedded Plate Washer Flexural Strength

Tension	669	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	5	threads/in
$A_{se,N}$	2.50	in^2
A_{brg}	22.50	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.5	in
w_u	7.4	ksi
M_u	8.4	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	5.0	in
Tension per Bolt	167	k
N_{pn}	810	k
ϕN_{pn}	567	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	1	in
Total Depth	6	in
Width	1	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	0	k
Shear Per Lug	0	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	2.0	in^2
$V_{brg,sl}$	10	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	97	in
ϕV_n	57	k
CHECK	OK	

Shear Reinforcement

T_u	0	k
A_{s_req}	0.0	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**0**	

Shear Lug Thickness

M_u	0	k-in
Required Thickness	0.00	in
Thickness	1	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	0.0	k/in
f_t	0.0	k/in
R	0.0	k/in
θ	#DIV/0!	degrees
Factor	#DIV/0!	
Weld Size	**#DIV/0!**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	0.75	in
(a) l_{dh}	15.2	in
(b) l_{dh}	6	in
(c) l_{dh}	6	in
l_{dh}	**15.2**	**in**

Required Footing Depth to Develop Bar

Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	15.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**18.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	669	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	5	threads/in
$A_{se,N}$	2.50	in^2
A_{brg}	22.50	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE'	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	254.6	k
Width Group bolt ϕN_{sbg}	261.4	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	11	in
Assumed Length Single bolt N_{sb}	560.1	k
Assumed Length Group bolt ϕN_{sbg}	475	k
Sum ϕN_{sbg}	736.6	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	6	4	4	in^2
β	0	1.14	1.17	1.19	
ω	0	1.33	1.33	1.35	
Fymax	46	46	46	45	ksi
Angle From Horiz	0	43.6	43.7	50.5	degress
BRB Expected Tension	0	367	245	243	k
BRB Expected Comp	0	418	286	289	k

BF7 Column Anchorage - B4 Column

Properties		
Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	2	in
No. of Bolts	4	
Loads		
RAM DL	89	k
RAM LL	39	k
RAM SL	10	k
RAM Uplift	192	k
RAM Shear	93	k
Reactions with Overstrength		
Factored Uplift	480	k
Factored Shear	233	k
Expected Forces		
Factored Compression	710	k
Factored Uplift	610	k
Factored Shear	303	k
Anchorage Design Forces		
EQ Compression	**710**	**k**
Uplift	**547**	**k**
Shear	**303**	**k**
Tension Reinforcement		
T_u	547	k
A_{s_req}	12.2	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**14**	
Embedded Plate Washer Flexural Strength		
Tension	547	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	5	threads/in
$A_{se,N}$	2.50	in^2
A_{brg}	22.50	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.5	in
w_u	6.1	ksi
M_u	6.8	k-in/in
CHECK	OK	
Anchor Bolt Pullout		
Washer Size	5.0	in
Tension per Bolt	137	k
N_{pn}	810	k
ϕN_{pn}	567	k
CHECK	OK	

Shear Lug Design		
No. of Lugs	1	
Thickness	3.5	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	303	k
Shear Per Lug	303	k
Concrete Bearing		
f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	
Shear Lug Spacing		
C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	95	in
ϕV_n	774	k
CHECK	OK	
Shear Reinforcement		
T_u	303	k
A_{s_req}	8.4	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**10**	
Shear Lug Thickness		
M_u	1818	k-in
Required Thickness	3.40	in
Thickness	3.5	in
CHECK	OK	
Shear Lug Weld to Base Plate		
No. of Welds	2	
f_v	10.8	k/in
f_t	37.1	k/in
R	38.7	k/in
θ	73.7	degrees
Factor	61.8	
Weld Size	**1 3/16**	**in**

Tension Reinforcement Development Length			
ACI 318-19 Section 25.4.3.1			
F_y	60	ksi	
ψ_e	1		
ψ_r	1.6		
ψ_o	1		
ψ_c	0.9		
d_b	0.75	in	
(a) l_{dh}	15.2	in	
(b) l_{dh}	6	in	
(c) l_{dh}	6	in	
$\mathbf{l_{dh}}$	**15.2**	**in**	
Required Footing Depth to Develop Bar			
Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	15.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**18.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4		
Tension	547	k
Thickness	1	in
Dimension	5	in
Washer Area	25	in^2
n_t	5	threads/in
$A_{se,N}$	2.50	in^2
A_{brg}	22.50	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE'	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	254.6	k
Width Group bolt ϕN_{sbg}	261.4	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	11	in
Assumed Length Single bolt N_{sb}	560.1	k
Assumed Length Group bolt ϕN_{sbg}	475	k
Sum ϕN_{sbg}	736.6	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	6	4	4	in^2
β	0	1.14	1.17	1.19	
ω	0	1.33	1.33	1.35	
Fymax	46	46	46	45	ksi
Angle From Horiz	0	43.6	43.7	50.5	degress
BRB Expected Tension	0	367	245	243	k
BRB Expected Comp	0	418	286	289	k

BF8 Column Anchorage - A3 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	1.5	in
No. of Bolts	4	

Loads

RAM DL	63	k
RAM LL	23	k
RAM SL	8	k
RAM Uplift	76	k
RAM Shear	0	k

Reactions with Overstrength

Factored Uplift	190	k
Factored Shear	0	k

Expected Forces

Factored Compression	352	k
Factored Uplift	423	k
Factored Shear	0	k

Anchorage Design Forces

EQ Compression	**352**	**k**
Uplift	**379**	**k**
Shear	**0**	**k**

Tension Reinforcement

T_u	379	k
A_{s_req}	8.4	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**10**	

Embedded Plate Washer Flexural Strength

Tension	379	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.25	in
w_u	6.5	ksi
M_u	5.1	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	4.0	in
Tension per Bolt	95	k
N_{pn}	525	k
ϕN_{pn}	368	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	1	in
Total Depth	6	in
Width	1	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	0	k
Shear Per Lug	0	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	2.0	in^2
$V_{brg,sl}$	10	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	97	in
ϕV_n	57	k
CHECK	OK	

Shear Reinforcement

T_u	0	k
A_{s_req}	0.0	in^2
Rebar Size	#5	
No. of Legs	2	
Rebar Area	0.61	in^2
No. of U-Bars	**0**	

Shear Lug Thickness

M_u	0	k-in
Required Thickness	0.00	in
Thickness	1	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	0.0	k/in
f_t	0.0	k/in
R	0.0	k/in
θ	#DIV/0!	degrees
Factor	#DIV/0!	
Weld Size	**#DIV/0!**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi	
ψ_e	1		
ψ_r	1.6		
ψ_o	1		
ψ_c	0.9		
d_b	0.75	in	
(a) l_{dh}	15.2	in	
(b) l_{dh}	6	in	
(c) l_{dh}	6	in	
$\mathbf{l_{dh}}$	**15.2**	**in**	

Required Footing Depth to Develop Bar

Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	15.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**18.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	379	k	
Thickness	1	in	
Dimension	4	in	
Washer Area	16	in^2	
n_t	6	threads/in	
$A_{se,N}$	1.41	in^2	
A_{brg}	14.59	in^2	
ϕ	0.7		
Lambda	1		
Baseplate 'X'	7	in	
Baseplate "EDGE'	3	in	
AB Spacing	14	in	
Pier Width	24	in	
Width C_{a1}	5	in	
Width Single bolt N_{sb}	205.0	k	
Width Group bolt ϕN_{sbg}	210.5	k	
Pier Assumed Length	24	in	
Assumed Length C_{a1}	5	in	
Assumed Length Single bolt N_{sb}	205.0	k	
Assumed Length Group bolt ϕN_{sbg}	210	k	
Sum ϕN_{sbg}	421.0	k	2 * minimum blowout
CHECK	OK		

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	3.5	2.5	2	in^2
β	0	1.2	1.21	1.19	
ω	0	1.36	1.37	1.34	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	42.9	43.1	50.8	degress
BRB Expected Tension	0	219	158	123	k
BRB Expected Comp	0	263	191	147	k

BF8 Column Anchorage - A1 Column

Properties		
Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2	ft
Bolt Diameter	1.5	in
No. of Bolts	4	
Loads		
RAM DL	50	k
RAM LL	19	k
RAM SL	6	k
RAM Uplift	76	k
RAM Shear	38	k
Reactions with Overstrength		
Factored Uplift	190	k
Factored Shear	95	k
Expected Forces		
Factored Compression	423	k
Factored Uplift	352	k
Factored Shear	192	k
Anchorage Design Forces		
EQ Compression	**423**	**k**
Uplift	**317**	**k**
Shear	**192**	**k**
Tension Reinforcement		
T_u	317	k
A_{s_req}	7.1	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**8**	
Embedded Plate Washer Flexural Strength		
Tension	317	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
Z_per unit width	0.25	in^3
ϕM_n	11.3	k-in/in
L_{cant}	1.25	in
w_u	5.4	ksi
M_u	4.2	k-in/in
CHECK	OK	
Anchor Bolt Pullout		
Washer Size	4.0	in
Tension per Bolt	79	k
N_{pn}	525	k
ϕN_{pn}	368	k
CHECK	OK	

Shear Lug Design		
No. of Lugs	1	
Thickness	2.5	in
Total Depth	6	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	192	k
Shear Per Lug	192	k
Concrete Bearing		
f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	56.0	in^2
$V_{brg,sl}$	278	k
CHECK	OK	
Shear Lug Spacing		
C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	96	in
ϕV_n	782	k
CHECK	OK	
Shear Reinforcement		
T_u	192	k
A_{s_req}	5.3	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**7**	
Shear Lug Thickness		
M_u	962	k-in
Required Thickness	2.47	in
Thickness	2.5	in
CHECK	OK	
Shear Lug Weld to Base Plate		
No. of Welds	2	
f_v	6.9	k/in
f_t	27.5	k/in
R	28.3	k/in
θ	76.0	degrees
Factor	62.1	
Weld Size	**14/16**	**in**

Tension Reinforcement Development Length			
ACI 318-19 Section 25.4.3.1			
F_y	60	ksi	
ψ_e	1		
ψ_r	1.6		
ψ_o	1		
ψ_c	0.9		
d_b	0.75	in	
(a) l_{dh}	15.2	in	
(b) l_{dh}	6	in	
(c) l_{dh}	6	in	
l_{dh}	**15.2**	**in**	
Required Footing Depth to Develop Bar			
Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	15.2	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**18.2**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4		
Tension	317	k
Thickness	1	in
Dimension	4	in
Washer Area	16	in^2
n_t	6	threads/in
$A_{se,N}$	1.41	in^2
A_{brg}	14.59	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	7	in
Baseplate "EDGE'	3	in
AB Spacing	14	in
Pier Width	24	in
Width C_{a1}	5	in
Width Single bolt N_{sb}	205.0	k
Width Group bolt ϕN_{sbg}	210.5	k
Pier Assumed Length	36	in
Assumed Length C_{a1}	11	in
Assumed Length Single bolt N_{sb}	451.0	k
Assumed Length Group bolt ϕN_{sbg}	383	k
Sum ϕN_{sbg}	593.2	k
CHECK	OK	

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	3.5	2.5	2	in^2
β	0	1.2	1.21	1.19	
ω	0	1.36	1.37	1.34	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	42.9	43.1	50.8	degress
BRB Expected Tension	0	219	158	123	k
BRB Expected Comp	0	263	191	147	k

BF9 Column Anchorage - C9 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2.5	ft
Bolt Diameter	2.5	in
No. of Bolts	4	

Loads

RAM DL	112	k
RAM LL	43	k
RAM SL	20	k
RAM Uplift	324	k
RAM Shear	104	k

Reactions with Overstrength

Factored Uplift	810	k
Factored Shear	260	k

Expected Forces

Factored Compression	1118	k
Factored Uplift	1044	k
Factored Shear	360	k

Anchorage Design Forces

EQ Compression	**1118**	**k**
Uplift	**966**	**k**
Shear	**360**	**k**

Tension Reinforcement

T_u	966	k
A_{s_req}	21.5	in^2
Rebar Size	#8	
No. of Legs	2	
Rebar Area	1.57	in^2
No. of U-Bars	**14**	

Embedded Plate Washer Flexural Strength

Tension	966	k
Thickness	1.5	in
Dimension	7	in
Washer Area	49	in^2
n_t	4	threads/in
$A_{se,N}$	4.00	in^2
A_{brg}	45.00	in^2
Z_per unit width	0.56	in^3
ϕM_n	25.3	k-in/in
L_{cant}	2.25	in
w_u	5.4	ksi
M_u	13.6	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	7.0	in
Tension per Bolt	242	k
N_{pn}	1620	k
ϕN_{pn}	1134	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	4	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	360	k
Shear Per Lug	360	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	94	in
ϕV_n	770	k
CHECK	OK	

Shear Reinforcement

T_u	360	k
A_{s_req}	10.0	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**12**	

Shear Lug Thickness

M_u	2158	k-in
Required Thickness	3.70	in
Thickness	4	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	12.8	k/in
f_t	38.5	k/in
R	40.6	k/in
θ	71.6	degrees
Factor	61.4	
Weld Size	**1 4/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	1	in
(a) l_{dh}	23.4	in
(b) l_{dh}	8	in
(c) l_{dh}	6	in
l_{dh}	**23.4**	**in**

Required Footing Depth to Develop Bar

Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	23.4	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**26.4**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

1117.858

629.92618

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	966	k	
Thickness	1.5	in	
Dimension	7	in	
Washer Area	49	in^2	
n_t	4	threads/in	
$A_{se,N}$	4.00	in^2	
A_{brg}	45.00	in^2	
ϕ	0.7		
Lambda	1		
Baseplate 'X'	8	in	
Baseplate "EDGE'	4	in	
AB Spacing	16	in	
Pier Width	30	in	
Width C_{a1}	7	in	
Width Single bolt N_{sb}	504.0	k	
Width Group bolt ϕN_{sbg}	487.2	k	
Pier Assumed Length	36	in	
Assumed Length C_{a1}	10	in	
Assumed Length Single bolt N_{sb}	720.0	k	
Assumed Length Group bolt ϕN_{sbg}	638	k	
Sum ϕN_{sbg}	974.4	k	2 * minimum blowout
CHECK	OK		

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	8.5	7	5.5	in^2
β	0	1.14	1.14	1.16	
ω	0	1.36	1.35	1.3	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	53.6	54.6	43.4	degress
BRB Expected Tension	0	532	435	329	k
BRB Expected Comp	0	606	496	382	k

BF9 Column Anchorage - C7/D6 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	2	ft
Ftg Depth	2.5	ft
Bolt Diameter	3	in
No. of Bolts	4	

Loads

RAM DL	126	k
RAM LL	48	k
RAM SL	18	k
RAM Uplift	528	k
RAM Shear	104	k

Reactions with Overstrength

Factored Uplift	1320	k
Factored Shear	260	k

Expected Forces

Factored Compression	1154	k
Factored Uplift	1008	k
Factored Shear	360	k

Anchorage Design Forces

EQ Compression	**2213**	**k**
Uplift	**1838**	**k**
Shear	**360**	**k**

Tension Reinforcement

T_u	1838	k
A_{s_req}	40.8	in^2
Rebar Size	#8	
No. of Legs	2	
Rebar Area	1.57	in^2
No. of U-Bars	**26**	

Embedded Plate Washer Flexural Strength

Tension	1838	k
Thickness	2	in
Dimension	9	in
Washer Area	81	in^2
n_t	4	threads/in
$A_{se,N}$	5.97	in^2
A_{brg}	75.03	in^2
Z_per unit width	1.00	in^3
ϕM_n	45.0	k-in/in
L_{cant}	3	in
w_u	6.1	ksi
M_u	27.6	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	9.0	in
Tension per Bolt	459	k
N_{pn}	2701	k
ϕN_{pn}	1891	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	4	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	360	k
Shear Per Lug	360	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	94	in
ϕV_n	770	k
CHECK	OK	

Shear Reinforcement

T_u	360	k
A_{s_req}	10.0	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**12**	

Shear Lug Thickness

M_u	2158	k-in
Required Thickness	3.70	in
Thickness	4	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	12.8	k/in
f_t	38.5	k/in
R	40.6	k/in
θ	71.6	degrees
Factor	61.4	
Weld Size	**1 4/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi
ψ_e	1	
ψ_r	1.6	
ψ_o	1	
ψ_c	0.9	
d_b	1	in
(a) l_{dh}	23.4	in
(b) l_{dh}	8	in
(c) l_{dh}	6	in
$\mathbf{l_{dh}}$	**23.4**	**in**

Required Footing Depth to Develop Bar

Rod Embed	22	in
U-Bar Dim from Rod	9	in
Total Horiz Dim of Cone	31.4	in
Dim from TOF to Cone	15.7	
Top Cover	2	in
Bar Length Above Cone	30.0	in
CHECK	OK	
Dim from Cone to Bottom of U-Bar	23.4	in
Bottom Cover	3	in
Minimum Required Footing Depth	**26.4**	**in**
CHECK	OK	

U-Bar to be in Pier, minimum height of peir = 36"

Only bottom portion of U-bar is in footing, top cone develops in Pier

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	1838	k
Thickness	2	in
Dimension	9	in
Washer Area	81	in^2
n_t	4	threads/in
$A_{se,N}$	5.97	in^2
A_{brg}	75.03	in^2
ϕ	0.7	
Lambda	1	
Baseplate 'X'	8	in
Baseplate "EDGE'	8	in
AB Spacing	16	in
Pier Width	48	in
Width C_{a1}	16	in
Width Single bolt N_{sb}	1487.5	k
Width Group bolt ϕN_{sbg}	1214.8	k
Pier Assumed Length	48	in
Assumed Length C_{a1}	16	in
Assumed Length Single bolt N_{sb}	1487.5	k
Assumed Length Group bolt ϕN_{sbg}	1215	k
Sum ϕN_{sbg}	2429.7	k
CHECK	OK	

2 * minimum blowout

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	8.5	7	5.5	in^2
β	0	1.14	1.14	1.16	
ω	0	1.36	1.35	1.3	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	53.6	54.6	43.4	degress
BRB Expected Tension	0	532	435	329	k
BRB Expected Comp	0	606	496	382	k

L1-L2 Orthognal Column Load

Overstrength Load	1320	k
Expected Load	666	k

100% Loads in Each Direction

Comp Design Load	**1320**	**k**

Use this compressive load to design orthogonal frame column in Enercalc at grid intersection C7/D6. Load includes 100% column load in the X-direction and 100% column load in the Y-direction

BF10 Column Anchorage - C7/D6 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	2.5	ft
Bolt Diameter	3	in
No. of Bolts	4	

Loads

RAM DL	126	k
RAM LL	48	k
RAM SL	18	k
RAM Uplift	528	k
RAM Shear	87	k

Reactions with Overstrength

Factored Uplift	1320	k
Factored Shear	218	k

Expected Forces

Factored Compression	1059	k
Factored Uplift	917	k
Factored Shear	330	k

Anchorage Design Forces

EQ Compression	**2213**	**k**
Uplift	**1838**	**k**
Shear	**330**	**k**

Tension Reinforcement

T_u	1838	k
A_{s_req}	40.8	in^2
Rebar Size	#8	
No. of Legs	2	
Rebar Area	1.57	in^2
No. of U-Bars	**26**	

Embedded Plate Washer Flexural Strength

Tension	1838	k
Thickness	2	in
Dimension	9	in
Washer Area	81	in^2
n_t	4	threads/in
$A_{se,N}$	5.97	in^2
A_{brg}	75.03	in^2
Z_per unit width	1.00	in^3
ϕM_n	45.0	k-in/in
L_{cant}	3	in
w_u	6.1	ksi
M_u	27.6	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	9.0	in
Tension per Bolt	459	k
N_{pn}	2701	k
ϕN_{pn}	1891	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	4	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	330	k
Shear Per Lug	330	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	94	in
ϕV_n	770	k
CHECK	OK	

Shear Reinforcement

T_u	330	k
A_{s_req}	9.2	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**11**	

Shear Lug Thickness

M_u	1978	k-in
Required Thickness	3.54	in
Thickness	4	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	11.8	k/in
f_t	35.3	k/in
R	37.2	k/in
θ	71.6	degrees
Factor	61.4	
Weld Size	**1 3/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi	
ψ_e	1		
ψ_r	1.6		
ψ_o	1		
ψ_c	0.9		
d_b	1	in	
(a) l_{dh}	23.4	in	
(b) l_{dh}	8	in	
(c) l_{dh}	6	in	
$\mathbf{l_{dh}}$	**23.4**	**in**	

Required Footing Depth to Develop Bar

Rod Embed	22	in	
U-Bar Dim from Rod	9	in	
Total Horiz Dim of Cone	31.4	in	
Dim from TOF to Cone	15.7		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	23.4	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**26.4**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	1838	k	
Thickness	2	in	
Dimension	9	in	
Washer Area	81	in^2	
n_t	4	threads/in	
$A_{se,N}$	5.97	in^2	
A_{brg}	75.03	in^2	
ϕ	0.7		
Lambda	1		
Baseplate 'X'	8	in	
Baseplate "EDGE"	8	in	
AB Spacing	16	in	
Pier Width	40	in	
Width C_{a1}	12	in	
Width Single bolt N_{sb}	1115.7	k	
Width Group bolt ϕN_{sbg}	954.5	k	
Pier Assumed Length	40	in	
Assumed Length C_{a1}	12	in	
Assumed Length Single bolt N_{sb}	1115.7	k	
Assumed Length Group bolt ϕN_{sbg}	955	k	
Sum ϕN_{sbg}	1909.0	k	2 * minimum blowout
CHECK	OK		

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	8	5.5	4.5	in^2
β	0	1.14	1.18	1.15	
ω	0	1.36	1.34	1.25	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	54.7	55.7	62.2	degress
BRB Expected Tension	0	500	339	259	k
BRB Expected Comp	0	571	400	298	k

L1-L2 Orthognal Column Load

Overstrength Load	1320	k
Expected Load	594	k

100% Loads in Each Direction

Comp Design Load	**1320**	**k**

Use this compressive load to design orthogonal frame column in Enercalc at grid intersection C7/D6. Load includes 100% column load in the X-direction and 100% column load in the Y-direction

BF10 Column Anchorage - D4 Column

Properties

Sds	1.003	
Ω_o	2.5	
f'_c	4.5	ksi
Ftg Width	4	ft
Ftg Depth	3	ft
Bolt Diameter	2.5	in
No. of Bolts	4	

Loads

RAM DL	62	k
RAM LL	34	k
RAM SL	3	k
RAM Uplift	290	k
RAM Shear	87	k

Reactions with Overstrength

Factored Uplift	725	k
Factored Shear	218	k

Expected Forces

Factored Compression	1059	k
Factored Uplift	917	k
Factored Shear	330	k

Anchorage Design Forces

EQ Compression	**1059**	**k**
Uplift	**874**	**k**
Shear	**330**	**k**

Tension Reinforcement

T_u	874	k
A_{s_req}	19.4	in^2
Rebar Size	#8	
No. of Legs	2	
Rebar Area	1.57	in^2
No. of U-Bars	**13**	

Embedded Plate Washer Flexural Strength

Tension	874	k
Thickness	1.5	in
Dimension	7	in
Washer Area	49	in^2
n_t	4	threads/in
$A_{se,N}$	4.00	in^2
A_{brg}	45.00	in^2
Z_per unit width	0.56	in^3
ϕM_n	25.3	k-in/in
L_{cant}	2.25	in
w_u	4.9	ksi
M_u	12.3	k-in/in
CHECK	OK	

Anchor Bolt Pullout

Washer Size	7.0	in
Tension per Bolt	219	k
N_{pn}	1620	k
ϕN_{pn}	1134	k
CHECK	OK	

Shear Lug Design

No. of Lugs	1	
Thickness	4	in
Total Depth	8	in
Width	14	in
Grout Thickness	2	in
F_y	50	ksi
Total Shear	330	k
Shear Per Lug	330	k

Concrete Bearing

f'_c	4.5	ksi
ϕ	0.65	
$\psi_{brg,sl}$	1	
$A_{ef,sl}$	84.0	in^2
$V_{brg,sl}$	418	k
CHECK	OK	

Shear Lug Spacing

C-C Spacing	100	in
Grout Around Lug	1	in
Clear Spacing	94	in
ϕV_n	770	k
CHECK	OK	

Shear Reinforcement

T_u	330	k
A_{s_req}	9.2	in^2
Rebar Size	#6	
No. of Legs	2	
Rebar Area	0.88	in^2
No. of U-Bars	**11**	

Shear Lug Thickness

M_u	1978	k-in
Required Thickness	3.54	in
Thickness	4	in
CHECK	OK	

Shear Lug Weld to Base Plate

No. of Welds	2	
f_v	11.8	k/in
f_t	35.3	k/in
R	37.2	k/in
θ	71.6	degrees
Factor	61.4	
Weld Size	**1 3/16**	**in**

Tension Reinforcement Development Length

ACI 318-19 Section 25.4.3.1

F_y	60	ksi	
ψ_e	1		
ψ_r	1.6		
ψ_o	1		
ψ_c	0.9		
d_b	1	in	
(a) l_{dh}	23.4	in	
(b) l_{dh}	8	in	
(c) l_{dh}	6	in	
$\mathbf{l_{dh}}$	**23.4**	**in**	

Required Footing Depth to Develop Bar

Rod Embed	18	in	
U-Bar Dim from Rod	12	in	
Total Horiz Dim of Cone	25.7	in	
Dim from TOF to Cone	9.6		
Top Cover	2	in	
Bar Length Above Cone	30.0	in	U-Bar to be in Pier, minimum height of peir = 36"
CHECK	OK		
Dim from Cone to Bottom of U-Bar	23.4	in	
Bottom Cover	3	in	
Minimum Required Footing Depth	**26.4**	**in**	Only bottom portion of U-bar is in footing, top cone develops in Pier
CHECK	OK		

Embedded Plate Washer Side Face Blowout, ACI 17.6.4

Tension	874	k	
Thickness	1.5	in	
Dimension	7	in	
Washer Area	49	in^2	
n_t	4	threads/in	
$A_{se,N}$	4.00	in^2	
A_{brg}	45.00	in^2	
ϕ	0.7		
Lambda	1		
Baseplate 'X'	8	in	
Baseplate "EDGE'	4	in	
AB Spacing	16	in	
Pier Width	30	in	
Width C_{a1}	7	in	
Width Single bolt N_{sb}	504.0	k	
Width Group bolt ϕN_{sbg}	487.2	k	
Pier Assumed Length	36	in	
Assumed Length C_{a1}	10	in	
Assumed Length Single bolt N_{sb}	720.0	k	
Assumed Length Group bolt ϕN_{sbg}	638	k	
Sum ϕN_{sbg}	974.4	k	2 * minimum blowout
CHECK	OK		

BRB Info

	L0-L1	L1-L2	L2-L3	L3-RF	
A	0	8	5.5	4.5	in^2
β	0	1.14	1.18	1.15	
ω	0	1.36	1.34	1.25	
Fymax	46	46	46	46	ksi
Angle From Horiz	0	54.7	55.7	62.2	degress
BRB Expected Tension	0	500	339	259	k
BRB Expected Comp	0	571	400	298	k

Design of column C7/D6 include Seismic loads of 100% in X-direction and 100% in Y-Direction

Steel Column

DESCRIPTION: Corner column BF9, BF10 - overstrength applied manually

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W12x152**
Analysis Method : Load Resistance Factor
Steel Stress Grade
Fy : Steel Yield 50.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 14.666 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Unbraced Length for buckling ABOUT Y-Y Axis = 14.666 ft, K = 1.0
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 14.666 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 2,229.23 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 14.666 ft, D = 126.0, L = 48.0, S = 18.0 k
Siesmic: Axial Load at 14.666 ft, E = 1,320.0 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9634** : 1
Load Combination +1.401D+L+0.20S+E
Location of max.above base 0.0 ft
At maximum location values are . . .
Pu 1,551.20 k
0.9 * Pn 1,610.16 k
Mu-x 0.0 k-ft
0.9 * Mn-x : 890.47 k-ft
Mu-y 0.0 k-ft
0.9 * Mn-y : 416.250 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
Load Combination 0.0
Location of max.above base 0.0 ft
At maximum location values are . . .
Vu : Applied 0.0 k
Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 0.0 k
Bottom along Y-Y 0.0 k

Maximum Load Deflections . . .
Along Y-Y 0.0 in at 0.0 ft above base
for load combination :
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location
+1.40D	0.111	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+1.20D+1.60L	0.143	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+1.20D+1.60L+0.50S	0.149	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+1.20D+L	0.125	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+1.20D	0.096	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+1.20D+L+1.60S	0.143	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+1.20D+1.60S	0.113	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+1.20D+L+0.50S	0.131	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+0.90D	0.072	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+1.401D+L+0.20S+E	0.963	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+1.401D+L+0.20S-E	0.541	PASS	14.67 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+0.6994D+E	0.875	PASS	0.00 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft
+0.6994D-E	0.612	PASS	14.67 ft	1.00	1.00	55.17	31.09	0.000	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments k-ft @ Base	@ Top	My - End Moments @ Base	@ Top
D Only	128.229								

PRCNC20221036

Steel Column

DESCRIPTION: Corner column BF9, BF10 - overstrength applied manually

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
+D+L	176.229								
+D+S	146.229								
+D+0.750L	164.229								
+D+0.750L+0.750S	177.729								
+0.60D	76.938								
+D+0.70E	1052.229								
+D+0.750L+0.750S+0.5250E	870.729								
+0.60D+0.70E	1000.938								
L Only	48.000								
S Only	18.000								
E Only	1320.000								

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction k @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	1320.000								
"	Minimum	18.000								
Reaction, X-X Axis Base	Maximum	128.229								
"	Minimum	128.229								
Reaction, Y-Y Axis Base	Maximum	128.229								
"	Minimum	128.229								
Reaction, X-X Axis Top	Maximum	128.229								
"	Minimum	128.229								
Reaction, Y-Y Axis Top	Maximum	128.229								
"	Minimum	128.229								
Moment, X-X Axis Base	Maximum	128.229								
"	Minimum	128.229								
Moment, Y-Y Axis Base	Maximum	128.229								
"	Minimum	128.229								
Moment, X-X Axis Top	Maximum	128.229								
"	Minimum	128.229								
Moment, Y-Y Axis Top	Maximum	128.229								
"	Minimum	128.229								

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
D Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+L	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+S	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L+0.750S	0.0000	in	0.000	ft	0.000	in	0.000	ft
+0.60D	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.70E	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L+0.750S+0.5250E	0.0000	in	0.000	ft	0.000	in	0.000	ft
+0.60D+0.70E	0.0000	in	0.000	ft	0.000	in	0.000	ft
L Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
S Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
E Only	0.0000	in	0.000	ft	0.000	in	0.000	ft

Steel Section Properties : W12x152

Title Block Line 1
You can change this area
using the "Settings" menu item
and then using the "Printing &
Title Block" selection.
Title Block Line 6

Project Title:
Engineer:
Project ID:
Project Descr:

Printed: 29 JUN 2022, 10:20AM

Steel Column

Education\2021\2I33TT~Q\SEV10W~K\C7A4YC~F\3YDNAQ~Y\BYOB7Y~P\Frame 9 and 10 corner Column.ec6 .

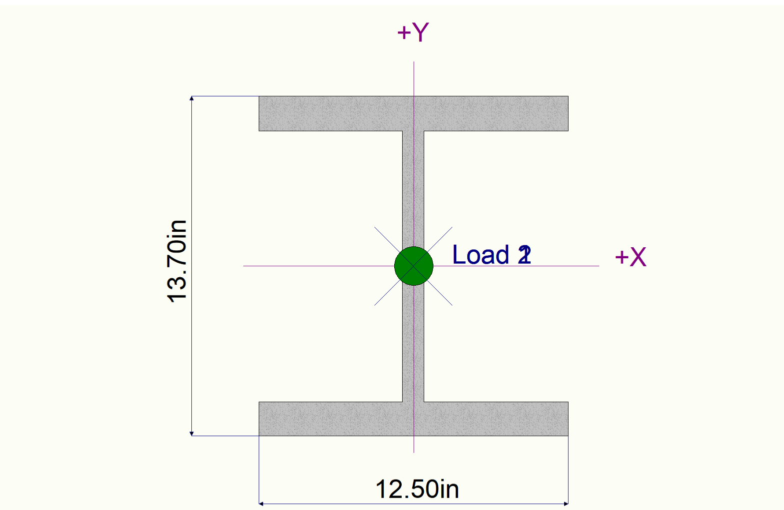
Lic. # : KW-06006560 **INTEGRUS ARCHITECTURE**

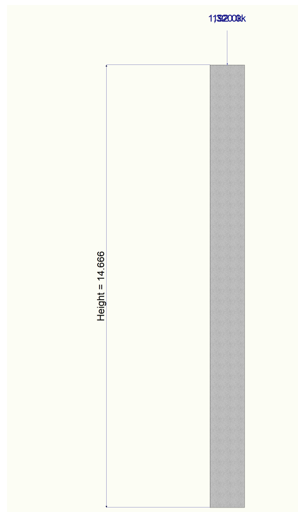
DESCRIPTION: Corner column BF9, BF10 - overstrength applied manually

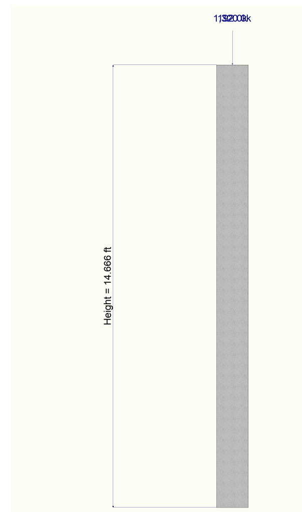
Steel Section Properties : W12x152

Depth	=	13.700	in	I xx	=	1,430.00	in^4	J	=	25.800	in^4
Web Thick	=	0.870	in	S xx	=	209.00	in^3	Cw	=	17200.00	in^6
Flange Width	=	12.500	in	R xx	=	5.660	in				
Flange Thick	=	1.400	in	Zx	=	243.000	in^3				
Area	=	44.700	in^2	I yy	=	454.000	in^4				
Weight	=	152.000	plf	S yy	=	72.800	in^3	Wno	=	38.400	in^2
Kdesign	=	2.000	in	R yy	=	3.190	in	Sw	=	168.000	in^4
K1	=	1.250	in	Zy	=	111.000	in^3	Qf	=	50.100	in^3
rts	=	3.660	in					Qw	=	121.000	in^3
Ycg	=	0.000	in								

Sketches







PRCNC20221036

integrus ARCHITECTURE

Pierce College Puyallup New STEM Building
22135.00

Lateral Load Resisting System - **Foundations**

PRCNC20221036

10 S. Cedar Street 117 S. Main Street, Suite 100	Spokane, WA 99201 Seattle, WA 98104	509-838-8681 206-628-3137	Fax 509-838-2194 Fax 206-628-3138
Title			Job Number
STRUCTURAL ENGINEERS	By	Date	Sheet

integrus ARCHITECTURE

BRACED FRAME HAND CALC

REACTIONS/LOADS FROM RAM → ATTACHED, ANALYSIS IN SAFE

LOAD PATTERNS: DEAD LOAD (INCLUDES SELF-WEIGHT), LIVE LOAD, EARTHQUAKE, SNOW

LOAD CASES: PER IBC AND ASCE 7-10 EARTHQUAKE PROVISIONS

LRFD: FOR CONCRETE AND REINFORCEMENT DESIGN

$1.2D + 1.6L + 1.6S$, NOTE: USING 1.6S VS. 0.5S (CONSERVATIVE) AND ACTS AS A COMBINATION OF $1.2D + 1.6L + 0.5S$ AND $1.2D + 1.6S + 1.0L$

$1.2D \pm 1.0E + 1.0L + 0.2S$

$0.9D \pm 1.0E$

ASD: FOR SOIL DESIGN, SOIL PROPERTIES AS "ALLOWABLE"

$1.0D$

$1.0D + 1.0L + 1.0S$

$0.6D \pm 0.7E$

$1.0D \pm \underbrace{0.75(0.7E)}_{0.525E} + 0.75L + 0.75S$

NOTE: FOR SLIDING, ACCEPTABLE TO USE ALTERNATIVE LOAD COMBOS W/ 0.9D VS. 0.6D

LOAD COMBOS: CASES PER ABOVE

LRFD1, LRFD2, LRFD3, ... ALL STRENGTH (ULTIMATE)

ASD1, ASD2, ASD3, ... ALL SERVICE (NORMAL)

CONT. →

ADDITIONAL NOTES:

1. PER ASCE 7-10 12.5 DIRECTION OF LOADING, 100% + 30% DOES NOT APPLY
2. PER ASCE 7-10 12.3.4 REDUNDANCY, $\rho = 1.3$ AND WILL BE APPLIED TO EQ. LOADS
3. PER ASCE 7-10 12.13.4 REDUCTION OF FDN OVERTURNING, PER MODAL ANALYSIS, ALLOWED TO REDUCE EQ. LOADS BY 10%

   → PER $\rho = 1.3$ AND REDUCE 10% MULTIPLY EQ. FORCES BY $EQ. \times 1.3 \times 0.9 = 1.17 EQ.$

   (WHEN CHECKING SLIDING, BY HAND, EQ. FORCES × $\rho = 1.3$, NO 10% REDUCTION)
4. SOIL PROPERTIES: PER GEOTECH, SUBGRADE MODULUS = $100\ \#/in^3 = 172{,}800\ \#/ft^3$ AND ONLY ALLOWED TO TAKE COMPRESSION LOAD

   4000 PSF ALLOWABLE BRG PRESSURE (GRAVITY)

   5333 PSF ALLOWABLE BRG PRESSURE (W/ SEISMIC 1/3 INCREASE)

PRCNC20221036

integrus ARCHITECTURE

10 S. Cedar Street | Spokane, WA 99201 | 509-838-8681 | Fax 509-838-2194
117 S. Main Street, Suite 100 | Seattle, WA 98104 | 206-628-3137 | Fax 206-628-3138

Title | Job Number

STRUCTURAL ENGINEERS | By | Date | Sheet

BRACED FRAME FTG CONT

OVERTURNING/STRENGTH DESIGN: EXAMPLE

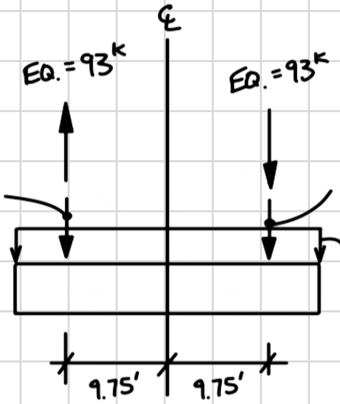
EARTHQUAKE: $22^k \times (17\frac{1}{2}' + 14\frac{1}{2}' + 4') + 41^k (14\frac{1}{2}' + 4')$

$= 1550.5^{k \cdot FT}$

$1550.5^{k \cdot FT} / 19\frac{1}{2}' = 79.5^k$

$\times 1.17 = 93^k$

COL 5:
DL = 23.96^k
LL = 6.35^k
SL = 6.7^k



COL 4:
DL = 31.39^k
LL = 9.35^k
SL = 4.47^k

18" OF SOIL
$= 110^{\#}/_{FT^3} \times 1.5'$
$= 165_{PSF}$

ANALYSIS/RESULTS IN SAFE: $29\frac{1}{2}' \times 6\frac{1}{2}' \times 42"$

↳ 5' PAST END OF COLUMN

MAXIMUM SOIL BEARING (0.6D ± 0.7E CONTROLS) = 3440 psf < 5333 psf ALLOWED

GRAVITY ONLY BRG = 1250 psf < 4000 psf ALLOWED

DEFORMATION: −0.24" & + 0.55" Σ = 0.79, NEAR 3/4" OVER 30' LIMIT, OKAY

FLEXURE: PER SAFE: LONGITUDINAL: BOT. = 1.692 IN^2, TOP = 0.634 IN^2

TRANSVERSE: BOT. = 0.631 IN^2, TOP = 0.321 IN^2 AT EA. COLUMN (78")

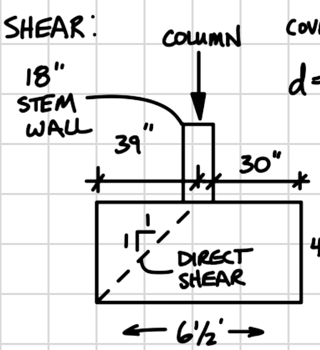
MINIMUM REINFORCING: LONGITUDINAL: $0.0018 \times 42" \times 78" = 5.90\ IN^2$ (2.95 IN^2 T&B)

$2.95\ IN^2 / 0.44\ IN^2 = 6.7 \rightarrow$ (7) #6 (78" − 2×2" COVER / 6 SPACES = 12.3")

TRANSVERSE: $0.0018 \times 42" \times 12" = 0.9072\ IN^2/FT$ (0.4536 IN^2 T&B)

#6 @ 12" o.c. OKAY (0.0018 CONSERVATIVE)

SHEAR:



COVER

#8 BAR

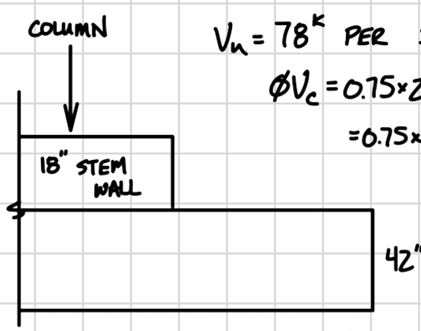
$d = 42" - 3" - \frac{1}{2}(1")$ CONSERVATIVE

$= 38.5"$

V_u @ d FROM SUPPORT

$d = 38.5" > 30"$

NOT OF CONCERN



$V_u = 78^k$ PER SAFE (WORST CASE)

$\phi V_c = 0.75 \times 2\sqrt{f'_c} \times b_w \times d$

$= 0.75 \times 2\sqrt{3000\,psi} \times 78" \times 38.5"$

$= 247^k >> V_u = 78^k$

OKAY

PUNCHING SHEAR NOT OF CONCERN WHEN COMPARING w/ OTHER SHEAR FAILURES

PRCNC20221036

integrus ARCHITECTURE

10 S. Cedar Street	Spokane, WA 99201	509-838-8681	Fax 509-838-2194
117 S. Main Street, Suite 100	Seattle, WA 98104	206-628-3137	Fax 206-628-3138
Title			Job Number
STRUCTURAL ENGINEERS	By	Date	Sheet

BRACED FRAME FTG CONT

SLIDING: LATERAL FORCE: $22^k + 41^k = 63^k \times 1.3 = 82^k$

PASSIVE RESISTANCE + FRICTION > SEISMIC FORCE

PASSIVE RESISTANCE + $(\mu \times 0.6D) > 0.7E$

$\hookrightarrow = 0.7 \times 82^k = 57.4^k$

DEAD LOAD: STRUCTURE: 55.35^k

FOOTING: $0.150^k/_{FT^3} \times 29\tfrac{1}{2}' \times 6\tfrac{1}{2}' \times 42/12 = 100.7^k$

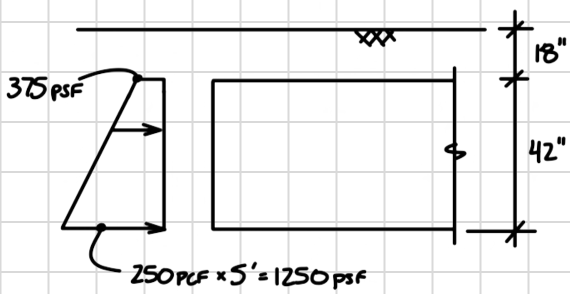
STEM WALL: $0.150^k/_{FT^3} \times 23\tfrac{1}{2}' \times 18/12 \times 4' = 21.15^k$

SOIL: $.110^k/_{FT^3} \times 29\tfrac{1}{2}' \times 18/12 \times 6\tfrac{1}{2}' = 31.7^k$

$\Sigma = 208.9^k \longrightarrow 208.9^k \times 0.30 \times 0.9 = 56.4^k$

ALT. LOAD COMBO

PASSIVE:



$\frac{1250\,psf + 375\,psf}{2} = 812.5$ psF AVG.

$812.5\,psf \times 6\tfrac{1}{2}' \times (42/12) = 18.5^k$

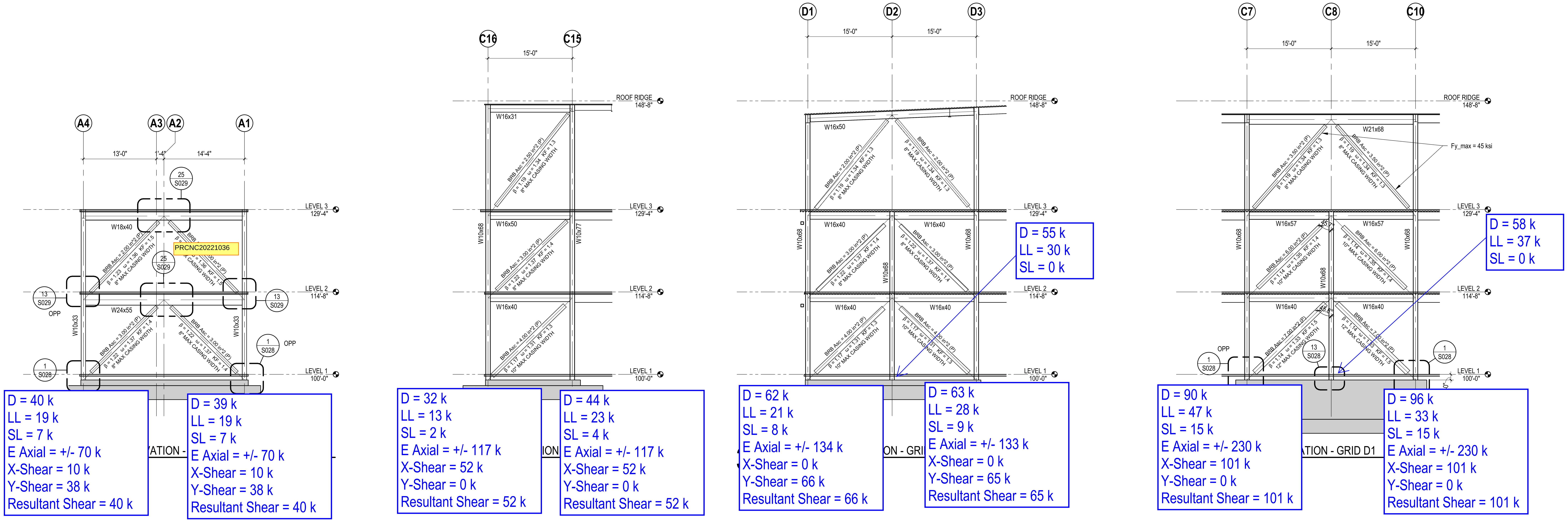
Σ PASSIVE + FRICTION $= 56.4^k + 18.5^k = 74.9^k > 57.4^k$ SEISMIC, OKAY

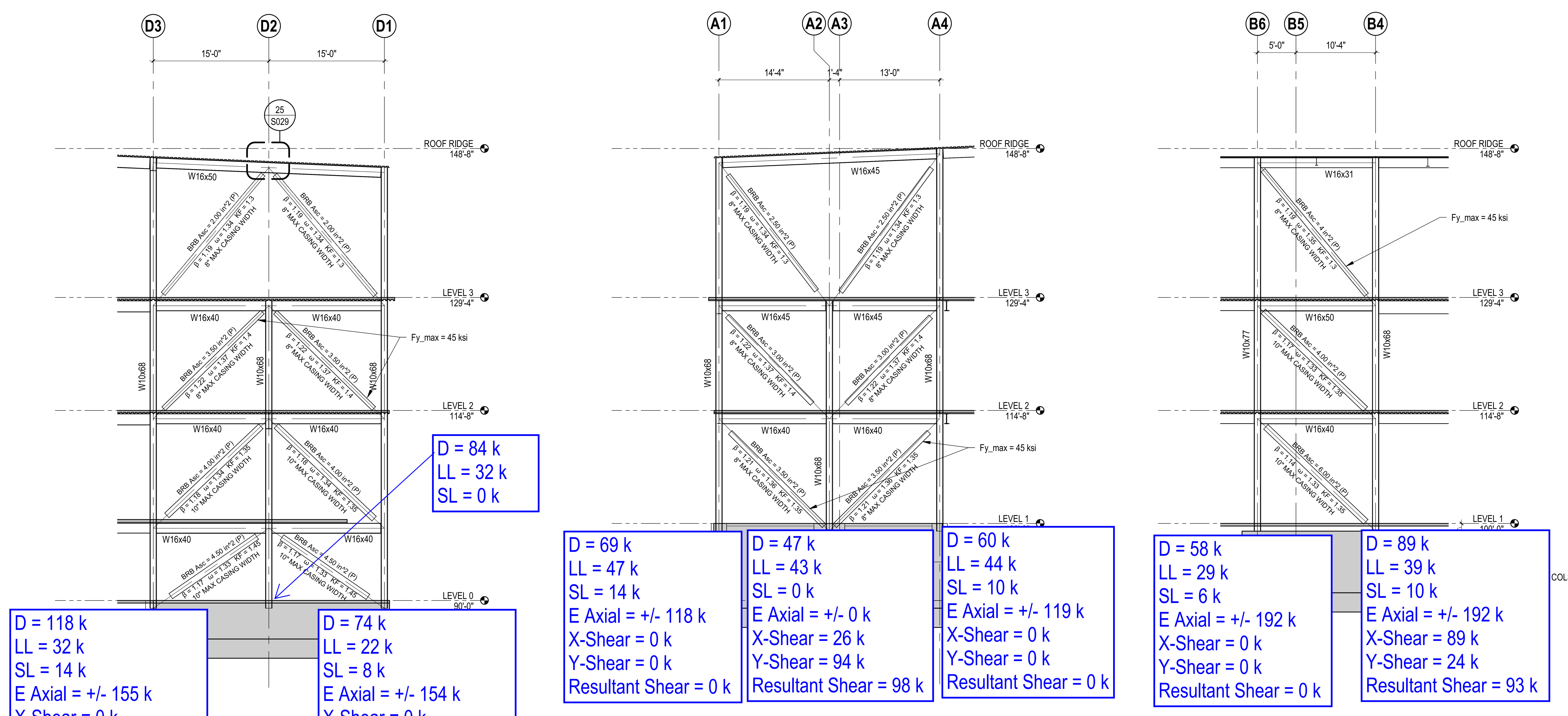
$$\boxed{\begin{array}{l} 29\tfrac{1}{2}' \times 6\tfrac{1}{2}' \times 42" \text{ (5' PAST END OF COLUMN)} \\ \quad \text{w/ (7) \#6 LONG. T\&B BARS} \\ \quad \text{w/ \#6 @ 12" o.c. T\&B TRANSVERSE BARS} \end{array}}$$

PRCNC20221036

6.21.22 RAM Model

All loads are un-factored.
Loads do not include rho.
Loads do not include overstrength





6 BRACE FRAME ELEVATION - GRID B2
SCALE: 1/8" = 1'-0"

7 BRACE FRAME ELEVATION - GRID A1
SCALE: 1/8" = 1'-0"

BUCKLING-RESTRAINED BRACED FRAME NOTES

1. Fy_min FOR ALL BUCKLING-RESTRAINED BRACES = 38 ksi
2. Fy_max FOR ALL BUCKLING-RESTRAINED BRACES = 46 ksi, UNO ON ELEVATIONS
3. Asc = STEEL CORE AREA
4. (B) = BOLTED BRACE END CONNECTIONS
   (P) = PINNED BRACE END CONNECTIONS
   (W) = WELDED BRACE END CONNECTIONS

5. BPx CALLED OUT ON BUCKLING-RESTRAINED BRACE FRAME ELEVATIONS INDICATES A COLUMN BASE PLATE ID. SEE 1/S028 FOR BASE PLATE SCHEDULE AND ADDITIONAL INFORMATION.

6. BPxa CALLED OUT ON BUCKLING-RESTRAINED BRACE FRAME ELEVATIONS INDICATES A COLUMN BASE PLATE ID. SEE 13/S028 FOR BASE PLATE SCHEDULE AND ADDITIONAL INFORMATION.

7. SEE 18/S028 FOR BRACED FRAME PROTECTED ZONE INFORMATION.

8. WHERE OUT-OF-PLANE (OOP) WIND LOADS ARE INDICATED ON THE BRACED FRAME ELEVATIONS, THE BRB MANUFACTURER IS TO PROVIDE CALCULATIONS SHOWING THAT THE STEEL CORE WILL NOT YIELD DUE TO WIND LOADING. WIND LOADS INDICATED ARE ULTIMATE LOADS.

integrus ARCHITECTURE
117 SOUTH MAIN STREET, SUITE 100, SEATTLE, WA 98104
TELEPHONE: (206)628-3137 FAX: (206)628-3138

PIERCE COLLEGE PUYALLUP
NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/10/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

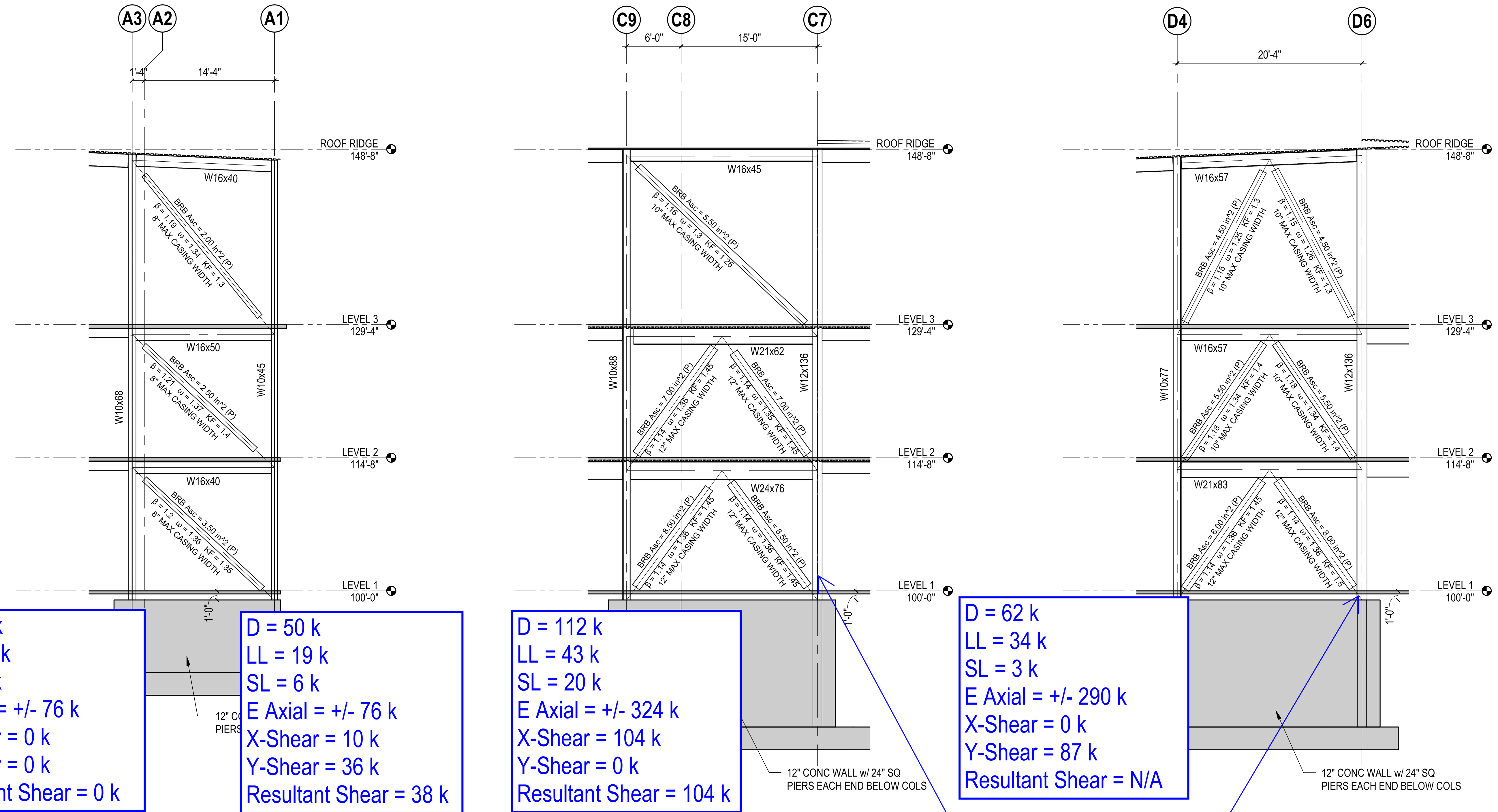
BRACE FRAME ELEVATIONS

S201

BUILDING PERMIT SET

All loads are un-factored.
Loads do not include rho.
Loads do not include overstrength

PRCNC20221036



D = 63 k
LL = 23 k
SL = 8 k
E Axial = +/- 76 k
X-Shear = 0 k
Y-Shear = 0 k
Resultant Shear = 0 k

D = 50 k
LL = 19 k
SL = 6 k
E Axial = +/- 76 k
X-Shear = 10 k
Y-Shear = 36 k
Resultant Shear = 38 k

D = 112 k
LL = 43 k
SL = 20 k
E Axial = +/- 324 k
X-Shear = 104 k
Y-Shear = 0 k
Resultant Shear = 104 k

D = 62 k
LL = 34 k
SL = 3 k
E Axial = +/- 290 k
X-Shear = 0 k
Y-Shear = 87 k
Resultant Shear = N/A

8 BRACE FRAME ELEVATION - GRID B5
SCALE: 1/8" = 1'-0"

9 BRACE FRAME ELEVATION - GRID D7
SCALE: 1/8" = 1'-0"

10 BRACE FRAME ELEVATION - GRID C4
SCALE: 1/8" = 1'-0"

D = 126 k
LL = 48 k
SL = 18 k
E Axial X direction = +/- 290 k
E Axial X direction = +/- 238 k
E Axial Resultant = +/- 528 k
X-Shear = 104 k
Y-Shear = 87 k
Resultant Shear = N/A

BUCKLING-RESTRAINED BRACED FRAME NOTES

1. Fy_min FOR ALL BUCKLING-RESTRAINED BRACES = 38 ksi
2. Fy_max FOR ALL BUCKLING-RESTRAINED BRACES = 46 ksi, UNO ON ELEVATIONS
3. Asc = STEEL CORE AREA
4. (B) = BOLTED BRACE END CONNECTIONS
   (P) = PINNED BRACE END CONNECTIONS
   (W) = WELDED BRACE END CONNECTIONS

5. BPx CALLED OUT ON BUCKLING-RESTRAINED BRACE FRAME ELEVATIONS INDICATES A COLUMN BASE PLATE ID. SEE 1/S028 FOR BASE PLATE SCHEDULE AND ADDITIONAL INFORMATION.

6. BPxa CALLED OUT ON BUCKLING-RESTRAINED BRACE FRAME ELEVATIONS INDICATES A COLUMN BASE PLATE ID. SEE 13/S028 FOR BASE PLATE SCHEDULE AND ADDITIONAL INFORMATION.
7. SEE 18/S028 FOR BRACED FRAME PROTECTED ZONE INFORMATION.
8. WHERE OUT-OF-PLANE (OOP) WIND LOADS ARE INDICATED ON THE BRACED FRAME ELEVATIONS, THE BRB MANUFACTURER IS TO PROVIDE CALCULATIONS SHOWING THAT THE STEEL CORE WILL NOT YIELD DUE TO WIND LOADING. WIND LOADS INDICATED ARE ULTIMATE LOADS.

integrus ARCHITECTURE

PIERCE COLLEGE PUYALLUP
NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/10/22
Job No.:	22135.00
Drawn By:	AM
Checked by:	Checker

Revisions

#	Date	Description

BRACE FRAME ELEVATIONS

S202

BUILDING PERMIT SET

Frame Reactions

RAM Frame 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

All Modal Scaled load cases

06/21/22 23:54:21

CRITICIA:

Rigid End Zones: Ignore Effects
Member Force Output: At Face of Joint
P-Delta: Yes Scale Factor: 1.00
Ground Level: Base
Mesh Criteria :
Max. Distance Between Nodes on Mesh Line (ft) : 3.00
Merge Node Tolerance (in) : 0.0100
Geometry Tolerance (in) : 0.0050
Walls Out-of-plane Stiffness Not Included in Analysis.
Sign considered for Dynamic Load Case Results.
Rigid Links Included at Fixed Beam-to-Wall Locations
Eigenvalue Analysis : Eigen Vectors (Subspace Iteration)

LOAD CASE DEFINITIONS:

D	DeadLoad	RAMUSER
Lp	PosLiveLoad	RAMUSER
Sp	PosSnowLoad	RAMUSER
Dyn5	Modal Force X	Dyn_ASCE716_CQC_X_+E
Dyn6	Modal Force X	Dyn_ASCE716_CQC_X_-E
Dyn7	Modal Force Y	Dyn_ASCE716_CQC_Y_+E
Dyn8	Modal Force Y	Dyn_ASCE716_CQC_Y_-E

Frame #1:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
109	D	-0.03	-0.00	39.49	0.00	0.00	0.00
	Lp	0.00	-0.07	18.88	0.00	0.00	0.00
	Sp	-0.01	0.02	6.91	0.00	0.00	0.00
	Dyn5	-3.18	12.27	-22.79	0.00	0.00	0.00
	Dyn6	-6.01	23.18	-42.78	0.00	0.00	0.00
	Dyn7	5.27	-19.57	36.87	0.00	0.00	0.00
	Dyn8	9.96	-37.27	69.86	0.00	0.00	0.00
110	D	-0.02	-0.03	38.42	0.00	0.00	0.00
	Lp	-0.04	0.07	18.54	0.00	0.00	0.00
	Sp	0.01	-0.03	6.71	0.00	0.00	0.00
	Dyn5	-3.20	12.27	22.77	0.00	0.00	0.00
	Dyn6	-6.02	23.18	42.73	0.00	0.00	0.00
	Dyn7	5.30	-19.57	-36.88	0.00	0.00	0.00
	Dyn8	9.98	-37.27	-69.86	0.00	0.00	0.00

Frame #2:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
104	D	0.10	-0.01	31.25	0.00	0.00	0.00

PRCNC20221036

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Lp	0.06	-0.00	12.23	0.00	0.00	0.00
	Sp	-0.00	0.00	1.80	0.00	0.00	0.00
	Dyn5	-51.75	-0.02	-116.28	0.00	0.00	0.00
	Dyn6	-46.41	0.05	-104.97	0.00	0.00	0.00
	Dyn7	-10.44	-0.04	-26.86	0.00	0.00	0.00
	Dyn8	-8.51	-0.10	-23.10	0.00	0.00	0.00
108	D	-0.18	0.05	43.23	0.00	0.00	0.00
	Lp	-0.07	0.06	22.72	0.00	0.00	0.00
	Sp	0.00	-0.00	3.72	0.00	0.00	0.00
	Dyn5	1.75	0.44	116.16	0.00	0.00	0.00
	Dyn6	1.62	-0.83	104.95	0.00	0.00	0.00
	Dyn7	0.37	1.03	26.82	0.00	0.00	0.00
	Dyn8	0.28	1.99	23.02	0.00	0.00	0.00

Frame #3:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
105	D	0.01	-0.02	62.38	0.00	0.00	0.00
	Lp	0.01	0.00	27.81	0.00	0.00	0.00
	Sp	-0.00	0.00	8.70	0.00	0.00	0.00
	Dyn5	0.18	-17.57	-36.05	0.00	0.00	0.00
	Dyn6	0.16	29.53	56.30	0.00	0.00	0.00
	Dyn7	0.04	-31.60	-61.04	0.00	0.00	0.00
	Dyn8	-0.05	-65.00	-132.82	0.00	0.00	0.00
106	D	0.02	-0.04	54.95	0.00	0.00	0.00
	Lp	0.01	-0.01	29.47	0.00	0.00	0.00
	Sp	-0.00	0.00	0.01	0.00	0.00	0.00
	Dyn5	0.17	0.07	-0.17	0.00	0.00	0.00
	Dyn6	0.14	-0.13	0.29	0.00	0.00	0.00
	Dyn7	-0.04	0.12	-0.31	0.00	0.00	0.00
	Dyn8	0.04	0.28	-0.69	0.00	0.00	0.00
107	D	0.01	-0.02	61.49	0.00	0.00	0.00
	Lp	0.01	-0.01	20.42	0.00	0.00	0.00
	Sp	0.00	0.00	7.51	0.00	0.00	0.00
	Dyn5	0.17	-17.58	35.99	0.00	0.00	0.00
	Dyn6	0.12	29.53	-56.54	0.00	0.00	0.00
	Dyn7	-0.07	-31.60	61.25	0.00	0.00	0.00
	Dyn8	-0.13	-65.01	133.17	0.00	0.00	0.00

Frame #4:

Frame Reactions

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
111	D	0.00	-0.00	95.43	0.00	0.00	0.00
	Lp	0.02	-0.01	32.50	0.00	0.00	0.00
	Sp	0.00	-0.00	14.06	0.00	0.00	0.00
	Dyn5	-100.81	-0.15	-229.53	0.00	0.00	0.00
	Dyn6	-74.17	-0.22	-168.21	0.00	0.00	0.00
	Dyn7	25.13	0.46	59.07	0.00	0.00	0.00
	Dyn8	-22.25	0.56	-54.71	0.00	0.00	0.00
113	D	0.09	0.01	57.44	0.00	0.00	0.00
	Lp	0.04	-0.00	36.14	0.00	0.00	0.00
	Sp	-0.00	0.00	0.02	0.00	0.00	0.00
	Dyn5	0.28	-0.02	0.42	0.00	0.00	0.00
	Dyn6	0.20	0.05	0.22	0.00	0.00	0.00
	Dyn7	-0.06	-0.11	-0.53	0.00	0.00	0.00
	Dyn8	-0.08	-0.12	-0.30	0.00	0.00	0.00
116	D	0.01	-0.01	89.96	0.00	0.00	0.00
	Lp	0.01	-0.02	46.59	0.00	0.00	0.00
	Sp	0.00	0.00	14.06	0.00	0.00	0.00
	Dyn5	-101.00	-0.08	229.31	0.00	0.00	0.00
	Dyn6	-74.25	0.17	168.20	0.00	0.00	0.00
	Dyn7	25.27	0.43	-58.74	0.00	0.00	0.00
	Dyn8	-22.26	0.39	54.84	0.00	0.00	0.00

Frame #5:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
139	D	-0.92	-1.30	117.68	0.00	0.00	0.00
	Lp	-0.15	-0.28	32.00	0.00	0.00	0.00
	Sp	0.00	-0.00	13.46	0.00	0.00	0.00
	Dyn5	0.40	-7.02	31.49	0.00	0.00	0.00
	Dyn6	0.33	-20.48	-71.55	0.00	0.00	0.00
	Dyn7	-0.11	-43.64	-154.92	0.00	0.00	0.00
	Dyn8	-0.08	-19.82	-69.24	0.00	0.00	0.00
140	D	0.16	-0.11	83.28	0.00	0.00	0.00
	Lp	0.02	-0.09	31.89	0.00	0.00	0.00
	Sp	0.00	-0.00	0.03	0.00	0.00	0.00
	Dyn5	0.46	-0.08	0.18	0.00	0.00	0.00
	Dyn6	0.36	0.22	0.63	0.00	0.00	0.00
	Dyn7	-0.21	0.48	1.28	0.00	0.00	0.00
	Dyn8	-0.22	0.21	0.56	0.00	0.00	0.00
141	D	-0.06	-0.12	73.70	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Lp	-0.01	-0.12	21.06	0.00	0.00	0.00
	Sp	0.00	-0.00	7.20	0.00	0.00	0.00
	Dyn5	0.45	-7.06	-31.30	0.00	0.00	0.00
	Dyn6	0.32	-20.60	71.10	0.00	0.00	0.00
	Dyn7	-0.13	-43.89	153.81	0.00	0.00	0.00
	Dyn8	0.09	-19.93	68.76	0.00	0.00	0.00

Frame #6:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
124	D	-0.13	0.06	59.07	0.00	0.00	0.00
	Lp	-0.06	0.01	43.21	0.00	0.00	0.00
	Sp	0.00	0.00	9.54	0.00	0.00	0.00
	Dyn5	0.76	0.11	-35.59	0.00	0.00	0.00
	Dyn6	0.83	0.35	-24.11	0.00	0.00	0.00
	Dyn7	0.22	0.92	118.77	0.00	0.00	0.00
	Dyn8	-0.20	0.51	67.72	0.00	0.00	0.00
125	D	0.02	0.06	46.68	0.00	0.00	0.00
	Lp	0.00	0.00	42.52	0.00	0.00	0.00
	Sp	-0.00	-0.00	0.02	0.00	0.00	0.00
	Dyn5	-7.31	27.68	0.87	0.00	0.00	0.00
	Dyn6	-7.31	26.98	-0.77	0.00	0.00	0.00
	Dyn7	25.09	-93.48	-2.42	0.00	0.00	0.00
	Dyn8	14.90	-55.59	-1.51	0.00	0.00	0.00
127	D	0.03	0.06	68.45	0.00	0.00	0.00
	Lp	0.01	0.01	46.04	0.00	0.00	0.00
	Sp	-0.00	-0.00	13.38	0.00	0.00	0.00
	Dyn5	-0.11	0.04	34.83	0.00	0.00	0.00
	Dyn6	-0.14	-0.10	23.66	0.00	0.00	0.00
	Dyn7	0.06	-0.20	-117.15	0.00	0.00	0.00
	Dyn8	0.08	0.10	-66.57	0.00	0.00	0.00

Frame #7:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
119	D	0.14	0.05	57.63	0.00	0.00	0.00
	Lp	0.04	0.02	28.18	0.00	0.00	0.00
	Sp	-0.00	-0.00	5.71	0.00	0.00	0.00
	Dyn5	0.39	0.08	-124.71	0.00	0.00	0.00
	Dyn6	0.53	0.12	-191.14	0.00	0.00	0.00
	Dyn7	0.17	0.16	-95.56	0.00	0.00	0.00
	Dyn8	0.18	0.10	-44.92	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
122	D	0.14	0.05	88.49	0.00	0.00	0.00
	Lp	0.02	0.01	38.14	0.00	0.00	0.00
	Sp	-0.00	-0.00	9.52	0.00	0.00	0.00
	Dyn5	-63.17	-16.92	125.02	0.00	0.00	0.00
	Dyn6	-88.23	-23.64	191.57	0.00	0.00	0.00
	Dyn7	-45.78	-12.26	95.61	0.00	0.00	0.00
	Dyn8	-24.58	-6.58	45.02	0.00	0.00	0.00

Frame #8:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
117	D	0.06	-0.00	62.15	0.00	0.00	0.00
	Lp	0.01	-0.05	22.29	0.00	0.00	0.00
	Sp	-0.00	0.00	7.14	0.00	0.00	0.00
	Dyn5	0.49	0.07	-25.03	0.00	0.00	0.00
	Dyn6	0.59	0.14	-20.81	0.00	0.00	0.00
	Dyn7	0.21	0.36	75.44	0.00	0.00	0.00
	Dyn8	-0.19	0.29	66.34	0.00	0.00	0.00
118	D	0.02	0.02	49.60	0.00	0.00	0.00
	Lp	-0.02	0.02	18.48	0.00	0.00	0.00
	Sp	0.00	-0.00	5.99	0.00	0.00	0.00
	Dyn5	-2.50	10.39	24.83	0.00	0.00	0.00
	Dyn6	-3.37	12.93	20.58	0.00	0.00	0.00
	Dyn7	9.69	-35.68	-75.62	0.00	0.00	0.00
	Dyn8	8.82	-33.03	-66.32	0.00	0.00	0.00

Frame #9:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
112	D	-0.07	-0.02	111.09	0.00	0.00	0.00
	Lp	-0.03	-0.03	42.12	0.00	0.00	0.00
	Sp	0.00	-0.00	19.44	0.00	0.00	0.00
	Dyn5	-100.46	-0.25	-299.55	0.00	0.00	0.00
	Dyn6	-103.60	-0.43	-323.60	0.00	0.00	0.00
	Dyn7	-26.76	1.05	-85.60	0.00	0.00	0.00
	Dyn8	23.24	1.13	-58.14	0.00	0.00	0.00
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn5	-100.93	13.74	279.32	0.00	0.00	0.00
	Dyn6	-103.97	-29.76	289.32	0.00	0.00	0.00
	Dyn7	-26.20	-86.18	-215.88	0.00	0.00	0.00
	Dyn8	23.49	-75.96	-237.36	0.00	0.00	0.00

Frame Reactions

Frame #10:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn5	-100.93	13.74	279.32	0.00	0.00	0.00
	Dyn6	-103.97	-29.76	289.32	0.00	0.00	0.00
	Dyn7	-26.20	-86.18	-215.88	0.00	0.00	0.00
	Dyn8	23.49	-75.96	-237.36	0.00	0.00	0.00
115	D	-0.05	0.01	61.44	0.00	0.00	0.00
	Lp	-0.01	-0.02	33.79	0.00	0.00	0.00
	Sp	0.00	0.00	2.95	0.00	0.00	0.00
	Dyn5	0.52	14.43	47.21	0.00	0.00	0.00
	Dyn6	0.47	-30.31	54.02	0.00	0.00	0.00
	Dyn7	0.11	-86.41	242.43	0.00	0.00	0.00
	Dyn8	0.10	-75.97	211.95	0.00	0.00	0.00

Frame Reactions

RAM Frame 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

X-direction Only Modal
Scaled load cases

06/22/22 08:01:21

CRITERIA:

Rigid End Zones:		Ignore Effects	
Member Force Output:		At Face of Joint	
P-Delta:	Yes	Scale Factor:	1.00
Ground Level:	Base		

Mesh Criteria :

Max. Distance Between Nodes on Mesh Line (ft) : 3.00
Merge Node Tolerance (in) : 0.0100
Geometry Tolerance (in) : 0.0050

Walls Out-of-plane Stiffness Not Included in Analysis.
Sign considered for Dynamic Load Case Results.
Rigid Links Included at Fixed Beam-to-Wall Locations
Eigenvalue Analysis : Eigen Vectors (Subspace Iteration)

LOAD CASE DEFINITIONS:

D	DeadLoad	RAMUSER
Lp	PosLiveLoad	RAMUSER
Sp	PosSnowLoad	RAMUSER
Dyn5	Modal Force X	Dyn_ASCE716_CQC_X_+E
Dyn6	Modal Force X	Dyn_ASCE716_CQC_X_-E

Frame #1:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
109	D	-0.03	-0.00	39.49	0.00	0.00	0.00
	Lp	0.00	-0.07	18.88	0.00	0.00	0.00
	Sp	-0.01	0.02	6.91	0.00	0.00	0.00
	Dyn5	-3.18	12.27	-22.79	0.00	0.00	0.00
	Dyn6	-6.01	23.18	-42.78	0.00	0.00	0.00
110	D	-0.02	-0.03	38.42	0.00	0.00	0.00
	Lp	-0.04	0.07	18.54	0.00	0.00	0.00
	Sp	0.01	-0.03	6.71	0.00	0.00	0.00
	Dyn5	-3.20	12.27	22.77	0.00	0.00	0.00
	Dyn6	-6.02	23.18	42.73	0.00	0.00	0.00

Frame #2:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
104	D	0.10	-0.01	31.25	0.00	0.00	0.00
	Lp	0.06	-0.00	12.23	0.00	0.00	0.00
	Sp	-0.00	0.00	1.80	0.00	0.00	0.00
	Dyn5	-51.75	-0.02	-116.28	0.00	0.00	0.00
	Dyn6	-46.41	0.05	-104.97	0.00	0.00	0.00
108	D	-0.18	0.05	43.23	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Lp	-0.07	0.06	22.72	0.00	0.00	0.00
	Sp	0.00	-0.00	3.72	0.00	0.00	0.00
	Dyn5	1.75	0.44	116.16	0.00	0.00	0.00
	Dyn6	1.62	-0.83	104.95	0.00	0.00	0.00

Frame #3:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
105	D	0.01	-0.02	62.38	0.00	0.00	0.00
	Lp	0.01	0.00	27.81	0.00	0.00	0.00
	Sp	-0.00	0.00	8.70	0.00	0.00	0.00
	Dyn5	0.18	-17.57	-36.05	0.00	0.00	0.00
	Dyn6	0.16	29.53	56.30	0.00	0.00	0.00
106	D	0.02	-0.04	54.95	0.00	0.00	0.00
	Lp	0.01	-0.01	29.47	0.00	0.00	0.00
	Sp	-0.00	0.00	0.01	0.00	0.00	0.00
	Dyn5	0.17	0.07	-0.17	0.00	0.00	0.00
	Dyn6	0.14	-0.13	0.29	0.00	0.00	0.00
107	D	0.01	-0.02	61.49	0.00	0.00	0.00
	Lp	0.01	-0.01	20.42	0.00	0.00	0.00
	Sp	0.00	0.00	7.51	0.00	0.00	0.00
	Dyn5	0.17	-17.58	35.99	0.00	0.00	0.00
	Dyn6	0.12	29.53	-56.54	0.00	0.00	0.00

Frame #4:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
111	D	0.00	-0.00	95.43	0.00	0.00	0.00
	Lp	0.02	-0.01	32.50	0.00	0.00	0.00
	Sp	0.00	-0.00	14.06	0.00	0.00	0.00
	Dyn5	-100.81	-0.15	-229.53	0.00	0.00	0.00
	Dyn6	-74.17	-0.22	-168.21	0.00	0.00	0.00
113	D	0.09	0.01	57.44	0.00	0.00	0.00
	Lp	0.04	-0.00	36.14	0.00	0.00	0.00
	Sp	-0.00	0.00	0.02	0.00	0.00	0.00
	Dyn5	0.28	-0.02	0.42	0.00	0.00	0.00
	Dyn6	0.20	0.05	0.22	0.00	0.00	0.00
116	D	0.01	-0.01	89.96	0.00	0.00	0.00
	Lp	0.01	-0.02	46.59	0.00	0.00	0.00
	Sp	0.00	0.00	14.06	0.00	0.00	0.00
	Dyn5	-101.00	-0.08	229.31	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Dyn6	-74.25	0.17	168.20	0.00	0.00	0.00

Frame #5:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
139	D	-0.92	-1.30	117.68	0.00	0.00	0.00
	Lp	-0.15	-0.28	32.00	0.00	0.00	0.00
	Sp	0.00	-0.00	13.46	0.00	0.00	0.00
	Dyn5	0.40	-7.02	31.49	0.00	0.00	0.00
	Dyn6	0.33	-20.48	-71.55	0.00	0.00	0.00
140	D	0.16	-0.11	83.28	0.00	0.00	0.00
	Lp	0.02	-0.09	31.89	0.00	0.00	0.00
	Sp	0.00	-0.00	0.03	0.00	0.00	0.00
	Dyn5	0.46	-0.08	0.18	0.00	0.00	0.00
	Dyn6	0.36	0.22	0.63	0.00	0.00	0.00
141	D	-0.06	-0.12	73.70	0.00	0.00	0.00
	Lp	-0.01	-0.12	21.06	0.00	0.00	0.00
	Sp	0.00	-0.00	7.20	0.00	0.00	0.00
	Dyn5	0.45	-7.06	-31.30	0.00	0.00	0.00
	Dyn6	0.32	-20.60	71.10	0.00	0.00	0.00

Frame #6:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
124	D	-0.13	0.06	59.07	0.00	0.00	0.00
	Lp	-0.06	0.01	43.21	0.00	0.00	0.00
	Sp	0.00	0.00	9.54	0.00	0.00	0.00
	Dyn5	0.76	0.11	-35.59	0.00	0.00	0.00
	Dyn6	0.83	0.35	-24.11	0.00	0.00	0.00
125	D	0.02	0.06	46.68	0.00	0.00	0.00
	Lp	0.00	0.00	42.52	0.00	0.00	0.00
	Sp	-0.00	-0.00	0.02	0.00	0.00	0.00
	Dyn5	-7.31	27.68	0.87	0.00	0.00	0.00
	Dyn6	-7.31	26.98	-0.77	0.00	0.00	0.00
127	D	0.03	0.06	68.45	0.00	0.00	0.00
	Lp	0.01	0.01	46.04	0.00	0.00	0.00
	Sp	-0.00	-0.00	13.38	0.00	0.00	0.00
	Dyn5	-0.11	0.04	34.83	0.00	0.00	0.00
	Dyn6	-0.14	-0.10	23.66	0.00	0.00	0.00

Frame #7:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
119	D	0.14	0.05	57.63	0.00	0.00	0.00
	Lp	0.04	0.02	28.18	0.00	0.00	0.00
	Sp	-0.00	-0.00	5.71	0.00	0.00	0.00
	Dyn5	0.39	0.08	-124.71	0.00	0.00	0.00
	Dyn6	0.53	0.12	-191.14	0.00	0.00	0.00
122	D	0.14	0.05	88.49	0.00	0.00	0.00
	Lp	0.02	0.01	38.14	0.00	0.00	0.00
	Sp	-0.00	-0.00	9.52	0.00	0.00	0.00
	Dyn5	-63.17	-16.92	125.02	0.00	0.00	0.00
	Dyn6	-88.23	-23.64	191.57	0.00	0.00	0.00

Frame #8:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
117	D	0.06	-0.00	62.15	0.00	0.00	0.00
	Lp	0.01	-0.05	22.29	0.00	0.00	0.00
	Sp	-0.00	0.00	7.14	0.00	0.00	0.00
	Dyn5	0.49	0.07	-25.03	0.00	0.00	0.00
	Dyn6	0.59	0.14	-20.81	0.00	0.00	0.00
118	D	0.02	0.02	49.60	0.00	0.00	0.00
	Lp	-0.02	0.02	18.48	0.00	0.00	0.00
	Sp	0.00	-0.00	5.99	0.00	0.00	0.00
	Dyn5	-2.50	10.39	24.83	0.00	0.00	0.00
	Dyn6	-3.37	12.93	20.58	0.00	0.00	0.00

Frame #9:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
112	D	-0.07	-0.02	111.09	0.00	0.00	0.00
	Lp	-0.03	-0.03	42.12	0.00	0.00	0.00
	Sp	0.00	-0.00	19.44	0.00	0.00	0.00
	Dyn5	-100.46	-0.25	-299.55	0.00	0.00	0.00
	Dyn6	-103.60	-0.43	-323.60	0.00	0.00	0.00
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn5	-100.93	13.74	279.32	0.00	0.00	0.00
	Dyn6	-103.97	-29.76	289.32	0.00	0.00	0.00

X Only reaction, from frame 9

Frame #10:

PRCNC20221036

Frame Reactions

RAM Frame 17.03.00.285
DataBase: Pierce College - 6.14.22
Building Code: IBC

Y-direction Only Modal
Scaled load cases

06/22/22 08:07:58

CRITICAL:

Rigid End Zones: Ignore Effects
Member Force Output: At Face of Joint
P-Delta: Yes Scale Factor: 1.00
Ground Level: Base
Mesh Criteria :
Max. Distance Between Nodes on Mesh Line (ft) : 3.00
Merge Node Tolerance (in) : 0.0100
Geometry Tolerance (in) : 0.0050
Walls Out-of-plane Stiffness Not Included in Analysis.
Sign considered for Dynamic Load Case Results.
Rigid Links Included at Fixed Beam-to-Wall Locations
Eigenvalue Analysis : Eigen Vectors (Subspace Iteration)

LOAD CASE DEFINITIONS:

D	DeadLoad	RAMUSER
Lp	PosLiveLoad	RAMUSER
Sp	PosSnowLoad	RAMUSER
Dyn7	Modal Force Y	Dyn_ASCE716_CQC_Y_+E
Dyn8	Modal Force Y	Dyn_ASCE716_CQC_Y_-E

Frame #1:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
109	D	-0.03	-0.00	39.49	0.00	0.00	0.00
	Lp	0.00	-0.07	18.88	0.00	0.00	0.00
	Sp	-0.01	0.02	6.91	0.00	0.00	0.00
	Dyn7	5.27	-19.57	36.87	0.00	0.00	0.00
	Dyn8	9.96	-37.27	69.86	0.00	0.00	0.00
110	D	-0.02	-0.03	38.42	0.00	0.00	0.00
	Lp	-0.04	0.07	18.54	0.00	0.00	0.00
	Sp	0.01	-0.03	6.71	0.00	0.00	0.00
	Dyn7	5.30	-19.57	-36.88	0.00	0.00	0.00
	Dyn8	9.98	-37.27	-69.86	0.00	0.00	0.00

Frame #2:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
104	D	0.10	-0.01	31.25	0.00	0.00	0.00
	Lp	0.06	-0.00	12.23	0.00	0.00	0.00
	Sp	-0.00	0.00	1.80	0.00	0.00	0.00
	Dyn7	-10.44	-0.04	-26.86	0.00	0.00	0.00
	Dyn8	-8.51	-0.10	-23.10	0.00	0.00	0.00
108	D	-0.18	0.05	43.23	0.00	0.00	0.00

PRCNC20221036

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Lp	-0.07	0.06	22.72	0.00	0.00	0.00
	Sp	0.00	-0.00	3.72	0.00	0.00	0.00
	Dyn7	0.37	1.03	26.82	0.00	0.00	0.00
	Dyn8	0.28	1.99	23.02	0.00	0.00	0.00

Frame #3:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
105	D	0.01	-0.02	62.38	0.00	0.00	0.00
	Lp	0.01	0.00	27.81	0.00	0.00	0.00
	Sp	-0.00	0.00	8.70	0.00	0.00	0.00
	Dyn7	0.04	-31.60	-61.04	0.00	0.00	0.00
	Dyn8	-0.05	-65.00	-132.82	0.00	0.00	0.00
106	D	0.02	-0.04	54.95	0.00	0.00	0.00
	Lp	0.01	-0.01	29.47	0.00	0.00	0.00
	Sp	-0.00	0.00	0.01	0.00	0.00	0.00
	Dyn7	-0.04	0.12	-0.31	0.00	0.00	0.00
	Dyn8	0.04	0.28	-0.69	0.00	0.00	0.00
107	D	0.01	-0.02	61.49	0.00	0.00	0.00
	Lp	0.01	-0.01	20.42	0.00	0.00	0.00
	Sp	0.00	0.00	7.51	0.00	0.00	0.00
	Dyn7	-0.07	-31.60	61.25	0.00	0.00	0.00
	Dyn8	-0.13	-65.01	133.17	0.00	0.00	0.00

Frame #4:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
111	D	0.00	-0.00	95.43	0.00	0.00	0.00
	Lp	0.02	-0.01	32.50	0.00	0.00	0.00
	Sp	0.00	-0.00	14.06	0.00	0.00	0.00
	Dyn7	25.13	0.46	59.07	0.00	0.00	0.00
	Dyn8	-22.25	0.56	-54.71	0.00	0.00	0.00
113	D	0.09	0.01	57.44	0.00	0.00	0.00
	Lp	0.04	-0.00	36.14	0.00	0.00	0.00
	Sp	-0.00	0.00	0.02	0.00	0.00	0.00
	Dyn7	-0.06	-0.11	-0.53	0.00	0.00	0.00
	Dyn8	-0.08	-0.12	-0.30	0.00	0.00	0.00
116	D	0.01	-0.01	89.96	0.00	0.00	0.00
	Lp	0.01	-0.02	46.59	0.00	0.00	0.00
	Sp	0.00	0.00	14.06	0.00	0.00	0.00
	Dyn7	25.27	0.43	-58.74	0.00	0.00	0.00

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
	Dyn8	-22.26	0.39	54.84	0.00	0.00	0.00

Frame #5:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
139	D	-0.92	-1.30	117.68	0.00	0.00	0.00
	Lp	-0.15	-0.28	32.00	0.00	0.00	0.00
	Sp	0.00	-0.00	13.46	0.00	0.00	0.00
	Dyn7	-0.11	-43.64	-154.92	0.00	0.00	0.00
	Dyn8	-0.08	-19.82	-69.24	0.00	0.00	0.00
140	D	0.16	-0.11	83.28	0.00	0.00	0.00
	Lp	0.02	-0.09	31.89	0.00	0.00	0.00
	Sp	0.00	-0.00	0.03	0.00	0.00	0.00
	Dyn7	-0.21	0.48	1.28	0.00	0.00	0.00
	Dyn8	-0.22	0.21	0.56	0.00	0.00	0.00
141	D	-0.06	-0.12	73.70	0.00	0.00	0.00
	Lp	-0.01	-0.12	21.06	0.00	0.00	0.00
	Sp	0.00	-0.00	7.20	0.00	0.00	0.00
	Dyn7	-0.13	-43.89	153.81	0.00	0.00	0.00
	Dyn8	0.09	-19.93	68.76	0.00	0.00	0.00

Frame #6:

Node	LdC	Rx	Ry	Rz	Mxx	Myy	Tzz
		kips	kips	kips	kip-ft	kip-ft	kip-ft
124	D	-0.13	0.06	59.07	0.00	0.00	0.00
	Lp	-0.06	0.01	43.21	0.00	0.00	0.00
	Sp	0.00	0.00	9.54	0.00	0.00	0.00
	Dyn7	0.22	0.92	118.77	0.00	0.00	0.00
	Dyn8	-0.20	0.51	67.72	0.00	0.00	0.00
125	D	0.02	0.06	46.68	0.00	0.00	0.00
	Lp	0.00	0.00	42.52	0.00	0.00	0.00
	Sp	-0.00	-0.00	0.02	0.00	0.00	0.00
	Dyn7	25.09	-93.48	-2.42	0.00	0.00	0.00
	Dyn8	14.90	-55.59	-1.51	0.00	0.00	0.00
127	D	0.03	0.06	68.45	0.00	0.00	0.00
	Lp	0.01	0.01	46.04	0.00	0.00	0.00
	Sp	-0.00	-0.00	13.38	0.00	0.00	0.00
	Dyn7	0.06	-0.20	-117.15	0.00	0.00	0.00
	Dyn8	0.08	0.10	-66.57	0.00	0.00	0.00

Frame #7:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
119	D	0.14	0.05	57.63	0.00	0.00	0.00
	Lp	0.04	0.02	28.18	0.00	0.00	0.00
	Sp	-0.00	-0.00	5.71	0.00	0.00	0.00
	Dyn7	0.17	0.16	-95.56	0.00	0.00	0.00
	Dyn8	0.18	0.10	-44.92	0.00	0.00	0.00
122	D	0.14	0.05	88.49	0.00	0.00	0.00
	Lp	0.02	0.01	38.14	0.00	0.00	0.00
	Sp	-0.00	-0.00	9.52	0.00	0.00	0.00
	Dyn7	-45.78	-12.26	95.61	0.00	0.00	0.00
	Dyn8	-24.58	-6.58	45.02	0.00	0.00	0.00

Frame #8:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
117	D	0.06	-0.00	62.15	0.00	0.00	0.00
	Lp	0.01	-0.05	22.29	0.00	0.00	0.00
	Sp	-0.00	0.00	7.14	0.00	0.00	0.00
	Dyn7	0.21	0.36	75.44	0.00	0.00	0.00
	Dyn8	-0.19	0.29	66.34	0.00	0.00	0.00
118	D	0.02	0.02	49.60	0.00	0.00	0.00
	Lp	-0.02	0.02	18.48	0.00	0.00	0.00
	Sp	0.00	-0.00	5.99	0.00	0.00	0.00
	Dyn7	9.69	-35.68	-75.62	0.00	0.00	0.00
	Dyn8	8.82	-33.03	-66.32	0.00	0.00	0.00

Frame #9:

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
112	D	-0.07	-0.02	111.09	0.00	0.00	0.00
	Lp	-0.03	-0.03	42.12	0.00	0.00	0.00
	Sp	0.00	-0.00	19.44	0.00	0.00	0.00
	Dyn7	-26.76	1.05	-85.60	0.00	0.00	0.00
	Dyn8	23.24	1.13	-58.14	0.00	0.00	0.00
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn7	-26.20	-86.18	-215.88	0.00	0.00	0.00
	Dyn8	23.49	-75.96	-237.36	0.00	0.00	0.00

Frame #10:

Frame Reactions

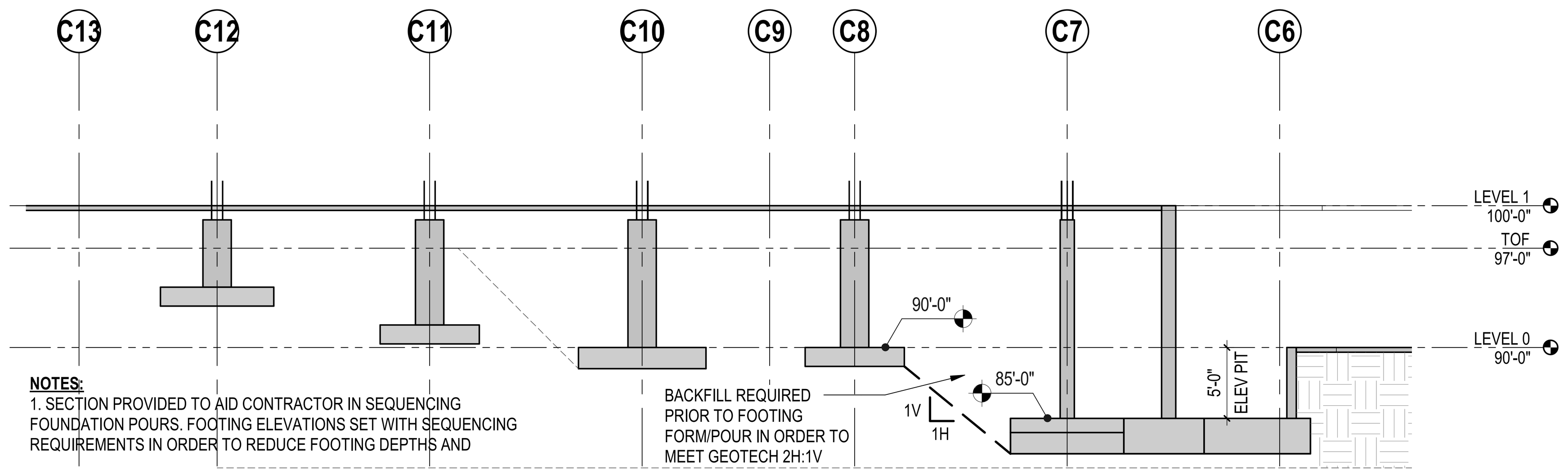
Y-direction Only Modal
Scaled load cases

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn7	-26.20	-86.18	-215.88	0.00	0.00	0.00
	Dyn8	23.49	-75.96	$\boxed{-237.36}$	0.00	0.00	0.00
115	D	-0.05	0.01	61.44	0.00	0.00	0.00
	Lp	-0.01	-0.02	33.79	0.00	0.00	0.00
	Sp	0.00	0.00	2.95	0.00	0.00	0.00
	Dyn7	0.11	-86.41	242.43	0.00	0.00	0.00
	Dyn8	0.10	-75.97	211.95	0.00	0.00	0.00

Y Only reaction, from frame 9

Frame Reactions

Node	LdC	Rx kips	Ry kips	Rz kips	Mxx kip-ft	Myy kip-ft	Tzz kip-ft
114	D	0.10	0.13	125.33	0.00	0.00	0.00
	Lp	0.02	0.01	47.79	0.00	0.00	0.00
	Sp	-0.00	0.00	17.75	0.00	0.00	0.00
	Dyn5	-100.93	13.74	279.32	0.00	0.00	0.00
	Dyn6	-103.97	-29.76	289.32	0.00	0.00	0.00
115	D	-0.05	0.01	61.44	0.00	0.00	0.00
	Lp	-0.01	-0.02	33.79	0.00	0.00	0.00
	Sp	0.00	0.00	2.95	0.00	0.00	0.00
	Dyn5	0.52	14.43	47.21	0.00	0.00	0.00
	Dyn6	0.47	-30.31	54.02	0.00	0.00	0.00



2 FOUNDATION SEQUENCING SECTION

SCALE: 1/8" = 1'-0"

STEEL COLUMNS AND POSTS

1. ALL COLUMNS BEAR AT TOP OF FOOTING OR TOP OF PIER. VERTICAL STEEL ELEMENTS SHOWN IN PLAN ARE 'COLUMNS', UNLESS NOTED OTHERWISE.
2. COLUMNS ARE CENTERED AT GRIDLINE INTERSECTIONS, UNLESS NOTED OTHERWISE.
3. ALL POST BEAR AT TOP OF SLAB OR STEM WALL. VERTICAL STEEL ELEMENTS ARE ONLY POSTS IF LABELED 'POST' IN PLAN.
4. SEE THE FOLLOWING DETAILS FOR ADDITIONAL INFORMATION:

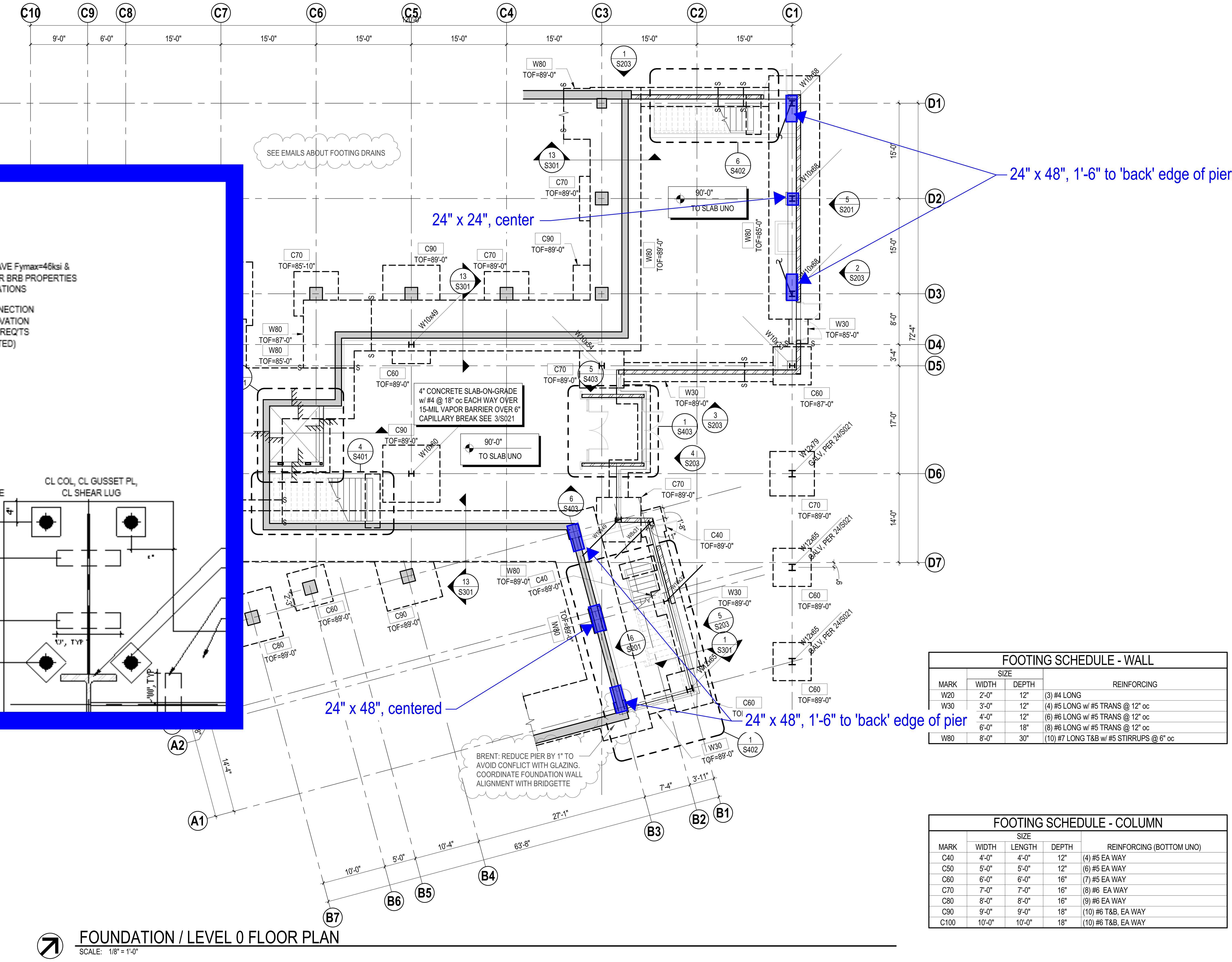
COLUMN BASEPLATE: 21/S021

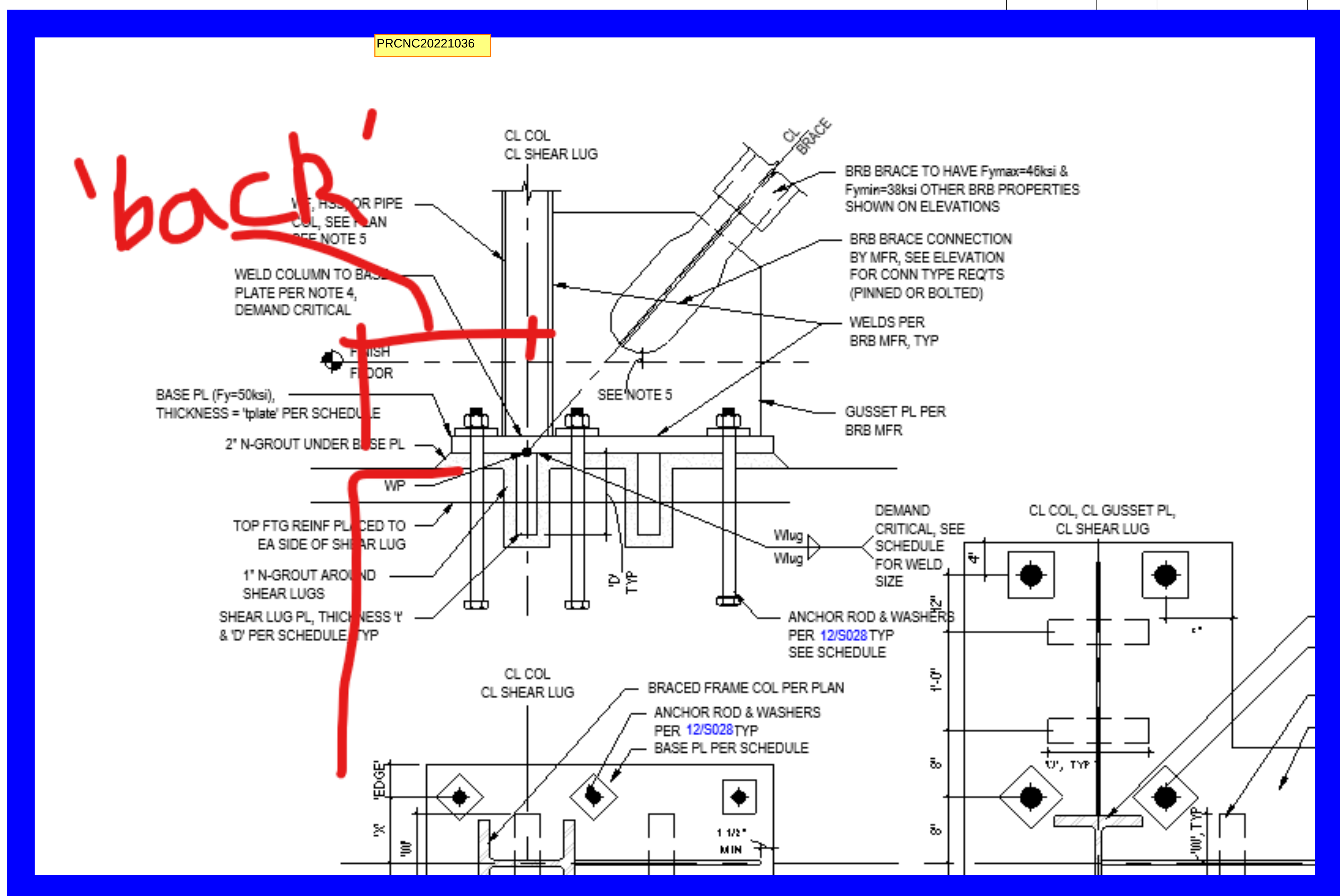
TYPICAL COLUMN CAP PLATE: 22/S026

TYPICAL INTERIOR STEEL COLUMN FOOTING, UNO: 24/S021

FOUNDATION/FIRST FLOOR PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. REFER TO DETAILS 3/S021 AND EARTHWORK SPECIFICATION FOR SOIL PREPARATION AT SLABS-ON-GRADE
6. INDICATES EXTENTS AND DEPTH OF RECESSED SLAB-ON-GRADE. CONFIRM DEPTH OF RECESS INDICATED WITH ARCHITECTURAL AND FLOOR FINISH MANUFACTURER WHERE NOT INDICATED ON PLAN. FLOOR FINISHES WITHIN REGION OF RECESS SHALL FLUSH WITH FINISHES ON ADJACENT SLAB SURFACES. SEE DETAIL 8/S021
7. REFER TO DETAIL 5/S021 FOR EQUIPMENT PADS. SEE MECH, ELEC, CIVIL FOR PAD QUANTITIES AND LOCATIONS. PAD SIZES TO BE PROVIDED BY EQUIPMENT MFRS
8. INDICATES FOOTING MARK NUMBER. SEE SCHEDULE THIS SHEET FOR SIZE AND REINFORCEMENT
9. S— — —S INDICATES FOOTING STEP LOCATION. SEE DETAIL 18/S021
10. INDICATES APPROXIMATE LOCATION OF PIPE OR CONDUIT PENETRATION THROUGH FOUNDATION WALL. SEE DETAIL 15/S021. NOT ALL LOCATIONS ARE INDICATED. COORDINATE WITH MEP DRAWINGS FOR QUANTITIES, SIZES AND LOCATIONS
11. STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH-UP AND GRIND SMOOTH
12. LOCALIZED SLOPE TO DRAIN. PROVIDE MAXIMUM 2% SLOPE TO DRAIN WITHIN 1'-0" RADIUS AROUND DRAIN
13. CONTINUE ALL WALL FOOTING REINFORCING THROUGH COLUMN FOOTINGS WHEREVER THEY INTERSECT
14. EXTEND LONGITUDINAL FOOTING REINFORCING INTO ADJACENT FOOTING WITH EXTENSION LENGTH EQUAL TO THE TYPICAL HORIZONTAL SPLICE LENGTH REQUIRED BY THE CONC REINF SPLICE TABLE ON SHEET S001.
15. APPLY COAL TAR EPOXY TO ALL STRUCTURAL STEEL SURFACES, INCLUDING ANCHOR BOLTS, EXPOSED TO SOIL IN THE FINISHED CONDITION
16. BRACED FRAMES AND FOOTINGS ARE CENTERED ON GRID LINES, UNLESS NOTED OTHERWISE
17. BRACED FRAME FOOTINGS SHALL EXTEND 4'-0" BEYOND CENTERLINE OF BRACED FRAME COLUMNS, TYPICAL UNLESS NOTED OTHERWISE IN PLAN





FOUNDATION / LEVEL 0 FLOOR PLAN

SCALE: 1/8" = 1'-0"

FOOTING SCHEDULE - WALL			
MARK	SIZE: WIDTH	SIZE: DEPTH	REINFORCING
W20	2'-0"	12"	(3) #4 LONG
W30	3'-0"	12"	(4) #5 LONG w/ #5 TRANS @ 12" oc
[illegible]	4'-0"	12"	(6) #6 LONG w/ #5 TRANS @ 12" oc
[illegible]	6'-0"	18"	(8) #6 LONG w/ #5 TRANS @ 12" oc
W80	8'-0"	30"	(10) #7 LONG T&B w/ #5 STIRRUPS @ 6" oc

FOOTING SCHEDULE - COLUMN				
MARK	SIZE: WIDTH	SIZE: LENGTH	SIZE: DEPTH	REINFORCING (BOTTOM UNO)
C40	4'-0"	4'-0"	12"	(4) #5 EA WAY
C50	5'-0"	5'-0"	12"	(6) #5 EA WAY
C60	6'-0"	6'-0"	16"	(7) #5 EA WAY
C70	7'-0"	7'-0"	16"	(8) #6 EA WAY
C80	8'-0"	8'-0"	16"	(9) #6 EA WAY
C90	9'-0"	9'-0"	18"	(10) #6 T&B, EA WAY
C100	10'-0"	10'-0"	18"	(10) #6 T&B, EA WAY

integrus ARCHITECTURE
117 SOUTH MAIN STREET, SUITE 100, SEATTLE, WA, 98104
TELEPHONE: (206)628-3137 FAX: (206)628-3138

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date:	06/30/22
Job No.:	22135.00
Drawn By:	RB
Checked By:	TD

Revisions

#	Date	Description
1	Date 1	Revision 1

FOUNDATION/ LEVEL 0 FLOOR PLAN

S100

BUILDING PERMIT SET

BEAM END CONNECTIONS

1. BEAMS MARKED WITH (c) AND (c)* ARE SEISMIC COLLECTORS. THESE BEAMS ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.

TYPICAL BEAM/GIRDER TO COLUMN: 11/S026
TYPICAL BEAM/GIRDER BOLTED CONNECTION: 25/S026
TYPICAL (c) CONNECTION AT COLUMNS: 7/S027
TYPICAL (c)* CONNECTION AT COLUMNS: 13/S027
TYPICAL (c) AND (c)* CONNECTION TO BEAM/GIRDER: 19/S027

FLOOR FRAMING PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. 3" CONCRETE TOPPING OVER 2" COMPOSITE 18 GAGE METAL DECK w/ 6x6 W2.9xW2.9 WELDED WIRE FABRIC REINFORCING, UNLESS NOTED OTHERWISE. SEE DETAILS 1/S025 AND 24/S025.
6. AT ALL COMPOSITE DECK, INSTALL HEADED STUDS AT 12" ON CENTER AT ALL SUPPORTS UNLESS NOTED OTHERWISE. SEE DETAIL 7/S025 .
7. COORDINATE SIZES AND LOCATIONS OF FLOOR AND ROOF OPENINGS WITH ARCHITECTURAL AND MEP DRAWINGS. NOT ALL REQUIRED OPENINGS ARE INDICATED IN THE STRUCTURAL DRAWINGS. REFER TO DETAILS 9/S025 AND 10/S025 FOR OPENINGS IN COMPOSITE FLOOR DECK. REFER TO DETAIL 4/S025 FOR OPENINGS IN ROOF DECK
8. INDICATES EXTENTS OF RECESSED CONCRETE SLABS. 1/2" RECESS UNO ON PLAN
9. HOT DIP GALVANIZE ALL STEEL, CONNECTIONS, AND BOLTS EXPOSED TO WEATHER.
10. AT CANTILEVERS DESIGNATED AS "CANT" ON PLAN, CANTILEVER MEMBER SIZE SHALL MATCH BACKSPAN MEMBER SIZE UNLESS NOTED OTHERWISE.
11. STRUCTURAL STEEL SHOP TAGS, ERECTION AIDS AND MILL MARKINGS EXPOSED TO VIEW SHALL BE REMOVED AFTER FIELD ASSEMBLY. PATCH, TOUCH UP AND GRIND SMOOTH.
12. LOCALIZED SLOPE TO DRAIN. PROVIDE MAXIMUM 2% SLOPE TO DRAIN WITHIN 1'-0" RADIUS AROUND DRAIN
13. REFER TO SHEET S501 FOR SNOW DRIFT LOADING. DESIGN JOISTS FOR ADDITIONAL LOAD COMBINATIONS INCLUDING DRIFTED SNOW LOADS IN ADDITION TO DISTRIBUTED SNOW LOAD

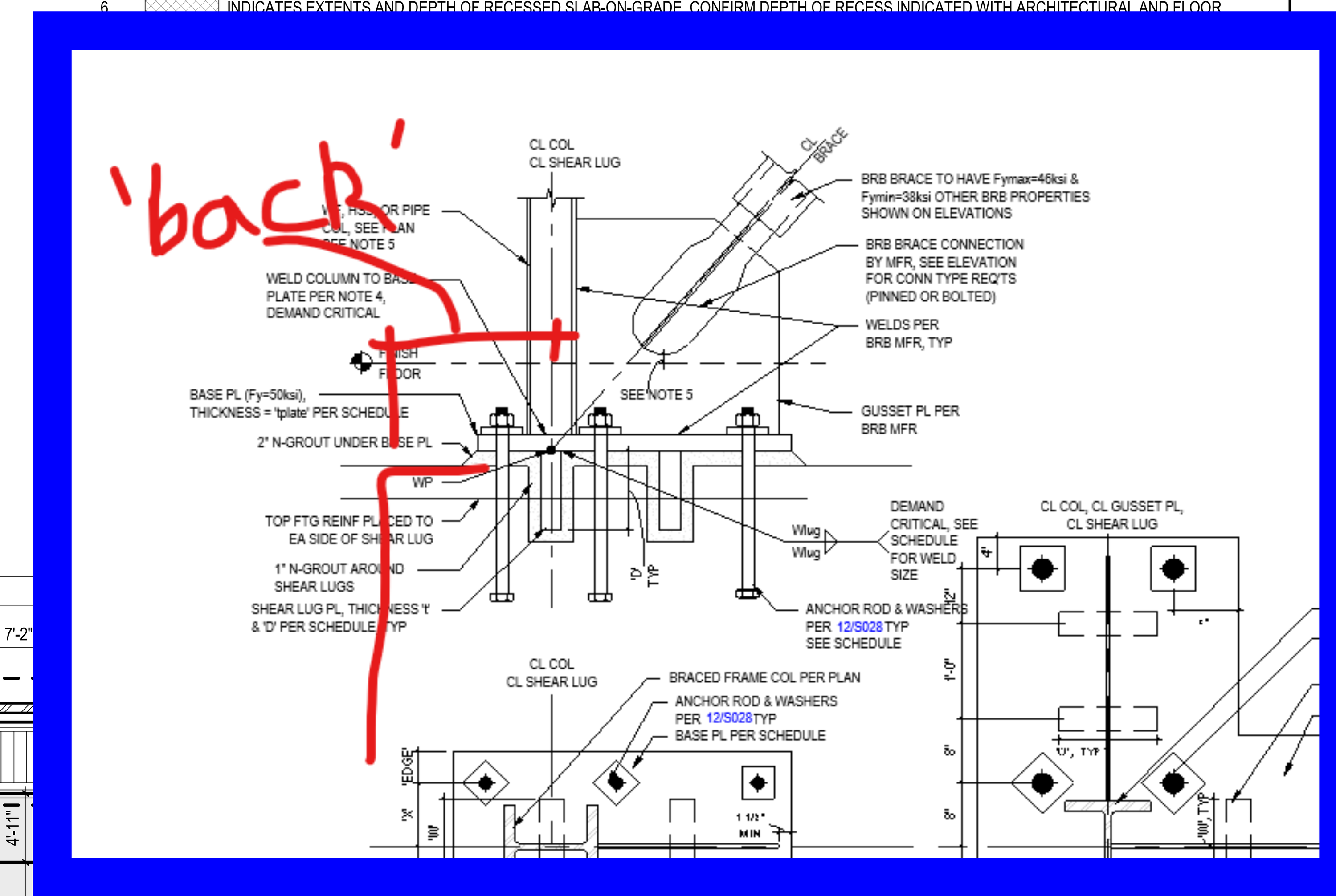
STEEL COLUMNS AND POSTS

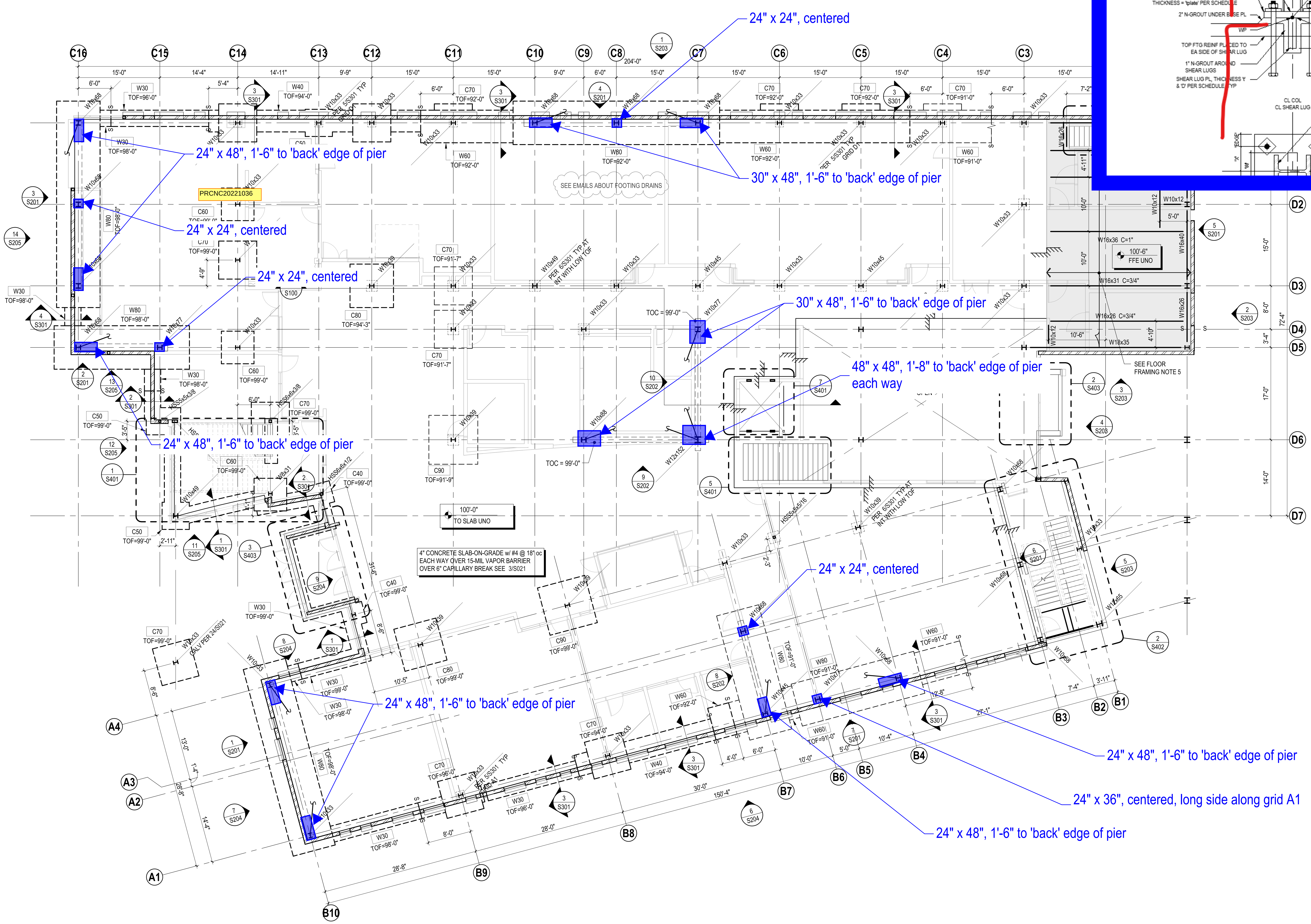
1. ALL COLUMNS BEAR AT TOP OF FOOTING OR TOP OF PIER. VERTICAL STEEL ELEMENTS SHOWN IN PLAN ARE 'COLUMNS', UNLESS NOTED OTHERWISE.
2. COLUMNS ARE CENTERED AT GRIDLINE INTERSECTIONS, UNLESS NOTED OTHERWISE.
3. ALL POST BEAR AT TOP OF SLAB OR STEM WALL. VERTICAL STEEL ELEMENTS ARE ONLY POSTS IF LABELED 'POST' IN PLAN.
4. SEE THE FOLLOWING DETAILS FOR ADDITIONAL INFORMATION:

COLUMN BASEPLATE: 21/S021
TYPICAL COLUMN CAP PLATE: 22/S026
TYPICAL INTERIOR STEEL COLUMN FOOTING, UNO: 24/S021

FOUNDATION/FIRST FLOOR PLAN NOTES

1. REFER TO SHEETS S001, S002 AND S003 FOR GENERAL STRUCTURAL AND SPECIAL INSPECTION NOTES
2. REFER TO SHEETS S021 THROUGH S024 FOR TYPICAL DETAILS
3. PROJECT ELEVATION 100'-0" = DATUM ELEVATION 534.0' PER CIVIL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
5. REFER TO DETAILS 3/S021 AND EARTHWORK SPECIFICATION FOR SOIL PREPARATION AT SLABS-ON-GRADE
6. INDICATES EXTENTS AND DEPTH OF RECESSED SLAB-ON-GRADE. CONFIRM DEPTH OF RECESS INDICATED WITH ARCHITECTURAL AND FLOOR





FOUNDATION / LEVEL 1 FLOOR PLAN
SCALE: 1/8" = 1'-0"

FOOTING SCHEDULE - WALL

MARK	SIZE WIDTH	SIZE DEPTH	REINFORCING
W20	2'-0"	12"	(3) #4 LONG
W30	3'-0"	12"	(4) #5 LONG w/ #5 TRANS @ 12" oc
W40	4'-0"	12"	(6) #6 LONG w/ #5 TRANS @ 12" oc
W60	6'-0"	18"	(8) #6 LONG w/ #5 TRANS @ 12" oc
W80	8'-0"	30"	(10) #7 LONG T&B w/ #5 STIRRUPS @ 6" oc

FOOTING SCHEDULE - COLUMN

MARK	SIZE WIDTH	SIZE LENGTH	SIZE DEPTH	REINFORCING (BOTTOM UNO)
C40	4'-0"	4'-0"	12"	(4) #5 EA WAY
C50	5'-0"	5'-0"	12"	(6) #5 EA WAY
C60	6'-0"	6'-0"	16"	(7) #5 EA WAY
C70	7'-0"	7'-0"	16"	(8) #6 EA WAY
C80	8'-0"	8'-0"	16"	(9) #6 EA WAY
C90	9'-0"	9'-0"	18"	(10) #6 T&B, EA WAY
C100	10'-0"	10'-0"	18"	(10) #6 T&B, EA WAY

integrus ARCHITECTURE

117 SOUTH MAIN STREET, SUITE 100, SEATTLE, WA 98104
TELEPHONE (206)628-3137 FAX (206)628-3138

PIERCE COLLEGE PUYALLUP NEW STEM BUILDING

1601 39th AVE SE
Puyallup, WA 98374

Date: 06/30/22
Job No.: 22135.00
Drawn By: AM
Checked by: Checker

Revisions

#	Date	Description
1	Date 1	Revision 1

FOUNDATION/LEVEL 1 FLOOR PLAN

S101

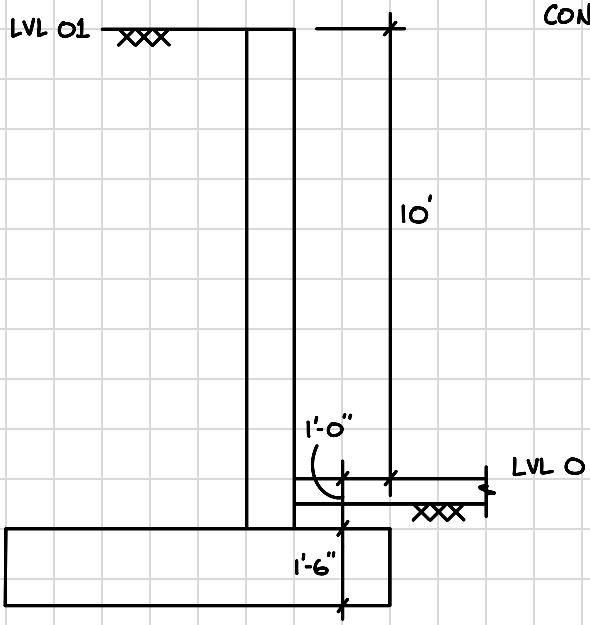
BUILDING PERMIT SET

integrus ARCHITECTURE

10 S. Cedar Street, Spokane, WA 99201, 509-838-8681, Fax 509-838-2194
117 S. Main Street, Suite 100, Seattle, WA 98104, 206-628-3137, Fax 206-628-3138

Title			Job Number
STRUCTURAL ENGINEERS	By	Date	Sheet

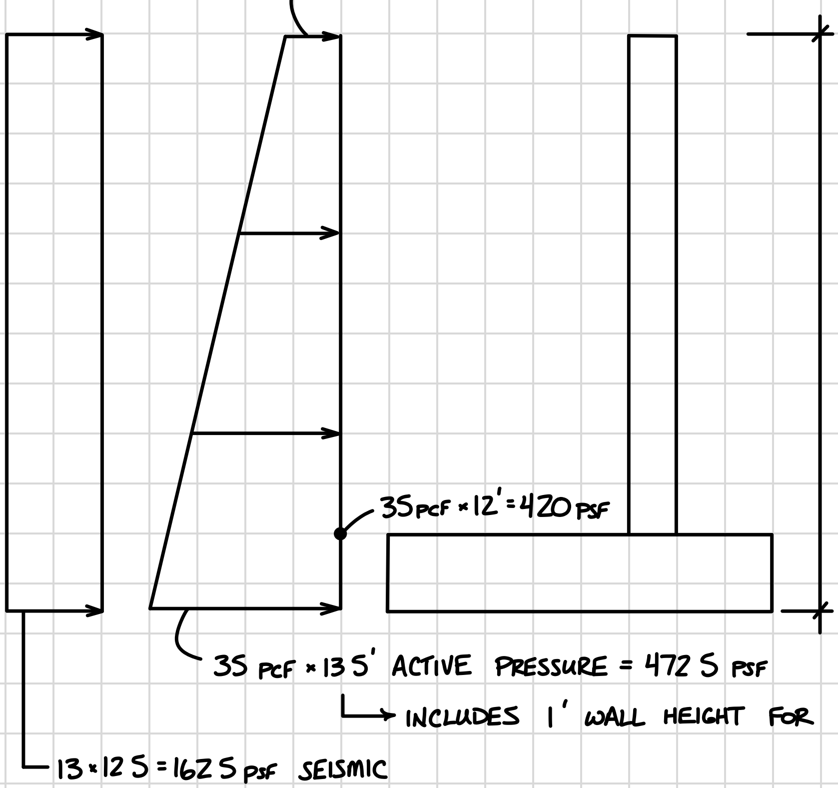
BASEMENT WALL



CONSIDER CANTILEVER CONDITION:

LOADS ACTIVE PRESSURE 35pcf (EQUIVALENT FLUID PRESSURE)
+ 1' EQUIVALENT WALL HEIGHT DUE TO 100psf SURCHARGE
+ 13H UNIFORM SEISMIC

35 pcf × 1' = 35 psf



10'+1'+1.5' = 12.5' ACTUAL HEIGHT

35pcf × 12' = 420 psf

35 pcf × 13.5' ACTIVE PRESSURE = 472.5 psf

↳ INCLUDES 1' WALL HEIGHT FOR 100psf SURCHARGE

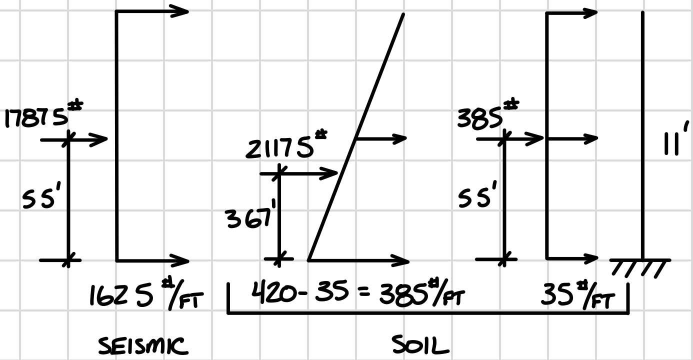
13 × 12.5 = 162.5 psf SEISMIC

CONT →

PRCNC20221036

CONT

WALL DESIGN: 1 6H + 1 0E FOR LRFD CONC DESIGN, ANALYZE 1' WALL WIDTH (PSF → #/FT)



SHEAR $1\ 6(2117\ 5^{\#} + 385^{\#}) + 1787\ 5^{\#} = 5791\ 5^{\#}$

$\phi V_c = 0\ 75(2\sqrt{f'_c}\, b_w d)$ TRY 12" CONC WALL w/ #6 BARS $d = 12" - 2"\text{CLR} - \tfrac{1}{2}(6/8) = 9\ 625"$

$= 0\ 75(2\sqrt{4000}\ \text{PSI} \times 12" \times 9\ 625" = 10{,}957^{\#} > V_u = 5791\ 5^{\#}$

SHEAR FRICTION $\phi V_n = 0\ 75(A_{vf} f_y \mu) = 0\ 75 \times 0\ 44\ \text{IN}^2 \times 60{,}000\ \text{PSI} \times 0\ 6$ (CAST AGAINST HARDENED CONC)

$= 11{,}880^{\#} > V_u = 5791\ 5^{\#}$

SHEAR DOES NOT CONTROL

MOMENT $1\ 6(2117\ 5^{\#} \times 3\ 67' + 385^{\#} \times 5\ 5') + 1787\ 5^{\#} \times 5\ 5' = 25{,}654^{\#\ FT}$

TRY 12" WALL w/ #6 @ 12" oc ($d = 9\ 625"$ PER ABOVE)

$\phi_b M_n = 0\ 9 A_s f_y (d - a/2)$, $a = A_s f_y / 0\ 85 f'_c \times b = 0\ 44 \times 60 / 0\ 85 \times 4 \times 12" = 0\ 65"$

$= 0\ 9 \times 0\ 44\ \text{IN}^2 \times 60{,}000\ \text{PSI}\ (9\ 625" - 0\ 65"/2) = 18{,}414^{\#\ FT} < M_u = 25{,}654^{\#\ FT}$ NO GOOD

TRY 12" WALL w/ #7 @ 12" oc, $A_s = 0\ 60\ \text{IN}^2$, $d = 12" - 2"\text{CLR} - \tfrac{1}{2}(7/8) = 9\ 5625"$, $a = 0\ 60 \times 60 / 0\ 85 \times 4 \times 12 = 0\ 89"$

$\phi_b M_n = 0\ 9 \times 0\ 60\ \text{IN}^2 \times 60{,}000\ \text{PSI}\ (9\ 5625" - 0\ 89"/2) = 24{,}617^{\#\ FT} < M_u = 25{,}654^{\#\ FT}$ NO GOOD

TRY 12" WALL w/ #7 @ 9" oc, $A_s = 0\ 60\ \text{IN}^2 (12/9) = 0\ 8\ \text{IN}^2$, $a = 0\ 80 \times 60 / 0\ 85 \times 4 \times 12 = 1\ 18"$

$\phi_b M_n = 0\ 9 \times 0\ 80\ \text{IN}^2 \times 60{,}000\ \text{PSI}\ (9\ 5625" - 1\ 18"/2) = 32{,}301^{\#\ FT} > M_u = 25{,}654^{\#\ FT}$ OK

$\boxed{12"\ \text{WALL w/ \#7 @ 9" oc}}$