RUSH

SUBMITTAL COVER SHEET

Project:	Bradley Heights Apartments
Submitted By:	Arc Welding
Submittal Number & Name:	134.1 - Trash and Recycling Structure
Date Submitted:	April 15, 2026
Additional Notes:	Post locations adjusted per comment from S4S

- [x] NO EXCEPTIONS NOTED
- [ ] REJECTED SEE REMARKS
- [ ] RESUBMIT SPECIFIED ITEMS
- [ ] _____
- [ ] _____
- [ ] REVISE AND RESUBMIT
- [ ] REVIEWED AS NOTED
- [ ] FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION

Corrections or Comments made on the shop drawings during this review do not relieve subcontractor/suppliers from compliance with requirements of the drawings and specifications. The subcontractor/supplier is responsible for confirming and correlating all quantities and dimensions; selecting fabrication process and techniques of construction; coordinating his work with that of all other trades, and performing this work in a safe and satisfactory manner.

RUSH COMMERCIAL CONSTRUCTION

DATE: 4/15/2026 BY: Tyler Sliva

STAMP AREA

- ❒ Conforms to Design Concept
- ☒ Conforms to Design Concept as noted
- ❒ Does not conform - Revise and Submit

Review is only for conformance with the design concept of the project. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for the coordination of the work of all trades.

By TLC Date 4/17/26

Solution 4 Structures, Inc.

Review by Solution 4 Structures, Inc. is only for conformance of the design criteria and concept. Structural performance of the supplier designed components is the responsibility of the components structural engineer.

- [x] CONFORMS TO DESIGN CONCEPT
- [ ] CONFORMS TO DESIGN CONCEPT WITH REVISIONS NOTED
- [ ] NON-CONFORMING – REVISE & RESUBMIT

THIS SHOP DRAWING HAS BEEN REVIEWED FOR GENERAL CONFORMANCE WITH DESIGN CONCEPT ONLY AND DOES NOT RELIEVE THE FABRICATOR/VENDOR OF RESPONSIBILITY FOR CONFORMANCE WITH DESIGN DRAWINGS, SPECIFICATIONS, AND APPLICABLE CODES, ALL OF WHICH HAVE PRIORITY OVER THIS SHOP DRAWING.

By Heather Mauldin Date 4/21/2026

MILBRANDT ARCHITECTS

MID FOOTING DIMENSIONS AS SHOWN BEYOND TYPICAL STEM FOOTING. FTG TO BE 18" DP w/#5 BARS @ 9"oc TOP AND BOTTOM EACH WAY, TYP @ TWO LOCATIONS.

IF STEM WALL IS ALREADY POURED, ADD #5 BARS x18" TO DOWEL INTO EXISTING @ 9"oc EPOXY EMBED 4" MIN. OTHERWISE POUR MONOLITHICALLY. TOP OF FOOTING TO BE FLUSH WITH SOG. BOTTOM OF FOOTING TO BE 18" BELOW GRADE. IF SOG IS POURED AFTERWARDS, EXTEND #5 TOP BARS 12" BEYOND FOOTING TO DOWEL INTO SOG. – WIBLE ENGINEERING

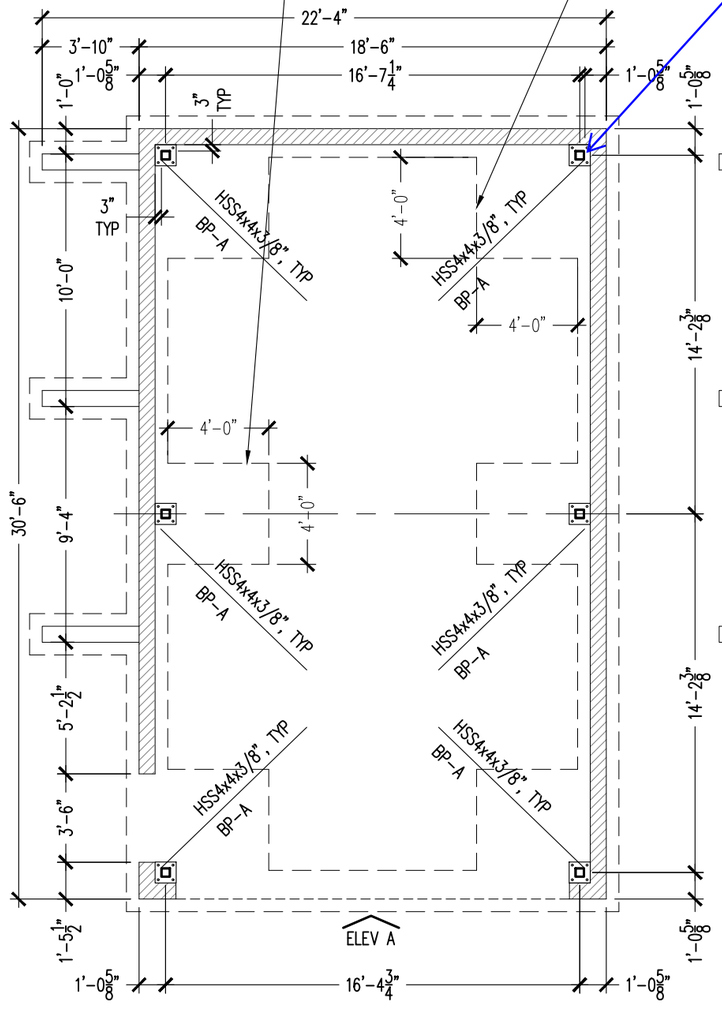
CORNER FOOTING DIMENSIONS AS SHOWN BEYOND TYPICAL STEM FOOTING. FTG TO BE 18" DP w/#5 BARS @ 9"oc TOP AND BOTTOM EACH WAY, TYP @ ALL CORNERS OF TRASH ENCLOSURE.

IF STEM WALL IS ALREADY POURED, ADD #5 BARS x18" TO DOWEL INTO EXISTING @ 9"oc EPOXY EMBED 4" MIN. OTHERWISE POUR MONOLITHICALLY. TOP OF FOOTING TO BE FLUSH WITH SOG. BOTTOM OF FOOTING TO BE 18" BELOW GRADE. IF SOG IS POURED AFTERWARDS, EXTEND #5 TOP BARS 12" BEYOND FOOTING TO DOWEL INTO SOG. – WIBLE ENGINEERING

This is acceptable provided the deflection of the cover post at the top of the walll does not exceed 3" (Did not find deflection values in calculations)

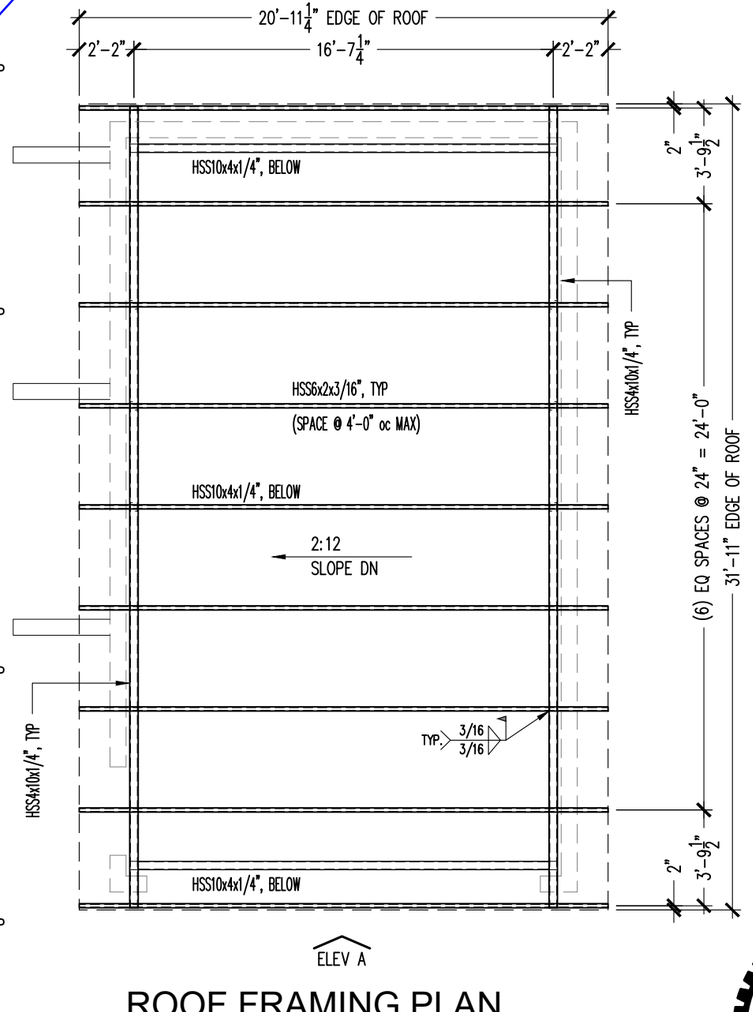
All posts 3" from CMU, Typ

Deflection confirmed not to exceed 3", see added sheet on page 3 of the calcs



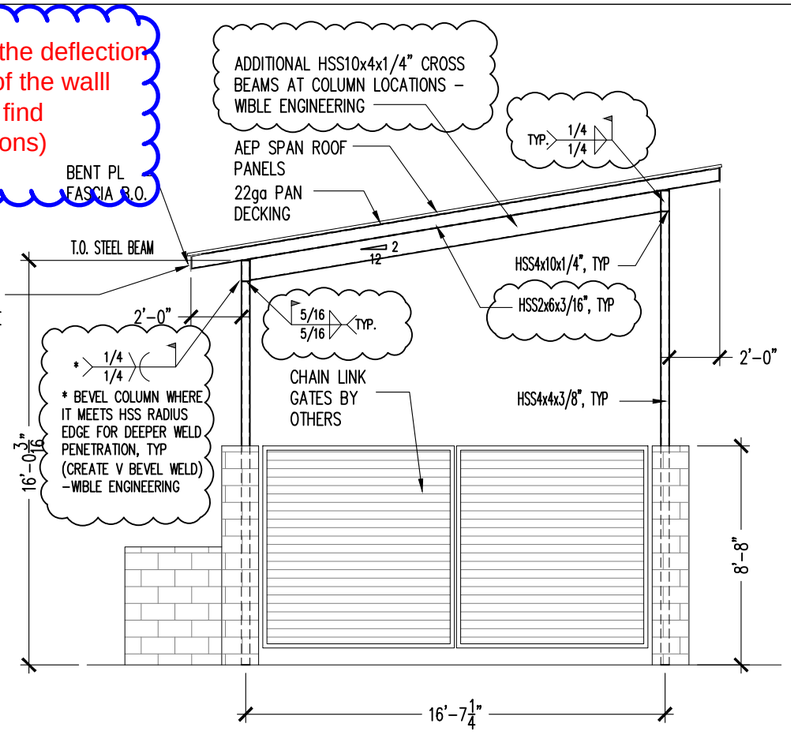
COMPACTOR ENCLOSURE PLAN

REF A4



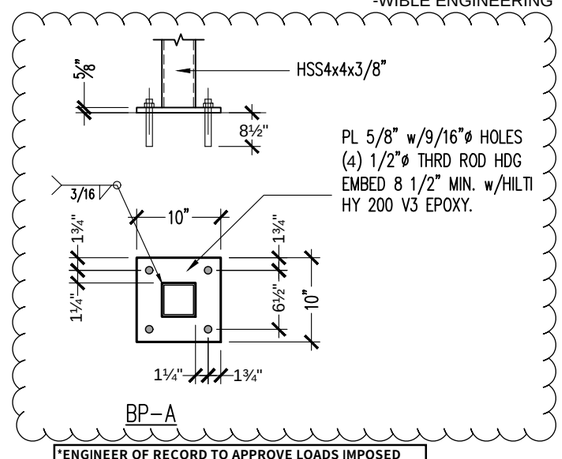
ROOF FRAMING PLAN

REF A4



ELEVATION A

REF A4



*ENGINEER OF RECORD TO APPROVE LOADS IMPOSED PRIOR TO CONSTRUCTION.

*WIBLE ENGINEERING IS NOT RESPONSIBLE FOR OVERALL DIMENSIONS.

*ALL STEEL MEMBERS TO BE PAINTED OR HDG. FIELD WELDS TO BE SIMILARLY PROTECTED AFTER COMPLETED

Wible Engineering (SLW), 4/15/26

SCOTT WIBLE STATE OF WASHINGTON 57996 STRUCTURAL ENGINEER PROFESSIONAL ENGINEER

4/15/26

City of Puyallup Building REVIEWED FOR COMPLIANCE SKinnear 04/27/2026 2:59:36 PM

City of Puyallup Development & Permitting Services ISSUED PERMIT
Building | Planning | Engineering | Public Works | Fire | Traffic

MATERIAL:
WF = ASTM A992, Fy=50ksi
C, L, PL = ASTM A36, Fy=36ksi
PIPE = ASTM A53, GRB Fy=35ksi
HSS = ASTM A500, GRB Fy=46ksi

HOLES: 13/16"ø (U.N.O.)

PAINT:

WELDING: 3/16" FILLET (U.N.O.)

ELECTRODES: 70XX

This is a conceptual drawing created from customer specs. Arc Welding Inc. will not be held responsible for product failure. Arc Welding Inc. is exempt from all liability of prints not being engineered by customer @ customers cost.

Arc Welding Inc.

Bradley Heights Apts

Puyallup, WA

PRCNC202600042

REVISIONS:
4/13/26 1
4/15/26 2

DRAWN BY: CWT

DATE: 08/20/25

CT PO#4095

E1

Approval of submitted plans is not an approval of omissions or oversights by this office or non compliance with any applicable regulations of local government. The contractor is responsible for making sure that the building complies with all applicable codes and regulations of the local government.

The approved construction plans, documents, and all engineering must be posted on the job at all inspections in a visible and readily accessible location.

Full sized legible color plans are required to be provided by the permitee on site for inspection.

Separate Electrical Permit is required with the Washington State Department of Labor & Industries.
https://lni.wa.gov/licensing-permits/electrical/electrical-permits-fees-and-inspections
or call for Licensing Information:
1-800-647-0982

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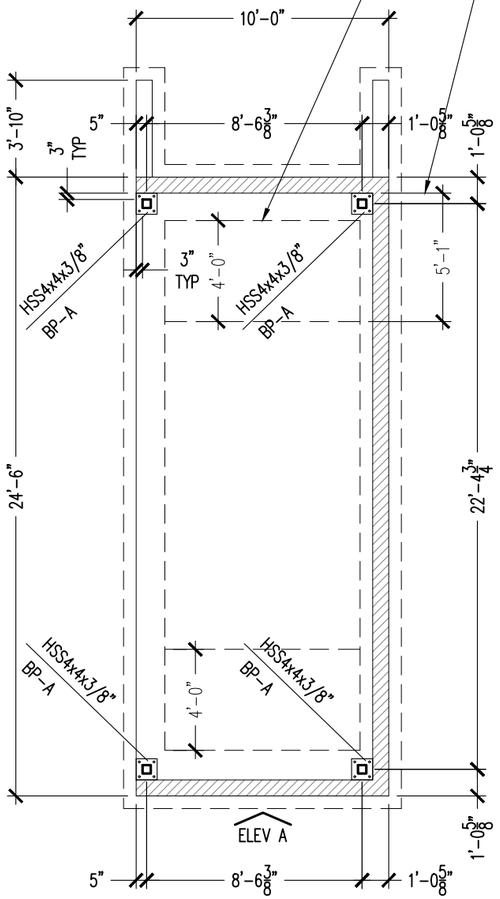
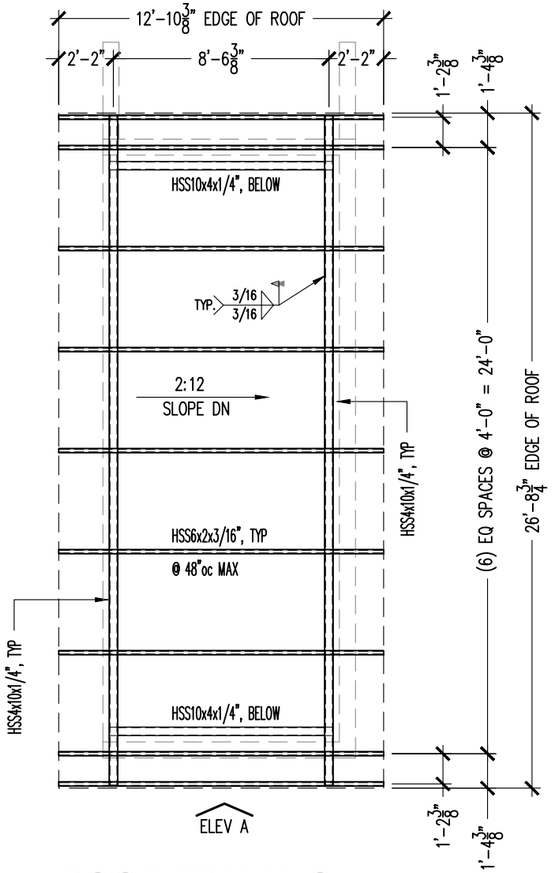
CORNER FOOTINGS THE EXACT SAME AS PAGE E1 MAY BE COMBINED FOR SIMPLICITY. EXTEND OUT FROM CMU STEM WALL FOOTING AS SHOWN. FOOTING EDGE WILL BE 13"+48"=61" AWAY FROM FACE OF CMU WALL. FTG TO BE 18" DP w/#5 BARS @ 9"oc TOP AND BOTTOM EACH WAY, TYP EA SIDE OF RECYCLING ENCLOSURE.



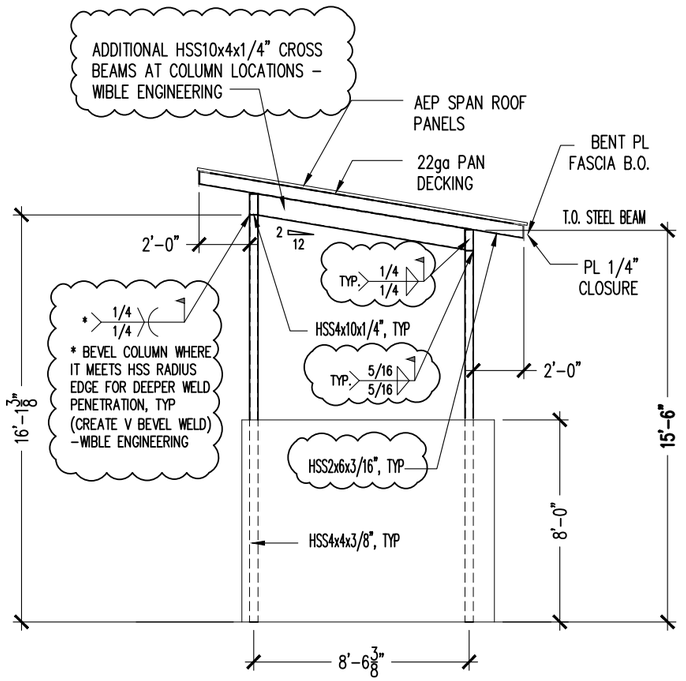
RECYCLING PLAN

REF A5



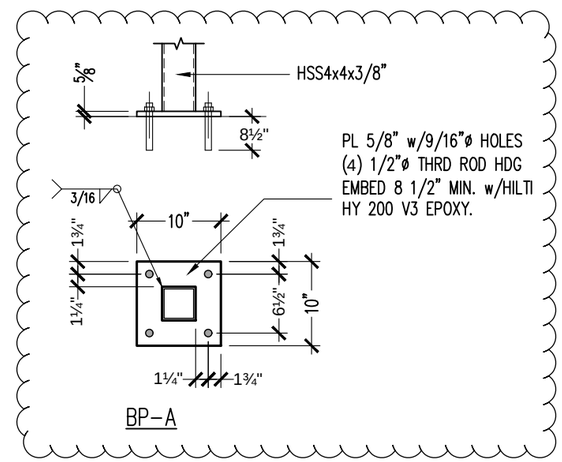
ROOF FRAMING

REF A5



ELEVATION A

REF A4



BP–A

-WIBLE ENGINEERING

*ENGINEER OF RECORD TO APPROVE LOADS IMPOSED PRIOR TO CONSTRUCTION.

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SCOTT WIBLE STATE OF WASHINGTON 57996 STRUCTURAL ENGINEER PROFESSIONAL ENGINEER

4/15/26

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C, L, PL = ASTM A36, Fy=36ksi
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ELECTRODES: 70XX

Arc Welding Inc.

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning | Engineering | Public Works | Fire | Traffic

PRCNC20260042

Bradley Heights Apts

Puyallup, WA

REVISIONS:
3/11/26 1
4/13/26 2
4/15/26 3

DRAWN BY: CWT

DATE: 08/20/25

CT PO#4095

E2

WIBLE
ENGINEERING

PRCNC20260042

Structural Calculations For:

Bradley Heights Apartments Trash Enclosure and Recycling Enclosure

202 27th Ave SE

Puyallup, WA

Revised 4/15/26
-Updated baseplate design

Prepared for:	Arc Welding
Job #:	00025-2026-05
Date:	April 10, 2026
Engineer:	Scott Wible, P.E., S.E.

Calculations required to be provided by the Permittee on site for all Inspections

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
Engineering | Public Works
Fire | Traffic

City of Puyallup
Building
REVIEWED FOR COMPLIANCE
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04/27/2026
3:05:17 PM

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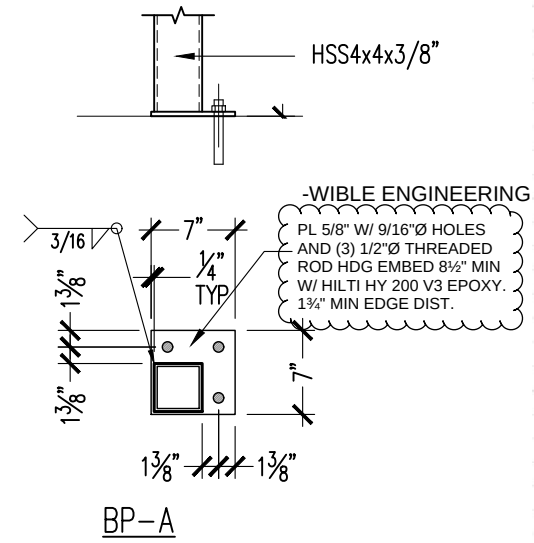
1301 Justin Rd, Ste 201 #5030
Lewisville, TX 75077
469.744.7256
wibleengineering.com

Loads Imposed



BP–A

TRASH: DOWN MAX = 3.239 K ASD

$F_{x\,max}$ = 0.403 K ASD

$F_{y\,max}$ = 0.296 K ASD

UPLIFT MAX = 68 lbs ASD

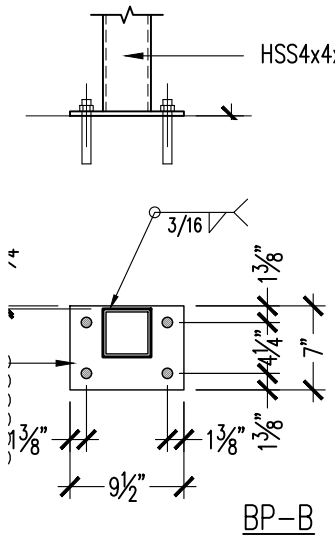
RECYCLE:

DOWN MAX = 3.687 K ASD

UPLIFT MAX = 0.597 K ASD MAX

$F_{x\,max}$ = 0.296 K ASD

$F_{y\,max}$ = 0.307 K ASD



BP–B

BP – B @ TRASH ENCLOSURE

P_a = 6.202 K max ASD

P_{up} = 325 # max ASD

$V_{x\,max}$ = 457 lbs ASD

$V_{y\,max}$ = 310 lbs ASD

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Bradley Apts Trash and Recycling Enclosure
PROJECT

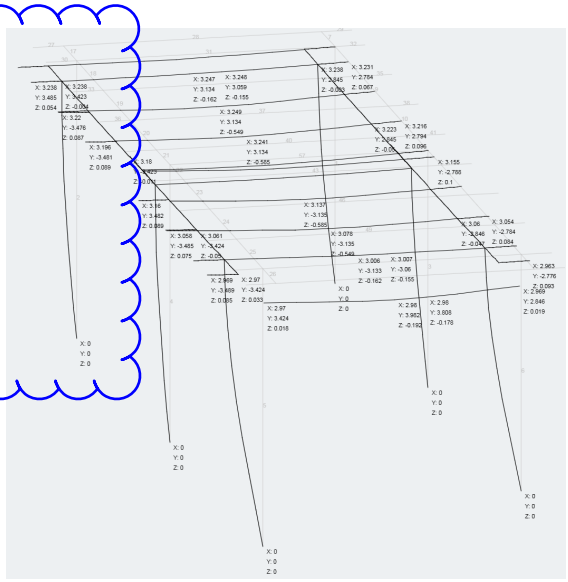
4/10/26
DATE

00025-2026-05
PROJ #

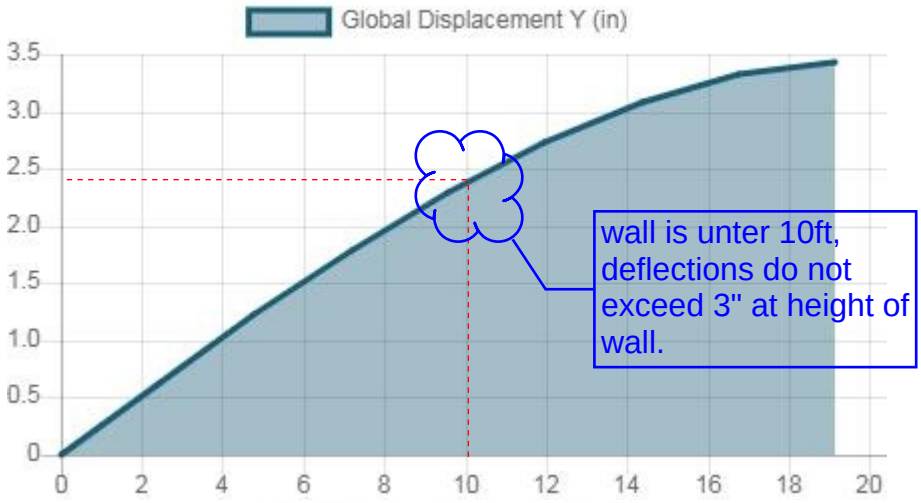
SLW
DESIGN

SHEET

worst case deflections at member 2

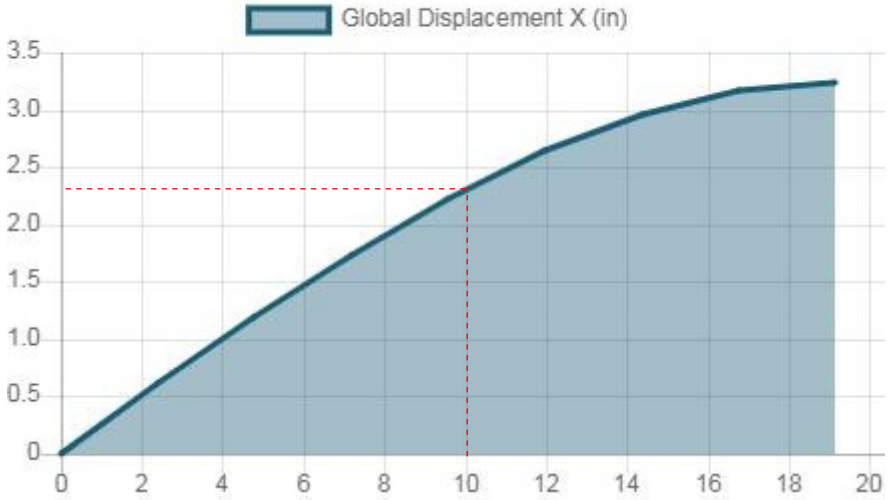


Member 2, Envelope Absolute Max



wall is unter 10ft, deflections do not exceed 3" at height of wall.

Member 2, Envelope Absolute Max



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Bradley Steel Trash Enclosure - Deflecitons
PROJECT

4/21/26
DATE

00025-2026-05
PROJ #

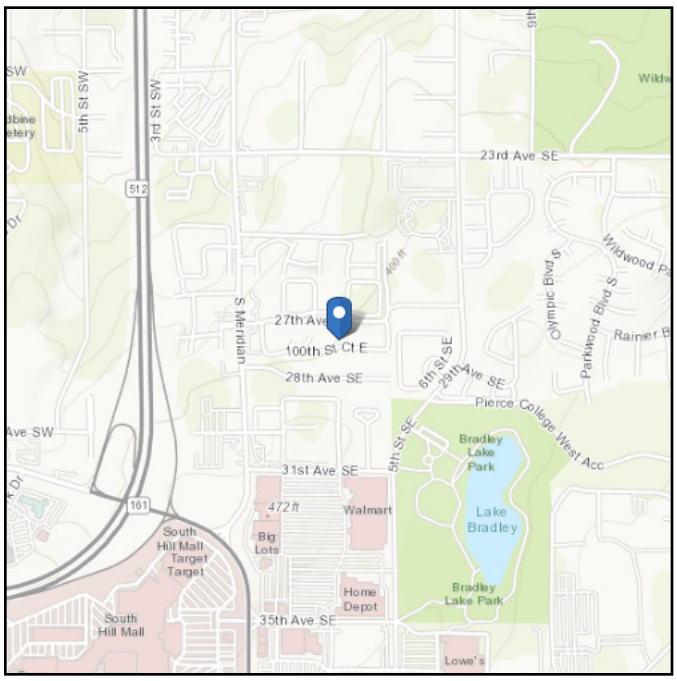
SLW
DESIGN

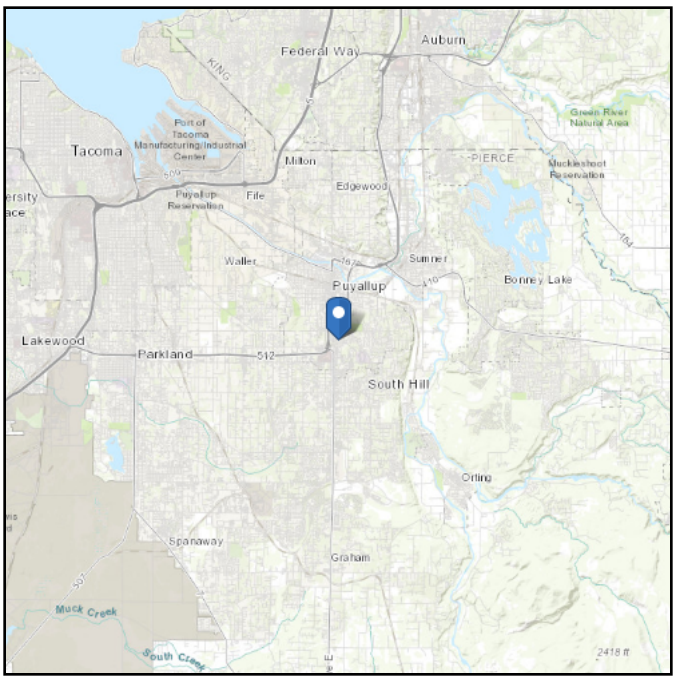
SHEET

ASCE Hazards Report

Address:
202 27th Ave SE
Puyallup, Washington
98374

Standard:	ASCE/SEI 7-16	**Latitude:**	47.165263
Risk Category:	II	**Longitude:**	-122.289753
Soil Class:	C - Very Dense Soil and Soft Rock	**Elevation:**	404.78392266765206 ft (NAVD 88)





Wind

Results:

Wind Speed	98 Vmph
10-year MRI	67 Vmph
25-year MRI	73 Vmph
50-year MRI	78 Vmph
100-year MRI	83 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Thu Mar 26 2026

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

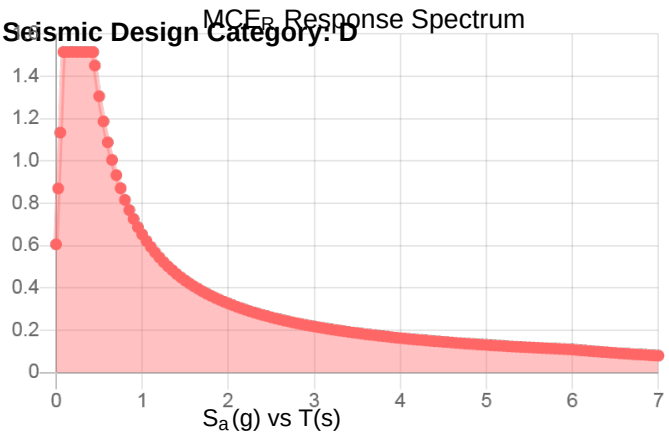
Seismic

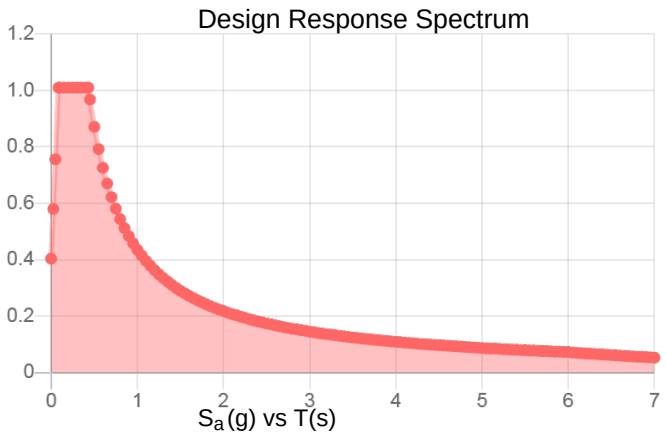
Site Soil Class: C - Very Dense Soil and Soft Rock

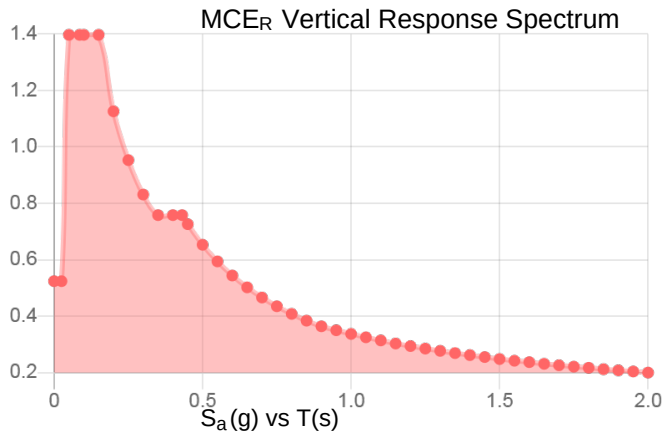
Results:

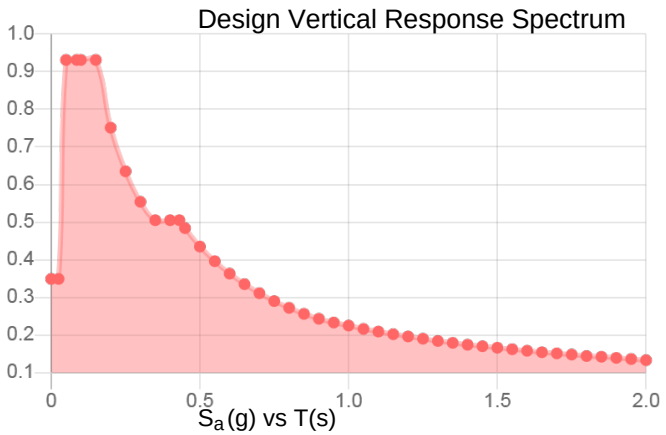
S_S :	1.263	S_{D1} :	0.435
S_1 :	0.435	T_L :	6
F_a :	1.2	PGA :	0.5
F_v :	1.5	PGA_M :	0.6
S_{MS} :	1.515	F_{PGA} :	1.2
S_{M1} :	0.653	I_e :	1
S_{DS} :	1.01	C_v :	1.153

Seismic Design Category: D









Data Accessed: Thu Mar 26 2026

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Snow

Results:

Mapped Elevation:

Data Source:

Date Accessed: Thu Mar 26 2026

In "Case Study" areas, site-specific case studies are required to establish ground snow loads. Extreme local variations in ground snow loads in these areas preclude mapping at this scale.

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 percent annual probability of being exceeded (50-year mean recurrence interval).

Statutory requirements of the Authority Having Jurisdiction are not included. Site is outside ASCE/SEI 7-16, Table 7.2-5 boundaries. For ground snow loads in this area, see SEAW Snow Load Analysis for Washington, 2nd Ed. (1995), Structural Engineers Association of Washington, Seattle, WA.

Snow load values are mapped to a 0.5 mile resolution. This resolution can create a mismatch between the mapped elevation and the site-specific elevation in topographically complex areas. Engineers should consult the local authority having jurisdiction in locations where the reported ‘elevation’ and ‘mapped elevation’ differ significantly from each other.

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE Hazard Tool.

REFERENCES	CALCULATIONS	RESULTS

Wind Load Calculations based on ASCE 7-16

Design Information :

Project Name : Bradley Heights Trash Enclosure
Client : Arc Welding
Designer : SLW
Company : Wible Engineering
Units : Imperial

Project Data

The structure is located in **202 27th Ave SE, Puyallup, WA 98374, USA** categorized as **Exposure B** (assumed to be homogeneous for the selected wind direction). The wind load calculation for the structure - Main Wind Force Resisting System (MWFRS) - is based on the Directional Procedure (Chapter 27) of ASCE 7. Moreover, the structure is classified as **Risk Category II**. The location is elevated at **385.16 ft** above mean sea level.

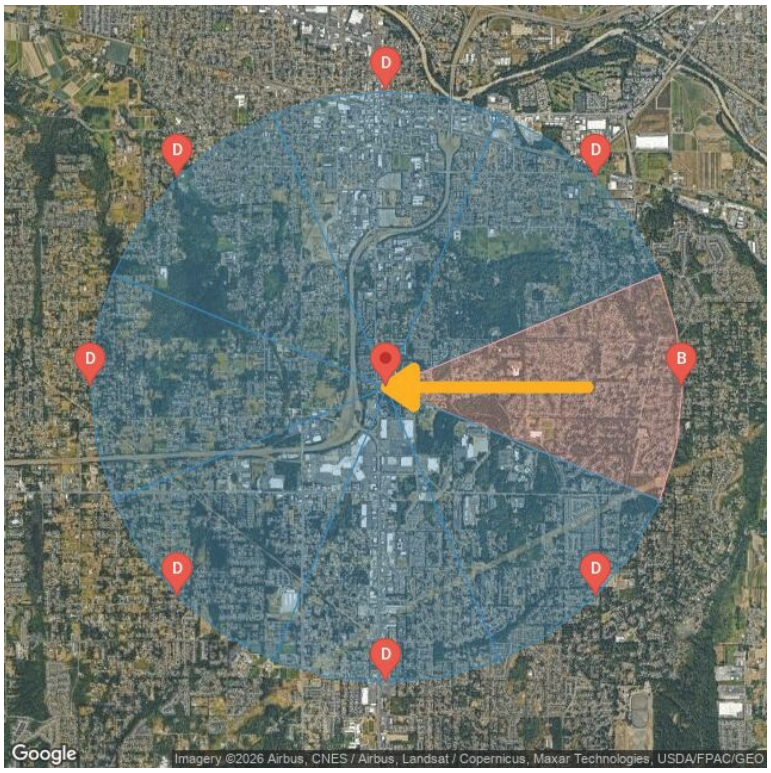


Figure 1. Site location.

Parameter	Value
Building Length, L	21.00 ft
Building Width, B	32.00 ft
Mean Roof Height, h	19.50 ft
Roof Profile	Open Monoslope
Roof Pitch Angle, θ	9.46°
Structure Type	Main Wind Force Resisting System (MWFRS)
Wind Blockage	Empty Under

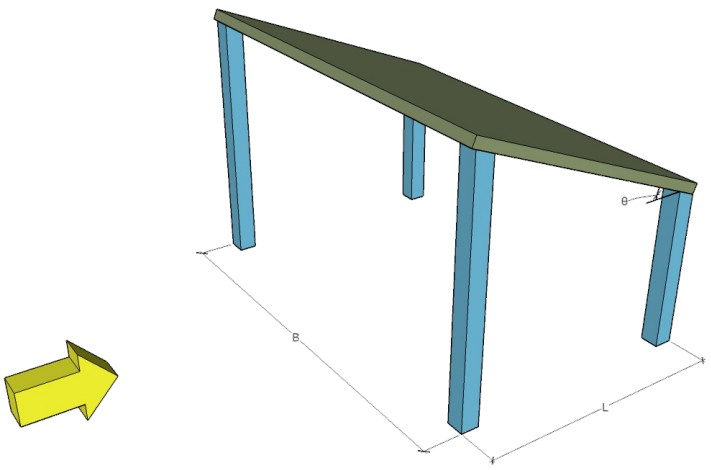


Figure 2. Building parameters.

Figure 26.5-1

Basic Wind Speed, V

Wind speed for the address is **98 mph** for Risk Category II and was calculated using Triangular Interpolation Network (TIN) method from points with known wind speed values based on Figure 26.5-1 of ASCE 7.

$V = 98$ mph

Wind Directionality Factor, K_d

Table 26.6-1

$K_d = 0.85$ - Wind Directionality Factor

For buildings

$K_d = 0.85$

Topographic Factor, K_{zt}

Figure 26.8-1

$H/(L_h) = 0.25331$

Slope of the hill, ridge, or escarpment

$H/(L_h) = 0.25331$

Figure 26.8-1

$L_h = 157.28$ ft

Distance upwind of crest to where the difference in ground elevation is half the length of hill or escarpment.

$L_h = 157.28$ ft

Figure 26.8-1

$H = 39.84$ ft

Height of the hill or escarpment relative to the upwind terrain

$H = 39.84$ ft

Figure 26.8-1

$K_{zt} = 1$ - Topographic Factor

For the selected wind source direction, $K_{zt} = 1.0$ since $H = 39.84ft$ is less than 60 ft for Exposure Category B.

$K_{zt} = 1$

For calculating the topographic factor, the detected topography for the selected wind source direction is Hill.

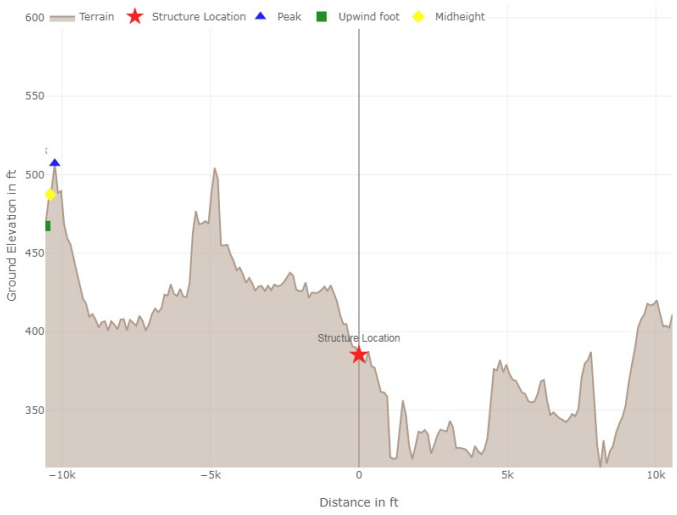


Figure 3. Ground elevation with wind coming from E.

Ground Elevation Factor, K_e

Section 26.9

K_e - Ground Elevation Factor

$$K_e = e^{-0.0000362\ E}$$

$$K_e = 0.98615$$

$$\text{Where } E = \text{Site Elevation} = 385.16 \text{ ft}$$

Section 26.9

$K_e = 0.98615$ - Ground Elevation Factor

$K_e = 0.98615$

Velocity Pressure Exposure Coefficient, K_z

Section 26.10

K_z - Velocity Pressure Exposure Coefficient

For $z < 15ft$

$$K_z = 2.01 \times (15/z_g)^{2/\alpha}$$

Section 26.10 K_z - Velocity Pressure Exposure Coefficient

For $15ft \leq z \leq z_g$

$$K_z = 2.01 \times (z/z_g)^{2/\alpha}$$

Table 26.11-1 $\alpha = 7$ | $\alpha = 7$

Table 26.11-1 $z_g = 1200$ ft | $z_g = 1200$ ft

Section 26.10 K_z - Velocity Pressure Exposure Coefficient

For $15ft \leq z \leq z_g$

$$K_z = 2.01\ (h/z_g)^{2/\alpha}$$

$$K_z = 0.61946$$

Where h = Mean Roof Height = 19.5 ft
$z_g = 1200$ ft
$\alpha = 7$

Level	Elevation (ft)	K_z
h	19.50	0.619

Velocity Pressure, q_h

For the selected wind source direction.

Section 26.10.2 q_h - Velocity Pressure at h

$$q_h = 0.00256\ K_z\ K_{zt}\ K_d\ K_e\ V^2$$

$$q_h = 12.766 \text{ psf}$$

Where K_z = Velocity Pressure Exposure Coefficient = 0.61946
K_{zt} = Topographic Factor = 1
K_d = Wind Directionality Factor = 0.85
V = Basic Wind Speed = 98 mi/h
K_e = Ground Elevation Factor = 0.98615

Velocity Pressure for All Directions

Section 26.8 K_{zt} - Topographic Factor

$$K_{zt} = (1 + K_1 \times K_2 \times K_3)^2 \geq 1.0$$

Direction	Terrain Detected	Slope	K_{zt}	H (ft)	x (ft)	L_h (ft)
E	Hill	0.127	1.000	39.84	10243.05	157.28

Section 26.10 K_z - Velocity Pressure Exposure Coefficient

For $15ft \leq z \leq z_g$

$$K_z = 2.01 \times (z/z_g)^{2/\alpha}$$

Section 26.10 K_z - Velocity Pressure Exposure Coefficient

For $z < 15ft$

$$K_z = 2.01 \times (15/z_g)^{2/\alpha}$$

Section 26.10.2 q_h - Velocity Pressure at h

$$q_h = 0.00256 \times K_{z,h} \times K_{zt} \times K_d \times K_e \times V^2$$

Direction	Exposure Category	K_z @ $h = 19.5ft$	K_{zt}	K_d	K_e	V (mph)	q_h (psf)
N	D	1.078	1.000	0.850	0.986	98.000	22.223
NE	D	1.078	1.000	0.850	0.986	98.000	22.223
E	B	0.619	1.000	0.850	0.986	98.000	12.766
SE	D	1.078	1.000	0.850	0.986	98.000	22.223
S	D	1.078	1.000	0.850	0.986	98.000	22.223
SW	D	1.078	1.000	0.850	0.986	98.000	22.223
W	D	1.078	1.000	0.850	0.986	98.000	22.223
NW	D	1.078	1.000	0.850	0.986	98.000	22.223

Net Pressure Coefficients, C_N

Figure 27.3-4 to 27.3-7 The net pressure coefficients, C_N, are calculated using Figures 27.3-4 to 27.3-7 of ASCE 7-16 - Clear Wind Flow - as shown in Table below.

Direction	Surface	C_N Case A	C_N Case B
0	Windward	-0.678	-1.531
	Leeward	-1.078	0.000
180	Windward	1.005	1.652
	Leeward	1.526	0.378
90	≤ h from windward edge	-0.800	0.800
	h to 2h from windward edge	-0.600	0.500
	> 2h from windward edge	-0.300	0.300

Gust Effect Factor, G

Section 26.11.1

$G = 0.85$ - Gust Effect Factor

The structure is assumed to be rigid.

$G = 0.85$

Design Wind Pressures (MWFRS)

Section 27.3.2

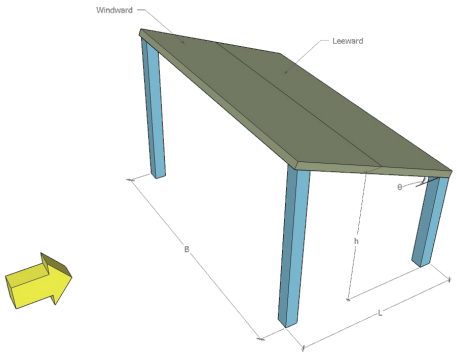
p - Design Wind Pressure

For open buildings

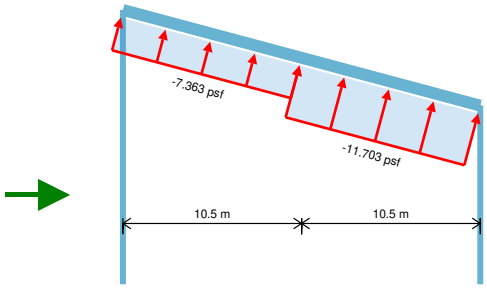
$$p = q_h \times G \times C_N$$

For Wind Pressure - 0°

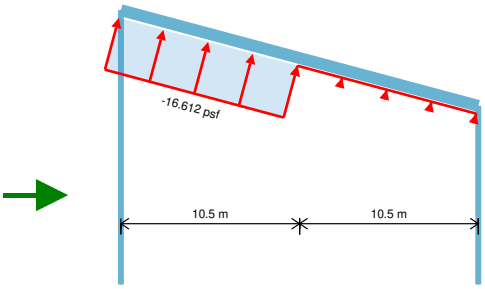
Direction	Surface	q_h (psf)	G	C_N Case A	C_N Case B	p Case A (psf)	p Case B (psf)
0	Windward	12.766	0.850	-0.678	-1.531	-7.363	-16.612
	Leeward	12.766	0.850	-1.078	0.000	-11.703	0.000



Wind along L - 180°



0° - Case A.



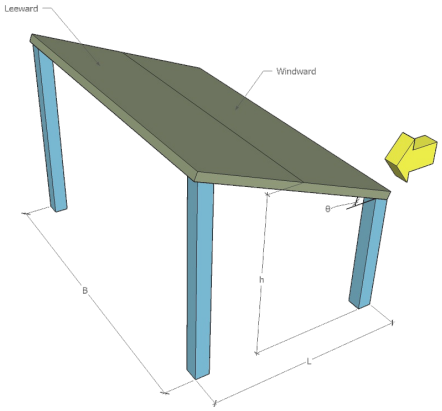
0° - Case B.

Service Wind Pressure - 0°

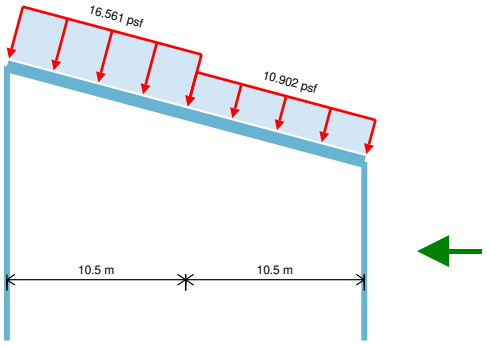
Direction	Surface	p Case A (psf)	p Case B (psf)
0	Windward	-4.418	-9.967
	Leeward	-7.022	0.000

For Wind Pressure - 180°

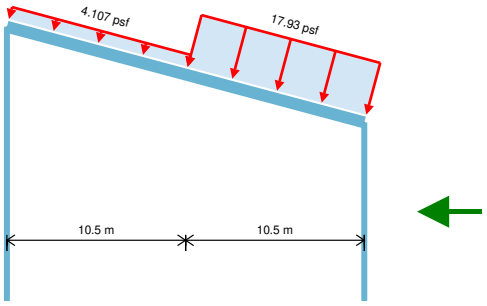
Direction	Surface	q_h (psf)	G	C_N Case A	C_N Case B	p Case A (psf)	p Case B (psf)
180	Windward	12.766	0.850	1.005	1.652	10.902	17.930
	Leeward	12.766	0.850	1.526	0.378	16.561	4.107



Wind along L - 0°



180° - Case A.



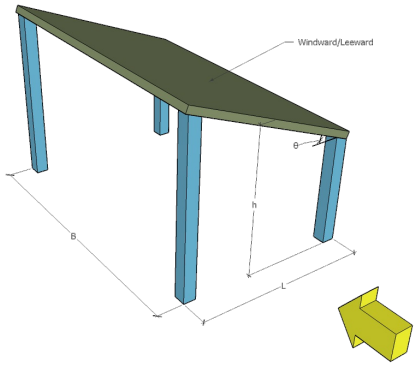
180° - Case B.

Service Wind Pressure - 180°

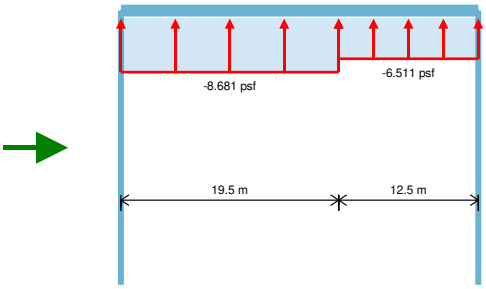
Direction	Surface	p Case A (psf)	p Case B (psf)
180	Windward	6.541	10.758
	Leeward	9.937	2.464

For Wind Pressure - 90°

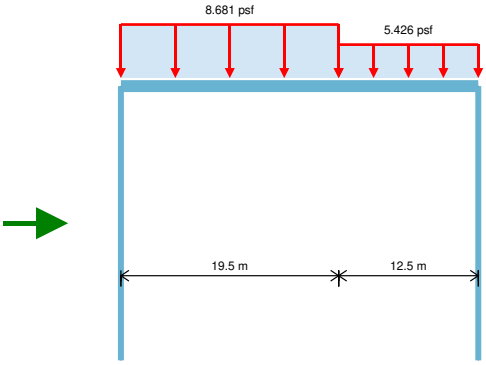
Direction	Surface	q_h (psf)	G	C_N Case A	C_N Case B	p Case A (psf)	p Case B (psf)
90	≤ h from windward edge	12.766	0.850	-0.800	0.800	-8.681	8.681
	h to 2h from windward edge	12.766	0.850	-0.600	0.500	-6.511	5.426
	> 2h from windward edge	12.766	0.850	-0.300	0.300	-3.255	3.255



Wind along B - 90°



90° - Case A.



90° - Case B.

Service Wind Pressure - 90°

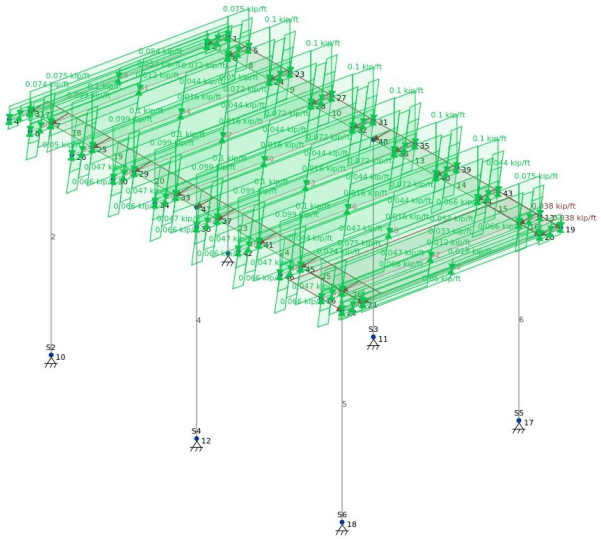
Direction	Surface	p Case A (psf)	p Case B (psf)
90	≤ h from windward edge	-5.209	5.209
	h to 2h from windward edge	-3.907	3.255
	> 2h from windward edge	-1.953	1.953

Section 27.3.2 *Section 28.3.5*	In addition to the roof pressures for 90°, an additional horizontal wind load on open building should be calculated for wind pressures parallel to the ridge in accordance with Section 28.3.5. We will assume $K_S = 1.0$ and should be adjusted and be reduced based on the actual solidity ratio ϕ and number of frames n - See Figure 28.3-2.	
Section 27.3.2 *Section 28.3.5*	p - Horizontal Wind Loads on Open or Partially Enclosed Buildings *For wind pressure parallel to the ridge (90°)* $$p = q_h \times [(GC_{pf})_{windward} - (GC_{pf})_{leeward}] \times K_B \times K_S$$	
Section 27.3.2 *Section 28.3.5*	K_B - Frame Width Factor *For* $L < 100ft$, $K_B = 1.8 - 0.01L$. *Otherwise,* $K_B = 0.8$. $$K_B = 1.8 - 0.01 * L \leq 0.8$$ $$K_B = 1.59$$ $$\text{Where } L = \text{Building Length} = 21 \text{ ft}$$	
Section 28.3.5	K_S - Shielding Factor $$K_S = 0.6 + 0.073 \times (n - 3) + \left(1.25 \times \phi^{1.8}\right)$$	
Section 28.3.5	$K_S = 1$ - Shielding Factor *Assumed to be equal to 1.0 and should be adjusted based on the actual wall solidity ratio* ϕ *and number of frames* n.	$K_S = 1$
Figure 28.3-1 *Section 28.3.5*	$(GC_{pf})_{windward} = 0.4$ *Using Zone 5 from Figure 28.3-1*	$(GC_{pf})_{windward} = 0.4$
Figure 28.3-1 *Section 28.3.5*	$(GC_{pf})_{leeward} = -0.29$ *Using Zone 6 from Figure 28.3-1*	$(GC_{pf})_{leeward} = -0.29$
Section 27.3.2 *Section 28.3.5*	p - Horizontal Wind Loads on Open or Partially Enclosed Buildings *For wind pressure parallel to the ridge (90°)* $$p = q_h \ [(GC_{pf})_{windward} - (GC_{pf})_{leeward}] \ K_B \, K_S$$ $$p = 14.006 \text{ psf}$$ $$\begin{aligned} \text{Where } q_h &= \text{Velocity Pressure at h} = 12.766 \text{ psf} \\ (GC_{pf})_{windward} &= 0.4 \\ (GC_{pf})_{leeward} &= -0.29 \\ K_B &= \text{Frame Width Factor} = 1.59 \\ K_S &= \text{Shielding Factor} = 1 \end{aligned}$$	

WIBLE ENGINEERING

Trash Enclosure SkyCiv Report

Tue 31 Mar 2026, 03:42PM (GMT-05:00)



File Name: Trash Enclosure
Software: SkyCiv Structural 3D v7.2.4 (Lic. No.: 1R2J59H4tY4w7B6tFNMr8pWH)
Analysis Type: Linear Static Analysis

Included in this Report:

Table of Contents

Job Setup

Trash Enclosure SkyCiv Report
SkyCiv Structural 3D v7.2.4
Licence Number: 1R2J59H4tY4w7B6tFNMr8pWH
Date: Tue 31 Mar 2026, 03:42PM (GMT-05:00)
Analysis Type: LINEAR STATIC ANALYSIS

File Name	Trash Enclosure
Job Name	Bradley Heights Apartments
Designer	SLW
Job Description	Empty

Length Units	ft
Section Length Units	in
Force Units	kip
Moment and Torsion Units	kip-ft
Pressure Units	ksf
Material Strength Units	ksi
Material Density Units	lb/ft^3
Mass Units	kip
Temperature Units	degF
Translation Units	in
Stress Units	ksi
Nodes	48
Members	56
Plates	0
Meshed Plates	0
Supports	6
Sections	3
Point Loads	0
Distributed Loads	23
Moments	0
Member Prestress Loads	0
Thermal Loads	0
Pressures	0
Area Loads	21
Self Weight	ON
User Defined Nodal Masses	0
Auto Defined Nodal Masses	0
Spectral Loads	0
Auto-Stabilize Model	NO
Member Evaluation Points	9
Extrapolate Plate Results From Gauss Points	YES
General Constraint	RRRRRR
Total Degrees of Freedom	270

NODE COORDINATES (ft)

NOTE: Nodes in the plate mesh are not displayed in the table below.

ID	X Coordinate	Y Coordinate	Z Coordinate
1	0.000	0.000	16.000
2	2.000	0.000	16.330
3	19.000	0.000	19.160
4	21.000	0.000	19.500
5	0.000	2.000	16.000
6	2.000	2.000	16.330
7	19.000	2.000	19.160
8	21.000	2.000	19.500
9	2.000	2.000	0.000
10	19.000	2.000	0.000
11	2.000	16.000	0.000
12	19.000	16.000	0.000
13	0.000	30.000	16.000
14	2.000	30.000	16.330
15	19.000	30.000	19.160
16	21.000	30.000	19.500
17	2.000	30.000	0.000
18	19.000	30.000	0.000
19	0.000	32.000	16.000
20	2.000	32.000	16.330
21	19.000	32.000	19.160
22	21.000	32.000	19.500
23	0.000	6.000	16.000
24	2.000	6.000	16.330
25	19.000	6.000	19.160
26	21.000	6.000	19.500
27	0.000	10.000	16.000
28	2.000	10.000	16.330
29	19.000	10.000	19.160
30	21.000	10.000	19.500
31	0.000	14.000	16.000
32	2.000	14.000	16.330
33	19.000	14.000	19.160
34	21.000	14.000	19.500
35	0.000	18.000	16.000
36	2.000	18.000	16.330
37	19.000	18.000	19.160
38	21.000	18.000	19.500
39	0.000	22.000	16.000
40	2.000	22.000	16.330
41	19.000	22.000	19.160
42	21.000	22.000	19.500
43	0.000	26.000	16.000
44	2.000	26.000	16.330
45	19.000	26.000	19.160
46	21.000	26.000	19.500
47	19.000	16.000	19.160
48	2.000	16.000	16.330

MEMBERS (deg, ft, in, ft, kip)

F=Fixed, R=Released, S=Spring

ID	Node A	Node B	Length	Type	Section ID	Rotation Angle	Node A Fixity	Node B Fixity
1	9	6	16.330	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
2	10	7	19.160	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
3	11	48	16.330	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
4	12	47	19.160	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
5	18	15	19.160	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
6	17	14	16.330	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
7	2	6	2.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
8	6	24	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
9	24	28	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
10	28	32	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
11	32	48	2.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
12	48	36	2.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
13	36	40	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
14	40	44	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
15	44	14	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
16	14	20	2.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
17	3	7	2.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
18	7	25	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
19	25	29	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
20	29	33	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
21	33	47	2.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
22	47	37	2.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
23	37	41	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
24	41	45	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
25	45	15	4.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
26	15	21	2.000	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
27	4	3	2.029	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
28	3	2	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
29	2	1	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
30	8	7	2.029	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
31	7	6	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
32	6	5	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
33	26	25	2.029	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
34	25	24	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
35	24	23	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
36	30	29	2.029	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
37	29	28	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
38	28	27	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
39	34	33	2.029	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
40	33	32	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
41	32	31	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
42	38	37	2.029	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
43	37	36	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
44	36	35	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
45	42	41	2.029	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
46	41	40	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
47	40	39	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
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49	45	44	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
50	44	43	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
51	16	15	2.029	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
52	15	14	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
53	14	13	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
54	22	21	2.029	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
55	21	20	17.234	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
56	20	19	2.027	Continuous & Normal	3	90.000	FFFFFF	FFFFFF

ID	Node A Offsets	Node B Offsets	Offset Axis	Node A Rot Stiff Y	Node A Rot Stiff Z	Node B Rot Stiff Y	Node B Rot Stiff Z	Cable Length	T/C Limit	Mirror	Disable Non-Linear
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2	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
3	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
4	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
5	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
6	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
7	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
8	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
9	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
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30	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
31	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
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45	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
46	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
47	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
48	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
49	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
50	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
51	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
52	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
53	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
54	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
55	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
56	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No

SUPPORTS (kip/ft, kip-ft/rad)

F=Fixed, R=Released, S=Spring

B=Both Axes Restraint, N=Negative-Axis Restraint Only, P=Positive-Axis Restraint Only

ID	Node ID	Restraint Code	Direction Code	X Trans Stiffness	Y Trans Stiffness	Z Trans Stiffness	X Rot Stiffness	Y Rot Stiffness	Z Rot Stiffness	Source
1	9	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support
2	10	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support
3	11	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support
4	12	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support
5	17	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support
6	18	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support

MATERIALS (ksi, lb/ft^3, 10^{-6}/degF)

Shear Modulus is used for members only.
Ex, Ey, Gxy, Gxz, Gyz are used for orthotropic plates only.

ID	Name	Young's Modulus	Shear Modulus	Density	Poisson's Ratio	Thermal Exp. Coeff.	Young's Modulus x	Young's Modulus y	Shear Modulus xy	Shear Modulus xz	Shear Modulus yz	Poisson's Ratio xy
1	American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	29000.000	Auto	487.296	0.290	6.670	-	-	-	-	-	Auto

SECTIONS (in, in^2, in^4, deg)

ID	Name	Shape	Material ID	Depth	Width	Shear Area z (STRESS)	Shear Area y (STRESS)	Shear Area z (TIMO)	Shear Area y (TIMO)	Torsion Radius
1	HSS4x4x3/8	HSS4x4x3/8	1	4.000	4.000	2.187	2.187	-	-	2.369
2	HSS10x4x1/4	HSS10x4x1/4	1	10.000	4.000	1.064	4.221	-	-	3.854
3	HSS6x2x1/8	HSS6x2x1/8	1	6.000	2.000	0.240	1.266	-	-	2.026

ID	Centroid y	Centroid z	Area (A)	y-Axis MoI (Iy)	z-Axis MoI (Iz)	Torsion Constant (J)	Principal Angle	Non Prismatic
1	2.000	2.000	4.780	10.300	10.300	17.500	0.000	N
2	5.000	2.000	6.170	17.700	74.700	47.400	0.000	N
3	3.000	1.000	1.770	1.310	7.420	3.720	0.000	N

ID	Area Red. Factor	Iy Red. Factor	Iz Red. Factor	Torsion Constant Red. Factor	Shear Area Y Red. Factor	Shear Area Z Red. Factor
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	-	-	-	-	-	-

MEMBER DISTRIBUTED LOADS (kip/ft)

ID	Load Group	Start Position (%)	End Position (%)	Member	Axes	X Start/ End	Y Start/ End	Z Start/ End
1	Seismic X	0%	100%	17	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
2	Seismic X	0%	100%	18	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
3	Seismic X	0%	100%	19	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
4	Seismic X	0%	100%	20	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
5	Seismic X	0%	100%	21	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
6	Seismic X	0%	100%	22	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
7	Seismic X	0%	100%	23	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
8	Seismic X	0%	100%	24	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
9	Seismic X	0%	100%	25	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
10	Seismic X	0%	100%	26	Global Proj.	0.038	0.000	0.000
						0.038	0.000	0.000
11	Seismic X	0%	100%	7	Global	0.038	0.000	0.000
						0.038	0.000	0.000
12	Seismic X	0%	100%	8	Global	0.038	0.000	0.000
						0.038	0.000	0.000
13	Seismic X	0%	100%	9	Global	0.038	0.000	0.000
						0.038	0.000	0.000
14	Seismic X	0%	100%	10	Global	0.038	0.000	0.000
						0.038	0.000	0.000
15	Seismic X	0%	100%	11	Global	0.038	0.000	0.000
						0.038	0.000	0.000
16	Seismic X	0%	100%	12	Global	0.038	0.000	0.000
						0.038	0.000	0.000
17	Seismic X	0%	100%	13	Global	0.038	0.000	0.000
						0.038	0.000	0.000
18	Seismic X	0%	100%	14	Global	0.038	0.000	0.000
						0.038	0.000	0.000
19	Seismic X	0%	100%	15	Global	0.038	0.000	0.000
						0.038	0.000	0.000
20	Seismic X	0%	100%	16	Global	0.038	0.000	0.000
						0.038	0.000	0.000
21	Seismic Y	0%	100%	54	Global	0.000	0.113	0.000
						0.000	0.113	0.000
22	Seismic Y	0%	100%	55	Global	0.000	0.113	0.000
						0.000	0.113	0.000
23	Seismic Y	0%	100%	56	Global	0.000	0.113	0.000
						0.000	0.113	0.000

AREA LOADS (ksf)

ID	Load Group	Node IDs	Pressure Magnitude	Type	Direction
1	Dead	1,19,20,2	-0.005	One-Way	Global Proj. Z-axis
2	Dead	2,20,21,3	-0.005	One-Way	Global Proj. Z-axis
3	Dead	21,22,4,3	-0.005	One-Way	Global Proj. Z-axis
4	Wind_0_case1	3,21,22,4	-0.012	General One-Way	Local
5	Wind_0_case2	3,21,22,4	0.000	General One-Way	Local
6	Wind_180_case1	3,21,22,4	0.011	General One-Way	Local
7	Wind_180_case2	3,21,22,4	0.018	General One-Way	Local
8	Wind_0_case1	2,20,21,3	-0.012	General One-Way	Local
9	Wind_0_case2	2,20,21,3	0.000	General One-Way	Local
10	Wind_180_case1	2,20,21,3	0.011	General One-Way	Local
11	Wind_180_case2	2,20,21,3	0.018	General One-Way	Local
12	Wind_0_case1	1,19,20,2	-0.012	General One-Way	Local
13	Wind_0_case2	1,19,20,2	0.000	General One-Way	Local
14	Wind_180_case1	1,19,20,2	0.011	General One-Way	Local
15	Wind_180_case2	1,19,20,2	0.018	General One-Way	Local
16	Snow	1,19,20,2	-0.025	One-Way	Global Proj. Z-axis
17	Snow	2,20,21,3	-0.025	One-Way	Global Z-axis
18	Snow	21,22,4,3	-0.025	One-Way	Global Proj. Z-axis
25	Seismic Z	1,19,20,2	0.002	General One-Way	Global Proj. Z-axis
26	Seismic Z	21,3,2,20	0.002	General One-Way	Global Proj. Z-axis
27	Seismic Z	22,4,3,21	0.002	General One-Way	Global Proj. Z-axis

SELF WEIGHT (g's)

Load Group	X Gravity	Y Gravity	Z Gravity
SW1	0.000	0.000	-1.000

LOAD COMBINATIONS

ID	Name	Criteria	Dead Factor	SW1 Factor	Snow Factor	Wind_0_case1 Factor	Wind_0_case2 Factor	Wind_180_case1 Factor	Wind_180_case2 Factor	Seismic X Factor	Seismic Y Factor	Seismic Z Factor
1	1: 1.00Dead + 1.00SW1	Strength	1.000	1.000	0	0	0	0	0	0	0	0
2	4: 1.00Dead + 1.00SW1 + 1.00Snow	Strength	1.000	1.000	1.000	0	0	0	0	0	0	0
3	9: 1.00Dead + 1.00SW1 + 0.60Wind_0_case1	Strength	1.000	1.000	0	0.600	0	0	0	0	0	0
4	10: 1.00Dead + 1.00SW1 + 0.60Wind_0_case2	Strength	1.000	1.000	0	0	0.600	0	0	0	0	0
5	11: 1.00Dead + 1.00SW1 + 0.60Wind_180_case1	Strength	1.000	1.000	0	0	0	0.600	0	0	0	0
6	12: 1.00Dead + 1.00SW1 + 0.60Wind_180_case2	Strength	1.000	1.000	0	0	0	0	0.600	0	0	0
7	25: 1.00Dead + 1.00SW1 + 0.70Seismic Z + 0.70Seismic X + 0.21Seismic Y	Strength	1.000	1.000	0	0	0	0	0	0.700	0.210	0.700
8	26: 1.00Dead + 1.00SW1 + 0.70Seismic Z + 0.21Seismic X + 0.70Seismic Y	Strength	1.000	1.000	0	0	0	0	0	0.210	0.700	0.700
9	29: 1.00Dead + 1.00SW1 + 0.53Seismic Z + 0.53Seismic X + 0.16Seismic Y + 0.75Snow	Strength	1.000	1.000	0.750	0	0	0	0	0.525	0.158	0.525
10	30: 1.00Dead + 1.00SW1 + 0.53Seismic Z + 0.16Seismic X + 0.53Seismic Y + 0.75Snow	Strength	1.000	1.000	0.750	0	0	0	0	0.158	0.525	0.525
11	33: 0.60Dead + 0.60SW1	Strength	0.600	0.600	0	0	0	0	0	0	0	0
12	36: 0.60Dead + 0.60SW1 + 1.00Snow	Strength	0.600	0.600	1.000	0	0	0	0	0	0	0
13	53: 0.60Dead + 0.60SW1 + 0.60Wind_0_case1	Strength	0.600	0.600	0	0.600	0	0	0	0	0	0
14	54: 0.60Dead + 0.60SW1 + 0.60Wind_0_case2	Strength	0.600	0.600	0	0	0.600	0	0	0	0	0
15	55: 0.60Dead + 0.60SW1 + 0.60Wind_180_case1	Strength	0.600	0.600	0	0	0	0.600	0	0	0	0
16	56: 0.60Dead + 0.60SW1 + 0.60Wind_180_case2	Strength	0.600	0.600	0	0	0	0	0.600	0	0	0
17	57: 0.60Dead + 0.60SW1 + -0.70Seismic Z + 0.70Seismic X + 0.21Seismic Y	Strength	0.600	0.600	0	0	0	0	0	0.700	0.210	-0.700
18	58: 0.60Dead + 0.60SW1 + -0.70Seismic Z + 0.21Seismic X + 0.70Seismic Y	Strength	0.600	0.600	0	0	0	0	0	0.210	0.700	-0.700

LOAD CASES

Design Code: ASCE-7-2016-ASD

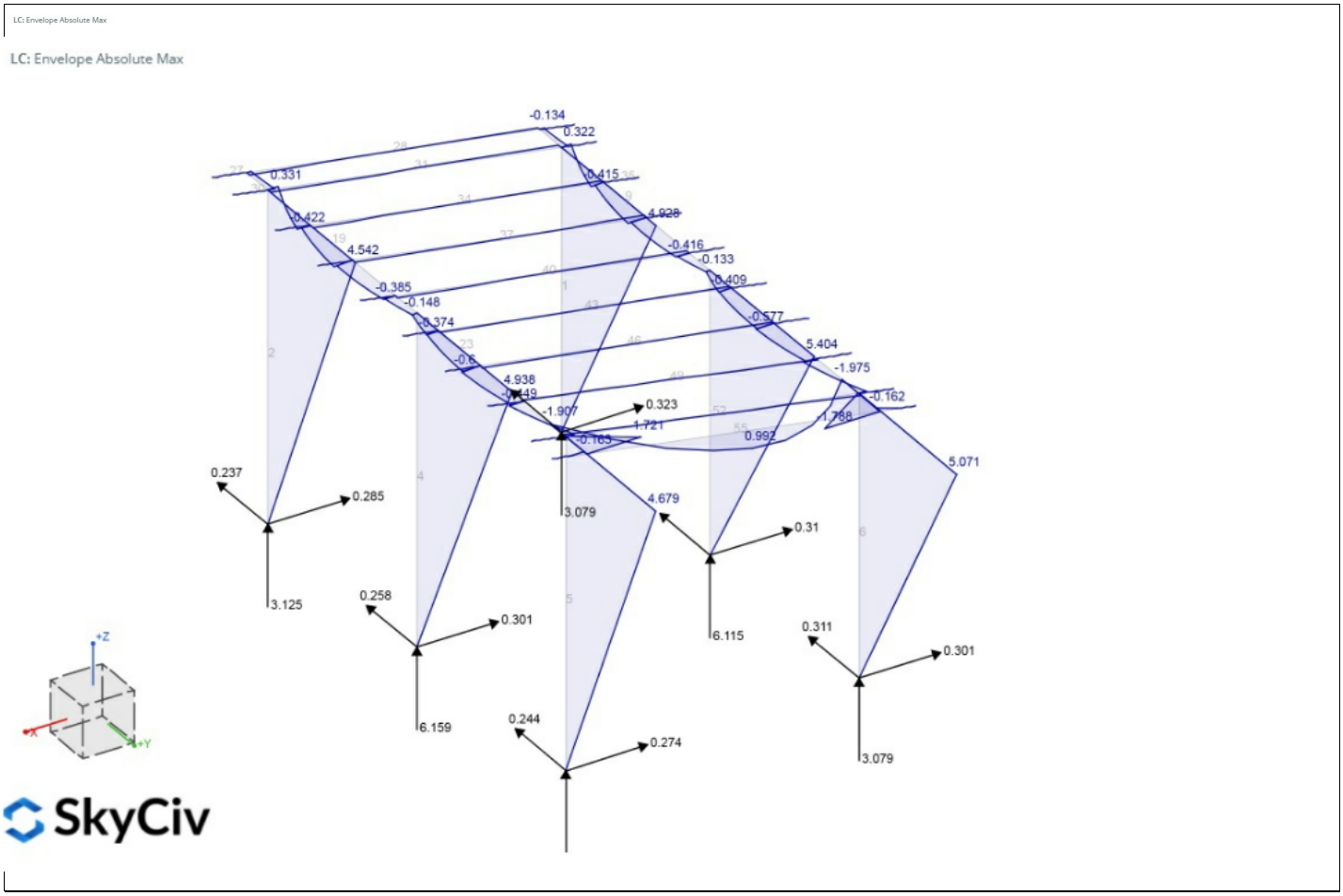
Load Group	Design Load Case
Dead	D
SW1	D
Snow	S
Wind_0_case1	W
Wind_0_case2	W
Wind_180_case1	W
Wind_180_case2	W
Seismic X	Eh
Seismic Y	Eh
Seismic Z	Ev

Bill of Materials

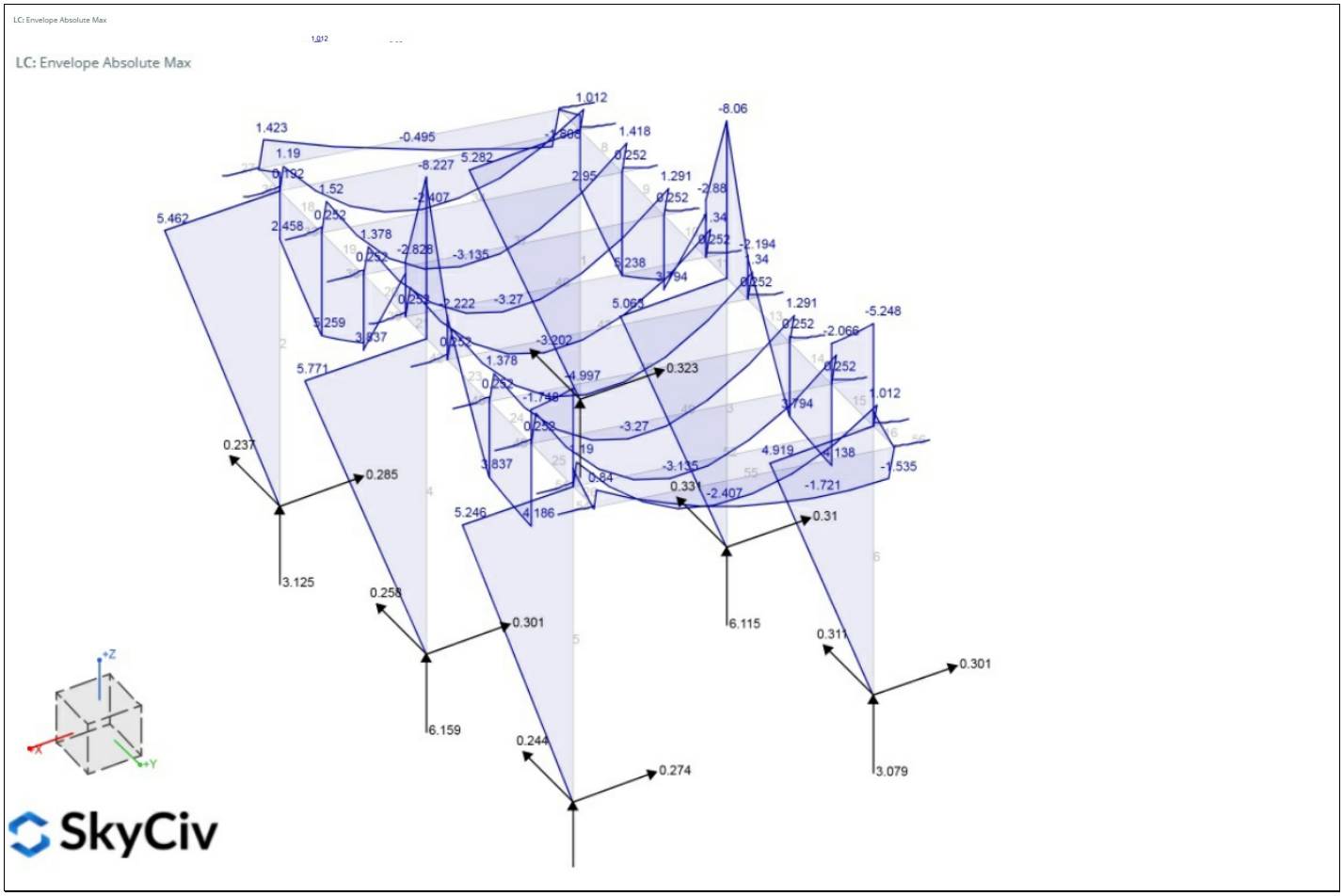
BILL OF MATERIALS FOR MEMBERS (ft, kip)

Section	Material	Quantity	Unit Length	Total Length	Unit Mass	Total Mass
1: HSS4x4x3/8	1: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	3	16.330	48.990	0.264	0.792
1: HSS4x4x3/8	1: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	3	19.160	57.480	0.310	0.930
2: HSS10x4x1/4	1: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	8	2.000	16.000	0.042	0.334
2: HSS10x4x1/4	1: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	12	4.000	48.000	0.084	1.002
3: HSS6x2x1/8	1: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	10	2.029	20.287	0.012	0.122
3: HSS6x2x1/8	1: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	10	17.234	172.339	0.103	1.032
3: HSS6x2x1/8	1: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	10	2.027	20.270	0.012	0.121
						4.334

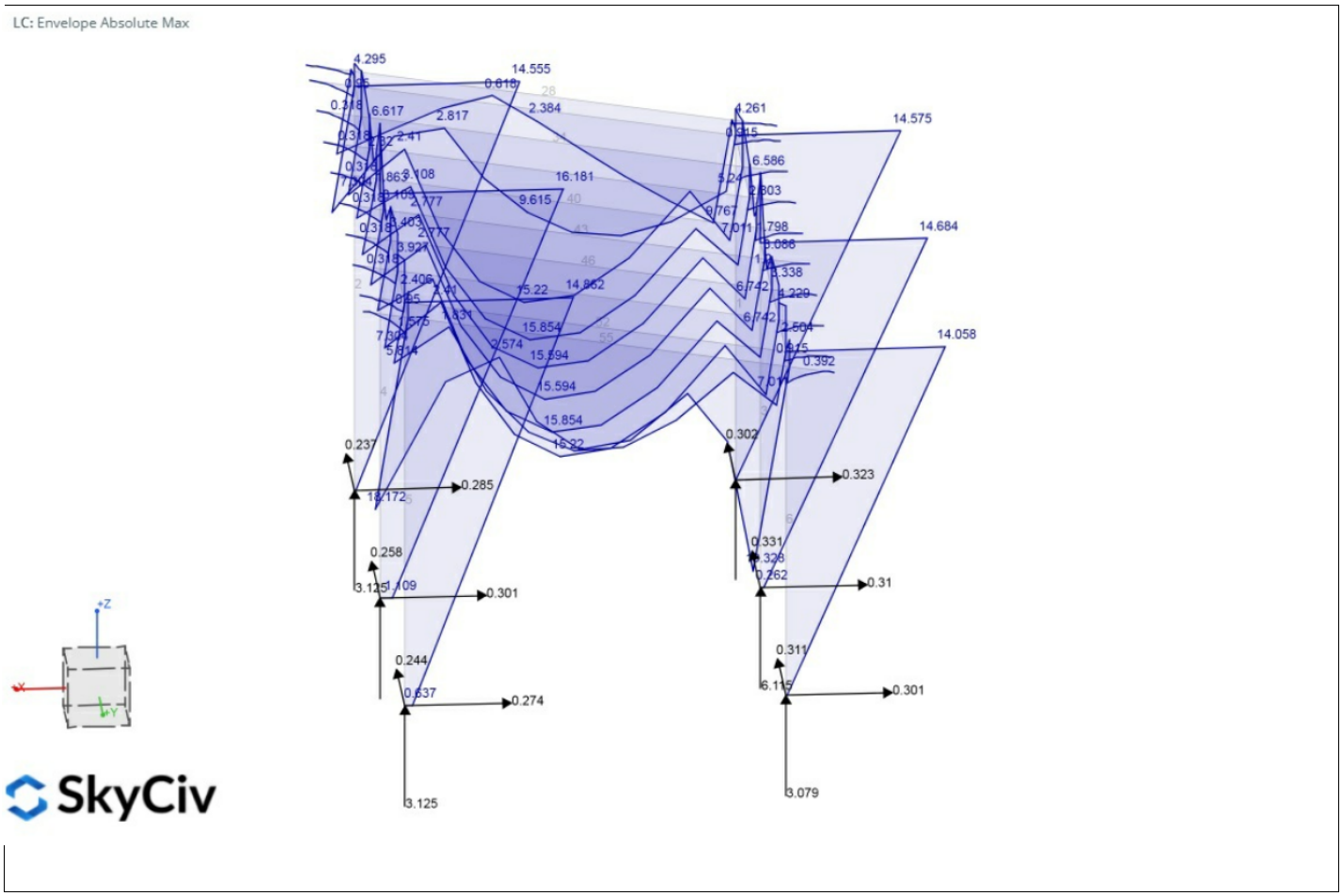
Screenshots



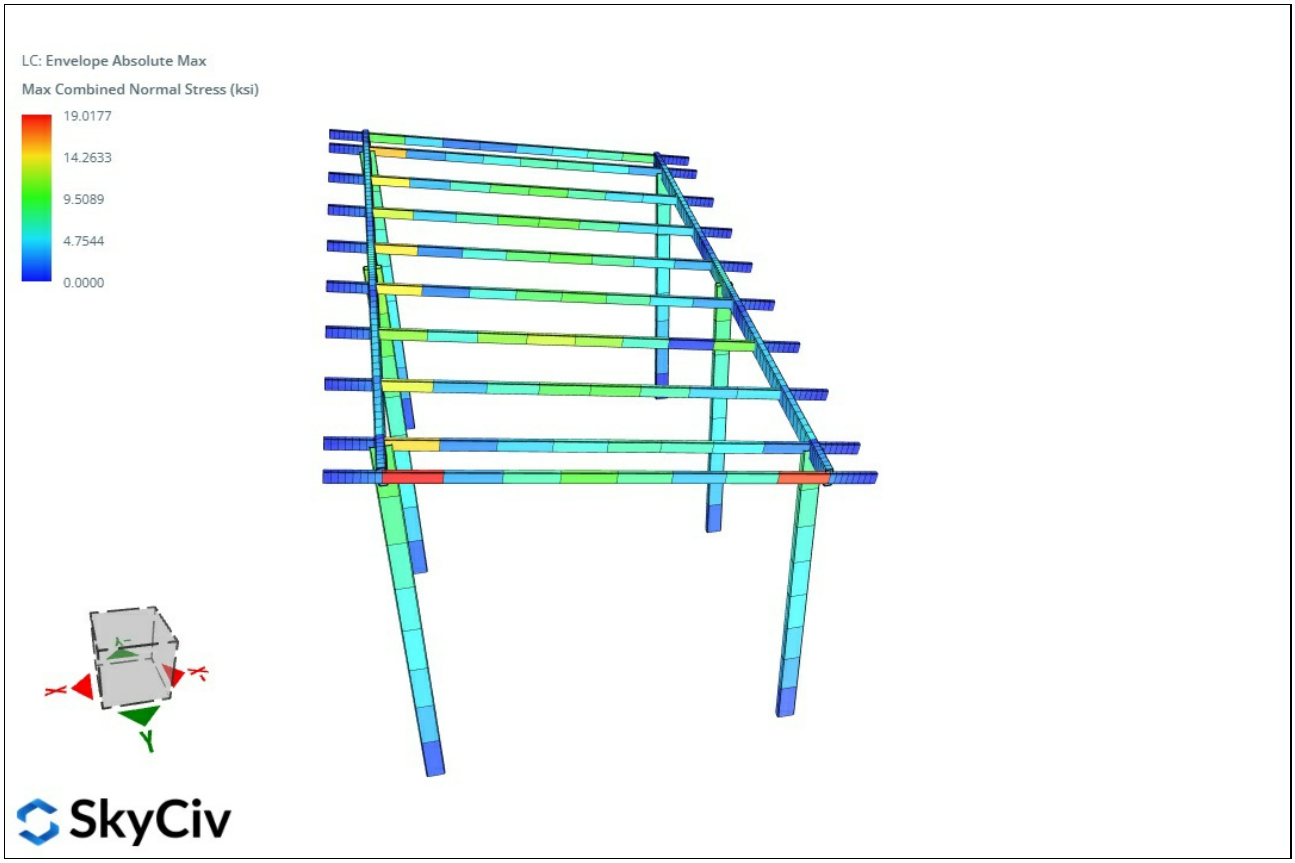
My max.jpg



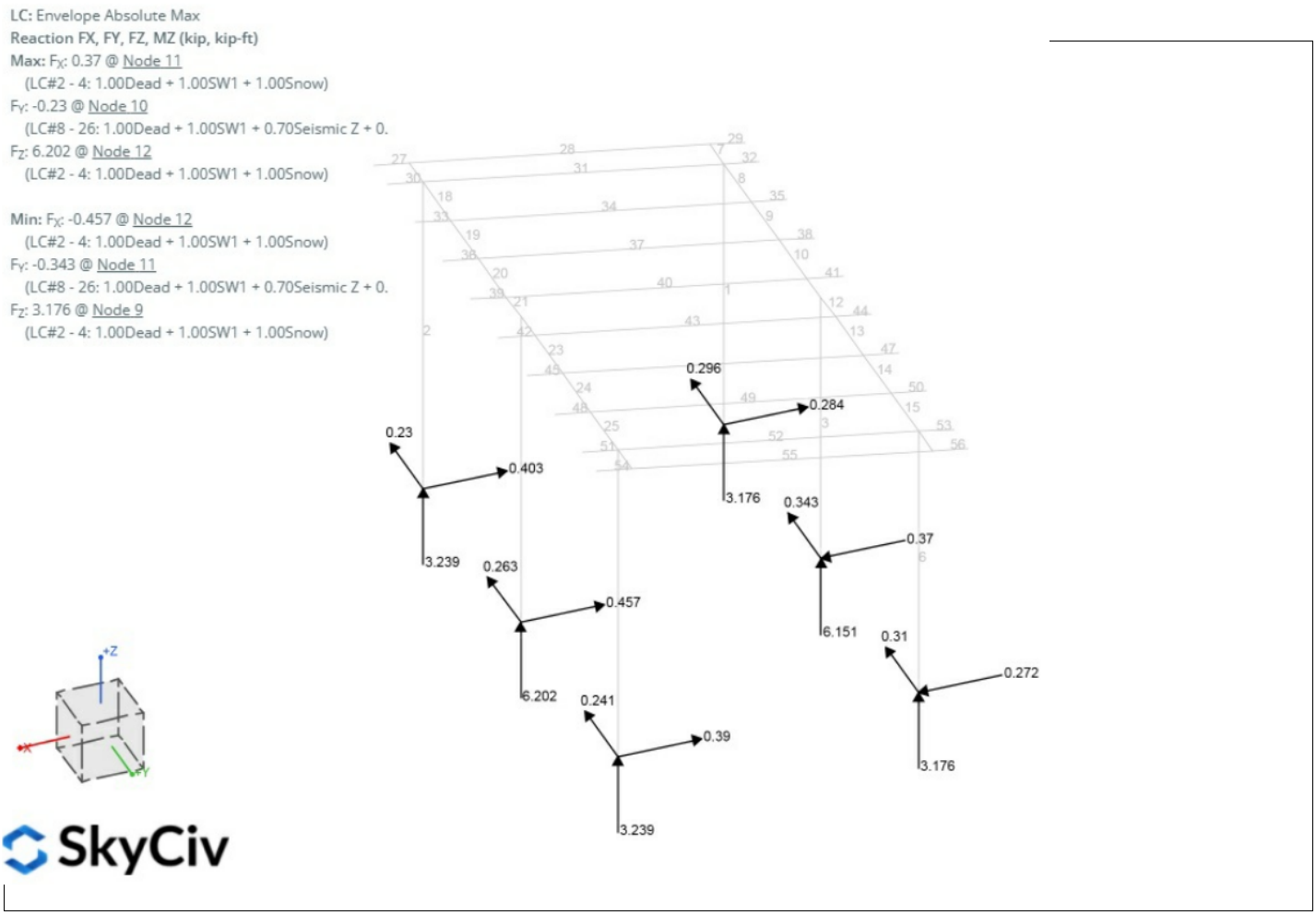
Mz max.jpg



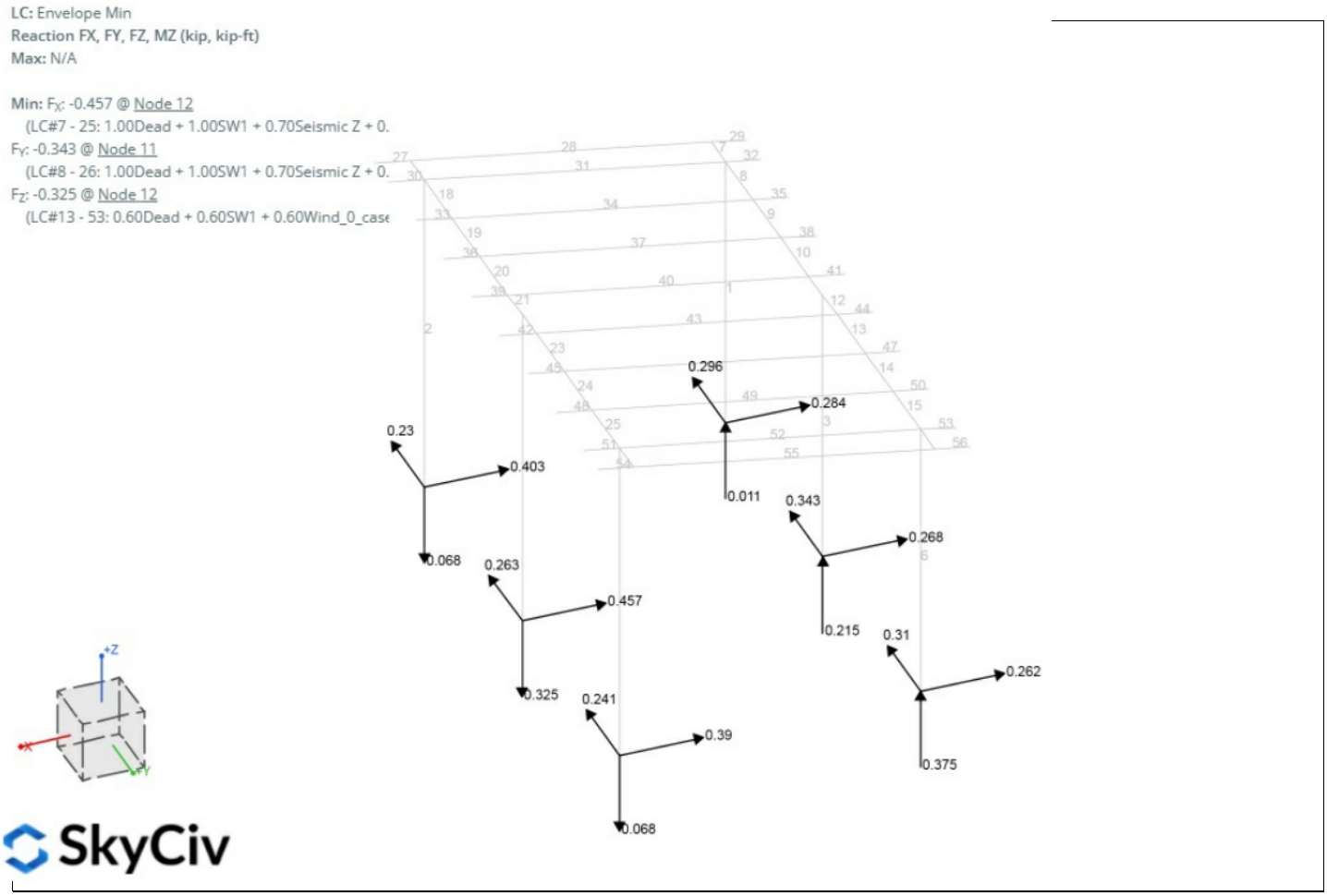
Stress max.jpg



Max Normal Stress b.jpg



Envelope Max Reactions.jpg



Envelope Min (Maximum Uplift Reactions) b.jpg

Nodal Results

Envelope Min

NODE REACTIONS (kip, kip-ft)

Support ID	Node	X Force	Y Force	Z Force	X Moment	Y Moment	Z Moment
1	9	-0.323	-0.302	-0.033	0.000	0.000	0.000
2	10	-0.285	-0.237	-0.122	0.000	0.000	0.000
3	11	-0.310	-0.331	0.168	0.000	0.000	0.000
4	12	-0.301	-0.258	-0.381	0.000	0.000	0.000
5	17	-0.301	-0.311	0.330	0.000	0.000	0.000
6	18	-0.274	-0.244	-0.122	0.000	0.000	0.000

Envelope Absolute Max

NODE REACTIONS (kip, kip-ft)

Support ID	Node	X Force	Y Force	Z Force	X Moment	Y Moment	Z Moment
1	9	-0.323	-0.302	3.079	0.000	0.000	0.000
2	10	-0.285	-0.237	3.125	0.000	0.000	0.000
3	11	-0.310	-0.331	6.115	0.000	0.000	0.000
4	12	-0.301	-0.258	6.159	0.000	0.000	0.000
5	17	-0.301	-0.311	3.079	0.000	0.000	0.000
6	18	-0.274	-0.244	3.125	0.000	0.000	0.000

Project Details

Design Code: AISC 360-16 ASD
Provision: ASD
Country: United States

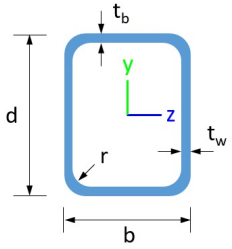
User Name: scott@wibleengineering.com
Project Name: Bradley Heights Apartments
Project ID: 00025-2026-05
Company: Wible Engineering
Designer: SLW
Client: Arc Welding
Unit System: imperial

Design Input Information

Design Factors			
Ω_t	Ω_c	Ω_b	Ω_v
1.67	1.67	1.67	1.67

Design Materials			
ID	E (ksi)	F_y (ksi)	F_u (ksi)
1	29000	45.7	61.6

Section Dimensions



ID	Name	d (in)	b (in)	t_w (in)	t_b (in)	r (in)		
1	HSS4x4x3/8	4.00	4.00	0.35	0.35	0.35		
2	HSS10x4x1/4	10.00	4.00	0.23	0.23	0.23		
3	HSS6x2x1/8	6.00	2.00	0.12	0.12	0.12		

Section Properties

ID	Name	A (in^2)	J (in^4)	I_{yp} (in^4)	I_{zp} (in^4)	I_w (in^6)	S_{yp} (in^3)	S_{zp} (in^3)
1	HSS4x4x3/8	4.78	17.50	10.30	10.30	0.05	6.39	6.39
2	HSS10x4x1/4	6.17	47.40	17.70	74.70	35.54	10.00	19.00
3	HSS6x2x1/8	1.77	3.72	1.31	7.42	1.24	1.46	3.19

Member Properties

Member ID	Section ID	K_zL (ft)	K_yL (ft)	L_b(ft)	C_b	LST	LSC
1	1	13.06	13.06	16.33	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67	300	200
2	1	15.33	15.33	19.16	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67	300	200
3	1	13.06	13.06	16.33	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67	300	200

4	1	15.33	15.33	19.16	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67	300	200
5	1	15.33	15.33	19.16	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67	300	200
6	1	13.06	13.06	16.33	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67	300	200
7	2	1.30	1.30	2.00	1.74,1.69,1.71,1.70,1.82,1.77,1.43,2.34,1.79,1.73,1.74,1.68,1.69,1.68,1.90,1.79,1.50,2.43	300	200
8	2	2.60	2.60	4.00	2.07,2.03,2.14,2.10,1.89,1.92,1.05,1.12,1.50,1.20,2.07,2.02,1.39,2.11,1.84,1.88,1.05,1.12	300	200
9	2	2.60	2.60	4.00	1.01,1.03,1.02,1.01,1.03,1.03,1.27,1.34,1.09,1.17,1.01,1.03,1.74,1.01,1.04,1.04,1.28,1.35	300	200
10	2	2.60	2.60	4.00	2.13,2.17,2.01,2.10,2.16,2.16,2.30,2.23,2.19,2.23,2.13,2.18,1.73,2.08,2.17,2.17,2.27,2.21	300	200
11	2	1.30	1.30	2.00	1.41,1.41,1.44,1.42,1.40,1.40,1.26,1.25,1.38,1.35,1.41,1.41,1.06,1.44,1.40,1.40,1.27,1.26	300	200
12	2	1.30	1.30	2.00	1.41,1.41,1.44,1.42,1.40,1.40,2.07,1.04,1.43,1.55,1.41,1.41,1.06,1.44,1.40,1.40,2.15,1.04	300	200
13	2	2.60	2.60	4.00	2.13,2.17,2.01,2.10,2.16,2.16,1.09,1.56,2.15,1.87,2.13,2.18,1.73,2.08,2.17,2.17,1.15,1.57	300	200
14	2	2.60	2.60	4.00	1.01,1.03,1.02,1.01,1.03,1.03,2.22,1.74,1.02,1.27,1.01,1.03,1.74,1.01,1.04,1.04,2.12,1.74	300	200
15	2	2.60	2.60	4.00	2.07,2.03,2.14,2.10,1.89,1.92,1.51,1.33,2.19,1.99,2.07,2.02,1.39,2.11,1.84,1.88,1.51,1.33	300	200
16	2	1.30	1.30	2.00	1.74,1.69,1.71,1.70,1.82,1.77,2.07,1.23,1.56,1.35,1.74,1.68,1.69,1.68,1.90,1.79,2.11,1.30	300	200
17	2	1.30	1.30	2.00	1.74,1.69,2.12,3.10,1.71,1.72,1.74,1.78,1.71,1.71,1.74,1.68,1.62,1.58,1.71,1.72,1.73,1.77	300	200
18	2	2.60	2.60	4.00	2.06,2.01,1.63,1.23,2.12,2.12,1.29,1.07,1.68,1.26,2.06,2.01,2.49,2.24,2.13,2.13,1.29,1.07	300	200
19	2	2.60	2.60	4.00	1.01,1.03,1.02,1.10,1.01,1.01,1.13,1.30,1.07,1.15,1.01,1.03,1.13,1.08,1.02,1.01,1.14,1.30	300	200
20	2	2.60	2.60	4.00	2.13,2.17,1.97,2.37,2.16,2.15,2.18,2.25,2.18,2.22,2.13,2.18,2.40,2.27,2.16,2.16,2.20,2.24	300	200
21	2	1.30	1.30	2.00	1.41,1.41,1.35,1.35,1.42,1.42,1.37,1.28,1.40,1.36,1.41,1.41,1.50,1.44,1.42,1.42,1.37,1.28	300	200
22	2	1.30	1.30	2.00	1.41,1.41,1.35,1.35,1.42,1.42,1.58,1.12,1.44,1.52,1.41,1.41,1.50,1.44,1.42,1.42,1.58,1.14	300	200
23	2	2.60	2.60	4.00	2.13,2.17,1.97,2.37,2.16,2.15,1.76,1.37,2.15,1.96,2.13,2.18,2.40,2.27,2.16,2.16,1.79,1.38	300	200
24	2	2.60	2.60	4.00	1.01,1.03,1.02,1.10,1.01,1.01,1.32,1.90,1.02,1.23,1.01,1.03,1.13,1.08,1.02,1.01,1.32,1.90	300	200
25	2	2.60	2.60	4.00	2.06,2.01,1.63,1.23,2.12,2.12,1.88,1.36,2.20,2.11,2.06,2.01,2.49,2.24,2.13,2.13,1.88,1.36	300	200
26	2	1.30	1.30	2.00	1.74,1.69,2.12,3.10,1.71,1.72,1.94,2.31,1.79,2.13,1.74,1.68,1.62,1.58,1.71,1.72,1.94,2.23	300	200
27	3	4.26	4.26	2.03	2.33,2.33,2.22,3.32,2.29,2.46,2.33,2.33,2.33,2.33,2.33,2.33,1.96,1.46,2.28,2.51,2.33,2.33	300	200
28	3	11.20	11.20	17.23	1.14,1.11,2.35,2.45,1.32,1.36,1.97,1.65,1.31,1.15,1.14,1.10,2.22,2.58,1.44,1.47,1.99,1.71	300	200
29	3	4.26	4.26	2.03	2.33,2.33,2.47,2.08,2.37,2.23,2.33,2.33,2.33,2.33,2.33,2.33,1.41,1.86,2.38,2.21,2.33,2.33	300	200
30	3	4.26	4.26	2.03	2.33,2.33,2.03,1.43,2.28,2.51,2.33,2.33,2.33,2.33,2.33,2.33,3.16,1.80,2.27,2.57,2.33,2.33	300	200
31	3	11.20	11.20	17.23	1.21,1.21,2.28,2.82,1.41,1.36,1.89,1.74,1.34,1.20,1.21,1.21,1.85,2.54,1.52,1.45,1.87,1.72	300	200
32	3	4.26	4.26	2.03	2.33,2.33,3.75,1.90,2.38,2.21,2.33,2.33,2.33,2.33,2.33,2.33,2.09,1.52,2.40,2.19,2.33,2.33	300	200
33	3	4.26	4.26	2.03	2.33,2.33,1.93,1.46,2.28,2.52,2.33,2.33,2.33,2.33,2.33,2.33,2.92,1.83,2.27,2.58,2.33,2.33	300	200
34	3	11.20	11.20	17.23	1.21,1.21,2.15,3.20,1.20,1.28,1.71,1.31,1.21,1.21,1.21,1.21,1.61,2.32,1.21,1.31,1.69,1.28	300	200
35	3	4.26	4.26	2.03	2.33,2.33,1.39,1.85,2.38,2.21,2.33,2.33,2.33,2.33,2.33,2.33,2.11,1.47,2.40,2.18,2.33,2.33	300	200
36	3	4.26	4.26	2.03	2.33,2.33,1.93,1.46,2.28,2.52,2.33,2.33,2.33,2.33,2.33,2.33,2.92,1.83,2.27,2.58,2.33,2.33	300	200
37	3	11.20	11.20	17.23	1.20,1.20,2.13,3.03,1.19,1.26,1.64,1.26,1.19,1.20,1.20,1.20,1.53,2.11,1.19,1.29,1.62,1.24	300	200
38	3	4.26	4.26	2.03	2.33,2.33,1.39,1.85,2.38,2.21,2.33,2.33,2.33,2.33,2.33,2.33,2.11,1.47,2.40,2.18,2.33,2.33	300	200
39	3	4.26	4.26	2.03	2.33,2.33,1.93,1.46,2.28,2.52,2.33,2.33,2.33,2.33,2.33,2.33,2.92,1.83,2.27,2.58,2.33,2.33	300	200
40	3	11.20	11.20	17.23	1.21,1.21,2.22,3.19,1.22,1.30,1.79,1.37,1.23,1.20,1.21,1.21,1.68,2.50,1.24,1.34,1.77,1.30	300	200
41	3	4.26	4.26	2.03	2.33,2.33,1.39,1.85,2.38,2.21,2.33,2.33,2.33,2.33,2.33,2.33,2.11,1.47,2.40,2.18,2.33,2.33	300	200
42	3	4.26	4.26	2.03	2.33,2.33,1.93,1.46,2.28,2.52,2.33,2.33,2.33,2.33,2.33,2.33,2.92,1.83,2.27,2.58,2.33,2.33	300	200
43	3	11.20	11.20	17.23	1.21,1.21,2.22,3.19,1.22,1.30,1.79,1.35,1.23,1.20,1.21,1.21,1.68,2.50,1.24,1.34,1.77,1.29	300	200
44	3	4.26	4.26	2.03	2.33,2.33,1.39,1.85,2.38,2.21,2.33,2.33,2.33,2.33,2.33,2.33,2.11,1.47,2.40,2.18,2.33,2.33	300	200
45	3	4.26	4.26	2.03	2.33,2.33,1.93,1.46,2.28,2.52,2.33,2.33,2.33,2.33,2.33,2.33,2.92,1.83,2.27,2.58,2.33,2.33	300	200
46	3	11.20	11.20	17.23	1.20,1.20,2.13,3.03,1.19,1.26,1.64,1.23,1.19,1.20,1.20,1.20,1.53,2.11,1.19,1.29,1.62,1.22	300	200
47	3	4.26	4.26	2.03	2.33,2.33,1.39,1.85,2.38,2.21,2.33,2.33,2.33,2.33,2.33,2.33,2.11,1.47,2.40,2.18,2.33,2.33	300	200
48	3	4.26	4.26	2.03	2.33,2.33,1.93,1.46,2.28,2.52,2.33,2.33,2.33,2.33,2.33,2.33,2.92,1.83,2.27,2.58,2.33,2.33	300	200
49	3	11.20	11.20	17.23	1.21,1.21,2.15,3.20,1.20,1.28,1.70,1.23,1.21,1.21,1.21,1.21,1.61,2.32,1.21,1.31,1.68,1.22	300	200
50	3	4.26	4.26	2.03	2.33,2.33,1.39,1.85,2.38,2.21,2.33,2.33,2.33,2.33,2.33,2.33,2.11,1.47,2.40,2.18,2.33,2.33	300	200

51	3	4.26	4.26	2.03	2.33,2.33,2.03,1.43,2.28,2.51,2.33,2.33,2.33,2.33,2.33,2.33,3.16,1.80,2.27,2.57,2.33,2.33	300	200
52	3	11.20	11.20	17.23	1.21,1.21,2.28,2.82,1.41,1.36,1.87,1.42,1.31,1.21,1.21,1.21,1.85,2.54,1.52,1.45,1.86,1.36	300	200
53	3	4.26	4.26	2.03	2.33,2.33,3.75,1.90,2.38,2.21,2.33,2.33,2.33,2.33,2.33,2.33,2.09,1.52,2.40,2.19,2.33,2.33	300	200
54	3	4.26	4.26	2.03	2.33,2.33,2.22,3.32,2.29,2.46,2.33,2.33,2.33,2.33,2.33,2.33,1.96,1.46,2.28,2.51,2.33,2.33	300	200
55	3	11.20	11.20	17.23	1.14,1.11,2.35,2.45,1.32,1.36,1.95,1.31,1.29,1.11,1.14,1.10,2.22,2.58,1.44,1.47,1.98,1.31	300	200
56	3	4.26	4.26	2.03	2.33,2.33,2.47,2.08,2.37,2.23,2.33,2.33,2.33,2.33,2.33,2.33,1.41,1.86,2.38,2.21,2.33,2.33	300	200

Member Design Capacity

Member ID	P_n/Ω_t (kip)	P_n/Ω_c (kip)	M_{zn}/Ω_b (k-ft)	M_{yn}/Ω_b (k-ft)	$V_{yn}/\Omega v$ (kip)	V_{zn}/Ω_v (kip)
1	130.81	61.04	14.57	14.57	33.84	33.84
2	130.81	45.76	14.57	14.57	33.84	33.84
3	130.81	61.04	14.57	14.57	33.84	33.84
4	130.81	45.76	14.57	14.57	33.84	33.84
5	130.81	45.76	14.57	14.57	33.84	33.84
6	130.81	61.04	14.57	14.57	33.84	33.84
7	168.84	160.94	43.33	18.80	71.17	25.26
8	168.84	158.82	43.33	18.80	71.17	25.26
9	168.84	158.82	43.33	18.80	71.17	25.26
10	168.84	158.82	43.33	18.80	71.17	25.26
11	168.84	160.94	43.33	18.80	71.17	25.26
12	168.84	160.94	43.33	18.80	71.17	25.26
13	168.84	158.82	43.33	18.80	71.17	25.26
14	168.84	158.82	43.33	18.80	71.17	25.26
15	168.84	158.82	43.33	18.80	71.17	25.26
16	168.84	160.94	43.33	18.80	71.17	25.26
17	168.84	160.94	43.33	18.80	71.17	25.26
18	168.84	158.82	43.33	18.80	71.17	25.26
19	168.84	158.82	43.33	18.80	71.17	25.26
20	168.84	158.82	43.33	18.80	71.17	25.26
21	168.84	160.94	43.33	18.80	71.17	25.26
22	168.84	160.94	43.33	18.80	71.17	25.26
23	168.84	158.82	43.33	18.80	71.17	25.26
24	168.84	158.82	43.33	18.80	71.17	25.26
25	168.84	158.82	43.33	18.80	71.17	25.26
26	168.84	160.94	43.33	18.80	71.17	25.26
27	48.44	35.04	7.27	2.45	21.53	6.29
28	48.44	10.90	7.27	2.45	21.53	6.29
29	48.44	35.05	7.27	2.45	21.53	6.29
30	48.44	35.04	7.27	2.45	21.53	6.29
31	48.44	10.90	7.27	2.45	21.53	6.29
32	48.44	35.05	7.27	2.45	21.53	6.29
33	48.44	35.04	7.27	2.45	21.53	6.29
34	48.44	10.90	7.27	2.45	21.53	6.29
35	48.44	35.05	7.27	2.45	21.53	6.29
36	48.44	35.04	7.27	2.45	21.53	6.29

37	48.44	10.90	7.27	2.45	21.53	6.29
38	48.44	35.05	7.27	2.45	21.53	6.29
39	48.44	35.04	7.27	2.45	21.53	6.29
40	48.44	10.90	7.27	2.45	21.53	6.29
41	48.44	35.05	7.27	2.45	21.53	6.29
42	48.44	35.04	7.27	2.45	21.53	6.29
43	48.44	10.90	7.27	2.45	21.53	6.29
44	48.44	35.05	7.27	2.45	21.53	6.29
45	48.44	35.04	7.27	2.45	21.53	6.29
46	48.44	10.90	7.27	2.45	21.53	6.29
47	48.44	35.05	7.27	2.45	21.53	6.29
48	48.44	35.04	7.27	2.45	21.53	6.29
49	48.44	10.90	7.27	2.45	21.53	6.29
50	48.44	35.05	7.27	2.45	21.53	6.29
51	48.44	35.04	7.27	2.45	21.53	6.29
52	48.44	10.90	7.27	2.45	21.53	6.29
53	48.44	35.05	7.27	2.45	21.53	6.29
54	48.44	35.04	7.27	2.45	21.53	6.29
55	48.44	10.90	7.27	2.45	21.53	6.29
56	48.44	35.05	7.27	2.45	21.53	6.29

Design Ratio

Member ID	P	M_z	M_y	V_y	V_z	(P,M_z,M_y)	Worst LC	KL/r	δ	Status
1	0.050	0.362	0.338	0.010	0.009	0.468	#8	0.534	Not Required	Pass
2	0.068	0.375	0.312	0.008	0.007	0.474	#10	0.627	Not Required	Pass
3	0.100	0.347	0.371	0.009	0.010	0.463	#7	0.534	Not Required	Pass
4	0.135	0.396	0.339	0.009	0.008	0.542	#10	0.627	Not Required	Pass
5	0.068	0.360	0.321	0.008	0.007	0.480	#9	0.627	Not Required	Pass
6	0.050	0.338	0.348	0.009	0.009	0.447	#7	0.534	Not Required	Pass
7	0.000	0.018	0.010	0.006	0.002	0.020	#2	0.046	Not Required	Pass
8	0.002	0.121	0.022	0.019	0.009	0.126	#10	0.092	Not Required	Pass
9	0.002	0.121	0.031	0.009	0.005	0.122	#10	0.092	Not Required	Pass
10	0.001	0.088	0.027	0.022	0.003	0.089	#2	0.092	Not Required	Pass
11	0.001	0.186	0.020	0.041	0.006	0.194	#10	0.046	Not Required	Pass
12	0.003	0.185	0.022	0.041	0.007	0.192	#2	0.046	Not Required	Pass
13	0.003	0.088	0.029	0.022	0.004	0.089	#2	0.092	Not Required	Pass
14	0.003	0.096	0.031	0.008	0.005	0.096	#2	0.092	Not Required	Pass
15	0.003	0.121	0.021	0.021	0.008	0.128	#8	0.092	Not Required	Pass
16	0.005	0.018	0.095	0.006	0.034	0.104	#8	0.046	Not Required	Pass
17	0.000	0.021	0.010	0.007	0.002	0.030	#9	0.046	Not Required	Pass
18	0.002	0.121	0.022	0.019	0.010	0.127	#10	0.092	Not Required	Pass
19	0.002	0.121	0.033	0.008	0.005	0.123	#10	0.092	Not Required	Pass
20	0.002	0.089	0.028	0.023	0.003	0.099	#9	0.092	Not Required	Pass
21	0.002	0.190	0.018	0.041	0.006	0.193	#10	0.046	Not Required	Pass
22	0.003	0.185	0.020	0.041	0.006	0.191	#2	0.046	Not Required	Pass

23	0.003	0.089	0.030	0.022	0.004	0.095	#9	0.092	Not Required	Pass
24	0.003	0.097	0.032	0.008	0.004	0.099	#2	0.092	Not Required	Pass
25	0.003	0.115	0.024	0.021	0.009	0.118	#8	0.092	Not Required	Pass
26	0.005	0.021	0.092	0.007	0.034	0.101	#8	0.046	Not Required	Pass
27	0.000	0.010	0.000	0.003	0.000	0.010	#2	0.198	Not Required	Pass
28	0.006	0.249	0.055	0.018	0.002	0.304	#17	0.781	Not Required	Pass
29	0.000	0.010	0.000	0.003	0.000	0.010	#2	0.198	Not Required	Pass
30	0.001	0.026	0.000	0.009	0.000	0.027	#2	0.198	Not Required	Pass
31	0.023	0.331	0.058	0.038	0.003	0.360	#9	0.781	Not Required	Pass
32	0.001	0.026	0.000	0.009	0.000	0.027	#2	0.198	Not Required	Pass
33	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
34	0.018	0.431	0.057	0.050	0.003	0.432	#2	0.521	Not Required	Pass
35	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
36	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
37	0.015	0.449	0.051	0.050	0.002	0.450	#2	0.521	Not Required	Pass
38	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
39	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
40	0.025	0.440	0.045	0.050	0.002	0.445	#2	0.781	Not Required	Pass
41	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
42	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
43	0.025	0.440	0.040	0.050	0.002	0.445	#2	0.781	Not Required	Pass
44	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
45	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
46	0.015	0.449	0.034	0.050	0.002	0.450	#2	0.521	Not Required	Pass
47	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
48	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
49	0.018	0.431	0.034	0.050	0.002	0.432	#2	0.781	Not Required	Pass
50	0.001	0.035	0.000	0.012	0.000	0.035	#2	0.198	Not Required	Pass
51	0.001	0.026	0.000	0.009	0.000	0.027	#2	0.198	Not Required	Pass
52	0.080	0.331	0.041	0.038	0.002	0.340	#9	0.781	Not Required	Pass
53	0.001	0.026	0.000	0.009	0.000	0.027	#2	0.198	Not Required	Pass
54	0.000	0.010	0.066	0.003	0.025	0.069	#8	0.198	Not Required	Pass
55	0.018	0.237	0.806	0.018	0.109	0.868	#18	0.781	Not Required	Pass
56	0.000	0.010	0.066	0.003	0.025	0.069	#8	0.198	Not Required	Pass

Definitions

Ω_t	Safety factor for tensile
Ω_c	Safety factor for compression
Ω_b	Safety factor for flexure
Ω_v	Safety factor for shear
E	Modulus of elasticity
F_y	Specified minimum yield stress
F_u	Specified minimum tensile strength
A	Cross-sectional area
J	Torsional constant
I_{yp}	Moment of inertia about the Y axes
I_{zp}	Moment of inertia about the Z axes
I_w	Warping constant
S_{yp}	Plastic section modulus about the Y axis
S_{zp}	Plastic section modulus about the Z axis
KL	Effective length
C_b	Buckling modification factor (from all load combinations)
L_b	Length between braced points
LST	Limited slenderness for tension
LSC	Limited slenderness for compression
LD	Limited deflection
P_n	Nominal axial strength (tension/comression)
M_n	Nominal flexural strength (about Z/Y axis)
V_n	Nominal shear strength (along Z/Y axis)
P	Design ratio in case of axial force
M_z	Design ratio in case of bending about Z axis
M_y	Design ratio in case of bending about Y axis
V_y	Design ratio in case of shear along Y axis
V_z	Design ratio in case of shear along Z axis
(P,M_z,M_y)	Design ratio in case of axial force and bending action
KL/r	Design ratio in case of section slenderness
δ	Design ratio in case of member deflection
OK	Capacity is provided
NG	Capacity is not provided

REFERENCES	CALCULATIONS	RESULTS

Wind Load Calculations based on ASCE 7-16

Design Information :

Project Name : Bradley Heights Recycling Enclosure
Client : Arc Welding
Designer : SLW
Company : Wible Engineering
Units : Imperial

Project Data

The structure is located in **202 27th Ave SE, Puyallup, WA 98374, USA** categorized as **Exposure B** (assumed to be homogeneous for the selected wind direction). The wind load calculation for the structure - Main Wind Force Resisting System (MWFRS) - is based on the Directional Procedure (Chapter 27) of ASCE 7. Moreover, the structure is classified as **Risk Category II**. The location is elevated at **385.16 ft** above mean sea level.

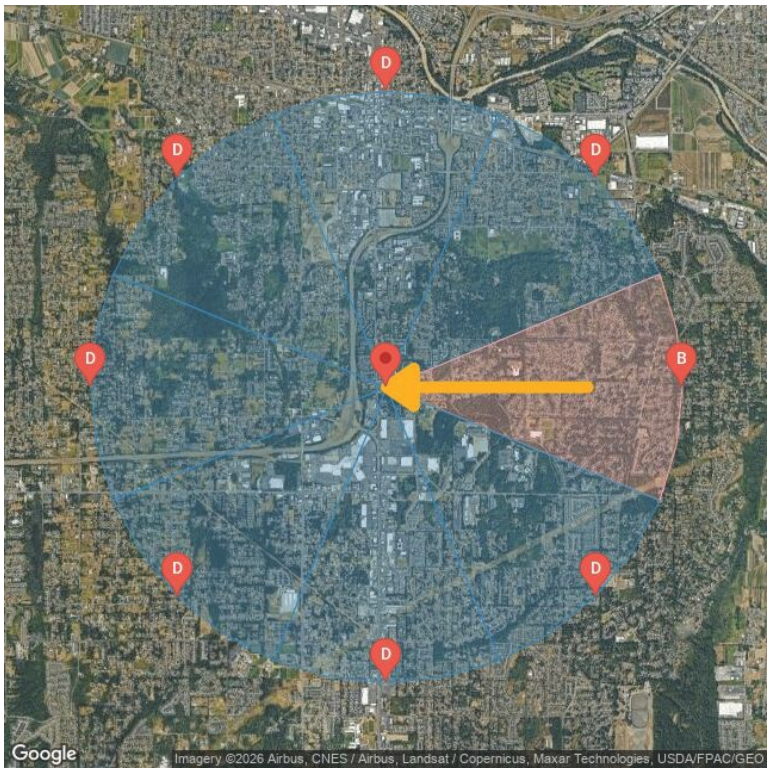


Figure 1. Site location.

Parameter	Value
Building Length, L	13.00 ft
Building Width, B	26.00 ft
Mean Roof Height, h	17.33 ft
Roof Profile	Open Monoslope
Roof Pitch Angle, θ	9.46°
Structure Type	Main Wind Force Resisting System (MWFRS)
Wind Blockage	Blocked Under

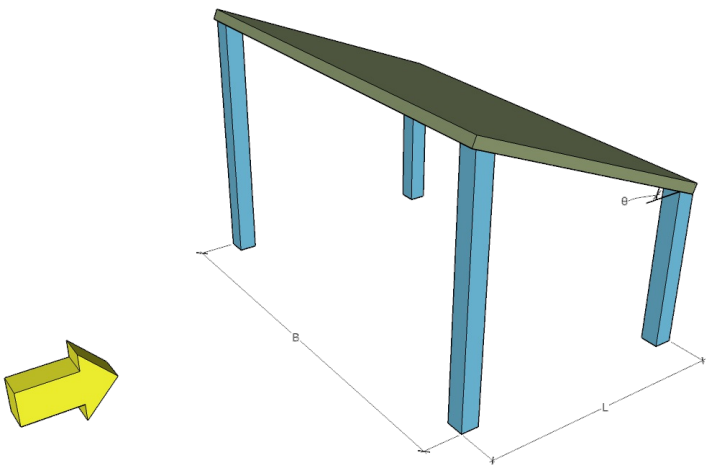


Figure 2. Building parameters.

Figure 26.5-1

Basic Wind Speed, V

Wind speed for the address is **98 mph** for Risk Category II and was calculated using Triangular Interpolation Network (TIN) method from points with known wind speed values based on Figure 26.5-1 of ASCE 7.

$V = 98$ mph

Wind Directionality Factor, K_d

Table 26.6-1

$K_d = 0.85$ - Wind Directionality Factor

For buildings

$K_d = 0.85$

Topographic Factor, K_{zt}

Figure 26.8-1

$H/(L_h) = 0.25331$

Slope of the hill, ridge, or escarpment

$H/(L_h) = 0.25331$

Figure 26.8-1

$L_h = 157.28$ ft

Distance upwind of crest to where the difference in ground elevation is half the length of hill or escarpment.

$L_h = 157.28$ ft

Figure 26.8-1

$H = 39.84$ ft

Height of the hill or escarpment relative to the upwind terrain

$H = 39.84$ ft

Figure 26.8-1

$K_{zt} = 1$ - Topographic Factor

For the selected wind source direction, $K_{zt} = 1.0$ since $H = 39.84ft$ is less than 60 ft for Exposure Category B.

$K_{zt} = 1$

For calculating the topographic factor, the detected topography for the selected wind source direction is Hill.

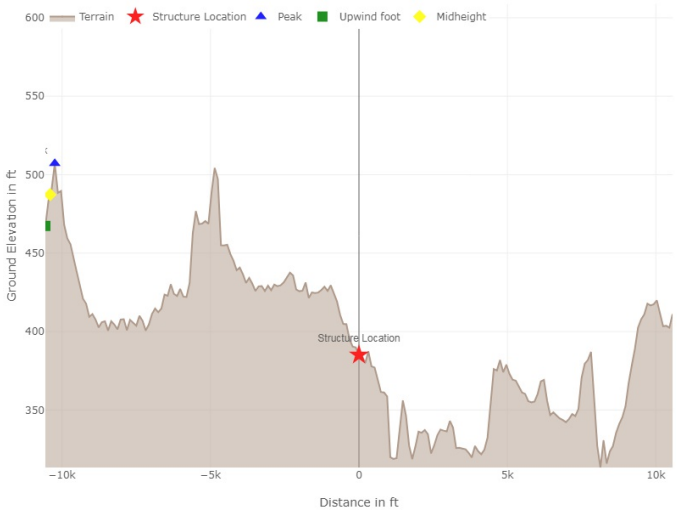


Figure 3. Ground elevation with wind coming from E.

Ground Elevation Factor, K_e

Section 26.9

K_e - Ground Elevation Factor

$$K_e = e^{-0.0000362\ E}$$

$$K_e = 0.98615$$

$$\text{Where } E = \text{Site Elevation} = 385.16 \text{ ft}$$

Section 26.9

$K_e = 0.98615$ - Ground Elevation Factor

$K_e = 0.98615$

Velocity Pressure Exposure Coefficient, K_z

Section 26.10

K_z - Velocity Pressure Exposure Coefficient

For $z < 15ft$

$$K_z = 2.01 \times (15/z_g)^{2/\alpha}$$

Section 26.10 K_z - Velocity Pressure Exposure Coefficient

For $15ft \leq z \leq z_g$

$$K_z = 2.01 \times (z/z_g)^{2/\alpha}$$

Table 26.11-1 $\alpha = 7$ | $\alpha = 7$

Table 26.11-1 $z_g = 1200$ ft | $z_g = 1200$ ft

Section 26.10 K_z - Velocity Pressure Exposure Coefficient

For $15ft \leq z \leq z_g$

$$K_z = 2.01 \ (h/z_g)^{2/\alpha}$$

$$K_z = 0.59892$$

Where h = Mean Roof Height = 17.33 ft
$z_g = 1200$ ft
$\alpha = 7$

Level	Elevation (ft)	K_z
h	17.33	0.599

Velocity Pressure, q_h

For the selected wind source direction.

Section 26.10.2 q_h - Velocity Pressure at h

$$q_h = 0.00256 \ K_z \ K_{zt} \ K_d \ K_e \ V^2$$

$$q_h = 12.343 \text{ psf}$$

Where K_z = Velocity Pressure Exposure Coefficient = 0.59892
K_{zt} = Topographic Factor = 1
K_d = Wind Directionality Factor = 0.85
V = Basic Wind Speed = 98 mi/h
K_e = Ground Elevation Factor = 0.98615

Velocity Pressure for All Directions

Section 26.8 K_{zt} - Topographic Factor

$$K_{zt} = (1 + K_1 \times K_2 \times K_3)^2 \geq 1.0$$

Direction	Terrain Detected	Slope	K_{zt}	H (ft)	x (ft)	L_h (ft)
E	Hill	0.127	1.000	39.84	10243.05	157.28

Section 26.10 K_z - Velocity Pressure Exposure Coefficient

For $15ft \leq z \leq z_g$

$$K_z = 2.01 \times (z/z_g)^{2/\alpha}$$

Section 26.10 K_z - Velocity Pressure Exposure Coefficient

For $z < 15ft$

$$K_z = 2.01 \times (15/z_g)^{2/\alpha}$$

Section 26.10.2 q_h - Velocity Pressure at h

$$q_h = 0.00256 \times K_{z,h} \times K_{zt} \times K_d \times K_e \times V^2$$

Direction	Exposure Category	K_z @ $h = 17.33ft$	K_{zt}	K_d	K_e	V (mph)	q_h (psf)
N	D	1.056	1.000	0.850	0.986	98.000	21.772
NE	D	1.056	1.000	0.850	0.986	98.000	21.772
E	B	0.599	1.000	0.850	0.986	98.000	12.343
SE	D	1.056	1.000	0.850	0.986	98.000	21.772
S	D	1.056	1.000	0.850	0.986	98.000	21.772
SW	D	1.056	1.000	0.850	0.986	98.000	21.772
W	D	1.056	1.000	0.850	0.986	98.000	21.772
NW	D	1.056	1.000	0.850	0.986	98.000	21.772

Net Pressure Coefficients, C_N

Figure 27.3-4 to 27.3-7 The net pressure coefficients, C_N, are calculated using Figures 27.3-4 to 27.3-7 of ASCE 7-16 - Obstructed Wind Flow - as shown in Table below.

Direction	Surface	C_N Case A	C_N Case B
0	Windward	-1.026	-1.805
	Leeward	-1.500	-0.748
180	Windward	-0.043	0.905
	Leeward	-1.174	-0.300
90	≤ h from windward edge	-1.200	0.500
	h to 2h from windward edge	-0.900	
	> 2h from windward edge	-0.600	0.300

Gust Effect Factor, G

Section 26.11.1

$G = 0.85$ - Gust Effect Factor

The structure is assumed to be rigid.

$G = 0.85$

Design Wind Pressures (MWFRS)

Section 27.3.2

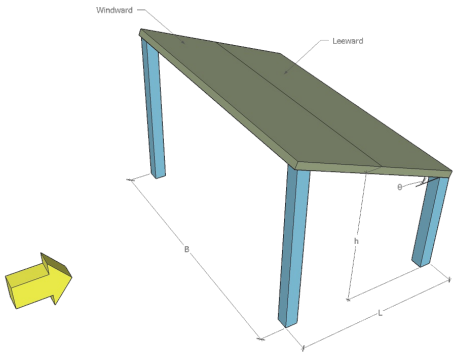
p - Design Wind Pressure

For open buildings

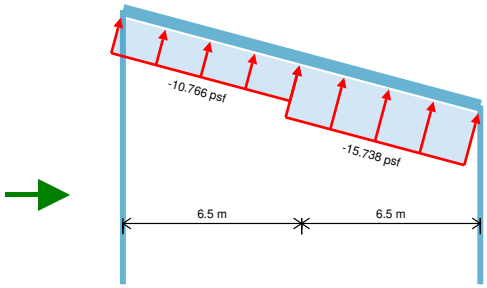
$$p = q_h \times G \times C_N$$

For Wind Pressure - 0°

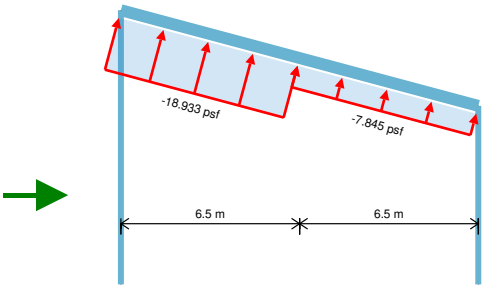
Direction	Surface	q_h (psf)	G	C_N Case A	C_N Case B	p Case A (psf)	p Case B (psf)
0	Windward	12.343	0.850	-1.026	-1.805	-10.766	-18.933
	Leeward	12.343	0.850	-1.500	-0.748	-15.738	-7.845



Wind along L - 180°



0° - Case A.



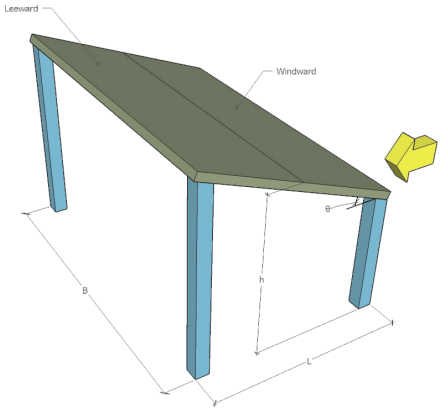
0° - Case B.

Service Wind Pressure - 0°

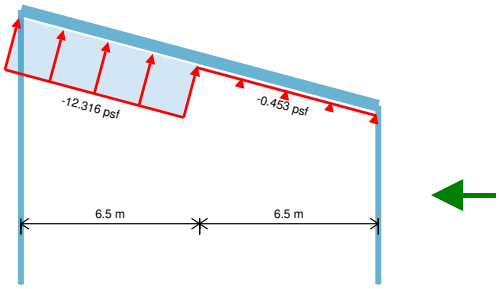
Direction	Surface	p Case A (psf)	p Case B (psf)
0	Windward	-6.460	-11.360
	Leeward	-9.443	-4.707

For Wind Pressure - 180°

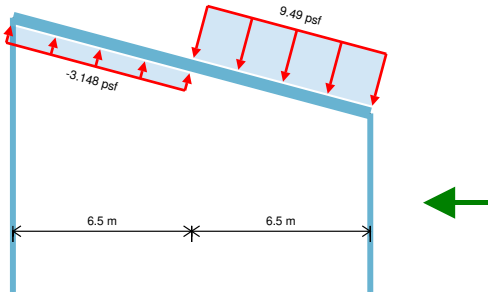
Direction	Surface	q_h (psf)	G	C_N Case A	C_N Case B	p Case A (psf)	p Case B (psf)
180	Windward	12.343	0.850	-0.043	0.905	-0.453	9.490
	Leeward	12.343	0.850	-1.174	-0.300	-12.316	-3.148



Wind along L - 0°



180° - Case A.



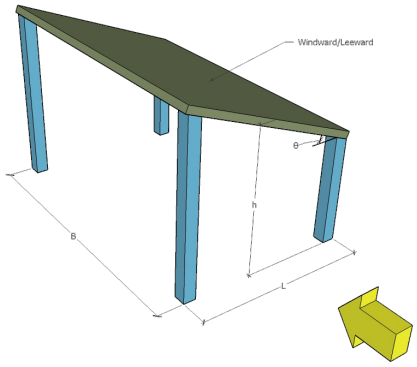
180° - Case B.

Service Wind Pressure - 180°

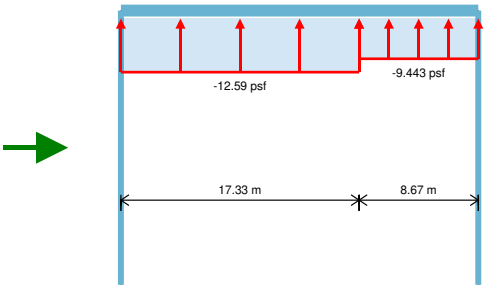
Direction	Surface	p Case A (psf)	p Case B (psf)
180	Windward	-0.272	5.694
	Leeward	-7.390	-1.889

For Wind Pressure - 90°

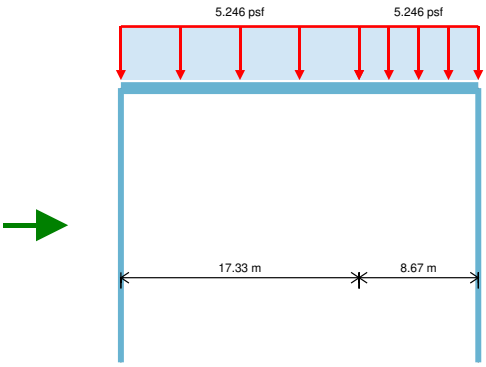
Direction	Surface	q_h (psf)	G	C_N Case A	C_N Case B	p Case A (psf)	p Case B (psf)
90	≤ h from windward edge	12.343	0.850	-1.200	0.500	-12.590	5.246
	h to 2h from windward edge	12.343	0.850	-0.900		-9.443	5.246
	> 2h from windward edge	12.343	0.850	-0.600	0.300	-6.295	3.148



Wind along B - 90°



90° - Case A.



90° - Case B.

Service Wind Pressure - 90°

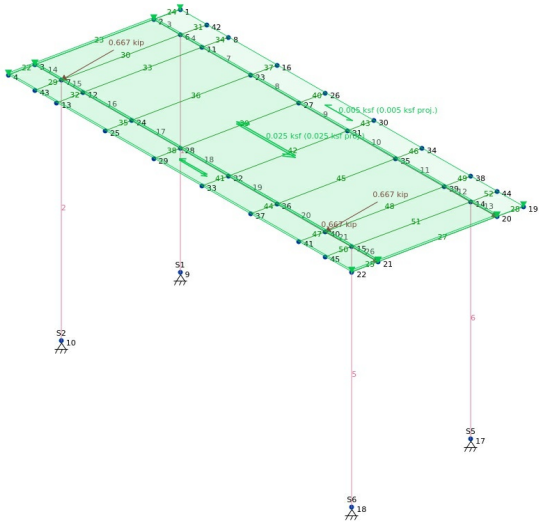
Direction	Surface	p Case A (psf)	p Case B (psf)
90	≤ h from windward edge	-7.554	3.148
	h to 2h from windward edge	-5.666	3.148
	> 2h from windward edge	-3.777	1.889

Section 27.3.2 *Section 28.3.5*	In addition to the roof pressures for 90°, an additional horizontal wind load on open building should be calculated for wind pressures parallel to the ridge in accordance with Section 28.3.5. We will assume $K_S = 1.0$ and should be adjusted and be reduced based on the actual solidity ratio ϕ and number of frames n - See Figure 28.3-2.	
Section 27.3.2 *Section 28.3.5*	p - Horizontal Wind Loads on Open or Partially Enclosed Buildings *For wind pressure parallel to the ridge (90°)* $$p = q_h \times [(GC_{pf})_{windward} - (GC_{pf})_{leeward}] \times K_B \times K_S$$	
Section 27.3.2 *Section 28.3.5*	K_B - Frame Width Factor *For* $L < 100ft$, $K_B = 1.8 - 0.01L$. *Otherwise,* $K_B = 0.8$. $$K_B = 1.8 - 0.01 * L \leq 0.8$$ $$K_B = 1.67$$ $$\text{Where } L = \text{Building Length} = 13 \text{ ft}$$	
Section 28.3.5	K_S - Shielding Factor $$K_S = 0.6 + 0.073 \times (n - 3) + \left(1.25 \times \phi^{1.8}\right)$$	
Section 28.3.5	$K_S = 1$ - Shielding Factor *Assumed to be equal to 1.0 and should be adjusted based on the actual wall solidity ratio* ϕ *and number of frames* n.	$K_S = 1$
Figure 28.3-1 *Section 28.3.5*	$(GC_{pf})_{windward} = 0.4$ *Using Zone 5 from Figure 28.3-1*	$(GC_{pf})_{windward} = 0.4$
Figure 28.3-1 *Section 28.3.5*	$(GC_{pf})_{leeward} = -0.29$ *Using Zone 6 from Figure 28.3-1*	$(GC_{pf})_{leeward} = -0.29$
Section 27.3.2 *Section 28.3.5*	p - Horizontal Wind Loads on Open or Partially Enclosed Buildings *For wind pressure parallel to the ridge (90°)* $$p = q_h \ [(GC_{pf})_{windward} - (GC_{pf})_{leeward}] \ K_B \, K_S$$ $$p = 14.223 \text{ psf}$$ $$\begin{aligned} \text{Where } q_h &= \text{Velocity Pressure at h} = 12.343 \text{ psf} \\ (GC_{pf})_{windward} &= 0.4 \\ (GC_{pf})_{leeward} &= -0.29 \\ K_B &= \text{Frame Width Factor} = 1.67 \\ K_S &= \text{Shielding Factor} = 1 \end{aligned}$$	

WIBLE ENGINEERING

Recycling Enclosure SkyCiv Report

Thu 02 Apr 2026, 04:30PM (GMT-05:00)



File Name: Recycling Enclosure
Software: SkyCiv Structural 3D v7.2.4 (Lic. No.: 1R2J59H4tY4w7B6tFNMr8pWH)
Analysis Type: Linear Static Analysis

Included in this Report:

Table of Contents

Job Setup

Recycling Enclosure SkyCiv Report
SkyCiv Structural 3D v7.2.4
Licence Number: 1R2J59H4tY4w7B6tFNMr8pWH
Date: Thu 02 Apr 2026, 04:30PM (GMT-05:00)
Analysis Type: LINEAR STATIC ANALYSIS

File Name	Recycling Enclosure
Job Name	Empty
Designer	Empty
Job Description	Empty

Length Units	ft
Section Length Units	in
Force Units	kip
Moment and Torsion Units	kip-ft
Pressure Units	ksf
Material Strength Units	ksi
Material Density Units	lb/ft^3
Mass Units	kip
Temperature Units	degF
Translation Units	in
Stress Units	ksi
Nodes	44
Members	52
Plates	0
Meshed Plates	0
Supports	4
Sections	3
Point Loads	4
Distributed Loads	0
Moments	0
Member Prestress Loads	0
Thermal Loads	0
Pressures	0
Area Loads	13
Self Weight	ON
User Defined Nodal Masses	0
Auto Defined Nodal Masses	0
Spectral Loads	0
Auto-Stabilize Model	NO
Member Evaluation Points	9
Extrapolate Plate Results From Gauss Points	YES
General Constraint	RRRRRR
Total Degrees of Freedom	252

NODE COORDINATES (ft)

NOTE: Nodes in the plate mesh are not displayed in the table below.

ID	X Coordinate	Y Coordinate	Z Coordinate
1	2.000	2.000	15.170
2	4.000	2.000	15.500
3	13.000	2.000	17.000
4	15.000	2.000	17.330
6	4.000	4.000	15.500
7	13.000	4.000	17.000
8	2.000	5.660	15.170
9	4.000	4.000	0.000
10	13.000	4.000	0.000
11	4.000	5.660	15.500
12	13.000	5.660	17.000
13	15.000	5.660	17.330
14	4.000	26.000	15.500
15	13.000	26.000	17.000
16	2.000	9.330	15.170
17	4.000	26.000	0.000
18	13.000	26.000	0.000
19	2.000	28.000	15.170
20	4.000	28.000	15.500
21	13.000	28.000	17.000
22	15.000	28.000	17.330
23	4.000	9.330	15.500
24	13.000	9.330	17.000
25	15.000	9.330	17.330
26	2.000	13.000	15.170
27	4.000	13.000	15.500
28	13.000	13.000	17.000
29	15.000	13.000	17.330
30	2.000	16.660	15.170
31	4.000	16.660	15.500
32	13.000	16.660	17.000
33	15.000	16.660	17.330
34	2.000	20.330	15.170
35	4.000	20.330	15.500
36	13.000	20.330	17.000
37	15.000	20.330	17.330
38	2.000	24.000	15.170
39	4.000	24.000	15.500
40	13.000	24.000	17.000
41	15.000	24.000	17.330
42	2.000	4.000	15.170
43	15.000	4.000	17.330
44	2.000	26.000	15.170
45	15.000	26.000	17.330

MEMBERS (deg, ft, in, ft, kip)

F=Fixed, R=Released, S=Spring

ID	Node A	Node B	Length	Type	Section ID	Rotation Angle	Node A Fixity	Node B Fixity
1	9	6	15.500	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
2	10	7	17.000	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
3	2	6	2.000	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
4	6	11	1.660	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
5	18	15	17.000	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
6	17	14	15.500	Continuous & Normal	3	90.000	FFFFFF	FFFFFF
7	11	23	3.670	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
8	23	27	3.670	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
9	27	31	3.660	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
10	31	35	3.670	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
11	35	39	3.670	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
12	39	14	2.000	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
13	14	20	2.000	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
14	3	7	2.000	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
15	7	12	1.660	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
16	12	24	3.670	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
17	24	28	3.670	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
18	28	32	3.660	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
19	32	36	3.670	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
20	36	40	3.670	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
21	40	15	2.000	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
22	4	3	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
23	3	2	9.124	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
24	2	1	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
25	22	21	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
26	15	21	2.000	Continuous & Normal	1	90.000	FFFFFF	FFFFFF
27	21	20	9.124	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
28	20	19	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
29	43	7	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
30	7	6	9.124	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
31	6	42	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
32	13	12	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
33	12	11	9.124	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
34	11	8	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
35	25	24	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
36	24	23	9.124	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
37	23	16	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
38	29	28	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
39	28	27	9.124	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
40	27	26	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
41	33	32	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
42	32	31	9.124	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
43	31	30	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
44	37	36	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
45	36	35	9.124	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
46	35	34	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
47	41	40	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
48	40	39	9.124	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
49	39	38	2.027	Continuous & Normal	2	90.000	FFFFFF	FFFFFF
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ID	Node A Offsets	Node B Offsets	Offset Axis	Node A Rot Stiff Y	Node A Rot Stiff Z	Node B Rot Stiff Y	Node B Rot Stiff Z	Cable Length	T/C Limit	Mirror	Disable Non-Linear
1	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
2	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
3	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
4	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
5	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
6	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
7	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
8	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
9	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
10	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
11	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
12	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
13	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
14	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
15	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
16	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
17	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
18	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
19	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
20	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
21	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
22	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
23	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
24	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
25	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
26	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
27	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
28	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
29	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
30	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
31	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
32	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
33	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
34	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
35	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
36	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
37	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
38	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
39	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
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47	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
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49	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
50	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
51	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No
52	0, 0, 0	0, 0, 0	Local	-	-	-	-	-	-	No	No

SUPPORTS (kip/ft, kip-ft/rad)

F=Fixed, R=Released, S=Spring

B=Both Axes Restraint, N=Negative-Axis Restraint Only, P=Positive-Axis Restraint Only

ID	Node ID	Restraint Code	Direction Code	X Trans Stiffness	Y Trans Stiffness	Z Trans Stiffness	X Rot Stiffness	Y Rot Stiffness	Z Rot Stiffness	Source
1	9	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support
2	10	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support
5	17	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support
6	18	FFFRRR	BBBBBB	-	-	-	-	-	-	User Defined Nodal Support

MATERIALS (ksi, lb/ft^3, 10^{-6}/degF)

Shear Modulus is used for members only.
Ex, Ey, Gxy, Gxz, Gyz are used for orthotropic plates only.

ID	Name	Young's Modulus	Shear Modulus	Density	Poisson's Ratio	Thermal Exp. Coeff.	Young's Modulus x	Young's Modulus y	Shear Modulus xy	Shear Modulus xz	Shear Modulus yz	Poisson's Ratio xy
1	Structural Steel	29000.000	Auto	490.000	0.270	6.500	-	-	-	-	-	Auto
8	American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	29000.000	Auto	487.296	0.290	6.670	-	-	-	-	-	Auto

SECTIONS (in, in^2, in^4, deg)

ID	Name	Shape	Material ID	Depth	Width	Shear Area z (STRESS)	Shear Area y (STRESS)	Shear Area z (TIMO)	Shear Area y (TIMO)	Torsion Radius
1	HSS10x4x1/4	HSS10x4x1/4	8	10.000	4.000	1.064	4.221	-	-	3.854
2	HSS6x2x1/8	HSS6x2x1/8	8	6.000	2.000	0.240	1.266	-	-	2.026
3	HSS4x4x3/8	HSS4x4x3/8	1	4.000	4.000	2.187	2.187	-	-	2.369

ID	Centroid y	Centroid z	Area (A)	y-Axis MoI (Iy)	z-Axis MoI (Iz)	Torsion Constant (J)	Principal Angle	Non Prismatic
1	5.000	2.000	6.170	17.700	74.700	47.400	0.000	N
2	3.000	1.000	1.770	1.310	7.420	3.720	0.000	N
3	2.000	2.000	4.780	10.300	10.300	17.500	0.000	N

ID	Area Red. Factor	Iy Red. Factor	Iz Red. Factor	Torsion Constant Red. Factor	Shear Area Y Red. Factor	Shear Area Z Red. Factor
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	-	-	-	-	-	-

POINT LOADS (kip)

ID	Load Group	Node	Member	Position (%)	X Magnitude	Y Magnitude	Z Magnitude
1	Seismic Y	20			0.000	0.667	0.000
2	Seismic Y	21			0.000	0.667	0.000
3	Seismic X	7			0.667	0.000	0.000
4	Seismic X	40			0.667	0.000	0.000

AREA LOADS (ksf)

ID	Load Group	Node IDs	Pressure Magnitude	Type	Direction
1	Dead	1,19,20,2	-0.005	One-Way	Global Proj. Z-axis
2	Dead	2,20,21,3	-0.005	One-Way	Global Proj. Z-axis
3	Dead	21,22,4,3	-0.005	One-Way	Global Proj. Z-axis
4	Snow	1,19,20,2	-0.025	General One-Way	Global Proj. Z-axis
5	Wind_0_case1	1,19,22,4	-0.016	General One-Way	Local
6	Wind_0_case2	1,19,22,4	-0.008	General One-Way	Local
7	Wind_180_case1	1,19,22,4	-0.000	General One-Way	Local
8	Wind_180_case2	1,19,22,4	0.009	General One-Way	Local
17	Snow	2,20,21,3	-0.025	One-Way	Global Proj. Z-axis
18	Snow	21,22,4,3	-0.025	One-Way	Global Proj. Z-axis
26	Seismic Z	21,3,2,20	0.003	General One-Way	Global Proj. Z-axis
27	Seismic Z	22,4,3,21	0.003	General One-Way	Global Proj. Z-axis
28	Seismic Z	1,19,20,2	0.003	General One-Way	Global Proj. Z-axis

SELF WEIGHT (g's)

Load Group	X Gravity	Y Gravity	Z Gravity
SW1	0.000	0.000	-1.000

LOAD COMBINATIONS

ID	Name	Criteria	Dead Factor	SW1 Factor	Snow Factor	Wind_0_case1 Factor	Wind_0_case2 Factor	Wind_180_case1 Factor	Wind_180_case2 Factor	Seismic Z Factor	Seismic X Factor	Seismic Y Factor
1	1: 1.00Dead + 1.00SW1	Strength	1.000	1.000	0	0	0	0	0	0	0	0
2	4: 1.00Dead + 1.00SW1 + 1.00Snow	Strength	1.000	1.000	1.000	0	0	0	0	0	0	0
3	9: 1.00Dead + 1.00SW1 + 0.60Wind_0_case1	Strength	1.000	1.000	0	0.600	0	0	0	0	0	0
4	10: 1.00Dead + 1.00SW1 + 0.60Wind_0_case2	Strength	1.000	1.000	0	0	0.600	0	0	0	0	0
5	11: 1.00Dead + 1.00SW1 + 0.60Wind_180_case1	Strength	1.000	1.000	0	0	0	0.600	0	0	0	0
6	12: 1.00Dead + 1.00SW1 + 0.60Wind_180_case2	Strength	1.000	1.000	0	0	0	0	0.600	0	0	0
7	25: 1.00Dead + 1.00SW1 + 0.70Seismic Z + 0.70Seismic X + 0.21Seismic Y	Strength	1.000	1.000	0	0	0	0	0	0.700	0.210	0.700
8	26: 1.00Dead + 1.00SW1 + 0.70Seismic Z + 0.21Seismic X + 0.70Seismic Y	Strength	1.000	1.000	0	0	0	0	0	0.210	0.700	0.700
9	29: 1.00Dead + 1.00SW1 + 0.53Seismic Z + 0.53Seismic X + 0.16Seismic Y + 0.75Snow	Strength	1.000	1.000	0.750	0	0	0	0	0.525	0.158	0.525
10	30: 1.00Dead + 1.00SW1 + 0.53Seismic Z + 0.16Seismic X + 0.53Seismic Y + 0.75Snow	Strength	1.000	1.000	0.750	0	0	0	0	0.158	0.525	0.525
11	33: 0.60Dead + 0.60SW1	Strength	0.600	0.600	0	0	0	0	0	0	0	0

12	36: 0.60Dead + 0.60SW1 + 1.00Snow	Strength	0.600	0.600	1.000	0	0	0	0	0	0	0
13	53: 0.60Dead + 0.60SW1 + 0.60Wind_0_case1	Strength	0.600	0.600	0	0.600	0	0	0	0	0	0
14	54: 0.60Dead + 0.60SW1 + 0.60Wind_0_case2	Strength	0.600	0.600	0	0	0.600	0	0	0	0	0
15	55: 0.60Dead + 0.60SW1 + 0.60Wind_180_case1	Strength	0.600	0.600	0	0	0	0.600	0	0	0	0
16	56: 0.60Dead + 0.60SW1 + 0.60Wind_180_case2	Strength	0.600	0.600	0	0	0	0	0.600	0	0	0
17	57: 0.60Dead + 0.60SW1 + -0.70Seismic Z + 0.70Seismic X + 0.21Seismic Y	Strength	0.600	0.600	0	0	0	0	0	0.700	0.210	-0.700
18	58: 0.60Dead + 0.60SW1 + -0.70Seismic Z + 0.21Seismic X + 0.70Seismic Y	Strength	0.600	0.600	0	0	0	0	0	0.210	0.700	-0.700
19	9: 1.00Dead + 1.00SW1 + 0.45Wind_0_case1 + 0.75Snow	Strength	1.000	1.000	0.750	0.450	0	0	0	0	0	0
20	10: 1.00Dead + 1.00SW1 + 0.45Wind_0_case2+ 0.75Snow	Strength	1.000	1.000	0.750	0	0.450	0	0	0	0	0
21	11: 1.00Dead + 1.00SW1 + 0.45Wind_180_case1+ 0.75Snow	Strength	1.000	1.000	0.750	0	0	0.450	0	0	0	0
22	12: 1.00Dead + 1.00SW1 + 0.45Wind_180_case2+ 0.75Snow	Strength	1.000	1.000	0.750	0	0	0	0.450	0	0	0
23	25: 1.00Dead + 1.00SW1 + 0.70Seismic Z - 0.70Seismic X - 0.21Seismic Y	Strength	1.000	1.000	0	0	0	0	0	-0.700	-0.210	0.700
24	26: 1.00Dead + 1.00SW1 + 0.70Seismic Z - 0.21Seismic X - 0.70Seismic Y	Strength	1.000	1.000	0	0	0	0	0	-0.210	-0.700	0.700
25	29: 1.00Dead + 1.00SW1 + 0.53Seismic Z - 0.53Seismic X - 0.16Seismic Y + 0.75Snow	Strength	1.000	1.000	0.750	0	0	0	0	-0.525	-0.158	0.525
26	30: 1.00Dead + 1.00SW1 + 0.53Seismic Z - 0.16Seismic X - 0.53Seismic Y + 0.75Snow	Strength	1.000	1.000	0.750	0	0	0	0	-0.158	-0.525	0.525
27	25: 1.00Dead + 1.00SW1 + 0.70Seismic Z+ 0.70Seismic X - 0.21Seismic Y	Strength	1.000	1.000	0	0	0	0	0	0.700	-0.210	0.700
28	26: 1.00Dead + 1.00SW1 + 0.70Seismic Z + 0.21Seismic X - 0.70Seismic Y	Strength	1.000	1.000	0	0	0	0	0	0.210	-0.700	0.700
29	25: 1.00Dead + 1.00SW1 + 0.70Seismic Z- 0.70Seismic X + 0.21Seismic Y	Strength	1.000	1.000	0	0	0	0	0	-0.700	0.210	0.700
30	26: 1.00Dead + 1.00SW1 + 0.70Seismic Z - 0.21Seismic X + 0.70Seismic Y	Strength	1.000	1.000	0	0	0	0	0	-0.210	0.700	0.700
31	25: 0.60Dead + 0.60SW1 + 0.70Seismic Z - 0.70Seismic X - 0.21Seismic Y	Strength	0.600	0.600	0	0	0	0	0	-0.700	-0.210	-0.700
32	26: 0.60Dead + 0.60SW1 + 0.70Seismic Z - 0.21Seismic X - 0.70Seismic Y	Strength	0.600	0.600	0	0	0	0	0	-0.210	-0.700	-0.700
33	25: 0.60Dead + 0.60SW1 + 0.70Seismic Z+ 0.70Seismic X - 0.21Seismic Y	Strength	0.600	0.600	0	0	0	0	0	0.700	-0.210	-0.700
34	26: 0.60Dead + 0.60SW1 + 0.70Seismic Z + 0.21Seismic X - 0.70Seismic Y	Strength	0.600	0.600	0	0	0	0	0	0.210	-0.700	-0.700
35	25: 0.60Dead + 0.60SW1 + 0.70Seismic Z- 0.70Seismic X + 0.21Seismic Y	Strength	0.600	0.600	0	0	0	0	0	-0.700	0.210	-0.700
36	26: 0.60Dead + 0.600SW1 + 0.70Seismic Z - 0.21Seismic X + 0.70Seismic Y	Strength	0.600	0.600	0	0	0	0	0	-0.210	0.700	-0.700

LOAD CASES

Design Code: ASCE-7-2016-ASD

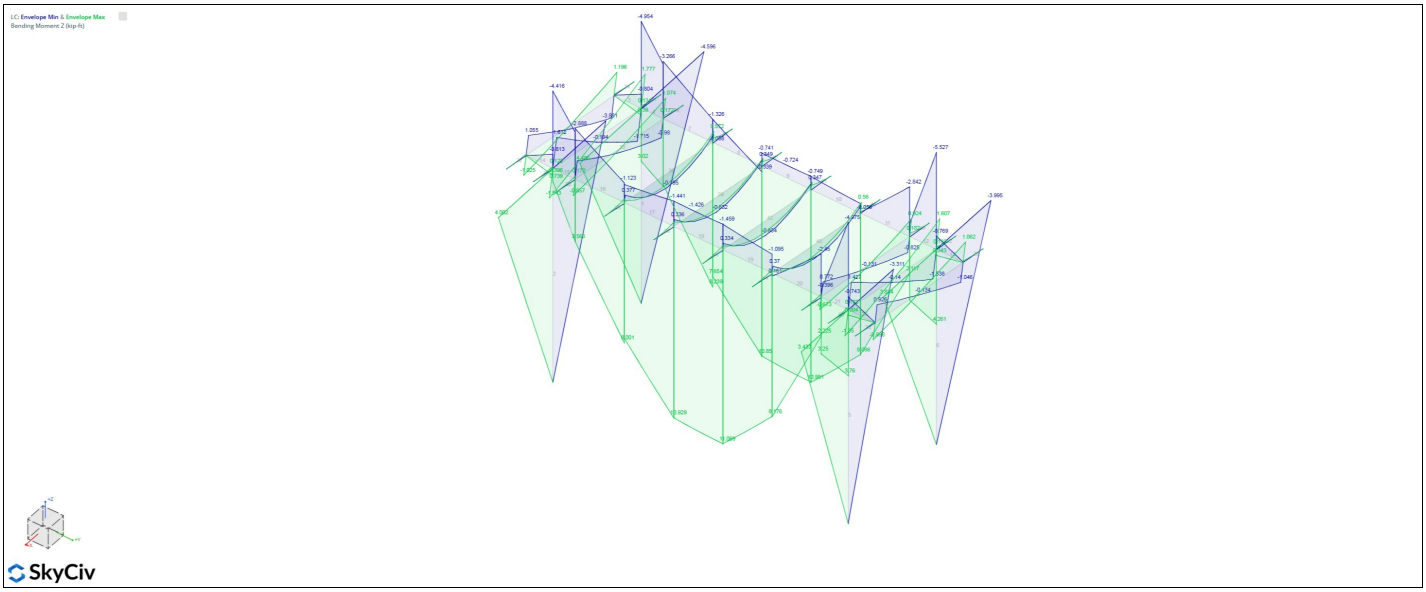
Load Group	Design Load Case
Dead	D
SW1	D
Snow	S
Wind_0_case1	W
Wind_0_case2	W
Wind_180_case1	W
Wind_180_case2	W
Seismic Z	Ev

Bill of Materials

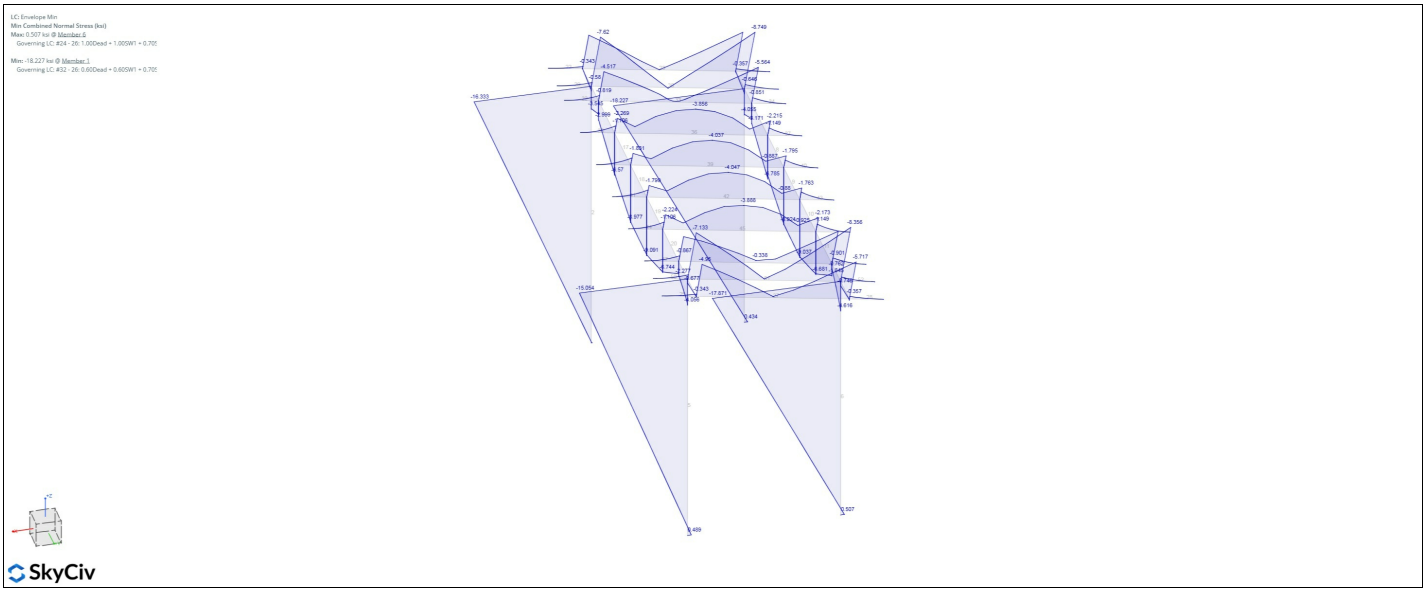
BILL OF MATERIALS FOR MEMBERS (ft, kip)

Section	Material	Quantity	Unit Length	Total Length	Unit Mass	Total Mass
1: HSS10x4x1/4	8: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	2	1.660	3.320	0.035	0.069
1: HSS10x4x1/4	8: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	2	3.660	7.320	0.076	0.153
1: HSS10x4x1/4	8: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	6	2.000	12.000	0.042	0.251
1: HSS10x4x1/4	8: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	8	3.670	29.360	0.077	0.613
2: HSS6x2x1/8	8: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	10	9.124	91.241	0.055	0.547
2: HSS6x2x1/8	8: American Standard (ASTM) - ASTM A500 - Round Structural Tubing - Grade C	20	2.027	40.541	0.012	0.243
3: HSS4x4x3/8	1: Structural Steel	2	15.500	31.000	0.252	0.504
3: HSS4x4x3/8	1: Structural Steel	2	17.000	34.000	0.277	0.553
						2.932

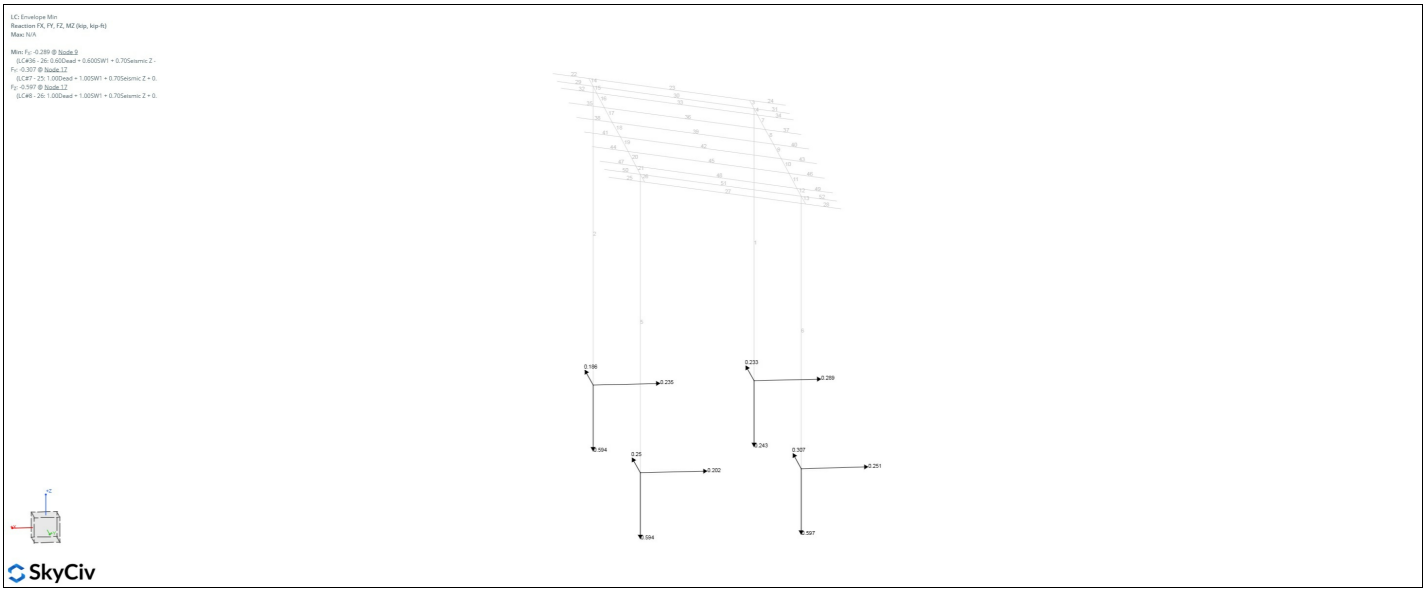
Screenshots



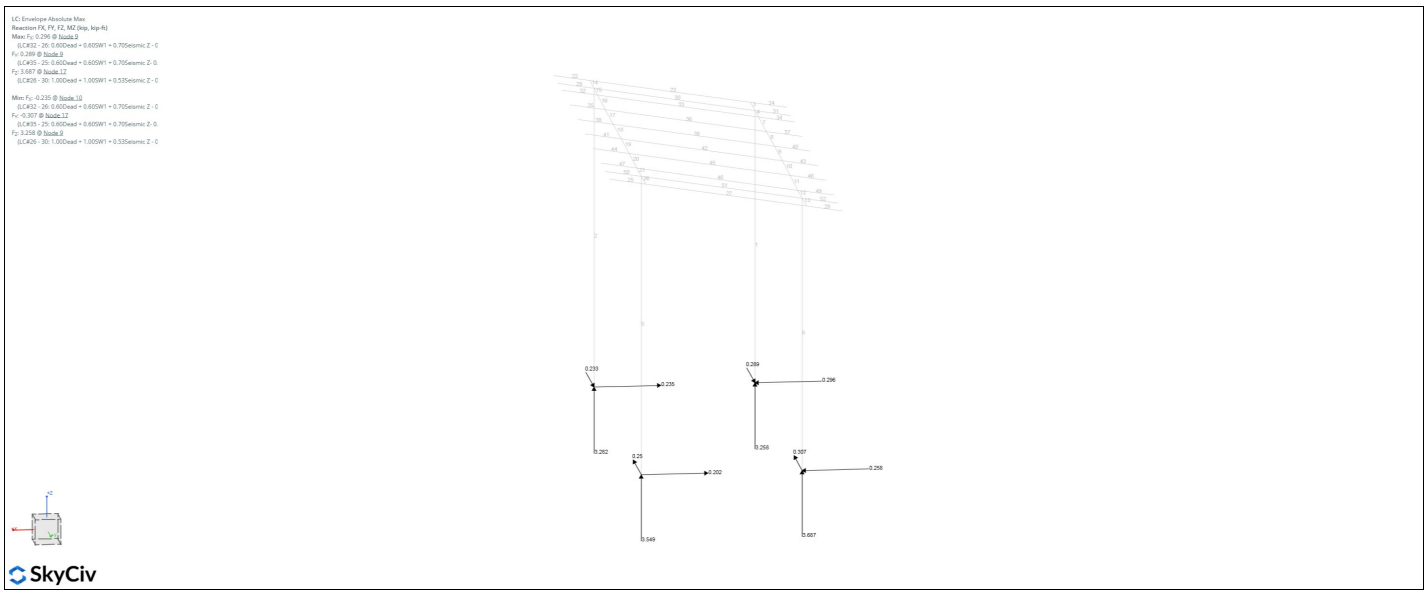
Max and Min Moments.jpg



Member Stress.jpg

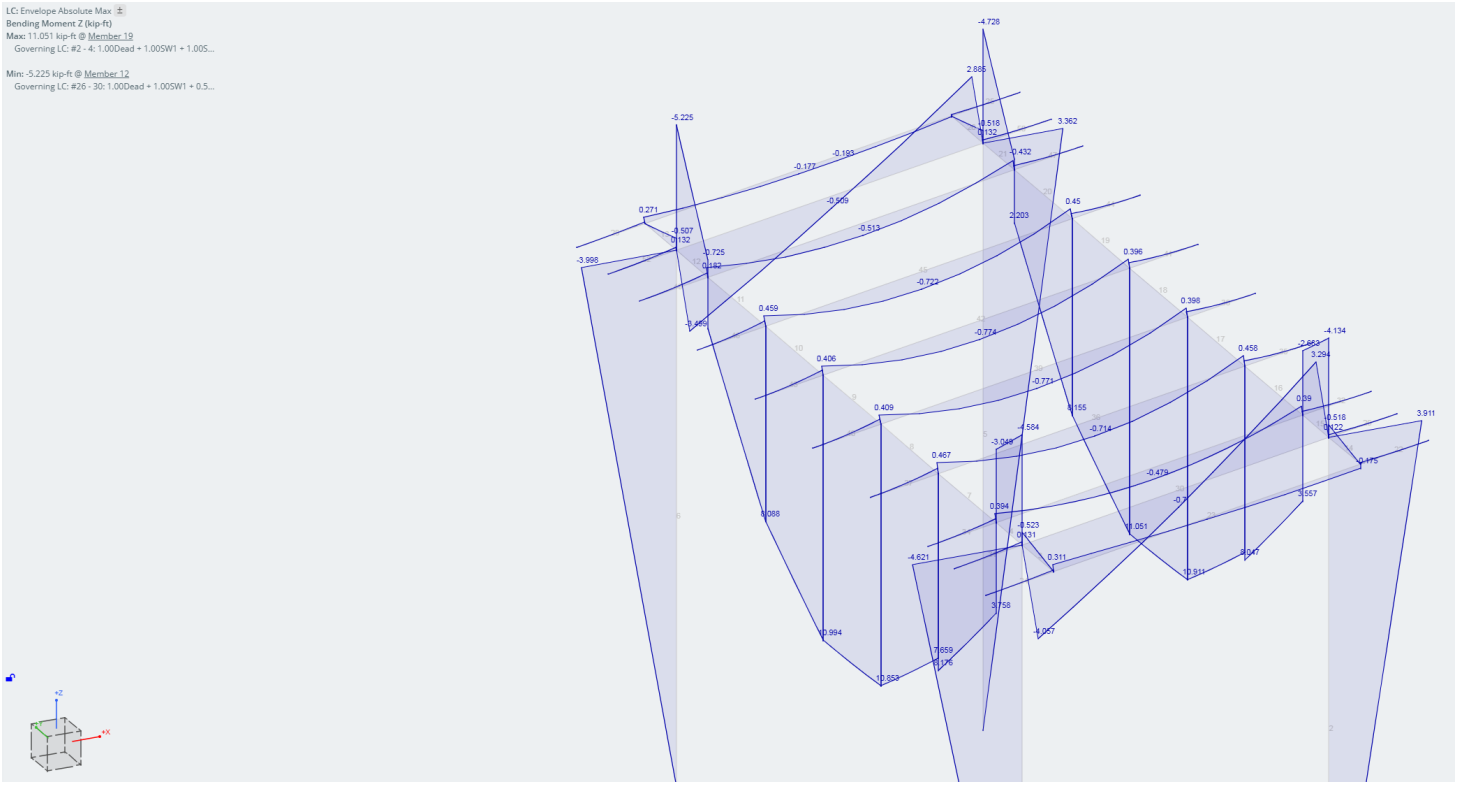


Min Envelope Load (Max Uplift).jpg



Max Envelope Reactions (down and side load).jpg

Moments with added cross beams



Project Details

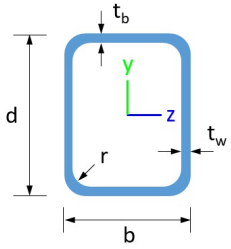
Design Code:	AISC 360-16 ASD
Provision:	ASD
Country:	United States
User Name:	scott@wibleengineering.com
Project Name:	Recycling Enclosure
Project ID:	00025-2026-05
Company:	Wible Engineering
Designer:	SLW
Client:	Arc Welding
Unit System:	imperial

Design Input Information

Design Factors			
Ω_t	Ω_c	Ω_b	Ω_v
1.67	1.67	1.67	1.67

Design Materials			
ID	E (ksi)	F_y (ksi)	F_u (ksi)
1	29000	36	58
8	29000	45.7	61.6

Section Dimensions



ID	Name	d (in)	b (in)	t_w (in)	t_b (in)	r (in)		
1	HSS10x4x1/4	10.00	4.00	0.23	0.23	0.23		
2	HSS6x2x1/8	6.00	2.00	0.12	0.12	0.12		
3	HSS4x4x3/8	4.00	4.00	0.35	0.35	0.35		

Section Properties								
ID	Name	A (in^2)	J (in^4)	I_{yp} (in^4)	I_{zp} (in^4)	I_w (in^6)	S_{yp} (in^3)	S_{zp} (in^3)
1	HSS10x4x1/4	6.17	47.40	17.70	74.70	35.54	10.00	19.00
2	HSS6x2x1/8	1.77	3.72	1.31	7.42	1.24	1.46	3.19
3	HSS4x4x3/8	4.78	17.50	10.30	10.30	0.05	6.39	6.39

Member Properties					
Member ID	Section ID	K_zL (ft)	K_yL (ft)	L_b(ft)	C_b
1	3	12.40	12.40	15.50	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1
2	3	13.60	13.60	17.00	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1

3	1	1.30	1.30	2.00	1.77,1.70,1.71,1.64,1.66,1.68,1.12,1.58,1.73,2.57,1.77,1.68,1.69,1.62,1.63,1.65,1.40,1.60,1.69,1.66,1
4	1	1.08	1.08	1.66	2.19,2.19,2.20,2.05,2.16,2.17,1.01,1.01,1.36,1.33,2.19,2.19,2.15,1.74,2.02,2.16,1.10,1.08,2.20,2.18,2
5	3	13.60	13.60	17.00	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1
6	3	12.40	12.40	15.50	1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1.67,1
7	1	2.39	2.39	3.67	1.47,1.48,1.16,1.45,1.49,1.51,1.00,1.00,1.25,1.25,1.47,1.48,1.77,1.34,1.51,1.52,1.32,1.33,1.46,1.48,1
8	1	2.39	2.39	3.67	1.12,1.13,1.08,1.12,1.13,1.13,1.07,1.06,1.07,1.07,1.12,1.13,1.15,2.20,1.13,1.13,2.05,2.18,1.13,1.13,1
9	1	2.38	2.38	3.66	1.00,1.00,1.01,1.00,1.00,1.00,1.20,1.18,1.04,1.04,1.00,1.00,1.02,1.64,1.00,1.00,1.45,1.40,1.00,1.00,1
10	1	2.39	2.39	3.67	1.11,1.12,1.06,1.10,1.11,1.11,1.78,1.68,1.19,1.19,1.11,1.12,1.14,1.53,1.11,1.11,1.17,1.16,1.11,1.12,1
11	1	2.39	2.39	3.67	1.40,1.41,1.44,1.47,1.43,1.41,1.60,1.66,1.86,1.83,1.40,1.41,1.38,2.28,1.46,1.42,1.10,1.09,1.42,1.42,1
12	1	1.30	1.30	2.00	2.25,2.25,1.85,2.03,2.20,2.25,1.17,1.16,1.50,1.51,2.25,2.25,1.36,1.47,2.17,2.24,1.04,1.06,2.24,2.23,2
13	1	1.30	1.30	2.00	1.77,1.69,1.71,1.64,1.65,1.68,2.60,1.52,1.74,2.03,1.77,1.68,1.69,1.62,1.62,1.65,1.45,1.59,1.69,1.66,1
14	1	1.30	1.30	2.00	1.76,1.68,1.60,1.54,1.21,1.89,1.73,1.69,1.69,1.68,1.76,1.67,1.67,1.60,1.49,2.02,1.68,1.67,1.68,1.82,1
15	1	1.08	1.08	1.66	2.21,2.21,1.74,1.18,2.14,2.22,1.06,1.13,1.45,1.53,2.21,2.21,1.59,1.71,1.08,2.23,1.13,1.17,2.23,2.26,2
16	1	2.39	2.39	3.67	1.46,1.47,1.21,2.21,1.31,1.44,1.03,1.07,1.27,1.28,1.46,1.47,1.75,1.69,1.73,1.43,1.39,1.57,1.45,1.44,1
17	1	2.39	2.39	3.67	1.12,1.13,1.11,1.24,1.11,1.12,1.05,1.02,1.07,1.07,1.12,1.13,1.14,1.14,1.77,1.12,2.26,1.90,1.13,1.13,1
18	1	2.38	2.38	3.66	1.00,1.00,1.01,1.13,1.00,1.00,1.16,1.13,1.03,1.03,1.00,1.00,1.03,1.02,1.69,1.00,1.33,1.21,1.00,1.00,1
19	1	2.39	2.39	3.67	1.11,1.11,1.09,1.22,1.10,1.11,1.56,1.41,1.18,1.17,1.11,1.12,1.12,1.12,1.72,1.11,1.14,1.08,1.11,1.11,1
20	1	2.39	2.39	3.67	1.40,1.40,1.34,1.94,1.34,1.39,1.77,2.14,1.76,1.74,1.40,1.41,1.45,1.47,2.23,1.38,1.05,1.00,1.40,1.40,1
21	1	1.30	1.30	2.00	2.27,2.27,1.73,1.72,2.12,2.29,1.21,1.26,1.57,1.59,2.27,2.27,2.14,2.16,1.52,2.25,1.01,1.09,2.25,2.24,2
22	2	4.26	4.26	2.03	2.33,2.33,2.33,2.34,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.27,2.32,2.33,2.32,2.32,2.33,2.33,2.33,2
23	2	5.93	5.93	9.12	1.16,1.13,2.31,2.35,2.28,1.17,1.92,2.11,1.31,1.82,1.16,1.13,2.16,2.23,2.45,1.20,2.04,2.17,1.62,1.77,1
24	2	4.26	4.26	2.03	2.33,2.33,2.32,2.33,2.32,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2
25	2	4.26	4.26	2.03	2.33,2.33,2.33,2.34,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.27,2.32,2.33,2.32,2.32,2.33,2.33,2.33,2
26	1	1.30	1.30	2.00	1.76,1.68,1.61,1.55,1.23,1.90,1.72,1.69,1.68,1.68,1.76,1.67,1.67,1.60,1.50,2.02,1.75,1.70,1.68,1.82,1
27	2	5.93	5.93	9.12	1.16,1.13,2.31,2.35,2.28,1.17,1.81,2.09,1.22,1.75,1.16,1.13,2.17,2.23,2.44,1.20,2.05,2.16,1.62,1.76,1
28	2	4.26	4.26	2.03	2.33,2.33,2.32,2.33,2.32,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2
29	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2
30	2	5.93	5.93	9.12	1.20,1.19,2.12,2.26,2.45,1.41,1.98,2.13,1.46,1.86,1.20,1.19,2.06,2.20,2.42,1.46,2.07,2.18,1.79,1.93,1
31	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2
32	2	4.26	4.26	2.03	2.33,2.33,2.32,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2.33,2.33,2
33	2	5.93	5.93	9.12	1.21,1.21,2.53,2.53,2.22,1.23,1.85,2.00,1.24,1.70,1.21,1.21,2.56,2.55,2.44,1.30,1.91,2.09,1.63,1.64,1
34	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2
35	2	4.26	4.26	2.03	2.33,2.33,2.36,2.33,2.32,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2
36	2	5.93	5.93	9.12	1.21,1.22,1.83,2.19,1.57,1.31,1.36,1.69,1.21,1.21,1.21,1.22,1.68,1.62,2.79,1.38,1.44,1.75,1.21,1.21,1
37	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2
38	2	4.26	4.26	2.03	2.33,2.33,2.25,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2
39	2	5.93	5.93	9.12	1.20,1.20,1.51,1.42,1.49,1.29,1.18,1.24,1.20,1.20,1.20,1.20,1.32,1.26,1.51,1.36,1.20,1.31,1.21,1.21,1
40	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2
41	2	4.26	4.26	2.03	2.33,2.33,2.25,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2
42	2	5.93	5.93	9.12	1.20,1.20,1.51,1.44,1.49,1.29,1.18,1.21,1.20,1.20,1.20,1.20,1.32,1.27,1.51,1.36,1.24,1.32,1.21,1.21,1
43	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2
44	2	4.26	4.26	2.03	2.33,2.33,2.36,2.33,2.32,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2
45	2	5.93	5.93	9.12	1.21,1.21,1.70,2.00,1.47,1.29,1.21,1.54,1.21,1.20,1.21,1.21,1.55,1.38,2.85,1.36,1.67,1.74,1.22,1.22,1
46	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2.33,2.33,2
47	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2
48	2	5.93	5.93	9.12	1.21,1.21,2.08,2.27,2.41,1.31,1.71,1.92,1.20,1.46,1.21,1.21,1.87,2.04,2.67,1.38,1.94,2.07,1.48,1.53,1
49	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.32,2.33,2.33,2.33,2.33,2.33,2

50	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.33,2
51	2	5.93	5.93	9.12	1.20,1.20,2.22,2.29,2.36,1.37,1.92,2.10,1.27,1.82,1.20,1.19,2.10,2.18,2.43,1.48,2.10,2.17,1.90,1.98,1
52	2	4.26	4.26	2.03	2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.33,2.32,2.33,2.32,2.68,2.33,2.33,2.33,2.32,2.33,2.33,2

Member Design Capacity

Member ID	P_n/Ω_t (kip)	P_n/Ω_c (kip)	M_{zn}/Ω_b (k-ft)	M_{yn}/Ω_b (k-ft)	$V_{yn}/\Omega v$ (kip)	V_{zn}/Ω_v (kip)
1	103.04	59.99	11.48	11.48	26.66	26.66
2	103.04	53.75	11.48	11.48	26.66	26.66
3	168.84	160.94	43.33	18.80	71.17	25.26
4	168.84	161.16	43.33	18.80	71.17	25.26
5	103.04	53.75	11.48	11.48	26.66	26.66
6	103.04	59.99	11.48	11.48	26.66	26.66
7	168.84	159.27	43.33	18.80	71.17	25.26
8	168.84	159.27	43.33	18.80	71.17	25.26
9	168.84	159.28	43.33	18.80	71.17	25.26
10	168.84	159.27	43.33	18.80	71.17	25.26
11	168.84	159.27	43.33	18.80	71.17	25.26
12	168.84	160.94	43.33	18.80	71.17	25.26
13	168.84	160.94	43.33	18.80	71.17	25.26
14	168.84	160.94	43.33	18.80	71.17	25.26
15	168.84	161.16	43.33	18.80	71.17	25.26
16	168.84	159.27	43.33	18.80	71.17	25.26
17	168.84	159.27	43.33	18.80	71.17	25.26
18	168.84	159.28	43.33	18.80	71.17	25.26
19	168.84	159.27	43.33	18.80	71.17	25.26
20	168.84	159.27	43.33	18.80	71.17	25.26
21	168.84	160.94	43.33	18.80	71.17	25.26
22	48.44	35.05	7.27	2.45	21.53	6.29
23	48.44	29.62	7.27	2.45	21.53	6.29
24	48.44	35.05	7.27	2.45	21.53	6.29
25	48.44	35.05	7.27	2.45	21.53	6.29
26	168.84	160.94	43.33	18.80	71.17	25.26
27	48.44	29.62	7.27	2.45	21.53	6.29
28	48.44	35.05	7.27	2.45	21.53	6.29
29	48.44	35.05	7.27	2.45	21.53	6.29
30	48.44	29.62	7.27	2.45	21.53	6.29
31	48.44	35.05	7.27	2.45	21.53	6.29
32	48.44	35.05	7.27	2.45	21.53	6.29
33	48.44	29.62	7.27	2.45	21.53	6.29
34	48.44	35.05	7.27	2.45	21.53	6.29
35	48.44	35.05	7.27	2.45	21.53	6.29
36	48.44	29.62	7.27	2.45	21.53	6.29
37	48.44	35.05	7.27	2.45	21.53	6.29
38	48.44	35.05	7.27	2.45	21.53	6.29
39	48.44	29.62	7.27	2.45	21.53	6.29

40	48.44	35.05	7.27	2.45	21.53	6.29
41	48.44	35.05	7.27	2.45	21.53	6.29
42	48.44	29.62	7.27	2.45	21.53	6.29
43	48.44	35.05	7.27	2.45	21.53	6.29
44	48.44	35.05	7.27	2.45	21.53	6.29
45	48.44	29.62	7.27	2.45	21.53	6.29
46	48.44	35.05	7.27	2.45	21.53	6.29
47	48.44	35.05	7.27	2.45	21.53	6.29
48	48.44	29.62	7.27	2.45	21.53	6.29
49	48.44	35.05	7.27	2.45	21.53	6.29
50	48.44	35.05	7.27	2.45	21.53	6.29
51	48.44	29.62	7.27	2.45	21.53	6.29
52	48.44	35.05	7.27	2.45	21.53	6.29

Design Ratio

Member ID	P	M_z	M_y	V_y	V_z	(P,M_z,M_y)	Worst LC	KL/r	δ	Status
1	0.054	0.400	0.390	0.011	0.011	0.792	#32	0.507	Not Required	Pass
2	0.061	0.349	0.345	0.009	0.009	0.680	#32	0.556	Not Required	Pass
3	0.000	0.019	0.004	0.006	0.001	0.023	#26	0.046	Not Required	Pass
4	0.002	0.114	0.008	0.033	0.003	0.121	#32	0.038	Not Required	Pass
5	0.066	0.299	0.371	0.008	0.009	0.664	#30	0.556	Not Required	Pass
6	0.061	0.348	0.415	0.010	0.012	0.781	#24	0.507	Not Required	Pass
7	0.002	0.190	0.010	0.024	0.003	0.198	#25	0.085	Not Required	Pass
8	0.002	0.250	0.014	0.013	0.001	0.261	#2	0.085	Not Required	Pass
9	0.002	0.254	0.014	0.006	0.001	0.265	#2	0.084	Not Required	Pass
10	0.002	0.254	0.016	0.014	0.001	0.264	#2	0.085	Not Required	Pass
11	0.002	0.187	0.016	0.024	0.002	0.195	#2	0.085	Not Required	Pass
12	0.002	0.128	0.017	0.034	0.008	0.136	#26	0.046	Not Required	Pass
13	0.003	0.018	0.005	0.006	0.001	0.022	#26	0.046	Not Required	Pass
14	0.000	0.019	0.004	0.006	0.001	0.021	#10	0.046	Not Required	Pass
15	0.002	0.102	0.009	0.033	0.003	0.104	#36	0.038	Not Required	Pass
16	0.002	0.185	0.012	0.024	0.003	0.192	#10	0.085	Not Required	Pass
17	0.002	0.252	0.016	0.013	0.001	0.263	#2	0.085	Not Required	Pass
18	0.002	0.255	0.015	0.005	0.001	0.267	#2	0.084	Not Required	Pass
19	0.002	0.255	0.016	0.014	0.001	0.267	#2	0.085	Not Required	Pass
20	0.002	0.189	0.019	0.023	0.003	0.197	#2	0.085	Not Required	Pass
21	0.002	0.115	0.019	0.032	0.010	0.119	#30	0.046	Not Required	Pass
22	0.000	0.010	0.000	0.003	0.000	0.010	#2	0.198	Not Required	Pass
23	0.002	0.164	0.028	0.015	0.002	0.180	#32	0.414	Not Required	Pass
24	0.000	0.010	0.000	0.003	0.000	0.010	#2	0.198	Not Required	Pass
25	0.000	0.010	0.000	0.003	0.000	0.010	#2	0.198	Not Required	Pass
26	0.003	0.017	0.006	0.005	0.001	0.019	#10	0.046	Not Required	Pass
27	0.001	0.146	0.035	0.014	0.003	0.178	#24	0.414	Not Required	Pass
28	0.000	0.010	0.000	0.003	0.000	0.010	#2	0.198	Not Required	Pass

29	0.001	0.017	0.000	0.006	0.000	0.017	#2	0.198	Not Required	Pass
30	0.009	0.244	0.032	0.023	0.003	0.265	#32	0.414	Not Required	Pass
31	0.000	0.018	0.000	0.006	0.000	0.018	#22	0.198	Not Required	Pass
32	0.001	0.024	0.000	0.008	0.000	0.024	#2	0.198	Not Required	Pass
33	0.004	0.148	0.035	0.021	0.003	0.172	#32	0.414	Not Required	Pass
34	0.001	0.024	0.000	0.008	0.000	0.024	#2	0.198	Not Required	Pass
35	0.001	0.032	0.000	0.011	0.000	0.032	#2	0.198	Not Required	Pass
36	0.003	0.109	0.031	0.024	0.003	0.109	#2	0.276	Not Required	Pass
37	0.001	0.032	0.000	0.011	0.000	0.032	#2	0.198	Not Required	Pass
38	0.001	0.032	0.000	0.011	0.000	0.032	#2	0.198	Not Required	Pass
39	0.003	0.114	0.028	0.024	0.002	0.114	#2	0.276	Not Required	Pass
40	0.001	0.032	0.000	0.011	0.000	0.032	#2	0.198	Not Required	Pass
41	0.001	0.032	0.000	0.011	0.000	0.032	#2	0.198	Not Required	Pass
42	0.003	0.115	0.024	0.024	0.002	0.115	#2	0.276	Not Required	Pass
43	0.001	0.032	0.000	0.011	0.000	0.032	#2	0.198	Not Required	Pass
44	0.001	0.032	0.000	0.011	0.000	0.032	#2	0.198	Not Required	Pass
45	0.003	0.110	0.034	0.024	0.003	0.112	#26	0.414	Not Required	Pass
46	0.001	0.032	0.000	0.011	0.000	0.032	#2	0.198	Not Required	Pass
47	0.001	0.025	0.000	0.008	0.000	0.025	#2	0.198	Not Required	Pass
48	0.009	0.127	0.044	0.021	0.004	0.170	#24	0.414	Not Required	Pass
49	0.001	0.025	0.000	0.008	0.000	0.025	#2	0.198	Not Required	Pass
50	0.001	0.018	0.000	0.006	0.000	0.018	#2	0.198	Not Required	Pass
51	0.005	0.221	0.039	0.022	0.003	0.259	#24	0.414	Not Required	Pass
52	0.000	0.018	0.000	0.006	0.000	0.018	#2	0.198	Not Required	Pass

Definitions

Ω_t	Safety factor for tensile
Ω_c	Safety factor for compression
Ω_b	Safety factor for flexure
Ω_v	Safety factor for shear
E	Modulus of elasticity
F_y	Specified minimum yield stress
F_u	Specified minimum tensile strength
A	Cross-sectional area
J	Torsional constant
I_{yp}	Moment of inertia about the Y axes
I_{zp}	Moment of inertia about the Z axes
I_w	Warping constant
S_{yp}	Plastic section modulus about the Y axis
S_{zp}	Plastic section modulus about the Z axis
KL	Effective length
C_b	Buckling modification factor (from all load combinations)
L_b	Length between braced points
LST	Limited slenderness for tension
LSC	Limited slenderness for compression
LD	Limited deflection
P_n	Nominal axial strength (tension/comression)
M_n	Nominal flexural strength (about Z/Y axis)
V_n	Nominal shear strength (along Z/Y axis)
P	Design ratio in case of axial force
M_z	Design ratio in case of bending about Z axis
M_y	Design ratio in case of bending about Y axis
V_y	Design ratio in case of shear along Y axis
V_z	Design ratio in case of shear along Z axis
(P,M_z,M_y)	Design ratio in case of axial force and bending action
KL/r	Design ratio in case of section slenderness
δ	Design ratio in case of member deflection
OK	Capacity is provided
NG	Capacity is not provided

LOAD CRITERIA:

DEAD LOAD:

ROOFING = 5 PSF

SELF WEIGHT = PER FEM MODEL...

TOTAL SEISMIC DL = 8.195 kips

S_{DS} = 1.01 g

R = 3.5

$C_s = \frac{S_{DS}}{R} I = \frac{1.01}{3.5} \times 1.0 = 0.2886$

$F_{x,y} = 0.2886 \times 8.2\,k = 2.37$ kips

$V/ft\ x = \frac{2.37k}{32ft} = 75.84$ plf (37.92 plf/side)

$V/ft\ y = \frac{2.37k}{21'} = 112.86$ plf

CHECK VERTICAL SEISMIC LOAD:

$E_v = 0.2 S_{DS} D = 0.2 \times 1.01 \times 8.195k$

$= 1.655$ kips

$E_v/sf = \frac{1.655k}{21' \times 32'} = 0.00246$ k/sf

SL = 25psf PER LEOR DRAWINGS

V_{wind} = 98mph PER ASCE HAZZARD MAP

WIND LOADS GENERATED IN FEM MODEL

QUICK DL CHECK:

5 psf x 32' x 21' = 3.36k

17.27 plf x (19.14' + 16.33') x 3 = 1.84k

6.46 plf x 21' x 10 = 1.36k

22.42 plf x 32' x 2 = 1.434k

= 8 kips Vdlc

MAX MOMENT @ COLUMN TOP WELD = 6.28 k-ft ASD

MAX MOMENT @ HSS 6x2x1/8 JOIST WELD TO HSS 4x10 BEAM = 2.337 k-ft

MAX MID COLUMN AXIAL LOAD: 6.482 kips ASD

MAX CORNER COLUMN AXIAL LOAD 3.393 kips ASD

MAX AXIAL TENSION FROM UPLIFT (WIND ↓) = 381 lbs ASD

MAX SHEAR FORCE = 370 lbs ASD

RECYCLING ENCLOSURE LOADS & CRITERIA

TOTAL DEAD LOAD: 4623 lbs

BASE SHEAR: $V = C_s W = \frac{S_{DS}}{R} W$

$= \frac{1.01\,g}{3.5} \times 4623\,lbs = 1334$ lbs EQ. UNIT

$\frac{V}{SF} = \frac{1334\,lbs}{13' \times 24'} = 4.27$ psf = 0.00427 ksf

QUICK DL CHECKS

SIDL = 5psf x 13' x 24' = 1560 #

HSS 4x4x3/8 = (15.5x2 + 17x2) x 17.27 plf = 1122 lbs

HSS 6x2x1/8 = 13' x 10 x 6.46 plf = 840 #

HSS 10x4x1/4 = 24' x 2 x 22.42 plf = 1076 #

DL TOTAL = 1076 + 840 + 1122 + 1560 = 4.6 kips

DISTRIBUTE LOADS AS POINT LOADS TO NODES

V/SIDE = 1.334k / 2 = 667 lbs PER NODE.

$E_v = \frac{0.2 \times 1.01 \times 4.6k}{13' \times 24'} = 0.00298$ k/sf

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Ftg & BASER CALCS:

BP-A MAX LOADS
(TRASH & RECYCLE)
- CORNER BP.

TRASH: DOWN MAX = 3.239 K ASD

$F_{x\,max}$ = **0.403K ASD**

$F_{y\,max}$ = 0.296K ASD

UPLIFT MAX = 68 lbs ASD

RECYCLE:

DOWN MAX = **3.687K ASD**

UPLIFT MAX = **0.597K ASD MAX**

$F_{x\,MAX}$ = 0.296K ASD

$F_{y\,max}$ = **0.307K ASD**

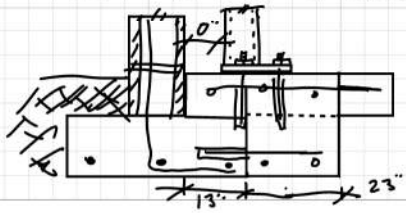
(E) FTG PER S2.23 TYP →

WALL HEIGHT = 8'8" MAX ∴

FTG WIDTH = 2'-10" @ CMU
& 12" THICK ... BOTTOM of
FTG = 18" BELOW GRADE...

S.O.G = 6" THICK...

6" + 12" = 18" ∴ DESIGN
FOOTING TO BE INTEGRAL
TO SLAB & CMU FTG.



ACCOUNT FOR ECCENTRIC LOAD →

e_x = FOOTING WIDTH / 2 + 11 in

Try 24" ftg → IN ENERCALC

P_m = 3.687K

e_x = 24"/2 + 11" = 23"

M_m = 3.687K × 23"/12" = 7.07K-FT

V_x = 0.597K ASD

V_y = 0.307K ASD

LOAD BREAKDOWN:

VERT: DL = 1.142 K
SL = 2.113 K
WL = 605 lbs UP
E_v = 0.252K UP
E_x = 1.184 K UP

HORIZ: 0.44K x
0.393K y

FOR BASER A → USE 5'x5'x12" ftg
W/ (7) #5 E.W. T&B → DOWEL INTO
(E) CMU FTG. & USE 12" + 4ftg
TO GET TO A 5' SQ ftg.
PER ENERCALC CALCS.

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Ftg + BASER

BP - B @ TRASH ENCLOSURE

P_a = 6.202k max ASD

P_{up} = 325 # max ASD

V_x max = 457 lbs ASD

V_y max = 310 lbs ASD

LOAD GROUPS:

DL = 1.773 kips

SL = 4.388 k

WIND = 2.408 k UP

E_v = 427 lbs UP

E_x = 844 lbs UP

V_y = 473 lbs

V_x = 481 lbs

GO WITH 4ft x 5ft FOOTING & USE 12" of CMU WALL

FOOTING (DOWEL IN)

W/ # 5 BARS @ 9" O.C. EA. WAY TOP + BOT ✓

WELDED CONNECTIONS:

HSS 4x4x3/8 COLUMN TO HSS 10x4x1/4

M_a max =

5.404 k-ft M_{xx} > WORST ENVELOPE LOADS

5.771 k-ft M_{yy}

→ CHECK MEMBER #4 LC #10

M_z = 3.4495 k-ft

M_y = 3.7032 k-ft

CHECK RECYCLING → MEMBER 1 LC # 32

M_x = 4.5956 k-ft

M_y = 4.31 k-ft CONTROLS!

CHECK WELD:

$S_{WELD} = bd + \frac{d^2}{3}$

$S_{xx} = 4.3125" \times 4" + \frac{4^2}{3} = 22.58 in^3/in$

$S_{yy} = 4.3125 \times 4 + \frac{4.3125^2}{3} = 23.45 in^3/in$

$F_{lb} = \frac{M_x}{S_x} + \frac{M_y}{S_y} = \frac{4.5956 \times 12}{22.58} + \frac{4.31 \times 12}{23.45}$

$= 4.65 k/in$

$D_{min} = \frac{4.65 k/in}{0.928 k/1/16"} = 5.0$

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PROJECT	Bradley Trash and Recycling Enclosures
DATE	4/10/26
PROJ #	00025-2026-05
DESIGN	SLW
SHEET	

WELDS CONT'D..

USE 5/16" FILLET WELD..

OR EQUIVALENT.

CALL OUT V BEVEL WELD

$5/8\,R \times 2 \times 1/4" = 5/16"$ (E)

√OK

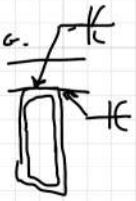
CHECK HSS 10x4x1/4 TO HSS C×2×1/8

M_x = 2.337K-Ft = 28 K-in CONTROLS TRASH

$M_{x\,RECYCLE}$ = 1.777K-Ft

$S_{WELD} = \frac{d^2}{3} = \frac{(2\frac{7}{8}")^2}{3} = 2.755\,in^3/in$

$F_b = \frac{M}{S} = \frac{28}{2.755} = 10.16$ → N.G.



ADD WELDS UNDER →

$S_{WELD} = bd + \frac{d^2}{3} = 2\times4" + 2.755 = 10.75\,in^3/in$

$F_b = \frac{28}{10.75\,in^3/in} = 2.6\,K/in$

$D_{min} = \frac{2.6K/in}{0.928} = 2.8$ →

(E) = 5/16 × 1/4 = TOO SMALL

→ ADD HSS 10×4×1/4 CROSS BEAMS TO RESOLVE MOMENT

ACTUAL DESIGN LOAD =

0.459 K-Ft = 5.51 K-in

$F_b = \frac{5.51}{2.758} = 2\,K/in$

$D_{min} = 2/0.928 = 2.155$

$T_{min} = \frac{3.19 \times 2.155}{58} = 0.118in$

USE HSS 6×2×1/8 JOISTS TYP

W/ SIMPLE 3/16" FILLET WELDS

CHECK CROSS BEAM WELDED CONN:

M_x = 5.225 K-Ft = 62.7K-in

$S = \frac{d^2}{3} = \frac{8.875^2}{3} = 26.3\,in^3/in$

$F_b = \frac{M}{S} = \frac{62.7}{26.3} = 2.38\,K/in$

$D_{min} = \frac{2.38}{0.928} = 2.57$ 1/16 in

CALL OUT 1/4" WELDS √OK

BASE DESIGN & LOADS:

RPA:

LOAD BREAKDOWN:

VERT: DL = 1.142 K

E_v = 0.252 K UP

E_x = 1.184 K UP

HORIZ: 0.44K x ×2 = 0.88K

W/ Ω_0 0.393K y ×2 = 0.786K Ω_0

VERT W/ Ω_0

$0.9D + E_{mh} = 1.142K \times 0.9 - (1.436) \times 2.0$

−1.844 K $F_p\,\Omega_0$ UPLIFT

LRFD W/ Ω_0

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Bradley Trash and Recycling Enclosures
PROJECT

4/10/26
DATE

00025-2026-05
PROJ #

SLW
DESIGN

SHEET

BASE PLATES CONT'D

BP B

LOAD GROUPS:

VERT $DL = 1.773$ kips

$E_v = 427$ lbs up

$E_x = 844$ lbs up

HORZ w/ Ω_0 $V_y = 473$ lbs $\times 2 =$ **946 #**

$V_x = 481$ lbs $=$ **962 #**

VERT w/ Ω_0: $0.9 \times 1.773k - (1.271k) \times 2$

$=$ **−946 lbs** $f_p \Omega_0$ UPLIFT

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General Footing

Project File: Enercalc Calcs.ec6

LIC# : KW-06019388, Build:20.26.04.01 Wible Engineering

DESCRIPTION: BP A Footing

Code References

Governing Code : IBC 2021
Referenced Design Standard(s) : ACI 318-19
Load Combinations Used : IBC 2021

Rho (or Omega) = 1.00

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.02	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	
Min. Overturning Safety Factor	=	1.50 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	Yes
Use Pedestal wt for stability, mom & shear	:	Yes

Soil Design Values

Allowable Soil Bearing	=	2.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	Yes	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

Footing base depth below soil surface	=	1.50	ft
Allow press. increase per foot of depth	=		ksf
when footing base is below	=		ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=		ksf
when max. length or width is greater than	=		ft

Dimensions

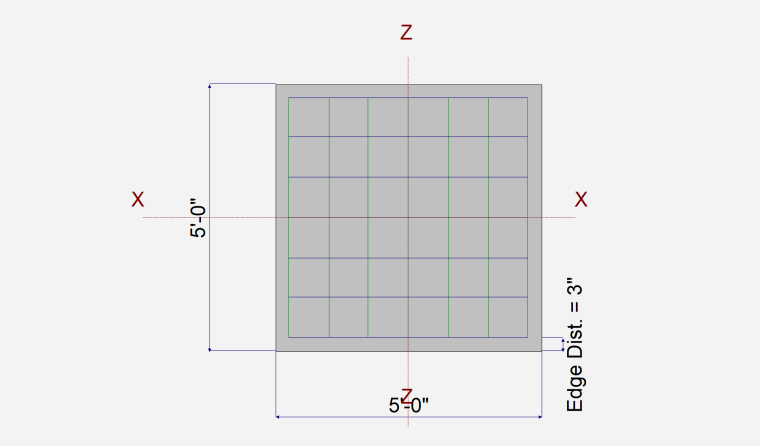
Width parallel to X-X Axis	=	5.0	ft
Length parallel to Z-Z Axis	=	5.0	ft
Footing Thickness	=	18.0	in

Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation		n/a
# Bars required within zone		n/a
# Bars required on each side of zone		n/a



Bottom Reinforcing

Bars parallel to X-X Axis (resisting Z Flexure)

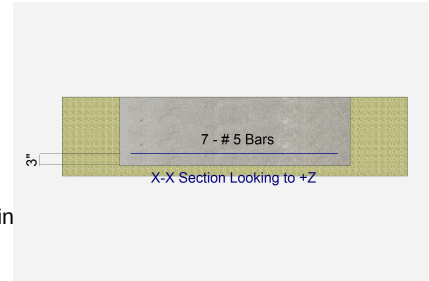
Number of Bars	=		7
Reinforcing Bar Size	=	#	5

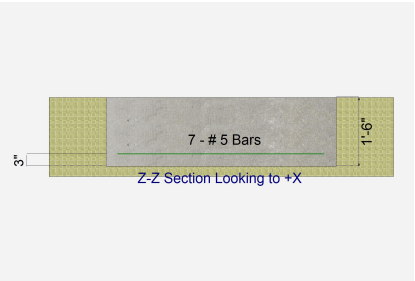
Bars parallel to Z-Z Axis (resisting X Flexure)

Number of Bars	=		7
Reinforcing Bar Size	=	#	5

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=		3.0 in





Top Reinforcing

Bars parallel to X-X Axis (resisting Z Flexure)

Number of Bars	=	7
Reinforcing Bar Size	=	5

Bars parallel to Z-Z Axis (resisting X Flexure)

Number of Bars	=	7
Reinforcing Bar Size	=	5

Rebar Centerline to Edge of Concrete...

at Top of footing	=	3.0 in

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General Footing

Project File: Enercalc Calcs.ec6

LIC# : KW-06019388, Build:20.26.04.01 Wible Engineering

DESCRIPTION: BP A Footing

Applied Loads

		D	Lr	L	S	W	E	H
P : Vertical Load	=	1.142	0.000	0.000	2.113	-0.605	-1.436	0.000 k
OB : Overburden	=	0.000	0.000	0.000	0.000	0.000	0.000	0.000 ksf
M-xx	=	3.520	0.000	0.000	6.510	0.000	0.000	0.000 k-ft
M-zz	=	3.520	0.000	0.000	6.510	0.000	0.000	0.000 k-ft
V-x	=	0.000	0.000	0.000	0.000	0.000	0.440	0.000 k
V-z	=	0.000	0.000	0.000	0.000	0.000	0.393	0.000 k

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.8672	Soil Bearing	1.923 ksf	2.218 ksf	+D+S
PASS	1.940	Overturning - X-X	10.520 k-ft	20.410 k-ft	+D+0.750S+0.5250E
PASS	1.935	Overturning - Z-Z	10.550 k-ft	20.410 k-ft	+D+0.750S+0.5250E
PASS	7.432	Sliding - X-X	0.3080 k	2.289 k	+0.60D+0.70E
PASS	8.321	Sliding - Z-Z	0.2751 k	2.289 k	+0.60D+0.70E
PASS	3.927	Uplift	-1.005 k	3.948 k	+0.60D+0.70E
PASS	0.2228	Z Flexure (+X) Bot Tens	6.342 k-ft/ft	28.464 k-ft/ft	+1.20D+1.60S+0.50W
PASS	0.01002	Z Flexure (-X) Bot Tens	0.2852 k-ft/ft	28.464 k-ft/ft	+1.20D+0.50S
PASS	0.896	Min Steel X Flexure Bottom	0.389 in2/ft	0.434 in2/ft	n/a
PASS	0.2227	X Flexure (+Z) Bot Tens	6.338 k-ft/ft	28.464 k-ft/ft	+1.20D+1.60S+0.50W
PASS	0.01002	X Flexure (-Z) Bot Tens	0.2852 k-ft/ft	28.464 k-ft/ft	+1.20D+0.50S
PASS	0.896	Min Steel Z Flexure Bottom	0.389 in2/ft	0.434 in2/ft	n/a
PASS	0.0	Z Flexure (+X) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS	0.01686	Z Flexure (-X) Top Tens	0.4798 k-ft/ft	28.464 k-ft/ft	+1.20D+1.60S+0.50W
PASS	0.896	Min Steel X Flexure Top	0.389 in2/ft	0.434 in2/ft	n/a
PASS	0.0	X Flexure (+Z) Top Tens	0 k-ft/ft	0.0 k-ft/ft	
PASS	0.01686	X Flexure (-Z) Top Tens	0.4798 k-ft/ft	28.464 k-ft/ft	+1.20D+1.60S+0.50W
PASS	0.896	Min Steel Z Flexure Top	0.389 in2/ft	0.434 in2/ft	n/a
PASS	0.3451	1-way Shear (+X)	15.209 psi	44.067 psi	+1.20D+1.60S+0.50W
PASS	0.03806	1-way Shear (-X)	1.677 psi	44.067 psi	+1.20D+1.60S+0.50W
PASS	0.3452	1-way Shear (+Z)	15.210 psi	44.067 psi	+1.20D+1.60S+0.50W
PASS	0.03868	1-way Shear (-Z)	1.704 psi	44.067 psi	+1.20D+1.60S+0.50W
PASS	0.03448	2-way Punching	5.666 psi	164.317 psi	+1.20D+1.60S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom Left	Top Left	Top Right	Bottom Right	Actual / Allow Ratio
, D Only								0.000
, 45.3 deg CCW	2.218	6.420	6.420	0.2635	0.0	0.2604	0.6185	0.279
, +D+S								0.000
, 45.3 deg CCW	2.218	13.846	13.846	0.07669	0.0	0.06051	1.923	0.867
, +D+0.750S								0.000
, 45.3 deg CCW	2.218	12.350	12.350	0.1937	0.0	0.1823	1.494	0.674
, +D+0.60W								0.000
, 45.3 deg CCW	2.218	6.795	6.795	0.2482	0.0	0.2450	0.6076	0.274
, +D+0.70E								0.000
, 44.8 deg CCW	2.218	8.572	8.466	0.2105	0.0	0.2143	0.6527	0.294
, +D+0.450W								0.000
, 45.3 deg CCW	2.218	6.697	6.697	0.2520	0.0	0.2489	0.6104	0.275
, +D+0.750S+0.450W								0.000
, 45.3 deg CCW	2.218	12.776	12.776	0.1623	0.0	0.1504	1.516	0.684
, +D+0.750S+0.5250E								0.000
, 45.0 deg CCW	2.218	14.168	14.108	0.02910	0.0	0.02910	1.702	0.768
, +0.60D+0.60W								0.000
, 45.3 deg CCW	2.218	7.070	7.070	0.1427	0.0	0.1407	0.3602	0.162
, +0.60D+0.70E								0.000
, 44.8 deg CCW	2.218	10.497	10.296	0.09746	0.0	0.1003	0.4250	0.192

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General Footing

Project File: Enercalc Calcs.ec6

LIC# : KW-06019388, Build:20.26.04.01 Wible Engineering

DESCRIPTION: BP A Footing

Overturning Stability

Rotation Axis & Load Combination...	Moment Sum About Negative Edge (k-ft) Overturning	Resisting	Ratio	Status	Moment Sum About Positive Edge (k-ft) Overturning	Resisting	Ratio	Status
X-X, D Only	None	19.97	Infinity	OK	3.52	16.45	4.673	OK
X-X, +D+S	None	31.76	Infinity	OK	10.03	21.73	2.167	OK
X-X, +D+0.750S	None	28.81	Infinity	OK	8.40	20.41	2.429	OK
X-X, +D+0.60W	0.91	19.97	22.004	OK	4.43	16.45	3.715	OK
X-X, +D+0.70E	2.51	20.28	8.069	OK	6.34	16.45	2.593	OK
X-X, +D+0.450W	0.68	19.97	29.339	OK	4.20	16.45	3.916	OK
X-X, +D+0.750S+0.450W	0.68	28.81	42.333	OK	9.08	20.41	2.247	OK
X-X, +D+0.750S+0.5250E	1.88	29.05	15.411	OK	10.52	20.41	1.940	OK
X-X, +0.60D+0.60W	0.91	11.98	13.202	OK	3.02	9.87	3.269	OK
X-X, +0.60D+0.70E	2.51	12.29	4.891	OK	4.93	9.87	2.000	OK
Z-Z, D Only	None	19.97	Infinity	OK	3.52	16.45	4.673	OK
Z-Z, +D+S	None	31.76	Infinity	OK	10.03	21.73	2.167	OK
Z-Z, +D+0.750S	None	28.81	Infinity	OK	8.40	20.41	2.429	OK
Z-Z, +D+0.60W	0.91	19.97	22.004	OK	4.43	16.45	3.715	OK
Z-Z, +D+0.70E	2.51	20.32	8.084	OK	6.38	16.45	2.578	OK
Z-Z, +D+0.450W	0.68	19.97	29.339	OK	4.20	16.45	3.916	OK
Z-Z, +D+0.750S+0.450W	0.68	28.81	42.333	OK	9.08	20.41	2.247	OK
Z-Z, +D+0.750S+0.5250E	1.88	29.07	15.425	OK	10.55	20.41	1.935	OK
Z-Z, +0.60D+0.60W	0.91	11.98	13.202	OK	3.02	9.87	3.269	OK
Z-Z, +0.60D+0.70E	2.51	12.33	4.906	OK	4.97	9.87	1.985	OK

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
X-X, D Only	0.0 k	3.380 k	999.0	OK
X-X, +D+S	0.0 k	4.014 k	999.0	OK
X-X, +D+0.750S	0.0 k	3.856 k	999.0	OK
X-X, +D+0.60W	0.0 k	3.271 k	999.0	OK
X-X, +D+0.70E	0.3080 k	3.079 k	9.995	OK
X-X, +D+0.450W	0.0 k	3.298 k	999.0	OK
X-X, +D+0.750S+0.450W	0.0 k	3.774 k	999.0	OK
X-X, +D+0.750S+0.5250E	0.2310 k	3.629 k	15.711	OK
X-X, +0.60D+0.60W	0.0 k	2.482 k	999.0	OK
X-X, +0.60D+0.70E	0.3080 k	2.289 k	7.432	OK
Z-Z, D Only	0.0 k	3.380 k	999.0	OK
Z-Z, +D+S	0.0 k	4.014 k	999.0	OK
Z-Z, +D+0.750S	0.0 k	3.856 k	999.0	OK
Z-Z, +D+0.60W	0.0 k	3.271 k	999.0	OK
Z-Z, +D+0.750S+0.5250E	0.2063 k	3.629 k	17.590	OK
Z-Z, +0.60D+0.60W	0.0 k	2.482 k	999.0	OK
Z-Z, +0.60D+0.70E	0.2751 k	2.289 k	8.321	OK
Z-Z, +D+0.70E	0.2751 k	3.079 k	11.191	OK
Z-Z, +D+0.450W	0.0 k	3.298 k	999.0	OK
Z-Z, +D+0.750S+0.450W	0.0 k	3.774 k	999.0	OK

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	1.355	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.40D	0.2675	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D	1.161	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D	0.2293	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50S	2.308	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50S	0.2852	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50W	1.128	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50W	0.1883	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+1.60S	6.183	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+1.60S+0.50W	6.338	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+W	1.093	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+W	0.1467	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50S+W	2.302	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50S+W	0.1567	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.20S+E	1.747	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +0.90D+W	0.8044	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +0.90D+W	0.08894	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +0.90D+E	0.9631	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK

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General Footing

Project File: Enercalc Calcs.ec6

DESCRIPTION: BP A Footing

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.40D	0.2675	-X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.40D	1.355	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D	0.2293	-X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D	1.162	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+0.50S	0.2852	-X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+0.50S	2.309	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+0.50W	0.1883	-X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+0.50W	1.128	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+1.60S	6.186	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+1.60S+0.50W	6.342	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+W	0.1467	-X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+W	1.094	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+0.50S+W	0.1567	-X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+0.50S+W	2.303	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+0.20S+E	1.747	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +0.90D+W	0.08894	-X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +0.90D+W	0.8047	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +0.90D+E	0.9626	+X	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.20D+1.60S	0.3940	-Z	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+1.60S+0.50W	0.4798	-Z	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.20S+E	0.02730	-Z	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +0.90D+E	0.08165	-Z	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+1.60S	0.3940	-X	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+1.60S+0.50W	0.4798	-X	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.20D+0.20S+E	0.02730	-X	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +0.90D+E	0.08165	-X	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.44 psi	3.16 psi	3.16 psi	44.07 psi	0.07	OK
+1.20D	0.38 psi	2.71 psi	2.71 psi	44.07 psi	0.06	OK
+1.20D+0.50S	0.35 psi	5.41 psi	5.41 psi	44.07 psi	0.12	OK
+1.20D+0.50W	0.29 psi	2.64 psi	2.64 psi	44.07 psi	0.06	OK
+1.20D+1.60S	1.55 psi	14.79 psi	14.79 psi	44.07 psi	0.34	OK
+1.20D+1.60S+0.50W	1.68 psi	15.21 psi	15.21 psi	44.07 psi	0.35	OK
+1.20D+W	0.19 psi	2.56 psi	2.56 psi	44.07 psi	0.06	OK
+1.20D+0.50S+W	0.05 psi	5.42 psi	5.42 psi	44.07 psi	0.12	OK
+1.20D+0.20S+E	0.31 psi	4.13 psi	4.13 psi	44.07 psi	0.09	OK
+0.90D+W	0.10 psi	1.89 psi	1.89 psi	44.07 psi	0.04	OK
+0.90D+E	0.33 psi	2.28 psi	2.28 psi	44.07 psi	0.05	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.42 psi	3.16 psi	3.16 psi	44.07 psi	0.07	OK
+1.20D	0.36 psi	2.71 psi	2.71 psi	44.07 psi	0.06	OK
+1.20D+0.50S	0.31 psi	5.41 psi	5.41 psi	44.07 psi	0.12	OK
+1.20D+0.50W	0.27 psi	2.64 psi	2.64 psi	44.07 psi	0.06	OK
+1.20D+1.60S	1.58 psi	14.79 psi	14.79 psi	44.07 psi	0.34	OK
+1.20D+1.60S+0.50W	1.70 psi	15.21 psi	15.21 psi	44.07 psi	0.35	OK
+1.20D+W	0.17 psi	2.56 psi	2.56 psi	44.07 psi	0.06	OK
+1.20D+0.50S+W	0.00 psi	5.42 psi	5.42 psi	44.07 psi	0.12	OK
+1.20D+0.20S+E	0.31 psi	4.13 psi	4.13 psi	44.07 psi	0.09	OK
+0.90D+W	0.08 psi	1.89 psi	1.89 psi	44.07 psi	0.04	OK
+0.90D+E	0.30 psi	2.28 psi	2.28 psi	44.07 psi	0.05	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	1.68 psi	164.32 psi	0.01	OK
+1.20D	1.44 psi	164.32 psi	0.01	OK
+1.20D+0.50S	2.63 psi	164.32 psi	0.02	OK
+1.20D+0.50W	1.12 psi	164.32 psi	0.01	OK
+1.20D+1.60S	5.67 psi	164.32 psi	0.03	OK
+1.20D+1.60S+0.50W	5.36 psi	164.32 psi	0.03	OK

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General Footing

Project File: Enercalc Calcs.ec6

DESCRIPTION: BP A Footing

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.20D+W	0.81 psi	164.32 psi	0.00	OK
+1.20D+0.50S+W	2.03 psi	164.32 psi	0.01	OK
+1.20D+0.20S+E	0.48 psi	164.32 psi	0.00	OK
+0.90D+W	0.45 psi	164.32 psi	0.00	OK
+0.90D+E	0.37 psi	164.32 psi	0.00	OK

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General Footing

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LIC# : KW-06019388, Build:20.26.04.01 Wible Engineering

DESCRIPTION: BP-B Footing at Trash Enclosure

Code References

Governing Code : IBC 2021
Referenced Design Standard(s) : ACI 318-19
Load Combinations Used : IBC 2021

Rho (or Omega) = 1.00

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.02	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	
Min. Overturning Safety Factor	=	1.50 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	Yes
Use Pedestal wt for stability, mom & shear	:	Yes

Soil Design Values

Allowable Soil Bearing	=	2.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	Yes	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

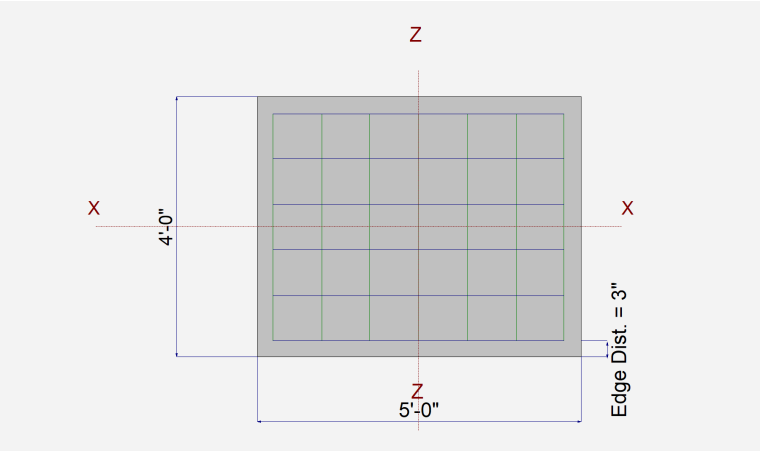
Footing base depth below soil surface	=	1.50	ft
Allow press. increase per foot of depth	=		ksf
when footing base is below	=		ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=		ksf
when max. length or width is greater than	=		ft

Dimensions

Width parallel to X-X Axis	=	5.0	ft
Length parallel to Z-Z Axis	=	4.0	ft
Footing Thickness	=	18.0	in
Load location offset from footing center...			
ex : Prll to X-X Axis	=	29	in
	=		in
Pedestal dimensions...			
px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in



Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation Bars along Z-Z Axis
Bars required within zone 88.9 %
Bars required on each side of zone 11.1 %

Bottom Reinforcing

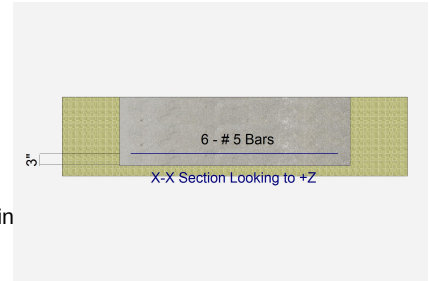
Bars parallel to X-X Axis (resisting Z Flexure)

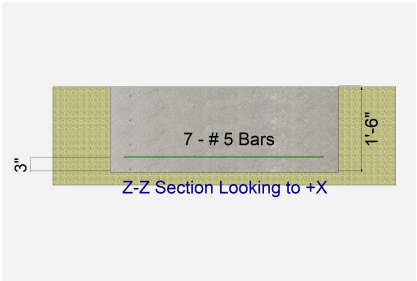
Number of Bars	=		6
Reinforcing Bar Size	=	#	5

Bars parallel to Z-Z Axis (resisting X Flexure)

Number of Bars	=		7
Reinforcing Bar Size	=	#	5

Rebar Centerline to Edge of Concrete...
at Bottom of footing = 3.0 in





Top Reinforcing

Bars parallel to X-X Axis (resisting Z Flexure)

Number of Bars	=	7
Reinforcing Bar Size	=	5

Bars parallel to Z-Z Axis (resisting X Flexure)

Number of Bars	=	7
Reinforcing Bar Size	=	5

Rebar Centerline to Edge of Concrete...
at Top of footing = 3.0 in

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General Footing

Project File: Enercalc Calcs.ec6

DESCRIPTION: BP-B Footing at Trash Enclosure

Applied Loads

		D	Lr	L	S	W	E	H
P : Vertical Load	=	1.773	0.000	0.000	4.388	-2.408	-1.271	0.000 k
OB : Overburden	=	0.000	0.000	0.000	0.000	0.000	0.000	0.000 ksf
M-xx	=	0.000	0.000	0.000	0.000	0.000	0.000	0.000 k-ft
M-zz	=	0.000	0.000	0.000	0.000	0.000	0.000	0.000 k-ft
V-x	=	0.000	0.000	0.000	0.000	0.000	0.481	0.000 k
V-z	=	0.000	0.000	0.000	0.000	0.000	0.473	0.000 k

DESIGN SUMMARY

Hand Calc Req'd

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7233	Soil Bearing	1.604 ksf	2.218 ksf	+D+S about Z-Z axis
PASS	2.543	Overturning - X-X	2.890 k-ft	7.350 k-ft	+0.60D+0.60W
PASS	1.655	Overturning - Z-Z	7.10 k-ft	11.760 k-ft	+0.60D+0.60W
PASS	2.543	Uplift	-1.445 k	3.674 k	+0.60D+0.60W
PASS	0.000241	Z Flexure (+X) Bot Tens	0.007344 k-ft/ft	30.434 k-ft/ft	+1.20D+1.60S
PASS	0.000248	Z Flexure (-X) Bot Tens	0.007551 k-ft/ft	30.434 k-ft/ft	+1.20D+1.60S
PASS	0.836	Min Steel X Flexure Bottom	0.389 in2/ft	0.465 in2/ft	n/a
PASS	0.03214	X Flexure (+Z) Bot Tens	0.9148 k-ft/ft	28.464 k-ft/ft	+1.20D+1.60S
PASS	0.03214	X Flexure (-Z) Bot Tens	0.9148 k-ft/ft	28.464 k-ft/ft	+1.20D+1.60S
PASS	0.896	Min Steel Z Flexure Bottom	0.389 in2/ft	0.434 in2/ft	n/a
PASS	.0000150	Z Flexure (+X) Top Tens	0.000523 k-ft/ft	35.320 k-ft/ft	+0.90D+W
PASS	0.005096	Z Flexure (-X) Top Tens	0.180 k-ft/ft	35.320 k-ft/ft	+0.90D+E
PASS	0.717	Min Steel X Flexure Top	0.389 in2/ft	0.543 in2/ft	n/a
PASS	0.002854	X Flexure (+Z) Top Tens	0.08123 k-ft/ft	28.464 k-ft/ft	+0.90D+W
PASS	0.002854	X Flexure (-Z) Top Tens	0.08123 k-ft/ft	28.464 k-ft/ft	+0.90D+W
PASS	0.896	Min Steel Z Flexure Top	0.389 in2/ft	0.434 in2/ft	n/a
PASS	n/a	1-way Shear (+X)	0.0 psi	45.093 psi	n/a
PASS	n/a	1-way Shear (-X)	0.8318 psi	45.093 psi	+1.20D+0.50S
PASS	0.04383	1-way Shear (+Z)	1.931 psi	44.067 psi	+1.20D+1.60S
PASS	0.04383	1-way Shear (-Z)	1.931 psi	44.067 psi	+1.20D+1.60S
		2-way Punching	**Hand check required due to small edge distances.**		

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	2.218	n/a	0.0	0.3062	0.3062	n/a	n/a	0.138
X-X, +D+S	2.218	n/a	0.0	0.5256	0.5256	n/a	n/a	0.237
X-X, +D+0.750S	2.218	n/a	0.0	0.4707	0.4707	n/a	n/a	0.212
X-X, +D+0.60W	2.218	n/a	0.0	0.2339	0.2339	n/a	n/a	0.106
X-X, +D+0.70E	2.218	n/a	1.139	0.2248	0.2985	n/a	n/a	0.135
X-X, +D+0.450W	2.218	n/a	0.0	0.2520	0.2520	n/a	n/a	0.114
X-X, +D+0.750S+0.450W	2.218	n/a	0.0	0.4165	0.4165	n/a	n/a	0.188
X-X, +D+0.750S+0.5250E	2.218	n/a	0.5110	0.4097	0.4650	n/a	n/a	0.210
X-X, +0.60D+0.60W	2.218	n/a	0.0	0.1115	0.1115	n/a	n/a	0.050
X-X, +0.60D+0.70E	2.218	n/a	2.141	0.1023	0.1761	n/a	n/a	0.079
Z-Z, D Only	2.218	8.397	n/a	n/a	n/a	0.05164	0.5607	0.253
Z-Z, +D+S	2.218	16.998	n/a	n/a	n/a	0.0	1.604	0.723
Z-Z, +D+0.750S	2.218	15.60	n/a	n/a	n/a	0.0	1.298	0.585
Z-Z, +D+0.60W	2.218	2.035	n/a	n/a	n/a	0.1868	0.2810	0.127
Z-Z, +D+0.70E	2.218	6.053	n/a	n/a	n/a	0.1049	0.4185	0.189
Z-Z, +D+0.450W	2.218	3.967	n/a	n/a	n/a	0.1530	0.3509	0.158
Z-Z, +D+0.750S+0.450W	2.218	13.857	n/a	n/a	n/a	0.0	1.026	0.463
Z-Z, +D+0.750S+0.5250E	2.218	15.097	n/a	n/a	n/a	0.0	1.166	0.526
Z-Z, +0.60D+0.60W	2.218	-4.957	n/a	n/a	n/a	0.1661	0.05676	0.075
Z-Z, +0.60D+0.70E	2.218	3.990	n/a	n/a	n/a	0.08421	0.1942	0.088

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General Footing

Project File: Enercalc Calcs.ec6

LIC# : KW-06019388, Build:20.26.04.01 Wible Engineering

DESCRIPTION: BP-B Footing at Trash Enclosure

Overturning Stability

Rotation Axis & Load Combination...	Moment Sum About Negative Edge (k-ft)				Moment Sum About Positive Edge (k-ft)			
	Overturning	Resisting	Ratio	Status	Overturning	Resisting	Ratio	Status
X-X, D Only	None	12.25	Infinity	OK	None	12.25	Infinity	OK
X-X, +D+S	None	21.02	Infinity	OK	None	21.02	Infinity	OK
X-X, +D+0.750S	None	18.83	Infinity	OK	None	18.83	Infinity	OK
X-X, +D+0.60W	2.89	12.25	4.238	OK	2.89	12.25	4.238	OK
X-X, +D+0.70E	1.78	12.74	7.161	OK	2.28	12.25	5.380	OK
X-X, +D+0.450W	2.17	12.25	5.651	OK	2.17	12.25	5.651	OK
X-X, +D+0.750S+0.450W	2.17	18.83	8.688	OK	2.17	18.83	8.688	OK
X-X, +D+0.750S+0.5250E	1.33	19.20	14.387	OK	1.71	18.83	11.030	OK
X-X, +0.60D+0.60W	2.89	7.35	2.543	OK	2.89	7.35	2.543	OK
X-X, +0.60D+0.70E	1.78	7.84	4.408	OK	2.28	7.35	3.228	OK
Z-Z, D Only	None	19.59	Infinity	OK	None	11.02	Infinity	OK
Z-Z, +D+S	None	41.17	Infinity	OK	None	11.39	Infinity	OK
Z-Z, +D+0.750S	None	35.77	Infinity	OK	None	11.30	Infinity	OK
Z-Z, +D+0.60W	7.10	19.59	2.758	OK	0.12	11.02	91.551	OK
Z-Z, +D+0.70E	4.37	20.10	4.594	OK	0.58	11.02	19.031	OK
Z-Z, +D+0.450W	5.33	19.59	3.677	OK	0.09	11.02	122.068	OK
Z-Z, +D+0.750S+0.450W	5.33	35.77	6.715	OK	0.09	11.30	125.105	OK
Z-Z, +D+0.750S+0.5250E	3.28	36.15	11.019	OK	0.43	11.30	26.006	OK
Z-Z, +0.60D+0.60W	7.10	11.76	1.655	OK	0.12	6.61	54.931	OK
Z-Z, +0.60D+0.70E	4.37	12.26	2.803	OK	0.58	6.61	11.419	OK

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	0.2482	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.40D	0.2482	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D	0.2128	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D	0.2128	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50S	0.4322	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50S	0.4322	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50W	0.09236	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50W	0.09236	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+1.60S	0.9148	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+1.60S	0.9148	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+1.60S+0.50W	0.7944	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+1.60S+0.50W	0.7944	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50S+W	0.1914	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.50S+W	0.1914	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.20S+E	0.2444	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+0.20S+E	0.1025	-Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +0.90D+E	0.1034	+Z	Bottom	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
Z-Z, +1.40D	0.001748	-X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.40D	0.001598	+X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D	0.001499	-X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D	0.001370	+X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+0.50S	0.002961	-X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+0.50S	0.002874	+X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+0.50W	0.000651	-X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+0.50W	0.000595	+X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+1.60S	0.007551	-X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+1.60S	0.007344	+X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+1.60S+0.50W	0.005890	-X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+1.60S+0.50W	0.006081	+X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+0.50S+W	0.001348	-X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+0.50S+W	0.001232	+X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +1.20D+0.20S+E	0.001259	+X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK
Z-Z, +0.90D+E	0.000352	+X	Bottom	0.3888	ACI 7.6.1.1	0.4650	30.434	OK

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.20D+W	0.02804	+Z	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +1.20D+W	0.02804	-Z	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +0.90D+W	0.08123	+Z	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +0.90D+W	0.08123	-Z	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK
X-X, +0.90D+E	0.03847	-Z	Top	0.3888	ACI 7.6.1.1	0.4340	28.464	OK

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General Footing

Project File: Enercalc Calcs.ec6

DESCRIPTION: BP-B Footing at Trash Enclosure

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.20D+W	0.000198	-X	Top	0.3888	ACI 7.6.1.1	0.5425	35.320	OK
Z-Z, +1.20D+W	0.000181	+X	Top	0.3888	ACI 7.6.1.1	0.5425	35.320	OK
Z-Z, +1.20D+0.20S+E	0.1790	-X	Top	0.3888	ACI 7.6.1.1	0.5425	35.320	OK
Z-Z, +0.90D+W	0.000572	-X	Top	0.3888	ACI 7.6.1.1	0.5425	35.320	OK
Z-Z, +0.90D+W	0.000523	+X	Top	0.3888	ACI 7.6.1.1	0.5425	35.320	OK
Z-Z, +0.90D+E	0.180	-X	Top	0.3888	ACI 7.6.1.1	0.5425	35.320	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.55 psi	0.00 psi	0.55 psi	45.09 psi	0.01	OK
+1.20D	0.47 psi	0.00 psi	0.47 psi	45.09 psi	0.01	OK
+1.20D+0.50S	0.83 psi	0.00 psi	0.83 psi	45.09 psi	0.02	OK
+1.20D+0.50W	0.20 psi	0.00 psi	0.20 psi	45.09 psi	0.00	OK
+1.20D+1.60S	0.35 psi	0.00 psi	0.35 psi	45.09 psi	0.01	OK
+1.20D+1.60S+0.50W	0.60 psi	0.00 psi	0.60 psi	45.09 psi	0.01	OK
+1.20D+W	0.06 psi	0.00 psi	0.06 psi	45.09 psi	0.00	OK
+1.20D+0.50S+W	0.42 psi	0.00 psi	0.42 psi	45.09 psi	0.01	OK
+1.20D+0.20S+E	0.14 psi	0.00 psi	0.14 psi	45.09 psi	0.00	OK
+0.90D+W	0.18 psi	0.00 psi	0.18 psi	45.09 psi	0.00	OK
+0.90D+E	0.17 psi	0.00 psi	0.17 psi	45.09 psi	0.00	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.52 psi	0.52 psi	0.52 psi	44.07 psi	0.01	OK
+1.20D	0.45 psi	0.45 psi	0.45 psi	44.07 psi	0.01	OK
+1.20D+0.50S	0.91 psi	0.91 psi	0.91 psi	44.07 psi	0.02	OK
+1.20D+0.50W	0.20 psi	0.20 psi	0.20 psi	44.07 psi	0.00	OK
+1.20D+1.60S	1.93 psi	1.93 psi	1.93 psi	44.07 psi	0.04	OK
+1.20D+1.60S+0.50W	1.68 psi	1.68 psi	1.68 psi	44.07 psi	0.04	OK
+1.20D+W	0.06 psi	0.06 psi	0.06 psi	44.07 psi	0.00	OK
+1.20D+0.50S+W	0.40 psi	0.40 psi	0.40 psi	44.07 psi	0.01	OK
+1.20D+0.20S+E	0.18 psi	0.55 psi	0.55 psi	44.07 psi	0.01	OK
+0.90D+W	0.17 psi	0.17 psi	0.17 psi	44.07 psi	0.00	OK
+0.90D+E	0.11 psi	0.25 psi	0.25 psi	44.07 psi	0.01	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00	OK
+1.20D	0.00 psi	0.00 psi	0.00	OK
+1.20D+0.50S	0.00 psi	0.00 psi	0.00	OK
+1.20D+0.50W	0.00 psi	0.00 psi	0.00	OK
+1.20D+1.60S	0.00 psi	0.00 psi	0.00	OK
+1.20D+1.60S+0.50W	0.00 psi	0.00 psi	0.00	OK
+1.20D+W	0.00 psi	0.00 psi	0.00	OK
+1.20D+0.50S+W	0.00 psi	0.00 psi	0.00	OK
+1.20D+0.20S+E	0.00 psi	0.00 psi	0.00	OK
+0.90D+W	0.00 psi	0.00 psi	0.00	OK
+0.90D+E	0.00 psi	0.00 psi	0.00	OK

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Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Concrete - Apr 10, 2026	Date:	4/11/2026
Fastening point:			

Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-HY 200 V3 + HAS-V-36 (ASTM F1554 Gr.36) 1/2**
Item number:	not available (element) / 2334276 HIT-HY 200-R V3 (adhesive)
Specification text:	HILTI ∅ 1/2 IN HIT-HY 200 V3 + HAS-V-36 (ASTM F1554 GR.36) WITH 8.5 IN NOMINAL EMBEDMENT DEPTH PER ICC-ES ESR-4868 , HAMMER DRILL BIT INSTALLATION PER MPII
Effective embedment depth:	$h_{ef,act}$ = 8.500 in. ($h_{ef,limit}$ = - in.)
Material:	ASTM F1554 Grade 36
Evaluation Service Report:	ESR-4868
Issued I Valid:	11/1/2024 | 11/1/2026
Proof:	Design Method ACI 318-19 / Chem
Shear edge breakout verification:	Row closest to edge (Case 3 only from ACI 318-19 Fig. R.17.7.2.1b)
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.625 in.
Anchor plate[R] :	l_x x l_y x t = 7.000 in. x 7.000 in. x 0.625 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS4X4X.375; (L x W x T) = 4.000 in. x 4.000 in. x 0.375 in.
Base material:	cracked concrete, 3000, f_c' = 3,000 psi; h = 18.000 in., Temp. short/long: 32/32 °F
Installation:	**Hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: present, shear: not present; no supplemental splitting reinforcement present edge reinforcement: > No. 4 bar
Seismic loads (cat. C, D, E, or F)	Tension load: yes (17.10.5.3 (d)) Shear load: yes (17.10.6.3 (c))

[R] - The anchor calculation is based on a rigid anchor plate assumption.

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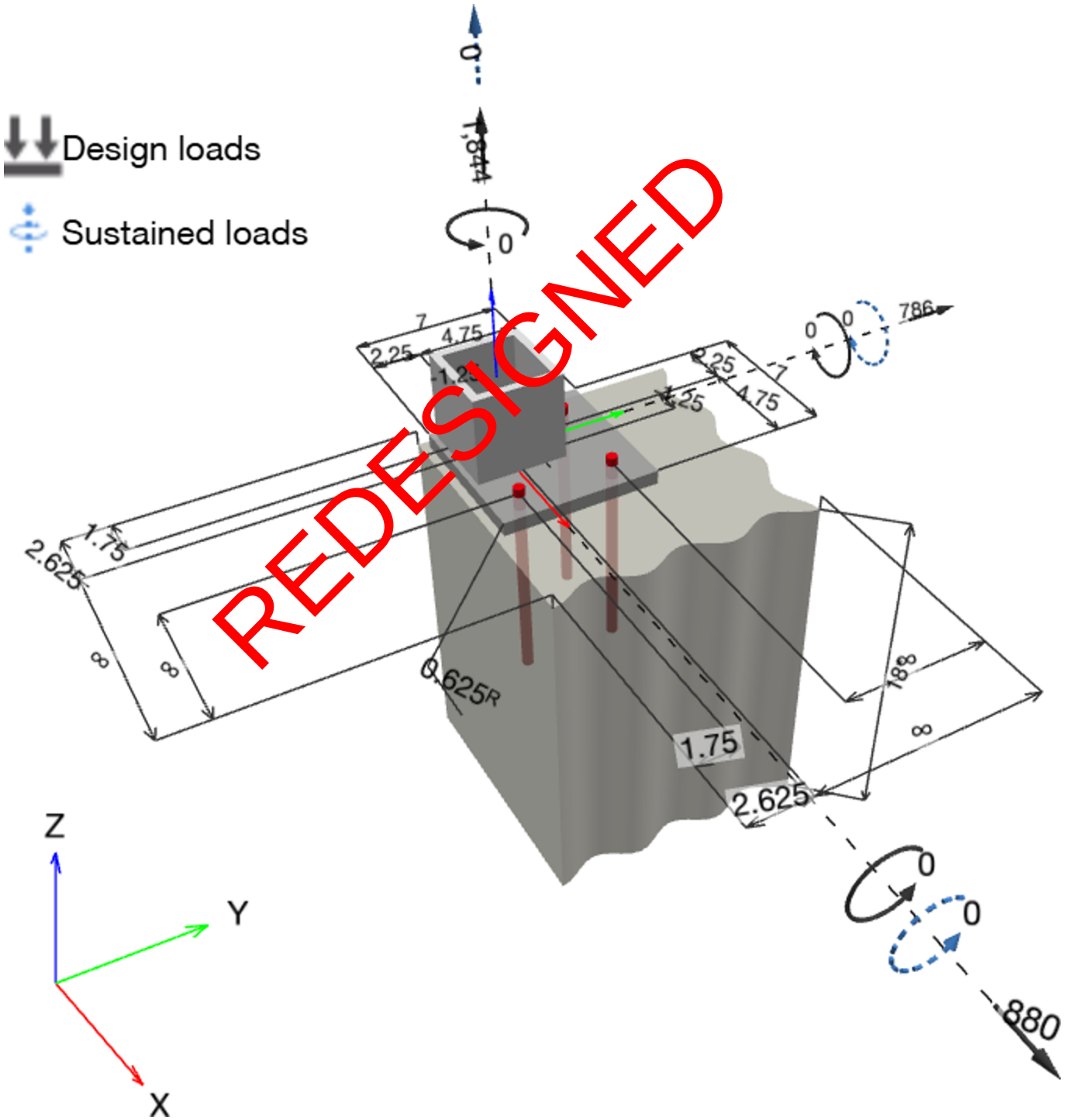
Geometry [in.] & Loading [lb, in.lb]



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Address:		Specifier:	
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Design:	Concrete - Apr 10, 2026	Date:	4/11/2026
Fastening point:			

1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 1,844; V_x = 880; V_y = 786; M_x = 0; M_y = 0; M_z = 0;	yes	87

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Design:	Concrete - Apr 10, 2026	Date:	4/11/2026
Fastening point:			

2 Proof I Utilization (Governing Cases)

		Design values [lb]		Utilization	
Loading	**Proof**	**Load**	**Capacity**	**β_N / β_V [%]**	**Status**
Tension	Bond Strength	2,695	4,091	66 / -	OK
Shear	Concrete edge failure in direction y-	880	1,598	- / 56	OK

Loading	**β_N**	**β_V**	**ζ**	**Utilization $\beta_{N,V}$ [%]**	**Status**
Combined tension and shear loads	0.659	0.551	5/3	87	OK

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

4 Remarks; Your Cooperation Duties

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- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

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Design:	Copy - Concrete - Apr 10, 2026	Date:	4/11/2026
Fastening point:			

Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-HY 200 V3 + HAS-V-36 (ASTM F1554 Gr.36) 1/2**
Item number:	not available (element) / 2334276 HIT-HY 200-R V3 (adhesive)
Specification text:	HILTI ∅ 1/2 IN HIT-HY 200 V3 + HAS-V-36 (ASTM F1554 GR.36) WITH 8.5 IN NOMINAL EMBEDMENT DEPTH PER ICC-ES ESR-4868 , HAMMER DRILL BIT INSTALLATION PER MPII
Effective embedment depth:	$h_{ef,act}$ = 8.500 in. ($h_{ef,limit}$ = - in.)
Material:	ASTM F1554 Grade 36
Evaluation Service Report:	ESR-4868
Issued I Valid:	11/1/2024 | 11/1/2026
Proof:	Design Method ACI 318-19 / Chem
Shear edge breakout verification:	Row closest to edge (Case 3 only from ACI 318-19 Fig. R.17.7.2.1b)
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.625 in.
Anchor plate[R] :	l_x x l_y x t = 7.000 in. x 9.500 in. x 0.625 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS4X4X.375; (L x W x T) = 4.000 in. x 4.000 in. x 0.375 in.
Base material:	cracked concrete, 3000, f_c' = 3,000 psi; h = 18.000 in., Temp. short/long: 32/32 °F
Installation:	**Hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: present, shear: present; no supplemental splitting reinforcement present edge reinforcement: > No. 4 bar
Seismic loads (cat. C, D, E, or F)	Tension load: yes (17.10.5.3 (d)) Shear load: yes (17.10.6.3 (c))

[R] - The anchor calculation is based on a rigid anchor plate assumption.

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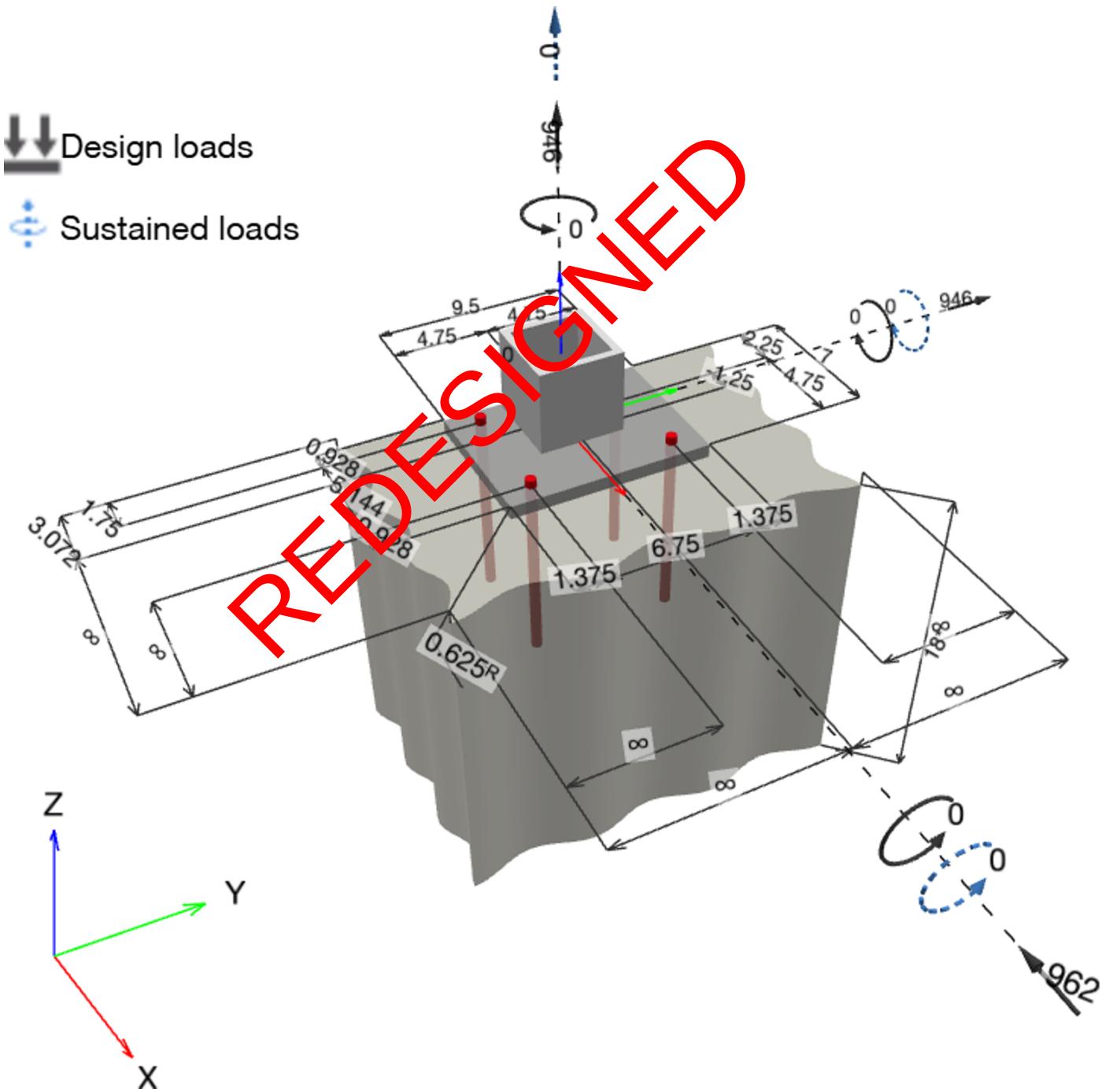
Geometry [in.] & Loading [lb, in.lb]



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Design:	Copy - Concrete - Apr 10, 2026	Date:	4/11/2026
Fastening point:			

1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 946; V_x = -962; V_y = 946; M_x = 0; M_y = 0; M_z = 0;	yes	96

Company:		Page:	4
Address:		Specifier:	
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Design:	Copy - Concrete - Apr 10, 2026	Date:	4/11/2026
Fastening point:			

2 Proof I Utilization (Governing Cases)

		Design values [lb]		Utilization	
Loading	**Proof**	**Load**	**Capacity**	**β_N / β_V [%]**	**Status**
Tension	Bond Strength	946	7,100	14 / -	OK
Shear	Concrete edge failure in direction x-	1,349	1,414	- / 96	OK

Loading	**β_N**	**β_V**	**ζ**	**Utilization $\beta_{N,V}$ [%]**	**Status**
Combined tension and shear loads	0.133	0.954	1.000	91	OK

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

4 Remarks; Your Cooperation Duties

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Company:		Page:	1
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	BP A - Corner Revised	Date:	4/15/2026
Fastening point:	BA - Corner		

Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-HY 200 V3 + HAS-V-36 (ASTM F1554 Gr.36) 1/2**
Item number:	not available (element) / 2334276 HIT-HY 200-R V3 (adhesive)
Specification text:	HILTI ∅ 1/2 IN HIT-HY 200 V3 + HAS-V-36 (ASTM F1554 GR.36) WITH 8.5 IN NOMINAL EMBEDMENT DEPTH PER ICC-ES ESR-4868 , HAMMER DRILL BIT INSTALLATION PER MPII
Effective embedment depth:	$h_{ef,act}$ = 8.500 in. ($h_{ef,limit}$ = - in.)
Material:	ASTM F1554 Grade 36
Evaluation Service Report:	ESR-4868
Issued I Valid:	11/1/2024 | 11/1/2026
Proof:	Design Method ACI 318-19 / Chem
Shear edge breakout verification:	Row closest to edge (Case 3 only from ACI 318-19 Fig. R.17.7.2.1b)
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.625 in.
Anchor plate[R] :	l_x x l_y x t = 10.000 in. x 10.000 in. x 0.625 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS4X4X.375; (L x W x T) = 4.000 in. x 4.000 in. x 0.375 in.
Base material:	cracked concrete, 3000, f_c' = 3,000 psi; h = 18.000 in., Temp. short/long: 32/32 °F
Installation:	**Hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: present, shear: not present; no supplemental splitting reinforcement present edge reinforcement: > No. 4 bar
Seismic loads (cat. C, D, E, or F)	Tension load: yes (17.10.5.3 (d)) Shear load: yes (17.10.6.3 (c))

[R] - The anchor calculation is based on a rigid anchor plate assumption.

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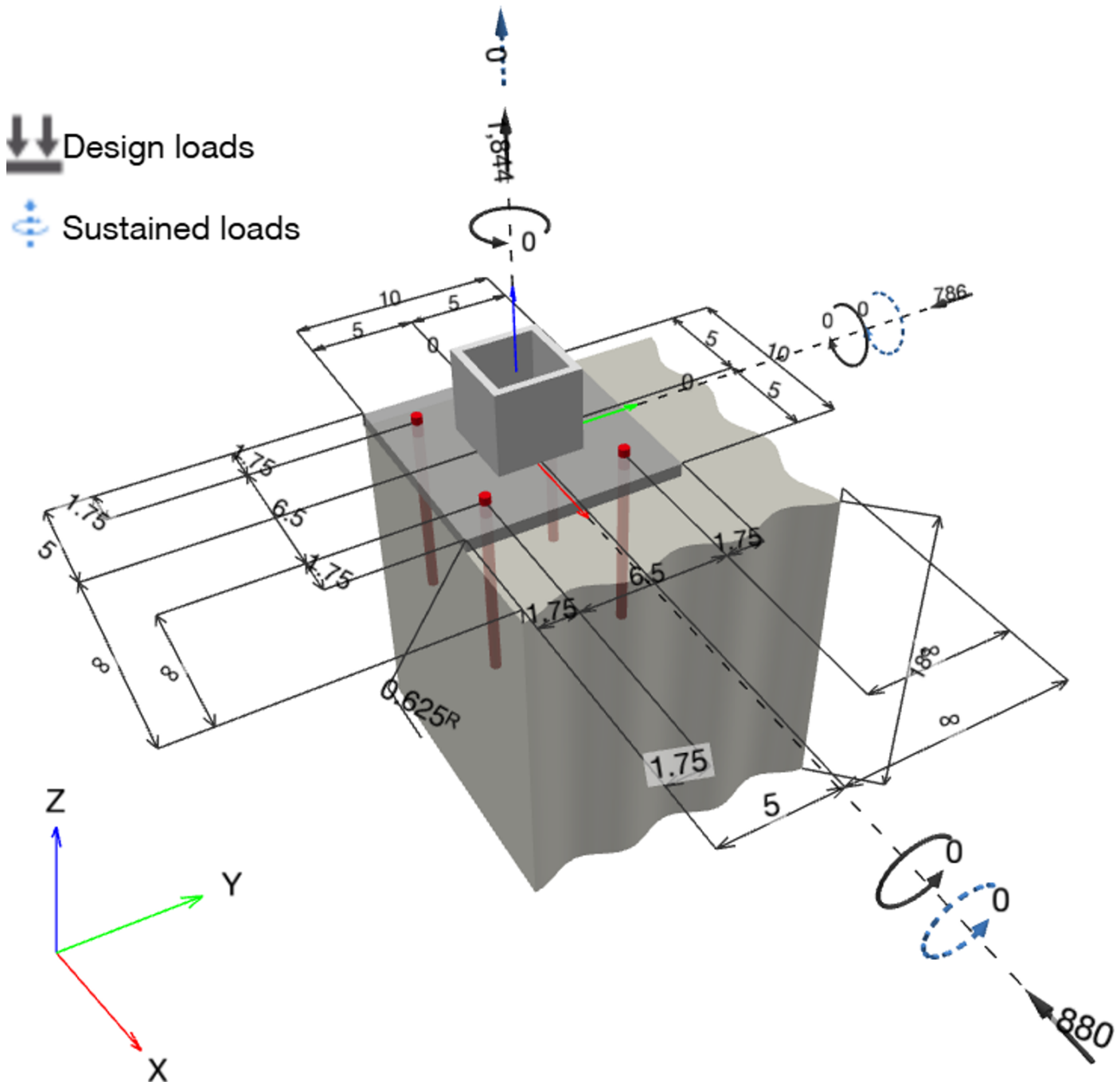
Geometry [in.] & Loading [lb, in.lb]



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Design:	BP A - Corner Revised	Date:	4/15/2026
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1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 1,844; V_x = -880; V_y = -786; M_x = 0; M_y = 0; M_z = 0;	yes	96

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2 Proof I Utilization (Governing Cases)

		Design values [lb]		Utilization	
Loading	**Proof**	**Load**	**Capacity**	**β_N / β_V [%]**	**Status**
Tension	Concrete Breakout Failure	1,844	6,524	29 / -	OK
Shear	Concrete edge failure in direction y-	1,180	1,319	- / 90	OK

Loading	**β_N**	**β_V**	**ζ**	**Utilization $\beta_{N,V}$ [%]**	**Status**
Combined tension and shear loads	0.283	0.895	5/3	96	OK

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

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Design:	BP A - Corner Revised	Date:	4/15/2026
Fastening point:	BA - Corner		

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Design:	BP-A Mid Column Revised	Date:	4/15/2026
Fastening point:	BA Mid Column Support		

Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-HY 200 V3 + HAS-V-36 (ASTM F1554 Gr.36) 1/2**
Item number:	not available (element) / 2334276 HIT-HY 200-R V3 (adhesive)
Specification text:	HILTI ∅ 1/2 IN HIT-HY 200 V3 + HAS-V-36 (ASTM F1554 GR.36) WITH 8.5 IN NOMINAL EMBEDMENT DEPTH PER ICC-ES ESR-4868 , HAMMER DRILL BIT INSTALLATION PER MPII
Effective embedment depth:	$h_{ef,act}$ = 8.500 in. ($h_{ef,limit}$ = - in.)
Material:	ASTM F1554 Grade 36
Evaluation Service Report:	ESR-4868
Issued I Valid:	11/1/2024 | 11/1/2026
Proof:	Design Method ACI 318-19 / Chem
Shear edge breakout verification:	Row closest to edge (Case 3 only from ACI 318-19 Fig. R.17.7.2.1b)
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.625 in.
Anchor plate[R] :	l_x x l_y x t = 10.000 in. x 9.500 in. x 0.625 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS4X4X.375; (L x W x T) = 4.000 in. x 4.000 in. x 0.375 in.
Base material:	cracked concrete, 3000, f_c' = 3,000 psi; h = 18.000 in., Temp. short/long: 32/32 °F
Installation:	**Hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: present, shear: present; no supplemental splitting reinforcement present edge reinforcement: > No. 4 bar
Seismic loads (cat. C, D, E, or F)	Tension load: yes (17.10.5.3 (d)) Shear load: yes (17.10.6.3 (c))

[R] - The anchor calculation is based on a rigid anchor plate assumption.

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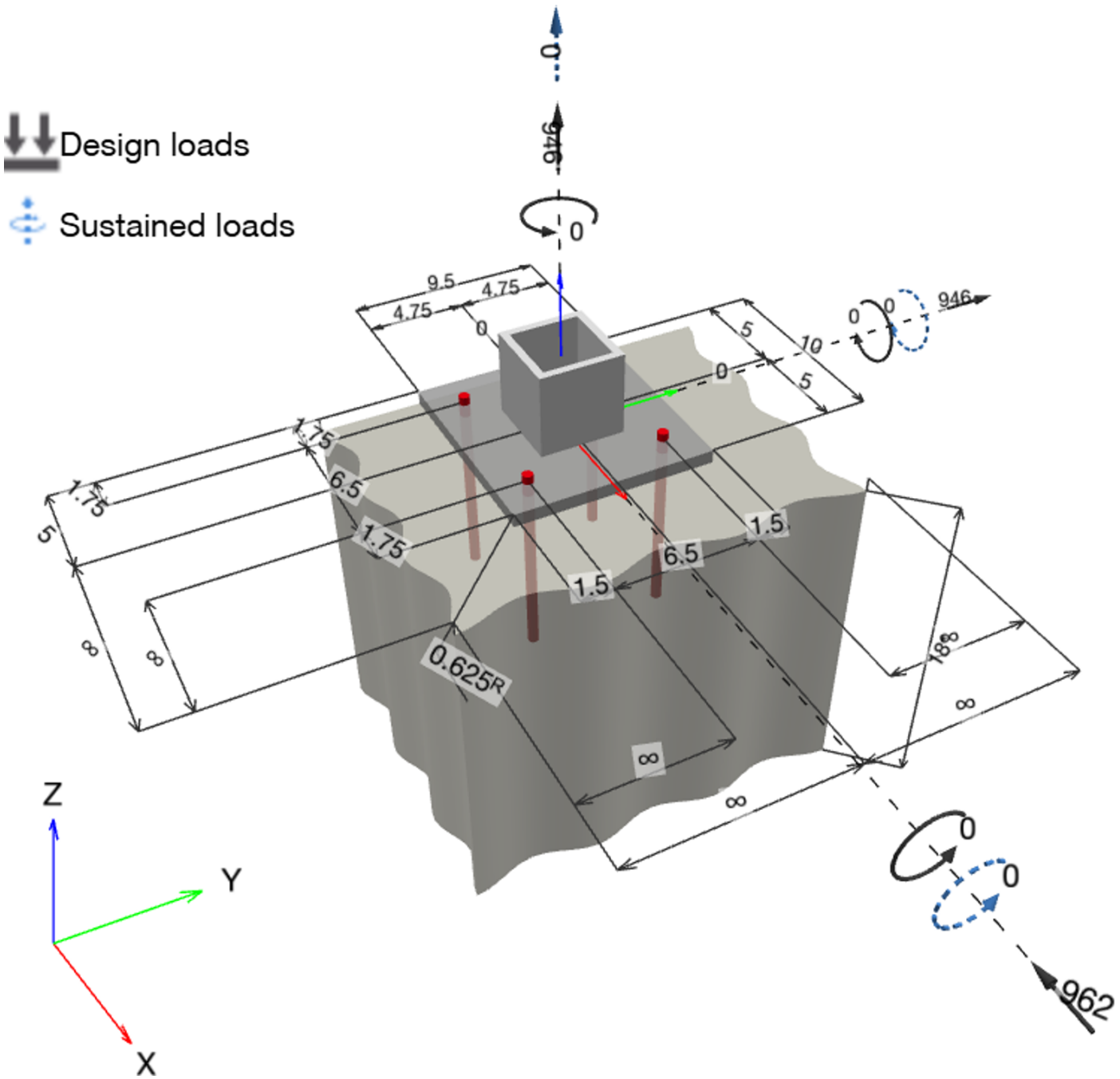
Fastening point:	BA Mid Column Support		

Geometry [in.] & Loading [lb, in.lb]



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Address:		Specifier:	
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Design:	BP-A Mid Column Revised	Date:	4/15/2026
Fastening point:	BA Mid Column Support		

1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 946; V_x = -962; V_y = 946; M_x = 0; M_y = 0; M_z = 0;	yes	79

Company:		Page:	4
Address:		Specifier:	
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Design:	BP-A Mid Column Revised	Date:	4/15/2026
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2 Proof I Utilization (Governing Cases)

		Design values [lb]		Utilization	
Loading	**Proof**	**Load**	**Capacity**	**β_N / β_V [%]**	**Status**
Tension	Bond Strength	946	9,041	11 / -	OK
Shear	Concrete edge failure in direction x-	1,349	1,712	- / 79	OK

Loading	**β_N**	**β_V**	**ζ**	**Utilization $\beta_{N,V}$ [%]**	**Status**
Combined tension and shear loads	0.105	0.788	5/3	70	OK

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

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