

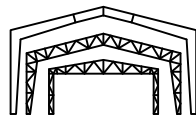
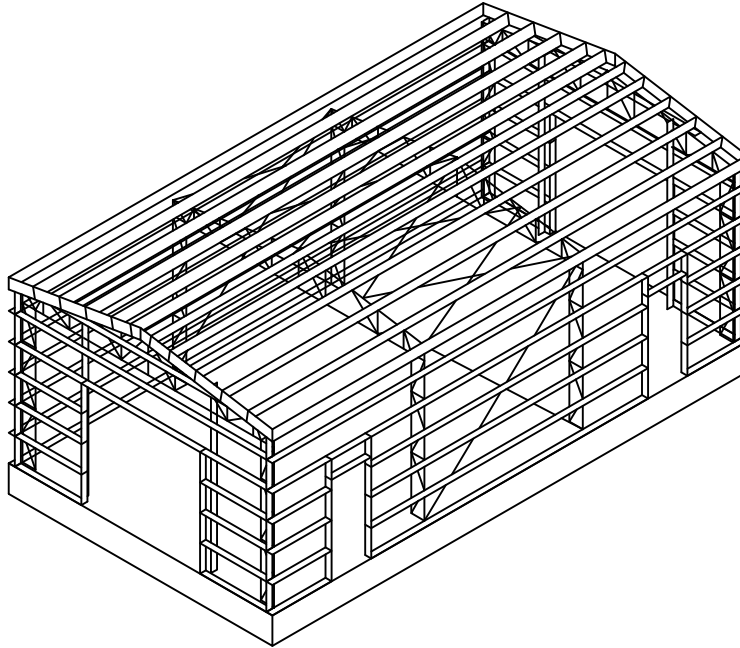
STRUCTURAL CALCULATIONS

FOR

FERRUCCI JR HIGH STORAGE BUILDING PUYALLUP, WASHINGTON 98374 Project Number: D22-010



PRPF20230822



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SHEETS: 1-13, F1-F21



Ferrucci Jr. High Storage Building

Project Number: D22-010

Building Information		Site Information	
Occupancy Category:	II	Project Location:	Puyallup, Washington
Building Type	Closed	V mph (3 sec):	110
Building Width (ft):	20	Exposure:	B
Building Length (ft):	36	Ground Snow (psf):	30
Eave Ht (ft):	12	Roof Live Load (psf):	20
Slope	2	Soil Pressure (psf):	1500
Frame Trib (ft):	12	S _s :	1.254
		S ₁ :	0.432

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General Notes

- Load Combinations per ASCE 7 Chapter 2.4 for Steel & Wood Design
- Load Combinations per ASCE7 Chapter 2.3 for Concrete and Anchor Bolt Design
- Seismic Design per ASCE7 Equivalent Lateral Force Procedure
- Special Inspections:
 - Per IBC 1704
 - Structural welding
 - A325 Bolt Installation
- Wood girt/purlin design per NDS
- Concrete design per ACI 318
- Steel design per Steel Construction Manual
- See sheet N1 of plan set for additional notes

Snow Design

Job Number: D22-010

Roof Snow Load

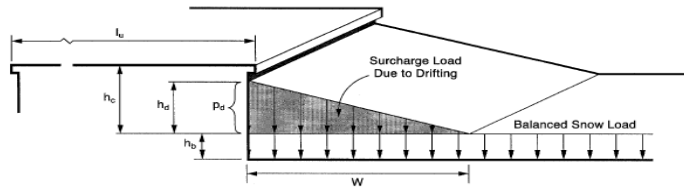
p_g (psf):	30	Ground snow load
λ (pcf):	17.90	$\lambda = 0.13p_g + 14$ (Eq. 7-3), Snow Density
C_e :	1	Table 7-2, Snow Exposure Factor
C_t :	1.2	Table 7-3, Thermal Factor
Class:	II	Building Classification
I_s :	1	Table 7-4, Importance Factor
p_f (psf):	25.2	$p_f = 0.7C_eC_tI_sp_g$ (Eq. 7-1), Flat Roof Snow Load
p_s (psf):	25.0	Slope adjusted snow

Unbalanced Snow Load

$L_{u,un}$ (ft):	10	$L_{u,un} = (\text{Building Width})/2$
h_d (ft):	1.66	Figure 7-9, h_d (ft) = $0.43(L_{u,un})^{0.33}(p_g+10)^{0.25} - 1.5$, where $L_{u,un} = 25'$ min
S:	6	Figure 7-5, $S = 12/\text{Slope}$
p_{drift} (psf):	12.1	Figure 7-5, $p_{drift} = h_d\lambda/S^{0.5}$
p_{unbal} (psf):	37.3	$p_{unbal} = p_{drift} + p_s$ Use p_s if p_{unbal} is less than p_s
W_{drift} (ft):	10.9	Figure 7-5, $W_{drift} = (8/3)(h_d)S^{0.5}$

Drift Snow Load/Sliding (If Applicable)

L_u (ft):	0	Length of upper roof	h_c/h_b :	-1.0	
h_Δ (ft):	0	Difference in roof heights	$4h_d$ (ft):	6.65	Controls if $h_d < h_c$
h_b (ft):	1.40	$h_b = p_s/\lambda$	$4h_d^2/h_c$ (ft):	-7.91	Controls if $h_d > h_c$
h_c (ft):	-1.40	$h_c = h_\Delta - h_b$	$8h_c$ (ft):	-11.2	Maximum length of drift
h_d (ft):	1.66	$h_d = 0.43(L_u)^{0.33}(p_g+10)^{0.25} - 1.5$	W_{drift} (ft):	0.0	
h_{drift} (ft):	0.0				



$p_{sliding}$ (psf):	0	$p_{sliding} = 0.4p_sW/15$
p_{drift} (psf):	0.0	<u>Tapered over 0 ft</u>

Frame Design

Trib (ft): 12

Windward Side

w_{bal} (plf):	300
P_{bal} (lb):	600
w_{unbal} (plf):	90
P_{unbal} (lb):	180

$$w_{unbal} = (\text{Trib})(0.3)(p_s)$$

$$P_{unbal} = (2)(w_{unbal})$$

Leeward Side

w_{bal} (plf):	300	
P_{bal} (lb):	600	
w_{unbal} (plf):	448	$w_{unbal} = (\text{Trib})(p_{unbal})$
P_{unbal} (lb):	896	$P_{unbal} = (2)(w_{unbal})$
W_{unbal} (ft):	10.9	

MAIN WIND FORCE RESISTING SYSTEM DESIGN (27-3)

TYPE:	Closed		K _d :	0.85	Directionality factor
V (MPH):	110	Wind Speed (3 second gust)	I _w :	1.00	Wind Load Importance Factor
EXPOSURE:	B	Exposure Category	q _z (PSF):	15.13	q _z = 0.00256K _e K _z K _{zt} K _d V ² I (Eq 26.10-1)
K _z :	0.57	Velocity Pressure Coefficient	G:	0.85	External pressure coefficient
K _{zt} :	1	Topographical Factor	GC _{pi} :	0.18	Internal pressure coefficient
K _e :	1	Ground Elevation Factor			

WALL PRESSURES

Geometry					C_p		GC_p+GC_{pi}		GC_p-GC_{pi}	
Direction	L (ft)	B (ft)	h (ft)	L/B	Windward	Leeward	p_{ww} (psf)	p_{lw} (psf)	p_{ww} (psf)	p_{lw} (psf)
Endwall	36	20	12.8	1.8	0.8	-0.34	12.6	-2.06	7.97	-6.7
Sidewall	20	36	12.8	0.56	0.8	-0.50	12.6	-4.12	7.97	-8.7

ROOF PRESSURES LOADING PERPENDICULAR TO RIDGE

				C_p		GC_p+GC_{pi}		GC_p-GC_{pi}		
	L (ft)	h (ft)	h/L	Windward	Leeward	p_{ww} (psf)	p_{lw} (psf)	p_{ww} (psf)	p_{lw} (psf)	
Case 1	20	12.8	0.64	-0.9	-0.50	-9.3	-4.12	-13.89	-8.7	
Case 2	20	12.8	0.64	-0.18	-0.50	0.0	-4.12	-4.63	-8.7	

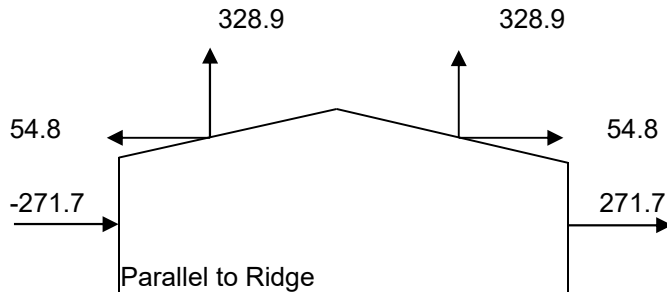
ROOF PRESSURES LOADING PARALLEL TO RIDGE

				C_p	GC_p+GC_{pi}	GC_p-GC_{pi}	
	L (ft)	h (ft)	h/L	C_p	p_{ww} (psf)	p_{ww} (psf)	
Case 1	36	12.8	0.36	-0.9	-9.3	-13.89	
Case 2	36	12.8	0.36	-0.18	0.0	-4.63	

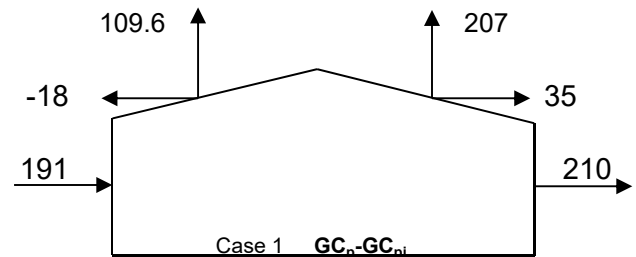
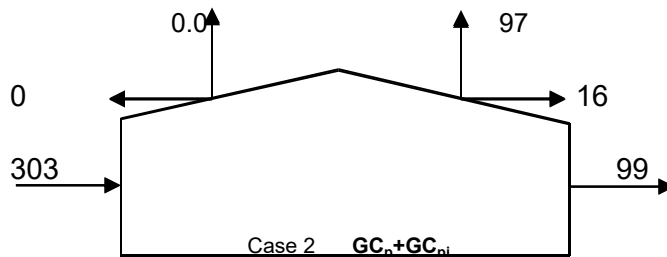
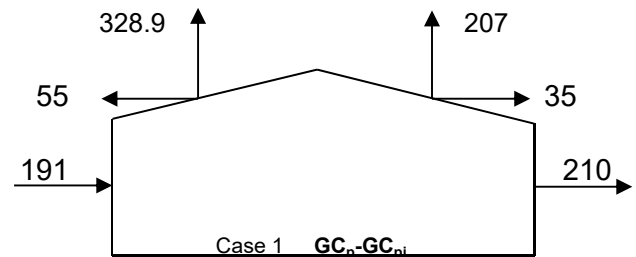
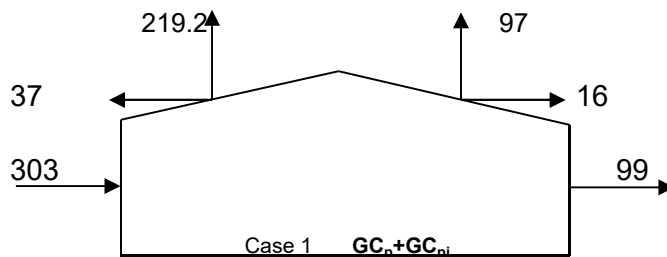
Frame Trib

12.0

Endwall Wind Pressure: 14.66



MRH	12.8333
B	20
0.1B	2
0.4h	5.13333
0.04B	0.8
a:	3



Seismic Design

Job Number: D22-010

Design Procedure: Equivalent Lateral Force per ASCE 7

Risk Category II ASCE 7 Table 1.5-1

Seismic Design Category: D ASCE7 Table 11.6-1 & 11.6-2

Importance Factor, I_E : 1 ASCE 7 Table 1.5-2

Notes:

Spectral Response at Short Periods

S_S : 1.254 ATC
 F_a : 1.200 ATC, ASCE7 11.4.4
 S_{DS} : 1.003 $2/3F_a S_S$, Eq. 11.4-1 and 11.4-3
 T_L (s): 16.0 ATC

Spectral Response at 1 Second Period

S_1 : 0.432 ATC
 F_v : 2.000 ASCE7 Table 11.4-2
 S_{D1} : 0.576 $2/3F_v S_1$, Eq 11.4-2 and 11.4-4

Building Properties

Steel Moment Resisting Frames

h_n (ft): 13.7 Maximum Building Height
 C_t : 0.028 ASCE 7 Table 12-8.2
 x : 0.8 ASCE 7 Table 12-8.2
 T_a (s): 0.20 $T_a = C_t h_n^x$, Eq. 12.8-7
 R : 3.5 ASCE 7 Table 12-2.1
 C_d : 3 ASCE 7 Table 12-2.1
 Ω_0 : 3 ASCE 7 Table 12-2.1
 p : 1.3 ASCE 7 Section 12.3.4.2
 PI : N For plan irregularity increase connection loading by 25% per 12.3.3.4

Other Structural Systems***

h_n (ft): 13.7 Maximum Building Height
 C_t : 0.020 ASCE 7 Table 12-8.2
 x : 0.8 ASCE 7 Table 12-8.2
 T_a (s): 0.14 $T_a = C_t h_n^x$, Eq. 12.8-7
 R : 3.25 ASCE 7 Table 12-2.1
 C_d : 3.25 ASCE 7 Table 12-2.1
 Ω_0 : 2 ASCE 7 Table 12-2.1
 p : 1.3 ASCE 7 Section 12.3.4.2
 PI : N For plan irregularity increase connection loading by 25% per 12.3.3.4

*** (Conservatively assume ordinary steel concentrically braced frame)

Seismic Response Coefficient

C_s : 0.287 $S_{DS} I_E / R$, Eq. 12.8-2
 $C_{s,max}$: 0.827 $S_{D1} I_E / TR$, Eq. 12.8-3
 $C_{s,min1}$: 0.010 Eq. 12.8-5
 $C_{s,min2}$: 0.062 $0.5 S_1 I_E / R$, Eq. 12.8-6
 C_s : 0.287

Seismic Response Coefficient

C_s : 0.309 $S_{DS} I_E / R$, Eq. 12.8-2
 $C_{s,max}$: 1.247 $S_{D1} I_E / TR$, Eq. 12.8-3
 $C_{s,min1}$: 0.01 Eq. 12.8-5
 $C_{s,min2}$: 0.066 $0.5 S_1 I_E / R$, Eq. 12.8-6
 C_s : 0.309

Dead Loads

Dead Loads (psf):

Roof	Roof Panel:	1	Wall	Siding	0
	19/32 Plywood	0		Panel	1
	Purlin/Girt:	1.7		Purlin/Girt:	1.0
	Insulation:	1.0		Insulation:	1.0
	Collateral	1.3		Collateral	2.0
	Total:	5.0		Total:	5

Frame Wts:

Frame Weight (lb):	450
Number of Frames:	4
Total Frames (lb):	1800

	Main Building			Shed							
	Sidewall	Endwall	Roof	Wall 1	Wall 2	Wall 3	Wall 4	Roof 1	Roof 2	Roof 3	Roof 4
DL (psf):	5	5	5.0	0	0	0	0	0	0	0	0
SL (psf):	0	0	0	0	0	0	0	0	0	0	0
Area (ft ²):	432	153	903	0	0	0	0	0	0	0	0
TL (lb):	2160	767	4504	0	0	0	0	0	0	0	0

W (lb): 9230

Seismic Base Shear

Q_E (lb): 2849 $C_s W$, Eq. 12.8-1
 E_h (lb): 3704 $p Q_E$, Eq. 12.4-3
 $0.7 E_h$: 2593 ASCE 7-05 12.4.2.3

Frame Point Loading

Roof PL (lb): 45 $2[C_{sp}(\text{Max Bay})(DL)]$
Wall PL (lb): 45 $2[C_{sp}(\text{Max Bay})(DL)]$

Purlin Design

Job Number: D22-010

End Zone?	Y	N								
Overhang?	Y	Y								
Width (ft):	12.00	12.00								
Repetitive Use?	Y	Y								
Unbalanced?	Y	N								
SUMMARY										
#	2X10	2X10								
Clip:	1	1								
Spacing (in):	6 HOLE	6 HOLE								
M _{req} /M _{all}	24	24								
L/	0.64	0.46								
Δ (in):	L/585	L/826								
	0.25	0.17								
DL + SL										
p (psf):	42.3	30.0								
w (plf):	83.5	59.2								
M _{req} (ft-lb):	1503	1065								
M _{all} (ft-lb):	2334	2334								
Δ (in):	0.246	0.174								
L/	L/585	L/826								
R (lb):	501.1	354.9								
Wind Design										
EWA (ft ²):	48.0	48.0								
a	2.0	2.0								
Positive Wind Zone										
G _{cp} :	0.375	0.375								
0.6p _z (psf):	5.0	5.0								
w _z (plf):	10.1	10.1								
M _{req} (ft-lb):	181	181								
M _{all} (ft-lb):	3247	3247								
Δ (in):	0.030	0.030								
L/	L/4847	L/4847								
R (lb):	60	60								
Negative Wind Zone										
G _{cp1} :	-1.18	-1.18								
0.6p _{z1} (psf):	12.38	12.38								
w _{z1} (plf):	24.77	24.77								
G _{cp2} :	-2.03	-2.03								
0.6p _{z2} (psf):	18.4	18.4								
w _{z2} (plf):	36.8	36.8								
G _{cp3} :	-2.37	-2.37								
0.6p _{z3} (psf):	21.6	18.4								
w _{z3} (plf):	43.1	36.8								
M _{req} (ft-lb)	673	446								
M _{out} (ft-lb):	3247	3247								
Δ (in):	0.108	0.073								
L/	L/1328	L/1972								
R (lb):	259	221								

Girt, Header and Trimmer Design

Job Number: D22-010

	FSW/RSW	FSW/RSW	LEW/REW							
Corner Bay?	Y	N	Y							
Width (ft):	11.43	12	12							
Repetitive Use?	Y	Y	Y							
Opening										
Width (ft)	3									
Height (ft)	8									
DFLE (ft):	4.22									
DFRE (ft)	4.21									
Girt Design										
Clip:	1-2x6	1-2x6	1-2x6							
L/	STD	STD	STD							
L/792	L/792	L/696	L/701							
Δ (in):	0.17	0.21	0.21							
EWA (ft ²):	43.5	48.0	48.0							
a	2.0	2.0	2.0							
0.6p _{z4} (psf):	10.6	10.5	10.5							
w _{z4} (plf):	21.2	21.1	21.1							
0.6p _{z5} (psf):	12.3	10.5	9.6							
w _{z5} (plf):	24.6	21.1	19.2							
R (lb):	140.5	126.4	115.2							
M _{req} (ft-lb)	352	379	376							
M _{all} (ft-lb)	1357	1357	1357							
Trimmer Design										
Size	2-2x6									
Connection	2-A23									
M _{req} /M _{all} :	0.15									
Δ (in):	0.06									
L/	L/1562									
Trib Width, L (ft):	3.6									
Trib Width, R (ft):	3.6									
EWA (ft ²):	28.8									
0.6p (psf):	12.30									
w _L (plf):	44.4									
w _R (plf):	44.3									
R _L (lb):	178									
R _R (lb):	177									
Connection	2-A23									
M _L (ft-lb):	355									
M _R (ft-lb):	355									
M _{req} (ft-lb):	355									
M _{all} (ft-lb):	2360									
Header Design										
Size:	1-2x6									
Connection	1-GC									
M _{req} /M _{all} :	0.80									
Δ (in):	0.61									
L/	223									
Trib Width (ft):	5									
EWA (ft ²):	57.2									
0.6p (psf):	11.92									
R _L (lb):	177									
R _R (lb):	178									
R _w (lb):	68									
R (lb):	246									
M _{req} (ft-lb):	943									
M _x (ft-lb):	1180									
Ratio	0.80									
#	1									
M _{all} :	1179.75									

LEFT ENDWALL DESIGN

Job Number: D22-010

INPUT

Endwall Bay (ft):	11.43	F _y Rafter (ksi):	36
Extended Eaves (ft):	2.07	p _{adj} (psf):	37.35
Rafter Trib (ft):	7.97	p _{DL} (psf):	5.0
		q _z (psf):	15.1

LEFT ENDWALL RAFTER DESIGN (ER)

Member Size	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
Maximum Span (Ft):						
Two Supported Spans?						
Cantilever Span (ft):						
Unbraced Length Backspan (ft):						
Unbraced Length Cantilever (ft):						
Unbraced Length 2 (ft):						
Point Load Trib (ft):						
Effective Wind Area						
Mean Wind Pressure						
<u>Line Loads</u>						
SL+DL (plf):						
0.6DL + WL (plf):						
<u>Point Loads@ Cantilever:</u>						
SL+DL (lb):						
0.6DL + WL (lb):						
<u>Moment Design</u>						
+M _{DL+SL} (ft-lb):						
+M _{0.6DL+WL} (ft-lb):						
+M _c (ft-lb):						
-M _{DL+SL} (ft-lb):						
-M _{0.6DL+WL} (ft-lb):						
-M _{c,bs} (ft-lb):						
-M _{c,c} (ft-lb):						
Interaction Equation:						
<u>Reactions</u>						
R _{1DL+SL} (lbs)						
R _{2DL+SL} (lbs)						
R _{10.6DL+WL} (lbs)						
R _{20.6DL+WL} (lbs)						
<u>Deflection</u>						
Midspan Deflection (in):						
Midspan Deflection Ratio:						
Cantilever Deflection (in):						
Cantilever Deflection Ratio:						

LEFT ENDWALL COLUMN DESIGN (EC)

	D	C	B					A
Distance from L-Corner (ft):	0	5.13	14.88					20.00
Distance from Edge	0	5.1	5.1					0
Member:	TEW	2x6	2x6	Not Used	Not Used	Not Used	Not Used	TEW
Quantity:		4	4					
X-Brace Start:								
X-Brace End:								
P _r (lb):								
Unbraced Length Weak (ft):		2.0	2.0					
Unbraced Length Strong (ft):		12.1	12.1					
P _c (lb):		200	200					
Column Length (ft):		12.10	12.1					
Z5 Trib. Width (ft):		0.88	0.88					
Z4 Trib. Width (ft):		6.56	6.56					
Effective Wind Area (ft ²):		79.40	79.40					
0.6Z5 wind pressure (psf):		11.46	11.46					
0.6Z4 wind pressure (psf):		10.18	10.18					
Lateral load (plf):		76.8	76.8					
M _r (ft-lb):		1,407	1,407					
M _c (ft-lb):		4719	4719					
Reaction (lb):		465	465					
Interaction Equation:		0.30	0.30					
Deflection Ratio:		L/744	L/744					
Deflection (in):		0.195	0.195					

RIGHT ENDWALL DESIGN

Job Number: D22-010

INPUT

Endwall Bay (ft):	11.43	p _{adj} (psf):	37.3
Extended Eaves (ft):	2.07	p _{DL} (psf):	5.0
Rafter Trib (ft):	7.97	q _z (psf):	15.1
F _y Rafter (ksi):	36		

RIGHT ENDWALL RAFTER DESIGN (ER)

Member Size	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
Maximum Span (Ft):						
Two Supported Spans?						
Cantilever Span (ft):						
Unbraced Length Backspan (ft):						
Unbraced Length Cantilever (ft):						
Unbraced Length 2 (ft):						
Point Load Trib (ft):						
Effective Wind Area						
Mean Wind Pressure						
<u>Line Loads</u>						
SL+DL (plf):						
0.6DL + WL (plf)						
<u>Point Loads@ Cantilever:</u>						
SL+DL (lb):						
0.6DL + WL (lb)						
<u>Moment Design</u>						
+M _{DL+SL} (ft-lb):						
+M _{0.6DL+WL} (ft-lb):						
+M _c (ft-lb):						
-M _{DL+SL} (ft-lb):						
-M _{0.6DL+WL} (ft-lb):						
-M _{c,bs} (ft-lb):						
-M _{c,c} (ft-lb):						
Interaction Equation:						
<u>Reactions</u>						
R _{1DL+SL} (lbs)						
R _{2DL+SL} (lbs)						
R _{10.6DL+WL} (lbs)						
R _{20.6DL+WL} (lbs)						
<u>Deflection</u>						
Midspan Deflection (in):						
Midspan Deflection Ratio:						
Cantilever Deflection (in):						
Cantilever Deflection Ratio:						

RIGHT ENDWALL COLUMN DESIGN (EC)

	A	B	C					D
Distance from L-Corner (ft):	0	5.13	14.88					20.00
Member:	TEW	2x6	2x6	Not Used	Not Used	Not Used	Not Used	TEW
Quantity:		4	4					
Unbraced Length Weak (ft):		2.0	2.0					
Unbraced Length Strong (ft):		12.1	12.1					
P _c (lb):		200	200					
Column Length (ft):		12.10	12.10					
Z5 Trib. Width (ft):		0.88	0.88					
Z4 Trib. Width (ft):		6.56	6.56					
Effective Wind Area (ft ²):		79.40	79.40					
0.6Z5 wind pressure (psf):		11.46	11.46					
0.6Z4 wind pressure (psf):		10.18	10.18					
Lateral load (plf):		76.8	76.8					
M _r (ft-lb):		1,407	1,407					
M _c (ft-lb):		4719	4719					
Reaction (lb):		465	465					
Interaction Equation:		0.30	0.30					
Deflection Ratio:		L/744	L/744					
Deflection (in):		0.195	0.195					

CONNECTION DESIGN

Job Number: D22-010

	Connection at Peak		Connection at Haunch	
	Top Chord	Bottom Chord	Outer Leg	Inner Leg
Model Frame Tension (lb):	5552	4922	3888	8105
Weld size (in):	0.188	0.188	0.188	0.188
Minimum Weld (in):	1.99	1.76	1.40	2.91
# of Bolts:	2	2	2	2
A325 Capacity (lb):	13800	13800	13800	13800
P_{design}/P_{allow} :	0.40	0.36	0.28	0.59

- Values per AISC Table 7-2

- 3/4" A307 Bolt Capacity (lb): 9940
 - 3/4" A325 Bolt Capacity (lb): 19900

- 5/8" A307 Bolt Capacity (lb): 6900
 - 5/8" A325 Bolt Capacity (lb): 13800

Frame Reactions:	12' Trib			
	Lateral	Vertical	Lateral	Vertical
DL (lb):	-41	1580		
SL (lb):	-251	4758		
WL (lb):	-385	-2100		
EQ (lb):	-567	-694		

ROOF/SIDEWALL X-BRACING DESIGN

Job Number: D22-010

Roof X-Brace Geometry							
	D	C	Ridge	B			A
Distance from L-Corner (ft):	0	5.13	10.00	14.9			20
# of Braced Bays:	1	1		1			1
Bay Width (ft):	12.0	12.0		12.0			12.0
Brace Width (ft):	5.1	4.9		4.9			5.1
Brace Length (ft):	13.0	13.0		13.0			13.0
Roof X-Brace Wind							
Force at Column (lb):	135	396		396			135
Force at Brace Bay (lb):	531	396		396			531
X-Brace Force (lb):	578	427		427			578
Roof X-Brace Seismic							
Force at Column (lb):	236	686		686			236
Force at Brace Bay (lb):	922	686		686			922
X-Brace Force (lb):	1003	740		740			1003
Brace Size:	250	250		250			250
Sidewall X-Brace Design							
	Wind	Seismic					
# of Bays from A1:	2	2					
# of Braced Bays:	1	1					
Force at Sidewall (lb):	531	922					
Force due to Wall Wt (lb):	--	281					
Bay Width (ft):	12	12					
Brace Height (ft):	12	12					
Brace Length (ft):	17.0	17.0					
X-Brace Force (lb):	751	1701					
X-Brace Uplift (lb):	531	1203					
Brace Size:	250						

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Company:
 Specifier:
 Address:
 Phone | Fax:
 E-Mail:

Page:
 Project:
 Sub-Project | Pos. No.:
 Date:

1

 3/22/2022

Specifier's comments:

1 Input data

Anchor type and diameter:

Hex Head ASTM F 1554 GR. 36 1/2



Effective embedment depth:

$h_{ef} = 6.000$ in.

Material:

ASTM F 1554

Proof:

design method ACI 318-11 / CIP

Stand-off installation:

$e_b = 0.000$ in. (no stand-off); $t = 0.500$ in.

Anchor plate:

$l_x \times l_y \times t = 3.000$ in. $\times$ 12.000 in. $\times$ 0.500 in.; (Recommended plate thickness: not calculated)

Profile:

S shape (AISC); ($L \times W \times T \times FT$) = 3.000 in. $\times$ 2.330 in. $\times$ 0.170 in. $\times$ 0.260 in.

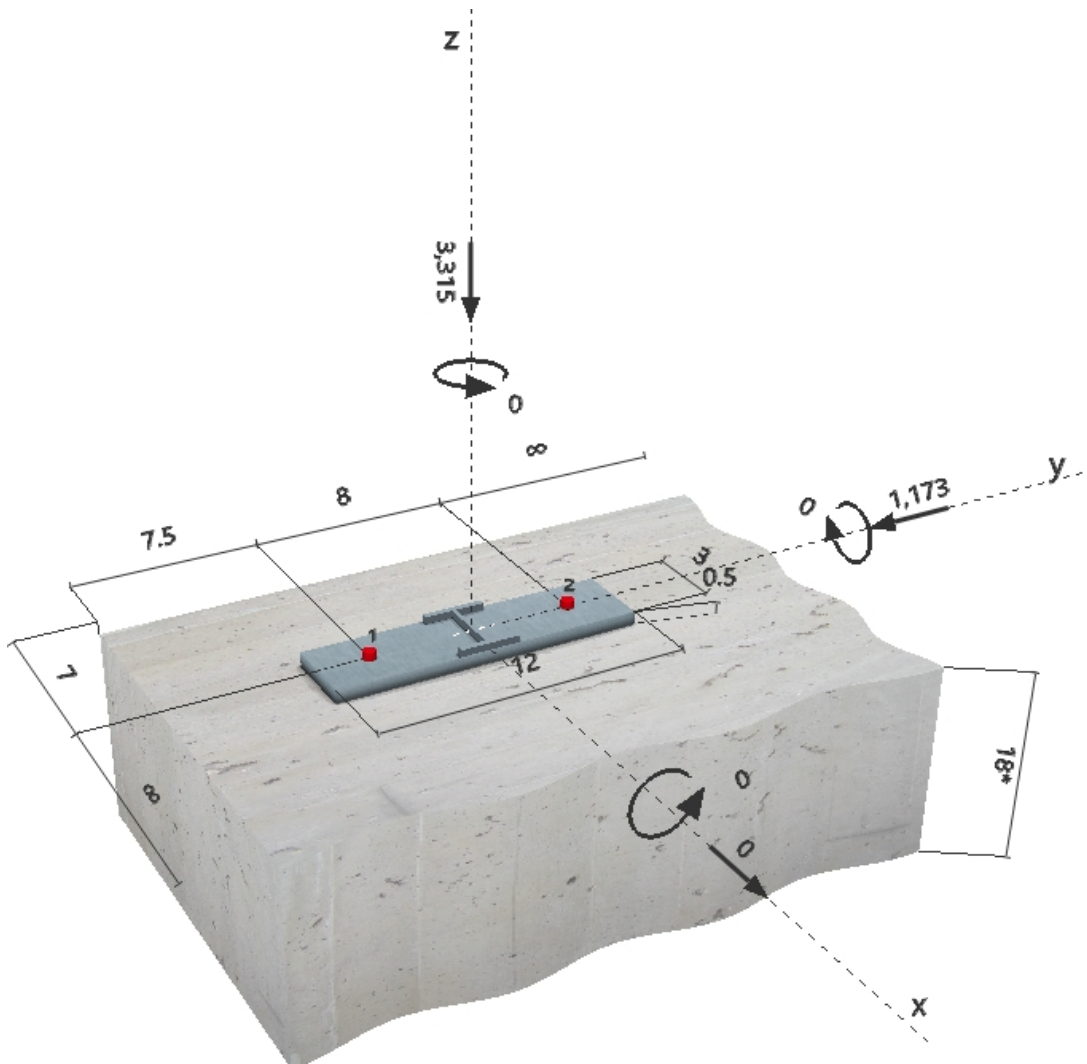
Base material:

cracked concrete, 2500, $f'_c = 2500$ psi; $h = 18.000$ in.

Reinforcement:

tension: condition B, shear: condition B;
 edge reinforcement: none or $< \text{No. 4 bar}$

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



Company:
 Specifier:
 Address:
 Phone | Fax: |
 E-Mail:

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 Date: 3/22/2022

2 Proof | Utilization (Governing Cases)

Loading	Proof	Design values [lb]		Utilization	
		Load	Capacity	β_N / β_V [%]	Status
Tension	-	-	-	- / -	-
Shear	Concrete edge failure in direction y-	1173	3879	- / 31	OK

Loading	β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
Combined tension and shear loads	-	-	-	-	-

3 Warnings

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

Fastening meets the design criteria!

4 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
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FOUNDATION DESIGN

Job Number: D22-010

General Information

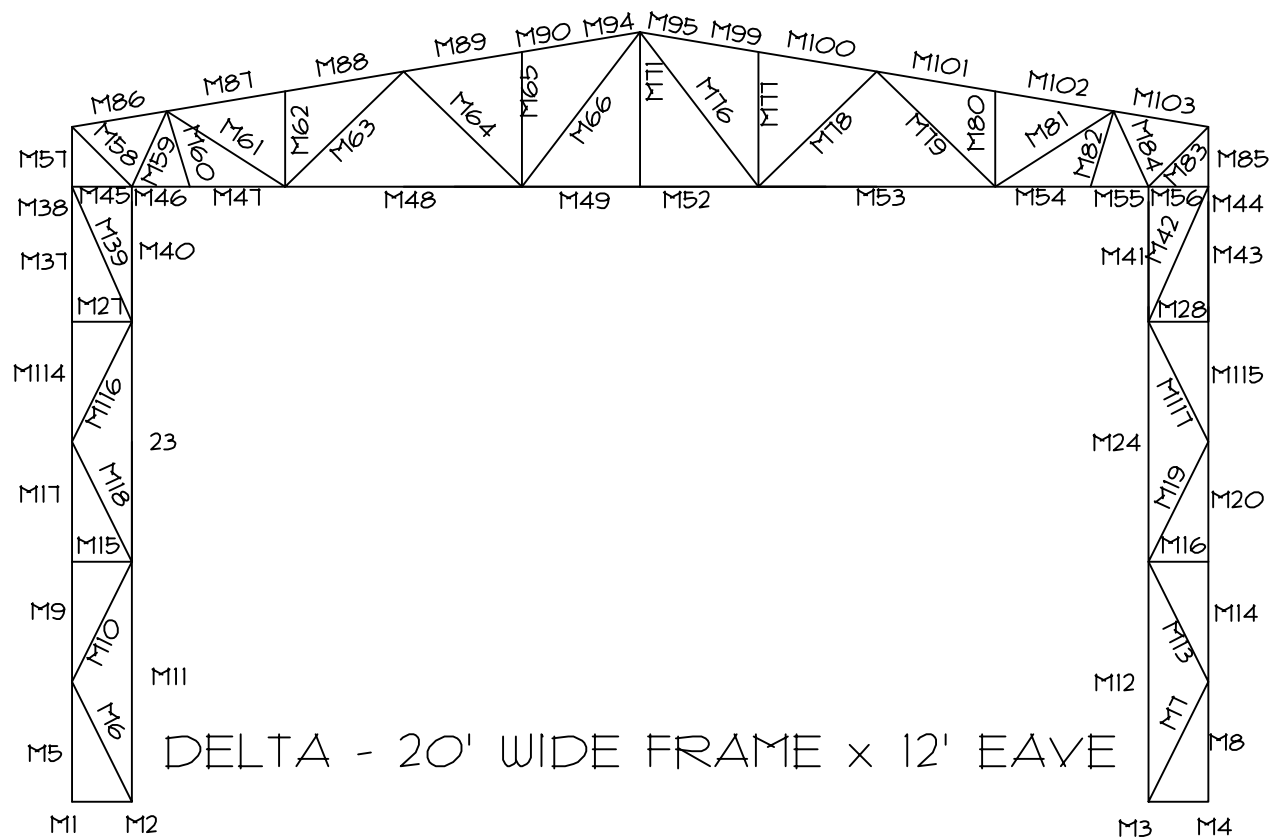
f'_c (psi):	2500	Concrete compressive stress
f'_y (psi):	60000	Steel yield stress
f'_{undist} (psf):	1500	Assumed undisturbed soil pressure
d_{frost} (in):	12	Assumed minimum frost depth

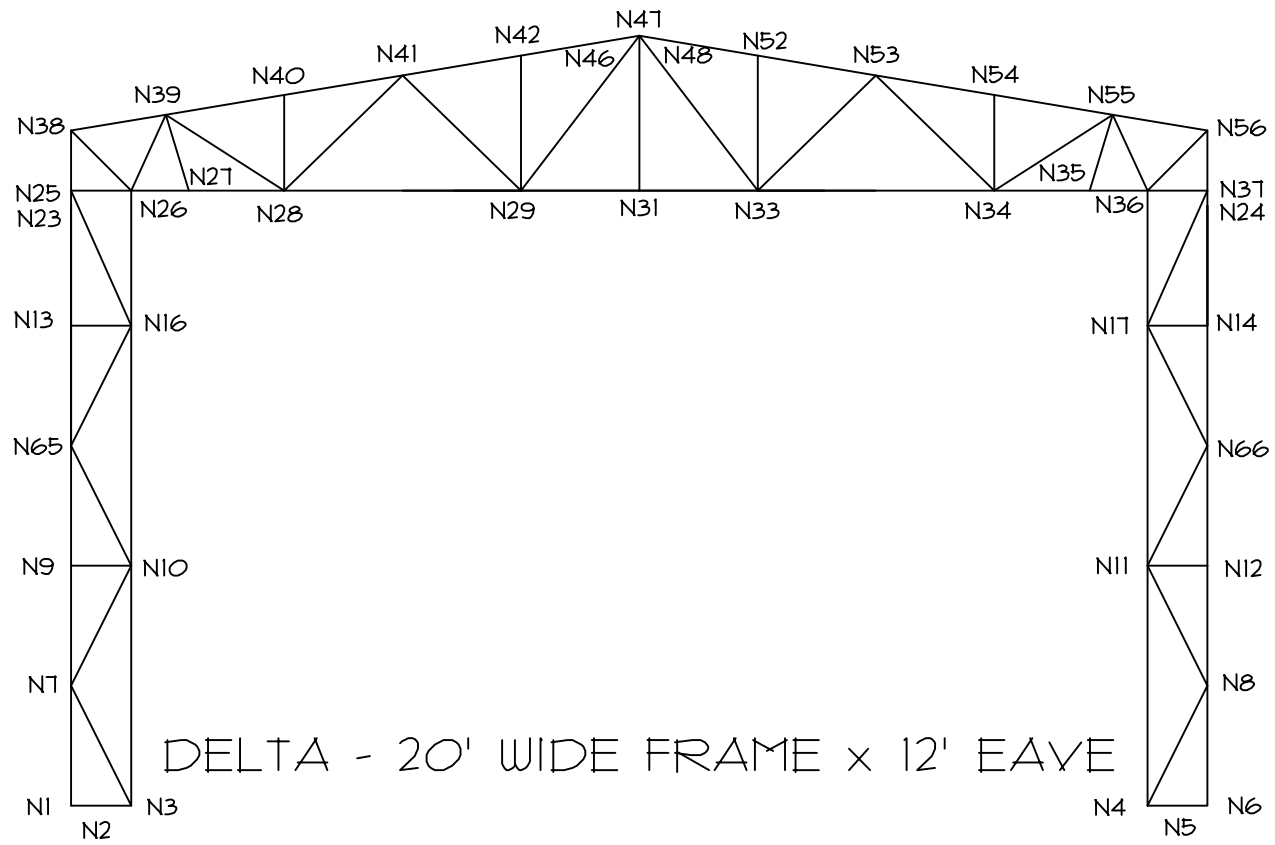
Notes:

- Customer/contractor to verify assumed soil bearing pressure
- Customer/contractor to verify assumed footing depth meets local frost depth requirements

Design

Item	Sidewall		Endwall	Comments
f'_{soil} (psf):	1275		1275	Design Soil Pressure
W (ft):	18		18	Footing Width
D (in):	18		18	Footing Depth
d (in):	14.75		14.75	Depth minus concrete cover
ϕV_e (ft-lb):	22567.5		22567.5	
DL+SL				
P_{DL} (lb):	1580.0		790.0	Unfactored Dead Load
P_{SL} (lb):	4758		2379	Unfactored Snow Load
P_{req} (lb):	6338		3169	$P_{req} = P_{DL} + P_{SL}$
A_{req} (ft ²):	5.0		2.5	$(P_{req})/f'_{soil}$
L_{req} (ft):	3.3		1.7	$L_{req} = A_{req}/(W/12)$
1.3M _{req} (ft-lb):	5461		1365	Adjust Load by 1.6 to Convert to LRFD, Add 30% (ACI10.5.3)
a (in):	0.13		0.03	
$A_{s,req}$ (in ²):	0.11		0.03	
$A_{s,provided}$ (in ²):	0.39		0.39	
a_{adj} (in):	0.61		0.61	
ϕM_n (ft-lb):	25477		25477	
Ductile design check:	Okay		Okay	
Reinforcing at Bottom:	(2)-#4		(2)-#4	
0.6DL+0.6WL				
$P_{down,frame}$ (lb):	1580		790.0	Unfactored downward loading
P_{WL} (lb):	-2985		-1919	WL
P_{req} (lb):	843		678	$P_{req} = 0.6P_{WL} - 0.6P_{DL}$
$w_{down,concrete}$ (lb):	337.5		337.5	Resisting concrete load
L_{req} (ft):	2.5		3.3	$P_{req}/w_{down,concrete}$
1.3M _{req} (ft-lb):	548		982	Adjust Load by 1.6 to Convert to LRFD, Add 30% (ACI10.5.3)
a (in):	0.01		0.02	
$A_{s,req}$ (in ²):	0.01		0.02	
$A_{s,provided}$ (in ²):	0.39		0.39	
a_{adj} (in):	0.61		0.61	
ϕM_n (ft-lb):	25477		25477	
Ductile design check:	Okay		Okay	
Reinforcing at Top:	(2)-#4		(2)-#4	





Current Date: 3/22/2022 3:06 PM

Units system: English

File name: C:\Users\2022\WEB\D22-010 Ferrucci Jr High School Storage\Calculations\RAM\2012 110B 5 12 EE.ret

Geometry Data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	0.50	0.00	0.00	0
3	1.00	0.00	0.00	0
4	18.0833	0.00	0.00	0
5	18.5833	0.00	0.00	0
6	19.0833	0.00	0.00	0
7	0.00	2.00	0.00	0
8	19.0833	2.00	0.00	0
9	0.00	4.00	0.00	0
10	1.00	4.00	0.00	0
11	18.0833	4.00	0.00	0
12	19.0833	4.00	0.00	0
13	0.00	8.00	0.00	0
14	19.0833	8.00	0.00	0
16	1.00	8.00	0.00	0
17	18.0833	8.00	0.00	0
23	0.00	10.00	0.00	0
24	19.0833	10.00	0.00	0
25	0.00	10.25	0.00	0
26	1.00	10.25	0.00	0
27	1.75	10.25	0.00	0
28	3.5529	10.25	0.00	0
29	7.49	10.25	0.00	0
31	9.54	10.25	0.00	0
33	11.585	10.25	0.00	0
34	15.5304	10.25	0.00	0

35	17.33	10.25	0.00	0
36	18.0833	10.25	0.00	0
37	19.0833	10.25	0.00	0
38	0.00	11.25	0.00	0
39	1.58	11.51	0.00	0
40	3.55	11.84	0.00	0
41	5.53	12.17	0.00	0
42	7.50	12.50	0.00	0
46	9.04	12.7557	0.00	0
47	9.54	12.8367	0.00	0
48	10.04	12.7557	0.00	0
52	11.59	12.50	0.00	0
53	13.56	12.17	0.00	0
54	15.53	11.84	0.00	0
55	17.50	11.51	0.00	0
56	19.0833	11.25	0.00	0
57	-2.00	11.045	0.00	0
58	-0.50	11.295	0.00	0
59	0.00	11.375	0.00	0
60	1.58	11.635	0.00	0
61	17.50	11.625	0.00	0
62	19.0833	11.375	0.00	0
63	19.5833	11.295	0.00	0
64	21.0833	11.045	0.00	0
65	0.00	6.00	0.00	0
66	19.0833	6.00	0.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
2	1	1	1	0	0	0
5	1	1	1	0	0	0
7	0	0	1	0	0	0
8	0	0	1	0	0	0
9	0	0	1	0	0	0
10	0	0	1	0	0	0
11	0	0	1	0	0	0
12	0	0	1	0	0	0
13	0	0	1	0	0	0
14	0	0	1	0	0	0
16	0	0	1	0	0	0
17	0	0	1	0	0	0
23	0	0	1	0	0	0
24	0	0	1	0	0	0
27	0	0	1	0	0	0
28	0	0	1	0	0	0
29	0	0	1	0	0	0
33	0	0	1	0	0	0
34	0	0	1	0	0	0
35	0	0	1	0	0	0
40	0	0	1	0	0	0
41	0	0	1	0	0	0
42	0	0	1	0	0	0
46	0	0	1	0	0	0
47	0	0	1	0	0	0
48	0	0	1	0	0	0
52	0	0	1	0	0	0
53	0	0	1	0	0	0
54	0	0	1	0	0	0
57	0	0	1	0	0	0
58	0	0	1	0	0	0
60	0	0	1	0	0	0
61	0	0	1	0	0	0
63	0	0	1	0	0	0
64	0	0	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	2	1	Base Plate	L 2X2X3_16	A36	0.00	0.00	0.00
2	3	2	Base Plate	L 3X3X3_8	A36	0.00	0.00	0.00
3	4	5	Base Plate	L 3X3X3_8	A36	0.00	0.00	0.00
4	5	6	Base Plate	L 3X3X3_8	A36	0.00	0.00	0.00
5	1	7	OL	L 2X2X3_16	A36	0.00	0.00	0.00
6	3	7	D1	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
7	4	8	D1	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
8	6	8	OL	L 2X2X3_16	A36	0.00	0.00	0.00
9	7	9	OL	L 2X2X3_16	A36	0.00	0.00	0.00
10	7	10	D1	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
11	10	3	IL	L 2X2X1_4	A36	0.00	0.00	0.00
12	11	4	IL	L 2X2X1_4	A36	0.00	0.00	0.00
13	11	8	D1	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
14	8	12	OL	L 2X2X3_16	A36	0.00	0.00	0.00
15	9	10	Web (Leg)	L 1X1X1_8	A36	0.00	0.00	0.00
16	11	12	Web (Leg)	L 1X1X1_8	A36	0.00	0.00	0.00
17	9	65	OL	L 2X2X3_16	A36	0.00	0.00	0.00
18	10	65	D2	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
20	12	66	OL	L 2X2X3_16	A36	0.00	0.00	0.00
19	11	66	D2	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
23	16	10	IL	L 2X2X1_4	A36	0.00	0.00	0.00
24	17	11	IL	L 2X2X1_4	A36	0.00	0.00	0.00
27	13	16	Web (Leg)	L 1X1X1_8	A36	0.00	0.00	0.00
28	17	14	Web (Leg)	L 1X1X1_8	A36	0.00	0.00	0.00
37	13	23	OL	L 2X2X3_16	A36	0.00	0.00	0.00
38	23	25	OL	L 2X2X3_16	A36	0.00	0.00	0.00
39	16	25	D4	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
40	26	16	IL	L 2X2X1_4	A36	0.00	0.00	0.00
41	36	17	IL	L 2X2X1_4	A36	0.00	0.00	0.00
42	37	17	D4	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
43	14	24	OL	L 2X2X3_16	A36	0.00	0.00	0.00
44	24	37	OL	L 2X2X3_16	A36	0.00	0.00	0.00
45	26	25	LC2	L 3X3X1_4	A36	0.00	0.00	0.00
46	27	26	LC2	L 3X3X1_4	A36	0.00	0.00	0.00
47	27	28	LC	L 2X2X3_16	A36	0.00	0.00	0.00
48	29	28	LC	L 2X2X3_16	A36	0.00	0.00	0.00
49	31	29	LC	L 2X2X3_16	A36	0.00	0.00	0.00
52	31	33	LC	L 2X2X3_16	A36	0.00	0.00	0.00
53	33	34	LC	L 2X2X3_16	A36	0.00	0.00	0.00
54	34	35	LC	L 2X2X3_16	A36	0.00	0.00	0.00
55	35	36	LC2	L 3X3X1_4	A36	0.00	0.00	0.00
56	36	37	LC2	L 3X3X1_4	A36	0.00	0.00	0.00
57	25	38	OL2	L 2X2X3_16	A36	0.00	0.00	0.00
58	26	38	D5	L 2X2X1_4	A36	0.00	0.00	0.00
59	39	26	D6	L 2X2X1_4	A36	0.00	0.00	0.00
60	39	27	D7	L 2X2X1_4	A36	0.00	0.00	0.00
61	39	28	D8	L 2X2X1_8	A36	0.00	0.00	0.00
62	28	40	Web (Truss)	L 1X1X1_8	A36	0.00	0.00	0.00
63	41	28	D9	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
64	41	29	D10	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
65	42	29	Web (Truss)	L 1X1X1_8	A36	0.00	0.00	0.00
66	47	29	D11	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
71	47	31	Peak	L 3X3X1_4	A36	0.00	0.00	0.00
76	33	47	D11	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
77	33	52	Web (Truss)	L 1X1X1_8	A36	0.00	0.00	0.00
78	53	33	D10	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
79	34	53	D9	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
80	54	34	Web (Truss)	L 1X1X1_8	A36	0.00	0.00	0.00
81	55	34	D8	L 2X2X1_8	A36	0.00	0.00	0.00
82	55	35	D7	L 2X2X1_4	A36	0.00	0.00	0.00
83	36	56	D5	L 2X2X1_4	A36	0.00	0.00	0.00

84	36	55	D6	L 2X2X1_4	A36	0.00	0.00	0.00
85	37	56	OL2	L 2X2X3_16	A36	0.00	0.00	0.00
86	38	39	UC	L 2X2X3_16	A36	0.00	0.00	0.00
87	39	40	UC	L 2X2X3_16	A36	0.00	0.00	0.00
88	40	41	UC	L 2X2X3_16	A36	0.00	0.00	0.00
89	41	42	UC	L 2X2X3_16	A36	0.00	0.00	0.00
90	42	46	UC	L 2X2X3_16	A36	0.00	0.00	0.00
94	46	47	UC	L 2X2X3_16	A36	0.00	0.00	0.00
95	47	48	UC	L 2X2X3_16	A36	0.00	0.00	0.00
99	48	52	UC	L 2X2X3_16	A36	0.00	0.00	0.00
100	52	53	UC	L 2X2X3_16	A36	0.00	0.00	0.00
101	53	54	UC	L 2X2X3_16	A36	0.00	0.00	0.00
102	54	55	UC	L 2X2X3_16	A36	0.00	0.00	0.00
103	55	56	UC	L 2X2X3_16	A36	0.00	0.00	0.00
104	59	38	Clip	L 2X2X1_4	A36	0.00	0.00	0.00
105	39	60	Clip	L 2X2X1_4	A36	0.00	0.00	0.00
106	55	61	Clip	L 2X2X1_4	A36	0.00	0.00	0.00
107	56	62	Clip	L 2X2X1_4	A36	0.00	0.00	0.00
108	57	58	Outrigger	S4S 2x10	DFir-L_No2	0.00	0.00	0.00
109	59	58	Outrigger	S4S 2x10	DFir-L_No2	0.00	0.00	0.00
110	60	59	Outrigger	S4S 2x10	DFir-L_No2	0.00	0.00	0.00
111	61	62	Outrigger	S4S 2x10	DFir-L_No2	0.00	0.00	0.00
112	62	63	Outrigger	S4S 2x10	DFir-L_No2	0.00	0.00	0.00
113	64	63	Outrigger	S4S 2x10	DFir-L_No2	0.00	0.00	0.00
114	65	13	OL	L 2X2X3_16	A36	0.00	0.00	0.00
115	66	14	OL	L 2X2X3_16	A36	0.00	0.00	0.00
116	16	65	D2	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00
117	17	66	D2	L 1-1_2X1-1_2X1_8	A36	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
5	180.00	0	0.00	0.00	0.00
9	180.00	0	0.00	0.00	0.00
10	180.00	0	0.00	0.00	0.00
11	180.00	0	0.00	0.00	0.00
13	90.00	0	0.00	0.00	0.00
17	180.00	0	0.00	0.00	0.00
23	180.00	0	0.00	0.00	0.00
27	270.00	0	0.00	0.00	0.00
37	180.00	0	0.00	0.00	0.00
38	180.00	0	0.00	0.00	0.00
40	180.00	0	0.00	0.00	0.00
42	90.00	0	0.00	0.00	0.00
47	270.00	0	0.00	0.00	0.00
57	180.00	0	0.00	0.00	0.00
60	270.00	0	0.00	0.00	0.00
61	270.00	0	0.00	0.00	0.00
64	270.00	0	0.00	0.00	0.00
65	90.00	0	0.00	0.00	0.00
76	270.00	0	0.00	0.00	0.00
78	270.00	0	0.00	0.00	0.00
79	270.00	0	0.00	0.00	0.00
80	90.00	0	0.00	0.00	0.00
81	270.00	0	0.00	0.00	0.00
82	270.00	0	0.00	0.00	0.00
84	270.00	0	0.00	0.00	0.00
86	180.00	0	0.00	0.00	0.00
87	180.00	0	0.00	0.00	0.00
88	180.00	0	0.00	0.00	0.00
89	180.00	0	0.00	0.00	0.00
90	180.00	0	0.00	0.00	0.00
94	180.00	0	0.00	0.00	0.00
95	90.00	0	0.00	0.00	0.00
99	90.00	0	0.00	0.00	0.00

100	90.00	0	0.00	0.00	0.00
101	90.00	0	0.00	0.00	0.00
102	90.00	0	0.00	0.00	0.00
103	90.00	0	0.00	0.00	0.00
114	180.00	0	0.00	0.00	0.00

Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
5	1	1	0	0	0	0	0	0	0	0	Full
6	1	1	0	0	1	1	0	0	0	0	Full
7	1	1	0	0	1	1	0	0	0	0	Full
8	1	1	0	0	0	0	0	0	0	0	Full
10	1	1	0	0	1	1	0	0	0	0	Full
11	1	1	0	0	1	1	0	0	0	0	Full
12	0	0	0	0	1	1	0	0	0	0	Full
13	1	1	0	0	1	1	0	0	0	0	Full
15	1	1	0	0	1	1	0	0	0	0	Full
16	1	1	0	0	1	1	0	0	0	0	Full
18	1	1	0	0	1	1	0	0	0	0	Full
19	1	1	0	0	1	1	0	0	0	0	Full
27	1	1	0	0	1	1	0	0	0	0	Full
28	1	1	0	0	1	1	0	0	0	0	Full
38	0	0	0	0	1	1	0	0	0	0	Full
39	1	1	0	0	1	1	0	0	0	0	Full
40	1	1	0	0	0	0	0	0	0	0	Full
41	1	1	0	0	0	0	0	0	0	0	Full
42	1	1	0	0	1	1	0	0	0	0	Full
44	0	0	0	0	1	1	0	0	0	0	Full
57	1	1	0	0	1	1	0	0	0	0	Full
58	1	1	0	0	1	1	0	0	0	0	Full
59	1	1	0	0	1	1	0	0	0	0	Full
60	1	1	0	0	1	1	0	0	0	0	Full
61	1	1	0	0	1	1	0	0	0	0	Full
62	1	1	0	0	1	1	0	0	0	0	Full
63	1	1	0	0	1	1	0	0	0	0	Full
64	1	1	0	0	1	1	0	0	0	0	Full
65	1	1	0	0	1	1	0	0	0	0	Full
66	1	1	0	0	1	1	0	0	0	0	Full
76	1	1	0	0	1	1	0	0	0	0	Full
77	1	1	0	0	1	1	0	0	0	0	Full
78	1	1	0	0	1	1	0	0	0	0	Full
79	1	1	0	0	1	1	0	0	0	0	Full
80	1	1	0	0	1	1	0	0	0	0	Full
81	1	1	0	0	1	1	0	0	0	0	Full
82	1	1	0	0	1	1	0	0	0	0	Full
83	1	1	0	0	1	1	0	0	0	0	Full
84	1	1	0	0	1	1	0	0	0	0	Full
85	1	1	0	0	1	1	0	0	0	0	Full
95	1	1	0	0	0	0	0	0	0	0	Full
104	0	0	0	0	1	1	0	0	1	0	Full
105	1	1	0	0	0	0	0	0	0	0	Full
106	1	1	0	0	0	0	0	0	0	0	Full
107	1	1	0	0	0	0	0	0	0	0	Full
116	1	1	0	0	1	1	0	0	0	0	Full
117	1	1	0	0	1	1	0	0	0	0	Full



Current Date: 3/22/2022 3:07 PM

Units system: English

File name: C:\Users\2022\WEB\D22-010 Ferrucci Jr High School Storage\Calculations\RAM\2012 110B 5 12 EE.ret

Load Data

GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
SL1	Balanced Snow Load	No	SNOW
SL2	Unbalanced Snow Load	No	SNOW
WL1	Positive Wind Load 1	No	WIND
WL2	Negative Wind Load 1	No	WIND
WL3	Parallel to Ridge	No	WIND
WL4	Positive Wind Load 2	No	WIND
WL5	Negative Wind Load 2	No	WIND
WL6	Minimum Wind	No	WIND
EQ	Seismic	No	EQ
LLR	Roof Live Load	No	LLr
C1	DL	Yes	
C2	DL+LLR	Yes	
C3	DL+SL1	Yes	
C4	DL+SL2	Yes	
C5	0.6DL+0.6WL1	Yes	
C6	0.6DL+0.6WL2	Yes	
C7	0.6DL+0.6WL3	Yes	
C8	0.6DL+0.6WL4	Yes	
C9	0.6DL+0.6WL5	Yes	
C10	0.6DL+0.6WL6	Yes	
C11	0.6DL+0.7EQ	Yes	
C12	DL+0.75SL1+0.45WL1	Yes	
C13	DL+0.75SL1+0.45WL2	Yes	
C14	DL+0.75SL1+0.45WL3	Yes	
C15	DL+0.75SL1+0.45WL4	Yes	
C16	DL+0.75SL1+0.45WL5	Yes	
C17	DL+0.75SL1+0.45WL6	Yes	
C18	DL+0.75SL1+0.525EQ	Yes	
C19	DL+0.75SL2+0.45WL1	Yes	
C20	DL+0.75SL2+0.45WL2	Yes	
C21	DL+0.75SL2+0.45WL3	Yes	
C22	DL+0.75SL2+0.45WL4	Yes	
C23	DL+0.75SL2+0.45WL5	Yes	
C24	DL+0.75SL2+0.45WL6	Yes	
C25	DL+0.75SL2+0.525EQ	Yes	
C26	DL+0.45WL1+0.75LLR	Yes	
C27	DL+0.45WL2+0.75LLR	Yes	
C28	DL+0.45WL3+0.75LLR	Yes	
C29	DL+0.45WL4+0.75LLR	Yes	
C30	DL+0.45WL5+0.75LLR	Yes	
C31	DL+0.45WL6+0.75LLR	Yes	

Load on nodes

Condition	Node	FX [Lb]	FY [Lb]	FZ [Lb]	MX [Lb*ft]	MY [Lb*ft]	MZ [Lb*ft]
DL	7	0.00	-120.00	0.00	0.00	0.00	0.00
	8	0.00	-120.00	0.00	0.00	0.00	0.00
	9	0.00	-120.00	0.00	0.00	0.00	0.00
	12	0.00	-120.00	0.00	0.00	0.00	0.00
	13	0.00	-120.00	0.00	0.00	0.00	0.00
	14	0.00	-120.00	0.00	0.00	0.00	0.00
	23	0.00	-120.00	0.00	0.00	0.00	0.00
	24	0.00	-120.00	0.00	0.00	0.00	0.00
	40	0.00	-156.00	0.00	0.00	0.00	0.00
	41	0.00	-156.00	0.00	0.00	0.00	0.00
	42	0.00	-156.00	0.00	0.00	0.00	0.00
	46	0.00	-141.492	0.00	0.00	0.00	0.00
	48	0.00	-141.492	0.00	0.00	0.00	0.00
	52	0.00	-156.00	0.00	0.00	0.00	0.00
	53	0.00	-156.00	0.00	0.00	0.00	0.00
	54	0.00	-156.00	0.00	0.00	0.00	0.00
	57	0.00	-58.50	0.00	0.00	0.00	0.00
	58	0.00	-156.00	0.00	0.00	0.00	0.00
	60	0.00	-156.00	0.00	0.00	0.00	0.00
	61	0.00	-156.00	0.00	0.00	0.00	0.00
	63	0.00	-156.00	0.00	0.00	0.00	0.00
	64	0.00	-58.50	0.00	0.00	0.00	0.00
	65	0.00	-120.00	0.00	0.00	0.00	0.00
	66	0.00	-120.00	0.00	0.00	0.00	0.00
SL1	40	0.00	-600.00	0.00	0.00	0.00	0.00
	41	0.00	-600.00	0.00	0.00	0.00	0.00
	42	0.00	-600.00	0.00	0.00	0.00	0.00
	46	0.00	-544.20	0.00	0.00	0.00	0.00
	48	0.00	-544.20	0.00	0.00	0.00	0.00
	52	0.00	-600.00	0.00	0.00	0.00	0.00
	53	0.00	-600.00	0.00	0.00	0.00	0.00
	54	0.00	-600.00	0.00	0.00	0.00	0.00
	57	0.00	-225.00	0.00	0.00	0.00	0.00
	58	0.00	-600.00	0.00	0.00	0.00	0.00
	60	0.00	-600.00	0.00	0.00	0.00	0.00
	61	0.00	-600.00	0.00	0.00	0.00	0.00
	63	0.00	-600.00	0.00	0.00	0.00	0.00
	64	0.00	-225.00	0.00	0.00	0.00	0.00
SL2	40	0.00	-180.00	0.00	0.00	0.00	0.00
	41	0.00	-180.00	0.00	0.00	0.00	0.00
	42	0.00	-180.00	0.00	0.00	0.00	0.00
	46	0.00	-163.26	0.00	0.00	0.00	0.00
	48	0.00	-812.672	0.00	0.00	0.00	0.00
	52	0.00	-896.00	0.00	0.00	0.00	0.00
	53	0.00	-896.00	0.00	0.00	0.00	0.00
	54	0.00	-896.00	0.00	0.00	0.00	0.00
	57	0.00	-67.50	0.00	0.00	0.00	0.00
	58	0.00	-180.00	0.00	0.00	0.00	0.00
	60	0.00	-180.00	0.00	0.00	0.00	0.00
	61	0.00	-896.00	0.00	0.00	0.00	0.00
	63	0.00	-896.00	0.00	0.00	0.00	0.00
	64	0.00	-336.00	0.00	0.00	0.00	0.00
WL1	7	303.00	0.00	0.00	0.00	0.00	0.00
	8	98.8201	0.00	0.00	0.00	0.00	0.00
	9	303.00	0.00	0.00	0.00	0.00	0.00
	12	98.8201	0.00	0.00	0.00	0.00	0.00
	13	303.00	0.00	0.00	0.00	0.00	0.00
	14	98.8201	0.00	0.00	0.00	0.00	0.00
	23	303.00	0.00	0.00	0.00	0.00	0.00
	24	98.8201	0.00	0.00	0.00	0.00	0.00
	40	-36.6463	219.439	0.00	0.00	0.00	0.00
	41	-36.6463	219.439	0.00	0.00	0.00	0.00
	42	-36.6463	219.439	0.00	0.00	0.00	0.00
	46	-36.6463	219.439	0.00	0.00	0.00	0.00

	48	16.2602	97.3666	0.00	0.00	0.00	0.00
	52	16.2602	97.3666	0.00	0.00	0.00	0.00
	53	16.2602	97.3666	0.00	0.00	0.00	0.00
	54	16.2602	97.3666	0.00	0.00	0.00	0.00
	57	-13.7435	82.2893	0.00	0.00	0.00	0.00
	58	-36.6463	219.439	0.00	0.00	0.00	0.00
	60	-36.6463	219.439	0.00	0.00	0.00	0.00
	61	16.2602	97.3666	0.00	0.00	0.00	0.00
	63	16.2602	97.3666	0.00	0.00	0.00	0.00
	64	6.0982	36.5127	0.00	0.00	0.00	0.00
	65	303.00	0.00	0.00	0.00	0.00	0.00
WL2	66	98.8201	0.00	0.00	0.00	0.00	0.00
	7	192.00	0.00	0.00	0.00	0.00	0.00
	8	210.1824	0.00	0.00	0.00	0.00	0.00
	9	192.00	0.00	0.00	0.00	0.00	0.00
	12	210.1824	0.00	0.00	0.00	0.00	0.00
	13	192.00	0.00	0.00	0.00	0.00	0.00
	14	210.1824	0.00	0.00	0.00	0.00	0.00
	23	192.00	0.00	0.00	0.00	0.00	0.00
	24	210.1824	0.00	0.00	0.00	0.00	0.00
	40	-55.0189	329.4547	0.00	0.00	0.00	0.00
	41	-55.0189	329.4547	0.00	0.00	0.00	0.00
	42	-55.0189	329.4547	0.00	0.00	0.00	0.00
	46	-55.0189	329.4547	0.00	0.00	0.00	0.00
	48	34.6145	207.2736	0.00	0.00	0.00	0.00
	52	34.6145	207.2736	0.00	0.00	0.00	0.00
	53	34.6145	207.2736	0.00	0.00	0.00	0.00
	54	34.6145	207.2736	0.00	0.00	0.00	0.00
	57	-20.6337	123.5455	0.00	0.00	0.00	0.00
	58	-55.0189	329.4547	0.00	0.00	0.00	0.00
	60	-55.0189	329.4547	0.00	0.00	0.00	0.00
	61	34.6145	207.2736	0.00	0.00	0.00	0.00
	63	34.6145	207.2736	0.00	0.00	0.00	0.00
	64	12.9815	77.7274	0.00	0.00	0.00	0.00
	65	192.00	0.00	0.00	0.00	0.00	0.00
WL3	66	210.1823	0.00	0.00	0.00	0.00	0.00
	7	-272.00	0.00	0.00	0.00	0.00	0.00
	8	272.00	0.00	0.00	0.00	0.00	0.00
	9	-272.00	0.00	0.00	0.00	0.00	0.00
	12	272.00	0.00	0.00	0.00	0.00	0.00
	13	-272.00	0.00	0.00	0.00	0.00	0.00
	14	272.00	0.00	0.00	0.00	0.00	0.00
	23	-272.00	0.00	0.00	0.00	0.00	0.00
	24	272.00	0.00	0.00	0.00	0.00	0.00
	40	-55.0188	329.4546	0.00	0.00	0.00	0.00
	41	-55.0188	329.4546	0.00	0.00	0.00	0.00
	42	-55.0188	329.4546	0.00	0.00	0.00	0.00
	46	-55.0188	329.4546	0.00	0.00	0.00	0.00
	48	55.0188	329.4546	0.00	0.00	0.00	0.00
	52	55.0188	329.4546	0.00	0.00	0.00	0.00
	53	55.0188	329.4546	0.00	0.00	0.00	0.00
	54	55.0188	329.4546	0.00	0.00	0.00	0.00
	57	-20.6339	123.5457	0.00	0.00	0.00	0.00
	58	-55.0188	329.4546	0.00	0.00	0.00	0.00
	60	-55.0188	329.4546	0.00	0.00	0.00	0.00
	61	55.0188	329.4546	0.00	0.00	0.00	0.00
	63	55.0188	329.4546	0.00	0.00	0.00	0.00
	64	20.6339	123.5457	0.00	0.00	0.00	0.00
	65	-272.00	0.00	0.00	0.00	0.00	0.00
WL4	66	272.00	0.00	0.00	0.00	0.00	0.00
	7	303.00	0.00	0.00	0.00	0.00	0.00
	8	98.8201	0.00	0.00	0.00	0.00	0.00
	9	303.00	0.00	0.00	0.00	0.00	0.00
	12	98.8201	0.00	0.00	0.00	0.00	0.00
	13	303.00	0.00	0.00	0.00	0.00	0.00
	14	98.8201	0.00	0.00	0.00	0.00	0.00
	23	303.00	0.00	0.00	0.00	0.00	0.00
	24	98.8201	0.00	0.00	0.00	0.00	0.00
	40	0.00	7.27E-06	0.00	0.00	0.00	0.00
	41	0.00	7.27E-06	0.00	0.00	0.00	0.00
	42	0.00	7.27E-06	0.00	0.00	0.00	0.00

	46	0.00	7.27E-06	0.00	0.00	0.00	0.00
	48	16.2602	97.3666	0.00	0.00	0.00	0.00
	52	16.2602	97.3666	0.00	0.00	0.00	0.00
	53	16.2602	97.3666	0.00	0.00	0.00	0.00
	54	16.2602	97.3666	0.00	0.00	0.00	0.00
	58	0.00	7.27E-06	0.00	0.00	0.00	0.00
	60	0.00	7.27E-06	0.00	0.00	0.00	0.00
	61	16.2602	97.3666	0.00	0.00	0.00	0.00
	63	16.2602	97.3666	0.00	0.00	0.00	0.00
	64	6.0982	36.5127	0.00	0.00	0.00	0.00
	65	303.00	0.00	0.00	0.00	0.00	0.00
WL5	66	98.8201	0.00	0.00	0.00	0.00	0.00
	7	191.00	0.00	0.00	0.00	0.00	0.00
	8	209.0877	0.00	0.00	0.00	0.00	0.00
	9	191.00	0.00	0.00	0.00	0.00	0.00
	12	209.0877	0.00	0.00	0.00	0.00	0.00
	13	191.00	0.00	0.00	0.00	0.00	0.00
	14	209.0877	0.00	0.00	0.00	0.00	0.00
	23	191.00	0.00	0.00	0.00	0.00	0.00
	24	209.0877	0.00	0.00	0.00	0.00	0.00
	40	-18.2441	109.2463	0.00	0.00	0.00	0.00
	41	-18.2441	109.2463	0.00	0.00	0.00	0.00
	42	-18.2441	109.2463	0.00	0.00	0.00	0.00
	46	-18.2441	109.2463	0.00	0.00	0.00	0.00
	48	34.4342	206.1941	0.00	0.00	0.00	0.00
	52	34.4342	206.1941	0.00	0.00	0.00	0.00
	53	34.4342	206.1941	0.00	0.00	0.00	0.00
	54	34.4342	206.1941	0.00	0.00	0.00	0.00
	57	-6.842	40.9674	0.00	0.00	0.00	0.00
	58	-18.2441	109.2463	0.00	0.00	0.00	0.00
	60	-18.2441	109.2463	0.00	0.00	0.00	0.00
	61	34.4342	206.1941	0.00	0.00	0.00	0.00
	63	34.4342	206.1941	0.00	0.00	0.00	0.00
	64	12.9139	77.3225	0.00	0.00	0.00	0.00
	65	191.00	0.00	0.00	0.00	0.00	0.00
WL6	66	209.0876	0.00	0.00	0.00	0.00	0.00
	7	384.00	0.00	0.00	0.00	0.00	0.00
	9	384.00	0.00	0.00	0.00	0.00	0.00
	13	384.00	0.00	0.00	0.00	0.00	0.00
	23	384.00	0.00	0.00	0.00	0.00	0.00
	40	25.7143	0.00	0.00	0.00	0.00	0.00
	41	25.7143	0.00	0.00	0.00	0.00	0.00
	42	25.7143	0.00	0.00	0.00	0.00	0.00
	46	25.7143	0.00	0.00	0.00	0.00	0.00
	57	25.7143	0.00	0.00	0.00	0.00	0.00
	58	25.7143	0.00	0.00	0.00	0.00	0.00
	60	25.7143	0.00	0.00	0.00	0.00	0.00
EQ	65	384.00	0.00	0.00	0.00	0.00	0.00
	7	50.00	10.00	0.00	0.00	0.00	0.00
	8	50.00	10.00	0.00	0.00	0.00	0.00
	9	50.00	10.00	0.00	0.00	0.00	0.00
	12	50.00	10.00	0.00	0.00	0.00	0.00
	13	50.00	10.00	0.00	0.00	0.00	0.00
	14	50.00	10.00	0.00	0.00	0.00	0.00
	23	50.00	10.00	0.00	0.00	0.00	0.00
	24	50.00	10.00	0.00	0.00	0.00	0.00
	40	50.00	10.00	0.00	0.00	0.00	0.00
	41	50.00	10.00	0.00	0.00	0.00	0.00
	42	50.00	10.00	0.00	0.00	0.00	0.00
	46	45.35	9.07	0.00	0.00	0.00	0.00
	48	45.35	9.07	0.00	0.00	0.00	0.00
	52	50.00	10.00	0.00	0.00	0.00	0.00
	53	50.00	10.00	0.00	0.00	0.00	0.00
	54	50.00	10.00	0.00	0.00	0.00	0.00
	57	18.75	3.75	0.00	0.00	0.00	0.00
	58	50.00	10.00	0.00	0.00	0.00	0.00
	60	50.00	10.00	0.00	0.00	0.00	0.00
	61	50.00	10.00	0.00	0.00	0.00	0.00
	63	50.00	10.00	0.00	0.00	0.00	0.00
	64	18.75	3.75	0.00	0.00	0.00	0.00
	65	50.00	10.00	0.00	0.00	0.00	0.00

LLR	66	50.00	10.00	0.00	0.00	0.00	0.00
	40	0.00	-560.00	0.00	0.00	0.00	0.00
	41	0.00	-560.00	0.00	0.00	0.00	0.00
	42	0.00	-560.00	0.00	0.00	0.00	0.00
	46	0.00	-507.92	0.00	0.00	0.00	0.00
	48	0.00	-507.92	0.00	0.00	0.00	0.00
	52	0.00	-560.00	0.00	0.00	0.00	0.00
	53	0.00	-560.00	0.00	0.00	0.00	0.00
	54	0.00	-560.00	0.00	0.00	0.00	0.00
	57	0.00	-210.00	0.00	0.00	0.00	0.00
	58	0.00	-560.00	0.00	0.00	0.00	0.00
	60	0.00	-560.00	0.00	0.00	0.00	0.00
	61	0.00	-560.00	0.00	0.00	0.00	0.00
	63	0.00	-560.00	0.00	0.00	0.00	0.00
	64	0.00	-210.00	0.00	0.00	0.00	0.00

Current Date: 3/22/2022 3:11 PM

Units system: English

File name: C:\Users\2022\WEB\D22-010 Ferrucci Jr High School Storage\Calculations\RAM\2012 110B 5 12 EE.ret看

Analysis Results at Peak

Forces envelope

Note.- Ic is the controlling load condition

Forces envelope for :

C1=DL
 C2=DL+LLR
 C3=DL+SL1
 C4=DL+SL2
 C5=0.6DL+0.6WL1
 C6=0.6DL+0.6WL2
 C7=0.6DL+0.6WL3
 C8=0.6DL+0.6WL4
 C9=0.6DL+0.6WL5
 C10=0.6DL+0.6WL6
 C11=0.6DL+0.7EQ
 C12=DL+0.75SL1+0.45WL1
 C13=DL+0.75SL1+0.45WL2
 C14=DL+0.75SL1+0.45WL3
 C15=DL+0.75SL1+0.45WL4
 C16=DL+0.75SL1+0.45WL5
 C17=DL+0.75SL1+0.45WL6
 C18=DL+0.75SL1+0.525EQ
 C19=DL+0.75SL2+0.45WL1
 C20=DL+0.75SL2+0.45WL2
 C21=DL+0.75SL2+0.45WL3
 C22=DL+0.75SL2+0.45WL4
 C23=DL+0.75SL2+0.45WL5
 C24=DL+0.75SL2+0.45WL6
 C25=DL+0.75SL2+0.525EQ
 C26=DL+0.45WL1+0.75LLR
 C27=DL+0.45WL2+0.75LLR
 C28=DL+0.45WL3+0.75LLR
 C29=DL+0.45WL4+0.75LLR
 C30=DL+0.45WL5+0.75LLR
 C31=DL+0.45WL6+0.75LLR

MEMBER 49

Station		Axial [Lb]	Ic	Shear V2 [Lb]	Ic	Shear V3 [Lb]	Ic	Torsion [Lb*ft]	Ic	M22 [Lb*ft]	Ic	M33 [Lb*ft]	Ic
0%	Max	4922.40	C3	18.86	C3	10.86	C15	0.28	C3	11.61	C17	7.80	WL3
	Min	-1670.61	WL2	-8.36	WL3	-4.72	WL3	-0.16	WL2	-5.94	WL3	-15.11	C17
25%	Max	4922.40	C3	18.86	C3	10.86	C15	0.28	C3	6.41	C17	4.64	SL2
	Min	-1670.61	WL2	-8.36	WL3	-4.72	WL3	-0.16	WL2	-3.50	WL3	-6.24	C15
50%	Max	4922.40	C3	18.86	C3	10.86	C15	0.28	C3	2.84	WL6	8.64	C4
	Min	-1670.61	WL2	-8.36	WL3	-4.72	WL3	-0.16	WL2	-2.65	C4	-3.50	WL5
75%	Max	4922.40	C3	18.86	C3	10.86	C15	0.28	C3	1.88	WL2	15.04	C3
	Min	-1670.61	WL2	-8.36	WL3	-4.72	WL3	-0.16	WL2	-5.31	C3	-5.06	WL2
100%	Max	4922.40	C3	18.86	C3	10.86	C15	0.28	C3	3.83	WL3	24.91	C3
	Min	-1670.61	WL2	-8.36	WL3	-4.72	WL3	-0.16	WL2	-10.47	C3	-9.29	WL3

MEMBER 52

Station		Axial [Lb]	Ic	Shear V2 [Lb]	Ic	Shear V3 [Lb]	Ic	Torsion [Lb*ft]	Ic	M22 [Lb*ft]	Ic	M33 [Lb*ft]	Ic
0%	Max	4853.52	C3	16.72	C4	8.22	C4	1.15	C4	6.09	SL2	11.89	C15
	Min	-1645.32	WL2	-6.31	WL5	-4.72	WL4	-0.08	WL3	-8.81	C15	-5.16	SL2
25%	Max	4853.52	C3	16.72	C4	8.22	C4	1.15	C4	2.29	SL2	14.62	C3
	Min	-1645.32	WL2	-6.31	WL5	-4.72	WL4	-0.08	WL3	-7.32	C15	-5.60	WL3
50%	Max	4853.52	C3	16.72	C4	8.22	C4	1.15	C4	1.94	WL3	18.73	C3
	Min	-1645.32	WL2	-6.31	WL5	-4.72	WL4	-0.08	WL3	-6.27	C3	-7.31	WL3
75%	Max	4853.52	C3	16.72	C4	8.22	C4	1.15	C4	1.77	WL3	22.84	C3
	Min	-1645.32	WL2	-6.31	WL5	-4.72	WL4	-0.08	WL3	-6.75	C4	-9.01	WL3
100%	Max	4853.52	C3	16.72	C4	8.22	C4	1.15	C4	3.19	WL5	29.73	C4
	Min	-1645.32	WL2	-6.31	WL5	-4.72	WL4	-0.08	WL3	-10.54	C4	-10.72	WL3

MEMBER 94

Station		Axial [Lb]	Ic	Shear V2 [Lb]	Ic	Shear V3 [Lb]	Ic	Torsion [Lb*ft]	Ic	M22 [Lb*ft]	Ic	M33 [Lb*ft]	Ic
0%	Max	2539.09	WL3	497.28	C3	296.52	C3	0.03	WL3	48.12	C3	80.15	WL2
	Min	-5426.14	C3	-246.13	WL2	-150.67	WL3	-0.09	WL4	-25.34	WL2	-149.17	C3
25%	Max	2539.09	WL3	497.28	C3	296.52	C3	0.03	WL3	9.90	C3	49.06	WL2
	Min	-5426.14	C3	-246.13	WL2	-150.67	WL3	-0.09	WL4	-8.00	WL2	-85.53	C3
50%	Max	2539.09	WL3	497.28	C3	296.52	C3	0.03	WL3	14.12	WL3	17.96	WL2
	Min	-5426.14	C3	-246.13	WL2	-150.67	WL3	-0.09	WL4	-28.32	C3	-21.89	C3
75%	Max	2539.09	WL3	497.28	C3	296.52	C3	0.03	WL3	33.05	WL3	41.75	C3
	Min	-5426.14	C3	-246.13	WL2	-150.67	WL3	-0.09	WL4	-66.53	C3	-21.52	WL3
100%	Max	2539.09	WL3	497.28	C3	296.52	C3	0.03	WL3	51.97	WL3	105.38	C3
	Min	-5426.14	C3	-246.13	WL2	-150.67	WL3	-0.09	WL4	-104.75	C3	-52.24	WL3

MEMBER 95

Station		Axial [Lb]	Ic	Shear V2 [Lb]	Ic	Shear V3 [Lb]	Ic	Torsion [Lb*ft]	Ic	M22 [Lb*ft]	Ic	M33 [Lb*ft]	Ic
0%	Max	2634.90	WL2	755.48	C4	71.28	WL3	0.81	C4	0.00	LLR	0.00	C15
	Min	-5552.16	C4	-263.62	WL3	-181.52	C4	0.00	DL	0.00	WL3	0.00	LLR
25%	Max	2634.90	WL2	755.48	C4	71.28	WL3	0.81	C4	24.84	C4	97.52	C4
	Min	-5552.16	C4	-263.62	WL3	-181.52	C4	0.00	DL	-8.76	WL3	-33.12	WL3
50%	Max	2634.90	WL2	755.48	C4	71.28	WL3	0.81	C4	49.67	C4	195.03	C4
	Min	-5552.16	C4	-263.62	WL3	-181.52	C4	0.00	DL	-17.52	WL3	-66.23	WL3
75%	Max	2634.90	WL2	755.48	C4	71.28	WL3	0.81	C4	74.51	C4	292.55	C4
	Min	-5552.16	C4	-263.62	WL3	-181.52	C4	0.00	DL	-26.28	WL3	-99.35	WL3
100%	Max	2634.90	WL2	755.48	C4	71.28	WL3	0.81	C4	99.34	C4	390.06	C4
	Min	-5552.16	C4	-263.62	WL3	-181.52	C4	0.00	DL	-35.04	WL3	-132.47	WL3

Current Date: 3/22/2022 3:14 PM

Units system: English

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Analysis Results at Haunch

Forces envelope

Note.- **Ic** is the controlling load condition

Forces envelope for :

C1=DL
 C2=DL+LLR
 C3=DL+SL1
 C4=DL+SL2
 C5=0.6DL+0.6WL1
 C6=0.6DL+0.6WL2
 C7=0.6DL+0.6WL3
 C8=0.6DL+0.6WL4
 C9=0.6DL+0.6WL5
 C10=0.6DL+0.6WL6
 C11=0.6DL+0.7EQ
 C12=DL+0.75SL1+0.45WL1
 C13=DL+0.75SL1+0.45WL2
 C14=DL+0.75SL1+0.45WL3
 C15=DL+0.75SL1+0.45WL4
 C16=DL+0.75SL1+0.45WL5
 C17=DL+0.75SL1+0.45WL6
 C18=DL+0.75SL1+0.525EQ
 C19=DL+0.75SL2+0.45WL1
 C20=DL+0.75SL2+0.45WL2
 C21=DL+0.75SL2+0.45WL3
 C22=DL+0.75SL2+0.45WL4
 C23=DL+0.75SL2+0.45WL5
 C24=DL+0.75SL2+0.45WL6
 C25=DL+0.75SL2+0.525EQ
 C26=DL+0.45WL1+0.75LLR
 C27=DL+0.45WL2+0.75LLR
 C28=DL+0.45WL3+0.75LLR
 C29=DL+0.45WL4+0.75LLR
 C30=DL+0.45WL5+0.75LLR
 C31=DL+0.45WL6+0.75LLR

MEMBER 85

Station		Axial [Lb]	Ic	Shear V2 [Lb]	Ic	Shear V3 [Lb]	Ic	Torsion [Lb*ft]	Ic	M22 [Lb*ft]	Ic	M33 [Lb*ft]	Ic
0%	Max	3887.94	C10	1.27	C9	2.48	C10	0.15	C7	0.00	C1	0.00	C1
	Min	-302.63	C7	-3.66	C24	-0.09	C2	-2.04	C4	0.00	C1	0.00	C1
25%	Max	3887.94	C10	1.27	C9	2.48	C10	0.15	C7	0.00	C1	0.00	C1
	Min	-302.63	C7	-3.66	C24	-0.09	C2	-2.04	C4	0.00	C2	0.00	C2
50%	Max	3887.94	C10	1.27	C9	2.48	C10	0.15	C7	0.00	C1	0.00	C1
	Min	-302.63	C7	-3.66	C24	-0.09	C2	-2.04	C4	0.00	C1	0.00	C1
75%	Max	3887.94	C10	1.27	C9	2.48	C10	0.15	C7	0.00	C1	0.00	C1
	Min	-302.63	C7	-3.66	C24	-0.09	C2	-2.04	C4	0.00	C1	0.00	C1
100%	Max	3887.94	C10	1.27	C9	2.48	C10	0.15	C7	0.00	C1	0.00	C1
	Min	-302.63	C7	-3.66	C24	-0.09	C2	-2.04	C4	0.00	C1	0.00	C1

MEMBER 57

Station		Axial [Lb]	Ic	Shear V2 [Lb]	Ic	Shear V3 [Lb]	Ic	Torsion [Lb*ft]	Ic	M22 [Lb*ft]	Ic	M33 [Lb*ft]	Ic
0%	Max	1404.32	C4	2.35	C16	2.12	C9	0.24	C6	0.00	C1	0.00	C1
	Min	-3573.81	C9	-1.23	C4	-0.52	C4	-0.57	C3	0.00	C1	0.00	C1
25%	Max	1404.32	C4	2.35	C16	2.12	C9	0.24	C6	0.00	C16	0.00	C2
	Min	-3573.81	C9	-1.23	C4	-0.52	C4	-0.57	C3	0.00	C20	0.00	C14
50%	Max	1404.32	C4	2.35	C16	2.12	C9	0.24	C6	0.00	C1	0.00	C1
	Min	-3573.81	C9	-1.23	C4	-0.52	C4	-0.57	C3	0.00	C1	0.00	C1
75%	Max	1404.32	C4	2.35	C16	2.12	C9	0.24	C6	0.00	C1	0.00	C1
	Min	-3573.81	C9	-1.23	C4	-0.52	C4	-0.57	C3	0.00	C1	0.00	C1
100%	Max	1404.32	C4	2.35	C16	2.12	C9	0.24	C6	0.00	C1	0.00	C1
	Min	-3573.81	C9	-1.23	C4	-0.52	C4	-0.57	C3	0.00	C1	0.00	C1

MEMBER 41

Station		Axial [Lb]	Ic	Shear V2 [Lb]	Ic	Shear V3 [Lb]	Ic	Torsion [Lb*ft]	Ic	M22 [Lb*ft]	Ic	M33 [Lb*ft]	Ic
0%	Max	1004.95	C7	-1.27	C1	1.38	C4	0.32	C23	0.00	C1	0.00	C9
	Min	-8104.39	C24	-20.73	C16	-9.52	C10	0.05	C7	0.00	C26	0.00	C30
25%	Max	1004.95	C7	-1.27	C1	1.38	C4	0.32	C23	1.62	C9	-0.75	C1
	Min	-8104.39	C24	-20.73	C16	-9.52	C10	0.05	C7	-0.04	C4	-9.05	C16
50%	Max	1004.95	C7	-1.27	C1	1.38	C4	0.32	C23	3.23	C9	-1.51	C1
	Min	-8104.39	C24	-20.73	C16	-9.52	C10	0.05	C7	-0.07	C4	-18.10	C16
75%	Max	1004.95	C7	-1.27	C1	1.38	C4	0.32	C23	4.85	C9	-2.26	C1
	Min	-8104.39	C24	-20.73	C16	-9.52	C10	0.05	C7	-0.11	C4	-27.15	C16
100%	Max	1004.95	C7	-1.27	C1	1.38	C4	0.32	C23	6.47	C9	-3.02	C1
	Min	-8104.39	C24	-20.73	C16	-9.52	C10	0.05	C7	-0.15	C4	-36.21	C16

MEMBER 40

Station		Axial [Lb]	Ic	Shear V2 [Lb]	Ic	Shear V3 [Lb]	Ic	Torsion [Lb*ft]	Ic	M22 [Lb*ft]	Ic	M33 [Lb*ft]	Ic
0%	Max	4096.23	C9	18.99	C10	4.07	C17	0.77	C3	0.00	C21	0.00	C9
	Min	-5675.45	C3	-8.05	C21	-1.58	C7	-0.08	C6	0.00	C17	0.00	C1
25%	Max	4096.23	C9	18.99	C10	4.07	C17	0.77	C3	1.05	C21	12.41	C10
	Min	-5675.45	C3	-8.05	C21	-1.58	C7	-0.08	C6	-3.00	C10	-4.90	C21
50%	Max	4096.23	C9	18.99	C10	4.07	C17	0.77	C3	2.09	C21	24.82	C10
	Min	-5675.45	C3	-8.05	C21	-1.58	C7	-0.08	C6	-6.00	C10	-9.80	C21
75%	Max	4096.23	C9	18.99	C10	4.07	C17	0.77	C3	3.14	C21	37.23	C10
	Min	-5675.45	C3	-8.05	C21	-1.58	C7	-0.08	C6	-8.99	C10	-14.71	C21
100%	Max	4096.23	C9	18.99	C10	4.07	C17	0.77	C3	4.18	C21	49.64	C10
	Min	-5675.45	C3	-8.05	C21	-1.58	C7	-0.08	C6	-11.99	C10	-19.61	C21



Current Date: 3/22/2022 3:17 PM

Units system: English

File name: C:\Users\2022\WEB\D22-010 Ferrucci Jr High School Storage\Calculations\RAM\2012 110B 5 12 EE.ret

Reactions

Node	Forces [Lb]			Moments [Lb*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition DL=Dead Load						
2	40.89816	1580.00060	0.16259	0.00000	0.00000	0.00000
5	-40.89816	1579.98340	-0.82825	0.00000	0.00000	0.00000
SUM	0.00000	3159.98400	-0.66567	0.00000	0.00000	0.00000
Condition SL1=Balanced Snow Load						
2	251.06589	3769.37950	-1.02325	0.00000	0.00000	0.00000
5	-251.06589	3769.02050	-1.07313	0.00000	0.00000	0.00000
SUM	0.00000	7538.40000	-2.09638	0.00000	0.00000	0.00000
Condition SL2=Unbalanced Snow Load						
2	225.43945	2001.24310	-0.04476	0.00000	0.00000	0.00000
5	-225.43945	4758.18890	-1.59266	0.00000	0.00000	0.00000
SUM	0.00000	6759.43200	-1.63743	0.00000	0.00000	0.00000
Condition WL1=Positive Wind Load 1						
2	-1210.78420	-1821.58950	-2.39156	0.00000	0.00000	0.00000
5	-668.35415	-198.04608	3.21538	0.00000	0.00000	0.00000
SUM	-1879.13840	-2019.63560	0.82382	0.00000	0.00000	0.00000
Condition WL2=Negative Wind Load 1						
2	-1043.39890	-2520.18550	-2.89929	0.00000	0.00000	0.00000
5	-837.43433	-901.45723	4.82297	0.00000	0.00000	0.00000
SUM	-1880.83330	-3421.64280	1.92368	0.00000	0.00000	0.00000
Condition WL3=Parallel to Ridge						
2	385.07626	-2100.03880	-0.63624	0.00000	0.00000	0.00000
5	-385.07626	-2100.50720	4.10068	0.00000	0.00000	0.00000
SUM	0.00000	-4200.54600	3.46445	0.00000	0.00000	0.00000
Condition WL4=Positive Wind Load 2						
2	-1278.72590	-856.29147	-1.48213	0.00000	0.00000	0.00000
5	-834.03397	235.57896	3.68928	0.00000	0.00000	0.00000
SUM	-2112.75990	-620.71251	2.20715	0.00000	0.00000	0.00000
Condition WL5=Negative Wind Load 2						
2	-1105.61370	-1545.29100	-1.91566	0.00000	0.00000	0.00000
5	-998.03734	-465.64083	5.26695	0.00000	0.00000	0.00000
SUM	-2103.65100	-2010.93180	3.35129	0.00000	0.00000	0.00000
Condition WL6=Minimum Wind						
2	-1426.36490	-755.65038	-1.57433	0.00000	0.00000	0.00000
5	-673.63506	755.65038	2.27797	0.00000	0.00000	0.00000
SUM	-2100.00000	0.00000	0.70364	0.00000	0.00000	0.00000

Condition EQ=Seismic						
2	-567.89901	-693.93602	-0.63575	0.00000	0.00000	0.00000
5	-560.30099	468.29602	2.16059	0.00000	0.00000	0.00000
SUM	-1128.20000	-225.64000	1.52483	0.00000	0.00000	0.00000
Condition LLR=Roof Live Load						
2	234.34880	3518.06820	-0.80439	0.00000	0.00000	0.00000
5	-234.34880	3517.77180	-1.04331	0.00000	0.00000	0.00000
SUM	0.00000	7035.84000	-1.84770	0.00000	0.00000	0.00000
Condition C1=DL						
2	40.89816	1580.00060	0.16259	0.00000	0.00000	0.00000
5	-40.89816	1579.98340	-0.82825	0.00000	0.00000	0.00000
SUM	0.00000	3159.98400	-0.66567	0.00000	0.00000	0.00000
Condition C2=DL+LLR						
2	275.00331	5098.28480	-2.39581	0.00000	0.00000	0.00000
5	-275.00331	5097.53920	-1.39037	0.00000	0.00000	0.00000
SUM	0.00000	10195.82400	-3.78619	0.00000	0.00000	0.00000
Condition C3=DL+SL1						
2	291.70064	5349.61190	-2.76221	0.00000	0.00000	0.00000
5	-291.70064	5348.77210	-1.38180	0.00000	0.00000	0.00000
SUM	0.00000	10698.38400	-4.14400	0.00000	0.00000	0.00000
Condition C4=DL+SL2						
2	266.09056	3581.68740	-0.91352	0.00000	0.00000	0.00000
5	-266.09056	6337.72860	-1.80638	0.00000	0.00000	0.00000
SUM	0.00000	9919.41600	-2.71990	0.00000	0.00000	0.00000
Condition C5=0.6DL+0.6WL1						
2	-701.16601	-148.09958	-0.41340	0.00000	0.00000	0.00000
5	-426.31702	832.30863	1.45637	0.00000	0.00000	0.00000
SUM	-1127.48300	684.20904	1.04297	0.00000	0.00000	0.00000
Condition C6=0.6DL+0.6WL2						
2	-600.77116	-568.00442	-0.59680	0.00000	0.00000	0.00000
5	-527.72880	411.00917	2.41330	0.00000	0.00000	0.00000
SUM	-1128.50000	-156.99525	1.81651	0.00000	0.00000	0.00000
Condition C7=0.6DL+0.6WL3						
2	255.50671	-312.12399	-0.00902	0.00000	0.00000	0.00000
5	-255.50671	-312.21324	1.90169	0.00000	0.00000	0.00000
SUM	0.00000	-624.33723	1.89267	0.00000	0.00000	0.00000
Condition C8=0.6DL+0.6WL4						
2	-742.09187	431.26807	-0.10263	0.00000	0.00000	0.00000
5	-525.56405	1092.29480	1.74113	0.00000	0.00000	0.00000
SUM	-1267.65590	1523.56290	1.63850	0.00000	0.00000	0.00000
Condition C9=0.6DL+0.6WL5						
2	-638.26402	16.98772	-0.26165	0.00000	0.00000	0.00000
5	-623.92658	672.44357	2.68099	0.00000	0.00000	0.00000
SUM	-1262.19060	689.43129	2.41934	0.00000	0.00000	0.00000
Condition C10=0.6DL+0.6WL6						
2	-830.40827	492.04630	-0.12019	0.00000	0.00000	0.00000
5	-429.59173	1403.94410	0.90124	0.00000	0.00000	0.00000
SUM	-1260.00000	1895.99040	0.78106	0.00000	0.00000	0.00000

Condition C11=0.6DL+0.7EQ						
2	-372.60236	460.10863	0.05660	0.00000	0.00000	0.00000
5	-417.13764	1277.93380	1.06235	0.00000	0.00000	0.00000
SUM	-789.74000	1738.04240	1.11895	0.00000	0.00000	0.00000
Condition C12=DL+0.75SL1+0.45WL1						
2	-314.90905	3578.03380	0.06219	0.00000	0.00000	0.00000
5	-530.70322	4326.91420	0.37371	0.00000	0.00000	0.00000
SUM	-845.61227	7904.94800	0.43590	0.00000	0.00000	0.00000
Condition C13=DL+0.75SL1+0.45WL2						
2	-239.65653	3262.85710	0.06715	0.00000	0.00000	0.00000
5	-606.71843	4011.18770	1.08731	0.00000	0.00000	0.00000
SUM	-846.37497	7274.04480	1.15446	0.00000	0.00000	0.00000
Condition C14=DL+0.75SL1+0.45WL3						
2	402.19759	3461.87890	-1.14527	0.00000	0.00000	0.00000
5	-402.19759	3461.65940	0.36224	0.00000	0.00000	0.00000
SUM	0.00000	6923.53830	-0.78303	0.00000	0.00000	0.00000
Condition C15=DL+0.75SL1+0.45WL4						
2	-345.69884	4011.29640	-0.06551	0.00000	0.00000	0.00000
5	-605.04309	4523.16700	0.71338	0.00000	0.00000	0.00000
SUM	-950.74194	8534.46340	0.64787	0.00000	0.00000	0.00000
Condition C16=DL+0.75SL1+0.45WL5						
2	-267.87204	3700.34450	-0.05722	0.00000	0.00000	0.00000
5	-678.77090	4208.52020	1.41331	0.00000	0.00000	0.00000
SUM	-946.64295	7908.86470	1.35609	0.00000	0.00000	0.00000
Condition C17=DL+0.75SL1+0.45WL6						
2	-411.81731	4056.93230	0.02043	0.00000	0.00000	0.00000
5	-533.18269	4756.85170	0.06844	0.00000	0.00000	0.00000
SUM	-945.00000	8813.78400	0.08887	0.00000	0.00000	0.00000
Condition C18=DL+0.75SL1+0.525EQ						
2	-68.64540	4034.66250	-0.57320	0.00000	0.00000	0.00000
5	-523.65960	4660.66050	0.15757	0.00000	0.00000	0.00000
SUM	-592.30500	8695.32300	-0.41563	0.00000	0.00000	0.00000
Condition C19=DL+0.75SL2+0.45WL1						
2	-335.93027	2252.51520	0.33630	0.00000	0.00000	0.00000
5	-509.68200	5068.20670	0.05926	0.00000	0.00000	0.00000
SUM	-845.61227	7320.72200	0.39556	0.00000	0.00000	0.00000
Condition C20=DL+0.75SL2+0.45WL2						
2	-260.67419	1937.30880	0.30197	0.00000	0.00000	0.00000
5	-585.70078	4752.50990	0.77475	0.00000	0.00000	0.00000
SUM	-846.37497	6689.81880	1.07672	0.00000	0.00000	0.00000
Condition C21=DL+0.75SL2+0.45WL3						
2	382.96409	2135.74720	-0.28448	0.00000	0.00000	0.00000
5	-382.96409	4203.56510	-0.00825	0.00000	0.00000	0.00000
SUM	0.00000	6339.31230	-0.29273	0.00000	0.00000	0.00000

Condition C22=DL+0.75SL2+0.45WL4						
2	-367.12249	2685.94460	0.32436	0.00000	0.00000	0.00000
5	-583.61945	5264.29280	0.42289	0.00000	0.00000	0.00000
SUM	-950.74194	7950.23740	0.74725	0.00000	0.00000	0.00000
Condition C23=DL+0.75SL2+0.45WL5						
2	-289.27994	2374.95900	0.29743	0.00000	0.00000	0.00000
5	-657.36301	4949.67970	1.12472	0.00000	0.00000	0.00000
SUM	-946.64295	7324.63870	1.42214	0.00000	0.00000	0.00000
Condition C24=DL+0.75SL2+0.45WL6						
2	-433.26128	2731.59630	0.37115	0.00000	0.00000	0.00000
5	-511.73872	5497.96170	-0.22811	0.00000	0.00000	0.00000
SUM	-945.00000	8229.55800	0.14303	0.00000	0.00000	0.00000
Condition C25=DL+0.75SL2+0.525EQ						
2	-89.61143	2709.18460	0.05766	0.00000	0.00000	0.00000
5	-502.69357	5401.91240	-0.14278	0.00000	0.00000	0.00000
SUM	-592.30500	8111.09700	-0.08512	0.00000	0.00000	0.00000
Condition C26=DL+0.45WL1+0.75LLR						
2	-327.44747	3389.93230	0.13926	0.00000	0.00000	0.00000
5	-518.16479	4138.09570	0.36652	0.00000	0.00000	0.00000
SUM	-845.61227	7528.02800	0.50578	0.00000	0.00000	0.00000
Condition C27=DL+0.45WL2+0.75LLR						
2	-252.19323	3074.75750	0.13785	0.00000	0.00000	0.00000
5	-594.18173	3822.36720	1.07979	0.00000	0.00000	0.00000
SUM	-846.37497	6897.12480	1.21764	0.00000	0.00000	0.00000
Condition C28=DL+0.45WL3+0.75LLR						
2	389.66772	3273.40120	-0.97168	0.00000	0.00000	0.00000
5	-389.66772	3273.21710	0.37740	0.00000	0.00000	0.00000
SUM	0.00000	6546.61830	-0.59428	0.00000	0.00000	0.00000
Condition C29=DL+0.45WL4+0.75LLR						
2	-358.23412	3823.27760	0.03033	0.00000	0.00000	0.00000
5	-592.50781	4334.26570	0.69716	0.00000	0.00000	0.00000
SUM	-950.74194	8157.54340	0.72749	0.00000	0.00000	0.00000
Condition C30=DL+0.45WL5+0.75LLR						
2	-280.40563	3512.32500	0.03293	0.00000	0.00000	0.00000
5	-666.23731	4019.61970	1.39683	0.00000	0.00000	0.00000
SUM	-946.64295	7531.94470	1.42976	0.00000	0.00000	0.00000
Condition C31=DL+0.45WL6+0.75LLR						
2	-424.35489	3868.91740	0.10985	0.00000	0.00000	0.00000
5	-520.64511	4567.94660	0.05385	0.00000	0.00000	0.00000
SUM	-945.00000	8436.86400	0.16371	0.00000	0.00000	0.00000

Current Date: 3/22/2022 3:19 PM

Units system: English

File name: C:\Users\2022\WEB\D22-010 Ferrucci Jr High School Storage\Calculations\RAM\2012 110B 5 12 EE.ret

Steel Code Check

Report: Summary - Group by description

Load conditions to be included in design :

C1=DL
 C2=DL+LLR
 C3=DL+SL1
 C4=DL+SL2
 C5=0.6DL+0.6WL1
 C6=0.6DL+0.6WL2
 C7=0.6DL+0.6WL3
 C8=0.6DL+0.6WL4
 C9=0.6DL+0.6WL5
 C10=0.6DL+0.6WL6
 C11=0.6DL+0.7EQ
 C12=DL+0.75SL1+0.45WL1
 C13=DL+0.75SL1+0.45WL2
 C14=DL+0.75SL1+0.45WL3
 C15=DL+0.75SL1+0.45WL4
 C16=DL+0.75SL1+0.45WL5
 C17=DL+0.75SL1+0.45WL6
 C18=DL+0.75SL1+0.525EQ
 C19=DL+0.75SL2+0.45WL1
 C20=DL+0.75SL2+0.45WL2
 C21=DL+0.75SL2+0.45WL3
 C22=DL+0.75SL2+0.45WL4
 C23=DL+0.75SL2+0.45WL5
 C24=DL+0.75SL2+0.45WL6
 C25=DL+0.75SL2+0.525EQ
 C26=DL+0.45WL1+0.75LLR
 C27=DL+0.45WL2+0.75LLR
 C28=DL+0.45WL3+0.75LLR
 C29=DL+0.45WL4+0.75LLR
 C30=DL+0.45WL5+0.75LLR
 C31=DL+0.45WL6+0.75LLR

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
D1	L 1-1_2X1-1_2X1_8	6	C10 at 0.00%	0.37	OK	
D10		64	C9 at 0.00%	0.19	OK	
D11		76	C9 at 0.00%	0.24	OK	
D2		117	C17 at 0.00%	0.24	OK	
D4		42	C7 at 0.00%	0.22	OK	
D5	L 2X2X1_4	83	C17 at 0.00%	0.32	OK	
D6		84	C4 at 0.00%	0.22	OK	
D7		82	C17 at 0.00%	0.01	OK	
D8	L 2X2X1_8	81	C24 at 0.00%	0.46	OK	
D9	L 1-1_2X1-1_2X1_8	79	C17 at 0.00%	0.68	OK	
IL	L 2X2X1_4	24	C23 at 0.00%	0.69	OK	
LC	L 2X2X3_16	53	C4 at 100.00%	0.40	OK	
LC2	L 3X3X1_4	55	C17 at 100.00%	0.33	OK	
OL	L 2X2X3_16	37	C10 at 100.00%	0.44	OK	
OL2		85	C10 at 0.00%	0.25	OK	
Peak	L 3X3X1_4	71	C3 at 0.00%	0.13	OK	
UC	L 2X2X3_16	95	C4 at 100.00%	0.85	OK	
Web (Leg)	L 1X1X1_8	27	C10 at 0.00%	0.06	OK	
Web (Truss)		77	C4 at 0.00%	0.76	OK	