CALCULATIONS FOR:

POLIGON CAR 16
MULTI RIB OVER TONGUE AND GROOVE
2018 INTERNATIONAL BUILDING CODE

DATE: 02/19/2021
EXPIRES: 12/31/2021

PREPARED UNDER THE CONTROL AND SUPERVISION
OF THE DESIGN PROFESSIONAL ABOVE

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DESIGN CRITERIA

GENERAL

Building Code:	See Cover Sheet	Lower Roof Slope (°):	26.57		*6:12 Pitch*
Design Code:	ASCE 7-16	Upper Roof Slope (°):	26.57		*6:12 Pitch*
Risk Category:	II	Equivalent Roof Height:	15.00	ft	

DEAD LOAD

Weight of Roofing System	6	psf	
Frame Dead Load	Frame Self-Weight		*(See RISA Analysis Report)*

LIVE LOAD

Roof Live Load, L_r	20	psf	*ASCE 7 Table 4-1*

SNOW LOAD

Ground Snow Load, p_g	20.0	psf	
Importance Factor, *I (Snow Loads)*	1.0		*ASCE 7 Table 1.5-2*
Slope Factor, C_s	1.0		*ASCE 7 Figure 7.4-1*
Thermal Factor, C_t	1.2		*ASCE 7 Table 7.3-2*
Exposure Factor, C_e	1.0		*ASCE 7 Table 7.3-1*
Flat Roof Snow Load, p_f	20.0	psf	*ASCE 7 Section 7.3*
Leeward Unbalanced Snow Load	20.0	psf	*ASCE 7 Section 7.6.1*

WIND LOAD

Basic Wind Speed,	V_{ult}	110	mph	V_{asd}	85 mph	*ASCE 7 Section 26.5*
Exposure Category		C				*ASCE 7 Section 26.7*
Ground Elevation Factor, Ke		1.00				*ASCE 7 Table 26.9-1*
Gust Effect Factor, *G*		0.85				*ASCE 7 Section 26.11.1*
Velocity Pressure Exposure Coefficient, K_z		0.85				*ASCE 7 Table 26.10-1*
Wind Directionality Factor, K_d		0.85				*ASCE 7 Table 26.6-1*
Topographic Factor, K_{zt}		1.00				*ASCE 7 Section 26.8.2*
Velocity Pressure, q_z		22.38	psf			*ASCE 7 Section 26.10.2*

Main Wind-Force Resisting System *ASCE 7 Section 27.3*

Open Building, Clear Wind Flow (Cn from ASCE 7 Fig. 27.3-4 - 27.3-7)

	Lower Roof		*Upper Roof*	
Load Case	A	B	A	B
γ = 0				
Windward Cp =	1.21	-0.10	1.21	-0.10
p (psf):	22.99	-1.90	22.99	-1.90
γ = 180				
Leeward Cp=	0.21	-0.85	0.21	-0.85
p (psf):	3.96	-16.25	3.96	-16.25
γ = 90				
Sideward Cp=	-0.80	0.80	-0.80	0.80
p (psf):	-15.22	15.22	-15.22	15.22

Component and Cladding Elements *ASCE 7 Section 6.5.13*

Open Building, Clear Wind Flow (Cn from ASCE 7 Fig. 6-19A - 6-19D)

	Wind Direction	*Toward Roof*	*Away From Roof*
Zone 3	Cn:	2.51	-1.89
	p (psf):	47.72	-35.98
Zone 2	Cn:	1.93	-1.47
	p (psf):	36.74	-27.94
Zone 1	Cn:	1.25	-0.95
	p (psf):	23.86	-17.99

SEISMIC LOAD

Analysis Procedure	Equivalent Lateral Force Procedure	*ASCE 7 Section 12.8*
Seismic Site Class	D Default	*ASCE 7 Section 11.4.2*
Basic Seismic Force Resisting System	Steel Systems Not Specifically Detailed For Seismic Resistance	*ASCE 7 Table 12.2-1*
Short Spectral Response Parameter, S_s	0.55	
1-Sec Spectral Response Parameter, S_1	0.13	
Seismic Design Category	C	*ASCE 7 Section 11.6*
Importance Factor, *I*	1.00	*ASCE 7 Table 11.5-1*
Response Modification Coefficient, *R*	3.00	*ASCE 7 Table 12.2-1*
Redundancy Factor, ρ	1.00	*ASCE 7 Table 12.2-1*
Overstrength Factor, Ω_o	3.00	*ASCE 7 Table 12.2-1*
Design Short Spectral Response Parameter, S_{DS}	0.50	*ASCE 7 Section 11.4.4*
1-Sec Design Spectral Response Parameter, S_{D1}	0.20	*ASCE 7 Section 11.4.4*
Seismic Response Coefficient, C_s	0.17	*ASCE 7 Section 12.8.1*
Effective Seismic Weight, *W*	6.00 psf	*ASCE 7 Section 12.7.2*
Seismic Base Shear, *V*	1.00 psf	*ASCE 7 Section 12.8.1*
Seismic Load, *E*	1.00 psf	*ASCE 7 Section 12.4*
Seismic Load with Overstrength Factor, E_m	3.00 psf	*ASCE 7 Section 12.4*

STRUCTURAL ENGINEERING NOTES

GENERAL NOTES

All field connections must be made with A325 High Strength bolts using the "Turn-of-Nut Pretensioning" method of tightening as described in the latest AISC Manual.

Loads applied to the structure may be greater than required for the project location.

Actual structure dimensions may be smaller than shown in this document.

STRUCTURAL ANALYSIS NOTES

RISA-3D structural analysis software was used to model the 3-D space frame.

To reduce the amount of computer printout, the analysis results only show each member's controlling load case.

Unless noted otherwise in the ‘RISA Analysis Report’, the roof deck was not utilized in the structural analysis to provide lateral support to the members.

From the analysis, all member deflections and structural drift are within allowable limits.

STRUCTURAL DESIGN NOTES

End plates were designed by applying beam end forced to the edges of the plate and calculating the resulting prying moment at the edge of the bolt holes. In determining the prying moment it was assumed that the area of the plate between bolts was fixed.

Light gage members were designed in accordance with the latest edition of the AISC specifications and the AISI Cold-Formed Steel Design Manual.

STRUCTURAL CONNECTION NOTES

Bolt threads were assumed to not be excluded from the connections.

LOAD COMBINATIONS

Key

Abbreviation	Description
DL	Dead Load
Lr	Roof Live Load
S	Snow Load
Su	Unbalanced Snow Load
Wx	Wind Load (X-Direction)
Wz	Wind Load (Z-Direction)
Wx (Minimum)	10 psf Minimum Wind Load (X-Direction)
Wz (Minimum)	10 psf Minimum Wind Load (Z-Direction)
Ex	Seismic Load (X-Direction)
Ez	Seismic Load (Z-Direction)
Emx	Seismic Load (X-Direction) with Overstrength Factor
Emz	Seismic Load (Z-Direction) with Overstrength Factor
Ev	Vertical Seismic Load Effect

Service (Unfactored)

Number	Description
1	SERVICE D
2	SERVICE Lr
3	SERVICE S
4	SERVICE Su
5	SERVICE Wx (Load Case A)
6	SERVICE Wx (Load Case B)
7	SERVICE Wz (Load Case A)
8	SERVICE Wz (Load Case B)
9	SERVICE Ex
10	SERVICE Ez
11	SERVICE Ev

Allowable Stress Design (Factored)

Number	Description
15	D
16	D + Lr
17	D + S
18	D + Su
19	D + 0.6Wx (Load Case A)
20	D + 0.6Wx (Load Case B)
21	D + (0.6Wx (Minimum))
22	D + 0.75(0.6Wx (Load Case A)) + 0.75Lr
23	D + 0.75(0.6Wx (Minimum)) + 0.75Lr
24	D + 0.75(0.6Wx (Load Case A)) + 0.75S
25	D + 0.75(0.6Wx (Minimum)) + 0.75S
26	0.6D + 0.6Wx (Load Case A)
27	0.6D + 0.6Wx (Load Case B)
28	0.6D + (0.6Wx (Minimum))
29	D + 0.6Wz (Load Case A)
30	D + 0.6Wz (Load Case B)
31	D + (0.6Wz (Minimum))
32	D + 0.75(0.6Wz (Load Case A)) + 0.75Lr
33	D + 0.75(0.6Wz (Minimum)) + 0.75Lr
34	D + 0.75(0.6Wz (Load Case A)) + 0.75S
35	D + 0.75(0.6Wz (Minimum)) + 0.75S
36	0.6D + 0.6Wz (Load Case A)
37	0.6D + 0.6Wz (Load Case B)
38	0.6D + (0.6Wz (Minimum))
39	1.0D+0.7Ev+0.7Ehx
40	1.0D+0.525Ev+0.525Ehx+0.75S
41	0.6D-0.7Ev+0.7Ehx
42	1.0D+0.7Ev+0.7Ehz
43	1.0D+0.525Ev+0.525Ehz+0.75S
44	0.6D-0.7Ev+0.7Ehz

Strength Design (Factored)

Number	Description
55	1.4D
56	1.2D + 0.5Lr
57	1.2D + 0.5S
58	1.2D + 0.5Su
59	1.2D + 1.6Lr + 0.5Wx (Load Case A)
60	1.2D + 1.6Lr + 0.5Wx (Minimum)
61	1.2D + 1.6S + 0.5Wx (Load Case A)
62	1.2D + 1.6S + 0.5Wx (Minimum)
63	1.2D + 1.0Wx (Load Case A) + 0.5Lr
64	1.2D + 1.0Wx (Load Case B) + 0.5Lr
65	1.2D + 1.0Wx (Minimum) + 0.5Lr
66	1.2D + 1.0Wx (Load Case A) + 0.5S
67	1.2D + 1.0Wx (Load Case B) + 0.5S
68	1.2D + 1.0Wx (Minimum) + 0.5S
69	0.9D + 1.0Wx (Load Case A)
70	0.9D + 1.0Wx (Load Case B)
71	0.9D + 1.0Wx (Minimum)
72	1.2D + 1.6Lr + 0.5Wz (Load Case A)
73	1.2D + 1.6Lr + 0.5Wz (Minimum)
74	1.2D + 1.6S + 0.5Wz (Load Case A)
75	1.2D + 1.6S + 0.5Wz (Minimum)
76	1.2D + 1.0Wz (Load Case A) + 0.5Lr
77	1.2D + 1.0Wz (Load Case B) + 0.5Lr
78	1.2D + 1.0Wz (Minimum) + 0.5Lr
79	1.2D + 1.0Wz (Load Case A) + 0.5S
80	1.2D + 1.0Wz (Load Case B) + 0.5S
81	1.2D + 1.0Wz (Minimum) + 0.5S
82	0.9D + 1.0Wz (Load Case A)
83	0.9D + 1.0Wz (Load Case B)
84	0.9D + 1.0Wz (Minimum)
85	1.2D+Ev+Ehx+0.2S
86	0.9D-Ev+Ehx
87	1.2D+Ev+Ehx+0.2S
88	0.9D-Ev+Ehz

Notes:

1. Load combinations are effective in all states that have adopted IBC as a base code.
2. See "RISA Analysis Report" for the load combinations that are not listed above.

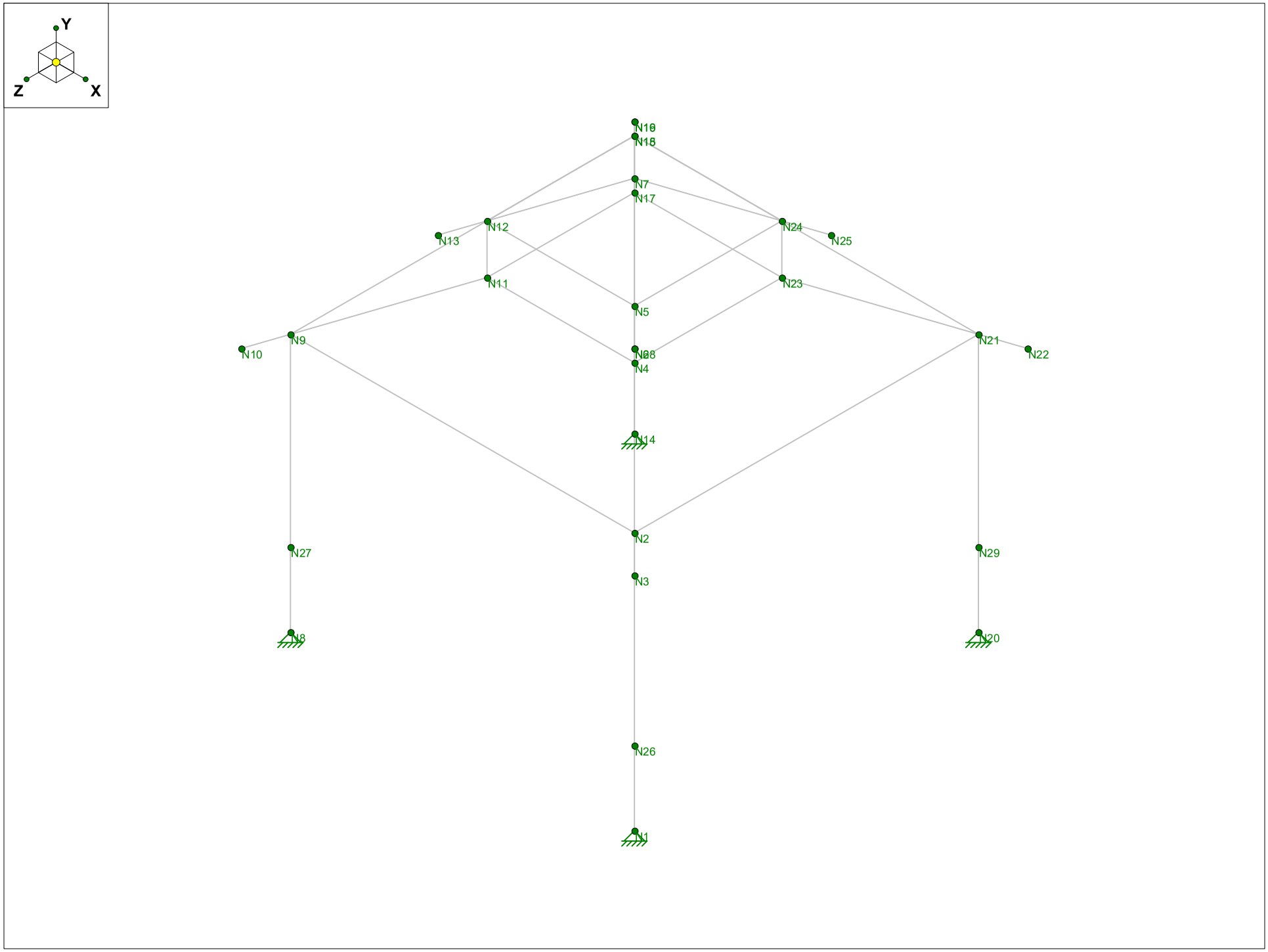
MATERIALS

Column	HSS6x6x3/16
Truss	HSS6x4x1/8
Tension	HSS5x3x1/8
Truss Tail	HSS4x4x1/8
Juncture Column	HSS5x5x1/2
Clerestory	HSS5x3x1/8
Upper Truss	HSS6x4x1/8
Upper Truss Tail	HSS4x4x1/8
Wooster Column	HSS8x8x3/16
Compression Tube	HSS5x5x1/2

HSS Sections:	ASTM A500 Gr. B
Pipe Sections:	ASTM A53 Gr. B
RMT Sections:	ASTM A519
Channel & Angle Sections:	ASTM A36
Connection Plates:	ASTM A36
Connections Bolts	ASTM A325
Welding Process:	Gas Metal Arc Welding
Welding Electrode:	E70xx

RISA MODEL VIEWS

Joint Labels
Member Labels
Member Shapes
Member Lengths
Member Local Axis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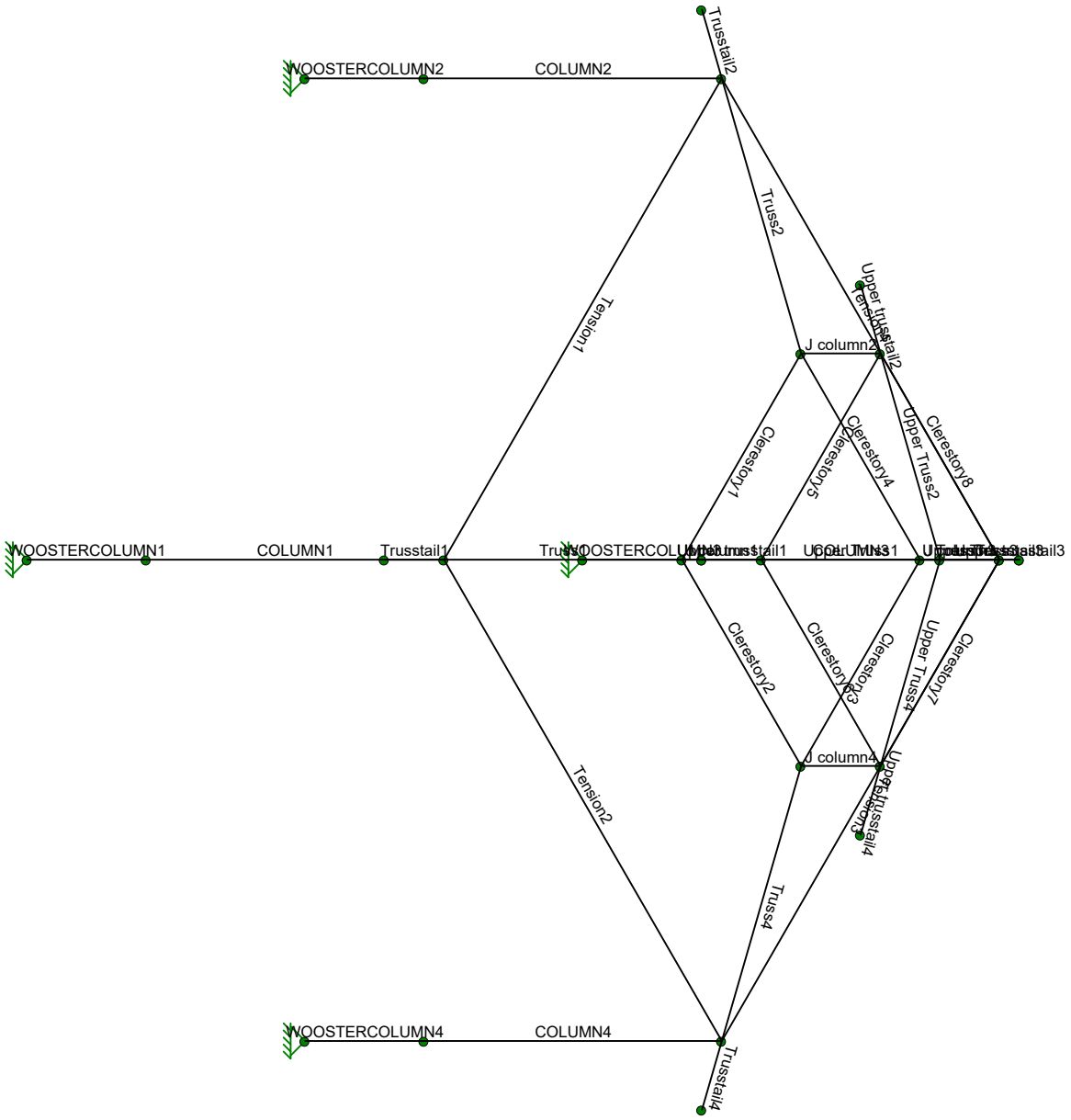
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Clerestory5
Clerestory4
Upper Truss2
Clerestory8
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COLUMN1
Trusstail1
Truss3
Upper Truss3
Clerestory2
Clerestory3
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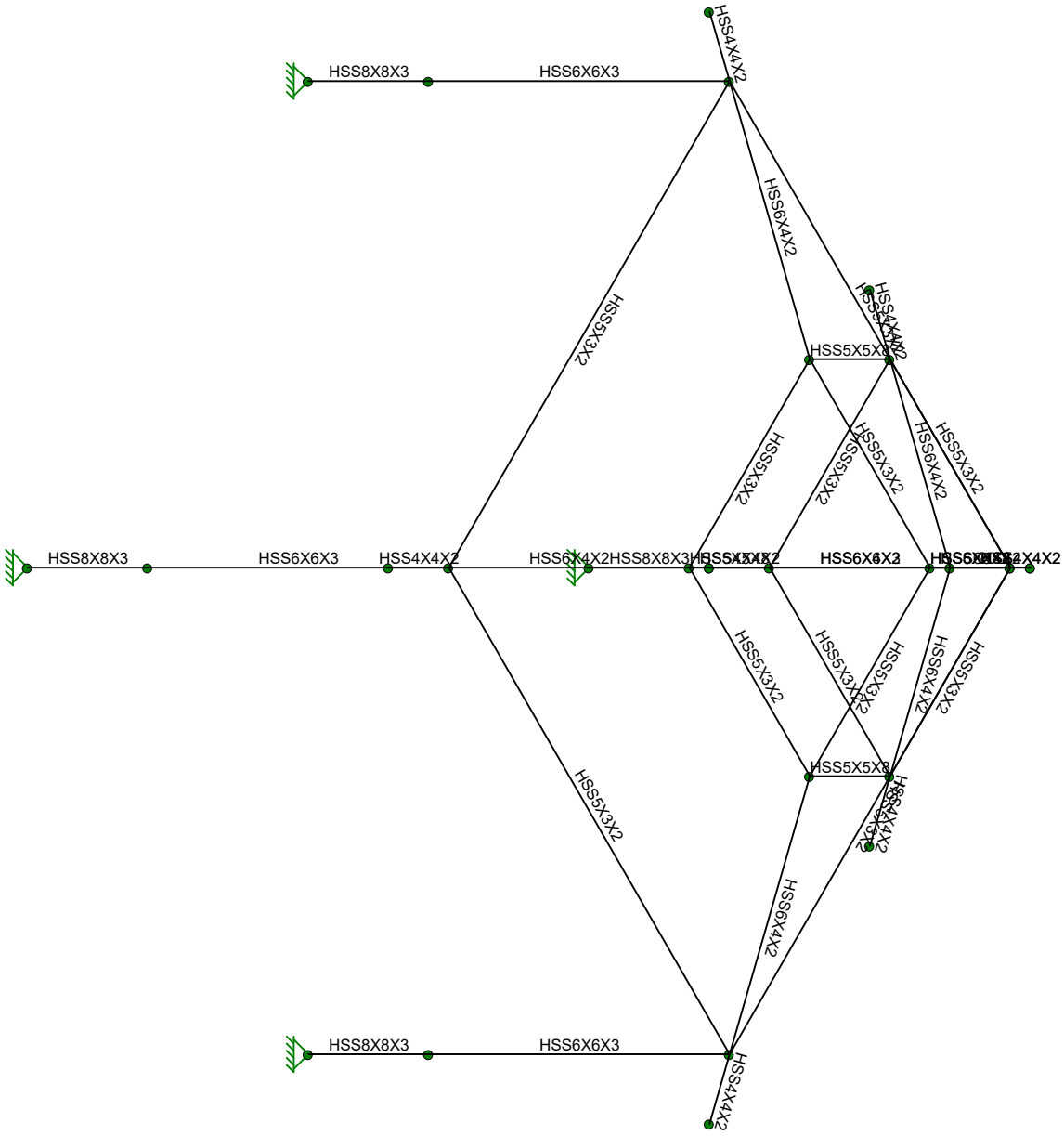
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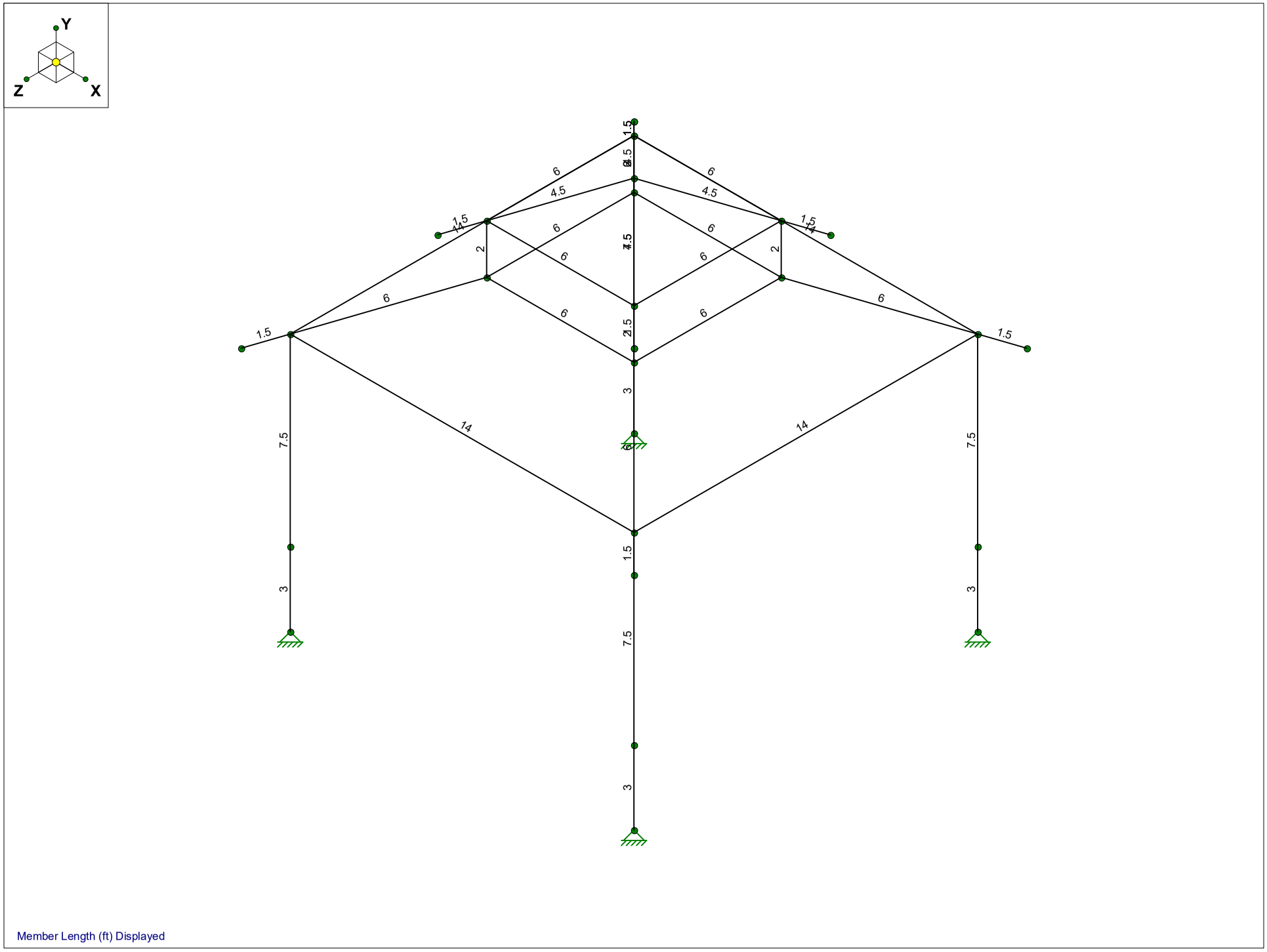
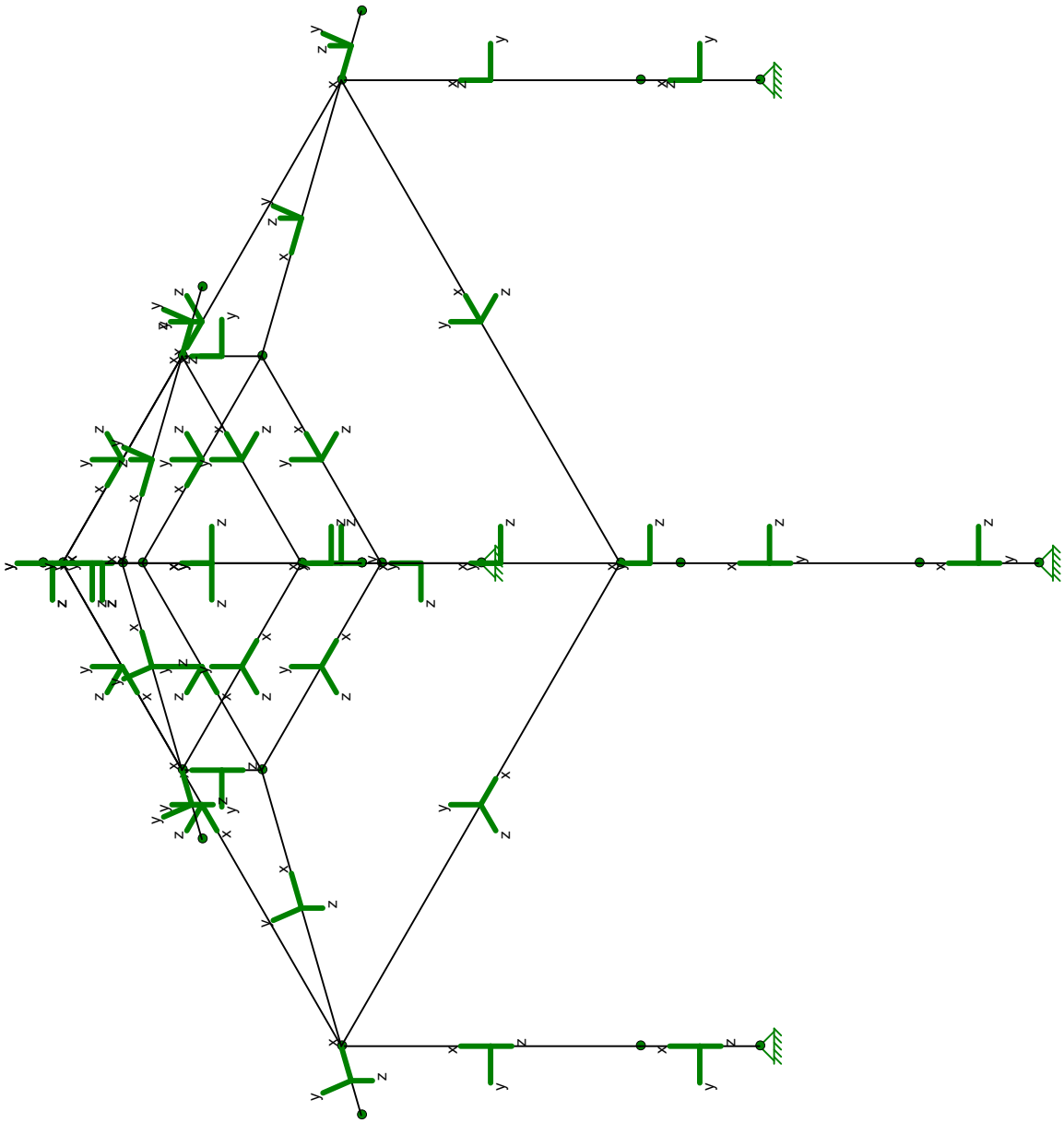


Member Length (ft) Displayed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X
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FOUNDATION DESIGN

FOUNDATION DESIGN

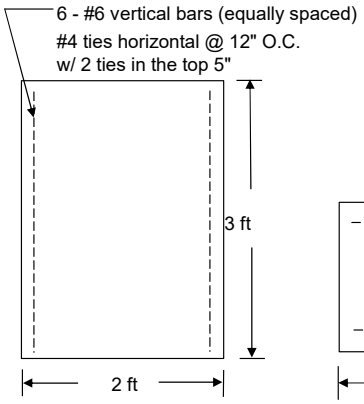
PINNED BASE (INTERNAL BOLTS)

Drilled Pier			**Allowable**	**Actual**	**Load Combination / Member**	
1	Bearing Pressure	(Chapter 18 of the Building Code)	1500 psf	763 psf	16 / WOOSTERCOLUMN1	**OK**
2	Uplift Check	*No Net Uplift*	0 lbs	x	x	**OK**
3	Sliding Check	*SF = 8.59*	1571 lbs	183 lbs	40 / WOOSTERCOLUMN2	**OK**
4	Area of Reinforcement	(ACI Chapter 10)	0.00 in^2	2.26 in^2	x	**OK**

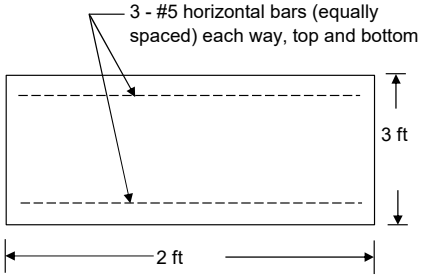
Spread Footing			**Allowable**	**Actual**	**Load Combination / Member**	
5	Bearing Pressure	(Chapter 18 of the Building Code)	1500 psf	599 psf	16 / WOOSTERCOLUMN1	**OK**
6	Uplift Check	*No Net Uplift*	0 lbs	x	x	**OK**
7	Sliding Check	*SF = 9.61*	1758 lbs	183 lbs	40 / WOOSTERCOLUMN2	**OK**
8	Area of Reinforcement	(ACI Chapter 7)	0.00 in^2	1.86 in^2	60 / WOOSTERCOLUMN2	**OK**

Design Forces / Moments

Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	16	WOOSTERCOLUMN	2.40	-0.13	0.00	0.00	0.00	0.00
x	x	x	x	x	x	x	x	x
3	40	WOOSTERCOLUMN	2.24	-0.18	0.06	0.00	0.00	0.00
x	x	x	x	x	x	x	x	x
5	16	WOOSTERCOLUMN	2.40	-0.13	0.00	0.00	0.00	0.00
x	x	x	x	x	x	x	x	x
7	40	WOOSTERCOLUMN	2.24	-0.18	0.06	0.00	0.00	0.00
8	60	WOOSTERCOLUMN	3.58	-0.25	0.05	0.00	0.00	0.00



Drilled Pier Option



Spread Footing Option

The foundation design contained herein is not site specific, but is based on the presumptive allowable foundation pressures in Chapter 18 of the Building Code (Class 5 soil). The building official in the jurisdiction in which this structure is located may require a site specific geotechnical report or letter from a qualified local professional engineer attesting to whether the actual site conditions meet the assumptions identified above.

Drilled Pier Diameter (ft):	2.0	Spread Footing Width (ft):	2.0
Drilled Pier Depth (ft):	3.0	Spread Footing Thickness (ft):	3.0

f'c (psi): 4500

Concrete Unit Weight (lb/ft^3): 145

CONNECTION DESIGN

COLUMN BASE PLATE CONNECTION

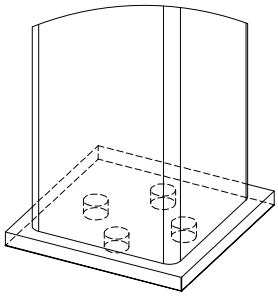
PINNED CONNECTION (INTERNAL BOLTS)

Base Plate Check: 9"x9"x1/2"			**Allowable**	**Actual**	**Load Combination / Member**	
1	Plate Size	(AISC J8-1)	1.3 in^2	81.0 in^2	16 / WOOSTERCOLUMN1	**OK**
2	Plate Thickness	(AISC PART 14)	0.04 in	0.50 in	16 / WOOSTERCOLUMN1	**OK**
3	Concrete Bearing	(AISC J8-1)	1530 psi	30 psi	16 / WOOSTERCOLUMN1	**OK**
4	Weld Check	(AISC J2-3)	2.78 k/in	0.01 k/in	40 / WOOSTERCOLUMN2	**OK**

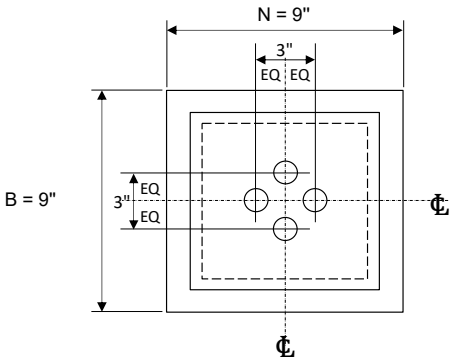
Anchor Bolt Check: (4) 1/2" A307 Anchors			**Allowable**	**Actual**	**Load Combination / Member**	
5	Tension	(ACI D5.1)	24.7 kip	0.5 kip	86 / WOOSTERCOLUMN1	**OK**
6	Concrete Breakout	(ACI D5.2)	27.3 kip	0.5 kip	86 / WOOSTERCOLUMN1	**OK**
7	Concrete Pullout	(ACI D5.3)	54.0 kip	0.5 kip	86 / WOOSTERCOLUMN1	**OK**
8	Sideface Blowout	(ACI D5.4)	N/A	N/A	Not Considered Per RD5.4	**OK**
9	Shear	(ACI D6.1)	10.6 kip	0.3 kip	64 / WOOSTERCOLUMN1	**OK**
10	Shear Breakout	(ACI D6.2)	16.3 kip	0.3 kip	64 / WOOSTERCOLUMN1	**OK**
11	Shear Pryout	(ACI D6.3)	38.2 kip	0.3 kip	64 / WOOSTERCOLUMN1	**OK**
12	Interaction	(ACI RD.7)	1.0	0.00	64 / WOOSTERCOLUMN1	**OK**

Design Forces / Moments

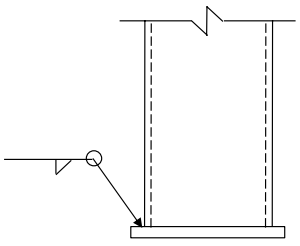
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	16	WOOSTERCOLUMN	2.40	-0.13	0.00	0.00	0.00	0.00
2	16	WOOSTERCOLUMN	2.40	-0.13	0.00	0.00	0.00	0.00
3	16	WOOSTERCOLUMN	2.40	-0.13	0.00	0.00	0.00	0.00
4	40	WOOSTERCOLUMN	2.24	-0.18	0.06	0.00	0.00	0.00
5	86	WOOSTERCOLUMN	0.52	0.10	0.10	0.00	0.00	0.00
6	86	WOOSTERCOLUMN	0.52	0.10	0.10	0.00	0.00	0.00
7	86	WOOSTERCOLUMN	0.52	0.10	0.10	0.00	0.00	0.00
8	x	x	x	x	x	x	x	x
9	64	WOOSTERCOLUMN	2.15	-0.20	-0.17	0.00	0.00	0.00
10	64	WOOSTERCOLUMN	2.15	-0.20	-0.17	0.00	0.00	0.00
11	64	WOOSTERCOLUMN	2.15	-0.20	-0.17	0.00	0.00	0.00
12	64	WOOSTERCOLUMN	2.15	-0.20	-0.17	0.00	0.00	0.00



Base Plate Isometric



Base Plate Plan



Base Plate Elevation

Anchor Bolt Diameter (in):	1/2	Column Size:	HSS8X8X3
Min. Embedment Depth (in):	8.0	Min. Base Plate Size:	9"x9"x1/2"
Concrete Cover From ℄ of Bolt (in):	10.5	Weld Size (in):	0.188
f'c (psi):	4500		

UPPER COLUMN TO WOOSTER COLUMN WELD CHECK

Weld Properties of Column Base

Width, b =	6.0 in	Aw =	24.0 in	2*(b+d)	Sy =	48.0 in^2	(b*d)+(d^2/3)
Depth, d =	6.0 in	Vz =	12.0 in	2*b	Sz =	48.0 in^2	(b*d)+(b^2/3)
		Vy =	12.0 in	2*d	Iw =	288.0 in^3	[(b+d)^3]/6

Weld Check: w = 0.1875"		**Allowable (k/in)**	**Actual (k/in)**	**Load Combination / Member**	
1	Tension (Fx/Aw + My/Sy + Mz/Sz)	2.78	0.11	41 / COLUMN3	**OK**
2	Shear Y (Fy/Vy + (Mx*(b/2))/Iw)	2.78	0.01	41 / COLUMN4	**OK**
3	Shear Z (Fz/Vz + (Mx*(d/2))/Iw)	2.78	0.01	19 / COLUMN3	**OK**
4	Combined $\sqrt{Tension^2 + Shear_y^2 + Shear_z^2}$	2.78	0.11	41 / COLUMN3	**OK**

Design Forces / Moments

Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	41	COLUMN3	0.67	-0.11	-0.07	0.00	-2.46	4.10
2	41	COLUMN4	0.31	0.07	-0.07	0.00	-2.46	-2.48
3	19	COLUMN3	0.85	0.03	0.12	0.00	4.51	-1.08
4	41	COLUMN3	0.67	-0.11	-0.07	0.00	-2.46	4.10
x	40	COLUMN3	2.17	-0.18	-0.05	0.00	-1.98	6.51

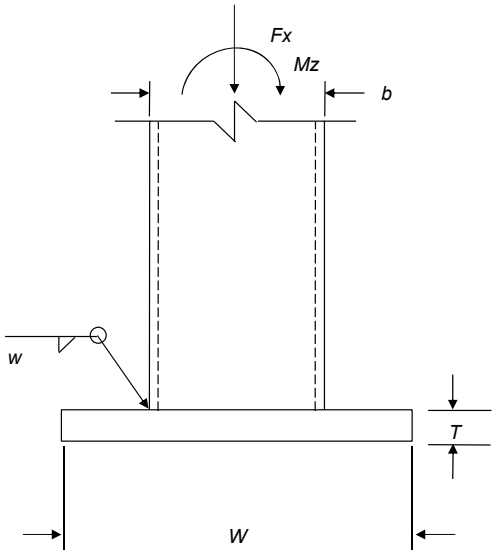


Plate Width, *W* (in): See Base Plate Calculations

Plate Thickness, *T* (in): See Base Plate Calculations

Column Size: HSS6x6x3/16

Weld Size, *w* (in): 3/16

TENSION MEMBER TO COLUMN

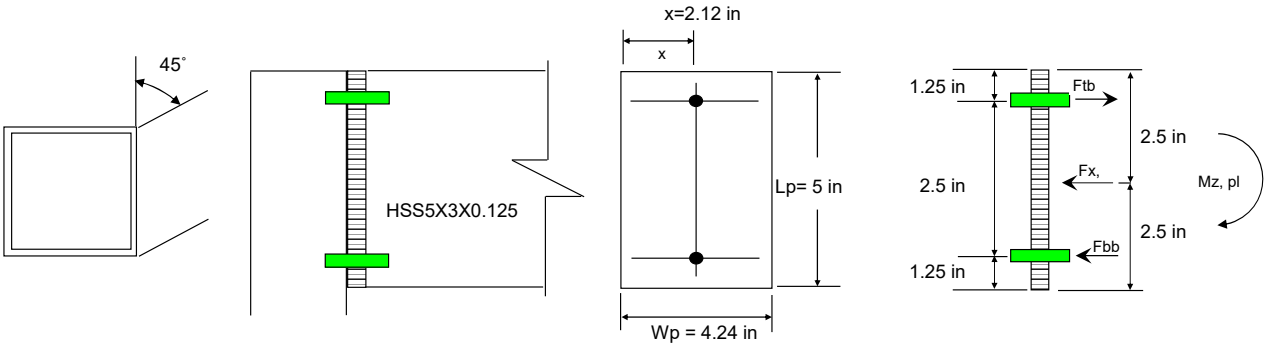
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				**Allowable**		**Actual**	**Load Combination / Member**	
1	Shear		AISC (J3-1)	R_N/Ω	8.3 kip	5.6 kip	40 / Tension1	**OK**
2	Tension	*allowable per J3.7*	AISC (J3-2)	R_N/Ω	8.9 kip	4.7 kip	22 / Tension4	**OK**
3	Bearing		AISC (J3-6b,d)	R_N/Ω	14.8 kip	5.6 kip	40 / Tension1	**OK**

End Plate Check: 0.375" Thick				**Allowable**		**Actual**	**Load Combination / Member**	
4	Shear Yielding		AISC (J4-3)	R_N/Ω	22.9 kip	1.5 kip	16 / Tension1	**OK**
5	Shear Rupture		AISC (J4-4)	R_N/Ω	23.2 kip	1.5 kip	16 / Tension1	**OK**
6	Weld Check	*w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	0.7 kip/in	22 / Tension4	**OK**
7	Plate Thickness (t_P)			$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.29 in	0.38 in	40 / Tension1	**OK**

Design Forces / Moments

Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	40	Tension1	-1.9	0.5	0.0	-0.1	0.0	17.5
2	22	Tension4	-1.7	0.6	0.1	0.0	-2.3	16.9
3	40	Tension1	-1.9	0.5	0.0	-0.1	0.0	17.5
4	16	Tension1	-2.2	0.5	0.0	0.0	0.0	14.2
5	16	Tension1	-2.2	0.5	0.0	0.0	0.0	14.2
6	22	Tension4	-1.7	0.6	0.1	0.0	-2.3	16.9
7	40	Tension1	-1.9	0.5	0.0	-0.1	0.0	17.5



Plan View | Connection Elevation | End Plate Elevation | End Plate Section

Member Height (in):	5	Number of Bolts:	2
Member Width (in):	3	Bolt Diameter (in):	0.625
Member Thickness (in):	0.125	End Plate Thickness (in):	0.375
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	0.250

LOWER TRUSS TO COLUMN

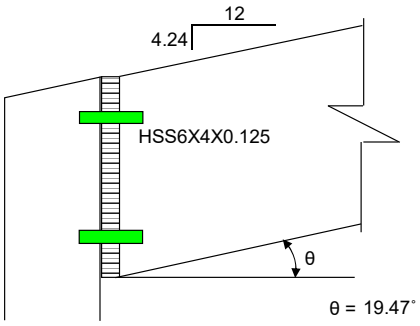
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				Allowable		Actual	Load Combination / Member	
1	Shear		AISC (J3-1)	R_N/Ω	8.3 kip	1.3 kip	40 / Truss3	**OK**
2	Tension		AISC (J3-1)	R_N/Ω	13.8 kip	2.2 kip	26 / Truss3	**OK**
3	Bearing		AISC (J3-6b,d)	R_N/Ω	18.9 kip	1.3 kip	40 / Truss3	**OK**

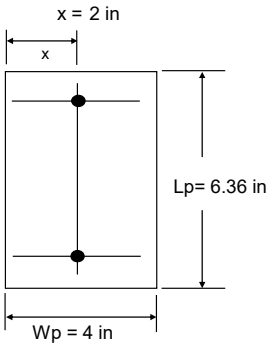
End Plate Check: 0.375" Thick				Allowable		Actual	Load Combination / Member	
4	Shear Yielding		AISC (J4-3)	R_N/Ω	34.4 kip	1.2 kip	16 / Truss1	**OK**
5	Shear Rupture		AISC (J4-4)	R_N/Ω	32.6 kip	1.2 kip	16 / Truss1	**OK**
6	Weld Check	*w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	0.3 kip/in	19 / Truss3	**OK**
7	Plate Thickness (t_P)			$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.19 in	0.38 in	41 / Truss1	**OK**

Design Forces / Moments

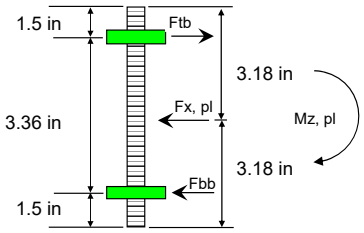
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	40	Truss3	3.0	0.1	0.0	1.9	-1.2	1.6
2	26	Truss3	0.6	0.0	-0.1	-1.0	5.2	-6.0
3	40	Truss3	3.0	0.1	0.0	1.9	-1.2	1.6
4	16	Truss1	3.4	0.1	0.0	0.0	0.0	-4.2
5	16	Truss1	3.4	0.1	0.0	0.0	0.0	-4.2
6	19	Truss3	1.1	0.0	-0.1	-1.1	5.3	-6.4
7	41	Truss1	0.6	0.0	0.0	-2.4	1.5	-6.6



Connection Elevation



End Plate Elevation



End Plate Section

Member Height (in):	6	Number of Bolts:	2
Member Width (in):	4	Bolt Diameter (in):	0.625
Member Thickness (in):	0.125	End Plate Thickness (in):	0.375
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	0.250

LOWER TRUSS TO JUNCTURE COLUMN

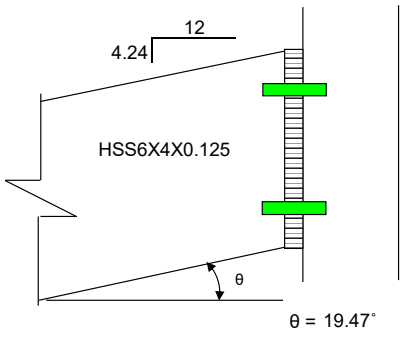
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				**Allowable**	**Actual**	**Load Combination / Member**	
1	Shear	AISC (J3-1)	R_N/Ω	8.3 kip	1.3 kip	22 / Truss1	**OK**
2	Tension	AISC (J3-1)	R_N/Ω	13.8 kip	1.2 kip	26 / Truss2	**OK**
3	Bearing	AISC (J3-6b,d)	R_N/Ω	18.9 kip	1.3 kip	22 / Truss1	**OK**

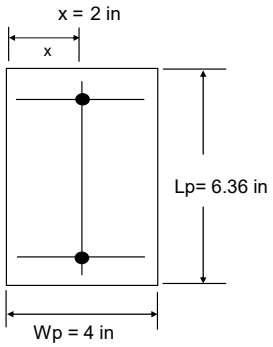
End Plate Check: 0.375" Thick				**Allowable**	**Actual**	**Load Combination / Member**	
4	Shear Yielding	AISC (J4-3)	R_N/Ω	34.4 kip	0.9 kip	16 / Truss1	**OK**
5	Shear Rupture	AISC (J4-4)	R_N/Ω	32.6 kip	0.9 kip	16 / Truss1	**OK**
6	Weld Check *w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	0.2 kip/in	18 / Truss4	**OK**
7	Plate Thickness (t_P)		$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.20 in	0.38 in	18 / Truss4	**OK**

Design Forces / Moments

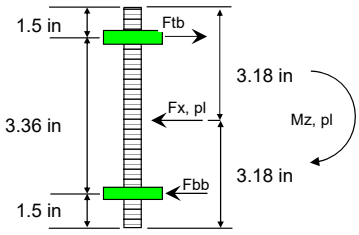
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	22	Truss1	2.8	-0.1	0.0	2.7	-1.6	1.3
2	26	Truss2	0.6	-0.1	0.1	1.0	1.3	-4.7
3	22	Truss1	2.8	-0.1	0.0	2.7	-1.6	1.3
4	16	Truss1	3.3	-0.2	0.0	0.0	0.0	-2.1
5	16	Truss1	3.3	-0.2	0.0	0.0	0.0	-2.1
6	18	Truss4	2.3	0.0	0.0	0.0	0.0	-9.3
7	18	Truss4	2.3	0.0	0.0	0.0	0.0	-9.3



Connection Elevation



End Plate Elevation



End Plate Section

Member Height (in):	6	Number of Bolts:	2
Member Width (in):	4	Bolt Diameter (in):	0.625
Member Thickness (in):	0.125	End Plate Thickness (in):	0.375
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	NONE

CLERESTORY MEMBER TO JUNCTURE COLUMN

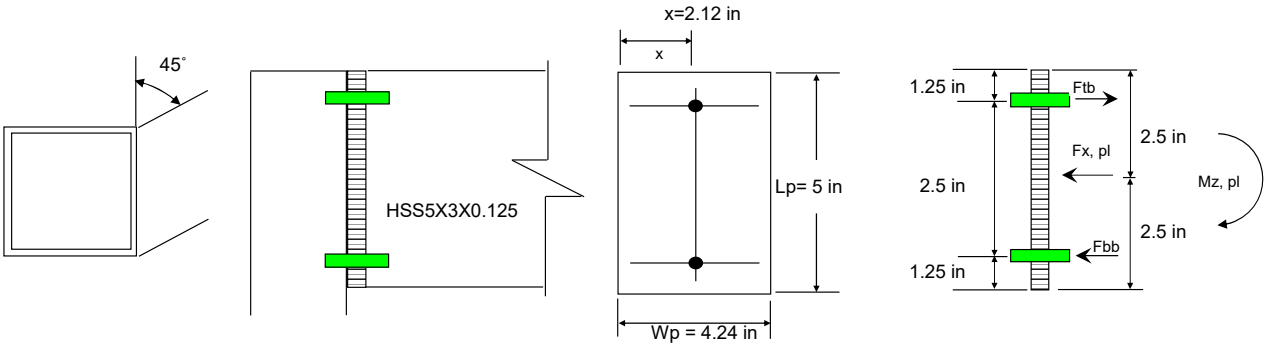
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				**Allowable**	**Actual**	**Load Combination / Member**	
1	Shear	AISC (J3-1)	R_N/Ω	8.3 kip	1.6 kip	22 / Clerestory3	**OK**
2	Tension	AISC (J3-1)	R_N/Ω	13.8 kip	0.6 kip	18 / Clerestory6	**OK**
3	Bearing	AISC (J3-6b,d)	R_N/Ω	14.8 kip	1.6 kip	22 / Clerestory3	**OK**

End Plate Check: 0.375" Thick				**Allowable**	**Actual**	**Load Combination / Member**	
4	Shear Yielding	AISC (J4-3)	R_N/Ω	22.9 kip	1.4 kip	16 / Clerestory1	**OK**
5	Shear Rupture	AISC (J4-4)	R_N/Ω	23.2 kip	1.4 kip	16 / Clerestory1	**OK**
6	Weld Check *w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	0.2 kip/in	22 / Clerestory3	**OK**
7	Plate Thickness (t_P)		$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.11 in	0.38 in	18 / Clerestory6	**OK**

Design Forces / Moments

Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	22	Clerestory3	1.8	0.2	0.0	0.0	0.2	3.4
2	18	Clerestory6	0.3	0.2	0.0	0.0	0.2	3.0
3	22	Clerestory3	1.8	0.2	0.0	0.0	0.2	3.4
4	16	Clerestory1	2.0	0.2	0.0	0.0	0.0	2.2
5	16	Clerestory1	2.0	0.2	0.0	0.0	0.0	2.2
6	22	Clerestory3	1.8	0.2	0.0	0.0	0.2	3.4
7	18	Clerestory6	0.3	0.2	0.0	0.0	0.2	3.0



Plan View | Connection Elevation | End Plate Elevation | End Plate Section

Member Height (in):	5	Number of Bolts:	2
Member Width (in):	3	Bolt Diameter (in):	0.625
Member Thickness (in):	0.125	End Plate Thickness (in):	0.375
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	NONE

UPPER TRUSS TO JUNCTURE COLUMN

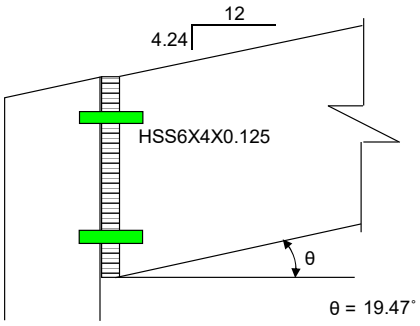
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				**Allowable**	**Actual**	**Load Combination / Member**	
1	Shear	AISC (J3-1)	R_N/Ω	8.3 kip	0.2 kip	18 / Upper Truss1	**OK**
2	Tension	AISC (J3-1)	R_N/Ω	13.8 kip	0.5 kip	18 / Upper Truss2	**OK**
3	Bearing	AISC (J3-6b,d)	R_N/Ω	18.9 kip	0.2 kip	18 / Upper Truss1	**OK**

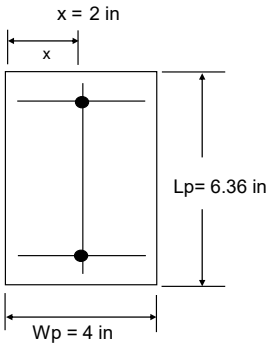
End Plate Check: 0.375" Thick				**Allowable**	**Actual**	**Load Combination / Member**	
4	Shear Yielding	AISC (J4-3)	R_N/Ω	34.4 kip	0.2 kip	40 / Upper Truss2	**OK**
5	Shear Rupture	AISC (J4-4)	R_N/Ω	32.6 kip	0.2 kip	40 / Upper Truss2	**OK**
6	Weld Check *w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	0.1 kip/in	22 / Upper Truss1	**OK**
7	Plate Thickness (t_P)		$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.12 in	0.38 in	18 / Upper Truss2	**OK**

Design Forces / Moments

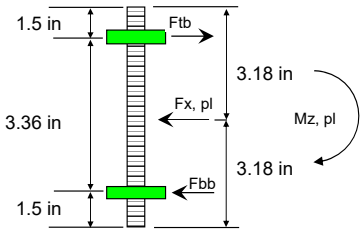
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	18	Upper Truss1	0.2	0.1	0.0	-0.3	0.7	1.2
2	18	Upper Truss2	0.2	0.1	0.0	0.0	0.0	2.5
3	18	Upper Truss1	0.2	0.1	0.0	-0.3	0.7	1.2
4	40	Upper Truss2	0.2	0.1	0.0	-0.2	0.0	2.2
5	40	Upper Truss2	0.2	0.1	0.0	-0.2	0.0	2.2
6	22	Upper Truss1	0.2	0.1	0.0	0.3	-0.2	2.4
7	18	Upper Truss2	0.2	0.1	0.0	0.0	0.0	2.5



Connection Elevation



End Plate Elevation



End Plate Section

Member Height (in):	6	Number of Bolts:	2
Member Width (in):	4	Bolt Diameter (in):	0.625
Member Thickness (in):	0.125	End Plate Thickness (in):	0.375
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	NONE

UPPER TRUSS TO COMPRESSION MEMBER

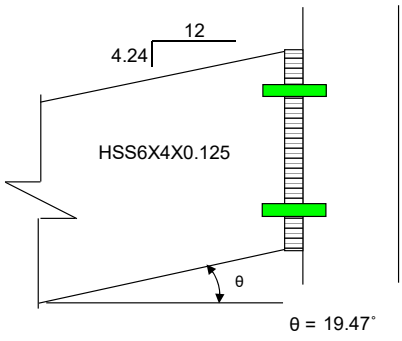
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				Allowable		Actual	Load Combination / Member	
1	Shear		AISC (J3-1)	R_N/Ω	8.3 kip	0.1 kip	19 / Upper Truss4	**OK**
2	Tension		AISC (J3-1)	R_N/Ω	13.8 kip	0.1 kip	26 / Upper Truss3	**OK**
3	Bearing		AISC (J3-6b,d)	R_N/Ω	18.9 kip	0.1 kip	19 / Upper Truss4	**OK**

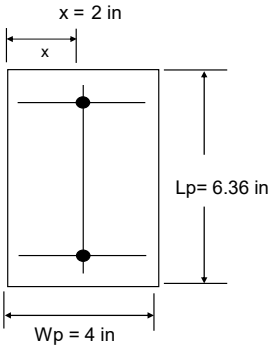
End Plate Check: 0.375" Thick				Allowable		Actual	Load Combination / Member	
4	Shear Yielding		AISC (J4-3)	R_N/Ω	34.4 kip	0.1 kip	18 / Upper Truss2	**OK**
5	Shear Rupture		AISC (J4-4)	R_N/Ω	32.6 kip	0.1 kip	18 / Upper Truss2	**OK**
6	Weld Check	*w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	0.0 kip/in	19 / Upper Truss3	**OK**
7	Plate Thickness (t_P)			$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.04 in	0.38 in	26 / Upper Truss3	**OK**

Design Forces / Moments

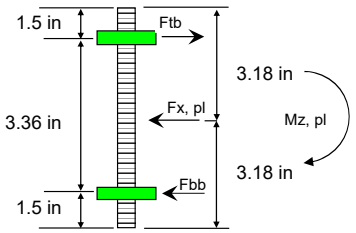
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	19	Upper Truss4	0.1	0.0	0.0	-0.3	0.0	-0.2
2	26	Upper Truss3	0.0	-0.1	0.0	-0.3	-0.1	0.3
3	19	Upper Truss4	0.1	0.0	0.0	-0.3	0.0	-0.2
4	18	Upper Truss2	0.2	0.0	0.0	0.0	0.0	-0.1
5	18	Upper Truss2	0.2	0.0	0.0	0.0	0.0	-0.1
6	19	Upper Truss3	0.0	-0.1	0.0	-0.3	-0.1	0.4
7	26	Upper Truss3	0.0	-0.1	0.0	-0.3	-0.1	0.3



Connection Elevation



End Plate Elevation



End Plate Section

Member Height (in):	6	Number of Bolts:	2
Member Width (in):	4	Bolt Diameter (in):	0.625
Member Thickness (in):	0.125	End Plate Thickness (in):	0.375
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	NONE

TAIL CONNECTION

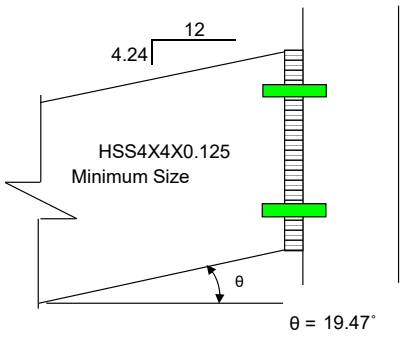
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				**Allowable**	**Actual**	**Load Combination / Member**	
1	Shear	AISC (J3-1)	R_N/Ω	8.3 kip	0.0 kip	40 / Trusstail2	**OK**
2	Tension	AISC (J3-1)	R_N/Ω	13.8 kip	0.1 kip	16 / Trusstail1	**OK**
3	Bearing	AISC (J3-6b,d)	R_N/Ω	14.8 kip	0.0 kip	40 / Trusstail2	**OK**

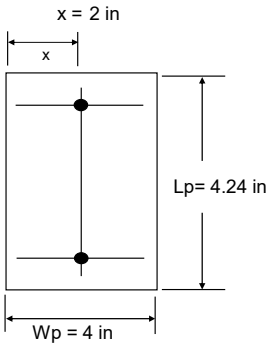
End Plate Check: 0.375" Thick				**Allowable**	**Actual**	**Load Combination / Member**	
4	Shear Yielding	AISC (J4-3)	R_N/Ω	22.9 kip	0.0 kip	16 / Trusstail1	**OK**
5	Shear Rupture	AISC (J4-4)	R_N/Ω	18.7 kip	0.0 kip	16 / Trusstail1	**OK**
6	Weld Check *w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	0.0 kip/in	22 / Trusstail2	**OK**
7	Plate Thickness (t_P)		$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.05 in	0.38 in	16 / Trusstail1	**OK**

Design Forces / Moments

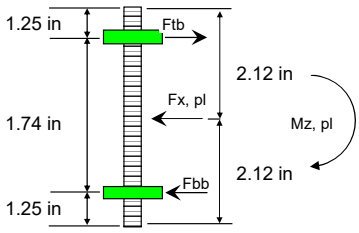
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	40	Trusstail2	0.0	0.0	0.0	0.0	0.0	0.2
2	16	Trusstail1	0.0	0.0	0.0	0.0	0.0	0.3
3	40	Trusstail2	0.0	0.0	0.0	0.0	0.0	0.2
4	16	Trusstail1	0.0	0.0	0.0	0.0	0.0	0.3
5	16	Trusstail1	0.0	0.0	0.0	0.0	0.0	0.3
6	22	Trusstail2	0.0	0.0	0.0	0.0	0.0	0.2
7	16	Trusstail1	0.0	0.0	0.0	0.0	0.0	0.3



Connection Elevation



End Plate Elevation



End Plate Section

Member Height (in):	4	Number of Bolts:	2
Member Width (in):	4	Bolt Diameter (in):	0.625
Member Thickness (in):	0.125	End Plate Thickness (in):	0.375
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	NONE

WELDED CONNECTION IS PERMITTED

RISA ANALYSIS REPORT

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distribut...	Area(...	Surfac...
1	FRAMEWEIGHT	DL		-1						
2	DL	DL							8	
3	LL	LL							8	
4	SL	SL							8	
5	SLU	SL							4	
6	X WINDWARD LOW	WL							3	
7	X LEEWARD LOW	WL							3	
8	X SIDEWARD LOW	WL							6	
9	X WINDWARD UPPER	WL							3	
10	X LEEWARD UPPER	WL							3	
11	X SIDEWARD UPPER	WL							6	
12	X10MINWIND	WL							2	
13	Z WINDWARD LOW	WL							3	
14	Z LEEWARD LOW	WL							3	
15	Z SIDEWARD LOW	WL							6	
16	Z WINDWARD UPPER	WL							3	
17	Z LEEWARD UPPER	WL							3	
18	Z SIDEWARD UPPER	WL							6	
19	Z10MINWIND	WL							2	
20	EX FRAME	EL	-1							
21	EX ROOF	EL							8	
22	EZ FRAME	EL			-1					
23	EZ ROOF	EL							8	
24	BLC 2 Transient Area Loads	None						152		
25	BLC 3 Transient Area Loads	None						152		
26	BLC 4 Transient Area Loads	None						152		
27	BLC 5 Transient Area Loads	None						88		
28	BLC 6 Transient Area Loads	None						64		
29	BLC 7 Transient Area Loads	None						64		
30	BLC 8 Transient Area Loads	None						128		
31	BLC 9 Transient Area Loads	None						36		
32	BLC 10 Transient Area Loads	None						36		
33	BLC 11 Transient Area Loads	None						72		
34	BLC 12 Transient Area Loads	None						50		
35	BLC 13 Transient Area Loads	None						64		
36	BLC 14 Transient Area Loads	None						64		
37	BLC 15 Transient Area Loads	None						128		
38	BLC 16 Transient Area Loads	None						36		
39	BLC 17 Transient Area Loads	None						36		
40	BLC 18 Transient Area Loads	None						72		
41	BLC 19 Transient Area Loads	None						50		
42	BLC 21 Transient Area Loads	None						152		
43	BLC 23 Transient Area Loads	None						152		

Load Combinations

	Description	Sol...	P...	S...	BLC	Factor	BLC	Fact...	BLC	Fact...	BLC	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...
1	SERVICE D				1	1	2	6															
2	SERVICE Lr				3	20																	
3	SERVICE S				4	20																	
4	SERVICE Su				5	20																	
5	SERVICE Wx (Load Case A)				6	13.793	7	2.379	8	-9.1...	9	1...	10	2...	11	-9...							
6	SERVICE Wx (Load Case B)				6	-1.141	7	-9.75	8	9.131	9	-1...	10	-9...	11	9...							
7	SERVICE Wz (Load Case A)				13	13.793	14	2.379	15	-9.1...	16	1...	17	2...	18	-9...							
8	SERVICE Wz (Load Case B)				13	-1.141	14	-9.75	15	9.131	16	-1...	17	-9...	18	9...							

Company : RISA Technologies
Designer :
Job Number :
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Load Combinations (Continued)

	Description	Sol...	P...	S...	BLC	Factor	BLC	Fact...	BLC	Fact...	BLC	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...
9	SERVICE Ex				20	.167	21	1															
10	SERVICE Ez				22	.167	23	1															
11	SERVICE Ev				1	.1	2	.6															
12																							
13																							
14																							
15	D	Yes	Y		L1	1																	
16	D + Lr	Yes	Y		L1	1	L2	1															
17	D + S	Yes	Y		L1	1	L3	1															
18	D + Su	Yes	Y		L1	1	L4	1															
19	D + 0.6Wx (Load Case A)	Yes	Y		L1	1	L5	1															
20	D + 0.6Wx (Load Case B)	Yes	Y		L1	1	L6	1															
21	D + (0.6Wx (Minimum))	Yes	Y		L1	1	12	9.6															
22	D + 0.75(0.6Wx (Load Case ...	Yes	Y		L1	1	L5	.75	L2	.75													
23	D + 0.75(0.6Wx (Minimum)) +...	Yes	Y		L1	1	12	7.2	L2	.75													
24	D + 0.75(0.6Wx (Load Case ...	Yes	Y		L1	1	L5	.75	L3	.75													
25	D + 0.75(0.6Wx (Minimum)) +...	Yes	Y		L1	1	12	7.2	L3	.75													
26	0.6D + 0.6Wx (Load Case A)	Yes	Y		L1	.6	L5	1															
27	0.6D + 0.6Wx (Load Case B)	Yes	Y		L1	.6	L6	1															
28	0.6D + (0.6Wx (Minimum))	Yes	Y		L1	.6	12	9.6															
29	D + 0.6Wz (Load Case A)	Yes	Y		L1	1	L7	1															
30	D + 0.6Wz (Load Case B)	Yes	Y		L1	1	L8	1															
31	D + (0.6Wz (Minimum))	Yes	Y		L1	1	19	9.6															
32	D + 0.75(0.6Wz (Load Case ...	Yes	Y		L1	1	L7	.75	L2	.75													
33	D + 0.75(0.6Wz (Minimum)) +...	Yes	Y		L1	1	19	7.2	L2	.75													
34	D + 0.75(0.6Wz (Load Case ...	Yes	Y		L1	1	L7	.75	L3	.75													
35	D + 0.75(0.6Wz (Minimum)) +...	Yes	Y		L1	1	19	7.2	L3	.75													
36	0.6D + 0.6Wz (Load Case A)	Yes	Y		L1	.6	L7	1															
37	0.6D + 0.6Wz (Load Case B)	Yes	Y		L1	.6	L8	1															
38	0.6D + (0.6Wz (Minimum))	Yes	Y		L1	.6	19	9.6															
39	1.0D+0.7Ev+0.7Ehx	Yes	Y		L1	1	L11	.7	L9	.7													
40	1.0D+0.525Ev+0.525Ehx+0.7...	Yes	Y		L1	1	L11	.525	L9	.525	L3	.75											
41	0.6D-0.7Ev+0.7Ehx	Yes	Y		L1	.6	L11	-.7	L9	.7													
42	1.0D+0.7Ev+0.7Ehz	Yes	Y		L1	1	L11	.7	L10	.7													
43	1.0D+0.525Ev+0.525Ehz+0.7...	Yes	Y		L1	1	L11	.525	L10	.525	L3	.75											
44	0.6D-0.7Ev+0.7Ehz	Yes	Y		L1	.6	L11	-.7	L10	.7													
45																							
46																							
47																							
48																							
49																							
50																							
51																							
52																							
53																							
54																							
55	1.4D				L1	1.4																	
56	1.2D + 0.5Lr				L1	1.2	L2	.5															
57	1.2D + 0.5S				L1	1.2	L3	.5															
58	1.2D + 0.5Su				L1	1.2	L4	.5															
59	1.2D + 1.6Lr + 0.5Wx (Load ...				L1	1.2	L2	1.6	L5	.833													
60	1.2D + 1.6Lr + 0.5Wx (Minim...				L1	1.2	L2	1.6	12	8													
61	1.2D + 1.6S + 0.5Wx (Load C...				L1	1.2	L3	1.6	L5	.833													
62	1.2D + 1.6S + 0.5Wx (Minimu...				L1	1.2	L3	1.6	12	8													
63	1.2D + 1.0Wx (Load Case A) ...				L1	1.2	L5	1.667	L2	.5													
64	1.2D + 1.0Wx (Load Case B) ...				L1	1.2	L6	1.667	L2	.5													
65	1.2D + 1.0Wx (Minimum) + 0...				L1	1.2	12	16	L2	.5													

Load Combinations (Continued)

	Description	Sol...	P...	S...	BLC	Factor	BLC	Fact...	BLC	Fact...	BLC	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...
66	1.2D + 1.0Wx (Load Case A) ...				L1	1.2	L5	1.667	L3	.5												
67	1.2D + 1.0Wx (Load Case B) ...				L1	1.2	L6	1.667	L3	.5												
68	1.2D + 1.0Wx (Minimum) + 0....				L1	1.2	12	16	L3	.5												
69	0.9D + 1.0Wx (Load Case A)				L1	.9	L5	1.667														
70	0.9D + 1.0Wx (Load Case B)				L1	.9	L6	1.667														
71	0.9D + 1.0Wx (Minimum)				L1	.9	12	16														
72	1.2D + 1.6Lr + 0.5Wz (Load ...				L1	1.2	L2	1.6	L7	.833												
73	1.2D + 1.6Lr + 0.5Wz (Minim...				L1	1.2	L2	1.6	19	8												
74	1.2D + 1.6S + 0.5Wz (Load C...				L1	1.2	L3	1.6	L7	.833												
75	1.2D + 1.6S + 0.5Wz (Minimu...				L1	1.2	L3	1.6	19	8												
76	1.2D + 1.0Wz (Load Case A) ...				L1	1.2	L7	1.667	L2	.5												
77	1.2D + 1.0Wz (Load Case B) ...				L1	1.2	L8	1.667	L2	.5												
78	1.2D + 1.0Wz (Minimum) + 0....				L1	1.2	19	16	L2	.5												
79	1.2D + 1.0Wz (Load Case A) ...				L1	1.2	L7	1.667	L3	.5												
80	1.2D + 1.0Wz (Load Case B) ...				L1	1.2	L8	1.667	L3	.5												
81	1.2D + 1.0Wz (Minimum) + 0....				L1	1.2	19	16	L3	.5												
82	0.9D + 1.0Wz (Load Case A)				L1	.9	L7	1.667														
83	0.9D + 1.0Wz (Load Case B)				L1	.9	L8	1.667														
84	0.9D + 1.0Wz (Minimum)				L1	.9	19	16														
85	1.2D+Ev+Ehx+0.2S				L1	1.2	L11	1	L9	1	L3	.2										
86	0.9D-Ev+Ehx				L1	.9	L11	-1	L9	1												
87	1.2D+Ev+Ehx+0.2S				L1	1.2	L11	1	L10	1	L3	.2										
88	0.9D-Ev+Ehz				L1	.9	L11	-1	L10	1												
89																						
90																						
91																						
92																						
93																						
94																						
95																						
96																						
97																						
98																						
99																						
100																						
101																						
102																						
103																						
104	SERVICE Emx				20	.5	21	2.999														
105	SERVICE Emz				22	.5	23	2.999														
106																						
107	1.0D+0.7Ev+0.7Emhx				L1	1	L11	.7	L104	.7												
108	1.0D+0.525Ev+0.525Emhx+0...				L1	1	L11	.525	L104	.525	L3	.75										
109	0.6D-0.7Ev+0.7Emhx				L1	.6	L11	-.7	L104	.7												
110	1.0D+0.7Ev+0.7Emhz				L1	1	L11	.7	L105	.7												
111	1.0D+0.525Ev+0.525Emhz+0...				L1	1	L11	.525	L105	.525	L3	.75										
112	0.6D-0.7Ev+0.7Emhz				L1	.6	L11	-.7	L105	.7												
113																						
114																						
115																						
116	1.2D+Ev+Emhx+0.2S				L1	1.2	L11	1	L104	1	L3	.2										
117	0.9D-Ev+Emhx				L1	.9	L11	-1	L104	1												
118	1.2D+Ev+Emhx+0.2S				L1	1.2	L11	1	L105	1	L3	.2										
119	0.9D-Ev+Emhz				L1	.9	L11	-1	L105	1												
120																						
121																						
122																						

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Designer :
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Load Combinations (Continued)

	Description	Sol...	P...	S...	BLC	Factor	BLC	Fact...	BLC	Fact...	BLC	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...	F...
123																						
124																						
125																						
126																						
127																						
128																						
129																						
130																						
131																						
132																						
133																						
134																						
135																						

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction			
2	N8	Reaction	Reaction	Reaction			
3	N14	Reaction	Reaction	Reaction			
4	N20	Reaction	Reaction	Reaction			

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Column	HSS6X6X3	Column	TUBE	A500 Gr.46	Typical	3.98	22.3	22.3	35
2	Truss	HSS6X4X2	Beam	TUBE	A500 Gr.46	Typical	2.23	6.15	11.4	12.6
3	Tension	HSS5X3X2	Beam	TUBE	A500 Gr.46	Typical	1.77	2.75	6.03	6.02
4	Truss Tail	HSS4X4X2	Beam	TUBE	A500 Gr.46	Typical	1.77	4.4	4.4	6.91
5	Juncture Column	HSS5X5X8	Column	Tube	A500 Gr.46	Typical	7.88	26	26	44.6
6	Clerestory	HSS5X3X2	Beam	TUBE	A500 Gr.46	Typical	1.77	2.75	6.03	6.02
7	Upper Truss	HSS6X4X2	Beam	TUBE	A500 Gr.46	Typical	2.23	6.15	11.4	12.6
8	Upper Truss Tail	HSS4X4X2	Beam	TUBE	A500 Gr.46	Typical	1.77	4.4	4.4	6.91
9	Wooster Column	HSS8X8X3	Column	Tube	A500 Gr.46	Typical	5.37	54.4	54.4	84.5

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design ...
1	WOOSTERCOLUMN1	N1	N26		135	Wooster Column	Colu...	Tube	A500 Gr....	Typical
2	WOOSTERCOLUMN2	N8	N27		45	Wooster Column	Colu...	Tube	A500 Gr....	Typical
3	WOOSTERCOLUMN3	N14	N28		315	Wooster Column	Colu...	Tube	A500 Gr....	Typical
4	WOOSTERCOLUMN4	N20	N29		225	Wooster Column	Colu...	Tube	A500 Gr....	Typical
5	Truss1	N2	N4			Truss	Beam	TUBE	A500 Gr....	Typical
6	Truss2	N9	N11			Truss	Beam	TUBE	A500 Gr....	Typical
7	Truss3	N15	N17			Truss	Beam	TUBE	A500 Gr....	Typical
8	Truss4	N21	N23			Truss	Beam	TUBE	A500 Gr....	Typical
9	Trusstail1	N3	N2			Truss Tail	Beam	TUBE	A500 Gr....	Typical
10	Trusstail2	N10	N9			Truss Tail	Beam	TUBE	A500 Gr....	Typical
11	Trusstail3	N16	N15			Truss Tail	Beam	TUBE	A500 Gr....	Typical
12	Trusstail4	N22	N21			Truss Tail	Beam	TUBE	A500 Gr....	Typical
13	Tension1	N9	N2			Tension	Beam	TUBE	A500 Gr....	Typical
14	Tension2	N2	N21			Tension	Beam	TUBE	A500 Gr....	Typical
15	Tension3	N21	N15			Tension	Beam	TUBE	A500 Gr....	Typical
16	Tension4	N15	N9			Tension	Beam	TUBE	A500 Gr....	Typical
17	J column1	N4	N5		135	Juncture Column	Colu...	Tube	A500 Gr....	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design ...
18	J column2	N11	N12		45	Juncture Column	Colu...	Tube	A500 Gr...	Typical
19	J column3	N17	N18		315	Juncture Column	Colu...	Tube	A500 Gr...	Typical
20	J column4	N23	N24		225	Juncture Column	Colu...	Tube	A500 Gr...	Typical
21	Clerestory1	N11	N4			Clerestory	Beam	TUBE	A500 Gr...	Typical
22	Clerestory2	N4	N23			Clerestory	Beam	TUBE	A500 Gr...	Typical
23	Clerestory3	N23	N17			Clerestory	Beam	TUBE	A500 Gr...	Typical
24	Clerestory4	N17	N11			Clerestory	Beam	TUBE	A500 Gr...	Typical
25	Clerestory5	N12	N5			Clerestory	Beam	TUBE	A500 Gr...	Typical
26	Clerestory6	N5	N24			Clerestory	Beam	TUBE	A500 Gr...	Typical
27	Clerestory7	N24	N18			Clerestory	Beam	TUBE	A500 Gr...	Typical
28	Clerestory8	N18	N12			Clerestory	Beam	TUBE	A500 Gr...	Typical
29	Upper Truss1	N5	N7			Upper Truss	Beam	TUBE	A500 Gr...	Typical
30	Upper Truss2	N12	N7			Upper Truss	Beam	TUBE	A500 Gr...	Typical
31	Upper Truss3	N18	N7			Upper Truss	Beam	TUBE	A500 Gr...	Typical
32	Upper Truss4	N24	N7			Upper Truss	Beam	TUBE	A500 Gr...	Typical
33	Upper trusstail1	N6	N5			Upper Truss Tail	Beam	TUBE	A500 Gr...	Typical
34	Upper trusstail2	N13	N12			Upper Truss Tail	Beam	TUBE	A500 Gr...	Typical
35	Upper trusstail3	N19	N18			Upper Truss Tail	Beam	TUBE	A500 Gr...	Typical
36	Upper trusstail4	N25	N24			Upper Truss Tail	Beam	TUBE	A500 Gr...	Typical
37	COLUMN1	N26	N2		135	Column	Colu...	TUBE	A500 Gr...	Typical
38	COLUMN2	N27	N9		45	Column	Colu...	TUBE	A500 Gr...	Typical
39	COLUMN3	N28	N15		315	Column	Colu...	TUBE	A500 Gr...	Typical
40	COLUMN4	N29	N21		225	Column	Colu...	TUBE	A500 Gr...	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl R...	Analysis...	Inactive	Seismi...
1	WOOSTERCOL...						Yes	** NA **			None
2	WOOSTERCOL...						Yes	** NA **			None
3	WOOSTERCOL...						Yes	** NA **			None
4	WOOSTERCOL...						Yes	** NA **			None
5	Truss1						Yes				None
6	Truss2						Yes				None
7	Truss3						Yes				None
8	Truss4						Yes				None
9	Trusstail1						Yes				None
10	Trusstail2						Yes				None
11	Trusstail3						Yes				None
12	Trusstail4						Yes				None
13	Tension1						Yes				None
14	Tension2						Yes				None
15	Tension3						Yes				None
16	Tension4						Yes				None
17	J column1						Yes	** NA **			None
18	J column2						Yes	** NA **			None
19	J column3						Yes	** NA **			None
20	J column4						Yes	** NA **			None
21	Clerestory1						Yes				None
22	Clerestory2						Yes				None
23	Clerestory3						Yes				None
24	Clerestory4						Yes				None
25	Clerestory5						Yes				None
26	Clerestory6						Yes				None
27	Clerestory7						Yes				None
28	Clerestory8						Yes				None
29	Upper Truss1						Yes				None

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Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl R...	Analysis...	Inactive	Seismi...
30	Upper Truss2						Yes				None
31	Upper Truss3						Yes				None
32	Upper Truss4						Yes				None
33	Upper trusstail1						Yes				None
34	Upper trusstail2						Yes				None
35	Upper trusstail3						Yes				None
36	Upper trusstail4						Yes				None
37	COLUMN1						Yes	** NA **			None
38	COLUMN2						Yes	** NA **			None
39	COLUMN3						Yes	** NA **			None
40	COLUMN4						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[...	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp ...	L-torq...	Kyy	Kzz	Cb	Function
1	WOOSTERC...	Wooster Column	3						2	2		Lateral
2	WOOSTERC...	Wooster Column	3						2	2		Lateral
3	WOOSTERC...	Wooster Column	3						2	2		Lateral
4	WOOSTERC...	Wooster Column	3						2	2		Lateral
5	Truss1	Truss	6						.65	.65		Lateral
6	Truss2	Truss	6						.65	.65		Lateral
7	Truss3	Truss	6						.65	.65		Lateral
8	Truss4	Truss	6						.65	.65		Lateral
9	Trusstail1	Truss Tail	1.5						2.1	2.1		Lateral
10	Trusstail2	Truss Tail	1.5						2.1	2.1		Lateral
11	Trusstail3	Truss Tail	1.5						2.1	2.1		Lateral
12	Trusstail4	Truss Tail	1.5						2.1	2.1		Lateral
13	Tension1	Tension	14						.65	.65		Lateral
14	Tension2	Tension	14						.65	.65		Lateral
15	Tension3	Tension	14						.65	.65		Lateral
16	Tension4	Tension	14						.65	.65		Lateral
17	J column1	Juncture Column	2						2	2		Lateral
18	J column2	Juncture Column	2						2	2		Lateral
19	J column3	Juncture Column	2						2	2		Lateral
20	J column4	Juncture Column	2						2	2		Lateral
21	Clerestory1	Clerestory	6						.65	.65		Lateral
22	Clerestory2	Clerestory	6						.65	.65		Lateral
23	Clerestory3	Clerestory	6						.65	.65		Lateral
24	Clerestory4	Clerestory	6						.65	.65		Lateral
25	Clerestory5	Clerestory	6						.65	.65		Lateral
26	Clerestory6	Clerestory	6						.65	.65		Lateral
27	Clerestory7	Clerestory	6						.65	.65		Lateral
28	Clerestory8	Clerestory	6						.65	.65		Lateral
29	Upper Truss1	Upper Truss	4.5						.65	.65		Lateral
30	Upper Truss2	Upper Truss	4.5						.65	.65		Lateral
31	Upper Truss3	Upper Truss	4.5						.65	.65		Lateral
32	Upper Truss4	Upper Truss	4.5						.65	.65		Lateral
33	Upper trusstail1	Upper Truss Tail	1.5						2.1	2.1		Lateral
34	Upper trusstail2	Upper Truss Tail	1.5						2.1	2.1		Lateral
35	Upper trusstail3	Upper Truss Tail	1.5						2.1	2.1		Lateral
36	Upper trusstail4	Upper Truss Tail	1.5						2.1	2.1		Lateral
37	COLUMN1	Column	7.5						2	2		Lateral
38	COLUMN2	Column	7.5						2	2		Lateral
39	COLUMN3	Column	7.5						2	2		Lateral
40	COLUMN4	Column	7.5						2	2		Lateral

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/...	Density[lb/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	490	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	490	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	490	50	1.1	65	1.1
4	A500 Gr.42	29000	11154	.3	.65	490	42	1.4	58	1.3
5	A500 Gr.46	29000	11154	.3	.65	527	46	1.4	58	1.3
6	A53 Gr. B	29000	11154	.3	.65	490	35	1.5	60	1.2

Envelope AISC 15th(360-16): ASD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	Pnc/o...	Pnt/om ...	Mnyy/o...	Mnzz/om [...	Cb	Eqn
1	WOOS...	HSS8...	.027	3	24	.004	0	y	24	127.049	147.916	346.357	346.357	1....	H1-1b
2	WOOS...	HSS8...	.033	3	40	.004	0	y	40	127.049	147.916	346.357	346.357	1....	H1-1b
3	WOOS...	HSS8...	.033	3	40	.004	0	y	43	127.049	147.916	346.357	346.357	1....	H1-1b
4	WOOS...	HSS8...	.033	3	43	.004	0	y	43	127.049	147.916	346.357	346.357	1....	H1-1b
5	Truss1	HSS6...	.120	0	35	.044	6	z	19	51.871	61.425	73.197	115.633	1.08	H1-1b
6	Truss2	HSS6...	.147	0	24	.044	6	z	29	51.871	61.425	73.197	115.633	1....	H1-1b
7	Truss3	HSS6...	.148	0	24	.036	6	y	30	51.871	61.425	73.197	115.633	1....	H1-1b
8	Truss4	HSS6...	.148	0	34	.044	6	z	19	51.871	61.425	73.197	115.633	1....	H1-1b
9	Trusst...	HSS4...	.004	1.5	17	.002	1.5	y	17	46.905	48.754	65.792	65.792	2....	H1-1b
10	Trusst...	HSS4...	.004	1.5	24	.002	1.5	y	17	46.905	48.754	65.792	65.792	2....	H1-1b
11	Trusst...	HSS4...	.004	1.5	24	.002	1.5	y	17	46.905	48.754	65.792	65.792	2....	H1-1b
12	Trusst...	HSS4...	.004	1.5	34	.002	1.5	y	18	46.905	48.754	65.792	65.792	2....	H1-1b
13	Tensio...	HSS5...	.237	0	40	.029	0	y	40	29.093	48.754	47.569	80.707	2.32	H1-1b
14	Tensio...	HSS5...	.236	14	43	.034	0	y	18	29.093	48.754	47.569	80.707	2....	H1-1b
15	Tensio...	HSS5...	.275	0	34	.034	14	y	18	29.093	48.754	47.569	80.707	1....	H1-1b
16	Tensio...	HSS5...	.275	0	24	.033	0	y	24	29.093	48.754	47.569	80.707	1....	H1-1b
17	J colu...	HSS5...	.018	2	24	.008	0	y	18	207.094	217.054	360.838	360.838	2....	H1-1b
18	J colu...	HSS5...	.023	0	24	.008	0	y	24	207.094	217.054	360.838	360.838	2....	H1-1b
19	J colu...	HSS5...	.023	0	34	.008	0	y	34	207.094	217.054	360.838	360.838	2....	H1-1b
20	J colu...	HSS5...	.029	0	18	.009	0	y	18	207.094	217.054	360.838	360.838	1....	H1-1b
21	Cleres...	HSS5...	.068	6	24	.010	0	y	40	42.924	48.754	47.569	80.707	2.64	H1-1b
22	Cleres...	HSS5...	.067	0	34	.014	0	y	18	42.924	48.754	47.569	80.707	2....	H1-1b
23	Cleres...	HSS5...	.067	0	24	.014	6	y	18	42.924	48.754	47.569	80.707	2....	H1-1b
24	Cleres...	HSS5...	.068	6	34	.012	6	y	24	42.924	48.754	47.569	80.707	2.64	H1-1b
25	Cleres...	HSS5...	.038	6	20	.009	6	y	17	42.924	48.754	47.569	80.707	2....	H1-1b
26	Cleres...	HSS5...	.044	0	18	.010	0	y	18	42.924	48.754	47.569	80.707	2....	H1-1b
27	Cleres...	HSS5...	.044	6	18	.011	6	y	34	42.924	48.754	47.569	80.707	2....	H1-1b
28	Cleres...	HSS5...	.042	6	24	.011	6	y	24	42.924	48.754	47.569	80.707	2....	H1-1b
29	Upper ...	HSS6...	.025	0	24	.007	0	y	24	52.85	61.425	73.197	115.633	2....	H1-1b
30	Upper ...	HSS6...	.025	0	34	.007	0	y	34	52.85	61.425	73.197	115.633	2....	H1-1b
31	Upper ...	HSS6...	.021	0	43	.006	4.5	y	24	52.85	61.425	73.197	115.633	2....	H1-1b
32	Upper ...	HSS6...	.025	0	24	.007	0	y	24	52.85	61.425	73.197	115.633	2....	H1-1b
33	Upper ...	HSS4...	.004	1.5	17	.002	1.5	y	17	46.905	48.754	65.792	65.792	2....	H1-1b
34	Upper ...	HSS4...	.004	1.5	24	.002	1.5	y	17	46.905	48.754	65.792	65.792	2....	H1-1b
35	Upper ...	HSS4...	.004	1.5	24	.002	1.5	y	17	46.905	48.754	65.792	65.792	2....	H1-1b
36	Upper ...	HSS4...	.004	1.5	34	.002	1.5	y	17	46.905	48.754	65.792	65.792	2....	H1-1b
37	COLU...	HSS6...	.120	7.5	30	.005	0	y	24	74.3	109.629	222.012	222.012	1....	H1-1b
38	COLU...	HSS6...	.141	7.5	40	.006	0	y	40	74.3	109.629	222.012	222.012	1....	H1-1b
39	COLU...	HSS6...	.141	7.5	40	.006	0	y	43	74.3	109.629	222.012	222.012	1....	H1-1b
40	COLU...	HSS6...	.141	7.5	43	.006	0	y	43	74.3	109.629	222.012	222.012	1....	H1-1b

Company : RISA Technologies
Designer :
Job Number :
Model Name :

Jan 21, 2021
11:49 AM
Checked By:_____

Material Takeoff

	Material	Size	Pieces	Length[ft]	Weight[LB]
1	Hot Rolled Steel				
2	A500 Gr.46	HSS4X4X2	8	12	77.733
3	A500 Gr.46	HSS5X3X2	12	104	673.682
4	A500 Gr.46	HSS5X5X8	4	8	230.709
5	A500 Gr.46	HSS6X4X2	8	42	342.77
6	A500 Gr.46	HSS6X6X3	4	30	436.971
7	A500 Gr.46	HSS8X8X3	4	12	235.833
8	Total HR Steel		40	208	1997.696

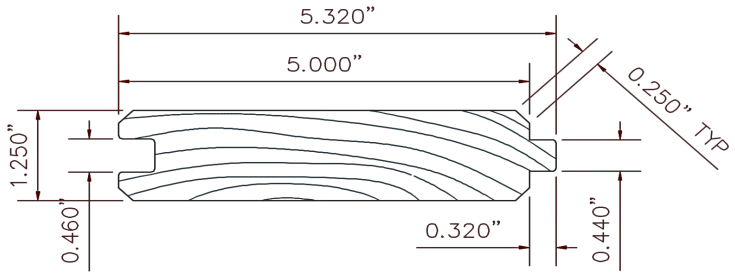
PANEL DATA

2 x 6 Tongue and Groove Panels

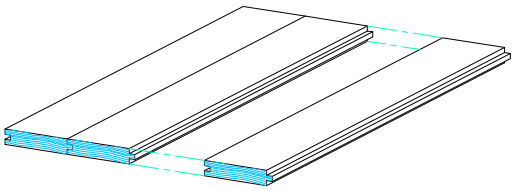
Allowable Loads

Southern Yellow Pine No. 1

Section / Isometric View of Panel Cross-Section



Section View of Typical Panel



Isometric View of Panels

Section Properties (Out of Plane Bending)

Member Size	Weight (psf)	F_b (ksi)	I_x (in^4)	S_e (in^3)	M_a (in-kips)
2" X 6"	3.55	1.65	0.792	1.268	2.092

Allowable Loads

Span Type	Span Lengths (ft)	Allowable Load (psf)
Single Span	4	197
	5	126
	6	87
	7	64
	8	49
Two Span	4	197
	5	126
	6	87
	7	64
	8	49
Three Span	4	246
	5	157
	6	109
	7	80
	8	61

Load Duration Factors (C_D)

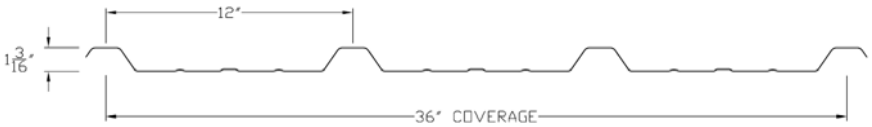
Typical Deisgn Loads	C_D
Dead Load	0.9
Live Load	1.0
Snow Load	1.15
Wind Load	1.6
Earthquake Load	1.6

Notes

1. All calculations for properties of panels are calculated in accordance with the National Design Specification (NDS) for Wood Construction, 2018 Edition. Allowable loads are based on at least two sections of the tongue and groove decking in place, with tongue and groove in contact.
2. The spans shown assume equal spacing between the multi-span conditions.
3. Weight of panels and roof covering material must be deducted from values to obtain net allowable load.
4. Per NDS 2018 Section 2.3.2, reference design values shall be multiplied by the appropriate load duration factor, C_D.

Multi-Rib

Bare Galvalume & Painted Galvalume



SECTION PROPERTIES						TOP IN COMPRESSION			BOTTOM IN COMPRESSION		
GAUGE	FY (KSI)	WEIGHT (PSF)	V_a kip/ft.	P_{a_end} lbs/ft.	P_{a_int} lbs/ft.	I_x ($in.^4$/ft.)	S_e ($in.^3$/ft.)	M_a kip-in./ft.	I_x ($in.^4$/ft.)	S_e ($in.^3$/ft.)	M_a kip-in./ft.
24	50.0	1.10	0.773	189.7	320.8	0.052	0.0575	1.723	0.031	0.0495	1.483

1. Section properties are calculated in accordance with the 2001 AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
2. Va is the allowable shear.
3. Pa is the allowable load for web crippling on end & interior supports.
4. Ix is for deflection determination.
5. Se is for bending.
6. Ma is the allowable bending moment.
7. All values are for one foot of panel width.

Allowable Uniform Loads (PSF)

		Span in Feet															
Span Type	Load Type	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00
Single	Positive Wind	500	287	183	127	93	71	56	45	37	31	27	23	20	17	15	14
	Negative Wind	439	247	158	109	80	61	48	39	32	27	23	20	17	15	13	12
	Live	500	287	183	127	93	71	56	45	37	31	27	23	20	17	15	14
	Deflection (L/180)	500	500	290	168	106	71	49	36	27	21	16	13	10	8	7	6
	Deflection (L/240)	500	426	218	126	79	53	37	27	20	15	12	9	8	6	5	4
2 Span	Positive Wind	387	229	150	106	78	60	48	39	32	27	23	20	17	15	13	12
	Negative Wind	434	260	172	121	90	69	55	45	37	31	26	23	20	17	15	14
	Live	387	229	150	106	78	60	48	39	32	27	23	20	17	15	13	12
	Deflection (L/180)	500	500	500	323	203	136	95	69	52	40	31	25	20	17	14	11
	Deflection (L/240)	500	500	419	242	152	102	71	52	39	30	23	19	15	12	10	8
3 Span	Positive Wind	462	278	184	130	97	75	59	48	40	33	28	24	21	19	16	15
	Negative Wind	500	313	209	149	111	86	68	56	46	39	33	28	25	22	19	17
	Live	462	278	184	130	97	75	59	48	40	33	28	24	21	19	16	15
	Deflection (L/180)	500	500	438	253	159	106	75	54	41	31	24	19	16	13	11	9
	Deflection (L/240)	500	500	328	190	119	80	56	41	30	23	18	14	12	10	8	7
4 Span	Positive Wind	438	262	173	122	91	70	55	45	37	31	27	23	20	17	15	14
	Negative Wind	487	296	197	140	104	81	64	52	43	36	31	27	23	20	18	16
	Live	438	262	173	122	91	70	55	45	37	31	27	23	20	17	15	14
	Deflection (L/180)	500	500	465	269	169	113	79	58	43	33	26	21	17	14	11	9
	Deflection (L/240)	500	500	348	201	127	85	59	43	32	25	19	15	12	10	8	7

Notes:

1. Allowable uniform loads are based upon equal span lengths.
2. Positive Wind is wind pressure and is **NOT** increased by 33 1/3 %.
3. Negative Wind is wind suction or uplift and is **NOT** increased by 33 1/3%.
4. Live is the allowable live or snow load.
5. Deflection (L/180) is the allowable load that limits the panel's deflection to L/180 while under positive or live load.
6. Deflection (L/240) is the allowable load that limits the panel's deflection to L/240 while under positive or live load.
7. The weight of the panel has **NOT** been deducted from the allowable loads.
8. Positive Wind, Negative Wind, and Live Load values are limited to combined shear & bending using Eq. C3.3.1-1 of the AISI Specification.
9. Positive Wind and Live Load values are limited by web crippling using a bearing length of 2".
10. Web crippling values are determined using a ratio of the uniform load **actually** supported by the top flanges of the section.
11. Load Tables are limited to a maximum allowable load of 500 psf.