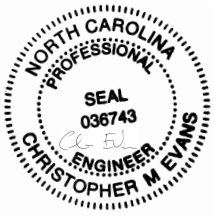
CALCULATIONS FOR:

POLIGON REK 16X24
MULTI RIB
2018 NORTH CAROLINA BUILDING CODE



Christopher Evans
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PREPARED UNDER THE CONTROL AND SUPERVISION
OF THE DESIGN PROFESSIONAL ABOVE

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DESIGN CRITERIA

GENERAL

Building Code:	See Cover Sheet		Roof Slope (°):	18.43	*4:12 Pitch*
Design Code:	ASCE 7-10				
Risk Category:	II		Equivalent Roof Height:	15.00	ft

DEAD LOAD

Weight of Roofing System	2	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 7-2*
Thermal Factor, C_t	1.2		*ASCE 7 Table 7-3*
Exposure Factor, C_e	1.0		*ASCE 7 Table 7-2*
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}	115	mph	V_{asd}	90 mph	*ASCE 7 Section 26.5*
Exposure Category		C				*ASCE 7 Section 26.7*
Gust Effect Factor, *G*		0.85				*ASCE 7 Section 26.9.1*
Velocity Pressure Exposure Coefficient, K_z		0.85				*ASCE 7 Table 27.3.1*
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		24.46	psf			*ASCE 7 Section 27.3.2*

Main Wind-Force Resisting System *ASCE 7 Section 27.4*

Open Building, Clear Wind Flow (Cn from ASCE 7 Fig. 27.4-4 - 27.4-7)

	Roof	
Load Case	A	B
γ = 0		
Windward Cp =	1.10	0.01
p (psf):	22.87	0.17
γ = 180		
Leeward Cp=	-0.17	-0.96
p (psf):	-3.56	-20.01
γ = 90		
Sideward Cp=	-0.80	0.80
p (psf):	-16.63	16.63

Component and Cladding Elements *ASCE 7 Section 30.8.2*

Open Building, Clear Wind Flow (Cn from ASCE 7 Fig. 30.8-1 - 30.8-3)

	Wind Direction	*Toward Roof*	*Away From Roof*
Zone 3	Cn:	2.29	-2.11
	p (psf):	47.65	-43.84
Zone 2	Cn:	1.77	-1.63
	p (psf):	36.77	-33.92
Zone 1	Cn:	1.15	-1.05
	p (psf):	23.82	-21.92

SEISMIC LOAD

Analysis Procedure	Equivalent Lateral Force Procedure	*ASCE 7 Section 12.8*
Seismic Site Class	D	*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*	2.00 psf	*ASCE 7 Section 12.7.2*
Seismic Base Shear, *V*	0.33 psf	*ASCE 7 Section 12.8.1*
Seismic Load, *E*	0.33 psf	*ASCE 7 Section 12.4*
Seismic Load with Overstrength Factor, E_m	1.00 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
Sds	Design Spectral Acceleration Parameter

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

Allowable Stress Design (Factored)

Number	Description
14	D
15	D + Lr
16	D + S
17	D + Su
18	D + 0.6Wx (Load Case A)
19	D + 0.6Wx (Load Case B)
20	D + (0.6Wx (Minimum))
21	D + 0.75(0.6Wx (Load Case A)) + 0.75Lr
22	D + 0.75(0.6Wx (Minimum)) + 0.75Lr
23	D + 0.75(0.6Wx (Load Case A)) + 0.75S
24	D + 0.75(0.6Wx (Minimum)) + 0.75S
25	0.6D + 0.6Wx (Load Case A)
26	0.6D + 0.6Wx (Load Case B)
27	0.6D + (0.6Wx (Minimum))
28	D + 0.6Wz (Load Case A)
29	D + 0.6Wz (Load Case B)
30	D + (0.6Wz (Minimum))
31	D + 0.75(0.6Wz (Load Case A)) + 0.75Lr
32	D + 0.75(0.6Wz (Minimum)) + 0.75Lr
33	D + 0.75(0.6Wz (Load Case A)) + 0.75S
34	D + 0.75(0.6Wz (Minimum)) + 0.75S
35	0.6D + 0.6Wz (Load Case A)
36	0.6D + 0.6Wz (Load Case B)
37	0.6D + (0.6Wz (Minimum))
38	(1.0+0.14*Sds)D+ 0.7Ex
39	(1.0+0.105*Sds)D + 0.525Ex + 0.75S
40	(0.6-0.14*Sds)D + 0.7Ex
41	(1.0+0.14*Sds)D + 0.7Ez
42	(1.0+0.105*Sds)D + 0.525Ez + 0.75S
43	(0.6-0.14*Sds)D + 0.7Ez

Strength Design (Factored)

Number	Description
54	1.4D
55	1.2D + 0.5Lr
56	1.2D + 0.5S
57	1.2D + 0.5Su
58	1.2D + 1.6Lr + 0.5Wx (Load Case A)
59	1.2D + 1.6Lr + 0.5Wx (Minimum)
60	1.2D + 1.6S + 0.5Wx (Load Case A)
61	1.2D + 1.6S + 0.5Wx (Minimum)
62	1.2D + 1.0Wx (Load Case A) + 0.5Lr
63	1.2D + 1.0Wx (Load Case B) + 0.5Lr
64	1.2D + 1.0Wx (Minimum) + 0.5Lr
65	1.2D + 1.0Wx (Load Case A) + 0.5S
66	1.2D + 1.0Wx (Load Case B) + 0.5S
67	1.2D + 1.0Wx (Minimum) + 0.5S
68	0.9D + 1.0Wx (Load Case A)
69	0.9D + 1.0Wx (Load Case B)
70	0.9D + 1.0Wx (Minimum)
71	1.2D + 1.6Lr + 0.5Wz (Load Case A)
72	1.2D + 1.6Lr + 0.5Wz (Minimum)
73	1.2D + 1.6S + 0.5Wz (Load Case A)
74	1.2D + 1.6S + 0.5Wz (Minimum)
75	1.2D + 1.0Wz (Load Case A) + 0.5Lr
76	1.2D + 1.0Wz (Load Case B) + 0.5Lr
77	1.2D + 1.0Wz (Minimum) + 0.5Lr
78	1.2D + 1.0Wz (Load Case A) + 0.5S
79	1.2D + 1.0Wz (Load Case B) + 0.5S
80	1.2D + 1.0Wz (Minimum) + 0.5S
81	0.9D + 1.0Wz (Load Case A)
82	0.9D + 1.0Wz (Load Case B)
83	0.9D + 1.0Wz (Minimum)
84	(1.2+0.2*Sds)D + 1.0Ex + 0.2S
85	(0.9-0.2*Sds)D + 1.0Ex
86	(1.2+0.2*Sds)D + 1.0Ez + 0.2S
87	(0.9-0.2*Sds)D + 1.0Ez
88	

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.

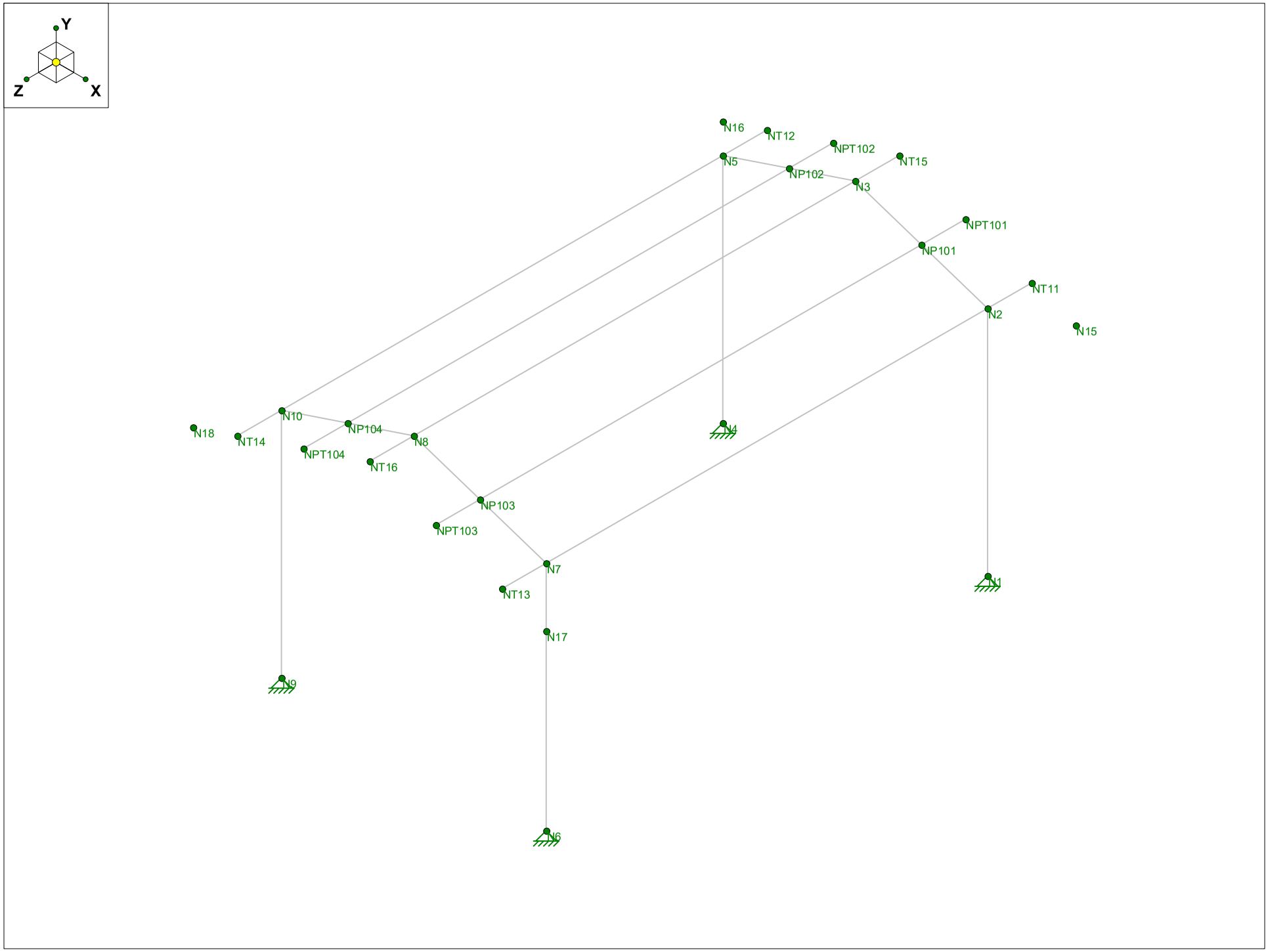
MATERIALS

Column	HSS5x5x3/16
Truss	HSS6x4x1/8
Eave	HSS5x3x1/8
Ridge	HSS5x3x1/8
Purlin	HSS6x4x1/8
Purlin Tail	HSS6x4x1/8
Eave Tail	HSS5x3x1/8
Ridge Tail	HSS5x3x1/8
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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NT12
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N18
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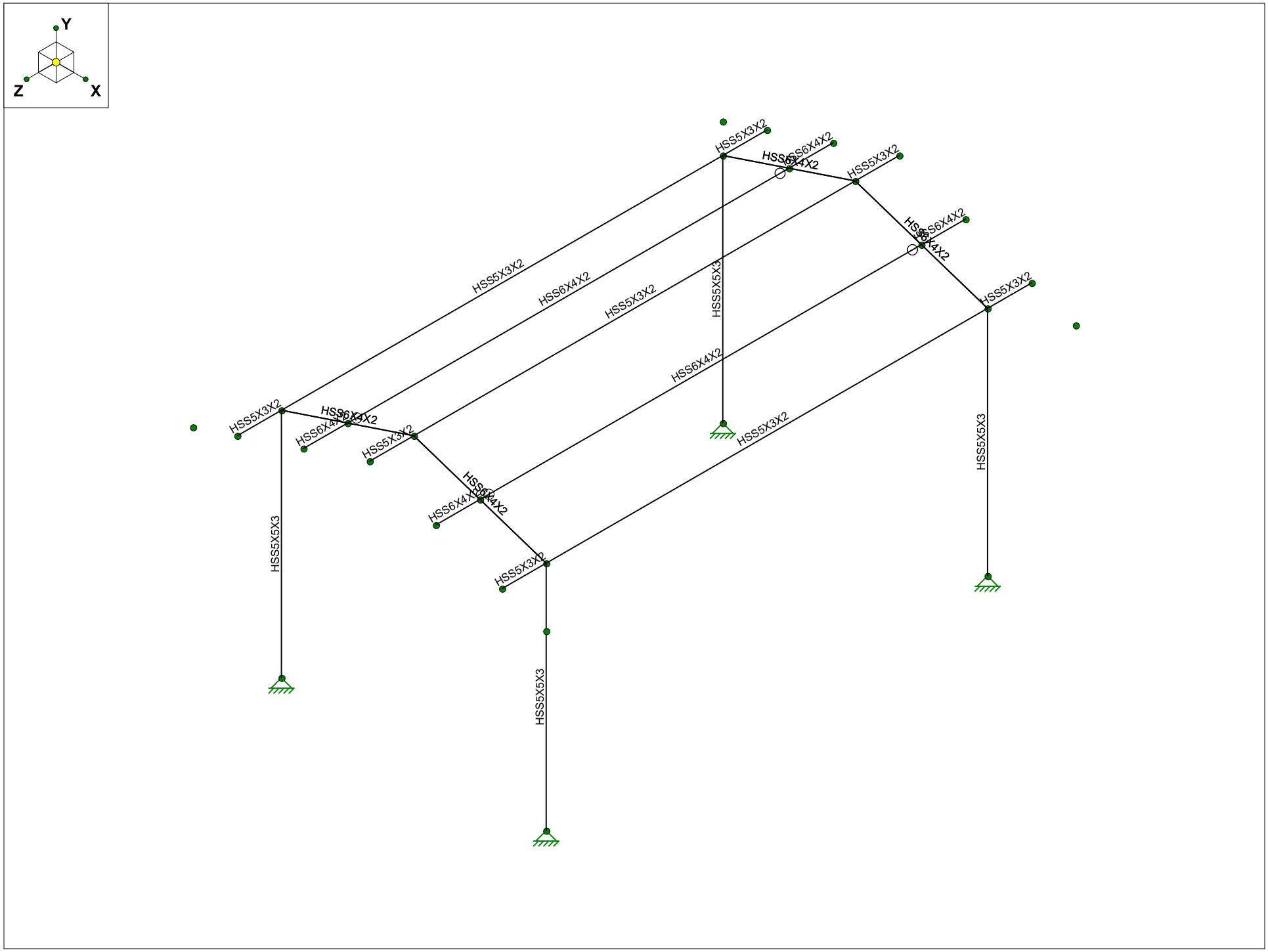
NT13
N17
N9
N6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Z
X
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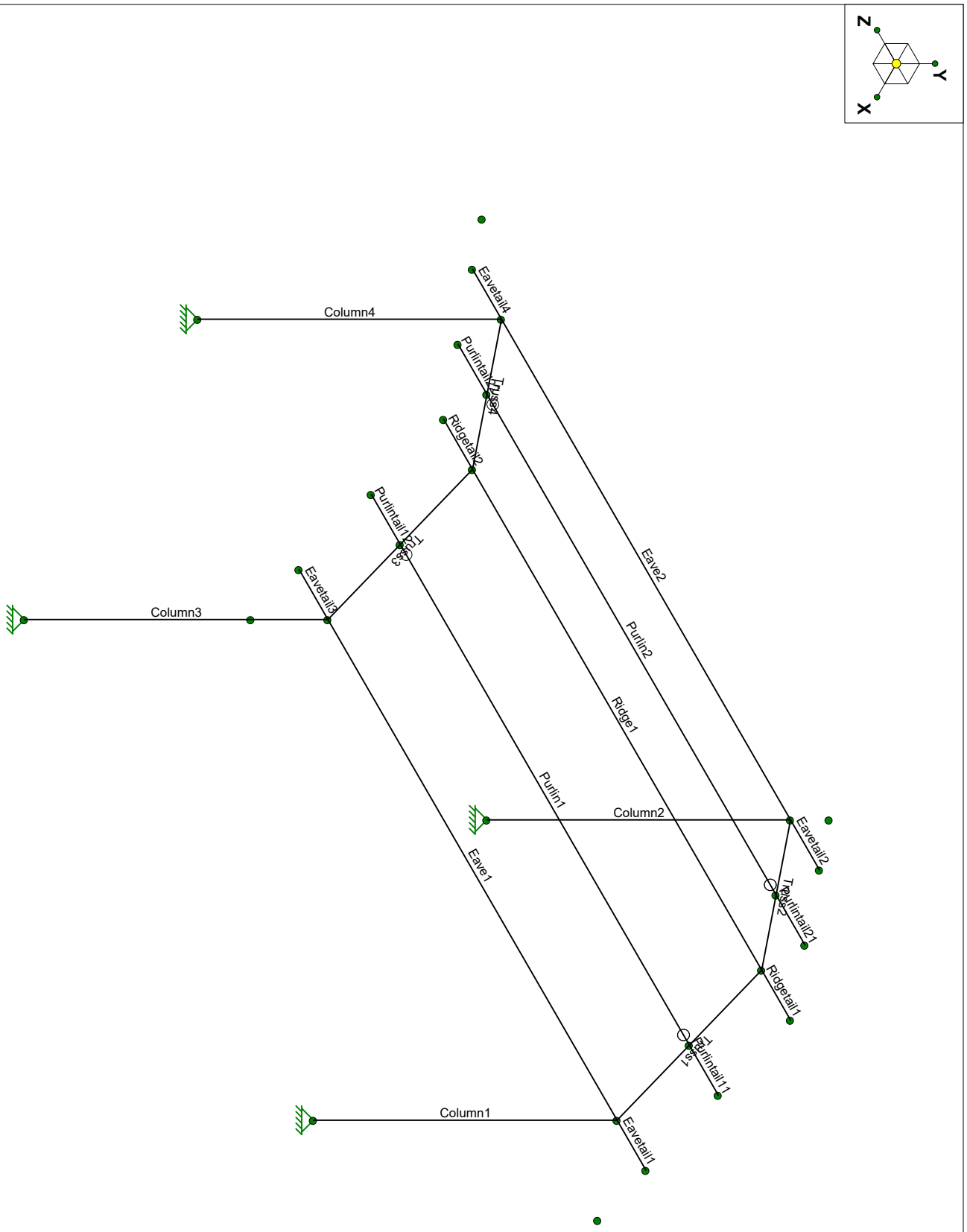
HSS6X4X2
HSS5X5X3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X
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Purlintail4
Truss4
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Truss3
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Eave2
Purlin2
Ridge1
Purlin1
Column2
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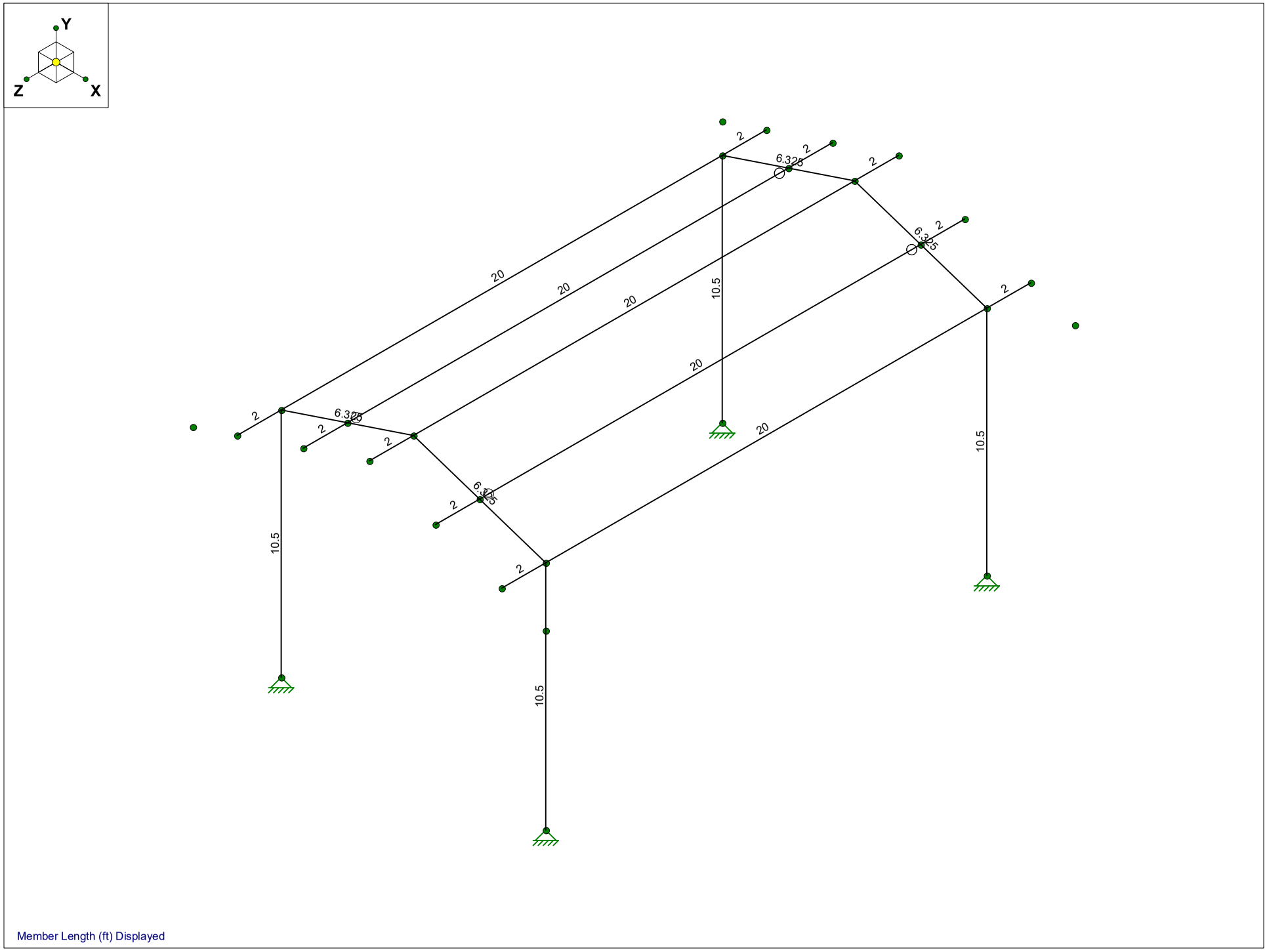
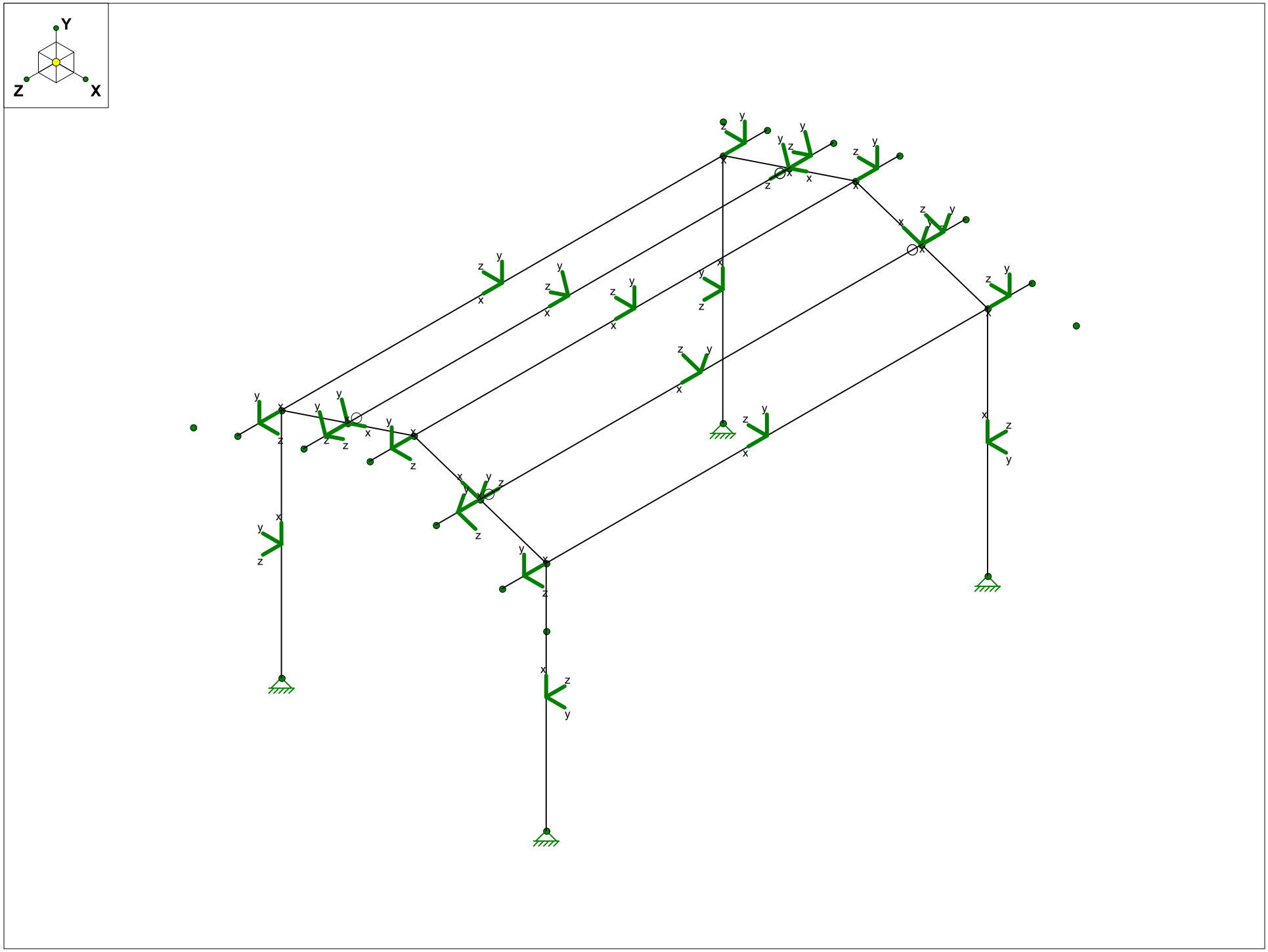
Eave1
Truss2
Purlintail21
Ridgetail1
Truss1
Purlintail11
Column1
Eavetail1


Y
Z
X
20
20
20
20
10.5
10.5
10.5
10.5
2
6.325
Member Length (ft) Displayed


Y
Z
X

FOUNDATION DESIGN

FOUNDATION DESIGN

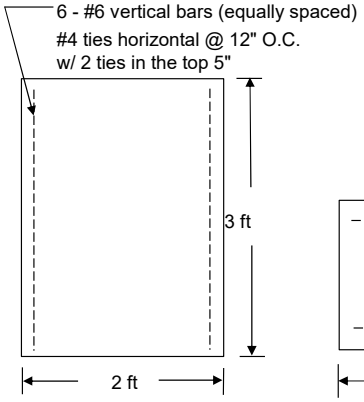
PINNED BASE (INTERNAL BOLTS)

Drilled Pier			**Allowable**	**Actual**	**Load Combination / Member**	
1	Bearing Pressure	(Chapter 18 of the Building Code)	1500 psf	799 psf	15 / Column1	**OK**
2	Uplift Check	*SF = 1.20*	820 lbs	681 lbs	35 / Column3	**OK**
3	Sliding Check	*SF = 5.56*	2339 lbs	421 lbs	21 / Column2	**OK**
4	Area of Reinforcement	(ACI Chapter 10)	0.02 in^2	2.26 in^2	81 / Column3	**OK**

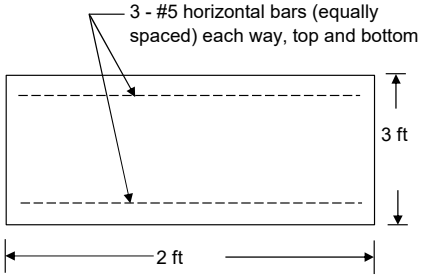
Spread Footing			**Allowable**	**Actual**	**Load Combination / Member**	
5	Bearing Pressure	(Chapter 18 of the Building Code)	1500 psf	628 psf	15 / Column1	**OK**
6	Uplift Check	*SF = 1.53*	1044 lbs	681 lbs	35 / Column3	**OK**
7	Sliding Check	*SF = 6.00*	2526 lbs	421 lbs	21 / Column2	**OK**
8	Area of Reinforcement	(ACI Chapter 7)	0.01 in^2	1.86 in^2	58 / Column2	**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	15	Column1	2.51	-0.22	-0.23	0.00	0.00	0.00
2	35	Column3	-0.68	0.05	-0.18	0.00	0.00	0.00
3	21	Column2	2.49	-0.42	0.18	0.00	0.00	0.00
4	81	Column3	-1.19	0.09	-0.30	0.00	0.00	0.00
5	15	Column1	2.51	-0.22	-0.23	0.00	0.00	0.00
6	35	Column3	-0.68	0.05	-0.18	0.00	0.00	0.00
7	21	Column2	2.49	-0.42	0.18	0.00	0.00	0.00
8	58	Column2	4.34	-0.63	0.35	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

OK

CONNECTION DESIGN

COLUMN BASE PLATE CONNECTION

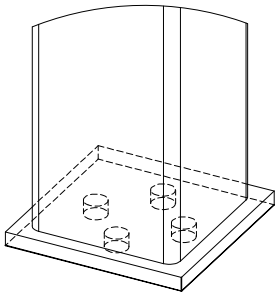
PINNED CONNECTION (INTERNAL BOLTS)

Base Plate Check: 6"x6"x1/2"			**Allowable**	**Actual**	**Load Combination / Member**	
1	Plate Size	(AISC J8-1)	1.3 in^2	36.0 in^2	15 / Column1	**OK**
2	Plate Thickness	(AISC PART 14)	0.13 in	0.50 in	35 / Column3	**OK**
3	Concrete Bearing	(AISC J8-1)	1530 psi	70 psi	15 / Column1	**OK**
4	Weld Check	(AISC J2-3)	2.78 k/in	0.05 k/in	21 / Column2	**OK**

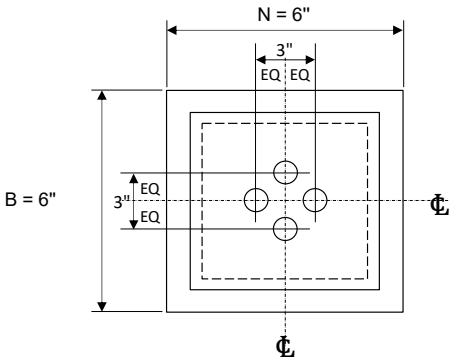
Anchor Bolt Check: (4) 1/2" A307 Anchors			**Allowable**	**Actual**	**Load Combination / Member**	
5	Tension	(ACI D5.1)	24.7 kip	1.2 kip	81 / Column3	**OK**
6	Concrete Breakout	(ACI D5.2)	27.3 kip	1.2 kip	81 / Column3	**OK**
7	Concrete Pullout	(ACI D5.3)	54.0 kip	1.2 kip	81 / Column3	**OK**
8	Sideface Blowout	(ACI D5.4)	N/A	N/A	Not Considered Per RD5.4	**OK**
9	Shear	(ACI D6.1)	10.6 kip	0.7 kip	58 / Column2	**OK**
10	Shear Breakout	(ACI D6.2)	16.3 kip	0.7 kip	58 / Column2	**OK**
11	Shear Pryout	(ACI D6.3)	38.2 kip	0.7 kip	58 / Column2	**OK**
12	Interaction	(ACI RD.7)	1.0	0.01	58 / Column2	**OK**

Design Forces / Moments

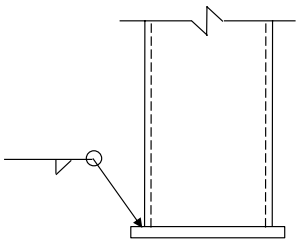
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	15	Column1	2.51	-0.22	-0.23	0.00	0.00	0.00
2	35	Column3	-0.68	0.05	-0.18	0.00	0.00	0.00
3	15	Column1	2.51	-0.22	-0.23	0.00	0.00	0.00
4	21	Column2	2.49	-0.42	0.18	0.00	0.00	0.00
5	81	Column3	-1.19	0.09	-0.30	0.00	0.00	0.00
6	81	Column3	-1.19	0.09	-0.30	0.00	0.00	0.00
7	81	Column3	-1.19	0.09	-0.30	0.00	0.00	0.00
8	x	x	x	x	x	x	x	x
9	58	Column2	4.34	-0.63	0.35	0.00	0.00	0.00
10	58	Column2	4.34	-0.63	0.35	0.00	0.00	0.00
11	58	Column2	4.34	-0.63	0.35	0.00	0.00	0.00
12	58	Column2	4.34	-0.63	0.35	0.00	0.00	0.00



Base Plate Isometric



Base Plate Plan



Base Plate Elevation

Anchor Bolt Diameter (in):	1/2	Column Size:	HSS5X5X3
Min. Embedment Depth (in):	8.0	Min. Base Plate Size:	6"x6"x1/2"
Concrete Cover From ℄ of Bolt (in):	10.5	Weld Size (in):	0.188
f'c (psi):	4500		

OK

TENSION MEMBER TO COLUMN

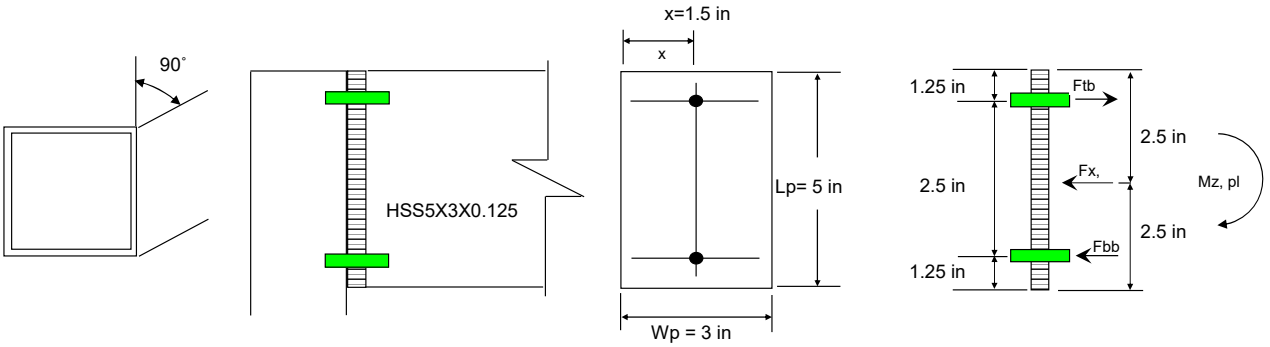
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				**Allowable**	**Actual**	**Load Combination / Member**	
1	Shear	AISC (J3-1)	R_N/Ω	8.3 kip	0.5 kip	21 / Eave1	**OK**
2	Tension	AISC (J3-1)	R_N/Ω	13.8 kip	11.6 kip	21 / Eave1	**OK**
3	Bearing	AISC (J3-6b)	R_N/Ω	24.6 kip	0.5 kip	21 / Eave1	**OK**

End Plate Check: 0.625" Thick				**Allowable**	**Actual**	**Load Combination / Member**	
4	Shear Yielding	AISC (J4-3)	R_N/Ω	45.0 kip	1.0 kip	21 / Eave1	**OK**
5	Shear Rupture	AISC (J4-4)	R_N/Ω	39.4 kip	1.0 kip	21 / Eave1	**OK**
6	Weld Check *w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	1.7 kip/in	21 / Eave1	**OK**
7	Plate Thickness (t_P)		$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.53 in	0.63 in	21 / Eave1	**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	21	Eave1	0.5	1.0	-0.1	0.0	3.8	35.2
2	21	Eave1	0.5	1.0	-0.1	0.0	3.8	35.2
3	21	Eave1	0.5	1.0	-0.1	0.0	3.8	35.2
4	21	Eave1	0.5	1.0	-0.1	0.0	3.8	35.2
5	21	Eave1	0.5	1.0	-0.1	0.0	3.8	35.2
6	21	Eave1	0.5	1.0	-0.1	0.0	3.8	35.2
7	21	Eave1	0.5	1.0	-0.1	0.0	3.8	35.2



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):	0.625
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	0.500

OK

TRUSS TO COLUMN

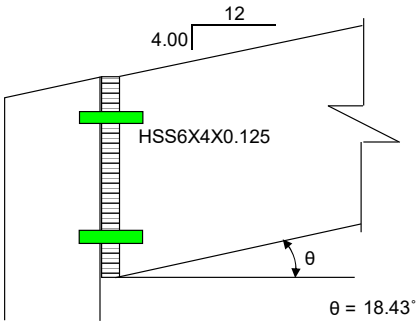
2 BOLTS

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	21 / Truss4	**OK**
2	Tension		AISC (J3-1)	R_N/Ω	13.8 kip	11.5 kip	21 / Truss2	**OK**
3	Bearing		AISC (J3-6b)	R_N/Ω	24.6 kip	1.3 kip	21 / Truss4	**OK**

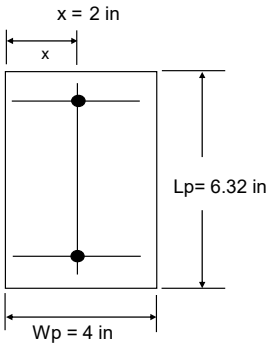
End Plate Check: 0.625" Thick				**Allowable**		**Actual**	**Load Combination / Member**	
4	Shear Yielding		AISC (J4-3)	R_N/Ω	56.9 kip	1.6 kip	21 / Truss2	**OK**
5	Shear Rupture		AISC (J4-4)	R_N/Ω	53.8 kip	1.6 kip	21 / Truss2	**OK**
6	Weld Check	*w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	1.4 kip/in	21 / Truss2	**OK**
7	Plate Thickness (t_P)			$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.49 in	0.63 in	21 / Truss2	**OK**

Design Forces / Moments

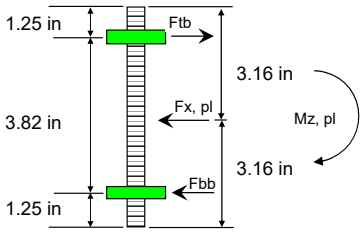
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	21	Truss4	0.9	1.4	0.1	3.6	0.1	53.1
2	21	Truss2	0.9	1.4	-0.1	-3.6	-0.1	53.1
3	21	Truss4	0.9	1.4	0.1	3.6	0.1	53.1
4	21	Truss2	0.9	1.4	-0.1	-3.6	-0.1	53.1
5	21	Truss2	0.9	1.4	-0.1	-3.6	-0.1	53.1
6	21	Truss2	0.9	1.4	-0.1	-3.6	-0.1	53.1
7	21	Truss2	0.9	1.4	-0.1	-3.6	-0.1	53.1



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):	0.625
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	0.500

OK

TRUSS TO COMPRESSION MEMBER

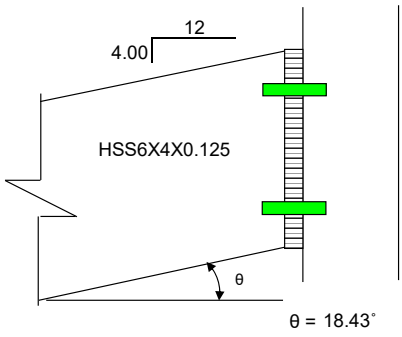
2 BOLTS

Bolt Check: (2) 0.75" Diameter, A325 Bolts				Allowable		Actual	Load Combination / Member	
1	Shear		AISC (J3-1)	R_N/Ω	11.9 kip	3.9 kip	21 / Truss2	**OK**
2	Tension	*allowable per J3.7*	AISC (J3-2)	R_N/Ω	19.9 kip	12.3 kip	15 / Truss1	**OK**
3	Bearing		AISC (J3-6b)	R_N/Ω	29.7 kip	3.9 kip	21 / Truss2	**OK**

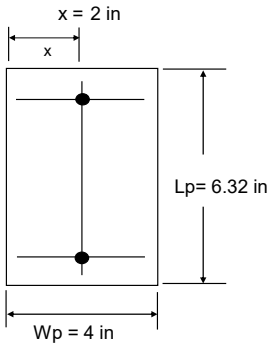
End Plate Check: 0.625" Thick				Allowable		Actual	Load Combination / Member	
4	Shear Yielding		AISC (J4-3)	R_N/Ω	36.0 kip	0.7 kip	21 / Truss2	**OK**
5	Shear Rupture		AISC (J4-4)	R_N/Ω	34.7 kip	0.7 kip	21 / Truss2	**OK**
6	Weld Check	*w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	1.5 kip/in	15 / Truss1	**OK**
7	Plate Thickness (t_P)			$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.44 in	0.63 in	15 / Truss1	**OK**

Design Forces / Moments

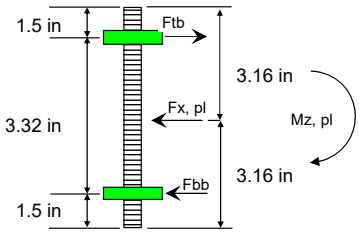
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	21	Truss2	0.6	0.8	0.7	-4.8	22.4	-31.2
2	15	Truss1	0.3	0.3	-0.6	3.6	-21.1	-33.4
3	21	Truss2	0.6	0.8	0.7	-4.8	22.4	-31.2
4	21	Truss2	0.6	0.8	0.7	-4.8	22.4	-31.2
5	21	Truss2	0.6	0.8	0.7	-4.8	22.4	-31.2
6	15	Truss1	0.3	0.3	-0.6	3.6	-21.1	-33.4
7	15	Truss1	0.3	0.3	-0.6	3.6	-21.1	-33.4



Connection Elevation



End Plate Elevation



End Plate Section

Member Height (in):	6	Number of Bolts:	2
Member Width (in):	4	Bolt Diameter (in):	0.750
Member Thickness (in):	0.125	End Plate Thickness (in):	0.625
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	0.250

RIDGE BEAM TO COMPRESSION TUBE

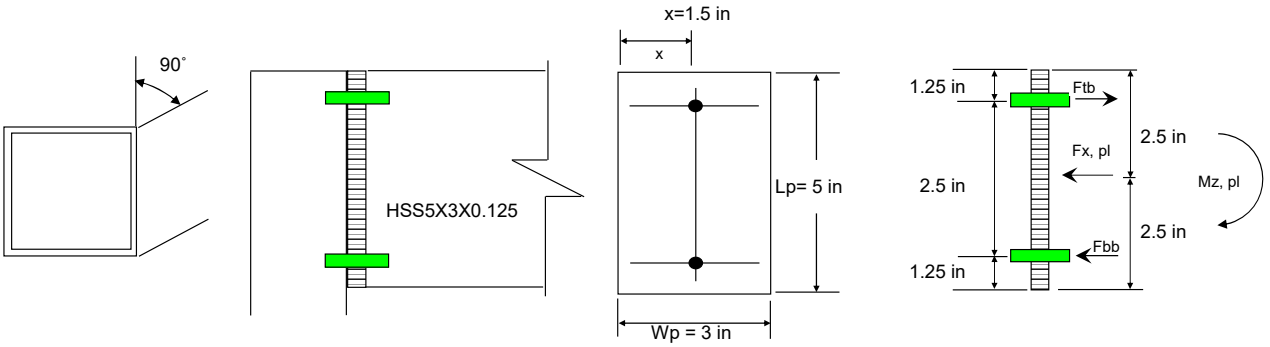
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				**Allowable**	**Actual**	**Load Combination / Member**	
1	Shear	AISC (J3-1)	R_N/Ω	8.3 kip	0.4 kip	15 / Ridge1	**OK**
2	Tension	AISC (J3-1)	R_N/Ω	13.8 kip	6.5 kip	21 / Ridge1	**OK**
3	Bearing	AISC (J3-6b)	R_N/Ω	19.7 kip	0.4 kip	15 / Ridge1	**OK**

End Plate Check: 0.5" Thick				**Allowable**	**Actual**	**Load Combination / Member**	
4	Shear Yielding	AISC (J4-3)	R_N/Ω	36.0 kip	0.7 kip	15 / Ridge1	**OK**
5	Shear Rupture	AISC (J4-4)	R_N/Ω	31.5 kip	0.7 kip	15 / Ridge1	**OK**
6	Weld Check *w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	1.0 kip/in	21 / Ridge1	**OK**
7	Plate Thickness (t_P)		$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.41 in	0.50 in	15 / Ridge1	**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	15	Ridge1	1.3	0.7	0.0	0.0	0.0	22.0
2	21	Ridge1	1.3	0.7	-0.1	0.0	2.3	21.3
3	15	Ridge1	1.3	0.7	0.0	0.0	0.0	22.0
4	15	Ridge1	1.3	0.7	0.0	0.0	0.0	22.0
5	15	Ridge1	1.3	0.7	0.0	0.0	0.0	22.0
6	21	Ridge1	1.3	0.7	-0.1	0.0	2.3	21.3
7	15	Ridge1	1.3	0.7	0.0	0.0	0.0	22.0



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):	0.500
End Plate Weld Size (in):	0.125	Flange Plate Thickness (in):	NONE

PURLIN CONNECTION

TWO-SIDED

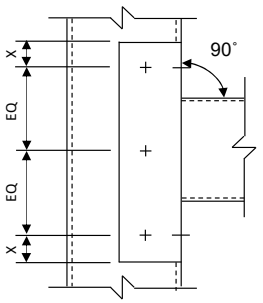
Top Flange Checks: (3) 12-24 Screws				**Allowable**	**Actual**	**Load Combination / Member**	
1	Shear (3 of the screws)			2420 lb	803 lb	21 / Purlin1	**OK**
2	Tension (none of the screws)			0 lb	0 lb	n/a	**OK**
3	Shear Yielding (plate)	AISC (J4-3)	R_N/Ω	15494 lb	803 lb	21 / Purlin1	**OK**
4	Shear Rupture (plate)	AISC (J4-4)	R_N/Ω	16967 lb	803 lb	21 / Purlin1	**OK**

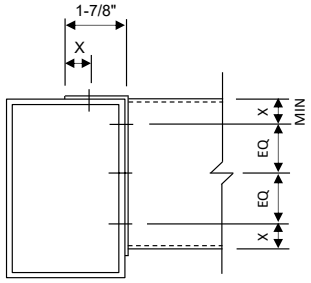
Side Flange Checks: (4) 12-24 Screws				**Allowable**	**Actual**	**Load Combination / Member**	
5	Shear (4 of the screws)			3227 lb	1078 lb	21 / Purlin1	**OK**
6	Tension (none of the screws)			0 lb	0 lb	n/a	**OK**
7	Shear Yielding (plate)	AISC (J4-3)	R_N/Ω	23242 lb	1078 lb	21 / Purlin1	**OK**
8	Shear Rupture (plate)	AISC (J4-4)	R_N/Ω	23403 lb	1078 lb	21 / Purlin1	**OK**

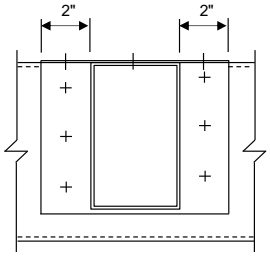
Weld Check: 0.125" Fillet Weld				**Allowable**	**Actual**	**Load Combination / Member**	
9	Weld Check	AISC (J2-3)	R_N/Ω	1.94 kip/in	0.09 kip/in	21 / Purlin1	**OK**

Design Forces / Moments

Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	21	Purlin1	-0.8	0.9	0.2	0.0	0.0	0.0
2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	21	Purlin1	-0.8	0.9	0.2	0.0	0.0	0.0
4	21	Purlin1	-0.8	0.9	0.2	0.0	0.0	0.0
5	21	Purlin1	-0.8	0.9	0.2	0.0	0.0	0.0
6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
7	21	Purlin1	-0.8	0.9	0.2	0.0	0.0	0.0
8	21	Purlin1	-0.8	0.9	0.2	0.0	0.0	0.0
9	21	Purlin1	-0.8	0.9	0.2	0.0	0.0	0.0







x = 3/4"

** Purlin on opposite side of truss not shown for clarity*

** Screw quantity in sketches above may not reflect actual requirements*

Plan View | Connection Elevation | End Plate Elevation

Member Height (in):	6	Sheet Metal Thickness:	10 gage *0.1345 in*
Member Width (in):	4	Screw Size:	12-24 *# 1P2905*
Member Thickness (in):	0.125	Screw Quantity (Top):	3
End Plate Weld Size (in):	1/8	Screw Quantity (Side):	4 *total*

PURLIN CONNECTION - TWO-SIDED **OK**

TAIL CONNECTION

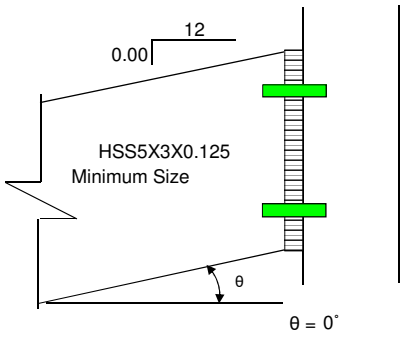
2 BOLTS

Bolt Check: (2) 0.625" Diameter, A325 Bolts				**Allowable**	**Actual**	**Load Combination / Member**	
1	Shear	AISC (J3-1)	R_N/Ω	8.3 kip	0.2 kip	21 / Eavetail3	**OK**
2	Tension	AISC (J3-1)	R_N/Ω	13.8 kip	0.8 kip	21 / Eavetail1	**OK**
3	Bearing	AISC (J3-6b)	R_N/Ω	14.8 kip	0.2 kip	21 / Eavetail3	**OK**

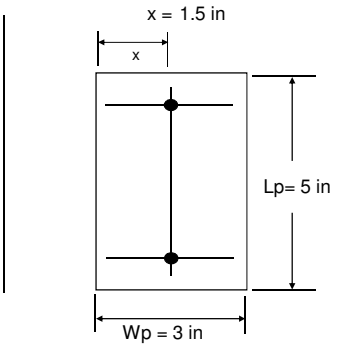
End Plate Check: 0.375" Thick				**Allowable**	**Actual**	**Load Combination / Member**	
4	Shear Yielding	AISC (J4-3)	R_N/Ω	27.0 kip	0.2 kip	21 / Eavetail1	**OK**
5	Shear Rupture	AISC (J4-4)	R_N/Ω	23.7 kip	0.2 kip	21 / Eavetail1	**OK**
6	Weld Check *w = 0.125"*	AISC (J2-3)	R_N/Ω	1.9 kip/in	0.1 kip/in	21 / Eavetail1	**OK**
7	Plate Thickness (t_P)		$\sqrt{\frac{4M_{PL}}{22W_P}}$	0.14 in	0.38 in	21 / Eavetail1	**OK**

Design Forces / Moments

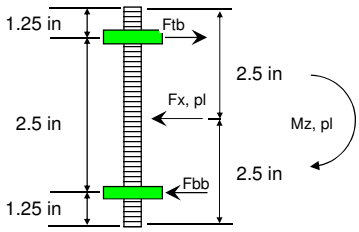
Check	Load Combination	Member	Fx (Axial) [k]	Fy [k]	Fz [k]	Mx [k-in]	My [k-in]	Mz [k-in]
1	21	Eavetail3	0.0	-0.2	0.0	0.0	-0.3	2.5
2	21	Eavetail1	0.0	-0.2	0.0	0.0	0.3	2.5
3	21	Eavetail3	0.0	-0.2	0.0	0.0	-0.3	2.5
4	21	Eavetail1	0.0	-0.2	0.0	0.0	0.3	2.5
5	21	Eavetail1	0.0	-0.2	0.0	0.0	0.3	2.5
6	21	Eavetail1	0.0	-0.2	0.0	0.0	0.3	2.5
7	21	Eavetail1	0.0	-0.2	0.0	0.0	0.3	2.5



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

WELDED CONNECTION IS PERMITTED

TAIL CONNECTION - 2 BOLTS **OK**

RISA ANALYSIS REPORT

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distribut...	Area(Memb...	Surface(Plate/...
1	FRAMEWEIGHT	DL		-1						
2	DL	DL							2	
3	LL	LL							2	
4	SL	SL							2	
5	SLU	SL							1	
6	X WINDWARD LOW	WL							3	
7	X LEEWARD LOW	WL							3	
8	X SIDEWARD LOW	WL								
9	X WINDWARD UPP...	WL								
10	X LEEWARD UPPER	WL								
11	X SIDEWARD UPPER	WL								
12	X10MINWIND	WL							1	
13	Z WINDWARD LOW	WL							2	
14	Z LEEWARD LOW	WL								
15	Z SIDEWARD LOW	WL							6	
16	Z WINDWARD UPP...	WL								
17	Z LEEWARD UPPER	WL								
18	Z SIDEWARD UPPER	WL								
19	Z10MINWIND	WL							2	
20	EX FRAME	EL	-1							
21	EX ROOF	EL							2	
22	EZ FRAME	EL			-1					
23	EZ ROOF	EL							2	
24	BLC 2 Transient Are...	None						15		
25	BLC 3 Transient Are...	None						15		
26	BLC 4 Transient Are...	None						15		
27	BLC 5 Transient Are...	None						9		
28	BLC 6 Transient Are...	None						18		
29	BLC 7 Transient Are...	None						18		
30	BLC 12 Transient Ar...	None						9		
31	BLC 13 Transient Ar...	None						8		
32	BLC 15 Transient Ar...	None						30		
33	BLC 19 Transient Ar...	None						8		
34	BLC 21 Transient Ar...	None						15		
35	BLC 23 Transient Ar...	None						15		

Load Combinations

	Description	S...	PDe...	S...	BLC	Factor	BLC	Factor	B...	Factor	B...	Fa...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...
1	SERVICE D				1	1	2	2																		
2	SERVICE Lr				3	20																				
3	SERVICE S				4	20																				
4	SERVICE Su				5	20																				
5	SERVICE Wx (Load Case A)				6	13.723	7	-2.133	8	-9.98	9		10		11											
6	SERVICE Wx (Load Case B)				6	.105	7	-12.009	8	9.98	9		10		11											
7	SERVICE Wz (Load Case A)				13	13.723	14	-2.133	15	-9.98	16		17		18											
8	SERVICE Wz (Load Case B)				13	.105	14	-12.009	15	9.98	16		17		18											
9	SERVICE Ex				20	.167	21	.333																		
10	SERVICE Ez				22	.167	23	.333																		
11																										
12																										
13																										
14	D	Y...	Y		L1	1																				
15	D + Lr	Y...	Y		L1	1	L2	1																		
16	D + S	Y...	Y		L1	1	L3	1																		

RISA A NEMETSCHEK COMPANY
Company : RISA Technologies
Designer :
Job Number :
Model Name :
Dec 3, 2020
5:37 AM
Checked By:_____

Load Combinations (Continued)

	Description	S...	PDe...	S...	BLC	Factor	BLC	Factor	B...	Factor	B...	Fa...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...
17	D + Su	Y...	Y		L1	1	L4	1																		
18	D + 0.6Wx (Load Case A)	Y...	Y		L1	1	L5	1																		
19	D + 0.6Wx (Load Case B)	Y...	Y		L1	1	L6	1																		
20	D + (0.6Wx (Minimum))	Y...	Y		L1	1	12	9.6																		
21	D + 0.75(0.6Wx (Load Cas...	Y...	Y		L1	1	L5	.75	L2	.75																
22	D + 0.75(0.6Wx (Minimum))...	Y...	Y		L1	1	12	7.2	L2	.75																
23	D + 0.75(0.6Wx (Load Cas...	Y...	Y		L1	1	L5	.75	L3	.75																
24	D + 0.75(0.6Wx (Minimum))...	Y...	Y		L1	1	12	7.2	L3	.75																
25	0.6D + 0.6Wx (Load Case A)	Y...	Y		L1	.6	L5	1																		
26	0.6D + 0.6Wx (Load Case B)	Y...	Y		L1	.6	L6	1																		
27	0.6D + (0.6Wx (Minimum))	Y...	Y		L1	.6	12	9.6																		
28	D + 0.6Wz (Load Case A)	Y...	Y		L1	1	L7	1																		
29	D + 0.6Wz (Load Case B)	Y...	Y		L1	1	L8	1																		
30	D + (0.6Wz (Minimum))	Y...	Y		L1	1	19	9.6																		
31	D + 0.75(0.6Wz (Load Cas...	Y...	Y		L1	1	L7	.75	L2	.75																
32	D + 0.75(0.6Wz (Minimum))...	Y...	Y		L1	1	19	7.2	L2	.75																
33	D + 0.75(0.6Wz (Load Cas...	Y...	Y		L1	1	L7	.75	L3	.75																
34	D + 0.75(0.6Wz (Minimum))...	Y...	Y		L1	1	19	7.2	L3	.75																
35	0.6D + 0.6Wz (Load Case A)	Y...	Y		L1	.6	L7	1																		
36	0.6D + 0.6Wz (Load Case B)	Y...	Y		L1	.6	L8	1																		
37	0.6D + (0.6Wz (Minimum))	Y...	Y		L1	.6	19	9.6																		
38	(1.0+0.14*Sds)D+ 0.7Ex	Y...	Y		L1	1.07	L9	.7																		
39	(1.0+0.105*Sds)D + 0.525E...	Y...	Y		L1	1.052	L9	.525	L3	.75																
40	(0.6-0.14*Sds)D + 0.7Ex	Y...	Y		L1	.53	L9	.7																		
41	(1.0+0.14*Sds)D + 0.7Ez	Y...	Y		L1	1.07	L10	.7																		
42	(1.0+0.105*Sds)D + 0.525E...	Y...	Y		L1	1.052	L10	.525	L3	.75																
43	(0.6-0.14*Sds)D + 0.7Ez	Y...	Y		L1	.53	L10	.7																		
44																										
45																										
46																										
47																										
48																										
49																										
50																										
51																										
52																										
53																										
54	1.4D				L1	1.4																				
55	1.2D + 0.5Lr				L1	1.2	L2	.5																		
56	1.2D + 0.5S				L1	1.2	L3	.5																		
57	1.2D + 0.5Su				L1	1.2	L4	.5																		
58	1.2D + 1.6Lr + 0.5Wx (Load...				L1	1.2	L2	1.6	L5	.833																
59	1.2D + 1.6Lr + 0.5Wx (Mini...				L1	1.2	L2	1.6	12	8																
60	1.2D + 1.6S + 0.5Wx (Load...				L1	1.2	L3	1.6	L5	.833																
61	1.2D + 1.6S + 0.5Wx (Mini...				L1	1.2	L3	1.6	12	8																
62	1.2D + 1.0Wx (Load Case ...				L1	1.2	L5	1.667	L2	.5																
63	1.2D + 1.0Wx (Load Case ...				L1	1.2	L6	1.667	L2	.5																
64	1.2D + 1.0Wx (Minimum) + ...				L1	1.2	12	16	L2	.5																
65	1.2D + 1.0Wx (Load Case ...				L1	1.2	L5	1.667	L3	.5																
66	1.2D + 1.0Wx (Load Case ...				L1	1.2	L6	1.667	L3	.5																
67	1.2D + 1.0Wx (Minimum) + ...				L1	1.2	12	16	L3	.5																
68	0.9D + 1.0Wx (Load Case A)				L1	.9	L5	1.667																		
69	0.9D + 1.0Wx (Load Case B)				L1	.9	L6	1.667																		
70	0.9D + 1.0Wx (Minimum)				L1	.9	12	16																		
71	1.2D + 1.6Lr + 0.5Wz (Load...				L1	1.2	L2	1.6	L7	.833																
72	1.2D + 1.6Lr + 0.5Wz (Mini...				L1	1.2	L2	1.6	19	8																
73	1.2D + 1.6S + 0.5Wz (Load...				L1	1.2	L3	1.6	L7	.833																

Load Combinations (Continued)

	Description	S..	PDe..	S...	BLC	Factor	BLC	Factor	B...	Factor	B...	Fa..	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...
74	1.2D + 1.6S + 0.5Wz (Mini...				L1	1.2	L3	1.6	19	8																
75	1.2D + 1.0Wz (Load Case ...				L1	1.2	L7	1.667	L2	.5																
76	1.2D + 1.0Wz (Load Case ...				L1	1.2	L8	1.667	L2	.5																
77	1.2D + 1.0Wz (Minimum) + ...				L1	1.2	19	16	L2	.5																
78	1.2D + 1.0Wz (Load Case ...				L1	1.2	L7	1.667	L3	.5																
79	1.2D + 1.0Wz (Load Case ...				L1	1.2	L8	1.667	L3	.5																
80	1.2D + 1.0Wz (Minimum) + ...				L1	1.2	19	16	L3	.5																
81	0.9D + 1.0Wz (Load Case A)				L1	.9	L7	1.667																		
82	0.9D + 1.0Wz (Load Case B)				L1	.9	L8	1.667																		
83	0.9D + 1.0Wz (Minimum)				L1	.9	19	16																		
84	(1.2+0.2*Sds)D + 1.0Ex + 0...				L1	1.3	L9	1	L3	.2																
85	(0.9-0.2*Sds)D + 1.0Ex				L1	.8	L9	1																		
86	(1.2+0.2*Sds)D + 1.0Ez + 0...				L1	1.3	L10	1	L3	.2																
87	(0.9-0.2*Sds)D + 1.0Ez				L1	.8	L10	1																		
88																										
89																										
90																										
91																										
92																										
93																										
94																										
95																										
96																										
97																										
98																										
99																										
100																										
101																										
102																										
103																										
104	SERVICE Emx				20	.5	21	1																		
105	SERVICE Emz				22	.5	23	1																		
106																										
107	(1.0+0.14*Sds)D + 0.7Emx				L1	1.07	L1...	.7																		
108	(1.0+0.105*Sds)D + 0.525E...				L1	1.052	L1...	.525	L3	.75																
109	(0.6-0.14*Sds)D + 0.7Emx				L1	.53	L1...	.7																		
110	(1.0+0.14*Sds)D + 0.7Emz				L1	1.07	L1...	.7																		
111	(1.0+0.105*Sds)D + 0.525E...				L1	1.052	L1...	.525	L3	.75																
112	(0.6-0.14*Sds)D + 0.7Emz				L1	.53	L1...	.7																		
113																										
114																										
115																										
116	(1.2+0.2*Sds)D + 1.0Emx +...				L1	1.3	L1...	1	L3	.2																
117	(0.9-0.2*Sds)D + 1.0Emx				L1	.8	L1...	1																		
118	(1.2+0.2*Sds)D + 1.0Emz +...				L1	1.3	L1...	1	L3	.2																
119	(0.9-0.2*Sds)D + 1.0Emz				L1	.8	L1...	1																		
120																										
121																										
122																										
123																										
124																										
125																										
126																										
127																										
128																										
129																										
130																										

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

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Load Combinations (Continued)

	Description	S..	PDe..	S...	BLC	Factor	BLC	Factor	B...	Factor	B...	Fa..	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...
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	N4	Reaction	Reaction	Reaction			
3	N6	Reaction	Reaction	Reaction			
4	N9	Reaction	Reaction	Reaction			

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Column	HSS5X5X3	Column	TUBE	A500 Gr.46	Typical	3.28	12.6	12.6	19.9
2	Truss	HSS6X4X2	Beam	TUBE	A500 Gr.46	Typical	2.23	6.15	11.4	12.6
3	Eave	HSS5X3X2	Beam	TUBE	A500 Gr.46	Typical	1.77	2.75	6.03	6.02
4	Ridge	HSS5X3X2	Beam	TUBE	A500 Gr.46	Typical	1.77	2.75	6.03	6.02
5	Purlin	HSS6X4X2	Beam	TUBE	A500 Gr.46	Typical	2.23	6.15	11.4	12.6
6	Purlin Tail	HSS6X4X2	Beam	TUBE	A500 Gr.46	Typical	2.23	6.15	11.4	12.6
7	Eave Tail	HSS5X3X2	Beam	TUBE	A500 Gr.46	Typical	1.77	2.75	6.03	6.02
8	Ridge Tail	HSS5X3X2	Beam	TUBE	A500 Gr.46	Typical	1.77	2.75	6.03	6.02

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	Column1	N1	N2		180	Column	Column	TUBE	A500 Gr.46	Typical
2	Column2	N4	N5			Column	Column	TUBE	A500 Gr.46	Typical
3	Column3	N6	N7		180	Column	Column	TUBE	A500 Gr.46	Typical
4	Column4	N9	N10			Column	Column	TUBE	A500 Gr.46	Typical
5	Truss1	N2	N3			Truss	Beam	TUBE	A500 Gr.46	Typical
6	Truss2	N5	N3			Truss	Beam	TUBE	A500 Gr.46	Typical
7	Truss3	N7	N8			Truss	Beam	TUBE	A500 Gr.46	Typical
8	Truss4	N10	N8			Truss	Beam	TUBE	A500 Gr.46	Typical
9	Eave1	N2	N7			Eave	Beam	TUBE	A500 Gr.46	Typical
10	Eave2	N5	N10			Eave	Beam	TUBE	A500 Gr.46	Typical
11	Ridge1	N3	N8			Ridge	Beam	TUBE	A500 Gr.46	Typical
12	Eavetail1	NT11	N2			Eave Tail	Beam	TUBE	A500 Gr.46	Typical
13	Eavetail2	NT12	N5			Eave Tail	Beam	TUBE	A500 Gr.46	Typical
14	Eavetail3	NT13	N7			Eave Tail	Beam	TUBE	A500 Gr.46	Typical
15	Eavetail4	NT14	N10			Eave Tail	Beam	TUBE	A500 Gr.46	Typical
16	Ridgetail1	NT15	N3			Ridge Tail	Beam	TUBE	A500 Gr.46	Typical
17	Ridgetail2	NT16	N8			Ridge Tail	Beam	TUBE	A500 Gr.46	Typical
18	Purlin1	NP101	NP103		341.57	Purlin	Beam	TUBE	A500 Gr.46	Typical
19	Purlintail11	NPT101	NP101		341.57	Purlin Tail	Beam	TUBE	A500 Gr.46	Typical
20	Purlintail12	NPT103	NP103		18.43	Purlin Tail	Beam	TUBE	A500 Gr.46	Typical
21	Purlin2	NP102	NP104		18.43	Purlin	Beam	TUBE	A500 Gr.46	Typical
22	Purlintail21	NPT102	NP102		18.43	Purlin Tail	Beam	TUBE	A500 Gr.46	Typical
23	Purlintail22	NPT104	NP104		341.57	Purlin Tail	Beam	TUBE	A500 Gr.46	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	Column1						Yes	** NA **			None
2	Column2						Yes	** NA **			None
3	Column3						Yes	** NA **			None
4	Column4						Yes	** NA **			None
5	Truss1						Yes				None
6	Truss2						Yes				None
7	Truss3						Yes				None
8	Truss4						Yes				None
9	Eave1						Yes				None
10	Eave2						Yes				None
11	Ridge1						Yes				None
12	Eavetail1						Yes				None
13	Eavetail2						Yes				None
14	Eavetail3						Yes				None
15	Eavetail4						Yes				None
16	Ridgetail1						Yes				None
17	Ridgetail2						Yes				None
18	Purlin1	AllPIN	BenPIN				Yes				None
19	Purlintail11						Yes				None
20	Purlintail12						Yes				None
21	Purlin2	AllPIN	BenPIN				Yes				None
22	Purlintail21						Yes				None
23	Purlintail22						Yes				None

Hot Rolled Steel Design Parameters

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[ft]	L-torque...	Kyy	Kzz	Cb	Function
1	Column1	Column	10.5						2	2		Lateral
2	Column2	Column	10.5						2	2		Lateral
3	Column3	Column	10.5						2	2		Lateral
4	Column4	Column	10.5						2	2		Lateral
5	Truss1	Truss	6.325	Segment					.65	.65		Lateral
6	Truss2	Truss	6.325	Segment					.65	.65		Lateral
7	Truss3	Truss	6.325	Segment					.65	.65		Lateral
8	Truss4	Truss	6.325	Segment					.65	.65		Lateral
9	Eave1	Eave	20						.65	.65		Lateral
10	Eave2	Eave	20						.65	.65		Lateral
11	Ridge1	Ridge	20						.65	.65		Lateral
12	Eavetail1	Eave Tail	2						2.1	2.1		Lateral
13	Eavetail2	Eave Tail	2						2.1	2.1		Lateral
14	Eavetail3	Eave Tail	2						2.1	2.1		Lateral
15	Eavetail4	Eave Tail	2						2.1	2.1		Lateral
16	Ridgetail1	Ridge Tail	2						2.1	2.1		Lateral
17	Ridgetail2	Ridge Tail	2						2.1	2.1		Lateral
18	Purlin1	Purlin	20						1	1		Lateral
19	Purlintail11	Purlin Tail	2						2.1	2.1		Lateral
20	Purlintail12	Purlin Tail	2						2.1	2.1		Lateral
21	Purlin2	Purlin	20						1	1		Lateral
22	Purlintail21	Purlin Tail	2						2.1	2.1		Lateral
23	Purlintail22	Purlin Tail	2						2.1	2.1		Lateral

Company : RISA Technologies
Designer :
Job Number :
Model Name :
Dec 3, 2020
5:37 AM
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Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E...	Density[lb/f...	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 14th(360-10): ASD Steel Code Checks

	Member	Shape	Code Check	Loc...	LC	Shea...	Lo...	Dir	LC	Pnc/o...	Pnt/o...	Mnyy/...	Mnzz/...	Cb	Eqn
1	Column1	HSS5...	.383	10.5	16	.010	0	z	23	29.823	90.347	162.24	162.24	1.6...	H1-1b
2	Column2	HSS5...	.506	10.5	23	.016	0	y	23	29.823	90.347	162.24	162.24	1.6...	H1-1b
3	Column3	HSS5...	.383	10.5	16	.010	0	z	23	29.823	90.347	162.24	162.24	1.6...	H1-1b
4	Column4	HSS5...	.506	10.5	23	.016	0	y	23	29.823	90.347	162.24	162.24	1.6...	H1-1b
5	Truss1	HSS6...	.580	6.3...	16	.087	3....	z	16	52.543	61.425	73.197	115.6...	1.6...	H1-1b
6	Truss2	HSS6...	.581	6.3...	23	.108	0	y	23	52.543	61.425	73.197	115.6...	2.5...	H1-1b
7	Truss3	HSS6...	.580	6.3...	16	.087	3....	z	16	52.543	61.425	73.197	115.6...	1.6...	H1-1b
8	Truss4	HSS6...	.581	6.3...	23	.108	0	y	23	52.543	61.425	73.197	115.6...	2.5...	H1-1b
9	Eave1	HSS5...	.530	0	23	.057	0	y	23	16.985	48.754	47.569	80.707	1.7...	H1-1b
10	Eave2	HSS5...	.384	0	42	.047	20	y	16	16.985	48.754	47.569	80.707	1.9...	H1-1b
11	Ridge1	HSS5...	.350	20	23	.041	20	y	16	16.985	48.754	47.569	80.707	1.3...	H1-1b
12	Eavetail1	HSS5...	.037	2	23	.011	2	y	23	41.676	48.754	47.569	80.707	2.3...	H1-1b
13	Eavetail2	HSS5...	.025	2	16	.009	2	y	16	41.676	48.754	47.569	80.707	2.3...	H1-1b
14	Eavetail3	HSS5...	.037	2	23	.011	2	y	23	41.676	48.754	47.569	80.707	2.3...	H1-1b
15	Eavetail4	HSS5...	.025	2	16	.009	2	y	16	41.676	48.754	47.569	80.707	2.3...	H1-1b
16	Ridgetail1	HSS5...	.024	2	23	.008	2	y	16	41.676	48.754	47.569	80.707	2.3...	H1-1b
17	Ridgetail2	HSS5...	.024	2	23	.008	2	y	16	41.676	48.754	47.569	80.707	2.3...	H1-1b
18	Purlin1	HSS6...	.622	9.8...	23	.041	20	y	23	16.048	61.425	73.197	115.6...	1.14	H1-1b
19	Purlintail11	HSS6...	.025	2	23	.008	2	y	23	51.177	61.425	73.197	115.6...	2.3...	H1-1b
20	Purlintail12	HSS6...	.025	2	23	.008	2	y	23	51.177	61.425	73.197	115.6...	2.3...	H1-1b
21	Purlin2	HSS6...	.566	9.8...	16	.033	20	y	16	16.048	61.425	73.197	115.6...	1.14	H1-1b
22	Purlintail21	HSS6...	.022	2	16	.007	2	y	16	51.177	61.425	73.197	115.6...	2.3...	H1-1b
23	Purlintail22	HSS6...	.022	2	16	.007	2	y	16	51.177	61.425	73.197	115.6...	2.3...	H1-1b

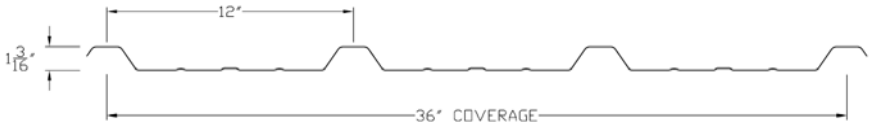
Material Takeoff

	Material	Size	Pieces	Length[ft]	Weight[LB]
1	Hot Rolled Steel				
2	A500 Gr.46	HSS5X3X2	9	72	466.395
3	A500 Gr.46	HSS5X5X3	4	42	504.163
4	A500 Gr.46	HSS6X4X2	10	73.3	598.2
5	Total HR Steel		23	187.3	1568.758

PANEL DATA

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	0.7727	235.0	320.8	0.050	0.055	1.375	0.029	0.046	1.148

1. Section properties are calculated in accordance with the 2016 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	407	229	146	101	74	57	45	36	30	25	21	18	16	14	12	11
	Negative Wind	340	191	122	85	62	47	37	30	25	21	18	15	13	11	10	9
	Live	407	229	146	101	74	57	45	36	30	25	21	18	16	14	12	11
	Deflection (L/180)	500	500	279	161	101	68	47	34	26	20	15	12	10	8	7	5
	Deflection (L/240)	500	409	209	121	76	51	35	26	19	15	11	9	7	6	5	4
2 Span	Positive Wind	314	182	118	83	61	47	37	30	25	21	18	15	13	11	10	9
	Negative Wind	365	214	140	98	73	56	44	36	30	25	21	18	16	14	12	11
	Live	314	182	118	83	61	47	37	30	25	21	18	15	13	11	10	9
	Deflection (L/180)	500	500	500	309	194	130	91	66	50	38	30	24	19	16	13	11
	Deflection (L/240)	500	500	400	231	146	97	68	50	37	28	22	18	14	12	10	8
3 Span	Positive Wind	380	224	146	103	76	58	46	37	31	26	22	19	16	14	13	11
	Negative Wind	438	261	172	122	90	69	55	45	37	31	26	23	20	17	15	14
	Live	380	224	146	103	76	58	46	37	31	26	22	19	16	14	13	11
	Deflection (L/180)	500	500	418	242	152	102	71	52	39	30	23	19	15	12	10	8
	Deflection (L/240)	500	500	314	181	114	76	53	39	29	22	17	14	11	9	7	6
4 Span	Positive Wind	359	210	137	96	71	54	43	35	29	24	21	18	15	13	12	10
	Negative Wind	414	246	162	114	84	65	51	42	34	29	25	21	18	16	14	13
	Live	359	210	137	96	71	54	43	35	29	24	21	18	15	13	12	10
	Deflection (L/180)	500	500	444	257	161	108	76	55	41	32	25	20	16	13	11	9
	Deflection (L/240)	500	500	333	192	121	81	57	41	31	24	18	15	12	10	8	7

Notes:
1. Allowable uniform loads are based upon equal span lengths.
2. Live is the allowable live or snow load.
3. Deflection (L/180) is the allowable load that limits the panel's deflection to L/180 while under positive or live load.
4. Deflection (L/240) is the allowable load that limits the panel's deflection to L/240 while under positive or live load.
5. The weight of the panel has **NOT** been deducted from the allowable loads.
6. Positive Wind, Negative Wind, and Live Load values are limited to combined shear & bending using Eq. H2-1 of the AISI Specification.
7. Positive Wind and Live Load values are limited by web crippling using a bearing length of 2".
8. Web crippling values are determined using a ratio of the uniform load **actually** supported by the top flanges of the section.
9. Load Tables are limited to a maximum allowable load of 500 psf.