STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

January 6, 2022

Ersilia Davis
Network Building + Consulting
1777 Sentry Parkway W | VEVA 7, Suite 400
Blue Bella, PA 19422
edavis@nbcllc.com

RE: **EM-T-MOBILE-083-211207** – T-Mobile notice of intent to modify an existing telecommunications facility located at 90 Industrial Park Road, Middletown, Connecticut.

Dear Ms. Davis:

The Connecticut Siting Council (Council) is in receipt of your correspondence of January 5, 2022 submitted in response to the Council's January 5, 2021 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/emr

Date: **October 11, 2021**

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6589

Trylon
1825 W. Walnut Hill Lane,
Suite 302
Irving, TX 75038
214-930-1730

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Anchor**	
	Carrier Site Number:	CT11057C
	Carrier Site Name:	Middletown_1
Crown Castle Designation:	**Crown Castle BU Number:**	825983
	Crown Castle Site Name:	Middletown_1
	Crown Castle JDE Job Number:	586786
	Crown Castle Order Number:	586786 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	193322
Site Data:	**90 Industrial Park Road, Middletown, Middlesex County, CT, 06457** **Latitude 41°35'8.30" Longitude -72°42'50.49"**	
Structure Information:	**Tower Height & Type:**	**185.0 ft Monopole**
	Mount Elevation:	**183.0 ft**
	Mount Type:	**12.5 ft Platform**

Dear Darcy Tarr,

Trylon is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Platform **Sufficient**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Aura Baltoiu

Respectfully Submitted by:
Cliff Abernathy, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

This is an existing 3 sector 12.5 ft Platform, designed by Site Pro 1.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	130 mph
Exposure Category:	C
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.180
Seismic S_1:	0.063
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
183.0	183.0	3	ERICSSON	AIR6449 B41_T-MOBILE	12.5 ft Platform
		3	RFS/CELWAVE	APXVAARR24_43-U-NA20	
		3	ERICSSON	RADIO 4449 B12/B71	
		3	ERICSSON	RADIO 4460 B2/B25 B66_TMO	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	586786, Rev.0	CCI Sites
Mount Manufacturer Drawings	Site Pro 1	RMQP-496-HK	Trylon

3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed, using Microsoft Excel, by Trylon was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision B).

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Trylon should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Platform, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2,3	Mount Pipe(s)	MP10	183.0	67.3	Pass
	Horizontal(s)	H3		14.9	Pass
	Standoff(s)	M86		18.0	Pass
	Bracing(s)	M5		22.2	Pass
	Handrail(s)	M10		56.4	Pass
	Kicker(s)	M101		22.6	Pass
	Tieback(s)	M39		33.4	Pass
	Mount Connection(s)	-		18.0	Pass

Structure Rating (max from all components) =	67.3%

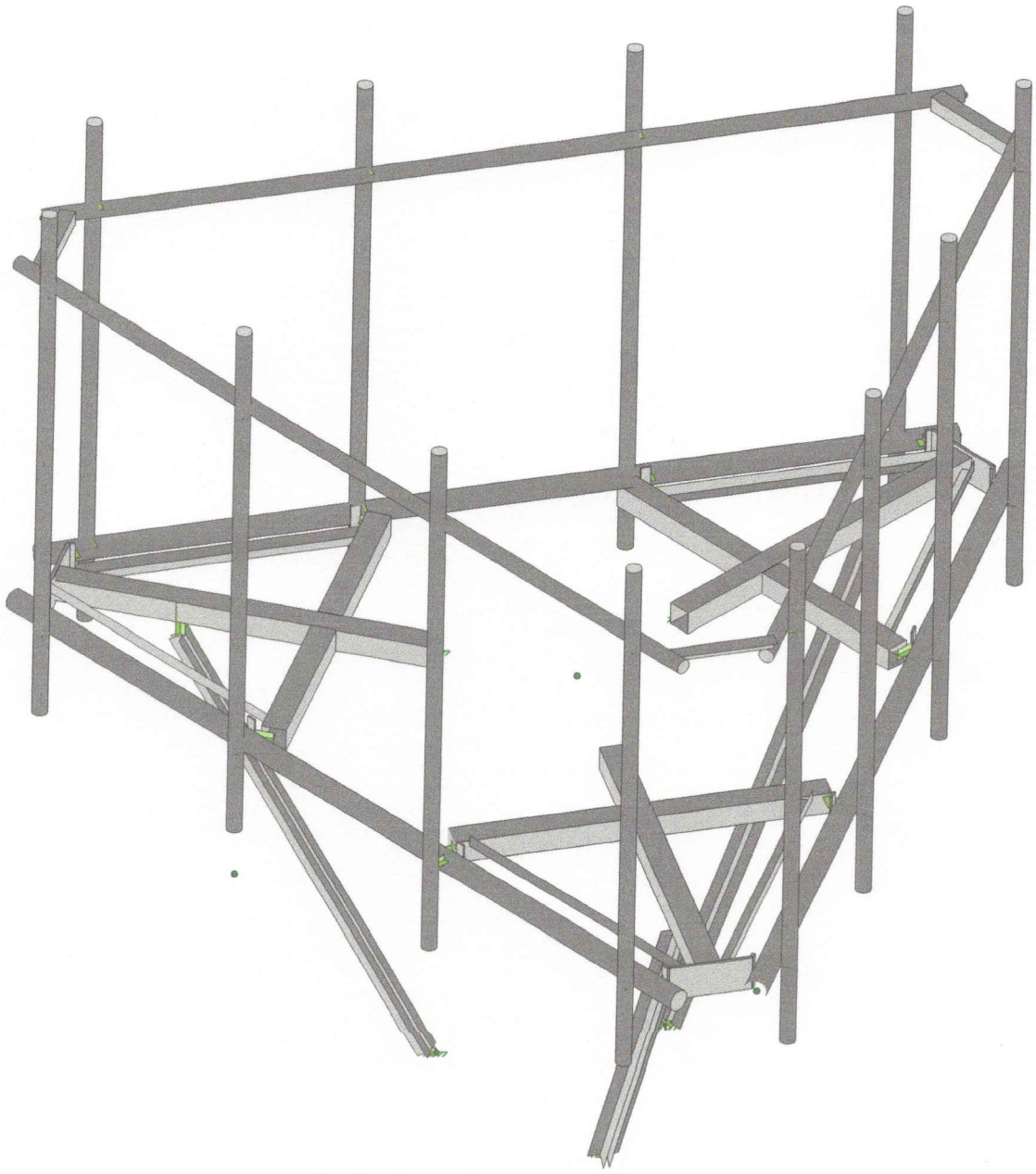
Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical
3) Rating per TIA-222-H, Section 15.5

4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

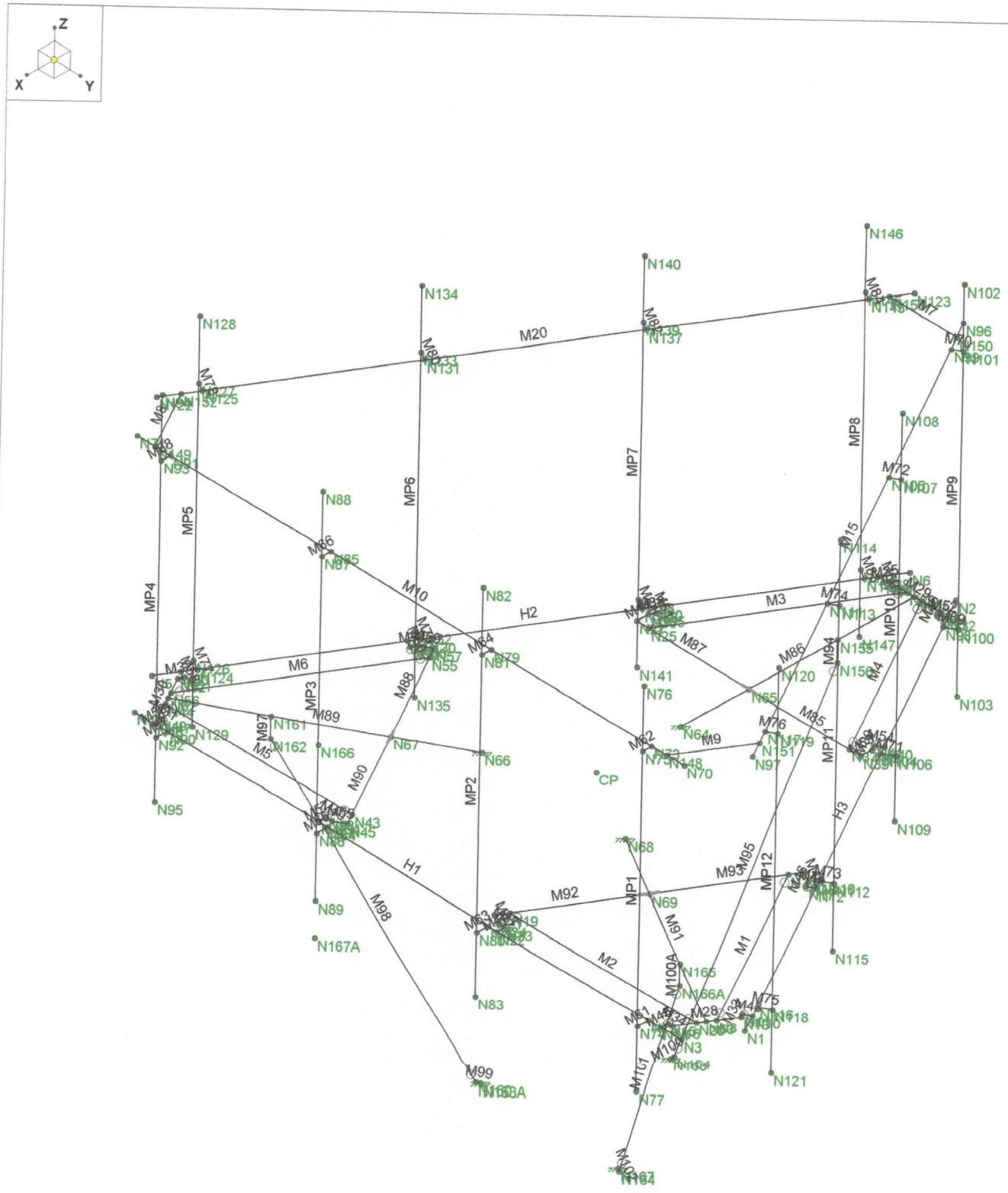
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Trylon	825983	SK - 1
AB		Oct 11, 2021 at 7:39 AM
193322		825983.r3d



Envelope Only Solution

Trylon	825983	SK - 2
AB		Oct 11, 2021 at 7:39 AM
193322		825983.r3d

APPENDIX B

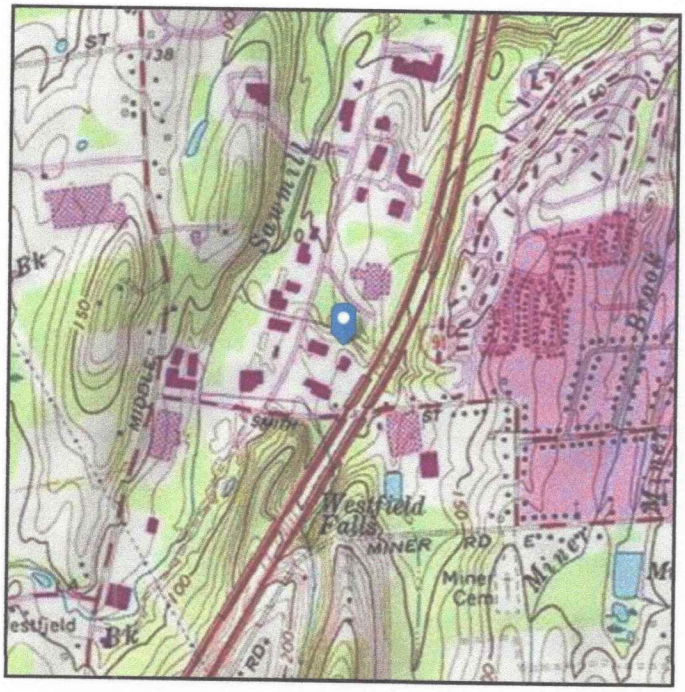
SOFTWARE INPUT CALCULATIONS

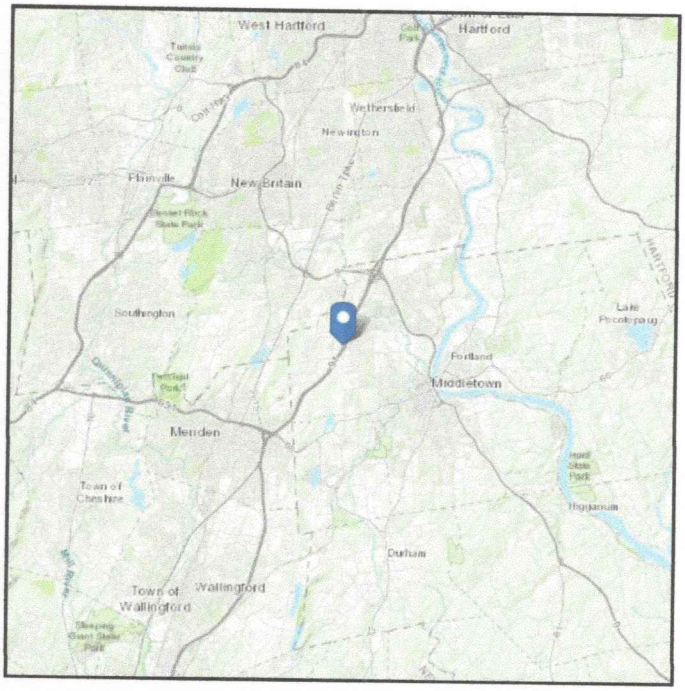
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 89.45 ft (NAVD 88)
Latitude: 41.585639
Longitude: -72.714025





Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Mon Oct 11 2021

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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Trylon
1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

TIA LOAD CALCULATOR 2.1

PROJECT DATA	
Job Code:	193322
Carrier Site ID:	CT11057C
Carrier Site Name:	-

CODES AND STANDARDS	
Building Code:	2015 IBC
Local Building Code:	Connecticut State Building
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	183.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	185.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	89.45	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	130	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.44	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	58.88	psf
Ground Elevation Factor (K_e):	1.00	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.50	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	58.88	psf
Mount Ice Thickness (t_{iz}):	1.78	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	105.99	psf
Round Member Pressure:	63.60	psf
Ice Wind Pressure:	7.77	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.180	g
1 Second Accel (S_1):	0.063	g
Short Period Des. (S_{DS}):	0.19	g
1 Second Des. (S_{D1}):	0.10	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.10	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

EQUIPMENT LOADING

Appurtenance Name	Qty.	Elevation [ft]	--	EPA N (ft2)	EPA T (ft2)	Weight (lbs)
AIR6449 B41_T-MOBILE	3	183	No Ice	5.27	2.03	114.63
--	--	--	w/ Ice	6.63	3.10	158.20
APXVAARR24_43-U-NA20	3	183	No Ice	14.67	5.32	128.00
--	--	--	w/ Ice	17.04	7.41	440.24
RADIO 4460B2/B25 B66_TMO	3	183	No Ice	2.14	1.69	109.00
--	--	--	w/ Ice	2.60	2.10	93.24
RADIO 4449B12/B71	3	183	No Ice	1.64	1.15	75.00
--	--	--	w/ Ice	2.05	1.51	69.61
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
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			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT LOADING [CONT.]

Appurtenance Name	*Qty.*	*Elevation [ft]*	--	*EPA $_N$ (ft2)*	*EPA $_T$ (ft2)*	*Weight (lbs)*
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT WIND CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
AIR6449 B41_T-MOBILE	3	183	1.00	1.44	0.95	1.78	58.88	8.71
APXVAARR24_43-U-NA20	3	183	1.00	1.44	0.95	1.78	58.88	8.71
DIO 4460B2/B25 B66_TM	3	183	1.00	1.44	0.95	1.78	58.88	8.71
RADIO 4449B12/B71	3	183	1.00	1.44	0.95	1.78	58.88	8.71

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
AIR6449 B41_T-MOBILE	3	No Ice	279.29	150.51	236.36	107.58	236.36	150.51
--	--	w/ Ice	52.01	31.23	45.08	24.30	45.08	31.23
APXVAARR24_43-U-NA20	3	No Ice	777.45	405.82	653.57	281.94	653.57	405.82
--	--	w/ Ice	133.57	76.93	114.69	58.06	114.69	76.93
RADIO 4460B2/B25 B66_TMO	3	No Ice	113.37	95.35	107.36	89.34	107.36	95.35
--	--	w/ Ice	20.35	17.45	19.38	16.48	19.38	17.45
RADIO 4449B12/B71	3	No Ice	87.09	67.58	80.58	61.07	80.58	67.58
--	--	w/ Ice	16.06	12.89	15.01	11.83	15.01	12.89
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
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		No Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

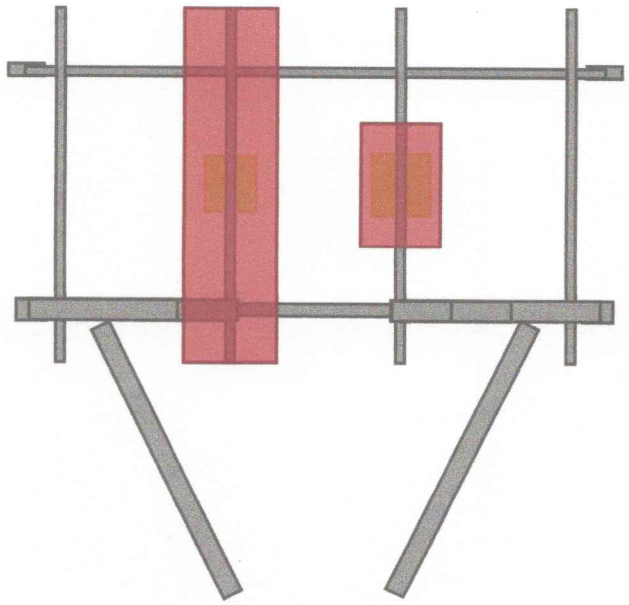
EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

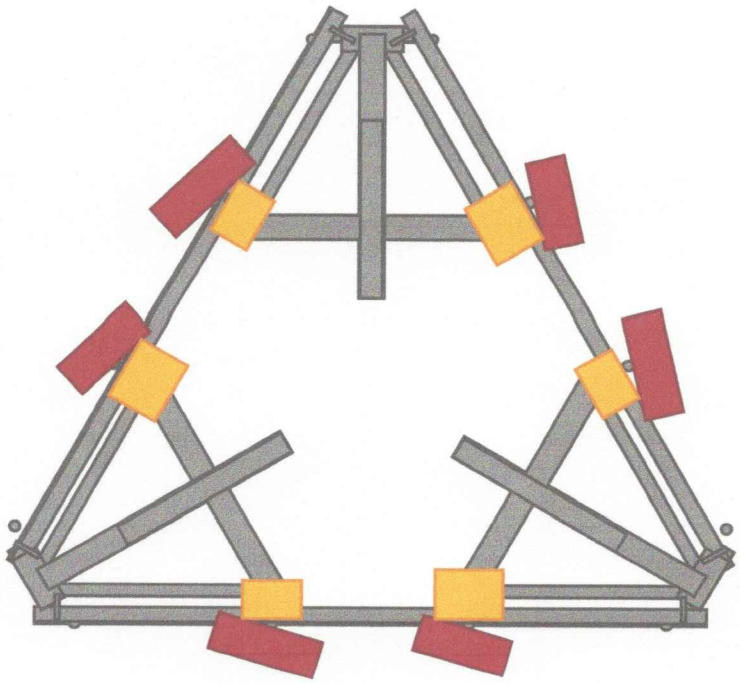
Appurtenance Name	*Qty.*	*Elevation [ft]*	*Weight [lbs]*	F_p [lbs]
AIR6449 B41_T-MOBILE	3	183	114.63	13.21
APXVAARR24_43-U-NA20	3	183	128	14.75
RADIO 4460B2/B25 B66_TMO	3	183	109	12.56
RADIO 4449B12/B71	3	183	75	8.64

ELEVATION VIEW



*Elevation View Shows Alpha Sector Only

PLAN VIEW



1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

Equipment Name	Total Quantity	Antenna Centerline	Mount Pipe Positions	Equipment Azimuths
AIR6449 B41_T-MOBILE	3	183	MP2/MP6/MP10	17/137/257
APXVAARR24_43-U-NA20	3	183	MP3/MP7/MP11	17/137/257
RADIO 4460B2/B25 B66_TMO	3	183	MP2/MP6/MP10	0/120/240
RADIO 4449B12/B71	3	183	MP3/MP7/MP11	0/120/240

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Z
Global Member Orientation Plane	XY
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E..	Density[k/ft..	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3
8	A913 Gr.65	29000	11154	.3	.65	.49	65	1.1	80	1.1

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33	45
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50	65

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	PIPE 2.0	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	HSS4X4X4	HSS4X4X4	Beam	Tube	A53 Gr.B	Typical	3.37	7.8	7.8	12.8
3	L2x2x3	L2x2x3	Beam	Single Angle	A53 Gr.B	Typical	.722	.271	.271	.009
4	L2.5x2.5x4	L2.5x2.5x4	Beam	Single Angle	A53 Gr.B	Typical	1.19	.692	.692	.026
5	Plate 6"x0.5"	Pl 6"x0.5"	Beam	RECT	A53 Gr.B	Typical	3	.063	9	.237
6	Plate 6"x0.375"	PL 6x0.375	Beam	RECT	A53 Gr.B	Typical	2.25	.026	6.75	.101

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
7	PIPE_3.0	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
8	PIPE_2.5	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
9	PRK 1245	LL2.5x2.5x3x0	Beam	Double An...	A53 Gr.B	Typical	1.8	1.91	1.07	.023

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8C U1.25X057	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

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	N64	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N68	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N66	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N154						
5	N155						
6	N156						
7	N163	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
8	N160						
9	N161						
10	N162						
11	N163A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
12	N164						
13	N165						
14	N166A						
15	N167	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL			-1		18		3	
2	Structure Wind X	WLX						102		
3	Structure Wind Y	WLY						102		
4	Wind Load 0 AZI	WLX					36			
5	Wind Load 30 AZI	None					36			
6	Wind Load 45 AZI	None					36			
7	Wind Load 60 AZI	None					36			
8	Wind Load 90 AZI	WLY					36			
9	Wind Load 120 AZI	None					36			
10	Wind Load 135 AZI	None					36			
11	Wind Load 150 AZI	None					36			
12	Ice Weight	OL1					18	102	3	
13	Ice Structure Wind X	OL2						102		
14	Ice Structure Wind Y	OL3						102		
15	Ice Wind Load 0 AZI	OL2					36			
16	Ice Wind Load 30 AZI	None					36			
17	Ice Wind Load 45 AZI	None					36			
18	Ice Wind Load 60 AZI	None					36			
19	Ice Wind Load 90 AZI	OL3					36			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
20	Ice Wind Load 120 AZI	None					36			
21	Ice Wind Load 135 AZI	None					36			
22	Ice Wind Load 150 AZI	None					36			
23	Seismic Load X	ELX	-.115				18			
24	Seismic Load Y	ELY		-.115			18			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Live Load 4 (Lv)	None					1			
29	Live Load 5 (Lv)	None					1			
30	Live Load 6 (Lv)	None					1			
31	Live Load 7 (Lv)	None					1			
32	Live Load 8 (Lv)	None					1			
33	Live Load 9 (Lv)	None					1			
34	Maintenance Load 1 (...	None					1			
35	Maintenance Load 2 (...	None					1			
36	Maintenance Load 3 (...	None					1			
37	Maintenance Load 4 (...	None					1			
38	Maintenance Load 5 (...	None					1			
39	Maintenance Load 6 (...	None					1			
40	Maintenance Load 7 (...	None					1			
41	Maintenance Load 8 (...	None					1			
42	Maintenance Load 9 (...	None					1			
43	Maintenance Load 10 ...	None					1			
44	Maintenance Load 11 ...	None					1			
45	Maintenance Load 12 ...	None					1			
46	BLC 1 Transient Area...	None						54		
47	BLC 12 Transient Are...	None						54		

Load Combinations

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.4DL	Yes	Y		DL	1.4																				
2	1.2DL + 1...	Yes	Y		DL	1.2	2	1	3		4	1														
3	1.2DL + 1...	Yes	Y		DL	1.2	2	.866	3	.5	5	1														
4	1.2DL + 1...	Yes	Y		DL	1.2	2	.707	3	.707	6	1														
5	1.2DL + 1...	Yes	Y		DL	1.2	2	.5	3	.866	7	1														
6	1.2DL + 1...	Yes	Y		DL	1.2	2		3	1	8	1														
7	1.2DL + 1...	Yes	Y		DL	1.2	2	-.5	3	.866	9	1														
8	1.2DL + 1...	Yes	Y		DL	1.2	2	-.707	3	.707	10	1														
9	1.2DL + 1...	Yes	Y		DL	1.2	2	-.866	3	.5	11	1														
10	1.2DL + 1...	Yes	Y		DL	1.2	2	-1	3		4	-1														
11	1.2DL + 1...	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1														
12	1.2DL + 1...	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1														
13	1.2DL + 1...	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1														
14	1.2DL + 1...	Yes	Y		DL	1.2	2		3	-1	8	-1														
15	1.2DL + 1...	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1														
16	1.2DL + 1...	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1														
17	1.2DL + 1...	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1														
18	0.9DL + 1...	Yes	Y		DL	.9	2	1	3		4	1														
19	0.9DL + 1...	Yes	Y		DL	.9	2	.866	3	.5	5	1														

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..
20	0.9DL + 1...	Yes	Y		DL	.9	2	.707	3	.707	6	1														
21	0.9DL + 1...	Yes	Y		DL	.9	2	.5	3	.866	7	1														
22	0.9DL + 1...	Yes	Y		DL	.9	2		3	1	8	1														
23	0.9DL + 1...	Yes	Y		DL	.9	2	-.5	3	.866	9	1														
24	0.9DL + 1...	Yes	Y		DL	.9	2	-.707	3	.707	10	1														
25	0.9DL + 1...	Yes	Y		DL	.9	2	-.866	3	.5	11	1														
26	0.9DL + 1...	Yes	Y		DL	.9	2	-1	3		4	-1														
27	0.9DL + 1...	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1														
28	0.9DL + 1...	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1														
29	0.9DL + 1...	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1														
30	0.9DL + 1...	Yes	Y		DL	.9	2		3	-1	8	-1														
31	0.9DL + 1...	Yes	Y		DL	.9	2	.5	3	-.866	9	-1														
32	0.9DL + 1...	Yes	Y		DL	.9	2	.707	3	-.707	10	-1														
33	0.9DL + 1...	Yes	Y		DL	.9	2	.866	3	-.5	11	-1														
34	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1												
35	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1												
36	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1												
37	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2S...	Yes	Y		DL	1.238	23	1	24																	
51	(1.2+0.2S...	Yes	Y		DL	1.238	23	.866	24	.5																
52	(1.2+0.2S...	Yes	Y		DL	1.238	23	.707	24	.707																
53	(1.2+0.2S...	Yes	Y		DL	1.238	23	.5	24	.866																
54	(1.2+0.2S...	Yes	Y		DL	1.238	23		24	1																
55	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.5	24	.866																
56	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.707	24	.707																
57	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.866	24	.5																
58	(1.2+0.2S...	Yes	Y		DL	1.238	23	-1	24																	
59	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.866	24	-.5																
60	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.707	24	-.707																
61	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.5	24	-.866																
62	(1.2+0.2S...	Yes	Y		DL	1.238	23		24	-1																
63	(1.2+0.2S...	Yes	Y		DL	1.238	23	.5	24	-.866																
64	(1.2+0.2S...	Yes	Y		DL	1.238	23	.707	24	-.707																
65	(1.2+0.2S...	Yes	Y		DL	1.238	23	.866	24	-.5																
66	(0.9-0.2Sd...	Yes	Y		DL	.862	23	1	24																	
67	(0.9-0.2Sd...	Yes	Y		DL	.862	23	.866	24	.5																
68	(0.9-0.2Sd...	Yes	Y		DL	.862	23	.707	24	.707																
69	(0.9-0.2Sd...	Yes	Y		DL	.862	23	.5	24	.866																
70	(0.9-0.2Sd...	Yes	Y		DL	.862	23		24	1																
71	(0.9-0.2Sd...	Yes	Y		DL	.862	23	-.5	24	.866																

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
72	(0.9-0.2Sd...	Yes	Y		DL	.862	23	-.707	24	.707																
73	(0.9-0.2Sd...	Yes	Y		DL	.862	23	-.866	24	.5																
74	(0.9-0.2Sd...	Yes	Y		DL	.862	23	-1	24																	
75	(0.9-0.2Sd...	Yes	Y		DL	.862	23	-.866	24	-.5																
76	(0.9-0.2Sd...	Yes	Y		DL	.862	23	-.707	24	-.707																
77	(0.9-0.2Sd...	Yes	Y		DL	.862	23	-.5	24	-.866																
78	(0.9-0.2Sd...	Yes	Y		DL	.862	23		24	-1																
79	(0.9-0.2Sd...	Yes	Y		DL	.862	23	.5	24	-.866																
80	(0.9-0.2Sd...	Yes	Y		DL	.862	23	.707	24	-.707																
81	(0.9-0.2Sd...	Yes	Y		DL	.862	23	.866	24	-.5																
82	1.2DL + 1...	Yes	Y		DL	1.2	25	1.5																		
83	1.2DL + 1...	Yes	Y		DL	1.2	26	1.5																		
84	1.2DL + 1...	Yes	Y		DL	1.2	27	1.5																		
85	1.2DL + 1...	Yes	Y		DL	1.2	28	1.5																		
86	1.2DL + 1...	Yes	Y		DL	1.2	29	1.5																		
87	1.2DL + 1...	Yes	Y		DL	1.2	30	1.5																		
88	1.2DL + 1...	Yes	Y		DL	1.2	31	1.5																		
89	1.2DL + 1...	Yes	Y		DL	1.2	32	1.5																		
90	1.2DL + 1...	Yes	Y		DL	1.2	33	1.5																		
91	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.053	3		4	.053												
92	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.046	3	.027	5	.053												
93	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.038	3	.038	6	.053												
94	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.027	3	.046	7	.053												
95	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2		3	.053	8	.053												
96	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.027	3	.046	9	.053												
97	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.038	3	.038	10	.053												
98	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.046	3	.027	11	.053												
99	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.053	3		4	-.053												
100	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.046	3	-.027	5	-.053												
101	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.038	3	-.038	6	-.053												
102	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.027	3	-.046	7	-.053												
103	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2		3	-.053	8	-.053												
104	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.027	3	-.046	9	-.053												
105	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.038	3	-.038	10	-.053												
106	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.046	3	-.027	11	-.053												
107	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.053	3		4	.053												
108	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.046	3	.027	5	.053												
109	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.038	3	.038	6	.053												
110	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.027	3	.046	7	.053												
111	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2		3	.053	8	.053												
112	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.027	3	.046	9	.053												
113	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.038	3	.038	10	.053												
114	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.046	3	.027	11	.053												
115	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.053	3		4	-.053												
116	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.046	3	-.027	5	-.053												
117	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.038	3	-.038	6	-.053												
118	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.027	3	-.046	7	-.053												
119	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2		3	-.053	8	-.053												
120	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.027	3	-.046	9	-.053												
121	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.038	3	-.038	10	-.053												
122	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.046	3	-.027	11	-.053												
123	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.053	3		4	.053												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..
124	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	.046	3	.027	5	.053												
125	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	.038	3	.038	6	.053												
126	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	.027	3	.046	7	.053												
127	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2		3	.053	8	.053												
128	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	-.027	3	.046	9	.053												
129	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	-.038	3	.038	10	.053												
130	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	-.046	3	.027	11	.053												
131	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	-.053	3		4	-.053												
132	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	-.046	3	-.027	5	-.053												
133	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	-.038	3	-.038	6	-.053												
134	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	-.027	3	-.046	7	-.053												
135	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2		3	-.053	8	-.053												
136	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	.027	3	-.046	9	-.053												
137	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	.038	3	-.038	10	-.053												
138	1.2DL + 1....	Yes	Y		DL	1.2	36	1.5	2	.046	3	-.027	11	-.053												
139	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	.053	3		4	.053												
140	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	.046	3	.027	5	.053												
141	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	.038	3	.038	6	.053												
142	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	.027	3	.046	7	.053												
143	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2		3	.053	8	.053												
144	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	-.027	3	.046	9	.053												
145	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	-.038	3	.038	10	.053												
146	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	-.046	3	.027	11	.053												
147	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	-.053	3		4	-.053												
148	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	-.046	3	-.027	5	-.053												
149	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	-.038	3	-.038	6	-.053												
150	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	-.027	3	-.046	7	-.053												
151	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2		3	-.053	8	-.053												
152	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	.027	3	-.046	9	-.053												
153	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	.038	3	-.038	10	-.053												
154	1.2DL + 1....	Yes	Y		DL	1.2	37	1.5	2	.046	3	-.027	11	-.053												
155	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	.053	3		4	.053												
156	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	.046	3	.027	5	.053												
157	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	.038	3	.038	6	.053												
158	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	.027	3	.046	7	.053												
159	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2		3	.053	8	.053												
160	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	-.027	3	.046	9	.053												
161	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	-.038	3	.038	10	.053												
162	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	-.046	3	.027	11	.053												
163	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	-.053	3		4	-.053												
164	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	-.046	3	-.027	5	-.053												
165	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	-.038	3	-.038	6	-.053												
166	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	-.027	3	-.046	7	-.053												
167	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2		3	-.053	8	-.053												
168	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	.027	3	-.046	9	-.053												
169	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	.038	3	-.038	10	-.053												
170	1.2DL + 1....	Yes	Y		DL	1.2	38	1.5	2	.046	3	-.027	11	-.053												
171	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	.053	3		4	.053												
172	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	.046	3	.027	5	.053												
173	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	.038	3	.038	6	.053												
174	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	.027	3	.046	7	.053												
175	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2		3	.053	8	.053												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..
176	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	-.027	3	.046	9	.053												
177	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	-.038	3	.038	10	.053												
178	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	-.046	3	.027	11	.053												
179	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	-.053	3		4	-.053												
180	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	-.046	3	-.027	5	-.053												
181	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	-.038	3	-.038	6	-.053												
182	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	-.027	3	-.046	7	-.053												
183	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2		3	-.053	8	-.053												
184	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	.027	3	-.046	9	-.053												
185	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	.038	3	-.038	10	-.053												
186	1.2DL + 1....	Yes	Y		DL	1.2	39	1.5	2	.046	3	-.027	11	-.053												
187	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	.053	3		4	.053												
188	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	.046	3	.027	5	.053												
189	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	.038	3	.038	6	.053												
190	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	.027	3	.046	7	.053												
191	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2		3	.053	8	.053												
192	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	-.027	3	.046	9	.053												
193	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	-.038	3	.038	10	.053												
194	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	-.046	3	.027	11	.053												
195	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	-.053	3		4	-.053												
196	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	-.046	3	-.027	5	-.053												
197	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	-.038	3	-.038	6	-.053												
198	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	-.027	3	-.046	7	-.053												
199	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2		3	-.053	8	-.053												
200	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	.027	3	-.046	9	-.053												
201	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	.038	3	-.038	10	-.053												
202	1.2DL + 1....	Yes	Y		DL	1.2	40	1.5	2	.046	3	-.027	11	-.053												
203	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	.053	3		4	.053												
204	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	.046	3	.027	5	.053												
205	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	.038	3	.038	6	.053												
206	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	.027	3	.046	7	.053												
207	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2		3	.053	8	.053												
208	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	-.027	3	.046	9	.053												
209	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	-.038	3	.038	10	.053												
210	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	-.046	3	.027	11	.053												
211	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	-.053	3		4	-.053												
212	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	-.046	3	-.027	5	-.053												
213	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	-.038	3	-.038	6	-.053												
214	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	-.027	3	-.046	7	-.053												
215	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2		3	-.053	8	-.053												
216	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	.027	3	-.046	9	-.053												
217	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	.038	3	-.038	10	-.053												
218	1.2DL + 1....	Yes	Y		DL	1.2	41	1.5	2	.046	3	-.027	11	-.053												
219	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	.053	3		4	.053												
220	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	.046	3	.027	5	.053												
221	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	.038	3	.038	6	.053												
222	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	.027	3	.046	7	.053												
223	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2		3	.053	8	.053												
224	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	-.027	3	.046	9	.053												
225	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	-.038	3	.038	10	.053												
226	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	-.046	3	.027	11	.053												
227	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	-.053	3		4	-.053												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..
228	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	-.046	3	-.027	5	-.053												
229	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	-.038	3	-.038	6	-.053												
230	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	-.027	3	-.046	7	-.053												
231	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2		3	-.053	8	-.053												
232	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	.027	3	-.046	9	-.053												
233	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	.038	3	-.038	10	-.053												
234	1.2DL + 1....	Yes	Y		DL	1.2	42	1.5	2	.046	3	-.027	11	-.053												
235	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	.053	3		4	.053												
236	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	.046	3	.027	5	.053												
237	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	.038	3	.038	6	.053												
238	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	.027	3	.046	7	.053												
239	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2		3	.053	8	.053												
240	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	-.027	3	.046	9	.053												
241	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	-.038	3	.038	10	.053												
242	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	-.046	3	.027	11	.053												
243	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	-.053	3		4	-.053												
244	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	-.046	3	-.027	5	-.053												
245	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	-.038	3	-.038	6	-.053												
246	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	-.027	3	-.046	7	-.053												
247	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2		3	-.053	8	-.053												
248	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	.027	3	-.046	9	-.053												
249	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	.038	3	-.038	10	-.053												
250	1.2DL + 1....	Yes	Y		DL	1.2	43	1.5	2	.046	3	-.027	11	-.053												
251	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	.053	3		4	.053												
252	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	.046	3	.027	5	.053												
253	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	.038	3	.038	6	.053												
254	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	.027	3	.046	7	.053												
255	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2		3	.053	8	.053												
256	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	-.027	3	.046	9	.053												
257	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	-.038	3	.038	10	.053												
258	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	-.046	3	.027	11	.053												
259	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	-.053	3		4	-.053												
260	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	-.046	3	-.027	5	-.053												
261	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	-.038	3	-.038	6	-.053												
262	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	-.027	3	-.046	7	-.053												
263	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2		3	-.053	8	-.053												
264	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	.027	3	-.046	9	-.053												
265	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	.038	3	-.038	10	-.053												
266	1.2DL + 1....	Yes	Y		DL	1.2	44	1.5	2	.046	3	-.027	11	-.053												
267	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	.053	3		4	.053												
268	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	.046	3	.027	5	.053												
269	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	.038	3	.038	6	.053												
270	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	.027	3	.046	7	.053												
271	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2		3	.053	8	.053												
272	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	-.027	3	.046	9	.053												
273	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	-.038	3	.038	10	.053												
274	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	-.046	3	.027	11	.053												
275	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	-.053	3		4	-.053												
276	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	-.046	3	-.027	5	-.053												
277	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	-.038	3	-.038	6	-.053												
278	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	-.027	3	-.046	7	-.053												
279	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2		3	-.053	8	-.053												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
280	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	.027	3	-.046	9	-.053												
281	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	.038	3	-.038	10	-.053												
282	1.2DL + 1....	Yes	Y		DL	1.2	45	1.5	2	.046	3	-.027	11	-.053												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N64	max	3960.047	2	1549.943	22	1181.569	42	695.183	182	1125.676	42	1853.677	30
2		min	-3366.797	26	-1550.039	30	-199.035	18	-677.017	254	-139.995	18	-1855.946	22
3	N68	max	1871.149	19	2911.078	22	1178.458	37	1017.075	35	240.387	200	1640.96	24
4		min	-2165.957	11	-3424.817	14	-186.154	29	-112.793	27	-957.454	112	-1638.807	32
5	N66	max	2187.701	33	3396.7	7	1178.447	47	176.775	25	251.589	237	1616.144	19
6		min	-2482.858	9	-2883.344	31	-186.194	23	-969.105	250	-937.013	133	-1618.065	27
7	N163	max	558.209	26	77.105	22	2320.831	2	.079	180	193.403	2	6.44	30
8		min	-1239.477	34	-77.122	30	-1179.345	26	-.077	252	-98.279	26	-6.442	22
9	N163A	max	617.358	39	450.596	32	2290.091	7	82.884	31	47.882	31	11.542	19
10		min	-270.291	31	-1067.074	39	-1148.647	31	-165.262	7	-95.44	7	-11.543	27
11	N167	max	617.486	45	1067.007	45	2290.006	13	165.3	13	47.8	21	11.541	25
12		min	-273.206	22	-450.252	21	-1148.602	21	-82.927	21	-95.36	13	-11.544	33
13	Totals:	max	6678.691	18	6476.44	22	8745.578	42						
14		min	-6678.681	26	-6476.441	30	2287.938	66						

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

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	MP10	PIPE 2.0	.707	80	4	.172	80		16	14916.096	32130	1871.625	1871.625	1	H1-1b
2	MP6	PIPE 2.0	.697	80	9	.173	80		5	14916.096	32130	1871.625	1871.625	1	H1-1b
3	MP2	PIPE 2.0	.676	80	14	.174	80		10	14916.096	32130	1871.625	1871.625	1....	H1-1b
4	MP7	PIPE 2.0	.641	80	17	.153	80		3	14916.096	32130	1871.625	1871.625	1....	H1-1b
5	MP11	PIPE 2.0	.641	80	11	.158	80		14	14916.096	32130	1871.625	1871.625	1....	H1-1b
6	MP3	PIPE 2.0	.620	80	6	.157	80		8	14916.096	32130	1871.625	1871.625	1	H1-1b
7	M10	PIPE 2.0	.593	98.438	10	.329	143.75		3	6295.422	32130	1871.625	1871.625	3....	H3-6
8	M15	PIPE 2.0	.589	98.438	15	.330	143.75		9	6295.422	32130	1871.625	1871.625	3....	H3-6
9	M20	PIPE 2.0	.587	98.438	4	.332	143.75		14	6295.422	32130	1871.625	1871.625	1	H3-6
10	M9	L2.5x2.5x4	.580	18.357	14	.142	0	y	16	34802.985	37485	1082.622	2466.905	1....	H2-1
11	M8	L2.5x2.5x4	.571	18.357	9	.140	0	y	11	34802.985	37485	1082.622	2466.905	1....	H2-1
12	M7	L2.5x2.5x4	.550	18.357	3	.141	0	y	6	34802.985	37485	1082.622	2466.905	1....	H2-1
13	MP12	PIPE 2.0	.531	80	12	.252	16		15	14916.096	32130	1871.625	1871.625	1....	H1-1b
14	MP8	PIPE 2.0	.521	80	17	.249	16		5	14916.096	32130	1871.625	1871.625	1....	H1-1b
15	MP9	PIPE 2.0	.511	80	4	.234	80		14	14916.096	32130	1871.625	1871.625	1	H1-1b
16	MP5	PIPE 2.0	.511	80	9	.239	16		4	14916.096	32130	1871.625	1871.625	1	H1-1b
17	MP4	PIPE 2.0	.504	80	6	.253	16		10	14916.096	32130	1871.625	1871.625	1	H1-1b
18	MP1	PIPE 2.0	.492	80	14	.237	80		9	14916.096	32130	1871.625	1871.625	1....	H1-1b
19	M39	PL 6x0.375	.351	0	10	.312	1.625	y	34	70050.692	70875	553.875	8859.375	1....	H1-1b
20	M38	PL 6x0.375	.350	0	10	.329	1.625	y	34	70050.692	70875	553.875	8859.375	1....	H1-1b
21	M41	PL 6x0.375	.346	0	15	.312	1.625	y	39	70050.692	70875	553.875	8859.375	1....	H1-1b
22	M46	PL 6x0.375	.345	0	5	.328	1.625	y	45	68719.518	70875	553.875	8842.083	1	H1-1b
23	M40	PL 6x0.375	.341	0	16	.329	1.625	y	40	70050.692	70875	553.875	8859.375	1....	H1-1b
24	M37	PL 6x0.375	.338	0	4	.312	1.625	y	44	70050.692	70875	553.875	8859.375	1....	H1-1b
25	M29	PI 6"x0.5"	.298	6.81	2	.114	6.81	y	159	93601.218	94500	984.375	11812.5	1....	H1-1b
26	M30	PI 6"x0.5"	.292	6.81	7	.114	6.81	y	228	93600.967	94500	984.375	11812.5	1....	H1-1b

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

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
27	M28	PI 6"x0.5"	.289	6.81	13	.102	6.81	y	106	93600.986	94500	984.375	11812.5	1....	H1-1b
28	M101	LL2.5x2.5x3x0	.238	42	15	.013	84	y	13	30884.34	56700	3208.8	2426.842	1....	H1-1b
29	M98	LL2.5x2.5x3x0	.237	42	5	.012	84	y	7	30884.34	56700	3208.8	2426.842	1....	H1-1b
30	M5	L2x2x3	.234	25.584	9	.012	0	z	2	9381.273	22743	542.224	1044.394	1....	H2-1
31	M2	L2x2x3	.227	25.584	11	.011	0	y	2	9381.273	22743	542.224	1044.393	1....	H2-1
32	M1	L2x2x3	.219	26.117	14	.010	51.168	y	38	9381.273	22743	542.224	1044.277	1....	H2-1
33	M6	L2x2x3	.212	26.117	6	.010	51.168	z	45	9381.273	22743	542.224	1044.276	1....	H2-1
34	M3	L2x2x3	.204	25.584	3	.010	51.168	y	44	9381.256	22743	542.224	1044.014	1....	H2-1
35	M4	L2x2x3	.197	25.584	17	.010	51.168	z	40	9381.256	22743	542.224	1044.013	1....	H2-1
36	M93	HSS4X4X4	.193	0	46	.062	25.699	z	14	105230.3...	106155	12311.25	12311.25	1	H1-1b
37	M90	HSS4X4X4	.192	0	41	.063	25.699	z	9	105230.3...	106155	12311.25	12311.25	1	H1-1b
38	M87	HSS4X4X4	.192	0	35	.063	25.699	z	3	105230.3...	106155	12311.25	12311.25	1	H1-1b
39	M86	HSS4X4X4	.190	62.5	13	.092	62.5	y	182	101706.2...	106155	12311.25	12311.25	1	H1-1b
40	M88	HSS4X4X4	.187	28.688	38	.063	2.988	z	6	105230.3...	106155	12311.25	12311.25	1	H1-1b
41	M92	HSS4X4X4	.185	28.687	43	.065	2.988	z	12	105230.3...	106155	12311.25	12311.25	1	H1-1b
42	M85	HSS4X4X4	.185	28.687	49	.064	2.988	z	17	105230.3...	106155	12311.25	12311.25	1	H1-1b
43	M91	HSS4X4X4	.185	20.182	13	.092	62.5	y	112	101706.2...	106155	12311.25	12311.25	1	H1-1b
44	M89	HSS4X4X4	.183	20.182	8	.092	62.5	y	235	101706.2...	106155	12311.25	12311.25	1	H1-1b
45	H3	PIPE_3.0	.157	140.6...	4	.096	98.438		16	28250.554	65205	5748.75	5748.75	1	H1-1b
46	H2	PIPE_3.0	.156	9.375	10	.098	51.563		6	28250.554	65205	5748.75	5748.75	1	H1-1b
47	H1	PIPE_3.0	.152	9.375	15	.097	51.563		11	28250.554	65205	5748.75	5748.75	1	H1-1b
48	M95	LL2.5x2.5x3x0	.142	42	3	.008	84	y	2	30884.34	56700	3208.8	2426.842	1....	H1-1b
49	M35	PI 6"x0.5"	.031	0	10	.180	1.108	y	3	94215.213	94500	984.375	11812.5	1....	H1-1b
50	M31	PI 6"x0.5"	.031	0	15	.179	1.108	y	9	94215.213	94500	984.375	11812.5	1....	H1-1b
51	M33	PI 6"x0.5"	.030	0	5	.178	1.108	y	14	94215.213	94500	984.375	11812.5	1....	H1-1b
52	M36	PI 6"x0.5"	.030	0	2	.173	1.108	y	170	94215.213	94500	984.375	11812.5	1....	H1-1b
53	M34	PI 6"x0.5"	.029	0	12	.173	1.108	y	100	94215.213	94500	984.375	11812.5	1....	H1-1b
54	M32	PI 6"x0.5"	.028	0	7	.173	1.108	y	223	94215.213	94500	984.375	11812.5	1....	H1-1b

Envelope AISI S100-16: LRFD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pn[lb]	phi*Tn[lb]	phi*Mny...	phi*Mnz...	phi*V...	phi*V...	Cb	Eqn
No Data to Print ...																

APPENDIX D

ADDITIONAL CALCUATIONS

Trylon

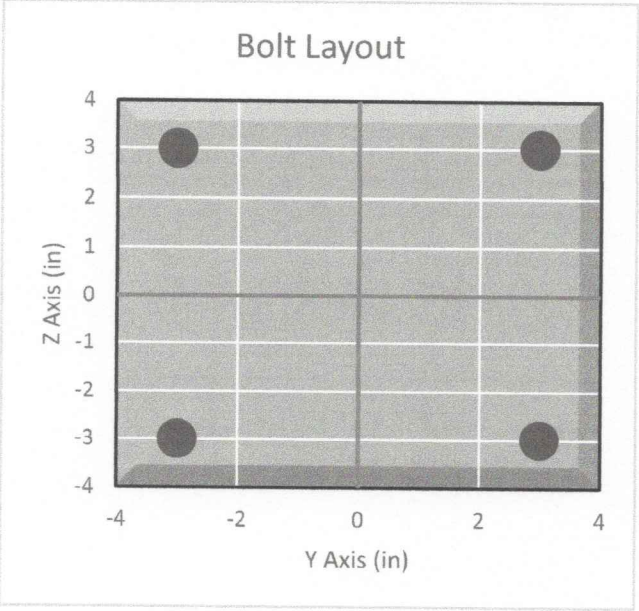
Analysis date: 10/11/21

BOLT TOOL 1.5.2

Project Data	
Job Code:	193322
Carrier Site ID:	CT11057C
Carrier Site Name:	MIDDLETOWN_1

Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	AISC

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
Standoff to Monopole

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	2400.6	lbs
Shear Force (V_u):	563.1	lbs
Tension Usage:	11.2%	--
Shear Usage:	3.9%	--
Interaction:	11.2%	Pass
Controlling Member:	M86	--
Controlling LC:	5	--

**Rating per TIA-222-H Section 15.5*

1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

Trylon

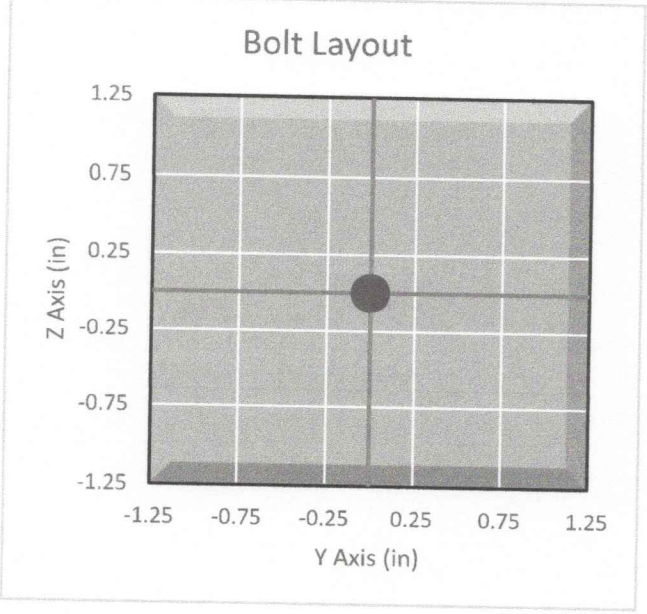
Analysis date: 10/11/21

BOLT TOOL 1.5.2

Project Data	
Job Code:	193322
Carrier Site ID:	CT11057C
Carrier Site Name:	MIDDLETOWN_1

Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	AISC

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	1	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
Kicker to Monopole

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	0.3	lbs
Shear Force (V_u):	2608.6	lbs
Tension Usage:	0.0%	--
Shear Usage:	18.0%	--
Interaction:	18.0%	Pass
Controlling Member:	M100	--
Controlling LC:	2	--

**Rating per TIA-222-H Section 15.5*