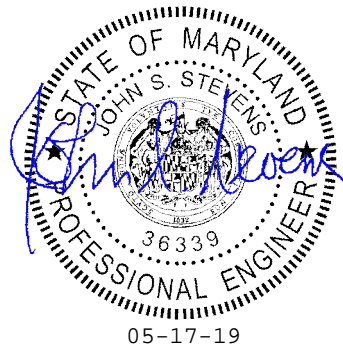


Structural Analysis Report

May 16, 2019

Site Name	Federalsburg
Client	Motorola
Carrier	MD First
Infinigy Job Number	626-000
Site Location	208 University Ave., Federalsburg, MD 21632 38° 41' 44.00" N NAD83 75° 46' 55.00" W NAD83
Structure Type	330' Self Support
Structural Usage Ratio	145.2%
Overall Result	Fail
Note	Tower must be reinforced prior to installation of proposed appurtenances.

Upon reviewing the results of this analysis, it is our opinion that the structure does not meet the specified TIA code requirements. The tower and foundations are therefore deemed inadequate to support the existing and proposed loading as listed in this report.



Ray Marshall
Structural Engineer II

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Introduction

Infinigy Engineering has been requested to perform a structural analysis on the existing 330' Self Support tower. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The tower as analyzed using tnxTower Version 8.0.5.0 tower analysis software.

Supporting Documentation

Previous Analysis	Infinigy Engineering, dated September 11, 2018
Photos	Infinigy Engineering, dated February 17, 2019
Mapping Report	Infinigy Engineering, dated May 3, 2019
Antenna Loading	Provided by Motorola, Dated March 15, 2019
Relocation Approval Email	Provided by MD First, Dated May 14, 2019

Analysis Code Requirements

Wind Speed	115 mph (3-Second Gust, V_{ULT})
Wind Speed w/ ice	40 mph (3-Second Gust) w/ 0.85" ice
TIA Revision	ANSI/TIA-222-H
Adopted IBC	2015 IBC
Structure Class	III
Exposure Category	C
Topographic Category	1
Calculated Crest Height	0 ft

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the structure does not meet the specified TIA code requirements. The tower and foundations are therefore deemed inadequate to support the existing and proposed loading as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

Ray Marshall
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Structural Analysis Report

May 16, 2019

Existing & Reserved Loading

Mount Height (ft)	Qty.	Appurtenance	Mount Type	Coax & Lines	Carrier	
325.0	2	12' Omni	Stand-off	(2) 7/8"	--	
322.0	1	Commscope VHLP-18-1GR	--	(1) 7/8"		
316.0	1	12"x12"x4" TTA		--		--
313.0	1	12' Omni	Stand-off	(1) 7/8"		
295.0	2	RFS BPS10-A-B1	Sector Frame	(2) 1-5/8"		
	1	18"x12"x6" Box		(2) 3/8"		
277.0	1	Sinclair SD212	Stand-off	(1) 7/8"		DNR
	1	RFS BPS10-A-B1		(1) 5/8"		
265.0	1	12"x12"x4" Box	--	--		
250.0	1	Sinclair SD212	Stand-off	(1) 7/8"		
215.0	1	Andrew PAR8-59W-PXA	Pipe Mount	(1) EW63		
203.0	1	Decibel DB222-A	Stand-off	(1) 1-5/8"		
197.0	1	10' Dipole		(1) 7/8"		
195.0	2	6' Dish w/ Radome	Pipe Mount	(2) EW63		
187.0	1	2' HP Dish		(1) 3/8"		
184.0	1	2'x2' Dish	Stand-off	(2) 3/8"		
174.0	1	Andrew PAR8-59W-PXA	Pipe Mount	(1) EW63		
168.0	1	10' Omni	Stand-off	(1) 5/8"	--	
	1	2'x2' Dish	--	(2) 3/8"		
165.0	1	Andrew D8F-2	Pipe Mount	(1) EW63		
	3	Beacons	--	(1) 1/2"		
150.0	2	6' HP Dish	Pipe Mount	(1) EW63 & (2) 3/8"		
				(1) EW63		
142.0	1	Andrew VHLP4-105	Stand-off	--		
85.0	1	--		--		
75.0	1	--		--		
20.0	3	4' Omni		(3) 3/8"		

Proposed Loading

Mount Height (ft)	Qty.	Appurtenance	Mount Type	Coax & Lines	Carrier
290.0 ⁽¹⁾	1	Sinclair SD212	Stand-off	(1) 7/8"	DNR
280.0 ⁽²⁾	1	Commscope Par8-59W	Pipe Mount	(1) EWP52-59	MD First
230.0 ⁽²⁾	1	Commscope Par8-59W		(1) EWP52-59	

⁽¹⁾ Relocation of existing appurtenance per MD First approval email.

⁽²⁾ Centerline of proposed appurtenance.

May 16, 2019

Final Loading Configuration

Mount Height (ft)	Qty.	Appurtenance	Mount Type	Coax & Lines	Carrier
325.0	2	12' Omni	Stand-off	(2) 7/8"	--
322.0	1	Commscope VHLP-18-1GR	--	(1) 7/8"	
316.0	1	12"x12"x4" TTA		--	
313.0	1	12' Omni	Stand-off	(1) 7/8"	
295.0	2	RFS BPS10-A-B1	Sector Frame	(2) 1-5/8"	
	1	18"x12"x6" Box		(2) 3/8"	
290.0	1	Sinclair SD212	Stand-off	(1) 7/8"	DNR
280.0	1	Commscope Par8-59W	Pipe Mount	(1) EWP52-59	MD First
277.0	1	RFS BPS10-A-B1	Stand-off	(1) 5/8"	--
265.0	1	12"x12"x4" Box	--	--	
250.0	1	Sinclair SD212	Stand-off	(1) 7/8"	
230.0	1	Commscope Par8-59W	Pipe Mount	(1) EWP52-59	MD First
215.0	1	Andrew PAR8-59W-PXA	Pipe Mount	(1) EW63	--
203.0	1	Decibel DB222-A	Stand-off	(1) 1-5/8"	
197.0	1	10' Dipole		(1) 7/8"	
195.0	2	6' Dish w/ Radome	Pipe Mount	(2) EW63	
187.0	1	2' HP Dish	Pipe Mount	(1) 3/8"	
184.0	1	2'x2' Dish	Stand-off	(2) 3/8"	
174.0	1	Andrew PAR8-59W-PXA	Pipe Mount	(1) EW63	
168.0	1	10' Omni	Stand-off	(1) 5/8"	
165.0	1	2'x2' Dish	--	(2) 3/8"	
	1	Andrew D8F-2	Pipe Mount	(1) EW63	
158.0	3	Beacons	--	(1) 1/2"	
150.0	2	6' HP Dish	Pipe Mount	(1) EW63 & (2) 3/8"	
				(1) EW63	
142.0	1	Andrew VHLP4-105	Stand-off	--	
85.0	1	--		--	
75.0	1	--		--	
20.0	3	4' Omni		(3) 3/8"	

Structure Usages

Leg (T15)	63.9%	Pass
Diagonal (T17)	145.2%	Fail
Horizontal (T17)	18.3%	Pass
Top Girt (T1)	0.3%	Pass
Redund Horz 1 Bracing (T17)	1.8%	Pass
Redund Horz 2 Bracing (T17)	1.7%	Pass
Redund Diag 1 Bracing (T17)	1.8%	Pass
Redund Diag 2 Bracing (T17)	1.8%	Pass
Redund Hip 1 Bracing (T17)	0.1%	Pass
Redund Hip 2 Bracing (T17)	0.3%	Pass
Inner Bracing (T17)	0.4%	Pass
Bolt Checks	45.6%	Pass
RATING =	145.2%	Fail

Foundation Reactions

Reaction Data	Design Reactions	Analysis Reactions	Results
Uplift (kips)	--	--	--
Axial (kips)	--	--	--
Shear (kips)	--	--	--

-The existing foundation was not evaluated because no information was made available at the time of this analysis.

Deflection, Twist, and Sway

Antenna Elevation (ft)	Deflection (in)	Twist (°)	Sway (°)
280.0	29.6	1.1	0.5
230.0	19.3	0.8	0.3

*Per ANSI/TIA-222-H Section 2.8.2 maximum serviceability structural deflection limit is 3% of structure height.

*Per ANSI/TIA-222-H Section 2.8.2 maximum serviceability structural twist and sway limit is 4 degrees.

*Per ANSI/TIA-222-H Section 2.8.3 deflection, Twist, and sway values were calculated using a basic 3-second gust wind speed of 60 mph.

*It is the responsibility of the client to ensure their proposed and/or existing equipment will meet ANSI/TIA-222-H Annex D or other appropriate microwave signal degradation limits based on the provided values above.

May 16, 2019

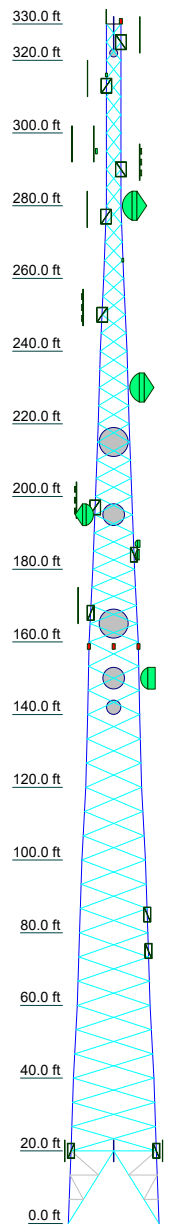
Assumptions and Limitations

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of “like new” and all members, connections, anchors, and masonry to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure’s condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the rooftop mounted equipment and/or antenna supporting structures to be proposed or modified as shown in the referenced construction drawings. Applicable building element adequacy to support these structures is also evaluated when the applied forces increase significantly based on engineering judgment.

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	
Legs	SR 2 1/4	SR 2 1/4	SR 2 3/4	SR 3	SR 3 1/4	SR 3 1/2	SR 3 3/4	SR 3 3/4	SR 4	SR 4 3/4	SR 5	SR 5	SR 5 1/4	SR 5 1/4	SR 5 1/2	SR 5 3/4	SR 5 3/4	
Leg Grade	A572-50																	
Diagonals	L1 3/4x1 3/4x3/16																	
Diagonal Grade	A36																	
Top Girts	N.A.																	
Horizontals	N.A.																	
Red. Horizontals	N.A.																	
Red. Diagonals	N.A.																	
Red. Hlps	N.A.																	
Inner Bracing	N.A.																	
Face Width (ft)	24.92	23.42	20	18.83	17.42	15.33	14.33	13.58	11.42	9.92	8.58	7.33	5.42					
# Panels @ (ft)	1 @ 20	21 @ 6.66667																
Weight (lb)	72566.2	10138.0	7676.0	7056.3	6861.5	6422.5	5925.6	5219.7	3502.6	3125.2	2381.8	2086.6	2017.1	1716.4	1597.5	1136.6	521.4	

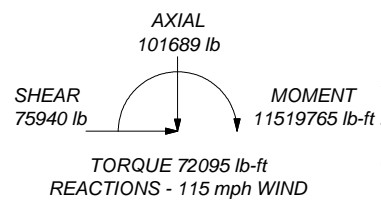
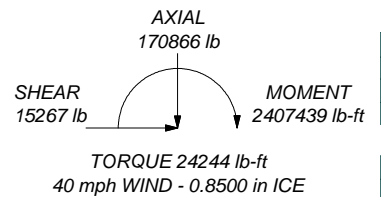


ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT E

DOWN: 567633 lb
SHEAR: 44924 lb

UPLIFT: -466400 lb
SHEAR: 38552 lb



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon Lighting	330	Pipe Mount	195
Lightning Rod	330	6' Dish w/ Radome	195
12' Omni	325	6' Dish w/ Radome	195
6' Stand-Off	325	Pipe Mount	195
12' Omni	325	Pipe Mount	187
6' Stand-Off	325	2' HP Dish	187
Pipe Mount	322	2' Stand-off	184
VHLP2-18-1GR	322	2'x2' Dish	184
12"x12"x4" TTA	316	Pipe Mount	174
6' Stand-Off	313	4' Stand-off	168
12' Omni	313	10' Omni	168
BPS10-A-B1	295	Pipe Mount	165
18"x12"x6" Box	295	2'x2' Dish	165
Angle Sector Frame	295	D8F-2	165
BPS10-A-B1	295	Beacon	158
6' Stand-Off	290	Beacon	158
SD212	290	Beacon	158
Pipe Mount	280	Pipe Mount	150
PAR8-59W	280	Pipe Mount	150
6' Stand-Off	277	6' HP Dish	150
BPS10-A-B1	277	6' HP Dish	150
12"x12"x4" Box	265	Pipe Mount	142
SD212	250	VHLP4-105	142
6' Stand-Off	250	2' Stand-off	85
Pipe Mount	230	2' Stand-off	75
PAR8-59W	230	2' Stand-off	20
PAR8-59W-PXA w/ Radome	215	4' Omni	20
Pipe Mount	215	4' Omni	20
DB222-A	203	2' Stand-off	20
6' Stand-Off	203	2' Stand-off	20
10' Dipole	197	4' Omni	20
6' Stand-Off	197		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	2L3x3x1/4x3/8	D	2L2 1/2x2 1/2x1/4x3/8
B	L2x2x1/4	E	2L2 1/2x2 1/2x1/4
C	2L5x5x5/16x3/8		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Caroline County, Maryland.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 115 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 mph basic wind with 0.85 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 145.2%

Infinigy Engineering PLLC.		Job: 626-000	
2500 West Higgins Road, Suite 500		Project: Federalburg	
Hoffman Estates, IL 60169		Client: Motorola	Drawn by: Ray Marshall
Phone: (847) 648-4068		Code: TIA-222-H	Date: 05/16/19
FAX:		Scale: NTS	Dwg No. E-1
		Path: D:\Infinigy\Jobs\Federalburg\Federalburg.eri	

tnxTower Infinifgy Engineering PLLC. 2500 West Higgins Road, Suite 500 Hoffman Estates, IL 60169 Phone: (847) 648-4068 FAX:	Job	626-000	Page	1 of 37
	Project	Federalsburg	Date	08:54:44 05/16/19
	Client	Motorola	Designed by	Ray Marshall

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 330.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 4.00 ft at the top and 24.92 ft at the base.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in Caroline County, Maryland.

Tower base elevation above sea level: 0.00 ft.

Basic wind speed of 115 mph.

Risk Category III.

Exposure Category C.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 0.8500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 40 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

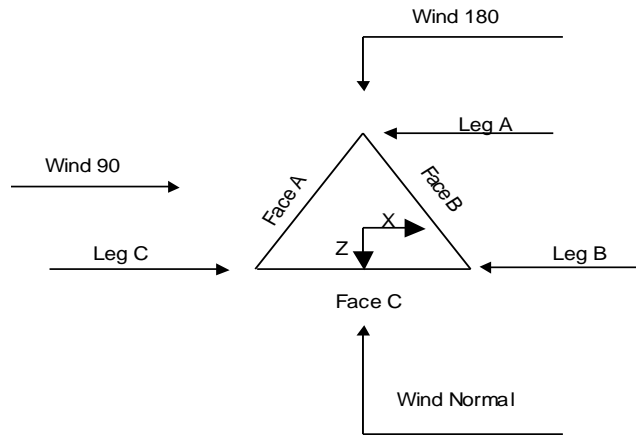
Stress ratio used in tower member design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

<ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component √ Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs 	<ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA √ SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque √ Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <li style="text-align: center;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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tnxTower Infinifgy Engineering PLLC. 2500 West Higgins Road, Suite 500 Hoffman Estates, IL 60169 Phone: (847) 648-4068 FAX:	Job 626-000	Page 2 of 37
	Project Federalsburg	Date 08:54:44 05/16/19
	Client Motorola	Designed by Ray Marshall



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	330.00-320.00			4.00	1	10.00
T2	320.00-300.00			4.00	1	20.00
T3	300.00-280.00			4.00	1	20.00
T4	280.00-260.00			4.00	1	20.00
T5	260.00-240.00			5.42	1	20.00
T6	240.00-220.00			7.33	1	20.00
T7	220.00-200.00			8.58	1	20.00
T8	200.00-180.00			9.92	1	20.00
T9	180.00-160.00			11.42	1	20.00
T10	160.00-140.00			13.58	1	20.00
T11	140.00-120.00			14.33	1	20.00
T12	120.00-100.00			15.33	1	20.00
T13	100.00-80.00			17.42	1	20.00
T14	80.00-60.00			18.83	1	20.00
T15	60.00-40.00			20.00	1	20.00
T16	40.00-20.00			22.17	1	20.00
T17	20.00-0.00			23.42	1	20.00

Tower Section Geometry (cont'd)

<p style="text-align: center;">tnxTower</p> <p>Infinifgy Engineering PLLC. 2500 West Higgins Road, Suite 500 Hoffman Estates, IL 60169 Phone: (847) 648-4068 FAX:</p>	<p>Job</p> <p style="text-align: center;">626-000</p>	<p>Page</p> <p style="text-align: center;">3 of 37</p>
	<p>Project</p> <p style="text-align: center;">Federalsburg</p>	<p>Date</p> <p style="text-align: center;">08:54:44 05/16/19</p>
	<p>Client</p> <p style="text-align: center;">Motorola</p>	<p>Designed by</p> <p style="text-align: center;">Ray Marshall</p>

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	330.00-320.00	5.00	X Brace	No	Yes	0.0000	0.0000
T2	320.00-300.00	5.00	X Brace	No	No	0.0000	0.0000
T3	300.00-280.00	5.00	X Brace	No	No	0.0000	0.0000
T4	280.00-260.00	5.00	X Brace	No	No	0.0000	0.0000
T5	260.00-240.00	5.00	X Brace	No	No	0.0000	0.0000
T6	240.00-220.00	5.00	X Brace	No	No	0.0000	0.0000
T7	220.00-200.00	5.00	X Brace	No	No	0.0000	0.0000
T8	200.00-180.00	5.00	X Brace	No	No	0.0000	0.0000
T9	180.00-160.00	5.00	X Brace	No	No	0.0000	0.0000
T10	160.00-140.00	6.67	X Brace	No	No	0.0000	0.0000
T11	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T12	120.00-100.00	6.67	X Brace	No	No	0.0000	0.0000
T13	100.00-80.00	6.67	X Brace	No	No	0.0000	0.0000
T14	80.00-60.00	6.67	X Brace	No	No	0.0000	0.0000
T15	60.00-40.00	6.67	X Brace	No	No	0.0000	0.0000
T16	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T17	20.00-0.00	20.00	K2 Down	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 330.00-320.00	Solid Round	2	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 320.00-300.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 300.00-280.00	Solid Round	2 3/4	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T4 280.00-260.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T5 260.00-240.00	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T6 240.00-220.00	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T7 220.00-200.00	Solid Round	3 1/2	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T8 200.00-180.00	Solid Round	3 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 180.00-160.00	Solid Round	4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T10 160.00-140.00	Solid Round	4 3/4	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T11 140.00-120.00	Solid Round	4 3/4	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T12 120.00-100.00	Solid Round	5	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T13 100.00-80.00	Solid Round	5 1/4	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T14 80.00-60.00	Solid Round	5 1/4	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T15 60.00-40.00	Solid Round	5 1/4	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T16 40.00-20.00	Solid Round	5 1/2	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T17 20.00-0.00	Solid Round	5 3/4	A572-50	Double Equal	2L3x3x1/4x3/8	A36 (36 ksi)

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Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
			(50 ksi)	Angle		(36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 330.00-320.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T17 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L5x5x5/16x3/8	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T17 20.00-0.00	Single Angle		A36 (36 ksi)	Double Equal Angle	2L2 1/2x2 1/2x1/4x3/8	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Redundant Bracing Grade	Redundant Type	Redundant Size	K Factor	
T17 20.00-0.00	A36 (36 ksi)	Horizontal (1)	Double Equal Angle	2L2 1/2x2 1/2x1/4x3/8	1
		Horizontal (2)		2L2 1/2x2 1/2x1/4x3/8	
	A36 (36 ksi)	Diagonal (1)	Double Equal Angle	2L2 1/2x2 1/2x1/4x3/8	1
		Diagonal (2)		2L2 1/2x2 1/2x1/4	
	A36 (36 ksi)	Hip (1)	Double Angle	2L2 1/2x2 1/2x1/4	1
		Hip (2)		2L2 1/2x2 1/2x1/4	

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Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T9 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 330.00-320.00	Flange	0.7500	8	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T2 320.00-300.00	Flange	0.7500	8	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T3 300.00-280.00	Flange	0.7500	8	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T4 280.00-260.00	Flange	0.7500	8	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T5 260.00-240.00	Flange	0.7500	8	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T6 240.00-220.00	Flange	0.7500	8	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T7 220.00-200.00	Flange	1.0000	8	0.7500	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T8 200.00-180.00	Flange	1.0000	8	0.7500	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T9 180.00-160.00	Flange	1.0000	8	0.7500	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T10 160.00-140.00	Flange	1.2500	8	0.7500	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T11 140.00-120.00	Flange	1.2500	8	0.7500	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T12 120.00-100.00	Flange	1.5000	8	0.7500	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T13 100.00-80.00	Flange	1.5000	8	0.7500	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0

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Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T14 80.00-60.00	Flange	1.5000 A325N	8	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T15 60.00-40.00	Flange	1.5000 A325N	8	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T16 40.00-20.00	Flange	1.5000 A325N	8	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T17 20.00-0.00	Flange	1.5000 A325N	8	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	2	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8 ***	C	No	No	Ar (CaAa)	325.00 - 5.00	2	2	0.5000	1.1100		0.54
7/8 ***	C	No	No	Ar (CaAa)	322.00 - 5.00	1	1	0.5000	1.1100		0.54
7/8 ***	C	No	No	Ar (CaAa)	313.00 - 5.00	1	1	0.5000	1.1100		0.54
1 5/8 ***	C	No	No	Ar (CaAa)	295.00 - 5.00	2	2	0.5000	1.9800		1.04
3/8 ***	C	No	No	Ar (CaAa)	295.00 - 5.00	2	2	0.4400	0.4400		0.08
7/8 ***	C	No	No	Ar (CaAa)	290.00 - 5.00	1	1	0.5000	1.1100		0.54
1 5/8 ***	C	No	No	Ar (CaAa)	277.00 - 5.00	1	1	0.5000	1.9800		1.04
7/8 ***	C	No	No	Ar (CaAa)	250.00 - 5.00	1	1	0.5000	1.1100		0.54
EW63 ***	C	No	No	Ar (CaAa)	215.00 - 5.00	1	1	1.5742	1.5742		0.51
7/8 ***	C	No	No	Ar (CaAa)	197.00 - 5.00	1	1	0.5000	1.1100		0.54
EW63 ***	C	No	No	Ar (CaAa)	195.00 - 5.00	2	2	1.5742	1.5742		0.51
3/8 ***	C	No	No	Ar (CaAa)	187.00 - 5.00	1	1	0.4400	0.4400		0.08
3/8 ***	C	No	No	Ar (CaAa)	184.00 - 5.00	2	2	0.4400	0.4400		0.08
EW63 ***	C	No	No	Ar (CaAa)	174.00 - 5.00	1	1	1.5742	1.5742		0.51
5/8 ***	C	No	No	Ar (CaAa)	168.00 - 5.00	1	1	0.8800	0.8800		0.40
3/8 ***	C	No	No	Ar (CaAa)	165.00 - 5.00	2	2	0.4400	0.4400		0.08
EW63 ***	C	No	No	Ar (CaAa)	165.00 - 5.00	1	1	1.5742	1.5742		0.51
1/2 ***	C	No	No	Ar (CaAa)	158.00 - 5.00	1	1	0.5800	0.5800		0.25
EW63 ***	C	No	No	Ar (CaAa)	150.00 - 5.00	1	1	1.5742	1.5742		0.51
3/8	C	No	No	Ar (CaAa)	150.00 - 5.00	2	2	0.4400	0.4400		0.08

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
*** EW63 ***	C	No	No	Ar (CaAa)	142.00 - 5.00	1	1	1.5742	1.5742		0.51
*** 3/8 ***	C	No	No	Ar (CaAa)	20.00 - 5.00	3	3	0.4400	0.4400		0.08
*** EWP52-59 ***	C	No	No	Ar (CaAa)	280.00 - 5.00	1	1	2.2100	2.2100		0.59
*** EWP52-59 ***	C	No	No	Ar (CaAa)	230.00 - 5.00	1	1	2.2100	2.2100		0.59
Feedline Ladder (Af)	C	No	No	Ar (CaAa)	330.00 - 10.00	1	1	0.5000	3.0000		6.51

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
T1	330.00-320.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.332	0.000	71.58
T2	320.00-300.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.103	0.000	169.62
T3	300.00-280.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	23.250	0.000	212.40
T4	280.00-260.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	34.566	0.000	258.48
T5	260.00-240.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	36.270	0.000	267.00
T6	240.00-220.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	39.590	0.000	278.30
T7	220.00-200.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	44.161	0.000	291.85
T8	200.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	52.218	0.000	320.08
T9	180.00-160.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	60.240	0.000	344.09
T10	160.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	69.735	0.000	374.22
T11	140.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	75.139	0.000	390.60
T12	120.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	75.139	0.000	390.60
T13	100.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	75.139	0.000	390.60
T14	80.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
T15	60.00-40.00	C	0.000	0.000	75.139	0.000	390.60
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
T16	40.00-20.00	C	0.000	0.000	75.139	0.000	390.60
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
T17	20.00-0.00	C	0.000	0.000	75.139	0.000	390.60
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	56.834	0.000	264.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
T1	330.00-320.00	A	1.229	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	10.101	0.000	168.92
T2	320.00-300.00	A	1.223	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	38.305	0.000	517.55
T3	300.00-280.00	A	1.215	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	68.370	0.000	783.47
T4	280.00-260.00	A	1.206	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	96.365	0.000	1094.10
T5	260.00-240.00	A	1.197	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	100.772	0.000	1141.66
T6	240.00-220.00	A	1.187	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	108.374	0.000	1225.71
T7	220.00-200.00	A	1.176	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	118.280	0.000	1335.59
T8	200.00-180.00	A	1.165	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	144.764	0.000	1571.67
T9	180.00-160.00	A	1.152	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	175.336	0.000	1816.18
T10	160.00-140.00	A	1.137	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	209.808	0.000	2099.04
T11	140.00-120.00	A	1.121	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	224.901	0.000	2219.90
T12	120.00-100.00	A	1.103	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	222.735	0.000	2178.43
T13	100.00-80.00	A	1.081	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	220.181	0.000	2130.05
T14	80.00-60.00	A	1.054	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	217.054	0.000	2071.58

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
T15	60.00-40.00	A	1.019	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	212.990	0.000	1996.83
T16	40.00-20.00	A	0.968	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	207.077	0.000	1890.58
T17	20.00-0.00	A	0.867	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	152.573	0.000	1258.36

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
T1	330.00-320.00	0.0000	3.1292	0.0000	2.9308
T2	320.00-300.00	0.0000	4.2033	0.0000	4.8364
T3	300.00-280.00	0.0000	5.2895	0.0000	6.7159
T4	280.00-260.00	0.0000	7.2595	0.0000	9.1507
T5	260.00-240.00	0.0000	8.9525	0.0000	11.5799
T6	240.00-220.00	0.0000	10.9922	0.0000	14.1693
T7	220.00-200.00	0.0000	12.8026	0.0000	16.4173
T8	200.00-180.00	0.0000	13.9021	0.0000	19.0346
T9	180.00-160.00	0.0000	16.2415	0.0000	22.8643
T10	160.00-140.00	0.0000	17.7379	0.0000	26.3590
T11	140.00-120.00	0.0000	19.0778	0.0000	28.3050
T12	120.00-100.00	0.0000	20.0060	0.0000	30.0107
T13	100.00-80.00	0.0000	20.2806	0.0000	31.7831
T14	80.00-60.00	0.0000	19.6366	0.0000	31.9904
T15	60.00-40.00	0.0000	20.2773	0.0000	33.2934
T16	40.00-20.00	0.0000	20.8135	0.0000	34.2855
T17	20.00-0.00	0.0000	20.8335	0.0000	33.4655

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	1		7/8 320.00 - 325.00	0.6000	0.6000
T1	3		7/8 320.00 - 322.00	0.6000	0.6000
T1	49	Feedline Ladder (Af)	320.00 - 330.00	1.0000	0.6000
T2	1		7/8 300.00 - 320.00	0.6000	0.6000
T2	3		7/8 300.00 - 320.00	0.6000	0.6000
T2	5		7/8 300.00 - 313.00	0.6000	0.6000
T2	49	Feedline Ladder (Af)	300.00 - 320.00	1.0000	0.6000

<p>tnxTower</p> <p>Infinifgy Engineering PLLC. 2500 West Higgins Road, Suite 500 Hoffman Estates, IL 60169 Phone: (847) 648-4068 FAX:</p>	Job	626-000	Page	12 of 37
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	Client	Motorola	Designed by	Ray Marshall

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T3	1		7/8 280.00 - 300.00	0.6000	0.6000
T3	3		7/8 280.00 - 300.00	0.6000	0.6000
T3	5		7/8 280.00 - 300.00	0.6000	0.6000
T3	7		1 5/8 280.00 - 295.00	0.6000	0.6000
T3	9		3/8 280.00 - 295.00	0.6000	0.6000
T3	11		7/8 280.00 - 290.00	0.6000	0.6000
T3	49	Feedline Ladder (Af)	280.00 - 300.00	1.0000	0.6000
T4	1		7/8 260.00 - 280.00	0.6000	0.6000
T4	3		7/8 260.00 - 280.00	0.6000	0.6000
T4	5		7/8 260.00 - 280.00	0.6000	0.6000
T4	7		1 5/8 260.00 - 280.00	0.6000	0.6000
T4	9		3/8 260.00 - 280.00	0.6000	0.6000
T4	11		7/8 260.00 - 280.00	0.6000	0.6000
T4	13		1 5/8 260.00 - 277.00	0.6000	0.6000
T4	45	EWP52-59	260.00 - 280.00	1.0000	1.0000
T4	49	Feedline Ladder (Af)	260.00 - 280.00	1.0000	0.6000
T5	1		7/8 240.00 - 260.00	0.6000	0.6000
T5	3		7/8 240.00 - 260.00	0.6000	0.6000
T5	5		7/8 240.00 - 260.00	0.6000	0.6000
T5	7		1 5/8 240.00 - 260.00	0.6000	0.6000
T5	9		3/8 240.00 - 260.00	0.6000	0.6000
T5	11		7/8 240.00 - 260.00	0.6000	0.6000
T5	13		1 5/8 240.00 - 260.00	0.6000	0.6000
T5	15		7/8 240.00 - 250.00	0.6000	0.6000
T5	45	EWP52-59	240.00 - 260.00	1.0000	1.0000
T5	49	Feedline Ladder (Af)	240.00 - 260.00	1.0000	0.6000
T6	1		7/8 220.00 - 240.00	0.6000	0.6000
T6	3		7/8 220.00 - 240.00	0.6000	0.6000
T6	5		7/8 220.00 - 240.00	0.6000	0.6000
T6	7		1 5/8 220.00 - 240.00	0.6000	0.6000
T6	9		3/8 220.00 - 240.00	0.6000	0.6000

<p>tnxTower</p> <p>Infinifgy Engineering PLLC. 2500 West Higgins Road, Suite 500 Hoffman Estates, IL 60169 Phone: (847) 648-4068 FAX:</p>	Job	626-000	Page	13 of 37
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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T6	11	7/8	220.00 - 240.00	0.6000	0.6000
T6	13	1 5/8	220.00 - 240.00	0.6000	0.6000
T6	15	7/8	220.00 - 240.00	0.6000	0.6000
T6	45	EWP52-59	220.00 - 240.00	1.0000	1.0000
T6	47	EWP52-59	220.00 - 230.00	1.0000	1.0000
T6	49	Feedline Ladder (Af)	220.00 - 240.00	1.0000	0.6000
T7	1	7/8	200.00 - 220.00	0.6000	0.6000
T7	3	7/8	200.00 - 220.00	0.6000	0.6000
T7	5	7/8	200.00 - 220.00	0.6000	0.6000
T7	7	1 5/8	200.00 - 220.00	0.6000	0.6000
T7	9	3/8	200.00 - 220.00	0.6000	0.6000
T7	11	7/8	200.00 - 220.00	0.6000	0.6000
T7	13	1 5/8	200.00 - 220.00	0.6000	0.6000
T7	15	7/8	200.00 - 220.00	0.6000	0.6000
T7	17	EW63	200.00 - 215.00	0.6000	0.6000
T7	45	EWP52-59	200.00 - 220.00	1.0000	1.0000
T7	47	EWP52-59	200.00 - 220.00	1.0000	1.0000
T7	49	Feedline Ladder (Af)	200.00 - 220.00	1.0000	0.6000
T8	1	7/8	180.00 - 200.00	0.6000	0.6000
T8	3	7/8	180.00 - 200.00	0.6000	0.6000
T8	5	7/8	180.00 - 200.00	0.6000	0.6000
T8	7	1 5/8	180.00 - 200.00	0.6000	0.6000
T8	9	3/8	180.00 - 200.00	0.6000	0.6000
T8	11	7/8	180.00 - 200.00	0.6000	0.6000
T8	13	1 5/8	180.00 - 200.00	0.6000	0.6000
T8	15	7/8	180.00 - 200.00	0.6000	0.6000
T8	17	EW63	180.00 - 200.00	0.6000	0.6000
T8	19	7/8	180.00 - 197.00	0.6000	0.6000
T8	21	EW63	180.00 - 195.00	0.6000	0.6000
T8	23	3/8	180.00 - 187.00	0.6000	0.6000
T8	25	3/8	180.00 - 184.00	0.6000	0.6000

<p style="text-align: center;">tnxTower</p> <p>Infinifgy Engineering PLLC. 2500 West Higgins Road, Suite 500 Hoffman Estates, IL 60169 Phone: (847) 648-4068 FAX:</p>	Job	626-000	Page	14 of 37
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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T8	45	EWP52-59	180.00 - 200.00	1.0000	1.0000
T8	47	EWP52-59	180.00 - 200.00	1.0000	1.0000
T8	49	Feedline Ladder (Af)	180.00 - 200.00	1.0000	0.6000
T9	1	7/8	160.00 - 180.00	0.6000	0.6000
T9	3	7/8	160.00 - 180.00	0.6000	0.6000
T9	5	7/8	160.00 - 180.00	0.6000	0.6000
T9	7	1 5/8	160.00 - 180.00	0.6000	0.6000
T9	9	3/8	160.00 - 180.00	0.6000	0.6000
T9	11	7/8	160.00 - 180.00	0.6000	0.6000
T9	13	1 5/8	160.00 - 180.00	0.6000	0.6000
T9	15	7/8	160.00 - 180.00	0.6000	0.6000
T9	17	EW63	160.00 - 180.00	0.6000	0.6000
T9	19	7/8	160.00 - 180.00	0.6000	0.6000
T9	21	EW63	160.00 - 180.00	0.6000	0.6000
T9	23	3/8	160.00 - 180.00	0.6000	0.6000
T9	25	3/8	160.00 - 180.00	0.6000	0.6000
T9	27	EW63	160.00 - 174.00	0.6000	0.6000
T9	29	5/8	160.00 - 168.00	0.6000	0.6000
T9	31	3/8	160.00 - 165.00	0.6000	0.6000
T9	33	EW63	160.00 - 165.00	0.6000	0.6000
T9	45	EWP52-59	160.00 - 180.00	1.0000	1.0000
T9	47	EWP52-59	160.00 - 180.00	1.0000	1.0000
T9	49	Feedline Ladder (Af)	160.00 - 180.00	1.0000	0.6000
T10	1	7/8	140.00 - 160.00	0.6000	0.6000
T10	3	7/8	140.00 - 160.00	0.6000	0.6000
T10	5	7/8	140.00 - 160.00	0.6000	0.6000
T10	7	1 5/8	140.00 - 160.00	0.6000	0.6000
T10	9	3/8	140.00 - 160.00	0.6000	0.6000
T10	11	7/8	140.00 - 160.00	0.6000	0.6000
T10	13	1 5/8	140.00 - 160.00	0.6000	0.6000
T10	15	7/8	140.00 - 160.00	0.6000	0.6000

<p style="text-align: center;"><i>tnxTower</i></p> <p>Infinifgy Engineering PLLC. 2500 West Higgins Road, Suite 500 Hoffman Estates, IL 60169 Phone: (847) 648-4068 FAX:</p>	Job	626-000	Page	15 of 37
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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T10	17	EW63	140.00 - 160.00	0.6000	0.6000
T10	19	7/8	140.00 - 160.00	0.6000	0.6000
T10	21	EW63	140.00 - 160.00	0.6000	0.6000
T10	23	3/8	140.00 - 160.00	0.6000	0.6000
T10	25	3/8	140.00 - 160.00	0.6000	0.6000
T10	27	EW63	140.00 - 160.00	0.6000	0.6000
T10	29	5/8	140.00 - 160.00	0.6000	0.6000
T10	31	3/8	140.00 - 160.00	0.6000	0.6000
T10	33	EW63	140.00 - 160.00	0.6000	0.6000
T10	35	1/2	140.00 - 158.00	0.6000	0.6000
T10	37	EW63	140.00 - 150.00	0.6000	0.6000
T10	39	3/8	140.00 - 150.00	0.6000	0.6000
T10	41	EW63	140.00 - 142.00	0.6000	0.6000
T10	45	EWP52-59	140.00 - 160.00	1.0000	1.0000
T10	47	EWP52-59	140.00 - 160.00	1.0000	1.0000
T10	49	Feedline Ladder (Af)	140.00 - 160.00	1.0000	0.6000
T11	1	7/8	120.00 - 140.00	0.6000	0.6000
T11	3	7/8	120.00 - 140.00	0.6000	0.6000
T11	5	7/8	120.00 - 140.00	0.6000	0.6000
T11	7	1 5/8	120.00 - 140.00	0.6000	0.6000
T11	9	3/8	120.00 - 140.00	0.6000	0.6000
T11	11	7/8	120.00 - 140.00	0.6000	0.6000
T11	13	1 5/8	120.00 - 140.00	0.6000	0.6000
T11	15	7/8	120.00 - 140.00	0.6000	0.6000
T11	17	EW63	120.00 - 140.00	0.6000	0.6000
T11	19	7/8	120.00 - 140.00	0.6000	0.6000
T11	21	EW63	120.00 - 140.00	0.6000	0.6000
T11	23	3/8	120.00 - 140.00	0.6000	0.6000
T11	25	3/8	120.00 - 140.00	0.6000	0.6000
T11	27	EW63	120.00 - 140.00	0.6000	0.6000
T11	29	5/8	120.00 - 140.00	0.6000	0.6000

<p>tnxTower</p> <p>Infinifgy Engineering PLLC. 2500 West Higgins Road, Suite 500 Hoffman Estates, IL 60169 Phone: (847) 648-4068 FAX:</p>	Job	626-000	Page	16 of 37
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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T11	31	3/8	120.00 - 140.00	0.6000	0.6000
T11	33	EW63	120.00 - 140.00	0.6000	0.6000
T11	35	1/2	120.00 - 140.00	0.6000	0.6000
T11	37	EW63	120.00 - 140.00	0.6000	0.6000
T11	39	3/8	120.00 - 140.00	0.6000	0.6000
T11	41	EW63	120.00 - 140.00	0.6000	0.6000
T11	45	EWP52-59	120.00 - 140.00	1.0000	1.0000
T11	47	EWP52-59	120.00 - 140.00	1.0000	1.0000
T11	49	Feedline Ladder (Af)	120.00 - 140.00	1.0000	0.6000
T12	1	7/8	100.00 - 120.00	0.6000	0.6000
T12	3	7/8	100.00 - 120.00	0.6000	0.6000
T12	5	7/8	100.00 - 120.00	0.6000	0.6000
T12	7	1 5/8	100.00 - 120.00	0.6000	0.6000
T12	9	3/8	100.00 - 120.00	0.6000	0.6000
T12	11	7/8	100.00 - 120.00	0.6000	0.6000
T12	13	1 5/8	100.00 - 120.00	0.6000	0.6000
T12	15	7/8	100.00 - 120.00	0.6000	0.6000
T12	17	EW63	100.00 - 120.00	0.6000	0.6000
T12	19	7/8	100.00 - 120.00	0.6000	0.6000
T12	21	EW63	100.00 - 120.00	0.6000	0.6000
T12	23	3/8	100.00 - 120.00	0.6000	0.6000
T12	25	3/8	100.00 - 120.00	0.6000	0.6000
T12	27	EW63	100.00 - 120.00	0.6000	0.6000
T12	29	5/8	100.00 - 120.00	0.6000	0.6000
T12	31	3/8	100.00 - 120.00	0.6000	0.6000
T12	33	EW63	100.00 - 120.00	0.6000	0.6000
T12	35	1/2	100.00 - 120.00	0.6000	0.6000
T12	37	EW63	100.00 - 120.00	0.6000	0.6000
T12	39	3/8	100.00 - 120.00	0.6000	0.6000
T12	41	EW63	100.00 - 120.00	0.6000	0.6000
T12	45	EWP52-59	100.00 - 120.00	1.0000	1.0000

tnxTower

Infinifgy Engineering PLLC.
2500 West Higgins Road, Suite 500
Hoffman Estates, IL 60169
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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	47	EWP52-59	100.00 - 120.00	1.0000	1.0000
T12	49	Feedline Ladder (Af)	100.00 - 120.00	1.0000	0.6000
T13	1	7/8	80.00 - 100.00	0.6000	0.6000
T13	3	7/8	80.00 - 100.00	0.6000	0.6000
T13	5	7/8	80.00 - 100.00	0.6000	0.6000
T13	7	1 5/8	80.00 - 100.00	0.6000	0.6000
T13	9	3/8	80.00 - 100.00	0.6000	0.6000
T13	11	7/8	80.00 - 100.00	0.6000	0.6000
T13	13	1 5/8	80.00 - 100.00	0.6000	0.6000
T13	15	7/8	80.00 - 100.00	0.6000	0.6000
T13	17	EW63	80.00 - 100.00	0.6000	0.6000
T13	19	7/8	80.00 - 100.00	0.6000	0.6000
T13	21	EW63	80.00 - 100.00	0.6000	0.6000
T13	23	3/8	80.00 - 100.00	0.6000	0.6000
T13	25	3/8	80.00 - 100.00	0.6000	0.6000
T13	27	EW63	80.00 - 100.00	0.6000	0.6000
T13	29	5/8	80.00 - 100.00	0.6000	0.6000
T13	31	3/8	80.00 - 100.00	0.6000	0.6000
T13	33	EW63	80.00 - 100.00	0.6000	0.6000
T13	35	1/2	80.00 - 100.00	0.6000	0.6000
T13	37	EW63	80.00 - 100.00	0.6000	0.6000
T13	39	3/8	80.00 - 100.00	0.6000	0.6000
T13	41	EW63	80.00 - 100.00	0.6000	0.6000
T13	45	EWP52-59	80.00 - 100.00	1.0000	1.0000
T13	47	EWP52-59	80.00 - 100.00	1.0000	1.0000
T13	49	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T14	1	7/8	60.00 - 80.00	0.6000	0.6000
T14	3	7/8	60.00 - 80.00	0.6000	0.6000
T14	5	7/8	60.00 - 80.00	0.6000	0.6000
T14	7	1 5/8	60.00 - 80.00	0.6000	0.6000
T14	9	3/8	60.00 - 80.00	0.6000	0.6000
T14	11	7/8	60.00 - 80.00	0.6000	0.6000
T14	13	1 5/8	60.00 - 80.00	0.6000	0.6000
T14	15	7/8	60.00 - 80.00	0.6000	0.6000
T14	17	EW63	60.00 - 80.00	0.6000	0.6000
T14	19	7/8	60.00 - 80.00	0.6000	0.6000
T14	21	EW63	60.00 - 80.00	0.6000	0.6000
T14	23	3/8	60.00 - 80.00	0.6000	0.6000
T14	25	3/8	60.00 - 80.00	0.6000	0.6000
T14	27	EW63	60.00 - 80.00	0.6000	0.6000
T14	29	5/8	60.00 - 80.00	0.6000	0.6000
T14	31	3/8	60.00 - 80.00	0.6000	0.6000
T14	33	EW63	60.00 - 80.00	0.6000	0.6000
T14	35	1/2	60.00 - 80.00	0.6000	0.6000
T14	37	EW63	60.00 - 80.00	0.6000	0.6000
T14	39	3/8	60.00 - 80.00	0.6000	0.6000
T14	41	EW63	60.00 - 80.00	0.6000	0.6000
T14	45	EWP52-59	60.00 - 80.00	1.0000	1.0000
T14	47	EWP52-59	60.00 - 80.00	1.0000	1.0000
T14	49	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T15	1	7/8	40.00 - 60.00	0.6000	0.6000
T15	3	7/8	40.00 - 60.00	0.6000	0.6000
T15	5	7/8	40.00 - 60.00	0.6000	0.6000
T15	7	1 5/8	40.00 - 60.00	0.6000	0.6000
T15	9	3/8	40.00 - 60.00	0.6000	0.6000
T15	11	7/8	40.00 - 60.00	0.6000	0.6000
T15	13	1 5/8	40.00 - 60.00	0.6000	0.6000
T15	15	7/8	40.00 - 60.00	0.6000	0.6000
T15	17	EW63	40.00 - 60.00	0.6000	0.6000
T15	19	7/8	40.00 - 60.00	0.6000	0.6000

<p style="text-align: center;">tnxTower</p> <p>Infinifgy Engineering PLLC. 2500 West Higgins Road, Suite 500 Hoffman Estates, IL 60169 Phone: (847) 648-4068 FAX:</p>	Job	626-000	Page	18 of 37
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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T15	21	EW63	40.00 - 60.00	0.6000	0.6000
T15	23	3/8	40.00 - 60.00	0.6000	0.6000
T15	25	3/8	40.00 - 60.00	0.6000	0.6000
T15	27	EW63	40.00 - 60.00	0.6000	0.6000
T15	29	5/8	40.00 - 60.00	0.6000	0.6000
T15	31	3/8	40.00 - 60.00	0.6000	0.6000
T15	33	EW63	40.00 - 60.00	0.6000	0.6000
T15	35	1/2	40.00 - 60.00	0.6000	0.6000
T15	37	EW63	40.00 - 60.00	0.6000	0.6000
T15	39	3/8	40.00 - 60.00	0.6000	0.6000
T15	41	EW63	40.00 - 60.00	0.6000	0.6000
T15	45	EWP52-59	40.00 - 60.00	1.0000	1.0000
T15	47	EWP52-59	40.00 - 60.00	1.0000	1.0000
T15	49	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T16	1	7/8	20.00 - 40.00	0.6000	0.6000
T16	3	7/8	20.00 - 40.00	0.6000	0.6000
T16	5	7/8	20.00 - 40.00	0.6000	0.6000
T16	7	1 5/8	20.00 - 40.00	0.6000	0.6000
T16	9	3/8	20.00 - 40.00	0.6000	0.6000
T16	11	7/8	20.00 - 40.00	0.6000	0.6000
T16	13	1 5/8	20.00 - 40.00	0.6000	0.6000
T16	15	7/8	20.00 - 40.00	0.6000	0.6000
T16	17	EW63	20.00 - 40.00	0.6000	0.6000
T16	19	7/8	20.00 - 40.00	0.6000	0.6000
T16	21	EW63	20.00 - 40.00	0.6000	0.6000
T16	23	3/8	20.00 - 40.00	0.6000	0.6000
T16	25	3/8	20.00 - 40.00	0.6000	0.6000
T16	27	EW63	20.00 - 40.00	0.6000	0.6000
T16	29	5/8	20.00 - 40.00	0.6000	0.6000
T16	31	3/8	20.00 - 40.00	0.6000	0.6000
T16	33	EW63	20.00 - 40.00	0.6000	0.6000
T16	35	1/2	20.00 - 40.00	0.6000	0.6000
T16	37	EW63	20.00 - 40.00	0.6000	0.6000
T16	39	3/8	20.00 - 40.00	0.6000	0.6000
T16	41	EW63	20.00 - 40.00	0.6000	0.6000
T16	45	EWP52-59	20.00 - 40.00	1.0000	1.0000
T16	47	EWP52-59	20.00 - 40.00	1.0000	1.0000
T16	49	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T17	1	7/8	5.00 - 20.00	0.6000	0.6000
T17	3	7/8	5.00 - 20.00	0.6000	0.6000
T17	5	7/8	5.00 - 20.00	0.6000	0.6000
T17	7	1 5/8	5.00 - 20.00	0.6000	0.6000
T17	9	3/8	5.00 - 20.00	0.6000	0.6000
T17	11	7/8	5.00 - 20.00	0.6000	0.6000
T17	13	1 5/8	5.00 - 20.00	0.6000	0.6000
T17	15	7/8	5.00 - 20.00	0.6000	0.6000
T17	17	EW63	5.00 - 20.00	0.6000	0.6000
T17	19	7/8	5.00 - 20.00	0.6000	0.6000
T17	21	EW63	5.00 - 20.00	0.6000	0.6000
T17	23	3/8	5.00 - 20.00	0.6000	0.6000
T17	25	3/8	5.00 - 20.00	0.6000	0.6000
T17	27	EW63	5.00 - 20.00	0.6000	0.6000
T17	29	5/8	5.00 - 20.00	0.6000	0.6000
T17	31	3/8	5.00 - 20.00	0.6000	0.6000
T17	33	EW63	5.00 - 20.00	0.6000	0.6000
T17	35	1/2	5.00 - 20.00	0.6000	0.6000
T17	37	EW63	5.00 - 20.00	0.6000	0.6000
T17	39	3/8	5.00 - 20.00	0.6000	0.6000
T17	41	EW63	5.00 - 20.00	0.6000	0.6000
T17	43	3/8	5.00 - 20.00	0.6000	0.6000
T17	45	EWP52-59	5.00 - 20.00	1.0000	1.0000
T17	47	EWP52-59	5.00 - 20.00	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T17	49	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	lb	
Flash Beacon Lighting	B	From Leg	0.00	0.00	0.0000	330.00	No Ice	2.70	2.70	50.00
			0.00	0.00			1/2" Ice	3.10	3.10	70.00
			0.00	0.00			1" Ice	3.50	3.50	90.00
Lightning Rod	C	From Leg	0.00	0.00	0.0000	330.00	No Ice	1.00	1.00	1.00
			0.00	0.00			1/2" Ice	2.02	2.02	10.26
			2.00	0.00			1" Ice	3.05	3.05	25.89

12' Omni	A	From Leg	6.00	0.00	0.0000	325.00	No Ice	3.60	3.60	12.00
			0.00	0.00			1/2" Ice	4.83	4.83	38.06
			2.00	0.00			1" Ice	6.08	6.08	71.92
6' Stand-Off	A	From Leg	0.00	0.00	0.0000	325.00	No Ice	0.46	3.55	150.00
			0.00	0.00			1/2" Ice	0.62	4.93	175.00
			0.00	0.00			1" Ice	0.78	5.89	200.00

12' Omni	B	From Leg	6.00	0.00	0.0000	325.00	No Ice	3.60	3.60	12.00
			0.00	0.00			1/2" Ice	4.83	4.83	38.06
			2.00	0.00			1" Ice	6.08	6.08	71.92
6' Stand-Off	B	From Leg	0.00	0.00	0.0000	325.00	No Ice	0.46	3.55	150.00
			0.00	0.00			1/2" Ice	0.62	4.93	175.00
			0.00	0.00			1" Ice	0.78	5.89	200.00

Pipe Mount	A	From Leg	0.00	0.00	0.0000	322.00	No Ice	2.52	2.52	72.88
			0.00	0.00			1/2" Ice	3.63	3.63	107.29
			0.00	0.00			1" Ice	4.13	4.13	146.69
12"x12"x4" TTA	C	From Leg	0.00	0.00	0.0000	316.00	No Ice	1.20	0.41	40.00
			0.00	0.00			1/2" Ice	1.34	0.50	48.72
			0.00	0.00			1" Ice	1.48	0.59	59.44

12' Omni	C	From Leg	6.00	0.00	0.0000	313.00	No Ice	3.60	3.60	12.00
			0.00	0.00			1/2" Ice	4.83	4.83	38.06
			2.00	0.00			1" Ice	6.08	6.08	71.92
6' Stand-Off	C	From Leg	0.00	0.00	0.0000	313.00	No Ice	0.46	3.55	150.00
			0.00	0.00			1/2" Ice	0.62	4.93	175.00
			0.00	0.00			1" Ice	0.78	5.89	200.00

BPS10-A-B1	C	From Leg	4.00	0.00	0.0000	295.00	No Ice	4.64	4.64	57.00
			0.00	0.00			1/2" Ice	10.17	10.17	119.41
			2.00	0.00			1" Ice	11.02	11.02	191.21
BPS10-A-B1	C	From Leg	4.00	0.00	0.0000	295.00	No Ice	4.64	4.64	57.00
			12.00	0.00			1/2" Ice	10.17	10.17	119.41
			2.00	0.00			1" Ice	11.02	11.02	191.21
18"x12"x6" Box	C	From Leg	2.00	0.00	0.0000	295.00	No Ice	1.80	0.92	40.00
			2.00	0.00			1/2" Ice	1.97	1.05	54.03
			0.00	0.00			1" Ice	2.15	1.19	70.59

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral					
2' Stand-off	B	From Leg	0.00	0.0000	184.00	No Ice	0.46	3.55	150.00
			0.00			1/2" Ice	0.62	4.93	175.00
			0.00			1" Ice	0.78	5.89	200.00

Pipe Mount	B	From Leg	0.00	0.0000	174.00	No Ice	2.69	2.69	72.88
			0.00			1/2" Ice	3.63	3.63	107.29
			0.00			1" Ice	4.13	4.13	146.69

10' Omni	C	From Leg	4.00	0.0000	168.00	No Ice	3.00	3.00	33.30
			0.00			1/2" Ice	4.03	4.03	55.09
			2.00			1" Ice	5.03	5.03	83.44
4' Stand-off	C	From Leg	0.00	0.0000	168.00	No Ice	0.46	3.55	150.00
			0.00			1/2" Ice	0.62	4.93	175.00
			0.00			1" Ice	0.78	5.89	200.00

Pipe Mount	B	From Leg	0.00	0.0000	165.00	No Ice	2.70	2.70	72.88
			0.00			1/2" Ice	3.63	3.63	107.29
			0.00			1" Ice	4.13	4.13	146.69

Beacon	A	From Leg	0.00	0.0000	158.00	No Ice	2.00	2.00	20.00
			0.00			1/2" Ice	0.00	0.00	26.00
			0.00			1" Ice	0.00	0.00	32.00
Beacon	B	From Leg	0.00	0.0000	158.00	No Ice	2.00	2.00	20.00
			0.00			1/2" Ice	0.00	0.00	26.00
			0.00			1" Ice	0.00	0.00	32.00
Beacon	C	From Leg	0.00	0.0000	158.00	No Ice	2.00	2.00	20.00
			0.00			1/2" Ice	0.00	0.00	26.00
			0.00			1" Ice	0.00	0.00	32.00

Pipe Mount	A	From Leg	0.00	0.0000	150.00	No Ice	2.73	2.73	72.88
			0.00			1/2" Ice	3.63	3.63	107.29
			0.00			1" Ice	4.13	4.13	146.69

Pipe Mount	B	From Leg	0.00	0.0000	150.00	No Ice	2.73	2.73	72.88
			0.00			1/2" Ice	3.63	3.63	107.29
			0.00			1" Ice	4.13	4.13	146.69

Pipe Mount	A	From Leg	0.00	0.0000	142.00	No Ice	2.75	2.75	72.88
			0.00			1/2" Ice	3.63	3.63	107.29
			0.00			1" Ice	4.13	4.13	146.69

2' Stand-off	B	From Leg	0.00	0.0000	85.00	No Ice	0.46	3.55	150.00
			0.00			1/2" Ice	0.62	4.93	175.00
			0.00			1" Ice	0.78	5.89	200.00

2' Stand-off	B	From Leg	0.00	0.0000	75.00	No Ice	0.46	3.55	150.00
			0.00			1/2" Ice	0.62	4.93	175.00
			0.00			1" Ice	0.78	5.89	200.00

4' Omni	A	From Leg	2.00	0.0000	20.00	No Ice	1.00	1.00	15.00
			0.00			1/2" Ice	1.25	1.25	23.96
			0.00			1" Ice	1.50	1.50	35.82
4' Omni	B	From Leg	2.00	0.0000	20.00	No Ice	1.00	1.00	15.00
			0.00			1/2" Ice	1.25	1.25	23.96
			0.00			1" Ice	1.50	1.50	35.82
4' Omni	C	From Leg	2.00	0.0000	20.00	No Ice	1.00	1.00	15.00
			0.00			1/2" Ice	1.25	1.25	23.96
			0.00			1" Ice	1.50	1.50	35.82

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight lb
2' Stand-off	A	From Leg	0.00 0.00 0.00	0.0000	20.00	No Ice 0.46 1/2" Ice 0.62 1" Ice 0.78	3.55 4.93 5.89	150.00 175.00 200.00
2' Stand-off	B	From Leg	0.00 0.00 0.00	0.0000	20.00	No Ice 0.46 1/2" Ice 0.62 1" Ice 0.78	3.55 4.93 5.89	150.00 175.00 200.00
2' Stand-off	C	From Leg	0.00 0.00 0.00	0.0000	20.00	No Ice 0.46 1/2" Ice 0.62 1" Ice 0.78	3.55 4.93 5.89	150.00 175.00 200.00

Pipe Mount	B	From Leg	0.00 0.00 0.00	0.0000	280.00	No Ice 2.56 1/2" Ice 3.63 1" Ice 4.13	2.56 3.63 4.13	72.88 107.29 146.69
Pipe Mount	B	From Leg	0.00 0.00 0.00	0.0000	230.00	No Ice 2.61 1/2" Ice 3.63 1" Ice 4.13	2.61 3.63 4.13	72.88 107.29 146.69

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb
VHLP2-18-1GR	A	Paraboloid w/Shroud (HP)	From Leg	0.50 0.00 0.00	0.0000		322.00	2.17	No Ice 3.72 1/2" Ice 4.01 1" Ice 4.30	31.00 51.58 72.17

PAR8-59W-PXA w/Radome	A	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	0.0000		215.00	8.00	No Ice 50.27 1/2" Ice 51.32 1" Ice 52.37	276.00 264.44 527.89

6' Dish w/ Radome	A	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	0.0000		195.00	6.00	No Ice 28.27 1/2" Ice 29.07 1" Ice 29.86	250.00 399.23 548.45

6' Dish w/ Radome	C	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	0.0000		195.00	6.00	No Ice 28.27 1/2" Ice 29.07 1" Ice 29.86	250.00 399.23 548.45

2' HP Dish	B	Paraboloid w/Shroud (HP)	From Leg	0.50 0.00 0.00	0.0000		187.00	2.00	No Ice 3.14 1/2" Ice 3.41 1" Ice 3.68	25.00 42.50 60.01

2'x2' Dish	B	Grid	From Leg	0.50 0.00 0.00	0.0000		184.00	3.00	No Ice 7.07 1/2" Ice 7.47 1" Ice 7.86	40.00 78.35 116.69

2'x2' Dish	A	Grid	From Leg	0.50 0.00 0.00	0.0000		165.00	3.00	No Ice 7.07 1/2" Ice 7.47 1" Ice 7.86	40.00 78.35 116.69

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Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft ²	Weight lb
*** D8F-2	A	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	0.0000		165.00	8.00	No Ice 1/2" Ice 1" Ice	50.27 51.32 52.37	500.00 763.44 1026.89
*** 6' HP Dish	A	Paraboloid w/Shroud (HP)	From Leg	0.50 0.00 0.00	0.0000		150.00	6.00	No Ice 1/2" Ice 1" Ice	28.27 29.07 29.86	280.00 430.00 580.00
*** 6' HP Dish	B	Paraboloid w/Shroud (HP)	From Leg	0.50 0.00 0.00	0.0000		150.00	6.00	No Ice 1/2" Ice 1" Ice	28.27 29.07 29.86	280.00 430.00 580.00
*** VHLP4-105	A	Paraboloid w/Shroud (HP)	From Leg	0.50 0.00 0.00	0.0000		142.00	4.11	No Ice 1/2" Ice 1" Ice	13.26 13.80 14.34	101.00 171.84 242.68
*** PAR8-59W	B	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	0.0000		280.00	8.00	No Ice 1/2" Ice 1" Ice	50.27 51.32 52.37	380.00 643.44 906.89
*** PAR8-59W	B	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	0.0000		230.00	8.00	No Ice 1/2" Ice 1" Ice	50.27 51.32 52.37	380.00 643.44 906.89

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	1.2D+1.0W (pattern 1) 0 deg - No Ice
4	1.2D+1.0W (pattern 2) 0 deg - No Ice
5	1.2D+1.0W (pattern 3) 0 deg - No Ice
6	1.2D+1.0W (pattern 4) 0 deg - No Ice
7	1.2D+1.0W (pattern 5) 0 deg - No Ice
8	1.2D+1.0W (pattern 6) 0 deg - No Ice
9	0.9 Dead+1.0 Wind 0 deg - No Ice
10	1.2 Dead+1.0 Wind 30 deg - No Ice
11	1.2D+1.0W (pattern 1) 30 deg - No Ice
12	1.2D+1.0W (pattern 2) 30 deg - No Ice
13	1.2D+1.0W (pattern 3) 30 deg - No Ice
14	1.2D+1.0W (pattern 4) 30 deg - No Ice
15	1.2D+1.0W (pattern 5) 30 deg - No Ice
16	1.2D+1.0W (pattern 6) 30 deg - No Ice
17	0.9 Dead+1.0 Wind 30 deg - No Ice
18	1.2 Dead+1.0 Wind 60 deg - No Ice
19	1.2D+1.0W (pattern 1) 60 deg - No Ice
20	1.2D+1.0W (pattern 2) 60 deg - No Ice
21	1.2D+1.0W (pattern 3) 60 deg - No Ice
22	1.2D+1.0W (pattern 4) 60 deg - No Ice
23	1.2D+1.0W (pattern 5) 60 deg - No Ice
24	1.2D+1.0W (pattern 6) 60 deg - No Ice
25	0.9 Dead+1.0 Wind 60 deg - No Ice
26	1.2 Dead+1.0 Wind 90 deg - No Ice
27	1.2D+1.0W (pattern 1) 90 deg - No Ice
28	1.2D+1.0W (pattern 2) 90 deg - No Ice

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<i>Comb. No.</i>	<i>Description</i>
29	1.2D+1.0W (pattern 3) 90 deg - No Ice
30	1.2D+1.0W (pattern 4) 90 deg - No Ice
31	1.2D+1.0W (pattern 5) 90 deg - No Ice
32	1.2D+1.0W (pattern 6) 90 deg - No Ice
33	0.9 Dead+1.0 Wind 90 deg - No Ice
34	1.2 Dead+1.0 Wind 120 deg - No Ice
35	1.2D+1.0W (pattern 1) 120 deg - No Ice
36	1.2D+1.0W (pattern 2) 120 deg - No Ice
37	1.2D+1.0W (pattern 3) 120 deg - No Ice
38	1.2D+1.0W (pattern 4) 120 deg - No Ice
39	1.2D+1.0W (pattern 5) 120 deg - No Ice
40	1.2D+1.0W (pattern 6) 120 deg - No Ice
41	0.9 Dead+1.0 Wind 120 deg - No Ice
42	1.2 Dead+1.0 Wind 150 deg - No Ice
43	1.2D+1.0W (pattern 1) 150 deg - No Ice
44	1.2D+1.0W (pattern 2) 150 deg - No Ice
45	1.2D+1.0W (pattern 3) 150 deg - No Ice
46	1.2D+1.0W (pattern 4) 150 deg - No Ice
47	1.2D+1.0W (pattern 5) 150 deg - No Ice
48	1.2D+1.0W (pattern 6) 150 deg - No Ice
49	0.9 Dead+1.0 Wind 150 deg - No Ice
50	1.2 Dead+1.0 Wind 180 deg - No Ice
51	1.2D+1.0W (pattern 1) 180 deg - No Ice
52	1.2D+1.0W (pattern 2) 180 deg - No Ice
53	1.2D+1.0W (pattern 3) 180 deg - No Ice
54	1.2D+1.0W (pattern 4) 180 deg - No Ice
55	1.2D+1.0W (pattern 5) 180 deg - No Ice
56	1.2D+1.0W (pattern 6) 180 deg - No Ice
57	0.9 Dead+1.0 Wind 180 deg - No Ice
58	1.2 Dead+1.0 Wind 210 deg - No Ice
59	1.2D+1.0W (pattern 1) 210 deg - No Ice
60	1.2D+1.0W (pattern 2) 210 deg - No Ice
61	1.2D+1.0W (pattern 3) 210 deg - No Ice
62	1.2D+1.0W (pattern 4) 210 deg - No Ice
63	1.2D+1.0W (pattern 5) 210 deg - No Ice
64	1.2D+1.0W (pattern 6) 210 deg - No Ice
65	0.9 Dead+1.0 Wind 210 deg - No Ice
66	1.2 Dead+1.0 Wind 240 deg - No Ice
67	1.2D+1.0W (pattern 1) 240 deg - No Ice
68	1.2D+1.0W (pattern 2) 240 deg - No Ice
69	1.2D+1.0W (pattern 3) 240 deg - No Ice
70	1.2D+1.0W (pattern 4) 240 deg - No Ice
71	1.2D+1.0W (pattern 5) 240 deg - No Ice
72	1.2D+1.0W (pattern 6) 240 deg - No Ice
73	0.9 Dead+1.0 Wind 240 deg - No Ice
74	1.2 Dead+1.0 Wind 270 deg - No Ice
75	1.2D+1.0W (pattern 1) 270 deg - No Ice
76	1.2D+1.0W (pattern 2) 270 deg - No Ice
77	1.2D+1.0W (pattern 3) 270 deg - No Ice
78	1.2D+1.0W (pattern 4) 270 deg - No Ice
79	1.2D+1.0W (pattern 5) 270 deg - No Ice
80	1.2D+1.0W (pattern 6) 270 deg - No Ice
81	0.9 Dead+1.0 Wind 270 deg - No Ice
82	1.2 Dead+1.0 Wind 300 deg - No Ice
83	1.2D+1.0W (pattern 1) 300 deg - No Ice
84	1.2D+1.0W (pattern 2) 300 deg - No Ice
85	1.2D+1.0W (pattern 3) 300 deg - No Ice
86	1.2D+1.0W (pattern 4) 300 deg - No Ice
87	1.2D+1.0W (pattern 5) 300 deg - No Ice
88	1.2D+1.0W (pattern 6) 300 deg - No Ice
89	0.9 Dead+1.0 Wind 300 deg - No Ice
90	1.2 Dead+1.0 Wind 330 deg - No Ice

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<i>Comb. No.</i>	<i>Description</i>
91	1.2D+1.0W (pattern 1) 330 deg - No Ice
92	1.2D+1.0W (pattern 2) 330 deg - No Ice
93	1.2D+1.0W (pattern 3) 330 deg - No Ice
94	1.2D+1.0W (pattern 4) 330 deg - No Ice
95	1.2D+1.0W (pattern 5) 330 deg - No Ice
96	1.2D+1.0W (pattern 6) 330 deg - No Ice
97	0.9 Dead+1.0 Wind 330 deg - No Ice
98	1.2 Dead+1.0 Ice+1.0 Temp
99	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
100	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
101	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
102	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
103	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
104	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
105	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
106	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
107	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
108	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
109	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
110	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
111	Dead+Wind 0 deg - Service
112	Dead+Wind 30 deg - Service
113	Dead+Wind 60 deg - Service
114	Dead+Wind 90 deg - Service
115	Dead+Wind 120 deg - Service
116	Dead+Wind 150 deg - Service
117	Dead+Wind 180 deg - Service
118	Dead+Wind 210 deg - Service
119	Dead+Wind 240 deg - Service
120	Dead+Wind 270 deg - Service
121	Dead+Wind 300 deg - Service
122	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

<i>Section No.</i>	<i>Elevation ft</i>	<i>Horz. Deflection in</i>	<i>Gov. Load Comb.</i>	<i>Tilt °</i>	<i>Twist °</i>
T1	330 - 320	11.573	119	0.3423	0.1367
T2	320 - 300	10.855	119	0.3419	0.1373
T3	300 - 280	9.428	119	0.3311	0.1385
T4	280 - 260	8.067	119	0.3049	0.1331
T5	260 - 240	6.835	119	0.2702	0.1022
T6	240 - 220	5.751	115	0.2403	0.0809
T7	220 - 200	4.772	115	0.2106	0.0596
T8	200 - 180	3.898	115	0.1832	0.0439
T9	180 - 160	3.150	115	0.1573	0.0370
T10	160 - 140	2.503	115	0.1351	0.0295
T11	140 - 120	1.936	115	0.1180	0.0269
T12	120 - 100	1.441	115	0.0986	0.0242
T13	100 - 80	1.036	115	0.0805	0.0208
T14	80 - 60	0.686	115	0.0644	0.0169
T15	60 - 40	0.403	111	0.0473	0.0128
T16	40 - 20	0.205	111	0.0300	0.0084
T17	20 - 0	0.049	111	0.0145	0.0039

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Critical Deflections and Radius of Curvature - Service Wind

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
330.00	Flash Beacon Lighting	119	11.573	0.3423	0.1367	Inf
325.00	12' Omni	119	11.214	0.3423	0.1370	Inf
322.00	VHLP2-18-1GR	119	10.998	0.3422	0.1372	805994
316.00	12"x12"x4" TTA	119	10.567	0.3410	0.1376	291337
313.00	12' Omni	119	10.352	0.3399	0.1377	204195
295.00	BPS10-A-B1	119	9.079	0.3260	0.1389	58403
290.00	SD212	119	8.735	0.3198	0.1386	47139
280.00	PAR8-59W	119	8.067	0.3049	0.1331	34680
277.00	BPS10-A-B1	119	7.872	0.2999	0.1296	33565
265.00	12"x12"x4" Box	119	7.129	0.2787	0.1102	31686
250.00	SD212	115	6.276	0.2548	0.0903	38648
230.00	PAR8-59W	115	5.250	0.2254	0.0703	49299
215.00	PAR8-59W-PXA w/ Radome	115	4.542	0.2035	0.0548	42891
203.00	DB222-A	115	4.021	0.1872	0.0456	34992
197.00	10' Dipole	115	3.778	0.1792	0.0425	35137
195.00	6' Dish w/ Radome	115	3.699	0.1765	0.0417	36304
187.00	2' HP Dish	115	3.399	0.1661	0.0392	42214
184.00	2'x2' Dish	115	3.291	0.1623	0.0383	44955
174.00	Pipe Mount	115	2.947	0.1501	0.0347	52125
168.00	10' Omni	115	2.752	0.1432	0.0322	55386
165.00	2'x2' Dish	115	2.657	0.1400	0.0311	57174
158.00	Beacon	115	2.443	0.1332	0.0290	61693
150.00	6' HP Dish	115	2.211	0.1264	0.0277	67411
142.00	VHLP4-105	115	1.989	0.1198	0.0270	73640
85.00	2' Stand-off	115	0.769	0.0684	0.0179	86482
75.00	2' Stand-off	115	0.607	0.0602	0.0158	64533
20.00	4' Omni	111	0.049	0.0145	0.0039	32074

Maximum Tower Deflections - Design Wind

<i>Section No.</i>	<i>Elevation ft</i>	<i>Horz. Deflection in</i>	<i>Gov. Load Comb.</i>	<i>Tilt °</i>	<i>Twist °</i>
T1	330 - 320	42.433	66	1.2514	0.5339
T2	320 - 300	39.807	66	1.2494	0.5363
T3	300 - 280	34.597	66	1.2093	0.5407
T4	280 - 260	29.621	66	1.1155	0.5209
T5	260 - 240	25.112	66	0.9900	0.4071
T6	240 - 220	21.118	66	0.8818	0.3288
T7	220 - 200	17.519	34	0.7734	0.2550
T8	200 - 180	14.310	2	0.6728	0.1940
T9	180 - 160	11.569	2	0.5779	0.1641
T10	160 - 140	9.195	2	0.4958	0.1326
T11	140 - 120	7.111	2	0.4331	0.1195
T12	120 - 100	5.296	2	0.3618	0.1051
T13	100 - 80	3.810	2	0.2954	0.0885
T14	80 - 60	2.525	2	0.2361	0.0706
T15	60 - 40	1.482	2	0.1734	0.0531
T16	40 - 20	0.753	2	0.1100	0.0346
T17	20 - 0	0.178	9	0.0533	0.0158

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Critical Deflections and Radius of Curvature - Design Wind

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
330.00	Flash Beacon Lighting	66	42.433	1.2514	0.5339	506317
325.00	12' Omni	66	41.120	1.2512	0.5351	506317
322.00	VHLP2-18-1GR	66	40.332	1.2504	0.5359	292015
316.00	12"x12"x4" TTA	66	38.758	1.2457	0.5371	87597
313.00	12' Omni	66	37.972	1.2416	0.5377	57461
295.00	BPS10-A-B1	66	33.321	1.1906	0.5419	16261
290.00	SD212	66	32.063	1.1686	0.5409	12902
280.00	PAR8-59W	66	29.621	1.1155	0.5209	9351
277.00	BPS10-A-B1	66	28.911	1.0974	0.5080	9118
265.00	12"x12"x4" Box	66	26.189	1.0209	0.4366	8707
250.00	SD212	66	23.059	0.9342	0.3630	10495
230.00	PAR8-59W	34	19.273	0.8276	0.2925	12889
215.00	PAR8-59W-PXA w/ Radome	34	16.676	0.7474	0.2372	11310
203.00	DB222-A	2	14.762	0.6875	0.2009	9545
197.00	10' Dipole	2	13.870	0.6582	0.1882	9584
195.00	6' Dish w/ Radome	2	13.582	0.6486	0.1848	9903
187.00	2' HP Dish	2	12.480	0.6104	0.1735	11515
184.00	2'x2' Dish	2	12.083	0.5963	0.1696	12263
174.00	Pipe Mount	2	10.822	0.5511	0.1544	14219
168.00	10' Omni	2	10.106	0.5258	0.1442	15110
165.00	2'x2' Dish	2	9.759	0.5140	0.1395	15598
158.00	Beacon	2	8.974	0.4890	0.1305	16824
150.00	6' HP Dish	2	8.121	0.4639	0.1245	18349
142.00	VHLP4-105	2	7.308	0.4396	0.1205	19999
85.00	2' Stand-off	2	2.829	0.2509	0.0750	23649
75.00	2' Stand-off	2	2.235	0.2209	0.0662	17599
20.00	4' Omni	9	0.178	0.0533	0.0158	8695

Bolt Design Data

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Bolt Grade</i>	<i>Bolt Size in</i>	<i>Number Of Bolts</i>	<i>Maximum Load per Bolt lb</i>	<i>Allowable Load per Bolt lb</i>	<i>Ratio Load Allowable</i>	<i>Allowable Ratio</i>	<i>Criteria</i>
T1	330	Leg	A325N	0.7500	8	168.12	30101.40	0.006 ✓	1	Bolt Tension
T2	320	Leg	A325N	0.7500	8	1732.88	30101.40	0.058 ✓	1	Bolt Tension
T3	300	Leg	A325N	0.7500	8	4970.14	30101.40	0.165 ✓	1	Bolt Tension
T4	280	Leg	A325N	0.7500	8	8267.05	30101.40	0.275 ✓	1	Bolt Tension
T5	260	Leg	A325N	0.7500	8	10594.40	30101.40	0.352 ✓	1	Bolt Tension
T6	240	Leg	A325N	0.7500	8	13716.40	30101.40	0.456 ✓	1	Bolt Tension
T7	220	Leg	A325N	1.0000	8	17303.80	54517.00	0.317 ✓	1	Bolt Tension
T8	200	Leg	A325N	1.0000	8	20826.60	54517.00	0.382 ✓	1	Bolt Tension
T9	180	Leg	A325N	1.0000	8	23440.60	54517.00	0.430 ✓	1	Bolt Tension
T10	160	Leg	A325N	1.2500	8	28192.60	87219.80	0.323 ✓	1	Bolt Tension
T11	140	Leg	A325N	1.2500	8	33676.10	87219.80	0.386 ✓	1	Bolt Tension
T12	120	Leg	A325N	1.5000	8	37151.40	126472.00	0.294 ✓	1	Bolt Tension
T13	100	Leg	A325N	1.5000	8	41276.00	126472.00	0.326 ✓	1	Bolt Tension

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T14	80	Leg	A325N	1.5000	8	46064.70	126472.00	0.364 ✓	1	Bolt Tension
T15	60	Leg	A325N	1.5000	8	49280.10	126472.00	0.390 ✓	1	Bolt Tension
T16	40	Leg	A325N	1.5000	8	53645.70	126472.00	0.424 ✓	1	Bolt Tension
T17	20	Leg	A325N	1.5000	8	53884.90	126472.00	0.426 ✓	1	Bolt Tension
		Horizontal	A325N	0.7500	2	7285.99	39760.80	0.183 ✓	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio P _u φP _n
T1	330 - 320	2	10.00	5.00	120.0 K=1.00	3.1416	-1954.84	49286.40	0.040 ¹ ✓
T2	320 - 300	2 1/4	20.00	5.00	106.7 K=1.00	3.9761	-16468.90	77870.40	0.211 ¹ ✓
T3	300 - 280	2 3/4	20.00	5.00	87.3 K=1.00	5.9396	-46832.10	153147.00	0.306 ¹ ✓
T4	280 - 260	3	20.02	5.00	80.1 K=1.00	7.0686	-77330.60	199056.00	0.388 ¹ ✓
T5	260 - 240	3 1/4	20.03	5.01	74.0 K=1.00	8.2958	-97986.70	250252.00	0.392 ¹ ✓
T6	240 - 220	3 1/4	20.01	5.00	73.9 K=1.00	8.2958	-125453.00	250426.00	0.501 ¹ ✓
T7	220 - 200	3 1/2	20.01	5.00	68.6 K=1.00	9.6211	-157133.00	306835.00	0.512 ¹ ✓
T8	200 - 180	3 3/4	20.02	5.00	64.1 K=1.00	11.0447	-190757.00	368176.00	0.518 ¹ ✓
T9	180 - 160	4	20.04	5.01	60.1 K=1.00	12.5664	-217467.00	434172.00	0.501 ¹ ✓
T10	160 - 140	4 3/4	20.00	6.67	67.4 K=1.00	17.7205	-263234.00	572143.00	0.460 ¹ ✓
T11	140 - 120	4 3/4	20.01	6.67	67.4 K=1.00	17.7205	-314640.00	572074.00	0.550 ¹ ✓
T12	120 - 100	5	20.04	6.68	64.1 K=1.00	19.6350	-350306.00	654188.00	0.535 ¹ ✓
T13	100 - 80	5 1/4	20.02	6.67	61.0 K=1.00	21.6475	-392070.00	742082.00	0.528 ¹ ✓
T14	80 - 60	5 1/4	20.01	6.67	61.0 K=1.00	21.6475	-439912.00	742186.00	0.593 ¹ ✓
T15	60 - 40	5 1/4	20.04	6.68	61.1 K=1.00	21.6475	-473926.00	741625.00	0.639 ¹ ✓
T16	40 - 20	5 1/2	20.01	6.67	58.2 K=1.00	23.7583	-517778.00	834440.00	0.621 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T17	20 - 0	5 3/4	20.02	6.67	55.7 K=1.00	25.9672	-528689.00	931333.00	0.568 ¹ ✓ ✓

¹ P_u / φP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	330 - 320	L1 3/4x1 3/4x3/16	6.40	3.07	110.4 K=1.03	0.6211	-1002.12	13790.00	0.073 ¹ ✓
T2	320 - 300	L1 3/4x1 3/4x3/16	6.40	3.05	110.0 K=1.03	0.6211	-1755.49	13857.70	0.127 ¹ ✓
T3	300 - 280	L1 3/4x1 3/4x3/16	6.40	3.02	109.1 K=1.03	0.6211	-3997.49	13992.30	0.286 ¹ ✓
T4	280 - 260	L2x2x1/8	7.25	3.57	110.9 K=1.03	0.4844	-3510.23	10554.70	0.333 ¹ ✓
T5	260 - 240	L2x2x1/8	8.68	4.32	127.9 K=0.98	0.4844	-3001.48	8468.11	0.354 ¹ ✓
T6	240 - 220	L2x2x1/8	9.80	4.83	139.7 K=0.96	0.4844	-5288.08	7100.50	0.745 ¹ ✓
T7	220 - 200	L2x2x1/8	10.96	5.41	153.0 K=0.94	0.4844	-5284.54	5919.12	0.893 ¹ ✓
T8	200 - 180	L2 1/2x2 1/2x3/16	12.30	6.08	140.9 K=0.96	0.9020	-6305.98	13003.70	0.485 ¹ ✓
T9	180 - 160	L2 1/2x2 1/2x3/16	14.22	7.08	159.3 K=0.93	0.9020	-5233.57	10172.60	0.514 ¹ ✓
T10	160 - 140	L3 1/2x3 1/2x1/4	15.69	7.70	130.0 K=0.98	1.6900	-11832.00	28619.70	0.413 ¹ ✓
T11	140 - 120	L3 1/2x3 1/2x1/4	16.56	8.16	136.1 K=0.96	1.6900	-12129.60	26123.10	0.464 ¹ ✓
T12	120 - 100	L3 1/2x3 1/2x1/4	18.33	9.13	148.9 K=0.94	1.6900	-7930.48	21828.20	0.363 ¹ ✓
T13	100 - 80	L3 1/2x3 1/2x1/4	19.75	9.77	157.3 K=0.93	1.6900	-12005.80	19543.40	0.614 ¹ ✓
T14	80 - 60	L4x4x1/4	20.90	10.32	147.3 K=0.95	1.9400	-14791.00	25588.80	0.578 ¹ ✓
T15	60 - 40	L4x4x1/4	22.81	11.36	159.3 K=0.93	1.9400	-9429.56	21881.80	0.431 ¹ ✓
T16	40 - 20	L4x4x1/4	24.15	11.95	166.0 K=0.92	1.9400	-15720.30	20152.40	0.780 ¹ ✓
T17	20 - 0	2L3x3x1/4x3/8	23.57	23.11	208.6 K=1.00	2.8800	-27295.60	18798.40	1.452 ¹ ✗

KL/R > 200 (C) - 386

¹ P_u / φP_n controls

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Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T17	20 - 0	2L5x5x5/16x3/8	23.42	11.25	86.0 K=1.00	6.0500	-14572.00	163146.00	0.089 ¹ ✓

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	330 - 320	L2x2x1/4	4.00	3.83	118.8 K=1.01	0.9380	-49.63	18776.20	0.003 ¹ ✓

¹ P_u / φP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T17	20 - 0	2L2 1/2x2 1/2x1/4x3/8	3.90	3.66	82.1 K=1.00	2.3800	-1226.49	66818.90	0.018 ¹ ✓
		2L 'a' > 21.0535 in - 398							

¹ P_u / φP_n controls

Redundant Horizontal (2) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T17	20 - 0	2L2 1/2x2 1/2x1/4x3/8	7.81	7.57	118.1 K=1.00	2.3800	-808.40	48114.30	0.017 ¹ ✓

¹ P_u / φP_n controls

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Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4x3/8	7.60	7.11	110.9 K=1.00	2.3800	-469.64	52560.40	0.009 ¹

¹ P_u / φP_n controls

Redundant Diagonal (2) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4	10.08	9.77	152.5 K=1.00	2.3800	-536.52	29292.10	0.018 ¹

¹ P_u / φP_n controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4	3.90	3.90	60.9 K=1.00	2.3800	-65.63	75684.50	0.001 ¹

¹ P_u / φP_n controls

Redundant Hip (2) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4	7.81	7.81	121.8 K=1.00	2.3800	-44.73	45697.90	0.001 ¹

¹ P_u / φP_n controls

Inner Bracing Design Data (Compression)

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T17	20 - 0	2L2 1/2x2 1/2x1/4x3/8	11.71	11.71	182.7 K=1.00	2.3800	-29.58	20401.00	0.001 ¹

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	330 - 320	2	10.00	5.00	120.0	3.1416	1344.96	141372.00	0.010 ¹
T2	320 - 300	2 1/4	20.00	5.00	106.7	3.9761	13863.10	178924.00	0.077 ¹
T3	300 - 280	2 3/4	20.00	5.00	87.3	5.9396	39761.10	267281.00	0.149 ¹
T4	280 - 260	3	20.02	5.00	80.1	7.0686	66136.40	318086.00	0.208 ¹
T5	260 - 240	3 1/4	20.03	5.01	74.0	8.2958	84755.30	373310.00	0.227 ¹
T6	240 - 220	3 1/4	20.01	5.00	73.9	8.2958	109731.00	373310.00	0.294 ¹
T7	220 - 200	3 1/2	20.01	5.00	68.6	9.6211	138430.00	432951.00	0.320 ¹
T8	200 - 180	3 3/4	20.02	5.00	64.1	11.0447	166613.00	497010.00	0.335 ¹
T9	180 - 160	4	20.04	5.01	60.1	12.5664	187524.00	565487.00	0.332 ¹
T10	160 - 140	4 3/4	20.00	6.67	67.4	17.7205	225541.00	797425.00	0.283 ¹
T11	140 - 120	4 3/4	20.01	6.67	67.4	17.7205	269409.00	797425.00	0.338 ¹
T12	120 - 100	5	20.04	6.68	64.1	19.6350	297211.00	883573.00	0.336 ¹
T13	100 - 80	5 1/4	20.02	6.67	61.0	21.6475	330208.00	974139.00	0.339 ¹
T14	80 - 60	5 1/4	20.01	6.67	61.0	21.6475	368518.00	974139.00	0.378 ¹
T15	60 - 40	5 1/4	20.04	6.68	61.1	21.6475	394241.00	974139.00	0.405 ¹
T16	40 - 20	5 1/2	20.01	6.67	58.2	23.7583	429166.00	1069120.00	0.401 ¹
T17	20 - 0	5 3/4	20.02	6.67	55.7	25.9672	434740.00	1168530.00	0.372 ¹

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¹ $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	330 - 320	L1 3/4x1 3/4x3/16	6.40	3.07	68.6	0.6211	999.36	20123.40	0.050 ¹
T2	320 - 300	L1 3/4x1 3/4x3/16	6.40	3.05	68.2	0.6211	1727.37	20123.40	0.086 ¹
T3	300 - 280	L1 3/4x1 3/4x3/16	6.40	3.02	67.5	0.6211	3678.23	20123.40	0.183 ¹
T4	280 - 260	L2x2x1/8	6.75	3.33	63.9	0.4844	3594.06	15693.80	0.229 ¹
T5	260 - 240	L2x2x1/8	8.68	4.32	82.8	0.4844	3012.71	15693.80	0.192 ¹
T6	240 - 220	L2x2x1/8	9.80	4.83	92.6	0.4844	5221.89	15693.80	0.333 ¹
T7	220 - 200	L2x2x1/8	10.66	5.26	100.8	0.4844	5201.65	15693.80	0.331 ¹
T8	200 - 180	L2 1/2x2 1/2x3/16	12.30	6.08	93.8	0.9020	6168.26	29224.80	0.211 ¹
T9	180 - 160	L2 1/2x2 1/2x3/16	14.22	7.08	109.1	0.9020	5316.15	29224.80	0.182 ¹
T10	160 - 140	L3 1/2x3 1/2x1/4	15.69	7.70	84.7	1.6900	11825.70	54756.00	0.216 ¹
T11	140 - 120	L3 1/2x3 1/2x1/4	16.56	8.16	89.8	1.6900	11646.10	54756.00	0.213 ¹
T12	120 - 100	L3 1/2x3 1/2x1/4	18.33	9.13	100.5	1.6900	7927.73	54756.00	0.145 ¹
T13	100 - 80	L3 1/2x3 1/2x1/4	19.75	9.77	107.6	1.6900	12052.90	54756.00	0.220 ¹
T14	80 - 60	L4x4x1/4	20.90	10.32	99.1	1.9400	14196.40	62856.00	0.226 ¹
T15	60 - 40	L4x4x1/4	22.81	11.36	109.1	1.9400	9621.00	62856.00	0.153 ¹
T16	40 - 20	L4x4x1/4	23.35	11.55	110.8	1.9400	15695.50	62856.00	0.250 ¹
T17	20 - 0	2L3x3x1/4x3/8	23.57	23.11	199.6	2.8800	26767.70	93312.00	0.287 ¹

¹ $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T17	20 - 0	2L5x5x5/16x3/8	23.42	11.25	87.8	4.1273	13515.40	179539.00	0.075 ¹

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Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	

¹ P_u / φP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T1	330 - 320	L2x2x1/4	4.00	3.83	75.5	0.9380	37.62	30391.20	0.001 ¹

¹ P_u / φP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4x3/8	3.90	3.66	57.2	2.3800	524.02	77112.00	0.007 ¹
		2L 'a' > 21.0535 in - 387							

¹ P_u / φP_n controls

Redundant Horizontal (2) Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4x3/8	7.81	7.57	118.1	2.3800	674.17	77112.00	0.009 ¹

¹ P_u / φP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4x3/8	7.60	7.11	110.9	2.3800	1414.11	77112.00	0.018 ¹

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Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	

¹ P_u / φP_n controls

Redundant Diagonal (2) Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4	10.08	9.77	152.5	2.3800	834.41	77112.00	0.011 ¹

¹ P_u / φP_n controls

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4	3.90	3.90	60.9	2.3800	33.90	77112.00	0.000 ¹

¹ P_u / φP_n controls

Redundant Hip (2) Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4	7.81	7.81	121.8	2.3800	22.49	77112.00	0.000 ¹

¹ P_u / φP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	lb	lb	
T17	20 - 0	2L2 1/2x2 1/2x1/4x3/8	11.71	11.71	182.7	2.3800	30.84	77112.00	0.000 ¹

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¹ $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	330 - 320	Leg	2	3	-1954.84	49286.40	4.0	Pass
		Diagonal	L1 3/4x1 3/4x3/16	10	-1002.12	13790.00	7.3	Pass
		Top Girt	L2x2x1/4	5	-49.63	18776.20	0.3	Pass
T2	320 - 300	Leg	2 1/4	19	-16468.90	77870.40	21.1	Pass
		Diagonal	L1 3/4x1 3/4x3/16	23	-1755.49	13857.70	12.7	Pass
T3	300 - 280	Leg	2 3/4	46	-46832.10	153147.00	30.6	Pass
		Diagonal	L1 3/4x1 3/4x3/16	53	-3997.49	13992.30	28.6	Pass
T4	280 - 260	Leg	3	73	-77330.60	199056.00	38.8	Pass
		Diagonal	L2x2x1/8	77	-3510.23	10554.70	33.3	Pass
T5	260 - 240	Leg	3 1/4	100	-97986.70	250252.00	39.2	Pass
		Diagonal	L2x2x1/8	104	-3001.48	8468.11	35.4	Pass
T6	240 - 220	Leg	3 1/4	127	-125453.00	250426.00	50.1	Pass
		Diagonal	L2x2x1/8	130	-5288.08	7100.50	74.5	Pass
T7	220 - 200	Leg	3 1/2	154	-157133.00	306835.00	51.2	Pass
		Diagonal	L2x2x1/8	157	-5284.54	5919.12	89.3	Pass
T8	200 - 180	Leg	3 3/4	181	-190757.00	368176.00	51.8	Pass
		Diagonal	L2 1/2x2 1/2x3/16	185	-6305.98	13003.70	48.5	Pass
T9	180 - 160	Leg	4	208	-217467.00	434172.00	50.1	Pass
		Diagonal	L2 1/2x2 1/2x3/16	212	-5233.57	10172.60	51.4	Pass
T10	160 - 140	Leg	4 3/4	235	-263234.00	572143.00	46.0	Pass
		Diagonal	L3 1/2x3 1/2x1/4	238	-11832.00	28619.70	41.3	Pass
T11	140 - 120	Leg	4 3/4	256	-314640.00	572074.00	55.0	Pass
		Diagonal	L3 1/2x3 1/2x1/4	259	-12129.60	26123.10	46.4	Pass
T12	120 - 100	Leg	5	279	-350306.00	654188.00	53.5	Pass
		Diagonal	L3 1/2x3 1/2x1/4	281	-7930.48	21828.20	36.3	Pass
T13	100 - 80	Leg	5 1/4	299	-392070.00	742082.00	52.8	Pass
		Diagonal	L3 1/2x3 1/2x1/4	301	-12005.80	19543.40	61.4	Pass
T14	80 - 60	Leg	5 1/4	320	-439912.00	742186.00	59.3	Pass
		Diagonal	L4x4x1/4	322	-14791.00	25588.80	57.8	Pass
T15	60 - 40	Leg	5 1/4	342	-473926.00	741625.00	63.9	Pass
		Diagonal	L4x4x1/4	344	-9429.56	21881.80	43.1	Pass
T16	40 - 20	Leg	5 1/2	363	-517778.00	834440.00	62.1	Pass
		Diagonal	L4x4x1/4	364	-15720.30	20152.40	78.0	Pass
T17	20 - 0	Leg	5 3/4	384	-528689.00	931333.00	56.8	Pass
		Diagonal	2L3x3x1/4x3/8	386	-27295.60	18798.40	145.2	Fail ✗
		Horizontal	2L5x5x5/16x3/8	385	-14572.00	163146.00	8.9	Pass
						18.3 (b)		
		Redund Horiz 1 Bracing	2L2 1/2x2 1/2x1/4x3/8	398	-1226.49	66818.90	1.8	Pass
		Redund Horiz 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	399	-808.40	48114.30	1.7	Pass
		Redund Diag 1 Bracing	2L2 1/2x2 1/2x1/4x3/8	400	1414.11	77112.00	1.8	Pass
		Redund Diag 2 Bracing	2L2 1/2x2 1/2x1/4	395	-536.52	29292.10	1.8	Pass
		Redund Hip 1 Bracing	2L2 1/2x2 1/2x1/4	422	-61.98	75684.50	0.1	Pass
		Redund Hip 2 Bracing	2L2 1/2x2 1/2x1/4	408	-44.73	45697.90	0.3	Pass
		Inner Bracing	2L2 1/2x2 1/2x1/4x3/8	426	-29.58	20401.00	0.4	Pass
						Summary		
						Leg (T15)	63.9	Pass
						Diagonal	145.2	Fail ✗

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						(T17)		
						Horizontal	18.3	Pass
						(T17)		
						Top Girt	0.3	Pass
						(T1)		
						Redund	1.8	Pass
						Horz 1		
						Bracing		
						(T17)		
						Redund	1.7	Pass
						Horz 2		
						Bracing		
						(T17)		
						Redund	1.8	Pass
						Diag 1		
						Bracing		
						(T17)		
						Redund	1.8	Pass
						Diag 2		
						Bracing		
						(T17)		
						Redund Hip	0.1	Pass
						1 Bracing		
						(T17)		
						Redund Hip	0.3	Pass
						2 Bracing		
						(T17)		
						Inner	0.4	Pass
						Bracing		
						(T17)		
						Bolt Checks	45.6	Pass
						RATING =	145.2	Fail 