



# EMPIRE telecom

16 Esquire Road  
Billerica, MA 01862

## LTE 2C

## Revision 1

### Antenna Mount Analysis

**Site Name:** North Canaan-Lower County RD

**FA #:** 10035410

**Site Number:** CTL01134

**Site Address:** 38 Lower Road  
North Canaan, CT 06018  
Litchfield County

**Maser Project Number:** 16963008A

October 6, 2016

<b>Analysis Type</b>	<b>Tower Feasibility</b>
<b>Pass/Fail</b>	<b>Pass</b>
<b>Mount Utilization</b>	<b>65.1 %</b>



FRANK E. AZDEN  
No. 28188  
Professional Engineer  
PE License # 28188

### **Objective:**

The objective of this report is to determine the capacity of the existing 195' lattice tower structure at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

### **Introduction:**

Maser Consulting Connecticut has performed limited field observations on July 26, 2016 to visually verify the existing condition of the structure from grade and to locate and quantify the existing wireless appurtenances where possible. Maser Consulting P.A. has reviewed the following documents in completing this report:

- RFDS 1129378 provided by Empire Telecom, dated March 28, 2016 for LTE 2C scope of work.
- Rev 1 Construction Drawings prepared by Maser Consulting Connecticut for LTE 2C Scope of Work
- Limited Visual Site Visit photos and notes prepared by Maser Consulting Connecticut on July 26, 2016.
- Tower Mapping Report prepared by Tower Engineering Professionals TEP#72508\_94731 dated, September 08, 2016.
- Previous structural Analysis and evaluation report performed by URS Corporation, dated March 13, 2013.

The existing **AT&T** equipment is supported on an existing 195' lattice tower structure. The primary tower structure is constructed of pirod lattice legs and diagonals, horizontals are constructed of angle members. The proposed **AT&T** antenna support pipes supported by pipes at a centerline of approximately **140'-0"** above ground level. This report is based only upon this information, as well as the information obtained in the field.

### **Discrete and Linear Appurtenances:**

Maser Consulting Connecticut understands the existing & proposed **AT&T** loading to be as follows:

- **(1) Andrew SBNHH-1D65A Antennas (Proposed per RFDS)**
- *(6) Powerwave 7770 Antennas (Existing per Mount Mapping)*
- **(2) CCI HPA-65R-BUU-H6 Antennas (Proposed per RFDS)**
- *(3) Ericsson RRUS-11 B12 (Existing per Mount Mapping)*
- **(3) Ericsson RRUS-12+A2 (Proposed per RFDS)**
- **(1) Raycap DC6 (Proposed mounted to the tower leg)**
- *(6) Powerwave TMAs (Existing)*

The overall antenna loading is found in the Appendix A of this report.

### **Codes, Standards and Loading:**

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 CT State Building Code And All Subsequent Amendments
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
  - Basic Wind Speed – 100 mph, Ice thickness of 0.5in.
  - Exposure Category – C

- Structure Class – II
- Topographic Category - 1
- Specification for Structural Steel Buildings ANSI/AISC 360-10

### **Analysis Approach & Assumptions:**

The analysis approach used in this structural analysis is based on the premise that if the existing lattice structure is structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure are deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. Risa-3D, a 3D finite element modeling and analysis program, was used to determine the capacity and usage of the existing antenna support frame.

The following assumptions were utilized in this report:

- Structural Steel Main Legs are constructed of A572-50 Grade Steel.
- Structural Steel Angles members are constructed of A36 Grade.
- Structural Bolts are assumed to be A325N grade.
- Tower is installed to plumb and is maintained properly without any structural deficiencies or deteriorations to the original design.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- Proposed equipment and locations should not deviate from the proposed locations noted herein and shown on the associated Maser Consulting Connecticut final Construction Drawings.

### **Calculations:**

The calculations are found in Appendix A of this report.

### **Conclusion:**

The existing lattice tower was analyzed for the loading in the applicable codes and standards. The tower has been determined to be structurally **ADEQUATE** to support the proposed and existing antennas, based upon the aforementioned assumptions.

The lattice tower has been determined to be stressed to a maximum of **65.1%** of its structural capacity with the maximum usage occurring at the diagonal bolts at elevation 120'-140'. The tower main legs and diagonals were stressed to a maximum of **61.8%** and **63.6%** of their capacity. The proposed foundation

reactions were compared with the previous structural analysis and the foundation has been determined to be **ADEQUATE** to support the proposed and existing antennas. Therefore, the proposed **AT&T** installation **CAN** be placed as intended in all sectors.

Prior to the installation of the proposed equipment, the contractor shall verify that all bolted connections are properly fastened from the original installation. Additionally, the contractor shall inspect all existing hardware and verify that it is in its original condition and free of rust and deterioration. If any deficiencies are noted the contractor shall notify the engineer of the conditions prior to installation of any equipment for additional evaluation.

The conclusions reached by Maser Consulting Connecticut in this evaluation are only applicable for the existing structural members supporting the proposed **AT&T** telecommunications installation described herein. Further, no structural qualifications are made or implied by this document for the existing structure.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,  
Maser Consulting Connecticut



Frank Pazden, P.E.  
Telecommunications Department Manager



Gowtham Penumatsa E.I.T  
Structural Design Engineer

## **APPENDIX A**

<b>tnxTower</b>  <b>Maser Consulting Connecticut</b> 331 Newman Springs Road, Suite 203 Red Bank, NJ 07701 Phone: 732.383.1950 FAX:	<b>Job</b>	16963008	<b>Page</b>	1 of 33
	<b>Project</b>	Tower Analysis	<b>Date</b>	13:06:57 10/06/16
	<b>Client</b>	Empire Telecom	<b>Designed by</b>	mcleary

## Tower Input Data

The main tower is a 3x free standing tower with an overall height of 195.00 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 12.00 ft at the top and 26.00 ft at the base.

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

The following design criteria apply:

Tower is located in Litchfield County, Connecticut.

Basic wind speed of 100 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 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.

Weld together tower sections have flange connections..

Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..

Welds are fabricated with ER-70S-6 electrodes..

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

Pressures are calculated at each section.

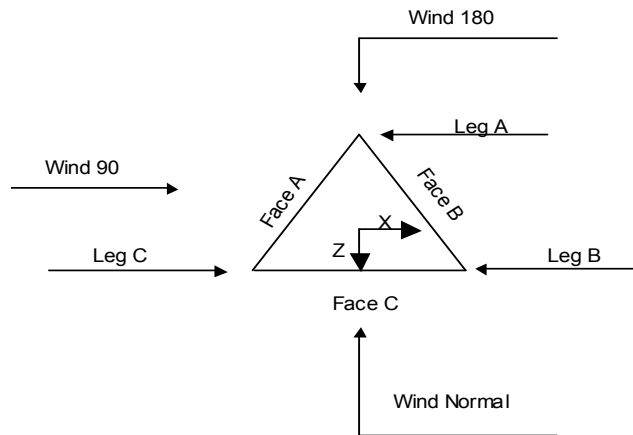
Stress ratio used in tower member design is 1.

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

## Options

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>√ Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>√ Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>√ Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>Bypass Mast Stability Checks</li> <li>Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>√ Sort Capacity Reports By Component</li> <li>√ Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>√ Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-G Bracing Resist. Exemption</li> <li>Use TIA-222-G Tension Splice Exemption</li> <li style="text-align: center;">Poles</li> <li>Include Shear-Torsion Interaction</li> <li>√ Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> </ul> |
|--|--|---|

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**Triangular Tower**

**Tower Section Geometry**

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	195.00-190.00			12.00	1	5.00
T2	190.00-180.00			12.00	1	10.00
T3	180.00-160.00			12.00	1	20.00
T4	160.00-150.00			12.00	1	10.00
T5	150.00-140.00			12.00	1	10.00
T6	140.00-120.00			12.00	1	20.00
T7	120.00-110.00			14.00	1	10.00
T8	110.00-100.00			15.00	1	10.00
T9	100.00-80.00			16.00	1	20.00
T10	80.00-60.00			18.00	1	20.00
T11	60.00-40.00			20.00	1	20.00
T12	40.00-20.00			22.00	1	20.00
T13	20.00-0.00			24.00	1	20.00

**Tower Section Geometry (cont'd)**

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	195.00-190.00	5.00	K Brace Down	No	Yes	0.0000	0.0000
T2	190.00-180.00	10.00	X Brace	No	No	0.0000	0.0000

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Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T3	180.00-160.00	10.00	X Brace	No	No	0.0000	0.0000
T4	160.00-150.00	10.00	X Brace	No	Yes	0.0000	0.0000
T5	150.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T6	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T7	120.00-110.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	110.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T9	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T10	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T11	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T12	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T13	20.00-0.00	20.00	X Brace	No	No	0.0000	0.0000

### Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 195.00-190.00	Truss Leg	Pirod 105244	A572-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 190.00-180.00	Truss Leg	Pirod 105244	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 180.00-160.00	Truss Leg	Pirod 105216	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T4 160.00-150.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T5 150.00-140.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T6 140.00-120.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T7 120.00-110.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T8 110.00-100.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T9 100.00-80.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T10 80.00-60.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)
T11 60.00-40.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Equal Angle	L5x5x3/8	A36 (36 ksi)
T12 40.00-20.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Equal Angle	L5x5x3/8	A36 (36 ksi)
T13 20.00-0.00	Truss Leg	Pirod 112738	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16	A36 (36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
T6 140.00-120.00	Equal Angle	L3x3x5/16	A36 (36 ksi)	Pipe		A53-B-42 (42 ksi)



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### Tower Section Geometry (cont'd)

Tower Elevation	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
ft							
T1 195.00-190.00	None	Solid Round		A36 (36 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16	A36 (36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
ft						
T4 160.00-150.00	Equal Angle	L3x3x5/16	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T7 120.00-110.00	Equal Angle	L3 1/2x3 1/2x5/16	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
T1 195.00-190.00	0.00	0.1875	A36 (36 ksi)	1	1	1.05	0.0000	Mid-Pt	36.0000
T2 190.00-180.00	0.00	0.1875	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 180.00-160.00	0.00	0.1875	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 160.00-150.00	0.00	0.1875	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 150.00-140.00	0.00	0.2500	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 140.00-120.00	0.00	0.2500	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 120.00-110.00	0.00	0.2500	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 110.00-100.00	0.00	0.2500	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 100.00-80.00	0.00	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 80.00-60.00	0.00	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 60.00-40.00	0.00	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
T12 40.00-20.00	0.00	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T13 20.00-0.00	0.00	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	Mid-Pt

### Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors <sup>1</sup>								
			Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace	
			X	X	X	X	X	X	X	X	
ft			Y	Y	Y	Y	Y	Y	Y	Y	
T1 195.00-190.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T2 190.00-180.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T3 180.00-160.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T4 160.00-150.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T5 150.00-140.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T6 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T7 120.00-110.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T8 110.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T9 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T10 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T11 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T12 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T13 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1

<sup>1</sup>Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

### Tower Section Geometry (cont'd)

Tower Elevation	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
ft						
T1 195.00-190.00	1	0.5	0.85	1	0.5	0.85



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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
T11 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
T12 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
T13 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 195.00-190.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 190.00-180.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 180.00-160.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 160.00-150.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 150.00-140.00	Flange	1.0000 A325N	0	1.0000 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 140.00-120.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 120.00-110.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 110.00-100.00	Flange	1.0000 A325N	0	1.0000 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 100.00-80.00	Flange	1.2500 A325N	6	1.2500 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 80.00-60.00	Flange	1.2500 A325N	6	1.2500 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 60.00-40.00	Flange	1.2500 A325N	6	1.2500 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 40.00-20.00	Flange	1.2500 A325N	6	1.2500 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 20.00-0.00	Flange	2.0000 A325N	6	1.0000 A325N	2	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield No	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
HJ7-50A (1-5/8 AIR)	A	No	Ar (CaAa)	167.00 - 7.00	-10.0000	0	12	6	1.9800	1.9800		1.04

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### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
Feed Line Ladder	A	No	CaAa (In Face)	167.00 - 7.00	-10.0000	0	1	No Ice	0.50	7.90
								1/2" Ice	0.75	10.60
								1" Ice	0.81	13.30
Feed Line Ladder	C	No	CaAa (In Face)	167.00 - 7.00	-10.0000	0	1	No Ice	0.50	7.90
								1/2" Ice	0.75	10.60
								1" Ice	0.81	13.30

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight lb
T1	195.00-190.00	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	0.000	0.000	0.00
T2	190.00-180.00	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	0.000	0.000	0.00
T3	180.00-160.00	A	0.000	0.000	20.132	0.000	142.66
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.500	0.000	55.30
T4	160.00-150.00	A	0.000	0.000	28.760	0.000	203.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.000	0.000	79.00
T5	150.00-140.00	A	0.000	0.000	28.760	0.000	203.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.000	0.000	79.00
T6	140.00-120.00	A	0.000	0.000	57.520	0.000	407.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	10.000	0.000	158.00
T7	120.00-110.00	A	0.000	0.000	28.760	0.000	203.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.000	0.000	79.00
T8	110.00-100.00	A	0.000	0.000	28.760	0.000	203.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.000	0.000	79.00
T9	100.00-80.00	A	0.000	0.000	57.520	0.000	407.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	10.000	0.000	158.00
T10	80.00-60.00	A	0.000	0.000	57.520	0.000	407.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	10.000	0.000	158.00
T11	60.00-40.00	A	0.000	0.000	57.520	0.000	407.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	10.000	0.000	158.00
T12	40.00-20.00	A	0.000	0.000	57.520	0.000	407.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	10.000	0.000	158.00
T13	20.00-0.00	A	0.000	0.000	37.388	0.000	264.94
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	6.500	0.000	102.70

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### Feed Line/Linear Appurtenances Section Areas - With Ice

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A<sub>R</sub> ft<sup>2</sup></i>	<i>A<sub>F</sub> ft<sup>2</sup></i>	<i>C<sub>A</sub>A<sub>A</sub> In Face ft<sup>2</sup></i>	<i>C<sub>A</sub>A<sub>A</sub> Out Face ft<sup>2</sup></i>	<i>Weight lb</i>
T1	195.00-190.00	A	2.386	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	0.000	0.000	0.00
T2	190.00-180.00	A	2.376	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	0.000	0.000	0.00
T3	180.00-160.00	A	2.356	0.000	0.000	35.592	0.000	873.22
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	11.747	0.000	144.37
T4	160.00-150.00	A	2.335	0.000	0.000	50.662	0.000	1240.52
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.673	0.000	205.07
T5	150.00-140.00	A	2.319	0.000	0.000	50.531	0.000	1235.56
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.595	0.000	204.23
T6	140.00-120.00	A	2.294	0.000	0.000	100.636	0.000	2455.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	32.939	0.000	405.74
T7	120.00-110.00	A	2.266	0.000	0.000	50.082	0.000	1218.61
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.330	0.000	201.36
T8	110.00-100.00	A	2.245	0.000	0.000	49.908	0.000	1212.08
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.227	0.000	200.25
T9	100.00-80.00	A	2.211	0.000	0.000	99.237	0.000	2402.35
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	32.110	0.000	396.80
T10	80.00-60.00	A	2.156	0.000	0.000	98.310	0.000	2367.63
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	31.562	0.000	390.87
T11	60.00-40.00	A	2.085	0.000	0.000	97.106	0.000	2322.71
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	30.848	0.000	383.16
T12	40.00-20.00	A	1.981	0.000	0.000	95.355	0.000	2257.79
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	29.738	0.000	371.95
T13	20.00-0.00	A	1.775	0.000	0.000	59.723	0.000	1384.80
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	17.481	0.000	227.30

### Feed Line Center of Pressure

<i>Section</i>	<i>Elevation ft</i>	<i>CP<sub>x</sub> in</i>	<i>CP<sub>z</sub> in</i>	<i>CP<sub>x</sub> Ice in</i>	<i>CP<sub>z</sub> Ice in</i>
T1	195.00-190.00	0.0000	0.0000	0.0000	0.0000
T2	190.00-180.00	0.0000	0.0000	0.0000	0.0000
T3	180.00-160.00	-2.7297	-1.0418	-1.4636	-0.1564
T4	160.00-150.00	-3.9981	-1.5260	-2.4397	-0.2650
T5	150.00-140.00	-4.1686	-1.5910	-2.5591	-0.2812
T6	140.00-120.00	-4.4371	-1.6914	-2.7440	-0.3047
T7	120.00-110.00	-4.7573	-1.8106	-2.9793	-0.3345

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Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub>	CP <sub>z</sub>
	ft	in	in	Ice in	Ice in
T8	110.00-100.00	-5.4185	-2.0606	-3.4054	-0.3862
T9	100.00-80.00	-5.7682	-2.1914	-3.7198	-0.4300
T10	80.00-60.00	-6.4651	-2.4535	-4.1850	-0.5001
T11	60.00-40.00	-6.7292	-2.5516	-4.5214	-0.5655
T12	40.00-20.00	-7.3197	-2.7737	-4.9581	-0.6686
T13	20.00-0.00	-7.0632	-2.6752	-4.4447	-0.7356

## Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
T3	1	HJ7-50A (1-5/8 AIR)	160.00 - 167.00	1.0000	1.0000
T3	2	Feed Line Ladder	160.00 - 167.00	1.0000	1.0000
T3	3	Feed Line Ladder	160.00 - 167.00	1.0000	1.0000
T4	1	HJ7-50A (1-5/8 AIR)	150.00 - 160.00	1.0000	1.0000
T4	2	Feed Line Ladder	150.00 - 160.00	1.0000	1.0000
T4	3	Feed Line Ladder	150.00 - 160.00	1.0000	1.0000
T5	1	HJ7-50A (1-5/8 AIR)	140.00 - 150.00	1.0000	1.0000
T5	2	Feed Line Ladder	140.00 - 150.00	1.0000	1.0000
T5	3	Feed Line Ladder	140.00 - 150.00	1.0000	1.0000
T6	1	HJ7-50A (1-5/8 AIR)	120.00 - 140.00	1.0000	1.0000
T6	2	Feed Line Ladder	120.00 - 140.00	1.0000	1.0000
T6	3	Feed Line Ladder	120.00 - 140.00	1.0000	1.0000
T7	1	HJ7-50A (1-5/8 AIR)	110.00 - 120.00	1.0000	1.0000
T7	2	Feed Line Ladder	110.00 - 120.00	1.0000	1.0000
T7	3	Feed Line Ladder	110.00 - 120.00	1.0000	1.0000
T8	1	HJ7-50A (1-5/8 AIR)	100.00 - 110.00	1.0000	1.0000
T8	2	Feed Line Ladder	100.00 - 110.00	1.0000	1.0000
T8	3	Feed Line Ladder	100.00 - 110.00	1.0000	1.0000
T9	1	HJ7-50A (1-5/8 AIR)	80.00 - 100.00	1.0000	1.0000
T9	2	Feed Line Ladder	80.00 - 100.00	1.0000	1.0000
T9	3	Feed Line Ladder	80.00 - 100.00	1.0000	1.0000
T10	1	HJ7-50A (1-5/8 AIR)	60.00 - 80.00	1.0000	1.0000
T10	2	Feed Line Ladder	60.00 - 80.00	1.0000	1.0000
T10	3	Feed Line Ladder	60.00 - 80.00	1.0000	1.0000
T11	1	HJ7-50A (1-5/8 AIR)	40.00 - 60.00	1.0000	1.0000
T11	2	Feed Line Ladder	40.00 - 60.00	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
T11	3	Feed Line Ladder	40.00 - 60.00	1.0000	1.0000
		HJ7-50A (1-5/8 AIR)	20.00 - 40.00	1.0000	1.0000
T12	1	Feed Line Ladder	20.00 - 40.00	1.0000	1.0000
T12	3	Feed Line Ladder	20.00 - 40.00	1.0000	1.0000
T13	1	HJ7-50A (1-5/8 AIR)	7.00 - 20.00	1.0000	1.0000
T13	2	Feed Line Ladder	7.00 - 20.00	1.0000	1.0000
T13	3	Feed Line Ladder	7.00 - 20.00	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	$C_{AA}$ Front	$C_{AA}$ Side	Weight	
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
GPS Antenna 18"x3" Dia	C	From Leg	2.50	0.0000	36.25	No Ice	0.30	0.30	10.00
			0.00			1/2" Ice	0.42	0.42	13.61
			0.00			1" Ice	0.56	0.56	18.60
4' Side Arm Mount	C	From Leg	0.00	0.0000	32.92	No Ice	4.25	4.25	120.00
			0.00			1/2" Ice	5.85	5.85	160.00
			0.00			1" Ice	7.45	7.45	200.00
2-element dipole	A	From Leg	7.00	0.0000	84.00	No Ice	1.60	1.60	20.00
			0.00			1/2" Ice	2.88	2.88	26.00
			0.00			1" Ice	4.16	4.16	32.00
PiROD 7' side arm mount	A	From Leg	3.50	0.0000	79.00	No Ice	9.63	9.63	160.00
			0.00			1/2" Ice	11.56	11.56	190.00
			0.00			1" Ice	13.49	13.49	220.00
PiROD 7' side arm mount	B	From Leg	3.50	0.0000	79.50	No Ice	9.63	9.63	160.00
			0.00			1/2" Ice	11.56	11.56	190.00
			0.00			1" Ice	13.49	13.49	220.00
Amphenol BCD-80609	B	From Leg	7.00	0.0000	79.60	No Ice	2.43	2.43	27.00
			-4.00			1/2" Ice	3.39	3.39	45.00
			0.00			1" Ice	4.35	4.35	69.13
1- Element Dipole	B	From Leg	7.00	0.0000	79.60	No Ice	1.00	1.00	8.00
			0.00			1/2" Ice	1.50	1.50	12.00
			0.00			1" Ice	2.00	2.00	16.00
PD-1142-2C	B	From Leg	7.00	0.0000	79.60	No Ice	2.08	2.08	25.00
			0.00			1/2" Ice	3.35	3.35	41.67
			10.00			1" Ice	4.64	4.64	66.30
Yagi Antenna	C	From Leg	7.00	0.0000	79.60	No Ice	1.60	2.75	11.84
			1.50			1/2" Ice	2.88	1.60	30.00
			1.50			1" Ice	4.16	2.88	50.00
PD-1142-2C	C	From Leg	7.00	0.0000	79.60	No Ice	2.08	2.08	25.00
			0.00			1/2" Ice	3.35	3.35	41.67
			6.00			1" Ice	4.64	4.64	66.30
PiROD 7' side arm mount	C	From Leg	3.50	0.0000	79.60	No Ice	9.63	9.63	160.00
			0.00			1/2" Ice	11.56	11.56	190.00
			0.00			1" Ice	13.49	13.49	220.00
PiROD 6' side arm mount	B	From Leg	3.00	0.0000	99.00	No Ice	9.63	9.63	160.00
			0.00			1/2" Ice	11.56	11.56	190.00
			0.00			1" Ice	13.49	13.49	220.00
PiROD 6' side arm mount	C	From Leg	3.00	0.0000	99.00	No Ice	9.63	9.63	160.00
			0.00			1/2" Ice	11.56	11.56	190.00
			0.00			1" Ice	13.49	13.49	220.00



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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
PD-458-2	C	From Leg	0.00		0.0000	99.00	1" Ice	13.49	13.49	220.00
			6.00				No Ice	3.66	3.66	50.00
			0.00				1/2" Ice	5.02	5.02	76.76
			10.00				1" Ice	6.40	6.40	112.08
ANT150D3	A	From Leg	6.00		0.0000	109.00	No Ice	1.60	1.60	18.00
			0.00				1/2" Ice	2.88	2.88	23.40
			10.00				1" Ice	4.16	4.16	28.80
			3.00				No Ice	9.63	9.63	160.00
PiROD 6' side arm mount	B	From Leg	0.00		0.0000	106.00	1/2" Ice	11.56	11.56	190.00
			1.50				1" Ice	13.49	13.49	220.00
			3.00				No Ice	9.63	9.63	160.00
			0.00				1/2" Ice	11.56	11.56	190.00
PiROD 6' side arm mount	B	From Leg	1.50		0.0000	120.00	1" Ice	13.46	13.49	220.00
			0.00				No Ice	9.63	9.63	160.00
			1.50				1/2" Ice	11.56	11.56	190.00
			1.50				1" Ice	13.46	13.49	220.00
PiROD 12' Universal T-Frame Sector Mount	A	From Leg	1.00		0.0000	125.00	No Ice	13.60	13.60	465.00
			0.00				1/2" Ice	18.40	18.40	600.00
			0.00				1" Ice	23.20	23.20	735.00
			1.00				No Ice	13.60	13.60	465.00
PiROD 12' Universal T-Frame Sector Mount	B	From Leg	0.00		0.0000	125.00	1/2" Ice	18.40	18.40	600.00
			0.00				1" Ice	23.20	23.20	735.00
			0.00				No Ice	13.60	13.60	465.00
			1.00				1/2" Ice	18.40	18.40	600.00
PiROD 12' Universal T-Frame Sector Mount	C	From Leg	0.00		0.0000	125.00	1" Ice	23.20	23.20	735.00
			0.00				No Ice	13.60	13.60	465.00
			0.00				1/2" Ice	18.40	18.40	600.00
			0.00				1" Ice	23.20	23.20	735.00
PiROD 12' T-Frame	A	From Leg	2.00		0.0000	125.00 - 137.00	No Ice	12.20	12.20	360.00
			0.00				1/2" Ice	17.60	17.60	490.00
			0.00				1" Ice	23.00	23.00	620.00
			2.00				No Ice	12.20	12.20	360.00
PiROD 12' T-Frame	B	From Leg	0.00		0.0000	137.00	1/2" Ice	17.60	17.60	490.00
			1.50				1" Ice	23.00	23.00	620.00
			2.00				No Ice	12.20	12.20	360.00
			0.00				1/2" Ice	17.60	17.60	490.00
PiROD 12' T-Frame	C	From Leg	1.50		0.0000	137.00	1" Ice	23.00	23.00	620.00
			2.00				No Ice	12.20	12.20	360.00
			0.00				1/2" Ice	17.60	17.60	490.00
			0.00				1" Ice	23.00	23.00	620.00
SBNHH-1D65A W/ MOUNT PIPE	A	From Leg	2.00		0.0000	140.00	No Ice	6.43	3.91	40.90
			-5.00				1/2" Ice	6.87	4.27	80.32
			0.00				1" Ice	7.32	4.67	124.78
			0.00				No Ice	5.88	2.93	35.00
Powerwave 7770 W/Mount Pipe	B	From Leg	2.00		0.0000	140.00	1/2" Ice	6.31	3.27	67.63
			0.00				1" Ice	6.75	3.63	105.06
			2.00				No Ice	5.88	2.93	35.00
			5.00				1/2" Ice	6.31	3.27	67.63
Powerwave 7770 W/Mount Pipe	C	From Leg	0.00		0.0000	140.00	1" Ice	6.75	3.63	105.06
			2.00				No Ice	5.88	2.93	35.00
			5.00				1/2" Ice	6.31	3.27	67.63
			0.00				1" Ice	6.75	3.63	105.06
CCI HPA-65R-H6 W/Mount Pipe	A	From Leg	2.00		0.0000	140.00	No Ice	10.08	6.45	51.00
			-5.00				1/2" Ice	10.64	6.91	112.92
			0.00				1" Ice	11.22	7.38	181.23
			2.00				No Ice	5.88	2.93	35.00
Powerwave 7770 W/Mount Pipe	B	From Leg	0.00		0.0000	140.00	1/2" Ice	6.31	3.27	67.63
			0.00				1" Ice	6.75	3.63	105.06
			2.00				No Ice	5.88	2.93	35.00
			5.00				1/2" Ice	6.31	3.27	67.63
Powerwave 7770 W/Mount Pipe	C	From Leg	0.00		0.0000	140.00	1" Ice	6.75	3.63	105.06
			2.00				No Ice	5.88	2.93	35.00
			5.00				1/2" Ice	6.31	3.27	67.63
			0.00				1" Ice	6.75	3.63	105.06
CCI HPA-65R-H6 W/Mount Pipe	A	From Leg	2.00		0.0000	140.00	No Ice	10.08	6.45	51.00
			-5.00				1/2" Ice	10.64	6.91	112.92
			0.00				1" Ice	11.22	7.38	181.23
			2.00				No Ice	5.88	2.93	35.00
Powerwave 7770 W/Mount Pipe	B	From Leg	0.00		0.0000	140.00	1/2" Ice	6.31	3.27	67.63
			0.00				1" Ice	6.75	3.63	105.06
			2.00				No Ice	5.88	2.93	35.00
			5.00				1/2" Ice	6.31	3.27	67.63
Powerwave 7770 W/Mount Pipe	C	From Leg	0.00		0.0000	140.00	1" Ice	6.75	3.63	105.06
			2.00				No Ice	5.88	2.93	35.00
			5.00				1/2" Ice	6.31	3.27	67.63
			5.00				1" Ice	6.75	3.63	105.06

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
RRUS 11 B12	A	From Leg	0.00		0.0000	140.00	1" Ice	6.75	3.63	105.06
			2.00				No Ice	2.94	1.25	55.00
			-4.00				1/2" Ice	3.17	1.41	74.32
RRUS 11 B12	B	From Leg	0.00		0.0000	140.00	1" Ice	3.41	1.59	96.56
			2.00				No Ice	2.94	1.25	55.00
			-4.00				1/2" Ice	3.17	1.41	74.32
RRUS 11 B12	C	From Leg	0.00		0.0000	140.00	1" Ice	3.41	1.59	96.56
			2.00				No Ice	2.94	1.25	55.00
			-4.00				1/2" Ice	3.17	1.41	74.32
RRUS 12	A	From Leg	0.00		0.0000	140.00	1" Ice	3.41	1.59	96.56
			2.00				No Ice	3.67	1.49	58.00
			-4.00				1/2" Ice	3.93	1.67	81.22
RRUS 12	B	From Leg	0.00		0.0000	140.00	1" Ice	4.19	1.87	107.64
			2.00				No Ice	3.67	1.49	58.00
			-4.00				1/2" Ice	3.93	1.67	81.22
RRUS 12	C	From Leg	0.00		0.0000	140.00	1" Ice	4.19	1.87	107.64
			2.00				No Ice	3.67	1.49	58.00
			-4.00				1/2" Ice	3.93	1.67	81.22
APXV9ERR18	A	From Leg	0.00		0.0000	157.42	1" Ice	4.19	1.87	107.64
			4.00				No Ice	8.26	7.23	83.90
			2.00				1/2" Ice	8.81	8.19	151.78
APXV9ERR18	B	From Leg	0.00		0.0000	157.42	1" Ice	9.36	9.02	227.47
			4.00				No Ice	8.26	7.23	83.90
			2.00				1/2" Ice	8.81	8.19	151.78
APXV9ERR18	C	From Leg	0.00		0.0000	157.42	1" Ice	9.36	9.02	227.47
			4.00				No Ice	8.26	7.23	83.90
			2.00				1/2" Ice	8.81	8.19	151.78
PiROD 13' Lightweight T-Frame	A	From Leg	0.00		0.0000	154.00	1" Ice	9.36	9.02	227.47
			2.00				No Ice	10.60	10.60	255.00
			2.00				1/2" Ice	16.80	16.80	359.00
PiROD 13' Lightweight T-Frame	B	From Leg	0.00		0.0000	154.00	1" Ice	23.00	23.00	463.00
			2.00				No Ice	10.60	10.60	255.00
			2.00				1/2" Ice	16.80	16.80	359.00
PiROD 13' Lightweight T-Frame	C	From Leg	0.00		0.0000	154.00	1" Ice	23.00	23.00	463.00
			2.00				No Ice	10.60	10.60	255.00
			2.00				1/2" Ice	16.80	16.80	359.00
RRH 2x50 800	A	From Leg	0.00		0.0000	157.42	1" Ice	23.00	23.00	463.00
			0.00				No Ice	2.63	2.63	35.00
			0.00				1/2" Ice	2.84	2.84	61.38
RRH 2x50 800	B	From Leg	0.00		0.0000	157.42	1" Ice	3.07	3.07	91.06
			0.00				No Ice	2.63	2.63	35.00
			0.00				1/2" Ice	2.84	2.84	61.38
RRH 2x50 800	C	From Leg	0.00		0.0000	157.42	1" Ice	3.07	3.07	91.06
			0.00				No Ice	2.63	2.63	35.00
			0.00				1/2" Ice	2.84	2.84	61.38
Amphenol LPA-80080-4CF-EDIN-4	A	From Leg	0.00		0.0000	169.00	1" Ice	3.07	3.07	91.06
			2.50				No Ice	2.62	6.06	12.00
			-4.00				1/2" Ice	2.92	6.45	45.12
Amphenol LPA-80080-4CF-EDIN-4	A	From Leg	0.00		0.0000	169.00	1" Ice	3.23	6.86	82.72
			2.50				No Ice	2.62	6.06	12.00
			4.00				1/2" Ice	2.92	6.45	45.12
Amphenol BXA-70063-6CF-EDIN-4	A	From Leg	0.00		0.0000	169.00	1" Ice	3.23	6.86	82.72
			2.50				No Ice	7.75	5.58	38.90
			-1.00				1/2" Ice	8.29	6.52	97.27
BXA-171085-8BF-EDIN-4	A	From Leg	0.00		0.0000	169.00	1" Ice	8.85	7.33	163.19
			2.50				No Ice	3.39	3.56	31.10
			1.00				1/2" Ice	3.87	4.36	65.66

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>Front</sub>	C <sub>A</sub> A <sub>Side</sub>	Weight	
			Horz	Vert						ft
					°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
Amphenol LPA-80080-4CF-EDIN-4	B	From Leg		0.00	0.0000	169.00	1" Ice	4.34	5.04	105.87
				2.50			No Ice	2.62	6.06	12.00
				-4.00			1/2" Ice	2.92	6.45	45.12
Amphenol LPA-80080-4CF-EDIN-4	B	From Leg		0.00	0.0000	169.00	1" Ice	3.23	6.86	82.72
				2.50			No Ice	2.62	6.06	12.00
				4.00			1/2" Ice	2.92	6.45	45.12
Amphenol BXA-70063-6CF-EDIN-4	B	From Leg		0.00	0.0000	169.00	1" Ice	3.23	6.86	82.72
				2.50			No Ice	7.75	5.58	38.90
				-1.00			1/2" Ice	8.29	6.52	97.27
BXA-171085-8BF-EDIN-4	B	From Leg		0.00	0.0000	169.00	1" Ice	8.85	7.33	163.19
				2.50			No Ice	3.39	3.56	31.10
				1.00			1/2" Ice	3.87	4.36	65.66
Amphenol LPA-80080-4CF-EDIN-4	C	From Leg		0.00	0.0000	169.00	1" Ice	4.34	5.04	105.87
				2.50			No Ice	2.62	6.06	12.00
				-4.00			1/2" Ice	2.92	6.45	45.12
Amphenol LPA-80080-4CF-EDIN-4	C	From Leg		0.00	0.0000	169.00	1" Ice	3.23	6.86	82.72
				2.50			No Ice	2.62	6.06	12.00
				4.00			1/2" Ice	2.92	6.45	45.12
Amphenol BXA-70063-6CF-EDIN-4	C	From Leg		0.00	0.0000	169.00	1" Ice	3.23	6.86	82.72
				2.50			No Ice	7.75	5.58	38.90
				-1.00			1/2" Ice	8.29	6.52	97.27
Amphenol BXA-70063-6CF-EDIN-4	C	From Leg		0.00	0.0000	169.00	1" Ice	8.85	7.33	163.19
				2.50			No Ice	7.75	5.58	38.90
				1.00			1/2" Ice	8.29	6.52	97.27
DB222-A	C	From Leg		0.00	0.0000	172.00 - 171.00	1" Ice	8.85	7.33	163.19
				2.50			No Ice	6.00	6.00	25.00
				1.00			1/2" Ice	8.03	8.03	40.00
Diplexers	A	From Leg		0.00	0.0000	169.00	1" Ice	9.90	9.90	80.00
				2.50			No Ice	0.23	0.17	10.00
				0.00			1/2" Ice	0.30	0.24	10.00
Diplexers	B	From Leg		0.00	0.0000	169.00	1" Ice	0.37	0.31	10.00
				2.50			No Ice	0.23	0.17	10.00
				0.00			1/2" Ice	0.30	0.24	10.00
Diplexers	C	From Leg		0.00	0.0000	169.00	1" Ice	0.37	0.31	10.00
				2.50			No Ice	0.23	0.17	10.00
				0.00			1/2" Ice	0.30	0.25	10.00
ANT150D3	A	From Leg		0.00	0.0000	184.17	1" Ice	0.37	0.33	10.00
				7.00			No Ice	1.60	1.60	18.00
				0.00			1/2" Ice	2.88	2.88	23.40
Super station C21 6004569	A	From Leg		-5.00	0.0000	184.17	1" Ice	4.16	4.16	28.80
				7.00			No Ice	1.29	1.29	10.00
				0.00			1/2" Ice	1.60	1.60	20.28
Pirod 7' Side arm mount	A	From Leg		5.00	0.0000	183.72	1" Ice	1.91	1.91	34.06
				3.50			No Ice	9.63	9.63	160.00
				0.00			1/2" Ice	11.56	11.56	190.00
OGT9-840N	B	From Leg		0.00	0.0000	184.00	1" Ice	13.49	13.49	220.00
				7.00			No Ice	2.27	2.27	18.50
				0.00			1/2" Ice	3.44	3.44	36.09
OGT9-840N	B	From Leg		5.00	0.0000	184.00	1" Ice	4.61	4.61	60.98
				7.00			No Ice	2.27	2.27	18.50
				0.00			1/2" Ice	3.44	3.44	36.09
Pirod 7' Side arm Mount	C	From Leg		5.00	0.0000	183.17	1" Ice	4.61	4.61	60.98
				3.50			No Ice	9.63	9.63	160.00
				0.00			1/2" Ice	11.56	11.56	190.00
ATN 150F2	C	From Leg		0.00	0.0000	186.00	1" Ice	13.49	13.49	220.00
				2.00			No Ice	1.29	1.29	12.00
				1.00			1/2" Ice	1.60	1.60	22.28

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight	
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
3' Side Arm Mount	C	From Leg	0.00	0.0000	183.00	1" Ice	1.91	1.91	36.06
			1.00			No Ice	3.15	3.15	100.00
			1.00			1/2" Ice	5.67	5.67	130.00
			0.00			1" Ice	8.19	8.19	160.00

### Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				ft ft ft	°	°	ft	ft	ft <sup>2</sup>	lb	
Andrew 6' w/Radome	A	Paraboloid w/Radome	From Leg	3.32	Worst		99.00	6.00	No Ice	28.27	380.00
				0.00					1/2" Ice	29.07	450.00
				0.00					1" Ice	29.86	520.00
Andrew 6' w/Radome	B	Paraboloid w/Radome	From Leg	0.00	Worst		189.50	6.00	No Ice	28.27	380.00
				0.00					1/2" Ice	29.07	450.00
				0.00					1" Ice	29.86	520.00

### Truss-Leg Properties

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in <sup>2</sup>	in <sup>2</sup>	lb	lb	in	in	in <sup>2</sup>
Pirod 105244	1026.8606	3441.5361	562.76	1224.98	7.1310	23.8996	3.6816
Pirod 105244	1026.8606	3437.3803	562.76	1222.56	7.1310	23.8707	3.6816
Pirod 105216	1998.0891	7043.9803	505.25	2521.58	6.9378	24.4583	3.6816
Pirod 105217	2130.7479	7096.8281	619.35	2557.90	7.3984	24.6418	5.3014
Pirod 105217	2130.7479	7083.1102	619.35	2549.32	7.3984	24.5941	5.3014
Pirod 105218	2263.4687	7132.8454	754.52	2581.83	7.8593	24.7668	7.2158
Pirod 105218	2263.4687	7108.1359	754.52	2566.26	7.8593	24.6810	7.2158
Pirod 105218	2263.4687	7089.9961	754.52	2554.86	7.8593	24.6180	7.2158
Pirod 105219	2441.8688	7131.6326	944.27	2580.20	8.4787	24.7626	9.4248
Pirod 105219	2441.8688	7083.1231	944.27	2549.57	8.4787	24.5942	9.4248
Pirod 105220	2578.8005	7092.0558	1121.16	2552.05	8.9542	24.6252	11.9282
Pirod 105220	2578.8005	7000.2743	1121.16	2494.23	8.9542	24.3065	11.9282
Pirod 112738	3466.5160	8985.6471	1689.34	4341.03	12.0365	31.2002	14.7262

### Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M <sub>x</sub>	Sum of Overturning Moments, M <sub>z</sub>	Sum of Torques
	lb	lb	lb	lb-ft	lb-ft	lb-ft

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Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M <sub>x</sub> lb-ft	Sum of Overturning Moments, M <sub>z</sub> lb-ft	Sum of Torques lb-ft
Leg Weight	26664.28					
Bracing Weight	21033.48					
Total Member Self-Weight	47697.76			-1339.88	11473.06	
Total Weight	59547.80			-1339.88	11473.06	
Wind 0 deg - No Ice		15.34	-46357.99	-4855701.91	7899.50	-17117.28
Wind 30 deg - No Ice		22140.49	-38337.73	-4041550.19	-2323655.83	-17774.56
Wind 60 deg - No Ice		37727.39	-21793.45	-2304154.22	-3974322.82	-14350.33
Wind 90 deg - No Ice		44254.40	-15.34	-4913.44	-4652595.13	-7531.35
Wind 120 deg - No Ice		40134.90	23165.71	2422746.34	-4191519.01	1726.75
Wind 150 deg - No Ice		22113.91	38322.38	4035296.86	-2317466.24	10243.21
Wind 180 deg - No Ice		-15.34	43560.32	4598099.20	15046.62	15862.34
Wind 210 deg - No Ice		-22140.49	38337.73	4038870.42	2346601.95	17774.56
Wind 240 deg - No Ice		-40150.25	23192.28	2428935.92	4218038.68	15390.53
Wind 270 deg - No Ice		-44254.40	15.34	2233.68	4675541.25	7531.35
Wind 300 deg - No Ice		-37712.04	-21766.87	-2297964.63	3993695.38	-1512.01
Wind 330 deg - No Ice		-22113.91	-38322.38	-4037976.63	2340412.36	-10243.21
Member Ice	124709.19					
Total Weight Ice	218238.82			-24817.94	75559.17	
Wind 0 deg - Ice		7.93	-14142.76	-1555967.03	74600.29	-3450.91
Wind 30 deg - Ice		6953.38	-12029.81	-1331667.65	-679891.18	-2956.92
Wind 60 deg - Ice		11961.63	-6907.24	-776101.14	-1225412.43	-1730.91
Wind 90 deg - Ice		13893.02	-7.93	-25776.82	-1433680.70	-67.66
Wind 120 deg - Ice		12249.89	7064.51	739926.19	-1250645.20	1658.68
Wind 150 deg - Ice		6939.64	12021.88	1281072.89	-678230.36	2889.26
Wind 180 deg - Ice		-7.93	13800.74	1476087.63	76518.04	3350.09
Wind 210 deg - Ice		-6953.38	12029.81	1282031.76	831009.51	2956.92
Wind 240 deg - Ice		-12257.82	7078.25	741587.01	1402722.41	1792.23
Wind 270 deg - Ice		-13893.02	7.93	-23859.06	1584799.04	67.66
Wind 300 deg - Ice		-11953.70	-6893.50	-774440.32	1375571.88	-1619.17
Wind 330 deg - Ice		-6939.64	-12021.88	-1330708.77	829348.69	-2889.26
Total Weight	59547.80			-1339.88	11473.06	
Wind 0 deg - Service		5.52	-16688.88	-1747279.25	-1891.48	-6162.22
Wind 30 deg - Service		7970.57	-13801.58	-1454184.63	-841251.40	-6398.84
Wind 60 deg - Service		13581.86	-7845.64	-828722.08	-1435491.52	-5166.12
Wind 90 deg - Service		15931.58	-5.52	-995.40	-1679669.55	-2711.29
Wind 120 deg - Service		14448.57	8339.65	872962.12	-1513682.14	621.63
Wind 150 deg - Service		7961.01	13796.06	1453480.31	-839023.15	3687.56
Wind 180 deg - Service		-5.52	15681.71	1656089.15	681.48	5710.44
Wind 210 deg - Service		-7970.57	13801.58	1454766.79	840041.40	6398.84
Wind 240 deg - Service		-14454.09	8349.22	875190.37	1513758.63	5540.59
Wind 270 deg - Service		-15931.58	5.52	1577.56	1678459.55	2711.29
Wind 300 deg - Service		-13576.34	-7836.07	-826493.83	1432995.04	-544.32
Wind 330 deg - Service		-7961.01	-13796.06	-1452898.15	837813.15	-3687.56

### Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice

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Comb. No.	Description
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	195 - 190	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	37	-609.59	-713.16	-4.01
			Max. Mx	29	-609.56	-724.36	16.40
			Max. My	4	-203.06	-178.71	372.38
			Max. Vy	6	207.74	-646.12	183.98
			Max. Vx	4	-155.54	0.00	0.00
		Diagonal	Max Tension	19	64.10	0.00	0.00
			Max. Compression	35	-440.75	0.00	0.00
			Max. Mx	36	-256.13	171.58	0.00
			Max. My	2	-112.96	0.00	0.22

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft			
T2	190 - 180	Top Girt	Max. Vy	36	-87.88	0.00	0.00			
			Max. Vx	2	-0.11	0.00	0.00			
			Max Tension	16	177.44	-26.89	-2.49			
			Max. Compression	5	-140.52	-29.42	1.94			
			Max. Mx	37	53.42	-124.51	2.19			
			Max. My	18	168.89	-25.88	-2.98			
		Leg	Max. Vy	37	108.49	-124.51	2.19			
			Max. Vx	18	0.66	0.00	0.00			
			Max Tension	23	778.00	-592.52	-29.46			
			Max. Compression	31	-3992.49	701.24	-5.17			
			Max. Mx	10	-2503.18	887.43	-11.51			
			Max. My	20	-1051.39	139.54	1124.73			
			Max. Vy	22	-659.10	-636.61	-29.42			
			Max. Vx	16	815.11	-180.89	-371.05			
Diagonal	Max Tension	14	1706.17	0.00	0.00					
	Max. Compression	2	-1772.10	0.00	0.00					
	Max. Mx	28	368.79	125.97	0.95					
	Max. My	4	-475.20	23.80	-2.64					
	Max. Vy	32	-79.30	125.86	0.08					
	Max. Vx	4	-0.39	0.00	0.00					
T3	180 - 160	Leg	Max Tension	15	11641.42	0.00	0.00			
			Max. Compression	18	-15865.76	1302.35	5.80			
			Max. Mx	18	-15865.76	1302.35	5.80			
			Max. My	12	-2203.83	76.67	-1035.37			
			Max. Vy	6	-812.18	0.00	0.00			
			Max. Vx	24	834.98	0.00	0.00			
		Diagonal	Max Tension	8	4487.50	0.00	0.00			
			Max. Compression	20	-4561.81	0.00	0.00			
			Max. Mx	35	666.80	148.99	0.52			
			Max. My	10	-4084.14	25.43	-3.20			
			Max. Vy	35	-90.19	148.99	0.52			
			Max. Vx	16	0.46	0.00	0.00			
			T4	160 - 150	Leg	Max Tension	15	22354.92	-1102.59	-34.78
						Max. Compression	18	-28953.20	-1015.98	-43.23
Max. Mx	18	-28444.73				2293.68	10.35			
Max. My	20	-3145.25				-416.23	-2489.21			
Max. Vy	18	1099.48				2293.68	10.35			
Max. Vx	20	701.88				-416.23	-2489.21			
Diagonal	Max Tension	21			6851.39	38.25	5.58			
	Max. Compression	8			-7064.65	0.00	0.00			
	Max. Mx	36			1300.57	157.42	-0.48			
	Max. My	20			-7024.27	32.75	8.51			
	Max. Vy	36			-99.45	157.42	-0.48			
	Max. Vx	20			1.09	0.00	0.00			
	Secondary Horizontal	Max Tension			18	933.52	0.00	0.00		
		Max. Compression			7	-719.28	36.18	4.65		
Max. Mx		34	-159.40	110.69	0.32					
Max. My		12	-595.03	44.51	5.54					
Max. Vy		34	-97.62	110.69	0.32					
Max. Vx		20	1.03	0.00	0.00					
T5		150 - 140	Leg	Max Tension	7	37057.88	267.14	44.28		
				Max. Compression	18	-46026.41	3293.71	83.85		
	Max. Mx			18	-46026.41	3293.71	83.85			
	Max. My			20	-3404.50	-416.23	-2489.21			
	Max. Vy			18	-600.58	3293.71	83.85			
	Max. Vx			20	-377.43	-416.23	-2489.21			
	Diagonal		Max Tension	8	8076.08	0.00	0.00			
			Max. Compression	20	-8292.06	0.00	0.00			
			Max. Mx	35	989.53	175.59	-0.30			
			Max. My	10	-7781.51	36.97	-8.09			

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft			
T6	140 - 120	Leg	Max. Vy	35	-101.26	175.57	0.03			
			Max. Vx	10	1.08	0.00	0.00			
			Max Tension	23	72611.88	0.00	0.00			
			Max. Compression	18	-88353.66	2109.65	-163.98			
			Max. Mx	18	-66265.67	3293.71	83.59			
			Max. My	20	-6919.67	-71.04	-2296.54			
		Diagonal	Max. Vy	2	749.56	3279.19	-3.03			
			Max. Vx	20	710.02	-71.04	-2296.54			
			Max Tension	4	9743.04	0.00	0.00			
			Max. Compression	4	-9812.59	0.00	0.00			
			Max. Mx	36	1691.64	199.81	-27.30			
			Max. My	34	1114.24	184.12	-28.41			
			Max. Vy	36	113.83	199.81	-27.30			
			Max. Vx	34	-6.59	0.00	0.00			
			Top Girt	Max Tension	2	125.65	0.00	0.00		
				Max. Compression	15	-145.20	0.00	0.00		
		Max. Mx		26	83.78	-466.91	0.00			
		Max. My		33	90.44	0.00	13.48			
		T7	120 - 110	Leg	Max. Vy	26	155.64	0.00	0.00	
					Max. Vx	33	4.49	0.00	0.00	
Max Tension	23				90036.15	-2151.58	-21.36			
Max. Compression	18				-108231.16	-558.05	68.80			
Max. Mx	18				-107963.79	6360.32	13.96			
Max. My	16				-7508.55	-400.98	4165.46			
Diagonal	Max. Vy			18	1421.40	6360.32	13.96			
	Max. Vx			24	-768.87	-395.45	4037.21			
	Max Tension			5	10846.01	89.15	4.47			
	Max. Compression			4	-11389.73	0.00	0.00			
	Max. Mx			37	1143.34	235.58	21.94			
	Max. My			34	-3216.41	216.11	-26.97			
	Max. Vy			37	134.42	235.58	21.94			
	Max. Vx			34	-6.72	0.00	0.00			
	Secondary Horizontal			Max Tension	18	1876.96	0.00	0.00		
				Max. Compression	18	-1876.96	36.33	2.72		
Max. Mx				33	-176.05	183.03	39.93			
Max. My				36	278.69	182.66	41.32			
T8	110 - 100			Leg	Max. Vy	33	-130.00	183.03	39.93	
					Max. Vx	27	-8.83	0.00	0.00	
		Max Tension	7		109474.68	-105.94	-66.91			
		Max. Compression	18		-130886.80	3978.94	81.30			
		Max. Mx	18		-130886.80	3978.94	81.30			
		Max. My	16		-8189.59	-400.99	4165.46			
		Diagonal	Max. Vy	18	-665.70	3978.94	81.30			
			Max. Vx	16	560.95	-400.99	4165.46			
			Max Tension	4	11052.07	0.00	0.00			
			Max. Compression	4	-11100.81	0.00	0.00			
			Max. Mx	35	2014.93	273.15	34.67			
			Max. My	27	321.37	251.73	37.06			
			Max. Vy	37	143.44	272.37	-36.33			
			Max. Vx	27	7.90	0.00	0.00			
			T9	100 - 80	Leg	Max Tension	7	149076.53	0.00	0.00
						Max. Compression	18	-176344.45	6023.31	-185.15
		Max. Mx				19	-173262.27	6036.55	-185.45	
		Max. My				20	-11293.20	-58.32	-3206.48	
		Diagonal			Max. Vy	14	-1097.00	-3632.98	61.99	
					Max. Vx	20	-1058.27	92.12	-1507.28	
Max Tension	16				12517.95	0.00	0.00			
Max. Compression	16				-12632.56	0.00	0.00			
Max. Mx	37	1476.72	344.60	-45.80						
Max. My	34	1309.18	321.77	-46.37						



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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T10	80 - 60	Leg	Max. Vy	36	166.33	344.51	-45.40
			Max. Vx	34	-8.95	0.00	0.00
			Max Tension	7	189057.39	0.00	0.00
			Max. Compression	18	-223294.79	5538.46	-74.85
			Max. Mx	19	-195427.32	6036.55	-185.44
			Max. My	20	-13893.46	-301.67	-3763.05
			Max. Vy	22	-1205.81	-5854.83	-68.45
		Diagonal	Max. Vx	24	965.02	-51.17	3059.21
			Max Tension	16	13992.54	0.00	0.00
			Max. Compression	4	-14305.81	0.00	0.00
			Max. Mx	35	2324.58	473.08	58.02
			Max. My	34	1314.20	444.71	-60.72
			Max. Vy	37	206.02	469.94	-60.19
			Max. Vx	34	-10.78	0.00	0.00
T11	60 - 40	Leg	Max Tension	23	227989.47	0.00	0.00
			Max. Compression	18	-270025.52	3397.52	-20.42
			Max. Mx	6	204695.32	-5807.14	71.45
			Max. My	24	-17312.36	-944.13	7368.30
			Max. Vy	6	-756.89	-5807.14	71.45
			Max. Vx	24	-915.23	-944.13	7368.30
			Max Tension	4	14773.15	0.00	0.00
		Diagonal	Max. Compression	4	-15265.13	0.00	0.00
			Max. Mx	35	2318.73	685.55	-77.65
			Max. My	38	-1476.74	628.45	83.58
			Max. Vy	37	269.27	678.46	80.13
			Max. Vx	38	13.72	0.00	0.00
			Max Tension	23	266295.58	0.00	0.00
			Max. Compression	18	-316901.63	5601.63	-113.56
T12	40 - 20	Leg	Max. Mx	6	260539.10	-7803.49	137.80
			Max. My	24	-20778.58	-1408.48	17845.15
			Max. Vy	6	941.79	-7803.49	137.80
			Max. Vx	24	-1945.52	-1408.48	17845.15
			Max Tension	5	15662.88	0.00	0.00
			Max. Compression	2	-16483.72	0.00	0.00
			Max. Mx	36	-1364.97	816.13	90.08
		Diagonal	Max. My	16	-14133.37	140.12	-121.25
			Max. Vy	36	286.80	816.13	90.08
			Max. Vx	37	-15.14	0.00	0.00
			Max Tension	23	288422.40	-7459.04	33.91
			Max. Compression	18	-343110.53	0.00	-0.55
			Max. Mx	6	283177.42	-7803.49	137.80
			Max. My	24	-20839.90	-1408.52	17845.15
T13	20 - 0	Leg	Max. Vy	6	-764.55	-7803.49	137.80
			Max. Vx	24	1231.22	-1408.52	17845.15
			Max Tension	15	20075.17	0.00	0.00
			Max. Compression	2	-22963.37	0.00	0.00
			Max. Mx	36	4910.22	-948.98	129.16
			Max. My	36	1758.57	-936.22	-136.93
			Max. Vy	36	-297.15	-948.98	129.16
		Diagonal	Max. Vx	36	-17.18	0.00	0.00

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	370443.36	43072.32	-25508.01

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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg B	Max. H <sub>x</sub>	18	370443.36	43072.32	-25508.01
	Max. H <sub>z</sub>	7	-309507.89	-36947.27	21915.26
	Min. Vert	7	-309507.89	-36947.27	21915.26
	Min. H <sub>x</sub>	7	-309507.89	-36947.27	21915.26
	Min. H <sub>z</sub>	18	370443.36	43072.32	-25508.01
	Max. Vert	10	368940.09	-43323.91	-24938.17
	Max. H <sub>x</sub>	23	-309862.40	37213.34	21433.11
	Max. H <sub>z</sub>	23	-309862.40	37213.34	21433.11
	Min. Vert	23	-309862.40	37213.34	21433.11
	Min. H <sub>x</sub>	10	368940.09	-43323.91	-24938.17
Leg A	Min. H <sub>z</sub>	10	368940.09	-43323.91	-24938.17
	Max. Vert	2	369751.07	-619.31	50027.34
	Max. H <sub>x</sub>	19	-155107.90	2157.48	-21995.00
	Max. H <sub>z</sub>	2	369751.07	-619.31	50027.34
	Min. Vert	15	-309556.56	550.61	-42948.59
	Min. H <sub>x</sub>	8	24147.19	-2018.26	2470.85
	Min. H <sub>z</sub>	15	-309556.56	550.61	-42948.59

## Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Dead Only	59547.80	0.00	0.00	-1339.83	11473.04	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	71457.35	24.55	-74172.63	-7789232.44	8125.03	-27438.68
0.9 Dead+1.6 Wind 0 deg - No Ice	53593.01	24.55	-74172.66	-7783313.02	4673.82	-27425.76
1.2 Dead+1.6 Wind 30 deg - No Ice	71457.36	35424.77	-61340.27	-6483303.46	-3732371.17	-28472.54
0.9 Dead+1.6 Wind 30 deg - No Ice	53593.01	35424.82	-61340.31	-6478304.54	-3733176.16	-28458.85
1.2 Dead+1.6 Wind 60 deg - No Ice	71457.38	60363.80	-34869.50	-3696061.36	-6380579.19	-22986.01
0.9 Dead+1.6 Wind 60 deg - No Ice	53593.01	60363.93	-34869.57	-3693037.43	-6379501.63	-22979.04
1.2 Dead+1.6 Wind 90 deg - No Ice	71457.36	70806.95	-24.59	-7387.11	-7468704.71	-12064.25
0.9 Dead+1.6 Wind 90 deg - No Ice	53593.11	70808.39	-25.55	-6978.52	-7466861.45	-12041.30
1.2 Dead+1.6 Wind 120 deg - No Ice	71457.35	64215.71	37065.06	3887226.69	-6728853.86	2780.96
0.9 Dead+1.6 Wind 120 deg - No Ice	53593.01	64215.73	37065.07	3884878.67	-6727535.62	2776.45
1.2 Dead+1.6 Wind 150 deg - No Ice	71457.36	35382.18	61315.77	6474323.38	-3722448.88	16434.12
0.9 Dead+1.6 Wind 150 deg - No Ice	53593.10	35382.08	61317.48	6470142.69	-3723259.20	16403.07
1.2 Dead+1.6 Wind 180 deg - No Ice	71457.38	-24.55	69696.49	7377250.90	19594.33	25422.59
0.9 Dead+1.6 Wind 180 deg - No Ice	53593.01	-24.55	69696.63	7372425.23	16132.59	25411.47
1.2 Dead+1.6 Wind 210 deg - No Ice	71457.36	-35424.70	61340.31	6480016.17	3760078.62	28472.50
0.9 Dead+1.6 Wind 210 deg - No Ice	53593.01	-35424.70	61340.37	6475830.48	3753962.30	28458.84
1.2 Dead+1.6 Wind 240 deg - No Ice	71457.35	-64240.26	37107.58	3897115.45	6762229.65	24656.98

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<i>Load Combination</i>	<i>Vertical</i> <i>lb</i>	<i>Shear<sub>x</sub></i> <i>lb</i>	<i>Shear<sub>z</sub></i> <i>lb</i>	<i>Overturning Moment, M<sub>x</sub></i> <i>lb-ft</i>	<i>Overturning Moment, M<sub>z</sub></i> <i>lb-ft</i>	<i>Torque</i> <i>lb-ft</i>
No Ice						
0.9 Dead+1.6 Wind 240 deg - No Ice	53593.01	-64240.28	37107.59	3894757.25	6753992.02	24648.56
1.2 Dead+1.6 Wind 270 deg - No Ice	71457.36	-70806.95	24.51	4097.39	7496306.33	12064.38
0.9 Dead+1.6 Wind 270 deg - No Ice	53593.12	-70808.39	23.55	4493.59	7487550.00	12041.38
1.2 Dead+1.6 Wind 300 deg - No Ice	71457.40	-60339.25	-34826.98	-3686069.39	6402465.40	-2435.86
0.9 Dead+1.6 Wind 300 deg - No Ice	53593.01	-60339.37	-34827.05	-3683055.96	6394481.82	-2431.86
1.2 Dead+1.6 Wind 330 deg - No Ice	71457.36	-35382.25	-61315.73	-6477513.38	3750112.85	-16434.22
0.9 Dead+1.6 Wind 330 deg - No Ice	53593.10	-35383.79	-61316.49	-6472522.80	3744012.52	-16403.13
1.2 Dead+1.0 Ice+1.0 Temp	230148.38	0.00	0.00	-25211.38	78347.47	-0.18
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	230148.37	7.93	-14142.75	-1571980.39	77722.96	-3515.96
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	230148.37	6953.38	-12029.80	-1345441.11	-684396.99	-3023.76
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	230148.37	11961.62	-6907.24	-784256.70	-1235436.77	-1782.75
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	230148.37	13893.01	-7.93	-26346.35	-1445805.64	-89.25
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	230148.37	12249.88	7064.51	747091.40	-1260895.72	1670.92
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	230148.37	6939.64	12021.87	1293724.69	-682711.92	2932.76
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	230148.37	-7.93	13800.74	1490715.56	79663.67	3414.75
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	230148.37	-6953.37	12029.80	1294694.23	841785.28	3023.74
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	230148.37	-12257.81	7078.24	748771.44	1419253.72	1844.02
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	230148.37	-13893.01	7.93	-24404.24	1603194.66	90.12
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	230148.37	-11953.69	-6893.50	-782580.22	1391859.52	-1631.89
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	230148.37	-6939.64	-12021.87	-1344469.41	840105.61	-2934.04
Dead+Wind 0 deg - Service	59547.80	5.52	-16688.87	-1752757.26	10208.25	-6170.53
Dead+Wind 30 deg - Service	59547.80	7970.57	-13801.58	-1459043.65	-831011.29	-6406.41
Dead+Wind 60 deg - Service	59547.80	13581.86	-7845.64	-832201.10	-1426576.17	-5171.00
Dead+Wind 90 deg - Service	59547.80	15931.58	-5.52	-2635.67	-1671288.47	-2712.06
Dead+Wind 120 deg - Service	59547.80	14448.56	8339.65	873245.30	-1504908.21	625.26
Dead+Wind 150 deg - Service	59547.80	7961.01	13796.06	1455064.69	-828777.03	3693.97
Dead+Wind 180 deg - Service	59547.80	-5.52	15681.71	1658130.95	12789.82	5718.58
Dead+Wind 210 deg - Service	59547.80	-7970.57	13801.58	1456353.48	854009.34	6406.41
Dead+Wind 240 deg - Service	59547.80	-14454.09	8349.22	875479.05	1529193.18	5545.56
Dead+Wind 270 deg - Service	59547.80	-15931.58	5.52	-53.51	1694280.94	2712.06
Dead+Wind 300 deg - Service	59547.80	-13576.33	-7836.07	-829962.37	1448279.15	-547.45
Dead+Wind 330 deg - Service	59547.80	-7961.01	-13796.06	-1457750.35	851771.71	-3693.97

## Solution Summary

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-59547.80	0.00	-0.00	59547.80	-0.00	0.000%
2	24.55	-71457.36	-74172.78	-24.55	71457.35	74172.63	0.000%
3	24.55	-53593.02	-74172.78	-24.55	53593.01	74172.66	0.000%
4	35424.77	-71457.36	-61340.35	-35424.77	71457.36	61340.27	0.000%
5	35424.77	-53593.02	-61340.35	-35424.82	53593.01	61340.31	0.000%
6	60363.81	-71457.36	-34869.51	-60363.80	71457.38	34869.50	0.000%
7	60363.81	-53593.02	-34869.51	-60363.93	53593.01	34869.57	0.000%
8	70807.02	-71457.36	-24.55	-70806.95	71457.36	24.59	0.000%
9	70807.02	-53593.02	-24.55	-70808.39	53593.11	25.55	0.002%
10	64215.84	-71457.36	37065.13	-64215.71	71457.35	-37065.06	0.000%
11	64215.84	-53593.02	37065.13	-64215.73	53593.01	-37065.07	0.000%
12	35382.25	-71457.36	61315.80	-35382.18	71457.36	-61315.77	0.000%
13	35382.25	-53593.02	61315.80	-35382.08	53593.10	-61317.48	0.002%
14	-24.55	-71457.36	69696.49	24.55	71457.38	-69696.49	0.000%
15	-24.55	-53593.02	69696.49	24.55	53593.01	-69696.63	0.000%
16	-35424.77	-71457.36	61340.35	35424.70	71457.36	-61340.31	0.000%
17	-35424.77	-53593.02	61340.35	35424.70	53593.01	-61340.37	0.000%
18	-64240.39	-71457.36	37107.65	64240.26	71457.35	-37107.58	0.000%
19	-64240.39	-53593.02	37107.65	64240.28	53593.01	-37107.59	0.000%
20	-70807.02	-71457.36	24.55	70806.95	71457.36	-24.51	0.000%
21	-70807.02	-53593.02	24.55	70808.39	53593.12	-23.55	0.002%
22	-60339.26	-71457.36	-34826.99	60339.25	71457.40	34826.98	0.000%
23	-60339.26	-53593.02	-34826.99	60339.37	53593.01	34827.05	0.000%
24	-35382.25	-71457.36	-61315.80	35382.25	71457.36	61315.73	0.000%
25	-35382.25	-53593.02	-61315.80	35383.79	53593.10	61316.49	0.002%
26	0.00	-230148.38	0.00	-0.00	230148.38	-0.00	0.000%
27	7.93	-230148.38	-14142.76	-7.93	230148.37	14142.75	0.000%
28	6953.38	-230148.38	-12029.81	-6953.38	230148.37	12029.80	0.000%
29	11961.62	-230148.38	-6907.24	-11961.62	230148.37	6907.24	0.000%
30	13893.02	-230148.38	-7.93	-13893.01	230148.37	7.93	0.000%
31	12249.89	-230148.38	7064.51	-12249.88	230148.37	-7064.51	0.000%
32	6939.64	-230148.38	12021.88	-6939.64	230148.37	-12021.87	0.000%
33	-7.93	-230148.38	13800.74	7.93	230148.37	-13800.74	0.000%
34	-6953.38	-230148.38	12029.81	6953.37	230148.37	-12029.80	0.000%
35	-12257.82	-230148.38	7078.25	12257.81	230148.37	-7078.24	0.000%
36	-13893.02	-230148.38	7.93	13893.01	230148.37	-7.93	0.000%
37	-11953.69	-230148.38	-6893.50	11953.69	230148.37	6893.50	0.000%
38	-6939.64	-230148.38	-12021.88	6939.64	230148.37	12021.87	0.000%
39	5.52	-59547.80	-16688.87	-5.52	59547.80	16688.87	0.000%
40	7970.57	-59547.80	-13801.58	-7970.57	59547.80	13801.58	0.000%
41	13581.86	-59547.80	-7845.64	-13581.86	59547.80	7845.64	0.000%
42	15931.58	-59547.80	-5.52	-15931.58	59547.80	5.52	0.000%
43	14448.56	-59547.80	8339.65	-14448.56	59547.80	-8339.65	0.000%
44	7961.01	-59547.80	13796.06	-7961.01	59547.80	-13796.06	0.000%
45	-5.52	-59547.80	15681.71	5.52	59547.80	-15681.71	0.000%
46	-7970.57	-59547.80	13801.58	7970.57	59547.80	-13801.58	0.000%
47	-14454.09	-59547.80	8349.22	14454.09	59547.80	-8349.22	0.000%
48	-15931.58	-59547.80	5.52	15931.58	59547.80	-5.52	0.000%
49	-13576.33	-59547.80	-7836.07	13576.33	59547.80	7836.07	0.000%
50	-7961.01	-59547.80	-13796.06	7961.01	59547.80	13796.06	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001

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2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000189
5	Yes	4	0.00000001	0.00000143
6	Yes	4	0.00000001	0.00000201
7	Yes	4	0.00000001	0.00000130
8	Yes	4	0.00000001	0.00000206
9	Yes	4	0.00000001	0.00000155
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000160
13	Yes	4	0.00000001	0.00000157
14	Yes	4	0.00000001	0.00000201
15	Yes	4	0.00000001	0.00000131
16	Yes	4	0.00000001	0.00000189
17	Yes	4	0.00000001	0.00000143
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000206
21	Yes	4	0.00000001	0.00000156
22	Yes	4	0.00000001	0.00000251
23	Yes	4	0.00000001	0.00000130
24	Yes	4	0.00000001	0.00000160
25	Yes	4	0.00000001	0.00000157
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000202
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 190	2.939	47	0.1124	0.0047
T2	190 - 180	2.822	47	0.1124	0.0047
T3	180 - 160	2.584	47	0.1122	0.0056
T4	160 - 150	2.107	47	0.1087	0.0062
T5	150 - 140	1.875	47	0.1056	0.0062

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	140 - 120	1.651	47	0.1005	0.0062
T7	120 - 110	1.232	47	0.0893	0.0045
T8	110 - 100	1.042	47	0.0822	0.0040
T9	100 - 80	0.868	47	0.0741	0.0036
T10	80 - 60	0.561	47	0.0599	0.0025
T11	60 - 40	0.323	47	0.0433	0.0018
T12	40 - 20	0.152	47	0.0288	0.0011
T13	20 - 0	0.039	47	0.0131	0.0005

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.50	Andrew 6' w/Radome	47	2.810	0.1124	0.0047	215007
186.00	ATN 150F2	47	2.727	0.1124	0.0050	267802
184.17	ANT150D3	47	2.684	0.1123	0.0052	368148
184.00	OGT9-840N	47	2.680	0.1123	0.0052	381155
183.72	PiROD 7' Side arm mount	47	2.673	0.1123	0.0052	405347
183.17	PiROD 7' Side arm Mount	47	2.660	0.1123	0.0053	461305
183.00	3' Side Arm Mount	47	2.656	0.1123	0.0053	481101
172.00	DB222-A	47	2.392	0.1113	0.0060	737777
171.50	DB222-A	47	2.380	0.1112	0.0060	691300
171.00	DB222-A	47	2.368	0.1111	0.0060	650335
169.00	Amphenol LPA-80080-4CF-EDIN-4	47	2.321	0.1108	0.0061	525718
157.42	APXV9ERR18	47	2.046	0.1081	0.0062	206267
154.00	PiROD 13' Lightweight T-Frame	47	1.967	0.1071	0.0062	155862
140.00	SBNHH-1D65A W/ MOUNT PIPE	47	1.651	0.1005	0.0062	135364
137.00	PiROD 12' T-Frame	47	1.586	0.0989	0.0060	130184
131.00	PiROD 12' T-Frame	47	1.457	0.0957	0.0055	114928
125.00	PiROD 12' Universal T-Frame Sector Mount	47	1.333	0.0924	0.0049	102710
120.00	PiROD 6' side arm mount	47	1.232	0.0893	0.0045	91595
109.00	ANT150D3	47	1.024	0.0814	0.0040	67300
106.00	PiROD 6' side arm mount	47	0.971	0.0789	0.0039	75865
99.00	Andrew 6' w/Radome	47	0.852	0.0733	0.0036	104581
84.00	2-element dipole	47	0.618	0.0629	0.0027	69696
79.60	Amphenol BCD-80609	47	0.556	0.0596	0.0025	64674
79.50	PiROD 7' side arm mount	47	0.554	0.0595	0.0025	64628
79.00	PiROD 7' side arm mount	47	0.547	0.0592	0.0025	64443
36.25	GPS Antenna 18"x3" Dia	47	0.126	0.0259	0.0010	85434
32.92	4' Side Arm Mount	47	0.104	0.0233	0.0009	74264

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 190	13.021	18	0.4975	0.0207
T2	190 - 180	12.501	18	0.4975	0.0209
T3	180 - 160	11.447	18	0.4966	0.0248
T4	160 - 150	9.337	18	0.4813	0.0275

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T5	150 - 140	8.307	18	0.4675	0.0277
T6	140 - 120	7.317	18	0.4449	0.0274
T7	120 - 110	5.463	18	0.3958	0.0201
T8	110 - 100	4.618	18	0.3642	0.0178
T9	100 - 80	3.849	18	0.3283	0.0161
T10	80 - 60	2.487	18	0.2655	0.0112
T11	60 - 40	1.431	18	0.1919	0.0079
T12	40 - 20	0.673	18	0.1275	0.0051
T13	20 - 0	0.175	18	0.0580	0.0022

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.50	Andrew 6' w/Radome	18	12.449	0.4975	0.0210	49118
186.00	ATN 150F2	18	12.082	0.4974	0.0222	61508
184.17	ANT150D3	18	11.888	0.4973	0.0230	85312
184.00	OGT9-840N	18	11.870	0.4973	0.0231	88428
183.72	PiROD 7' Side arm mount	18	11.840	0.4973	0.0232	94244
183.17	PiROD 7' Side arm Mount	18	11.782	0.4972	0.0235	107787
183.00	3' Side Arm Mount	18	11.765	0.4972	0.0235	112600
172.00	DB222-A	18	10.599	0.4925	0.0267	174898
171.50	DB222-A	18	10.546	0.4921	0.0268	162955
171.00	DB222-A	18	10.493	0.4917	0.0269	152539
169.00	Amphenol LPA-80080-4CF-EDIN-4	18	10.282	0.4901	0.0271	121478
157.42	APXV9ERR18	18	9.068	0.4784	0.0275	46907
154.00	PiROD 13' Lightweight T-Frame	18	8.715	0.4740	0.0276	35393
140.00	SBNHH-1D65A W/ MOUNT PIPE	18	7.317	0.4449	0.0274	30989
137.00	PiROD 12' T-Frame	18	7.027	0.4378	0.0267	29764
131.00	PiROD 12' T-Frame	18	6.459	0.4238	0.0245	26144
125.00	PiROD 12' Universal T-Frame Sector Mount	18	5.908	0.4092	0.0220	23270
120.00	PiROD 6' side arm mount	18	5.463	0.3958	0.0201	20706
109.00	ANT150D3	18	4.538	0.3606	0.0176	15218
106.00	PiROD 6' side arm mount	18	4.302	0.3498	0.0171	17143
99.00	Andrew 6' w/Radome	18	3.775	0.3249	0.0158	23571
84.00	2-element dipole	18	2.737	0.2785	0.0121	15705
79.60	Amphenol BCD-80609	18	2.462	0.2642	0.0111	14574
79.50	PiROD 7' side arm mount	18	2.456	0.2638	0.0110	14564
79.00	PiROD 7' side arm mount	18	2.426	0.2621	0.0109	14523
36.25	GPS Antenna 18"x3" Dia	18	0.557	0.1147	0.0046	19283
32.92	4' Side Arm Mount	18	0.461	0.1030	0.0041	16777

### Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load Allowable	Allowable Ratio	Criteria
T1	195	Leg	A325N	1.0000	6	33.87	53014.40	0.001 ✓	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 lb	Ratio Load Allowable	Allowable Ratio	Criteria
T2	190	Diagonal	A325N	1.0000	1	440.75	20880.00	0.021 ✓	1	Gusset Bearing
		Leg	A325N	1.0000	6	221.80	53014.40	0.004 ✓	1	Bolt Tension
T3	180	Diagonal	A325N	1.0000	1	1706.17	12723.80	0.134 ✓	1	Gusset Bearing
		Leg	A325N	1.0000	6	1940.24	53014.40	0.037 ✓	1	Bolt Tension
T4	160	Diagonal	A325N	1.0000	1	4487.50	12723.80	0.353 ✓	1	Member Bearing
		Leg	A325N	1.0000	6	3681.33	53014.40	0.069 ✓	1	Bolt Tension
T5	150	Diagonal	A325N	1.0000	1	6851.39	12723.80	0.538 ✓	1	Gusset Bearing
		Leg	A325N	1.0000	6	8076.08	16965.00	0.476 ✓	1	Gusset Bearing
T6	140	Diagonal	A325N	1.0000	1	12102.00	53014.40	0.228 ✓	1	Bolt Tension
		Leg	A325N	1.0000	6	9743.04	16965.00	0.574 ✓	1	Gusset Bearing
T7	120	Diagonal	A325N	1.0000	1	14952.80	53014.40	0.282 ✓	1	Bolt Tension
		Leg	A325N	1.0000	6	10846.00	16965.00	0.639 ✓	1	Gusset Bearing
T8	110	Diagonal	A325N	1.0000	1	11052.10	16965.00	0.651 ✓	1	Gusset Bearing
		Leg	A325N	1.2500	6	24846.10	82835.00	0.300 ✓	1	Bolt Tension
T9	100	Diagonal	A325N	1.2500	1	12517.90	21315.00	0.587 ✓	1	Member Bearing
		Leg	A325N	1.2500	6	31509.60	82835.00	0.380 ✓	1	Bolt Tension
T10	80	Diagonal	A325N	1.2500	1	13992.50	31972.50	0.438 ✓	1	Member Bearing
		Leg	A325N	1.2500	6	37998.20	82835.00	0.459 ✓	1	Bolt Tension
T11	60	Diagonal	A325N	1.2500	1	14773.20	31972.50	0.462 ✓	1	Gusset Bearing
		Leg	A325N	1.2500	6	44382.60	82835.00	0.536 ✓	1	Bolt Tension
T12	40	Diagonal	A325N	1.2500	1	15662.90	31972.50	0.490 ✓	1	Member Bearing
		Leg	A325N	1.2500	6	48070.40	212058.00	0.227 ✓	1	Bolt Tension
T13	20	Diagonal	A325N	1.0000	2	10037.60	33603.80	0.299 ✓	1	Gusset Bearing

### Compression Checks

### Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	Pirod 105244	5.00	5.00	45.4 K=1.00	3.6816	-609.59	142493.00	0.004 <sup>1</sup> ✓
T2	190 - 180	Pirod 105244	10.00	10.00	45.4 K=1.00	3.6816	-3992.49	142493.00	0.028 <sup>1</sup> ✓
T3	180 - 160	Pirod 105216	20.00	10.00	45.4 K=1.00	3.6816	-15865.80	142493.00	0.111 <sup>1</sup> ✓
T4	160 - 150	Pirod 105217	10.00	5.00	37.8 K=1.00	5.3014	-28953.20	214859.00	0.135 <sup>1</sup> ✓



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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio $\frac{P_u}{\phi P_n}$
T5	150 - 140	Pirod 105217	10.00	10.00	37.8 K=1.00	5.3014	-46026.40	214859.00	0.214 <sup>1</sup>
T6	140 - 120	Pirod 105218	20.03	10.02	32.4 K=1.00	7.2158	-88353.70	300681.00	0.294 <sup>1</sup>
T7	120 - 110	Pirod 105218	10.02	5.18	32.4 K=1.00	7.2158	-108231.00	300681.00	0.360 <sup>1</sup>
T8	110 - 100	Pirod 105218	10.02	10.02	32.4 K=1.00	7.2158	-130887.00	300681.00	0.435 <sup>1</sup>
T9	100 - 80	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-176344.00	399868.00	0.441 <sup>1</sup>
T10	80 - 60	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-223295.00	399868.00	0.558 <sup>1</sup>
T11	60 - 40	Pirod 105220	20.03	10.02	25.2 K=1.00	11.9282	-270026.00	512375.00	0.527 <sup>1</sup>
T12	40 - 20	Pirod 105220	20.03	10.02	25.2 K=1.00	11.9282	-316902.00	512375.00	0.618 <sup>1</sup>
T13	20 - 0	Pirod 112738	20.03	20.03	32.6 K=1.00	14.7262	-343111.00	613145.00	0.560 <sup>1</sup>

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L <sub>d</sub> ft	Kl/r	φP <sub>n</sub> lb	A in <sup>2</sup>	V <sub>u</sub> lb	φV <sub>n</sub> lb	Stress Ratio
T1	195 - 190	0.5	1.48	121.0	165670.00	0.1963	210.98	3388.58	0.062
T2	190 - 180	0.5	1.48	121.0	165670.00	0.1963	815.61	3388.58	0.241
T3	180 - 160	0.5	1.48	121.0	165670.00	0.1963	849.44	3292.47	0.258
T4	160 - 150	0.5	1.47	120.0	238565.00	0.1963	1099.69	3335.33	0.330
T5	150 - 140	0.5	1.47	120.0	238565.00	0.1963	601.50	3335.33	0.180
T6	140 - 120	0.5	1.46	119.0	324713.00	0.1963	759.32	3377.71	0.225
T7	120 - 110	0.5	1.46	119.0	324713.00	0.1963	1421.58	3377.71	0.421
T8	110 - 100	0.5	1.46	119.0	324713.00	0.1963	667.78	3377.71	0.198
T9	100 - 80	0.625	1.45	94.4	424115.00	0.3068	1143.03	6957.62	0.165
T10	80 - 60	0.625	1.45	94.4	424115.00	0.3068	1207.75	6957.62	0.174
T11	60 - 40	0.625	1.43	93.6	536771.00	0.3068	930.26	7011.35	0.133
T12	40 - 20	0.625	1.43	93.6	536771.00	0.3068	1952.21	7011.35	0.279
T13	20 - 0	0.75	1.73	93.9	662680.00	0.4418	1238.13	14363.90	0.087

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Section No.	Elevation ft	Diagonal Size	$L_d$ ft	$Kl/r$	$\phi P_n$ lb	$A$ in <sup>2</sup>	$V_u$ lb	$\phi V_n$ lb	Stress Ratio
									✓

### Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	$L$ ft	$L_u$ ft	$Kl/r$	$A$ in <sup>2</sup>	$P_u$ lb	$\phi P_n$ lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	2L2 1/2x2 1/2x3/16	7.81	6.83	105.3 K=1.00	1.8000	-440.75	32536.80	0.014 <sup>1</sup> ✓
T2	190 - 180	L2 1/2x2 1/2x3/16	15.62	6.99	169.5 K=1.00	0.9020	-1772.10	7090.89	0.250 <sup>1</sup> ✓
T3	180 - 160	L3x3x3/16	15.62	6.99	140.8 K=1.00	1.0900	-4561.81	12422.30	0.367 <sup>1</sup> ✓
T4	160 - 150	L3x3x5/16	15.62	6.99	142.5 K=1.00	1.7800	-7064.65	19812.30	0.357 <sup>1</sup> ✓
T5	150 - 140	L3x3x5/16	15.62	6.99	142.5 K=1.00	1.7800	-8292.06	19812.30	0.419 <sup>1</sup> ✓
T6	140 - 120	L3x3x5/16	16.80	7.92	161.4 K=1.00	1.7800	-9812.59	15430.20	0.636 <sup>1</sup> ✓
T7	120 - 110	L3 1/2x3 1/2x5/16	17.62	8.34	145.0 K=1.00	2.0900	-11389.70	22455.00	0.507 <sup>1</sup> ✓
T8	110 - 100	L3 1/2x3 1/2x5/16	18.45	8.76	152.3 K=1.00	2.0900	-11100.80	20343.20	0.546 <sup>1</sup> ✓
T9	100 - 80	L4x4x1/4	20.16	9.59	144.8 K=1.00	1.9400	-12297.00	20902.60	0.588 <sup>1</sup> ✓
T10	80 - 60	L4x4x3/8	21.92	10.48	159.6 K=1.00	2.8600	-13508.40	25370.10	0.532 <sup>1</sup> ✓
T11	60 - 40	L5x5x3/8	23.71	11.38	138.0 K=1.00	3.6100	-14228.60	42837.90	0.332 <sup>1</sup> ✓
T12	40 - 20	L5x5x3/8	24.62	11.84	143.6 K=1.00	3.6100	-16483.70	39567.80	0.417 <sup>1</sup> ✓
T13	20 - 0	2L3 1/2x3 1/2x5/16	32.02	15.40	159.0 K=0.93	4.1800	-22963.40	37363.80	0.615 <sup>1</sup> ✓

<sup>1</sup>  $P_u / \phi P_n$  controls

### Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	$L$ ft	$L_u$ ft	$Kl/r$	$A$ in <sup>2</sup>	$P_u$ lb	$\phi P_n$ lb	Ratio $\frac{P_u}{\phi P_n}$
T4	160 - 150	L3x3x5/16	12.00	11.00	134.2 K=0.94	1.7800	-719.28	22312.40	0.032 <sup>1</sup> ✓
T7	120 - 110	L3 1/2x3 1/2x5/16	14.48	13.48	138.3 K=0.92	2.0900	-1876.96	24674.00	0.076 <sup>1</sup> ✓

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<sup>1</sup>  $P_u / \phi P_n$  controls

### Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	2L2 1/2x2 1/2x3/16	12.00	8.25	95.2 K=1.00	1.8000	-140.52	36194.40	0.004 <sup>1</sup>
T6	140 - 120	L3x3x5/16	12.00	11.00	184.0 K=0.82	1.7800	-145.20	11874.00	0.012 <sup>1</sup>

<sup>1</sup>  $P_u / \phi P_n$  controls

### Tension Checks

### Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio $\frac{P_u}{\phi P_n}$
T2	190 - 180	Pirod 105244	10.00	10.00	45.4	3.6816	778.00	165670.00	0.005 <sup>1</sup>
T3	180 - 160	Pirod 105216	20.00	10.00	45.4	3.6816	11641.40	165670.00	0.070 <sup>1</sup>
T4	160 - 150	Pirod 105217	10.00	5.00	37.8	5.3014	22354.90	238565.00	0.094 <sup>1</sup>
T5	150 - 140	Pirod 105217	10.00	10.00	37.8	5.3014	37057.90	238565.00	0.155 <sup>1</sup>
T6	140 - 120	Pirod 105218	20.03	10.02	32.4	7.2158	72611.90	324713.00	0.224 <sup>1</sup>
T7	120 - 110	Pirod 105218	10.02	4.84	32.4	7.2158	90036.10	324713.00	0.277 <sup>1</sup>
T8	110 - 100	Pirod 105218	10.02	10.02	32.4	7.2158	109475.00	324713.00	0.337 <sup>1</sup>
T9	100 - 80	Pirod 105219	20.03	10.02	28.4	9.4248	149077.00	424115.00	0.352 <sup>1</sup>
T10	80 - 60	Pirod 105219	20.03	10.02	28.4	9.4248	189057.00	424115.00	0.446 <sup>1</sup>
T11	60 - 40	Pirod 105220	20.03	10.02	25.2	11.9282	227989.00	536771.00	0.425 <sup>1</sup>
T12	40 - 20	Pirod 105220	20.03	10.02	25.2	11.9282	266296.00	536771.00	0.496 <sup>1</sup>
T13	20 - 0	Pirod 112738	20.03	20.03	32.6	14.7262	288422.00	662680.00	0.435 <sup>1</sup>

<sup>1</sup>  $P_u / \phi P_n$  controls

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### Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	$L_d$ ft	$Kl/r$	$\phi P_n$ lb	$A$ in <sup>2</sup>	$V_u$ lb	$\phi V_n$ lb	Stress Ratio
T1	195 - 190	0.5	1.48	121.0	165670.00	0.1963	210.98	3388.58	0.062
T2	190 - 180	0.5	1.48	121.0	165670.00	0.1963	815.61	3388.58	0.241
T3	180 - 160	0.5	1.48	121.0	165670.00	0.1963	849.44	3292.47	0.258
T4	160 - 150	0.5	1.47	120.0	238565.00	0.1963	1099.69	3335.33	0.330
T5	150 - 140	0.5	1.47	120.0	238565.00	0.1963	601.50	3335.33	0.180
T6	140 - 120	0.5	1.46	119.0	324713.00	0.1963	759.32	3377.71	0.225
T7	120 - 110	0.5	1.46	119.0	324713.00	0.1963	1421.58	3377.71	0.421
T8	110 - 100	0.5	1.46	119.0	324713.00	0.1963	667.78	3377.71	0.198
T9	100 - 80	0.625	1.45	94.4	424115.00	0.3068	1143.03	6957.62	0.165
T10	80 - 60	0.625	1.45	94.4	424115.00	0.3068	1207.75	6957.62	0.174
T11	60 - 40	0.625	1.43	93.6	536771.00	0.3068	930.26	7011.35	0.133
T12	40 - 20	0.625	1.43	93.6	536771.00	0.3068	1952.21	7011.35	0.279
T13	20 - 0	0.75	1.73	93.9	662680.00	0.4418	1238.13	14363.90	0.087

### Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	$L$ ft	$L_u$ ft	$Kl/r$	$A$ in <sup>2</sup>	$P_u$ lb	$\phi P_n$ lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	2L2 1/2x2 1/2x3/16	7.81	6.83	110.4	1.0336	64.10	44961.30	0.001 <sup>1</sup>
T2	190 - 180	L2 1/2x2 1/2x3/16	15.62	6.99	110.4	0.5183	1706.17	22545.90	0.076 <sup>1</sup>
T3	180 - 160	L3x3x3/16	15.62	6.99	91.5	0.6593	4487.50	28679.40	0.156 <sup>1</sup>
T4	160 - 150	L3x3x5/16	15.62	6.99	93.2	1.0713	6851.39	46602.80	0.147 <sup>1</sup>
T5	150 - 140	L3x3x5/16	15.62	6.99	93.2	1.0713	8076.08	46602.80	0.173 <sup>1</sup>
T6	140 - 120	L3x3x5/16	16.80	7.92	105.3	1.0713	9743.04	46602.80	0.209 <sup>1</sup>
T7	120 - 110	L3 1/2x3 1/2x5/16	17.62	8.34	94.5	1.3038	10846.00	56716.50	0.191 <sup>1</sup>
T8	110 - 100	L3 1/2x3 1/2x5/16	18.45	8.76	99.2	1.3038	11052.10	56716.50	0.195 <sup>1</sup>

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio $\frac{P_u}{\phi P_n}$
T9	100 - 80	L4x4x1/4	19.30	9.17	89.9	1.1972	12517.90	52077.70	0.240 <sup>1</sup> ✓
T10	80 - 60	L4x4x3/8	21.03	10.04	99.9	1.7583	13992.50	76485.20	0.183 <sup>1</sup> ✓
T11	60 - 40	L5x5x3/8	22.81	10.93	85.6	2.3208	14773.20	100954.00	0.146 <sup>1</sup> ✓
T12	40 - 20	L5x5x3/8	24.62	11.84	92.6	2.3208	15662.90	100954.00	0.155 <sup>1</sup> ✓
T13	20 - 0	2L3 1/2x3 1/2x5/16	32.02	15.40	174.3	2.6077	20075.20	113433.00	0.177 <sup>1</sup> ✓

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio $\frac{P_u}{\phi P_n}$
T4	160 - 150	L3x3x5/16	12.00	11.00	143.2	1.3350	933.52	65081.30	0.014 <sup>1</sup> ✓
T7	120 - 110	L3 1/2x3 1/2x5/16	14.48	13.48	149.8	1.5675	1876.96	76415.60	0.025 <sup>1</sup> ✓

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	2L2 1/2x2 1/2x3/16	12.00	8.25	95.2	1.8000	177.44	58320.00	0.003 <sup>1</sup> ✓
T6	140 - 120	L3x3x5/16	12.00	11.00	143.2	1.7800	125.65	57672.00	0.002 <sup>1</sup> ✓

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	φP <sub>allow</sub> lb	% Capacity	Pass Fail
T1	195 - 190	Leg	Pirod 105244	1	-609.56	142493.00	6.2	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\phi P_{allow}$ lb	% Capacity	Pass Fail	
T2	190 - 180	Leg	Pirod 105244	14	-3992.49	142493.00	24.1	Pass	
T3	180 - 160	Leg	Pirod 105216	22	-15865.80	142493.00	25.8	Pass	
T4	160 - 150	Leg	Pirod 105217	37	-28953.20	214859.00	33.0	Pass	
T5	150 - 140	Leg	Pirod 105217	49	-46026.40	214859.00	21.4	Pass	
T6	140 - 120	Leg	Pirod 105218	58	-88353.70	300681.00	29.4	Pass	
T7	120 - 110	Leg	Pirod 105218	76	-108231.00	300681.00	42.1	Pass	
T8	110 - 100	Leg	Pirod 105218	88	-130887.00	300681.00	43.5	Pass	
T9	100 - 80	Leg	Pirod 105219	97	-176344.00	399868.00	44.1	Pass	
T10	80 - 60	Leg	Pirod 105219	112	-223295.00	399868.00	55.8	Pass	
T11	60 - 40	Leg	Pirod 105220	127	-270026.00	512375.00	52.7	Pass	
T12	40 - 20	Leg	Pirod 105220	142	-316902.00	512375.00	61.8	Pass	
T13	20 - 0	Leg	Pirod 112738	157	-343111.00	613145.00	56.0	Pass	
T1	195 - 190	Diagonal	2L2 1/2x2 1/2x3/16	7	-440.75	32536.80	1.4	Pass	
T2	190 - 180	Diagonal	L2 1/2x2 1/2x3/16	19	-1772.10	7090.89	25.0	Pass	
T3	180 - 160	Diagonal	L3x3x3/16	25	-4561.81	12422.30	36.7	Pass	
T4	160 - 150	Diagonal	L3x3x5/16	41	-7064.65	19812.30	35.7	Pass	
T5	150 - 140	Diagonal	L3x3x5/16	52	-8292.06	19812.30	41.9	Pass	
T6	140 - 120	Diagonal	L3x3x5/16	68	-9812.59	15430.20	63.6	Pass	
T7	120 - 110	Diagonal	L3 1/2x3 1/2x5/16	83	-11389.70	22455.00	50.7	Pass	
T8	110 - 100	Diagonal	L3 1/2x3 1/2x5/16	95	-11100.80	20343.20	54.6	Pass	
T9	100 - 80	Diagonal	L4x4x1/4	104	-12297.00	20902.60	58.8	Pass	
T10	80 - 60	Diagonal	L4x4x3/8	119	-13508.40	25370.10	53.2	Pass	
T11	60 - 40	Diagonal	L5x5x3/8	134	-14228.60	42837.90	33.2	Pass	
T12	40 - 20	Diagonal	L5x5x3/8	155	-16483.70	39567.80	41.7	Pass	
T13	20 - 0	Diagonal	2L3 1/2x3 1/2x5/16	164	-22963.40	37363.80	61.5	Pass	
T4	160 - 150	Secondary Horizontal	L3x3x5/16	48	-719.28	22312.40	3.2	Pass	
T7	120 - 110	Secondary Horizontal	L3 1/2x3 1/2x5/16	85	-1876.96	24674.00	7.6	Pass	
T1	195 - 190	Top Girt	2L2 1/2x2 1/2x3/16	6	-78.87	36194.40	0.6	Pass	
T6	140 - 120	Top Girt	L3x3x5/16	61	-145.20	11874.00	1.2	Pass	
							Summary		
							Leg (T12)	61.8	Pass
							Diagonal (T6)	63.6	Pass
							Secondary Horizontal (T7)	7.6	Pass
							Top Girt (T6)	1.2	Pass
							Bolt Checks	65.1	Pass
							<b>RATING =</b>	<b>65.1</b>	<b>Pass</b>