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Structural Analysis Report

140' Existing ROHN SSV Lattice Tower

Proposed Verizon Wireless
Antenna Installation

Verizon Site Ref: South Woodstock

87 West Quassett Road
Woodstock, CT

Centek Project No. 09122

Date: September 13, 2011

Prepared for:

Verizon Wireless
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East Hartford, CT 06108

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Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the existing self supporting lattice tower owned by American Tower Corporation (ATC), located in Woodstock, Connecticut for utilization by Verizon Wireless for a proposed typical panel antenna array installation.

The host tower is a 140-ft three legged, tapered steel lattice tower originally designed and manufactured by UNR-ROHN. The tower geometry and structure member sizes were obtained from standard UNR-ROHN self support tower design drawings with N series tower sections. Foundation information was also taken from UNR-ROHN standard design drawings with plan dimensions verified in the field.

The existing antenna and appurtenance inventory were obtained from a tower mapping and inventory report prepared by JWB tower Services, dated August 18, 2011.

The tower is consists of six (6) tapered and one (1) straight vertical leg sections consisting of steel pipe conforming to ASTM A572-50 and solid round steel conforming to ASTM A36. Diagonal lateral support bracing consists of equal angle and solid round steel conforming to ASTM A36. All lateral bracing and flange plate connections are bolted with A325 bolts. The tower face width is 6.56-ft at the bottom tapering to 1.17-ft at the top.

Antenna and Appurtenance Summary

The existing loads considered in the analysis consist of the following:

Load Condition #1 - Existing Verizon equipment.

- VERIZON (Existing):
  Antenna: Two (2) 11-ft Omni-directional whip antennas (one up, one inverted) mounted on a 6-ft stand-off frame with respective RAD center elevations of ±142.83-ft and 126.5-ft above the tower base.
  Coax Cable: Two (2) 7/8" ∅ coax cables running on the East leg of the existing tower as specified in Section 3 of this report.

Load Condition #2 – PROPOSED VERIZON EQUIPMENT.

- VERIZON (Typical LTE Equipment Configuration):
  Antenna: Fifteen (15) 5-ft x1-ft panel antennas mounted on three (3) 13-ft T-Frames with a RAD center elevation of ±140-ft above the tower base.
  Coax Cables: Eighteen (18) 1-5/8" ∅ coax cables running on the leg/face of the existing tower.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- **All coax cables routed as specified in Section 3 of this report.**

Analysis

The existing tower was analyzed using a comprehensive computer program entitled RISATower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower legs, and the model assumes that the leg members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for 85mph basic wind speed (fastest mile) with no ice and 74mph with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice tower structure and its components.

Basic Wind Speed:	Windham v = 80 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Woodstock; v = 100 mph (3 second gust) equivalent to v = 85 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	Appendix K wind speed criteria controls.	
Load Cases:	Load Case 1; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. This load case typically controls the design of lattice towers.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; 45 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses.	*[Does not conform to Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 4; 39 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. This load case typically controls the design of lattice towers.	*[Does not conform to Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 6; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software RISATower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

Under Load Condition #1 (existing conditions) the tower program failed to converge based on excessive displacement of the structure. Successive analyses utilizing the same loading condition were conducted at reduced wind speeds until the stability of the structure was within the program tolerances and convergence was possible. Convergence of the tower was only possible by reducing the basic wind speed (fastest mile) to 45mph without ice and 39mph with 1/2in radial ice, which does not meet the provisions of the TIA/EIA standard or Appendix K of the Connecticut State Building Code.

Calculated stresses were evaluated at the aforementioned reduced wind speed and were **NOT** found to be within allowable limits. In Load Case 4, per RISATower "Section Capacity Table", this tower was found to be **271.1%** of its total capacity. Please refer to Table 1 below for reference.

Table 1.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T1)	140'-0"- 120'-0"	271.1%	**FAIL**
Leg (T2)	120'-0"- 100'-0"	163.7%	**FAIL**
Leg (T3)	100'-0"- 80'-0"	102.6%	**FAIL**

Note: The above results are based on the assumption that all tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection. A review of the tower mapping report finds that some of the tower members are damaged and warrant replacement. Additionally, the effects of the vegetative growth observed on the lower section of the tower were not considered in evaluation of the tower.

Load Condition #2 (proposed equipment) was not evaluated. Considering the significant overstress under Load Condition #1 it is safe to assume that the subject tower will not accommodate any additional loading.

Conclusion

This analysis finds that the subject tower structure is not adequate to support the existing or proposed loading condition. Reinforcement of the structure is considered impracticable due to the magnitude of overstress displayed and the instability of the structure. Replacement of the tower structure in its entirety is warranted.

The analysis provided is based, in part, on the information provided to this office by Verizon Wireless. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principal ~ Structural Engineer

Prepared by:

Jason R. Mead
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

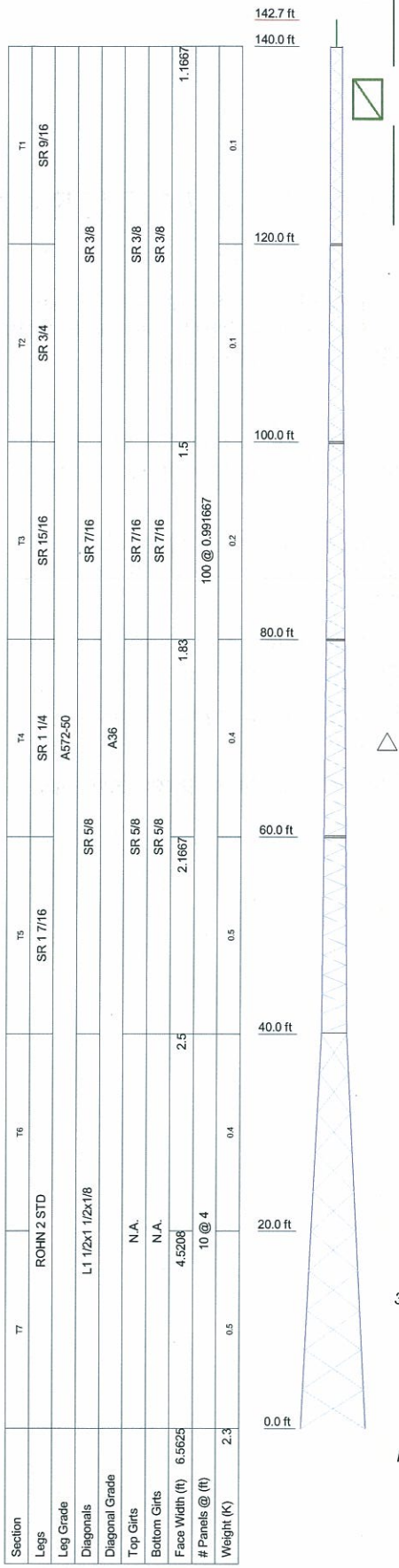
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

RISATower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, RISATower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

RISATower Features:

- RISATower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- RISATower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
11' x 3" Dia Omni (ATC)	143	11' x 3" Dia Omni (ATC)	127
Rohn 6' Side-Arm(1) (ATC)	134.67		

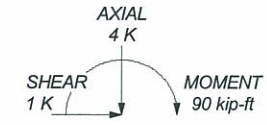
MATERIAL STRENGTH

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

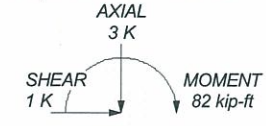
TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for a 45 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 39 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. 2.67 ft ROHN Tapered Top is included for load transfer only.
6. Load Condition #1 - Existing Tower
7. TOWER RATING: 271.1%

MAX. CORNER REACTIONS AT BASE:
DOWN: 17 K
UPLIFT: -14 K
SHEAR: 1 K



TORQUE 1 kip-ft
39 mph WIND - 0.5000 in ICE



TORQUE 1 kip-ft
REACTIONS - 45 mph WIND

CENTEK Engineering, Inc.
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Phone: (203) 488-0580
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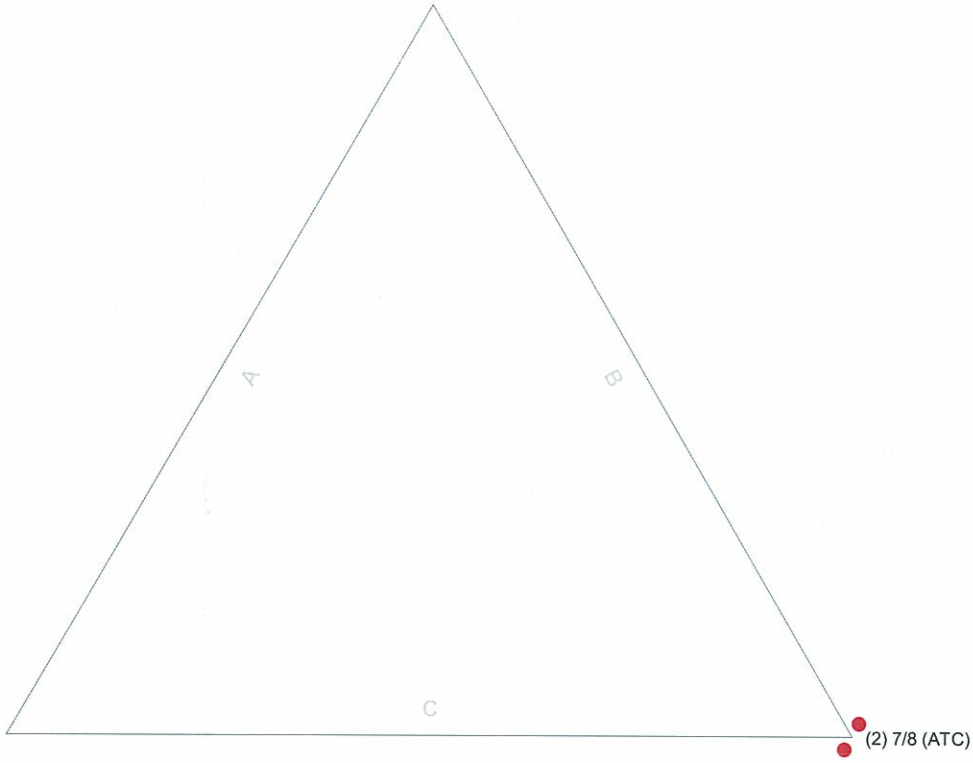
Job: ***140-ft ROHN SSV Woodstock - Exist***		
Project: ***87 West Quasset Road***		
Client: Verizon Wireless	Drawn by: Jrm	App'd:
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path:		Dwg No. E-1

Feedline Plan

Round Flat App In Face App Out Face



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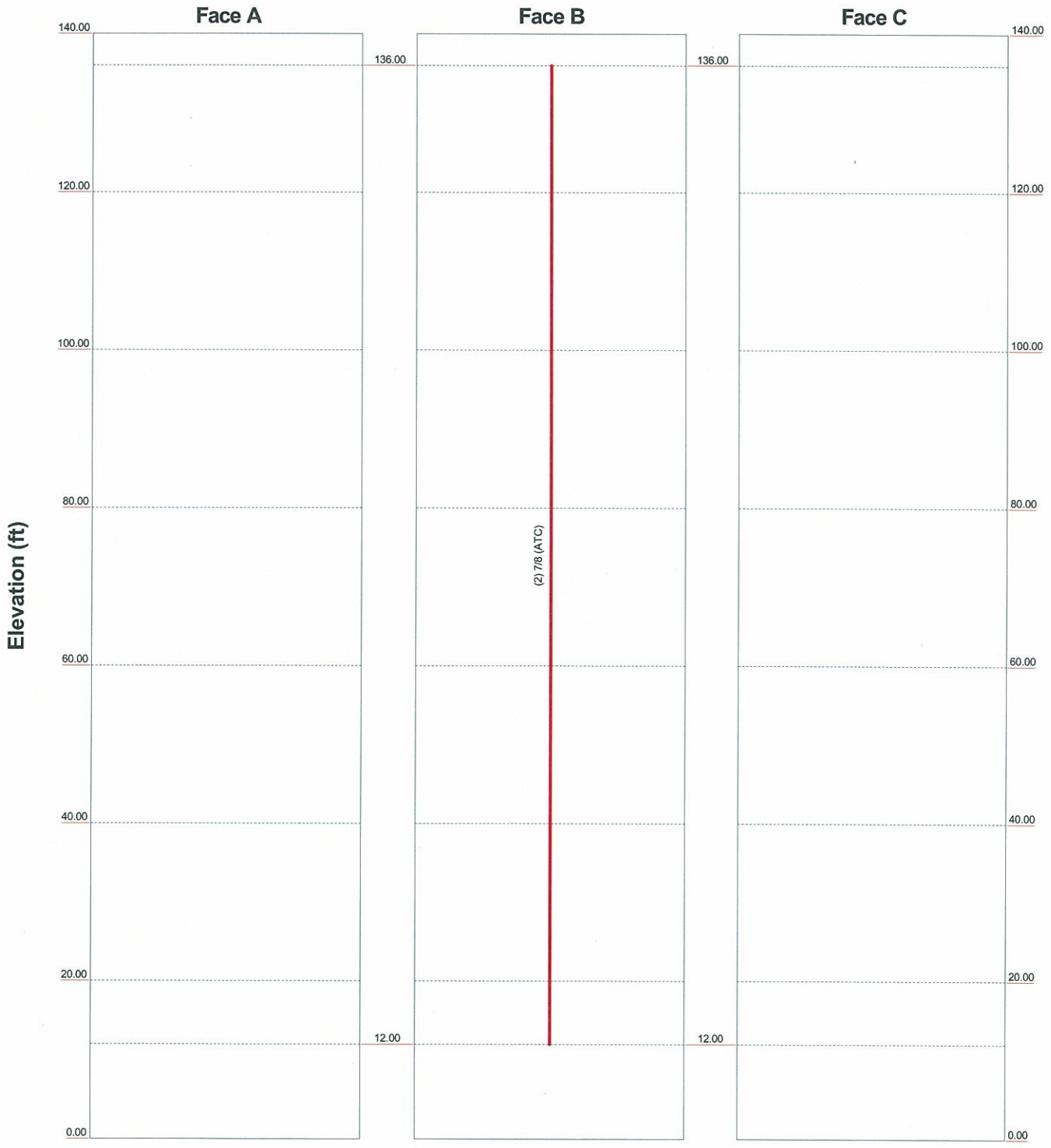
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path:		Dwg No. E-7

Feedline Distribution Chart
0' - 140'

Round | Flat | App In Face | App Out Face | Truss Leg



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Project: 87 West Quasset Road		
Client: Verizon Wireless	Drawn by: Jrm	App'd:
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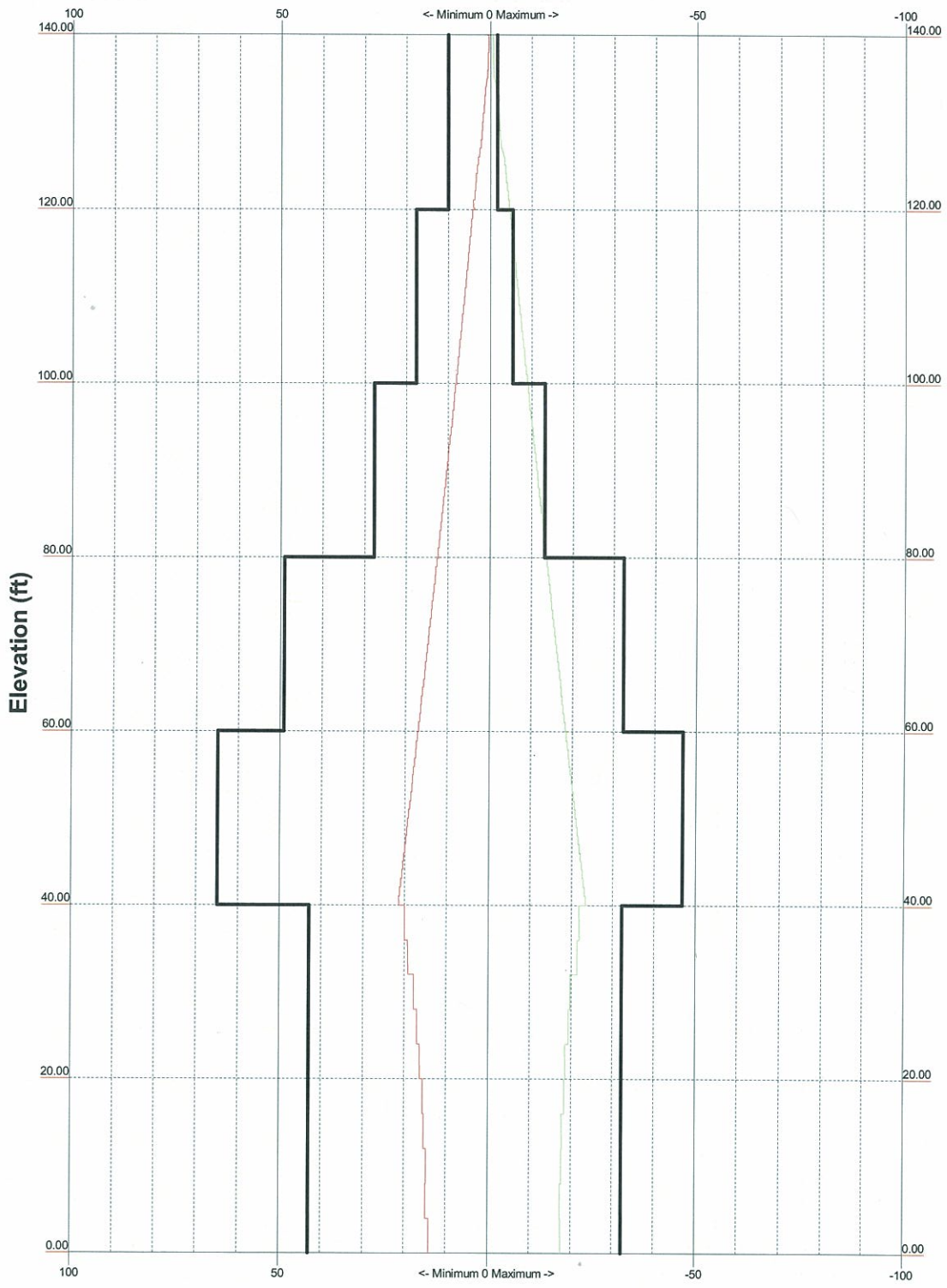
Path:		Dwg No. E-7

TIA/EIA-222-F - 45 mph/39 mph 0.5000 in Ice

Leg Capacity ——— **Leg Compression (K)**



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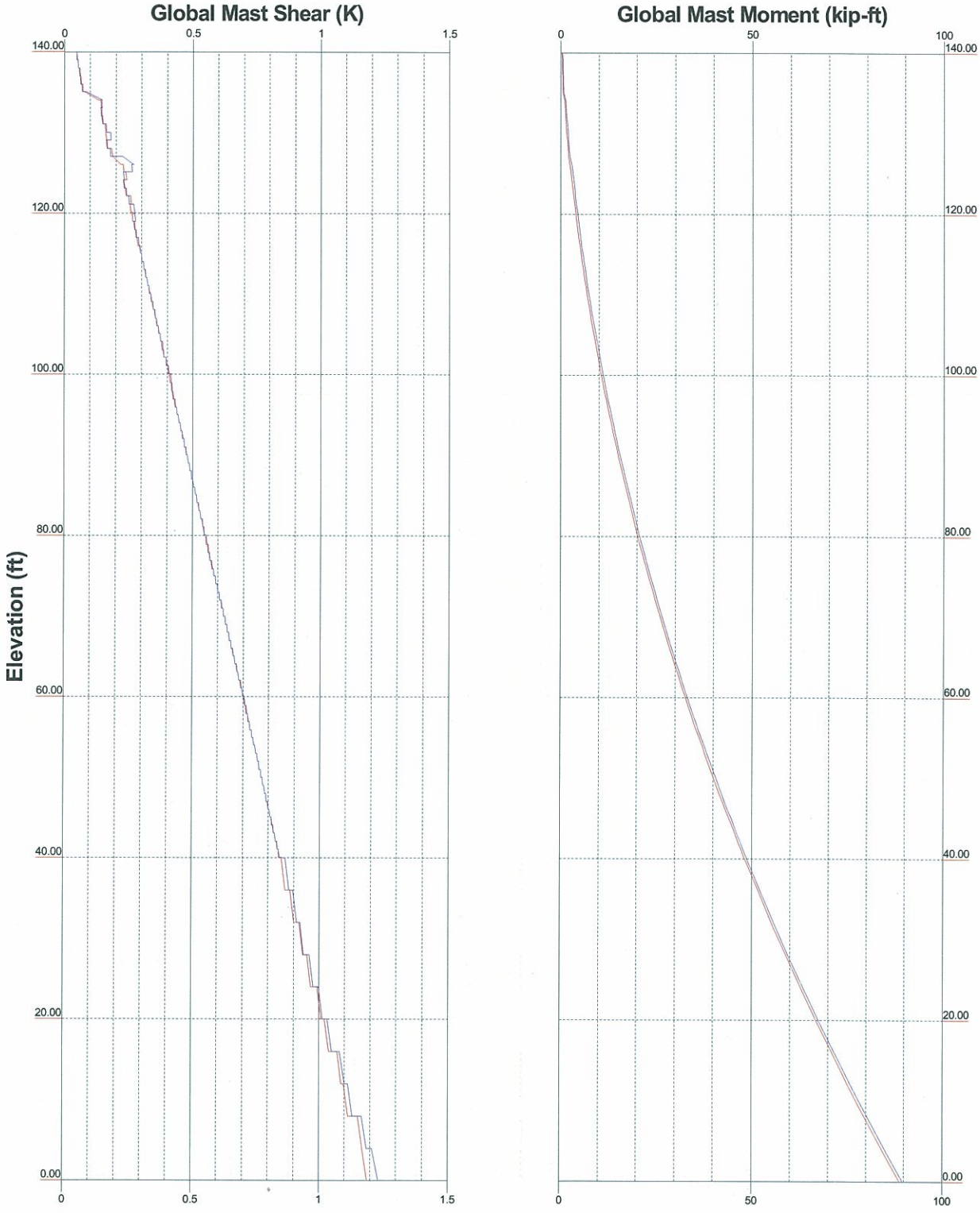
Project: ***87 West Quasset Road***		
Client: Verizon Wireless	Drawn by: Jrm	App'd:
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path:		Dwg No. E-3

TIA/EIA-222-F - 45 mph/39 mph 0.5000 in Ice

Maximum Values

Vx Vz Mx Mz



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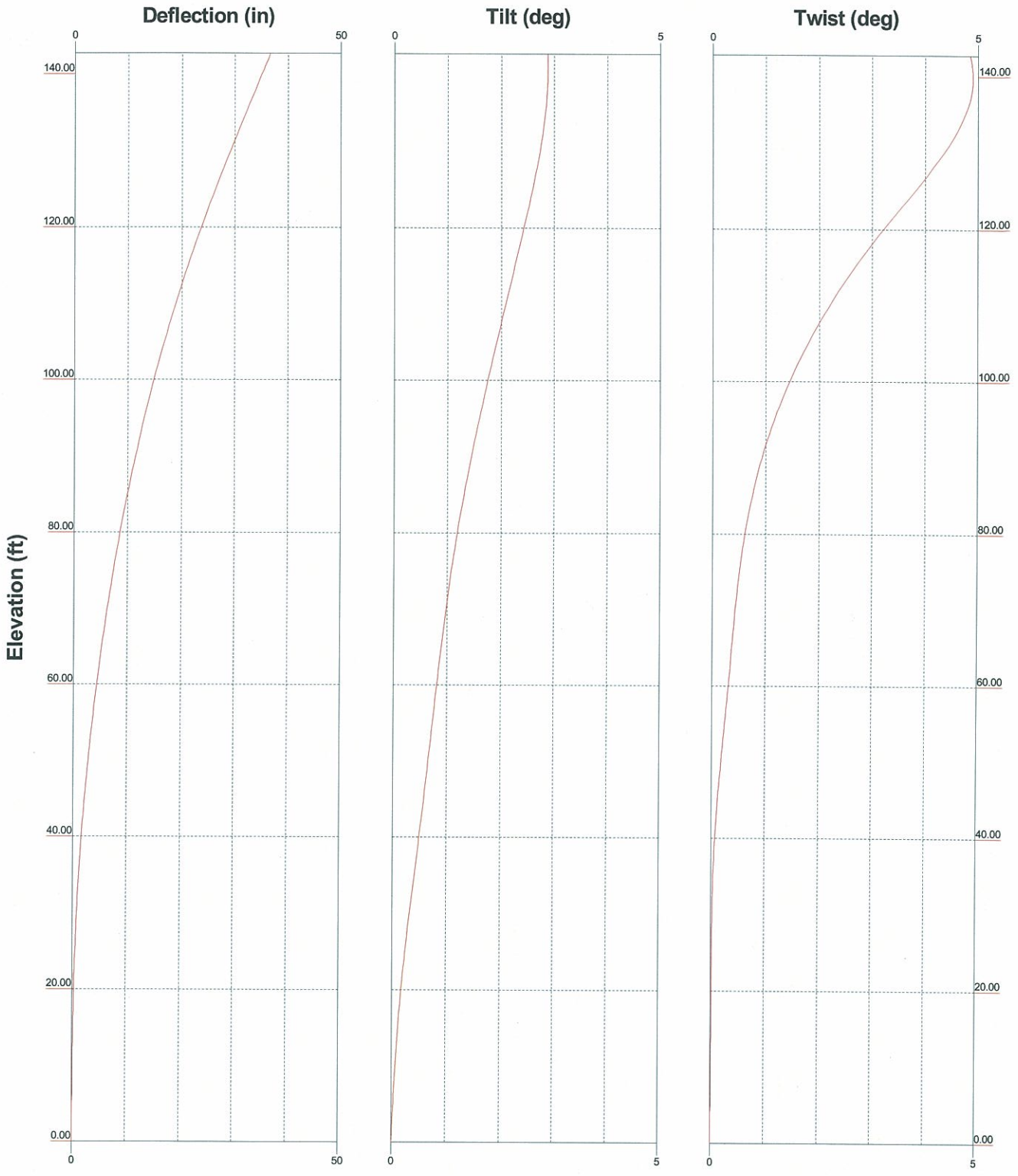
Job: 140-ft ROHN SSV Woodstock - Exist		
Project: 87 West Quasset Road		
Client: Verizon Wireless	Drawn by: Jrm	App'd:
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path:		Dwg No. E-4

TIA/EIA-222-F - Service - 50 mph

Maximum Values



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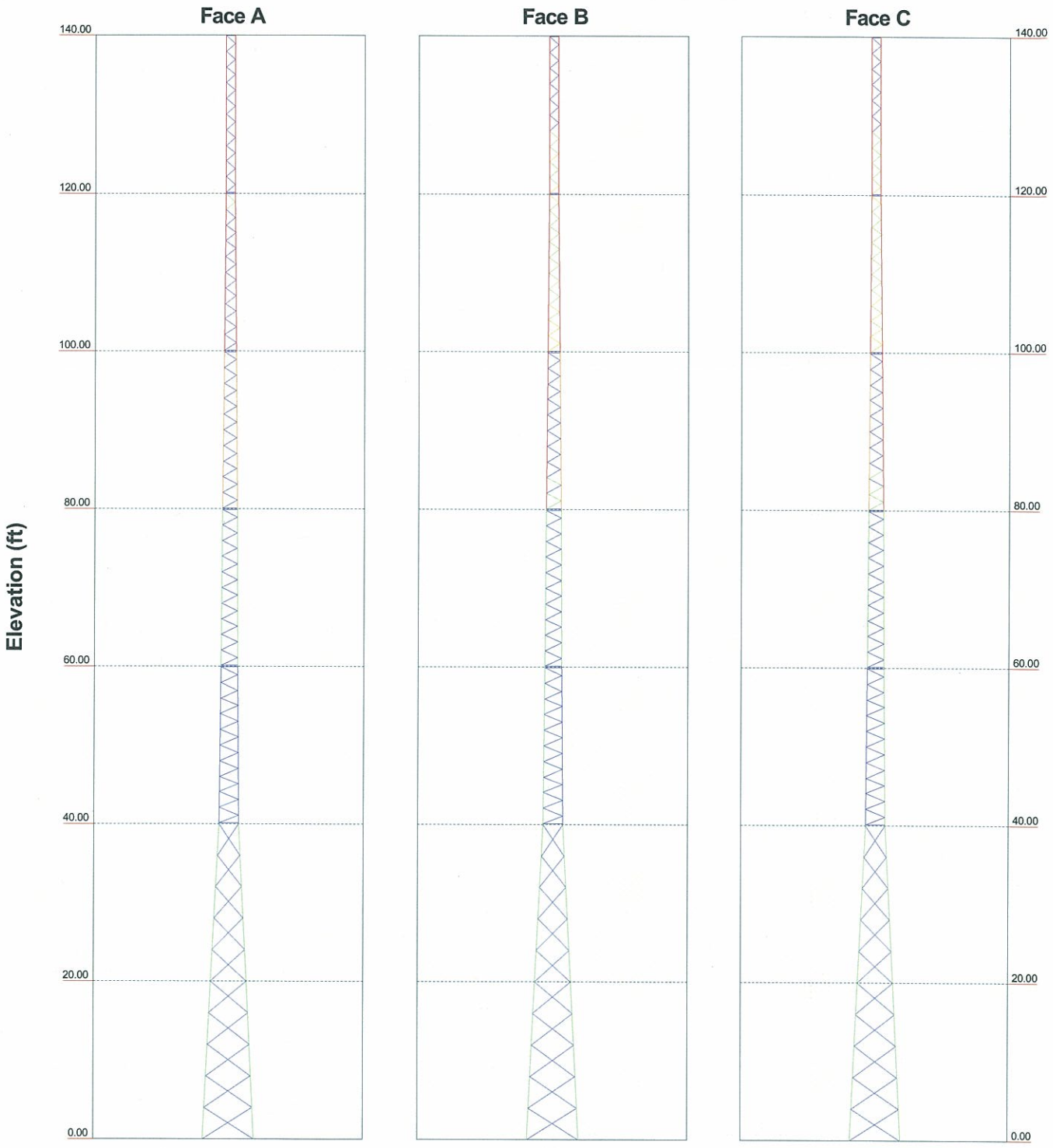
Job: ***140-ft ROHN SSV Woodstock - Exist***		
Project: ***87 West Quasset Road***		
Client: Verizon Wireless	Drawn by: Jrm	App'd:
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS
Path:		Dwg No. E-5

Stress Distribution Chart
0' - 140'

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress



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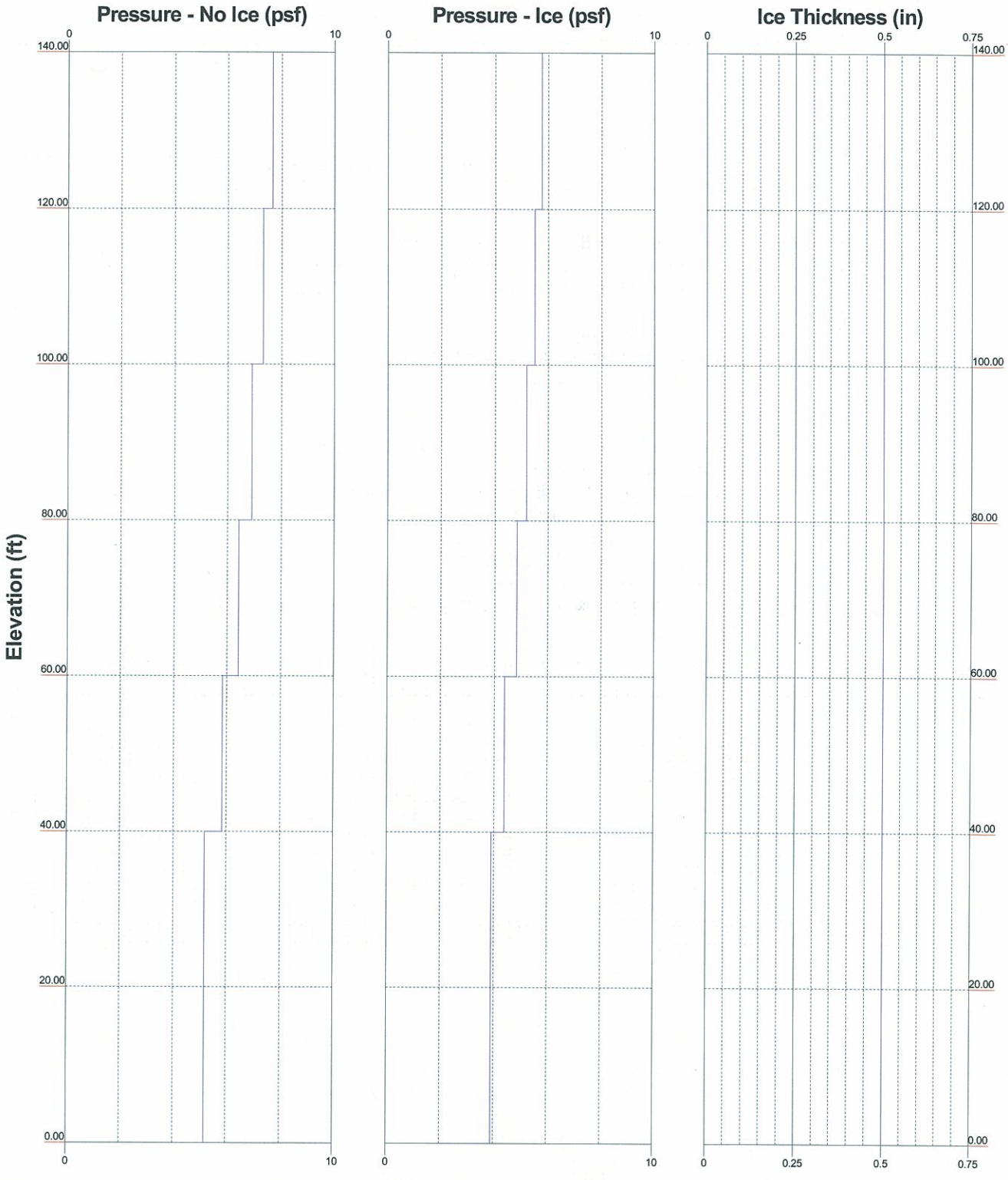
Project: ***87 West Quasset Road***			
Client: Verizon Wireless	Drawn by: Jrm	App'd:	
Code: TIA/EIA-222-F	Date: 09/02/11	Scale: NTS	
Path:		Dwg No. E-8	

Wind Pressures and Ice Thickness

TIA/EIA-222-F - 45 mph/39 mph 0.5000 in Ice



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Project:	***87 West Quasset Road***		
Client: Verizon Wireless		Drawn by: Jrm	App'd:
Code: TIA/EIA-222-F		Date: 09/02/11	Scale: NTS
Path:			Dwg No. E-9

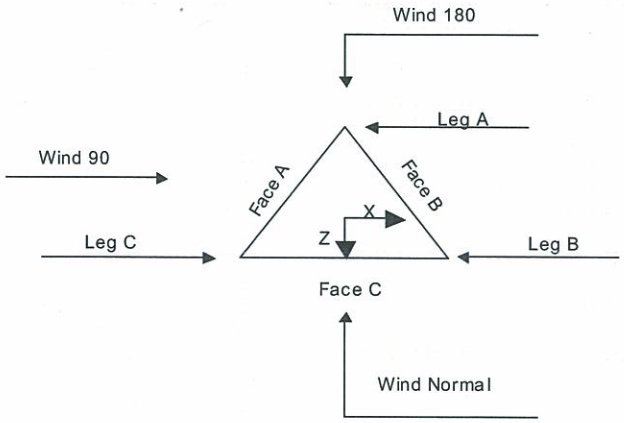
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 140.00 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 1.17 ft at the top and 6.56 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Windham County, Connecticut.
Basic wind speed of 45 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 39 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Load Condition #1 - Existing Tower.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform	√	Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate	√	Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension	√	All Leg Panels Have Same Allowable
	Escalate Ice		Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section	√	SR Members Have Cut Ends		Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination				



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	140.00-120.00			1.17	1	20.00
T2	120.00-100.00			1.17	1	20.00
T3	100.00-80.00			1.50	1	20.00
T4	80.00-60.00			1.83	1	20.00
T5	60.00-40.00			2.17	1	20.00
T6	40.00-20.00			2.50	1	20.00
T7	20.00-0.00			4.52	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
	ft	ft				in	in
T1	140.00-120.00	0.99	K Brace Left	No	No	1.0000	1.0000
T2	120.00-100.00	0.99	K Brace Left	No	No	1.0000	1.0000
T3	100.00-80.00	0.99	K Brace Left	No	No	1.0000	1.0000
T4	80.00-60.00	0.99	K Brace Left	No	No	1.0000	1.0000
T5	60.00-40.00	0.99	K Brace Left	No	No	1.0000	1.0000
T6	40.00-20.00	4.00	X Brace	No	No	0.0000	0.0000
T7	20.00-0.00	4.00	X Brace	No	No	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 140.00-120.00	Solid Round	9/16	A572-50 (50 ksi)	Solid Round	3/8	A36 (36 ksi)
T2 120.00-100.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/8	A36 (36 ksi)
T3 100.00-80.00	Solid Round	15/16	A572-50 (50 ksi)	Solid Round	7/16	A36 (36 ksi)
T4 80.00-60.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 60.00-40.00	Solid Round	1 7/16	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 40.00-20.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)
T7 20.00-0.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A36 (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 140.00-120.00	Solid Round	3/8	A36 (36 ksi)	Solid Round	3/8	A36 (36 ksi)
T2 120.00-100.00	Solid Round	3/8	A36 (36 ksi)	Solid Round	3/8	A36 (36 ksi)
T3 100.00-80.00	Solid Round	7/16	A36 (36 ksi)	Solid Round	7/16	A36 (36 ksi)
T4 80.00-60.00	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 60.00-40.00	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T2 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T3 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T4 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T5 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T6 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000
T7 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*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 ft	Leg Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 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
T2 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
T3 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
T4 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
T5 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
T6 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
T7 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 Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 140.00-120.00	Flange	0.3750 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 120.00-100.00	Flange	0.3750 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 100.00-80.00	Flange	0.5000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 80.00-60.00	Flange	0.6250 A325N	4	0.3750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 60.00-40.00	Flange	0.6250 A325N	4	0.3750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 40.00-20.00	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 20.00-0.00	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 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	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8 (ATC)	B	No	Ar (Leg)	136.00 - 12.00	2	1	1.1100	1.1100		0.54

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	140.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	2.960	0.000	0.000	0.000	0.02
		C	2.960	0.000	0.000	0.000	0.00
T2	120.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	3.700	0.000	0.000	0.000	0.02
		C	3.700	0.000	0.000	0.000	0.00
T3	100.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	3.700	0.000	0.000	0.000	0.02
		C	3.700	0.000	0.000	0.000	0.00
T4	80.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	3.700	0.000	0.000	0.000	0.02
		C	3.700	0.000	0.000	0.000	0.00
T5	60.00-40.00	A	0.000	0.000	0.000	0.000	0.00
		B	3.700	0.000	0.000	0.000	0.02
		C	3.700	0.000	0.000	0.000	0.00
T6	40.00-20.00	A	0.000	0.000	0.000	0.000	0.00
		B	3.700	0.000	0.000	0.000	0.02

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	3.700	0.000	0.000	0.000	0.00
T7	20.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	1.480	0.000	0.000	0.000	0.01
		C	1.480	0.000	0.000	0.000	0.00

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_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	140.00-120.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		5.627	0.000	0.000	0.000	0.05
		C		5.627	0.000	0.000	0.000	0.00
T2	120.00-100.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		7.033	0.000	0.000	0.000	0.06
		C		7.033	0.000	0.000	0.000	0.00
T3	100.00-80.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		7.033	0.000	0.000	0.000	0.06
		C		7.033	0.000	0.000	0.000	0.00
T4	80.00-60.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		7.033	0.000	0.000	0.000	0.06
		C		7.033	0.000	0.000	0.000	0.00
T5	60.00-40.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		7.033	0.000	0.000	0.000	0.06
		C		7.033	0.000	0.000	0.000	0.00
T6	40.00-20.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		7.033	0.000	0.000	0.000	0.06
		C		7.033	0.000	0.000	0.000	0.00
T7	20.00-0.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		2.813	0.000	0.000	0.000	0.02
		C		2.813	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	140.00-120.00	1.4280	0.8244	1.0433	0.6024
T2	120.00-100.00	1.6345	0.9437	1.2984	0.7496
T3	100.00-80.00	1.7465	1.0083	1.4680	0.8476
T4	80.00-60.00	1.6369	0.9451	1.5252	0.8806
T5	60.00-40.00	1.7276	0.9974	1.6470	0.9509
T6	40.00-20.00	1.5548	0.8976	1.8650	1.0768
T7	20.00-0.00	0.8500	0.4907	1.0313	0.5954

Antenna Pole Forces *ROHN Tapered Top*

Length of Pole	Ix	Iy	Modulus E		Antenna Pole C_AA_A	Antenna Pole Weight	Length of Beacon	Beacon C_AA_A	Beacon Weight
ft	in^4	in^4	ksi		ft^2/ft	plf	ft	ft^2	K
2.67	1.0000	1.0000	29000	No Ice	0.24	0.07	0.00	0.00	0.00
				With Ice	0.34	0.10		0.00	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
11' x 3" Dia Omni (ATC)	B	From Leg	6.00 0.00 0.00	0.0000	143.00	No Ice 1/2" Ice	3.30 4.43	3.30 4.43	0.04 0.06
11' x 3" Dia Omni (ATC)	B	From Leg	6.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice	3.30 4.43	3.30 4.43	0.04 0.06
Rohn 6' Side-Arm(1) (ATC)	B	From Leg	3.00 0.00 0.00	0.0000	134.67	No Ice 1/2" Ice	5.04 6.78	5.04 6.78	0.11 0.14

Tower Pressures - No Ice

$G_H = 1.138$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1 140.00-120.00	130.00	1.48	8	24.272	A	0.000	2.864	1.875	65.48	0.000	0.000
					B	0.000	5.824		32.20	0.000	0.000
					C	0.000	5.824		32.20	0.000	0.000
T2 120.00-100.00	110.00	1.411	7	27.917	A	0.000	3.570	2.500	70.03	0.000	0.000
					B	0.000	7.270		34.39	0.000	0.000
					C	0.000	7.270		34.39	0.000	0.000
T3 100.00-80.00	90.00	1.332	7	34.863	A	0.000	4.588	3.125	68.12	0.000	0.000
					B	0.000	8.288		37.71	0.000	0.000
					C	0.000	8.288		37.71	0.000	0.000
T4 80.00-60.00	70.00	1.24	6	42.050	A	0.000	6.567	4.167	63.45	0.000	0.000
					B	0.000	10.267		40.58	0.000	0.000
					C	0.000	10.267		40.58	0.000	0.000
T5 60.00-40.00	50.00	1.126	6	49.063	A	0.000	7.528	4.792	63.65	0.000	0.000
					B	0.000	11.228		42.68	0.000	0.000
					C	0.000	11.228		42.68	0.000	0.000
T6 40.00-20.00	30.00	1	5	74.171	A	6.311	7.930	7.930	55.68	0.000	0.000
					B	6.311	11.630		44.20	0.000	0.000
					C	6.311	11.630		44.20	0.000	0.000
T7 20.00-0.00	10.00	1	5	114.796	A	8.248	7.930	7.930	49.02	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					B	8.248	9.410		44.91	0.000	0.000
					C	8.248	9.410		44.91	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.138$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 140.00-120.00	130.00	1.48	6	0.5000	25.938	A	0.000	8.833	5.208	58.96	0.000	0.000
						B	0.000	14.460		36.02	0.000	0.000
						C	0.000	14.460		36.02	0.000	0.000
T2 120.00-100.00	110.00	1.411	5	0.5000	29.584	A	0.000	9.756	5.834	59.79	0.000	0.000
						B	0.000	16.790		34.75	0.000	0.000
						C	0.000	16.790		34.75	0.000	0.000
T3 100.00-80.00	90.00	1.332	5	0.5000	36.529	A	0.000	11.265	6.459	57.33	0.000	0.000
						B	0.000	18.298		35.30	0.000	0.000
						C	0.000	18.298		35.30	0.000	0.000
T4 80.00-60.00	70.00	1.24	5	0.5000	43.717	A	0.000	13.741	7.500	54.58	0.000	0.000
						B	0.000	20.775		36.10	0.000	0.000
						C	0.000	20.775		36.10	0.000	0.000
T5 60.00-40.00	50.00	1.126	4	0.5000	50.730	A	0.000	15.240	8.125	53.32	0.000	0.000
						B	0.000	22.273		36.48	0.000	0.000
						C	0.000	22.273		36.48	0.000	0.000
T6 40.00-20.00	30.00	1	4	0.5000	75.840	A	6.311	15.477	11.269	51.72	0.000	0.000
						B	6.311	22.510		39.10	0.000	0.000
						C	6.311	22.510		39.10	0.000	0.000
T7 20.00-0.00	10.00	1	4	0.5000	116.465	A	8.248	16.768	11.270	45.05	0.000	0.000
						B	8.248	19.582		40.49	0.000	0.000
						C	8.248	19.582		40.49	0.000	0.000

Tower Pressure - Service

$G_H = 1.138$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 140.00-120.00	130.00	1.48	9	24.272	A	0.000	2.864	1.875	65.48	0.000	0.000
					B	0.000	5.824		32.20	0.000	0.000
					C	0.000	5.824		32.20	0.000	0.000
T2 120.00-100.00	110.00	1.411	9	27.917	A	0.000	3.570	2.500	70.03	0.000	0.000
					B	0.000	7.270		34.39	0.000	0.000
					C	0.000	7.270		34.39	0.000	0.000
T3 100.00-80.00	90.00	1.332	9	34.863	A	0.000	4.588	3.125	68.12	0.000	0.000
					B	0.000	8.288		37.71	0.000	0.000
					C	0.000	8.288		37.71	0.000	0.000
T4 80.00-60.00	70.00	1.24	8	42.050	A	0.000	6.567	4.167	63.45	0.000	0.000
					B	0.000	10.267		40.58	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	10.267		40.58	0.000	0.000
T5 60.00-40.00	50.00	1.126	7	49.063	A	0.000	7.528	4.792	63.65	0.000	0.000
					B	0.000	11.228		42.68	0.000	0.000
					C	0.000	11.228		42.68	0.000	0.000
T6 40.00-20.00	30.00	1	6	74.171	A	6.311	7.930	7.930	55.68	0.000	0.000
					B	6.311	11.630		44.20	0.000	0.000
					C	6.311	11.630		44.20	0.000	0.000
T7 20.00-0.00	10.00	1	6	114.796	A	8.248	7.930	7.930	49.02	0.000	0.000
					B	8.248	9.410		44.91	0.000	0.000
					C	8.248	9.410		44.91	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1 140.00-120.00	0.02	0.09	A	0.118	2.893	0.577	1	1	1.653	0.08	3.76	C
			B	0.24	2.468	0.599	1	1	3.490			
			C	0.24	2.468	0.599	1	1	3.490			
T2 120.00-100.00	0.02	0.13	A	0.128	2.855	0.578	1	1	2.065	0.09	4.40	C
			B	0.26	2.407	0.605	1	1	4.395			
			C	0.26	2.407	0.605	1	1	4.395			
T3 100.00-80.00	0.02	0.21	A	0.132	2.84	0.579	1	1	2.656	0.10	4.83	C
			B	0.238	2.475	0.599	1	1	4.963			
			C	0.238	2.475	0.599	1	1	4.963			
T4 80.00-60.00	0.02	0.41	A	0.156	2.749	0.582	1	1	3.825	0.11	5.53	C
			B	0.244	2.455	0.6	1	1	6.164			
			C	0.244	2.455	0.6	1	1	6.164			
T5 60.00-40.00	0.02	0.51	A	0.153	2.759	0.582	1	1	4.381	0.11	5.57	C
			B	0.229	2.502	0.597	1	1	6.700			
			C	0.229	2.502	0.597	1	1	6.700			
T6 40.00-20.00	0.02	0.42	A	0.192	2.623	0.589	1	1	10.980	0.19	9.65	C
			B	0.242	2.462	0.6	1	1	13.287			
			C	0.242	2.462	0.6	1	1	13.287			
T7 20.00-0.00	0.01	0.48	A	0.141	2.805	0.58	1	1	12.849	0.22	11.16	C
			B	0.154	2.757	0.582	1	1	13.726			
			C	0.154	2.757	0.582	1	1	13.726			
Sum Weight:	0.13	2.26						OTM	49.49 kip-ft	0.90		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1 140.00-120.00	0.02	0.09	A	0.118	2.893	0.577	0.8	1	1.653	0.08	3.76	C
			B	0.24	2.468	0.599	0.8	1	3.490			
			C	0.24	2.468	0.599	0.8	1	3.490			
T2 120.00-100.00	0.02	0.13	A	0.128	2.855	0.578	0.8	1	2.065	0.09	4.40	C
			B	0.26	2.407	0.605	0.8	1	4.395			
			C	0.26	2.407	0.605	0.8	1	4.395			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T3 100.00-80.00	0.02	0.21	A	0.132	2.84	0.579	0.8	1	2.656	0.10	4.83	C
			B	0.238	2.475	0.599	0.8	1	4.963			
			C	0.238	2.475	0.599	0.8	1	4.963			
T4 80.00-60.00	0.02	0.41	A	0.156	2.749	0.582	0.8	1	3.825	0.11	5.53	C
			B	0.244	2.455	0.6	0.8	1	6.164			
			C	0.244	2.455	0.6	0.8	1	6.164			
T5 60.00-40.00	0.02	0.51	A	0.153	2.759	0.582	0.8	1	4.381	0.11	5.57	C
			B	0.229	2.502	0.597	0.8	1	6.700			
			C	0.229	2.502	0.597	0.8	1	6.700			
T6 40.00-20.00	0.02	0.42	A	0.192	2.623	0.589	0.8	1	9.718	0.17	8.73	C
			B	0.242	2.462	0.6	0.8	1	12.025			
			C	0.242	2.462	0.6	0.8	1	12.025			
T7 20.00-0.00	0.01	0.48	A	0.141	2.805	0.58	0.8	1	11.199	0.20	9.82	C
			B	0.154	2.757	0.582	0.8	1	12.076			
			C	0.154	2.757	0.582	0.8	1	12.076			
Sum Weight:	0.13	2.26						OTM	48.67 kip-ft	0.85		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1 140.00-120.00	0.02	0.09	A	0.118	2.893	0.577	0.85	1	1.653	0.08	3.76	C
			B	0.24	2.468	0.599	0.85	1	3.490			
			C	0.24	2.468	0.599	0.85	1	3.490			
T2 120.00-100.00	0.02	0.13	A	0.128	2.855	0.578	0.85	1	2.065	0.09	4.40	C
			B	0.26	2.407	0.605	0.85	1	4.395			
			C	0.26	2.407	0.605	0.85	1	4.395			
T3 100.00-80.00	0.02	0.21	A	0.132	2.84	0.579	0.85	1	2.656	0.10	4.83	C
			B	0.238	2.475	0.599	0.85	1	4.963			
			C	0.238	2.475	0.599	0.85	1	4.963			
T4 80.00-60.00	0.02	0.41	A	0.156	2.749	0.582	0.85	1	3.825	0.11	5.53	C
			B	0.244	2.455	0.6	0.85	1	6.164			
			C	0.244	2.455	0.6	0.85	1	6.164			
T5 60.00-40.00	0.02	0.51	A	0.153	2.759	0.582	0.85	1	4.381	0.11	5.57	C
			B	0.229	2.502	0.597	0.85	1	6.700			
			C	0.229	2.502	0.597	0.85	1	6.700			
T6 40.00-20.00	0.02	0.42	A	0.192	2.623	0.589	0.85	1	10.034	0.18	8.96	C
			B	0.242	2.462	0.6	0.85	1	12.341			
			C	0.242	2.462	0.6	0.85	1	12.341			
T7 20.00-0.00	0.01	0.48	A	0.141	2.805	0.58	0.85	1	11.612	0.20	10.16	C
			B	0.154	2.757	0.582	0.85	1	12.489			
			C	0.154	2.757	0.582	0.85	1	12.489			
Sum Weight:	0.13	2.26						OTM	48.87 kip-ft	0.86		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1 140.00-120.00	0.05	0.18	A	0.341	2.194	0.629	1	1	5.557	0.13	6.33	C
			B	0.557	1.837	0.728	1	1	10.534			
			C	0.557	1.837	0.728	1	1	10.534			
T2 120.00-100.00	0.06	0.24	A	0.33	2.22	0.625	1	1	6.102	0.14	7.03	C
			B	0.568	1.828	0.734	1	1	12.328			
			C	0.568	1.828	0.734	1	1	12.328			
T3 100.00-80.00	0.06	0.33	A	0.308	2.274	0.619	1	1	6.968	0.14	7.15	C
			B	0.501	1.899	0.698	1	1	12.772			
			C	0.501	1.899	0.698	1	1	12.772			
T4 80.00-60.00	0.06	0.58	A	0.314	2.259	0.62	1	1	8.525	0.15	7.55	C
			B	0.475	1.934	0.685	1	1	14.234			
			C	0.475	1.934	0.685	1	1	14.234			
T5 60.00-40.00	0.06	0.70	A	0.3	2.295	0.616	1	1	9.388	0.15	7.39	C
			B	0.439	1.992	0.668	1	1	14.885			
			C	0.439	1.992	0.668	1	1	14.885			
T6 40.00-20.00	0.06	0.78	A	0.287	2.33	0.612	1	1	15.784	0.19	9.69	C
			B	0.38	2.105	0.644	1	1	20.800			
			C	0.38	2.105	0.644	1	1	20.800			
T7 20.00-0.00	0.02	0.90	A	0.215	2.547	0.594	1	1	18.201	0.22	10.92	C
			B	0.239	2.471	0.599	1	1	19.980			
			C	0.239	2.471	0.599	1	1	19.980			
Sum Weight:	0.38	3.71						OTM	70.75 kip-ft	1.12		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1 140.00-120.00	0.05	0.18	A	0.341	2.194	0.629	0.8	1	5.557	0.13	6.33	C
			B	0.557	1.837	0.728	0.8	1	10.534			
			C	0.557	1.837	0.728	0.8	1	10.534			
T2 120.00-100.00	0.06	0.24	A	0.33	2.22	0.625	0.8	1	6.102	0.14	7.03	C
			B	0.568	1.828	0.734	0.8	1	12.328			
			C	0.568	1.828	0.734	0.8	1	12.328			
T3 100.00-80.00	0.06	0.33	A	0.308	2.274	0.619	0.8	1	6.968	0.14	7.15	C
			B	0.501	1.899	0.698	0.8	1	12.772			
			C	0.501	1.899	0.698	0.8	1	12.772			
T4 80.00-60.00	0.06	0.58	A	0.314	2.259	0.62	0.8	1	8.525	0.15	7.55	C
			B	0.475	1.934	0.685	0.8	1	14.234			
			C	0.475	1.934	0.685	0.8	1	14.234			
T5 60.00-40.00	0.06	0.70	A	0.3	2.295	0.616	0.8	1	9.388	0.15	7.39	C
			B	0.439	1.992	0.668	0.8	1	14.885			
			C	0.439	1.992	0.668	0.8	1	14.885			
T6 40.00-20.00	0.06	0.78	A	0.287	2.33	0.612	0.8	1	14.522	0.18	9.10	C
			B	0.38	2.105	0.644	0.8	1	19.537			
			C	0.38	2.105	0.644	0.8	1	19.537			
T7 20.00-0.00	0.02	0.90	A	0.215	2.547	0.594	0.8	1	16.551	0.20	10.02	C
			B	0.239	2.471	0.599	0.8	1	18.330			
			C	0.239	2.471	0.599	0.8	1	18.330			
Sum Weight:	0.38	3.71						OTM	70.22 kip-ft	1.09		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1 140.00-120.00	0.05	0.18	A	0.341	2.194	0.629	0.85	1	5.557	0.13	6.33	C
			B	0.557	1.837	0.728	0.85	1	10.534			
			C	0.557	1.837	0.728	0.85	1	10.534			
T2 120.00-100.00	0.06	0.24	A	0.33	2.22	0.625	0.85	1	6.102	0.14	7.03	C
			B	0.568	1.828	0.734	0.85	1	12.328			
			C	0.568	1.828	0.734	0.85	1	12.328			
T3 100.00-80.00	0.06	0.33	A	0.308	2.274	0.619	0.85	1	6.968	0.14	7.15	C
			B	0.501	1.899	0.698	0.85	1	12.772			
			C	0.501	1.899	0.698	0.85	1	12.772			
T4 80.00-60.00	0.06	0.58	A	0.314	2.259	0.62	0.85	1	8.525	0.15	7.55	C
			B	0.475	1.934	0.685	0.85	1	14.234			
			C	0.475	1.934	0.685	0.85	1	14.234			
T5 60.00-40.00	0.06	0.70	A	0.3	2.295	0.616	0.85	1	9.388	0.15	7.39	C
			B	0.439	1.992	0.668	0.85	1	14.885			
			C	0.439	1.992	0.668	0.85	1	14.885			
T6 40.00-20.00	0.06	0.78	A	0.287	2.33	0.612	0.85	1	14.838	0.18	9.25	C
			B	0.38	2.105	0.644	0.85	1	19.853			
			C	0.38	2.105	0.644	0.85	1	19.853			
T7 20.00-0.00	0.02	0.90	A	0.215	2.547	0.594	0.85	1	16.964	0.20	10.25	C
			B	0.239	2.471	0.599	0.85	1	18.743			
			C	0.239	2.471	0.599	0.85	1	18.743			
Sum Weight:	0.38	3.71						OTM	70.35 kip-ft	1.10		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1 140.00-120.00	0.02	0.09	A	0.118	2.893	0.577	1	1	1.653	0.09	4.64	C
			B	0.24	2.468	0.599	1	1	3.490			
			C	0.24	2.468	0.599	1	1	3.490			
T2 120.00-100.00	0.02	0.13	A	0.128	2.855	0.578	1	1	2.065	0.11	5.43	C
			B	0.26	2.407	0.605	1	1	4.395			
			C	0.26	2.407	0.605	1	1	4.395			
T3 100.00-80.00	0.02	0.21	A	0.132	2.84	0.579	1	1	2.656	0.12	5.96	C
			B	0.238	2.475	0.599	1	1	4.963			
			C	0.238	2.475	0.599	1	1	4.963			
T4 80.00-60.00	0.02	0.41	A	0.156	2.749	0.582	1	1	3.825	0.14	6.83	C
			B	0.244	2.455	0.6	1	1	6.164			
			C	0.244	2.455	0.6	1	1	6.164			
T5 60.00-40.00	0.02	0.51	A	0.153	2.759	0.582	1	1	4.381	0.14	6.88	C
			B	0.229	2.502	0.597	1	1	6.700			
			C	0.229	2.502	0.597	1	1	6.700			
T6 40.00-20.00	0.02	0.42	A	0.192	2.623	0.589	1	1	10.980	0.24	11.91	C
			B	0.242	2.462	0.6	1	1	13.287			
			C	0.242	2.462	0.6	1	1	13.287			
T7 20.00-0.00	0.01	0.48	A	0.141	2.805	0.58	1	1	12.849	0.28	13.78	C
			B	0.154	2.757	0.582	1	1	13.726			
			C	0.154	2.757	0.582	1	1	13.726			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	0.13	2.26						OTM	61.09 kip-ft	1.11		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1 140.00-120.00	0.02	0.09	A	0.118	2.893	0.577	0.8	1	1.653	0.09	4.64	C
			B	0.24	2.468	0.599	0.8	1	3.490			
			C	0.24	2.468	0.599	0.8	1	3.490			
T2 120.00-100.00	0.02	0.13	A	0.128	2.855	0.578	0.8	1	2.065	0.11	5.43	C
			B	0.26	2.407	0.605	0.8	1	4.395			
			C	0.26	2.407	0.605	0.8	1	4.395			
T3 100.00-80.00	0.02	0.21	A	0.132	2.84	0.579	0.8	1	2.656	0.12	5.96	C
			B	0.238	2.475	0.599	0.8	1	4.963			
			C	0.238	2.475	0.599	0.8	1	4.963			
T4 80.00-60.00	0.02	0.41	A	0.156	2.749	0.582	0.8	1	3.825	0.14	6.83	C
			B	0.244	2.455	0.6	0.8	1	6.164			
			C	0.244	2.455	0.6	0.8	1	6.164			
T5 60.00-40.00	0.02	0.51	A	0.153	2.759	0.582	0.8	1	4.381	0.14	6.88	C
			B	0.229	2.502	0.597	0.8	1	6.700			
			C	0.229	2.502	0.597	0.8	1	6.700			
T6 40.00-20.00	0.02	0.42	A	0.192	2.623	0.589	0.8	1	9.718	0.22	10.78	C
			B	0.242	2.462	0.6	0.8	1	12.025			
			C	0.242	2.462	0.6	0.8	1	12.025			
T7 20.00-0.00	0.01	0.48	A	0.141	2.805	0.58	0.8	1	11.199	0.24	12.13	C
			B	0.154	2.757	0.582	0.8	1	12.076			
			C	0.154	2.757	0.582	0.8	1	12.076			
Sum Weight:	0.13	2.26						OTM	60.08 kip-ft	1.05		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1 140.00-120.00	0.02	0.09	A	0.118	2.893	0.577	0.85	1	1.653	0.09	4.64	C
			B	0.24	2.468	0.599	0.85	1	3.490			
			C	0.24	2.468	0.599	0.85	1	3.490			
T2 120.00-100.00	0.02	0.13	A	0.128	2.855	0.578	0.85	1	2.065	0.11	5.43	C
			B	0.26	2.407	0.605	0.85	1	4.395			
			C	0.26	2.407	0.605	0.85	1	4.395			
T3 100.00-80.00	0.02	0.21	A	0.132	2.84	0.579	0.85	1	2.656	0.12	5.96	C
			B	0.238	2.475	0.599	0.85	1	4.963			
			C	0.238	2.475	0.599	0.85	1	4.963			
T4 80.00-60.00	0.02	0.41	A	0.156	2.749	0.582	0.85	1	3.825	0.14	6.83	C
			B	0.244	2.455	0.6	0.85	1	6.164			
			C	0.244	2.455	0.6	0.85	1	6.164			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T5 60.00-40.00	0.02	0.51	A	0.153	2.759	0.582	0.85	1	4.381	0.14	6.88	C
			B	0.229	2.502	0.597	0.85	1	6.700			
			C	0.229	2.502	0.597	0.85	1	6.700			
T6 40.00-20.00	0.02	0.42	A	0.192	2.623	0.589	0.85	1	10.034	0.22	11.07	C
			B	0.242	2.462	0.6	0.85	1	12.341			
			C	0.242	2.462	0.6	0.85	1	12.341			
T7 20.00-0.00	0.01	0.48	A	0.141	2.805	0.58	0.85	1	11.612	0.25	12.54	C
			B	0.154	2.757	0.582	0.85	1	12.489			
			C	0.154	2.757	0.582	0.85	1	12.489			
Sum Weight:	0.13	2.26						OTM	60.34 kip-ft	1.07		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	1.33					
Bracing Weight	0.93					
Total Member Self-Weight	2.26			0.55	-0.96	
Total Weight	2.59			0.55	-0.96	
Wind 0 deg - No Ice		0.00	-1.01	-63.59	-0.96	0.58
Wind 30 deg - No Ice		0.49	-0.84	-54.47	-32.73	0.67
Wind 60 deg - No Ice		0.83	-0.48	-31.11	-55.81	0.58
Wind 90 deg - No Ice		0.97	0.00	0.55	-64.49	0.34
Wind 120 deg - No Ice		0.87	0.50	32.63	-56.51	0.00
Wind 150 deg - No Ice		0.49	0.84	55.58	-32.73	-0.34
Wind 180 deg - No Ice		0.00	0.96	63.88	-0.96	-0.58
Wind 210 deg - No Ice		-0.49	0.84	55.58	30.81	-0.67
Wind 240 deg - No Ice		-0.87	0.50	32.63	54.59	-0.58
Wind 270 deg - No Ice		-0.97	0.00	0.55	62.57	-0.34
Wind 300 deg - No Ice		-0.83	-0.48	-31.11	53.88	0.00
Wind 330 deg - No Ice		-0.49	-0.84	-54.47	30.81	0.34
Member Ice	1.45					
Total Weight Ice	4.35			0.89	-1.55	
Wind 0 deg - Ice		0.00	-1.23	-84.69	-1.55	0.61
Wind 30 deg - Ice		0.60	-1.05	-72.87	-44.13	0.71
Wind 60 deg - Ice		1.04	-0.60	-41.63	-75.20	0.61
Wind 90 deg - Ice		1.21	0.00	0.89	-86.72	0.35
Wind 120 deg - Ice		1.07	0.62	43.68	-75.66	0.00
Wind 150 deg - Ice		0.60	1.05	74.66	-44.13	-0.35
Wind 180 deg - Ice		0.00	1.20	85.94	-1.55	-0.61
Wind 210 deg - Ice		-0.60	1.05	74.66	41.04	-0.71
Wind 240 deg - Ice		-1.07	0.62	43.68	72.57	-0.61
Wind 270 deg - Ice		-1.21	0.00	0.89	83.63	-0.35
Wind 300 deg - Ice		-1.04	-0.60	-41.63	72.11	0.00
Wind 330 deg - Ice		-0.60	-1.05	-72.87	41.04	0.35
Total Weight	2.59			0.55	-0.96	
Wind 0 deg - Service		0.00	-1.24	-78.73	-0.81	0.72
Wind 30 deg - Service		0.60	-1.04	-67.46	-40.03	0.83
Wind 60 deg - Service		1.03	-0.59	-38.62	-68.52	0.72
Wind 90 deg - Service		1.20	0.00	0.47	-79.25	0.41
Wind 120 deg - Service		1.08	0.62	40.07	-69.40	0.00
Wind 150 deg - Service		0.60	1.04	68.40	-40.03	-0.41
Wind 180 deg - Service		0.00	1.19	78.65	-0.81	-0.72

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 210 deg - Service		-0.60	1.04	68.40	38.41	-0.83
Wind 240 deg - Service		-1.08	0.62	40.07	67.77	-0.72
Wind 270 deg - Service		-1.20	0.00	0.47	77.62	-0.41
Wind 300 deg - Service		-1.03	-0.59	-38.62	66.90	0.00
Wind 330 deg - Service		-0.60	-1.04	-67.46	38.41	0.41

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	140 - 120	Leg	Max Tension	21	4.07	-0.00	-0.00
			Max. Compression	19	-4.68	-0.01	-0.00
			Max. Mx	22	-0.12	-0.06	0.03
			Max. My	21	-1.49	0.03	0.07
			Max. Vy	23	-0.78	0.01	-0.00
			Max. Vx	22	-0.83	0.00	0.01
		Diagonal	Max Tension	28	1.10	0.00	0.00
			Max. Compression	34	-1.09	0.00	0.00
			Max. Mx	20	0.17	0.00	0.00
			Max. My	22	-0.48	0.00	0.00
			Max. Vy	20	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Top Girt	Max Tension	16	0.51	0.00	0.00
			Max. Compression	34	-0.07	0.00	0.00
			Max. Mx	14	0.44	0.00	0.00
			Max. My	22	0.38	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Bottom Girt	Max Tension	34	0.52	0.00	0.00
			Max. Compression	28	-0.46	0.00	0.00
			Max. Mx	14	0.00	0.00	0.00
			Max. My	22	0.22	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Pole Antenna	Max Tension	21	0.48	-0.00	-0.01
			Max. Compression	2	-0.00	0.00	-0.00
			Max. Mx	36	0.00	0.01	-0.00
			Max. My	27	0.00	-0.00	0.01
			Max. Vy	36	-0.01	0.01	-0.00
			Max. Vx	27	-0.01	-0.00	0.01
			Max. Torque	21			-0.00
T2	120 - 100	Leg	Max Tension	21	8.09	-0.00	0.00
			Max. Compression	19	-8.93	0.01	-0.00
			Max. Mx	21	3.33	-0.02	0.04
			Max. My	34	-1.20	-0.01	0.06
			Max. Vy	28	-0.16	0.02	-0.05
			Max. Vx	34	-0.45	-0.01	0.06
		Diagonal	Max Tension	34	1.16	0.00	0.00
			Max. Compression	28	-1.14	0.00	0.00
			Max. Mx	18	0.54	0.00	0.00
			Max. My	16	-1.01	0.00	-0.00
			Max. Vy	18	-0.00	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Top Girt	Max Tension	28	0.48	0.00	0.00
			Max. Compression	34	-0.57	0.00	0.00
			Max. Mx	14	-0.00	0.00	0.00
			Max. My	22	-0.25	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Bottom Girt	Max Tension	34	0.37	0.00	0.00
			Max. Compression	28	-0.30	0.00	0.00
			Max. Mx	14	0.00	0.00	0.00
			Max. My	22	0.13	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T3	100 - 80	Leg	Max Tension	21	12.42	-0.00	0.00
			Max. Compression	19	-13.55	0.02	-0.00
			Max. Mx	17	7.90	-0.02	-0.03
			Max. My	34	-1.07	0.00	0.05
			Max. Vy	23	-0.25	0.02	0.01
			Max. Vx	34	-0.37	0.00	0.05

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	34	0.87	0.00	0.00
			Max. Compression	28	-0.87	0.00	0.00
			Max. Mx	18	0.52	0.00	0.00
			Max. My	16	-0.80	0.00	-0.00
			Max. Vy	18	-0.00	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Top Girt	Max Tension	28	0.33	0.00	0.00
			Max. Compression	34	-0.40	0.00	0.00
			Max. Mx	14	-0.00	0.00	0.00
			Max. My	22	-0.15	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Bottom Girt	Max Tension	34	0.24	0.00	0.00
			Max. Compression	28	-0.21	0.00	0.00
			Max. Mx	14	0.00	0.00	0.00
			Max. My	22	0.07	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T4	80 - 60	Leg	Max Tension	21	16.85	-0.01	0.00
			Max. Compression	19	-18.41	0.02	-0.00
			Max. Mx	23	-12.13	0.04	0.03
			Max. My	34	-0.98	0.02	0.05
			Max. Vy	23	-0.33	0.02	0.00
			Max. Vx	34	-0.32	0.02	0.05
		Diagonal	Max Tension	35	0.75	0.00	0.00
			Max. Compression	27	-0.76	0.00	0.00
			Max. Mx	18	0.54	0.00	0.00
			Max. My	17	-0.47	0.00	-0.00
			Max. Vy	18	0.00	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Top Girt	Max Tension	28	0.23	0.00	0.00
			Max. Compression	34	-0.26	0.00	0.00
			Max. Mx	14	-0.00	0.00	0.00
			Max. My	22	-0.09	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Bottom Girt	Max Tension	34	0.19	0.00	0.00
			Max. Compression	28	-0.17	0.00	0.00
			Max. Mx	14	0.00	0.00	0.00
			Max. My	22	0.04	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T5	60 - 40	Leg	Max Tension	21	21.37	-0.01	-0.01
			Max. Compression	19	-23.42	0.08	-0.01
			Max. Mx	21	21.35	-0.08	0.02
			Max. My	28	-0.74	-0.03	-0.04
			Max. Vy	23	-0.33	0.05	0.02
			Max. Vx	34	-0.34	0.01	0.03
		Diagonal	Max Tension	35	0.69	0.00	0.00
			Max. Compression	27	-0.71	0.00	0.00
			Max. Mx	18	0.50	0.00	0.00
			Max. My	17	-0.40	0.00	-0.00
			Max. Vy	18	-0.00	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Top Girt	Max Tension	27	0.16	0.00	0.00
			Max. Compression	35	-0.18	0.00	0.00
			Max. Mx	14	-0.00	0.00	0.00
			Max. My	22	-0.04	0.00	-0.00
			Max. Vy	14	0.00	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Bottom Girt	Max Tension	22	0.36	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	28	-0.34	0.00	0.00
			Max. Mx	14	0.01	0.00	0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T6	40 - 20	Leg	Max Tension	17	20.08	-0.08	-0.01
			Max. Compression	19	-21.88	0.02	0.00
			Max. Mx	21	20.06	-0.08	0.02
			Max. My	18	-0.71	-0.00	0.14
			Max. Vy	21	-0.02	-0.06	0.00
			Max. Vx	18	0.04	-0.00	0.14
		Diagonal	Max Tension	17	1.03	0.00	0.00
			Max. Compression	23	-1.15	0.02	-0.00
			Max. Mx	18	0.04	0.02	-0.00
			Max. My	18	-0.62	0.02	-0.01
			Max. Vy	18	-0.01	0.02	-0.00
			Max. Vx	18	0.00	0.02	-0.01
T7	20 - 0	Leg	Max Tension	21	15.62	0.01	0.00
			Max. Compression	19	-18.36	-0.01	-0.00
			Max. Mx	21	14.69	-0.09	0.00
			Max. My	20	-1.01	0.06	-0.05
			Max. Vy	21	-0.04	-0.09	0.00
			Max. Vx	28	0.02	-0.00	-0.05
		Diagonal	Max Tension	16	0.38	0.00	0.00
			Max. Compression	16	-0.38	0.00	0.00
			Max. Mx	21	-0.37	0.01	0.00
			Max. My	22	0.03	0.00	0.00
			Max. Vy	21	0.01	0.01	0.00
			Max. Vx	22	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	23	16.85	0.68	-0.32
	Max. H_x	35	14.98	0.87	-0.42
	Max. H_z	18	-12.14	-0.82	0.50
	Min. Vert	17	-14.20	-0.96	0.49
	Min. H_x	17	-14.20	-0.96	0.49
	Min. H_z	35	14.98	0.87	-0.42
Leg B	Max. Vert	19	17.35	-0.65	-0.38
	Max. H_x	25	-13.67	0.92	0.53
	Max. H_z	25	-13.67	0.92	0.53
	Min. Vert	25	-13.67	0.92	0.53
	Min. H_x	31	15.27	-0.84	-0.48
	Min. H_z	31	15.27	-0.84	-0.48
Leg A	Max. Vert	15	16.85	0.06	0.75
	Max. H_x	17	9.03	0.15	0.27
	Max. H_z	27	14.98	0.07	0.96
	Min. Vert	21	-14.20	-0.05	-1.08
	Min. H_x	23	-6.52	-0.14	-0.64
	Min. H_z	21	-14.20	-0.05	-1.08

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	2.59	0.00	0.00	0.59	-1.01	-0.00
Dead+Wind 0 deg - No Ice	2.59	0.00	-1.01	-64.87	-1.04	0.61
Dead+Wind 30 deg - No Ice	2.59	0.49	-0.84	-55.58	-33.43	0.70
Dead+Wind 60 deg - No Ice	2.59	0.83	-0.48	-31.76	-56.97	0.61
Dead+Wind 90 deg - No Ice	2.59	0.97	0.00	0.55	-65.82	0.35
Dead+Wind 120 deg - No Ice	2.59	0.87	0.50	33.29	-57.65	0.00
Dead+Wind 150 deg - No Ice	2.59	0.49	0.84	56.73	-33.39	-0.35
Dead+Wind 180 deg - No Ice	2.59	0.00	0.96	65.22	-0.98	-0.61
Dead+Wind 210 deg - No Ice	2.59	-0.49	0.84	56.75	31.41	-0.71
Dead+Wind 240 deg - No Ice	2.59	-0.87	0.50	33.34	55.65	-0.62
Dead+Wind 270 deg - No Ice	2.59	-0.97	0.00	0.62	63.79	-0.35
Dead+Wind 300 deg - No Ice	2.59	-0.83	-0.48	-31.70	54.91	0.00
Dead+Wind 330 deg - No Ice	2.59	-0.49	-0.84	-55.55	31.36	0.35
Dead+Ice+Temp	4.35	0.00	0.00	0.97	-1.68	-0.00
Dead+Wind 0 deg+Ice+Temp	4.35	0.00	-1.23	-87.54	-1.71	0.67
Dead+Wind 30 deg+Ice+Temp	4.35	0.60	-1.05	-75.36	-45.73	0.77
Dead+Wind 60 deg+Ice+Temp	4.35	1.04	-0.60	-43.07	-77.83	0.66
Dead+Wind 90 deg+Ice+Temp	4.35	1.21	-0.00	0.90	-89.72	0.38
Dead+Wind 120 deg+Ice+Temp	4.35	1.07	0.62	45.18	-78.25	0.00
Dead+Wind 150 deg+Ice+Temp	4.35	0.60	1.05	77.25	-45.66	-0.38
Dead+Wind 180 deg+Ice+Temp	4.35	0.00	1.20	88.95	-1.63	-0.67
Dead+Wind 210 deg+Ice+Temp	4.35	-0.60	1.05	77.29	42.39	-0.78
Dead+Wind 240 deg+Ice+Temp	4.35	-1.07	0.62	45.26	74.94	-0.68
Dead+Wind 270 deg+Ice+Temp	4.35	-1.21	0.00	1.02	86.36	-0.39
Dead+Wind 300 deg+Ice+Temp	4.35	-1.04	-0.60	-42.97	74.43	0.00
Dead+Wind 330 deg+Ice+Temp	4.35	-0.60	-1.05	-75.30	42.31	0.39
Dead+Wind 0 deg - Service	2.59	0.00	-1.24	-80.22	-1.04	0.76
Dead+Wind 30 deg - Service	2.59	0.60	-1.04	-68.76	-41.03	0.86
Dead+Wind 60 deg - Service	2.59	1.03	-0.59	-39.35	-70.08	0.75
Dead+Wind 90 deg - Service	2.59	1.20	0.00	0.54	-81.01	0.43
Dead+Wind 120 deg - Service	2.59	1.08	0.62	40.95	-70.93	0.00
Dead+Wind 150 deg - Service	2.59	0.60	1.04	69.89	-40.98	-0.43
Dead+Wind 180 deg - Service	2.59	0.00	1.19	80.38	-0.97	-0.75
Dead+Wind 210 deg - Service	2.59	-0.60	1.04	69.92	39.02	-0.87
Dead+Wind 240 deg - Service	2.59	-1.08	0.62	41.02	68.94	-0.76
Dead+Wind 270 deg - Service	2.59	-1.20	0.00	0.62	78.98	-0.44
Dead+Wind 300 deg - Service	2.59	-1.03	-0.59	-39.28	68.03	0.00
Dead+Wind 330 deg - Service	2.59	-0.60	-1.04	-68.71	38.96	0.44

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-2.59	0.00	0.00	2.59	0.00	0.000%
2	0.00	-2.59	-1.01	-0.00	2.59	1.01	0.000%
3	0.49	-2.59	-0.84	-0.49	2.59	0.84	0.000%
4	0.83	-2.59	-0.48	-0.83	2.59	0.48	0.000%
5	0.97	-2.59	0.00	-0.97	2.59	0.00	0.000%
6	0.87	-2.59	0.50	-0.87	2.59	-0.50	0.000%
7	0.49	-2.59	0.84	-0.49	2.59	-0.84	0.000%
8	0.00	-2.59	0.96	-0.00	2.59	-0.96	0.000%
9	-0.49	-2.59	0.84	0.49	2.59	-0.84	0.000%
10	-0.87	-2.59	0.50	0.87	2.59	-0.50	0.000%
11	-0.97	-2.59	0.00	0.97	2.59	0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
12	-0.83	-2.59	-0.48	0.83	2.59	0.48	0.000%
13	-0.49	-2.59	-0.84	0.49	2.59	0.84	0.000%
14	0.00	-4.35	0.00	0.00	4.35	0.00	0.000%
15	0.00	-4.35	-1.23	-0.00	4.35	1.23	0.000%
16	0.60	-4.35	-1.05	-0.60	4.35	1.05	0.000%
17	1.04	-4.35	-0.60	-1.04	4.35	0.60	0.000%
18	1.21	-4.35	0.00	-1.21	4.35	0.00	0.000%
19	1.07	-4.35	0.62	-1.07	4.35	-0.62	0.000%
20	0.60	-4.35	1.05	-0.60	4.35	-1.05	0.000%
21	0.00	-4.35	1.20	-0.00	4.35	-1.20	0.000%
22	-0.60	-4.35	1.05	0.60	4.35	-1.05	0.000%
23	-1.07	-4.35	0.62	1.07	4.35	-0.62	0.000%
24	-1.21	-4.35	0.00	1.21	4.35	-0.00	0.000%
25	-1.04	-4.35	-0.60	1.04	4.35	0.60	0.000%
26	-0.60	-4.35	-1.05	0.60	4.35	1.05	0.000%
27	0.00	-2.59	-1.24	0.00	2.59	1.24	0.000%
28	0.60	-2.59	-1.04	-0.60	2.59	1.04	0.000%
29	1.03	-2.59	-0.59	-1.03	2.59	0.59	0.000%
30	1.20	-2.59	0.00	-1.20	2.59	0.00	0.000%
31	1.08	-2.59	0.62	-1.08	2.59	-0.62	0.000%
32	0.60	-2.59	1.04	-0.60	2.59	-1.04	0.000%
33	0.00	-2.59	1.19	-0.00	2.59	-1.19	0.000%
34	-0.60	-2.59	1.04	0.60	2.59	-1.04	0.000%
35	-1.08	-2.59	0.62	1.08	2.59	-0.62	0.000%
36	-1.20	-2.59	0.00	1.20	2.59	-0.00	0.000%
37	-1.03	-2.59	-0.59	1.03	2.59	0.59	0.000%
38	-0.60	-2.59	-1.04	0.60	2.59	1.04	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00054492
3	Yes	5	0.00000001	0.00090122
4	Yes	5	0.00004241	0.00065746
5	Yes	5	0.00000001	0.00017434
6	Yes	4	0.00000001	0.00085831
7	Yes	5	0.00009394	0.00033922
8	Yes	6	0.00004683	0.00059762
9	Yes	6	0.00000001	0.00019796
10	Yes	5	0.00000001	0.00052594
11	Yes	5	0.00000001	0.00011917
12	Yes	4	0.00000001	0.00026884
13	Yes	5	0.00000001	0.00010272
14	Yes	4	0.00000001	0.00018218
15	Yes	5	0.00000001	0.00077150
16	Yes	6	0.00003549	0.00043017
17	Yes	6	0.00007623	0.00059570
18	Yes	5	0.00010109	0.00026662
19	Yes	5	0.00005631	0.00006764
20	Yes	5	0.00046015	0.00041515
21	Yes	7	0.00024954	0.00079203
22	Yes	6	0.00003995	0.00069316
23	Yes	5	0.00000001	0.00081982
24	Yes	5	0.00000001	0.00029773

25	Yes	4	0.00000001	0.00068969
26	Yes	5	0.00000001	0.00025649
27	Yes	6	0.00000001	0.00010953
28	Yes	6	0.00004375	0.00067750
29	Yes	6	0.00005624	0.00081074
30	Yes	5	0.00007123	0.00030681
31	Yes	5	0.00000001	0.00003764
32	Yes	5	0.00024647	0.00044322
33	Yes	7	0.00009778	0.00099582
34	Yes	6	0.00000001	0.00034294
35	Yes	6	0.00000001	0.00030001
36	Yes	5	0.00000001	0.00023250
37	Yes	4	0.00000001	0.00054269
38	Yes	5	0.00000001	0.00019543

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	142.67 - 140	36.677	31	2.8772	4.8595
Antenna					
T1	140 - 120	35.070	31	2.8746	4.9061
T2	120 - 100	23.637	31	2.4226	3.2138
T3	100 - 80	14.783	31	1.7489	1.4354
T4	80 - 60	8.577	31	1.1823	0.6090
T5	60 - 40	4.372	31	0.8089	0.3077
T6	40 - 20	1.611	31	0.4934	0.0698
T7	20 - 0	0.326	31	0.1718	0.0165

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
143.00	11' x 3" Dia Omni	31	36.677	2.8772	4.8892	8444
134.67	Rohn 6' Side-Arm(1)	31	31.881	2.8202	4.7122	4814
127.00	11' x 3" Dia Omni	31	27.430	2.6428	4.0162	2256

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	142.67 - 140	41.814	19	3.2750	4.2328
Antenna					
T1	140 - 120	39.986	19	3.2726	4.2301
T2	120 - 100	26.987	19	2.7566	2.7917
T3	100 - 80	16.892	19	2.0013	1.2543
T4	80 - 60	9.783	19	1.3557	0.5352
T5	60 - 40	4.966	19	0.9256	0.2714

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	40 - 20	1.814	19	0.5617	0.0618
T7	20 - 0	0.361	19	0.1928	0.0147

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
143.00	11' x 3" Dia Omni	19	41.814	3.2750	4.2328	7086
134.67	Rohn 6' Side-Arm(1)	19	36.359	3.2106	4.0706	4152
127.00	11' x 3" Dia Omni	19	31.301	3.0072	3.4792	1992

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	140	Leg	A325N	0.3750	4	0.93	4.86	0.192 ✔	1.333	Bolt Tension
T2	120	Leg	A325N	0.3750	4	1.98	4.86	0.407 ✔	1.333	Bolt Tension
T3	100	Leg	A325N	0.5000	4	3.08	8.64	0.357 ✔	1.333	Bolt Tension
T4	80	Leg	A325N	0.6250	4	4.20	13.50	0.311 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.3750	1	0.74	2.32	0.318 ✔	1.333	Bolt Shear
T5	60	Leg	A325N	0.6250	4	5.34	13.50	0.396 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.3750	1	0.70	2.32	0.303 ✔	1.333	Bolt Shear
T6	40	Leg	A325N	0.6250	4	4.07	13.50	0.302 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.03	3.17	0.324 ✔	1.333	Member Bearing
T7	20	Leg	A325N	0.6250	4	3.53	13.50	0.261 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	0.38	3.17	0.120 ✔	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	140 - 120	9/16	20.00	0.99	169.2 K=2.00	5.213	0.2485	-4.68	1.30	3.614 ✘

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	120 - 100	KL/R > 150 (C) - 3 3/4	20.00	0.99	126.9 K=2.00	9.267	0.4418	-8.93	4.09	2.182 ✗
T3	100 - 80	H1-3 (2.18 CR) - 72 15/16	20.00	0.99	101.6 K=2.00	14.345	0.6903	-13.55	9.90	1.368 ✗
T4	80 - 60	H1-3 (1.37 CR) - 141 1 1/4	20.00	0.99	76.2 K=2.00	19.768	1.2272	-18.41	24.26	0.759 ✓
T5	60 - 40	1 7/16	20.00	0.99	66.2 K=2.00	21.626	1.6229	-23.42	35.10	0.667 ✓
T6	40 - 20	ROHN 2 STD	20.03	4.01	61.1 K=1.00	22.531	1.0745	-21.88	24.21	0.904 ✓
T7	20 - 0	ROHN 2 STD	20.03	4.01	61.1 K=1.00	22.531	1.0745	-18.36	24.21	0.758 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	140 - 120	3/8	1.53	1.47	131.7 K=0.70	8.612	0.1104	-0.97	0.95	1.016 ✓
T2	120 - 100	3/8	1.79	1.72	153.7 K=0.70	6.324	0.1104	-0.77	0.70	1.102 ✓
T3	100 - 80	7/16	2.07	1.98	152.4 K=0.70	6.432	0.1503	-0.69	0.97	0.717 ✓
T4	80 - 60	5/8	2.37	2.26	121.5 K=0.70	10.072	0.3068	-0.69	3.09	0.222 ✓
T5	60 - 40	5/8	2.67	2.54	136.3 K=0.70	8.032	0.3068	-0.67	2.46	0.270 ✓
T6	40 - 20	L1 1/2x1 1/2x1/8	4.83	2.35	101.3 K=1.07	12.817	0.3594	-1.15	4.61	0.250 ✓
T7	20 - 0	L1 1/2x1 1/2x1/8	7.17	3.48	140.9 K=1.00	7.526	0.3594	-0.37	2.70	0.137 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	140 - 120	3/8	1.17	1.12	100.3 K=0.70	12.935	0.1104	-0.06	1.43	0.042 ✓
T2	120 - 100	3/8	1.17	1.11	99.1 K=0.70	13.096	0.1104	-0.51	1.45	0.354 ✓
T3	100 - 80	7/16	1.50	1.42	109.3 K=0.70	11.765	0.1503	-0.37	1.77	0.211 ✓
T4	80 - 60	5/8	1.83	1.73	92.9	13.862	0.3068	-0.25	4.25	0.059

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T5	60 - 40	5/8	2.17	2.05	K=0.70 110.1 K=0.70	11.656	0.3068	-0.18	3.58	0.049

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	140 - 120	3/8	1.17	1.12	100.3 K=0.70	12.935	0.1104	-0.41	1.43	0.289
T2	120 - 100	3/8	1.50	1.44	128.7 K=0.70	9.019	0.1104	-0.28	1.00	0.280
T3	100 - 80	7/16	1.83	1.75	134.4 K=0.70	8.262	0.1503	-0.20	1.24	0.162
T4	80 - 60	5/8	2.17	2.06	110.8 K=0.70	11.563	0.3068	-0.17	3.55	0.047
T5	60 - 40	5/8	2.50	2.38	127.9 K=0.70	9.131	0.3068	-0.33	2.80	0.119

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	140 - 120	9/16	20.00	0.99	84.6	30.000	0.2485	4.07	7.46	0.545
T2	120 - 100	3/4	20.00	0.99	63.5	30.000	0.4418	8.09	13.25	0.610
T3	100 - 80	H1-3 (1.83 CR) - 73 15/16	20.00	0.99	50.8	30.000	0.6903	12.42	20.71	0.600
T4	80 - 60	1 1/4	20.00	0.99	38.1	30.000	1.2272	16.85	36.82	0.458
T5	60 - 40	1 7/16	20.00	0.99	33.1	30.000	1.6229	21.37	48.69	0.439
T6	40 - 20	ROHN 2 STD	20.03	4.01	61.1	30.000	1.0745	20.08	32.24	0.623
T7	20 - 0	ROHN 2 STD	20.03	4.01	61.1	30.000	1.0745	15.62	32.24	0.484

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	140 - 120	3/8	1.53	1.47	188.1	21.600	0.1104	0.98	2.39	0.409 ✓
T2	120 - 100	3/8	1.54	1.46	187.3	21.600	0.1104	1.03	2.39	0.431 ✓
T3	100 - 80	7/16	1.81	1.72	188.4	21.600	0.1503	0.81	3.25	0.248 ✓
T4	80 - 60	5/8	2.09	1.98	151.7	21.600	0.3068	0.73	6.63	0.110 ✓
T5	60 - 40	5/8	2.39	2.26	173.8	21.600	0.3068	0.68	6.63	0.103 ✓
T6	40 - 20	L1 1/2x1 1/2x1/8	4.83	2.35	63.5	29.000	0.2109	1.03	6.12	0.168 ✓
T7	20 - 0	L1 1/2x1 1/2x1/8	6.19	3.00	80.3	29.000	0.2109	0.38	6.12	0.062 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	140 - 120	3/8	1.17	1.12	143.3	21.600	0.1104	0.44	2.39	0.184* ✓
T2	120 - 100	3/8	1.17	1.11	141.5	21.600	0.1104	0.43	2.39	0.181 ✓
T3	100 - 80	7/16	1.50	1.42	156.2	21.600	0.1503	0.29	3.25	0.091 ✓
T4	80 - 60	5/8	1.83	1.73	132.7	21.600	0.3068	0.21	6.63	0.032 ✓
T5	60 - 40	5/8	2.17	2.05	157.3	21.600	0.3068	0.15	6.63	0.023 ✓

* DL controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	140 - 120	3/8	1.17	1.12	143.3	21.600	0.1104	0.47	2.39	0.196 ✓
T2	120 - 100	3/8	1.50	1.44	183.8	21.600	0.1104	0.35	2.39	0.147 ✓
T3	100 - 80	7/16	1.83	1.75	192.1	21.600	0.1503	0.23	3.25	0.072 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	80 - 60	5/8	2.17	2.06	158.3	21.600	0.3068	0.19	6.63	0.028 ✓
T5	60 - 40	5/8	2.50	2.38	182.7	21.600	0.3068	0.36	6.63	0.054 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	140 - 120	Leg	9/16	3	-4.68	1.73	271.1	Fail ✗
T2	120 - 100	Leg	3/4	72	-8.93	5.46	163.7	Fail ✗
T3	100 - 80	Leg	15/16	141	-13.55	13.20	102.6	Fail ✗
T4	80 - 60	Leg	1 1/4	210	-18.41	32.34	56.9	Pass
T5	60 - 40	Leg	1 7/16	279	-23.42	46.79	50.1	Pass
T6	40 - 20	Leg	ROHN 2 STD	348	-21.88	32.27	67.8	Pass
T7	20 - 0	Leg	ROHN 2 STD	381	-18.36	32.27	56.9	Pass
T1	140 - 120	Diagonal	3/8	12	-0.97	1.27	76.3	Pass
T2	120 - 100	Diagonal	3/8	80	-0.77	0.93	82.7	Pass
T3	100 - 80	Diagonal	7/16	149	-0.69	1.29	53.8	Pass
T4	80 - 60	Diagonal	5/8	218	-0.69	4.12	16.7 23.9 (b)	Pass
T5	60 - 40	Diagonal	5/8	291	-0.67	3.28	20.3 22.7 (b)	Pass
T6	40 - 20	Diagonal	L1 1/2x1 1/2x1/8	378	-1.15	6.14	18.7 24.3 (b)	Pass
T7	20 - 0	Diagonal	L1 1/2x1 1/2x1/8	394	-0.37	3.61	10.3	Pass
T1	140 - 120	Top Girt	3/8	5	0.44	2.39	18.4	Pass
T2	120 - 100	Top Girt	3/8	74	-0.51	1.93	26.5	Pass
T3	100 - 80	Top Girt	7/16	143	-0.37	2.36	15.8	Pass
T4	80 - 60	Top Girt	5/8	212	-0.25	5.67	4.4	Pass
T5	60 - 40	Top Girt	5/8	281	-0.18	4.77	3.7	Pass
T1	140 - 120	Bottom Girt	3/8	9	-0.41	1.90	21.7	Pass
T2	120 - 100	Bottom Girt	3/8	77	-0.28	1.33	21.0	Pass
T3	100 - 80	Bottom Girt	7/16	146	-0.20	1.66	12.1	Pass
T4	80 - 60	Bottom Girt	5/8	215	-0.17	4.73	3.5	Pass
T5	60 - 40	Bottom Girt	5/8	284	-0.33	3.73	8.9	Pass
							Summary	
						Leg (T1)	271.1	Fail ✗
						Diagonal (T2)	82.7	Pass
						Top Girt (T2)	26.5	Pass
						Bottom Girt (T1)	21.7	Pass
						Bolt Checks	30.5	Pass
						RATING =	**271.1**	**Fail ✗**

JWB Tower Services, LLC
148 Governor Street
New Britain, CT 06053
(800) 819-3084
(860) 256-8175 fax

Self-Support Lattice Tower Mapping and Inventory
General Information

Site Name:		S Woodstock
Site Number:		6290
FCC Number:		1044251
Manufacturer ID #		Rohn SSV
Street Address:		87 West Quassett Road
City/State/Zip Code:		Woodstock, CT
County:		
Lat:	N/S	41° 55' 43.6"
Long:	E/W	71° 59' 13.3"
Performed By:		JWB
Date:		8/19/2011

Manufacture: (Circle One)

Rohn	Summit	EEI	Pirod	Sabre	Fort Worth	Valmont	Nudd	Other

Foundation:

Reveal: 0 Uphill and 12" Downhill
Grout: 1" (No Grout)
Size/Circumference: 10'x10'

Anchor Bolts:

Base Plate Grouted: Yes | No

Number of Anchor Bolts: 4/Leg
Diameter of Anchor Bolts: 5/8"
Anchor Bolt Spacing: Equal

Safety Climb:

Start Elevation (AGL) N/A
End Elevation (AGL) N/A

Location N/A

Climbing Components: Climbing Access is via Diagonals

	Step Bolts	Climbing Ladder	Internal	External
N/A Leg				
Start Elevation: (AGL)	N/A	End Elevation: (AGL)	N/A	
Leg				
Start Elevation: (AGL)		End Elevation: (AGL)		
Leg				
Start Elevation: (AGL)		End Elevation: (AGL)		
Leg				
Start Elevation: (AGL)		End Elevation: (AGL)		

Lighting System Information:

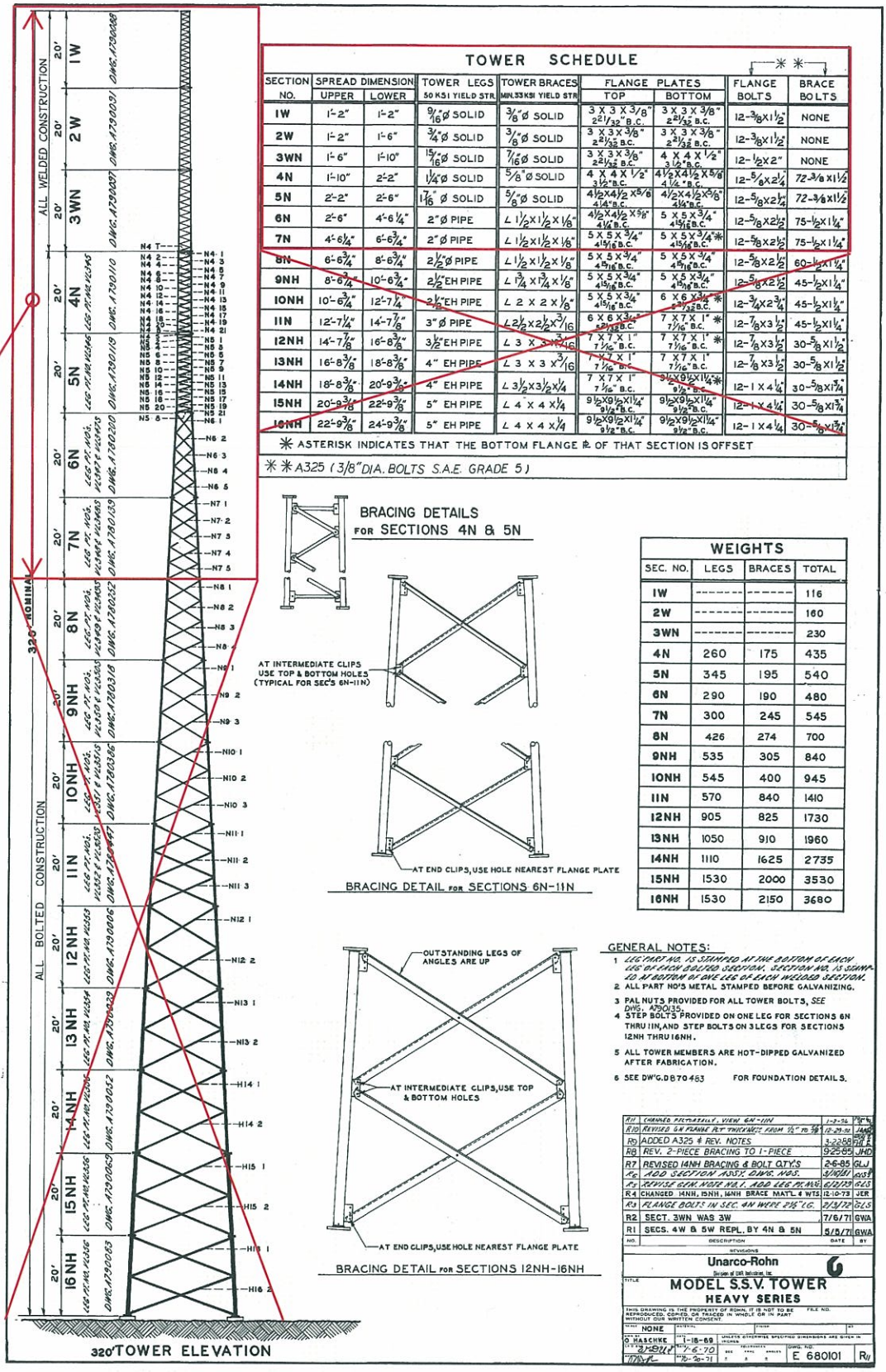
1st OB: N/A
2nd OB:
3rd OB:
4th OB:

1st Beacon: N/A
2nd Beacon:
3rd Beacon:
4th Beacon:

Top of Tower Steel (Top of Concrete) 142'-9"

Antenna Information:

CARRIER	Verizon				PIC #	5
MOUNT						
Type:	Standoof	Manf.:	Custom			
Elev. C/L:		Bottom:	132'	Top:	137'-4"	Leg:
Face Width:	3"	Height:	5'-4"	Projection:	6'	Azimuth/s:
ANTENNA 1						
Type:	Omni	Manf.:	Celwave?	Model:	Unknown	
Elev. C/L:		Bottom:	137'-4"	Top:	148'-4"	Leg: E
Quantity:	1	Dim: (HxWxD)	11'x3" + 11'x0.5"			Azimuth/s:
ANTENNA 2						
Type:	Omni	Manf.:	Celwave?	Model:	Unknown	
Elev. C/L:		Bottom:	132'	Top:	121'	Leg: E
Quantity:	1	Dim: (HxWxD)	11'x3" + 11'x0.5"			Azimuth/s:
TMA'S						
Quantity:	N/A	Manf.:		Model:		
COAX	Taped to E Leg - 12' - 136'					
Quantity:	2	Size:	7/8"	Jumper:	1/2"	Color: N/A



TOWER SCHEDULE

SECTION NO.	SPREAD DIMENSION UPPER	SPREAD DIMENSION LOWER	TOWER LEGS 50 KSI YIELD STR.	TOWER BRACES MIN.33KSI YIELD STR.	FLANGE PLATES TOP	FLANGE PLATES BOTTOM	FLANGE BOLTS **	BRACE BOLTS
1W	1'-2"	1'-2"	9/16"Ø SOLID	3/8"Ø SOLID	3 X 3 X 3/8" 2 21/32" B.C.	3 X 3 X 3/8" 2 21/32 B.C.	12-3/8X1 1/2"	NONE
2W	1'-2"	1'-6"	3/4"Ø SOLID	3/8"Ø SOLID	3 X 3 X 3/8" 2 21/32 B.C.	3 X 3 X 3/8" 2 21/32 B.C.	12-3/8X1 1/2"	NONE
3WN	1'-6"	1'-10"	15/16"Ø SOLID	7/16"Ø SOLID	3 X 3 X 3/8" 2 21/32 B.C.	4 X 4 X 1/2" 3 1/2" B.C.	12-1/2X2"	NONE
4N	1'-10"	2'-2"	1 1/4"Ø SOLID	5/8"Ø SOLID	4 X 4 X 1/2" 3 1/2" B.C.	4 1/2 X 4 1/2 X 5/8 4 1/4" B.C.	12-5/8X2 1/4"	72-3/8 X 1 1/2"
5N	2'-2"	2'-6"	1 1/16" Ø SOLID	5/8"Ø SOLID	4 1/2 X 4 1/2 X 5/8 4 1/4" B.C.	4 1/2 X 4 1/2 X 5/8 4 1/4" B.C.	12-5/8X2 1/4"	72-3/8 X 1 1/2"
6N	2'-6"	4'-6 1/4"	2"Ø PIPE	L 1 1/2 X 1 1/2 X 1/8"	4 1/2 X 4 1/2 X 5/8 4 1/4" B.C.	5 X 5 X 3/4" * 4 15/16 B.C.	12-5/8X2 1/2	75-1/2 X 1 1/4"
7N	4'-6 1/4"	6'-6 3/4"	2"Ø PIPE	L 1 1/2 X 1 1/2 X 1/8"	5 X 5 X 3/4" 4 15/16 B.C.	5 X 5 X 3/4" * 4 15/16 B.C.	12-5/8X2 1/2	75-1/2 X 1 1/4"
8N	6'-6 3/4"	8'-6 3/4"	2 1/2"Ø PIPE	L 1 1/2 X 1 1/2 X 1/8"	5 X 5 X 3/4" 4 15/16 B.C.	5 X 5 X 3/4" 4 15/16 B.C.	12-5/8X2 1/2	60-1/2 X 1 1/4"
9NH	8'-6 3/4"	10'-6 3/4"	2 1/2"EH PIPE	L 1 3/4 X 1 3/4 X 1/8"	5 X 5 X 3/4" 4 15/16 B.C.	5 X 5 X 3/4" 4 15/16 B.C.	12-5/8X2 1/2	45-1/2 X 1 1/4"
10NH	10'-6 3/4"	12'-7 1/4"	2 1/2"EH PIPE	L 2 X 2 X 1/8"	5 X 5 X 3/4" 4 15/16 B.C.	6 X 6 X 3/4" * 5 13/32 B.C.	12-3/4X2 3/4"	45-1/2 X 1 1/4"
11N	12'-7 1/4"	14'-7 7/8"	3"Ø PIPE	L 2 1/2 X 2 1/2 X 3/16	6 X 6 X 3/4" * 5 13/32 B.C.	7 X 7 X 1" * 7 1/16" B.C.	12-7/8X3 1/2	45-1/2 X 1 1/4"
12NH	14'-7 7/8"	16'-8 3/8"	3 1/2"EH PIPE	L 3 X 3 X 3/16	7 X 7 X 1" 7 1/16" B.C.	7 X 7 X 1" * 7 1/16" B.C.	12-7/8X3 1/2	30-5/8 X 1 1/2"
13NH	16'-8 3/8"	18'-8 3/4"	4" EH PIPE	L 3 X 3 X 3/16	7 X 7 X 1" 7 1/16" B.C.	7 X 7 X 1" 7 1/16" B.C.	12-7/8X3 1/2	30-5/8 X 1 1/2"
14NH	18'-8 3/8"	20'-9 3/16"	4" EH PIPE	L 3 1/2 X 3 1/2 X 1/4	7 X 7 X 1" 7 1/16" B.C.	9 1/2 X 9 1/2 X 1 1/4" * 8 1/2" B.C.	12-1 X 4 1/4"	30-5/8 X 1 3/4"
15NH	20'-9 3/16"	22'-9 7/8"	5" EH PIPE	L 4 X 4 X 1/4	9 1/2 X 9 1/2 X 1 1/4" 8 1/2" B.C.	9 1/2 X 9 1/2 X 1 1/4" 8 1/2" B.C.	12-1 X 4 1/4"	30-5/8 X 1 3/4"
16NH	22'-9 7/8"	24'-9 3/8"	5" EH PIPE	L 4 X 4 X 1/4	9 1/2 X 9 1/2 X 1 1/4" 8 1/2" B.C.	9 1/2 X 9 1/2 X 1 1/4" 8 1/2" B.C.	12-1 X 4 1/4"	30-5/8 X 1 3/4"

* ASTERISK INDICATES THAT THE BOTTOM FLANGE OF THAT SECTION IS OFFSET

** A325 (3/8" DIA. BOLTS S.A.E. GRADE 5)

BRACING DETAILS FOR SECTIONS 4N & 5N

BRACING DETAIL FOR SECTIONS 6N-11N

WEIGHTS

SEC. NO.	LEGS	BRACES	TOTAL
1W	-------	-------	116
2W	-------	-------	160
3WN	-------	-------	230
4N	260	175	435
5N	345	195	540
6N	290	190	480
7N	300	245	545
8N	426	274	700
9NH	535	305	840
10NH	545	400	945
11N	570	840	1410
12NH	905	825	1730
13NH	1050	910	1960
14NH	1110	1625	2735
15NH	1530	2000	3530
16NH	1530	2150	3680

BRACING DETAIL FOR SECTIONS 12NH-16NH

GENERAL NOTES:

1. LEG PART NO. IS STAMPED AT THE BOTTOM OF EACH LEG OF EACH BOLTED SECTION. SECTION NO. IS STAMPED AT BOTTOM OF ONE LEG OF EACH WELDED SECTION.
2. ALL PART NO'S METAL STAMPED BEFORE GALVANIZING.
3. PAL NUTS PROVIDED FOR ALL TOWER BOLTS, SEE DWG. A790135.
4. STEP BOLTS PROVIDED ON ONE LEG FOR SECTIONS 6N THRU 11N, AND STEP BOLTS ON 3 LEGS FOR SECTIONS 12NH THRU 16NH.
5. ALL TOWER MEMBERS ARE HOT-DIPPED GALVANIZED AFTER FABRICATION.
6. SEE DWG. D870483 FOR FOUNDATION DETAILS.

NO.	DESCRIPTION	DATE	BY
R11	CHANGED PRIMARILY, VIEW 6N-11N	1-2-96	PG
R10	REVISED 6N FLANGE PLT THICKNESS FROM 1/2" TO 3/4"	12-29-94	JMD
R9	ADDED A325 & REV. NOTES	3-2388	PJF
R8	REV. 2-PIECE BRACING TO 1-PIECE	9-25-85	JHD
R7	REVISED 14NH BRACING & BOLT QTY'S	2-6-85	GLJ
R6	ADD SECTION A325; DWG. NOS.	4/10/81	GWA
R5	REVISED GEN. NOTE NO.1, ADD LEG PC. MK.	10/2/75	GLD
R4	CHANGED 14NH, 15NH, 16NH BRACE MATL. & WTS.	12-18-73	JER
R3	FLANGE BOLTS IN SEC. 4N WERE 2 1/2" LG.	2/3/72	GLS
R2	SECT. 3WN WAS 3W	7/6/71	GWA
R1	SECS. 4W & 5W REPL. BY 4N & 5N	5/5/71	GWA

Unarco-Rohn
Division of UNR Industries, Inc.

TITLE: MODEL S.S.V. TOWER
HEAVY SERIES

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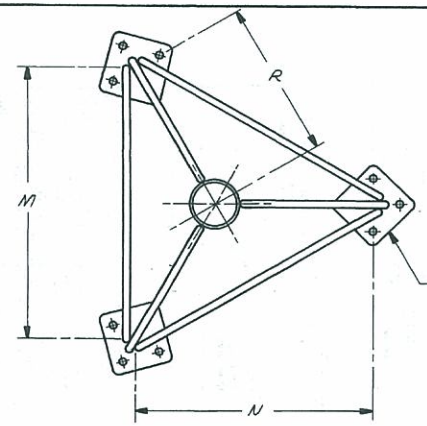
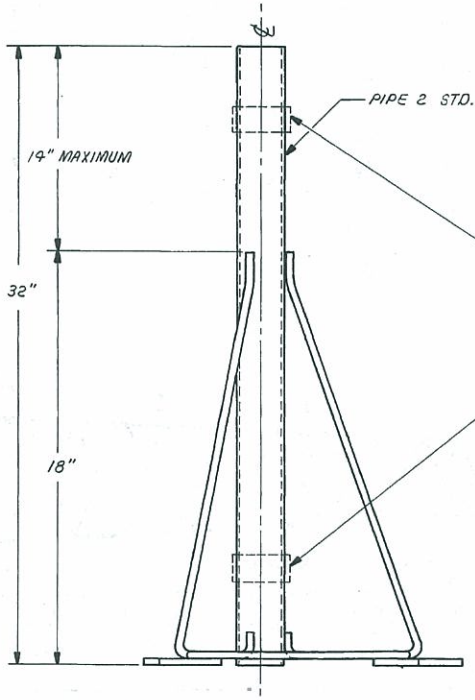
FILE NO.

DRAWN	MATERIAL	FINISH	NO.
O. HASCHKE	1-18-69	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE GIVEN IN INCHES	
CHECKED	7-6-70	TOLERANCES	SCALE
ENGR.	10-20-71	DEC. / FRAC. / ANGLES	E 680101 R/1





DESIGN BASED ON THRUST OF 500# @ CLAMPING POSITION

TAPERED TOP DETAILS

TAPERED TOP ASSY. BILL of MATERIAL & DETAIL

ASSY. NO.	TOWER SEC. NO.	TAPERED TOP QUAN.	TAPERED TOP PT. NO.	M	N	R	FLANGE PL SIZE	FLANGE BOLTS QUAN.	FLANGE BOLTS SIZE	FLANGE BOLTS PT. NO.
1TT	1W, 1WB 2W	1	1TTA	1'-2"	1'-0 1/8"	0'-8 1/16"	3 x 3 x 3/8	9	3/8 x 1 1/2	210008GA
3TT	2W, ST, 2WB, 3WN	1	3TTA	1'-6"	1'-3 3/16"	0'-10 3/8"	3 x 3 x 3/8	9	3/8 x 1 1/2	210008GA
4TTN	3WNST, 3WNB, 4N	1	4TNA	1'-10"	1'-7 1/16"	1'-0 11/16"	4 x 4 x 1/2	9	1/2 x 2	210020GA
5TTN	4NST, 4NA 4NB, 4NC, 5N	1	5TNA	2'-2"	1'-10 1/2"	1'-3"	9 1/2 x 9 1/2 x 5/8	9	5/8 x 2 1/4	210032GA
6TT	5NST, 5NA 5NB, 5NC, 6N	1	6TTA	2'-6"	2'-2"	1'-5 5/16"	9 1/2 x 9 1/2 x 5/8	9	5/8 x 2 1/4	210032GA

R10	REMOVED APL SECTIONS	9-28-88	FHT
R9	REVISED 2STD NOTES	3-22-88	DHD
R8	REVISED BILL OF MATERIAL	8-27-80	KTL
R7	UPDATE DWG.	2/2/79	GLS

R6 REDRAWN 1-3-77 MDI

No. ▲ Revision Description ▲Date ▲By

Unarco-Rohn
Division of Unarco Industries, Inc.

Title: SUPPORT TUBE DETAILS FOR S.S.V. TOWERS

Scale: NONE
Drawn by: MDI 1-3-77
Checked by: DHL 1-4-77
Approved by Engineering: OLU 1-5-77
Approved by Production:
Approved by Sales: PAH 1-11-77

Unless otherwise specified, dimensions are given in inches. Tolerances
Decimals ± Fractions ± Angles ±
Material Finish Weight

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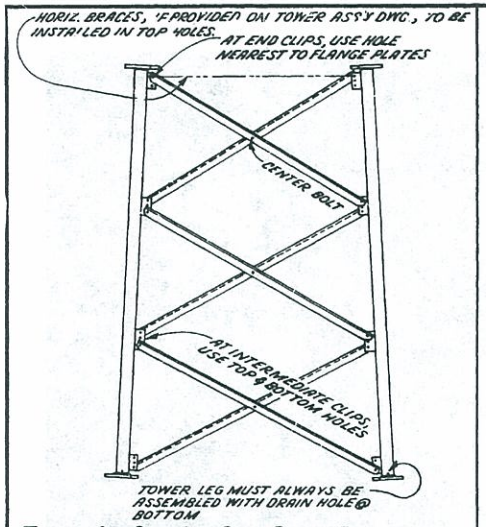
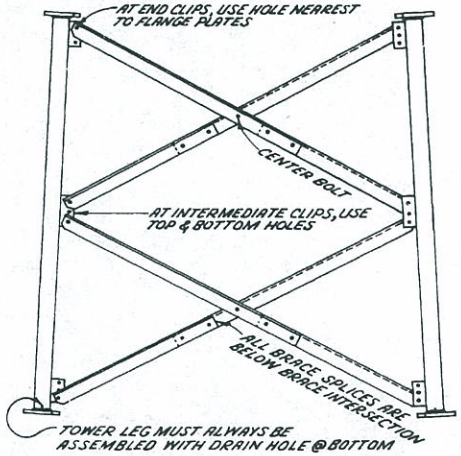
File Number

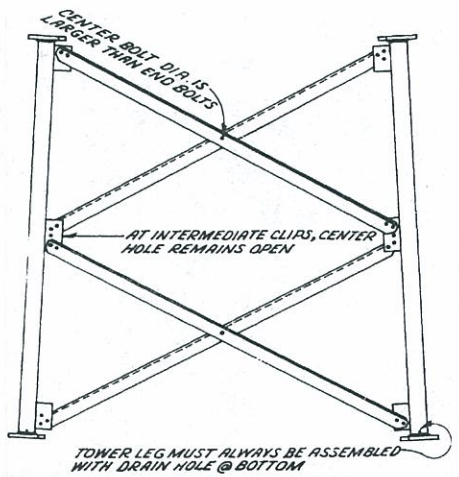
Drawing Number: SK 670407 R10



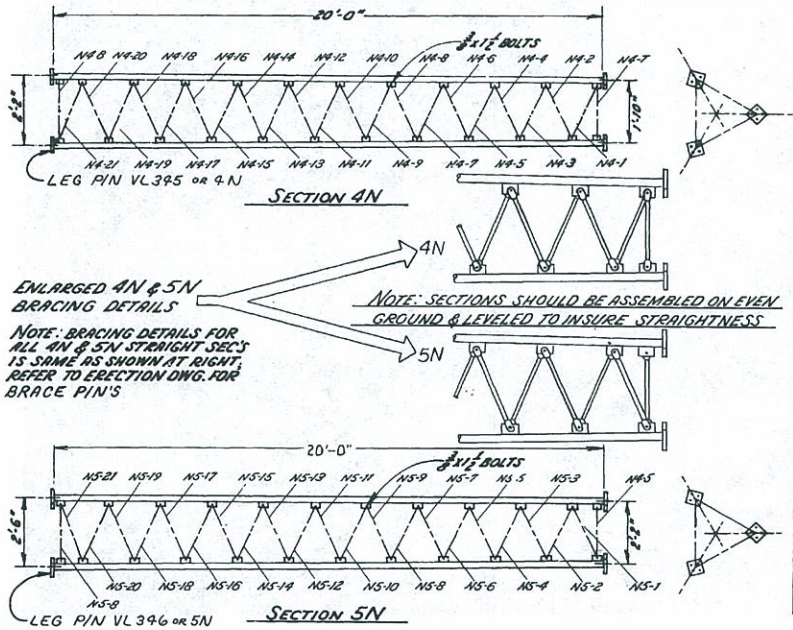
TYPICAL ONE-BOLT, ONE-PIECE BRACE CONNECTION

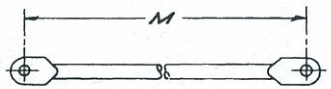


TYPICAL ONE-BOLT, TWO-PIECE BRACE CONNECTION DETAIL



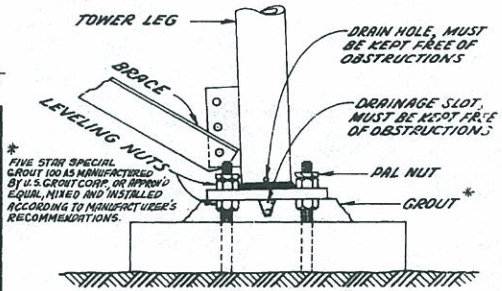
TYPICAL TWO-BOLT, ONE-PIECE BRACE CONNECTION DETAIL





SECTION 4N	
PART No.	M
N4-1	21 3/8"
N4-2	21 5/16"
N4-3	22 1/16"
N4-4	22 1/4"
N4-5	22 3/8"
N4-6	22 9/16"
N4-7	22 3/4"
N4-8	22 7/8"
N4-9	23 1/16"
N4-10	23 3/16"
N4-11	23 3/8"
N4-12	23 9/16"
N4-13	23 11/16"
N4-14	23 7/8"
N4-15	24 1/16"
N4-16	24 3/16"
N4-17	24 3/8"
N4-18	24 9/16"
N4-19	24 11/16"
N4-20	24 7/8"
N4-21	25 1/16"
N4-T	18 9/16"
N4-B	22 1/2"

SECTION 5N	
PART No.	M
N5-1	24 3/16"
N5-2	25 1/4"
N5-3	25 7/16"
N5-4	25 5/8"
N5-5	25 3/4"
N5-6	25 15/16"
N5-7	26 1/8"
N5-8	26 1/4"
N5-9	26 7/16"
N5-10	26 5/8"
N5-11	26 3/4"
N5-12	26 15/16"
N5-13	27 1/8"
N5-14	27 5/16"
N5-15	27 7/16"
N5-16	27 5/8"
N5-17	27 13/16"
N5-18	28"
N5-19	28 1/8"
N5-20	28 5/16"
N5-21	28 1/2"



* FIVE STAR SPECIAL GROUT 100 AS MANUFACTURED BY U.S. GROUT CORP. OR APPROV'D EQUAL, MIXED AND INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

GROUTING & DRAINAGE DETAILS

NO	DESCRIPTION	DATE	BY
R3	REVISED MK. NO'S. TO PIN'S & ADDED LEG PIN'S.	5 15 77	PLH
R2	ADDED ASSEMBLY NOTE	7 5 76	D.A.
R1	REVISED GENERAL LOCATION OF NOTES & MK. NO'S	7 6 76	D.H.

REVISIONS

ROHN® MANUFACTURING
DIVISION OF ABARCO

TITLE: BRACING, GROUTING, & DRAINAGE DATA FOR MODEL S.S.V. TOWERS

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FILE NO

SCALE	MATERIAL	FINISH
~		

DWN BY	DATE
D.H.	2-3-72
CHK'D BY	DATE
[illegible]	3-6-72
APP'D DWG	DATE
CW	3-8-72
APP'D SALES	DATE
RAH	3-10-72

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE GIVEN IN INCHES

TOLERANCES: DEC ± FRAC ± ANGLES ±

DWG NO SK-720305 R5

IMPORTANT: LEG PART NO. IS STAMPED AT BOTTOM OF BASE FLANGE PLATE OF EACH SECTION LEG.

PRINTED IN U.S.A.

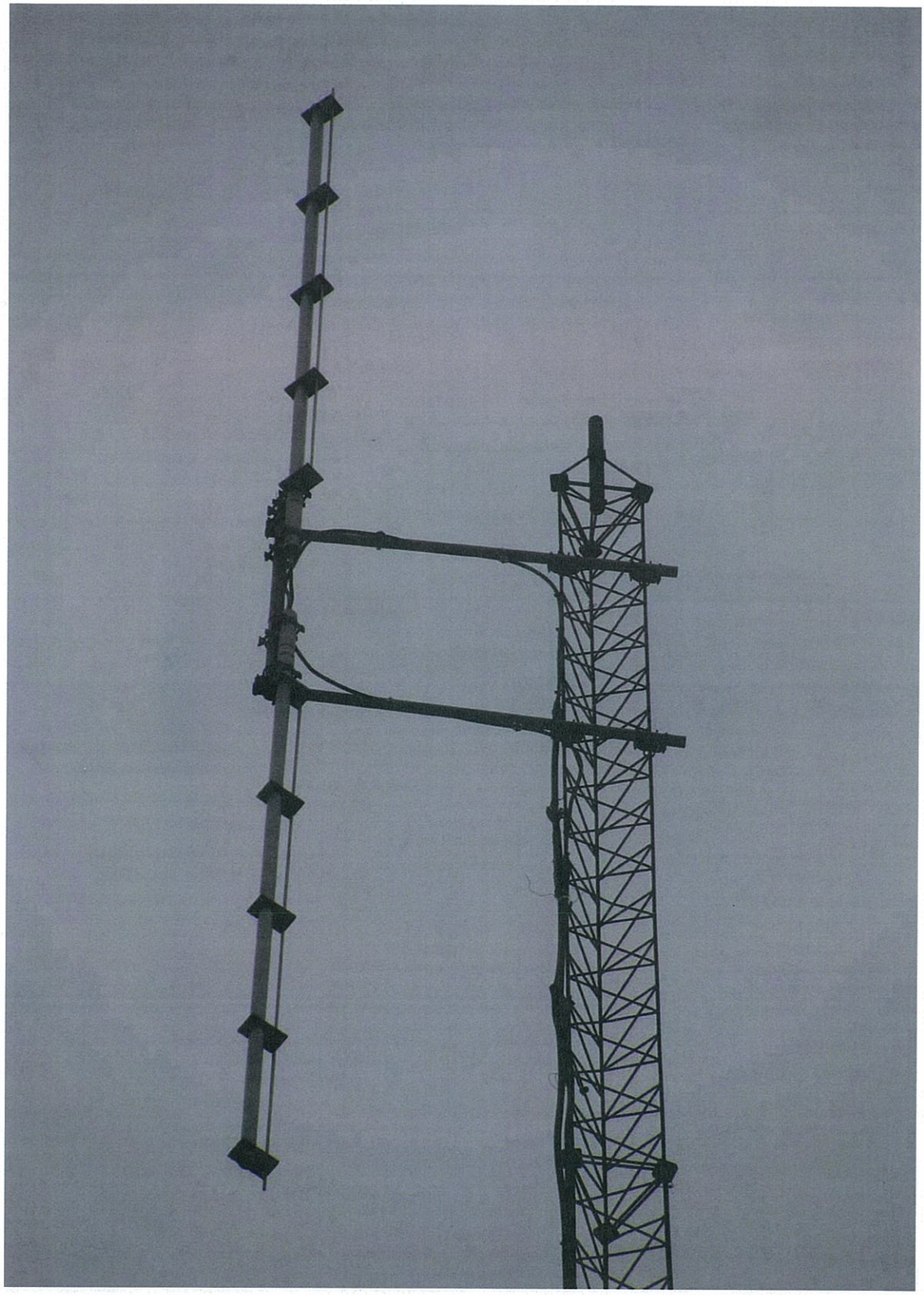
1.0 Elevation

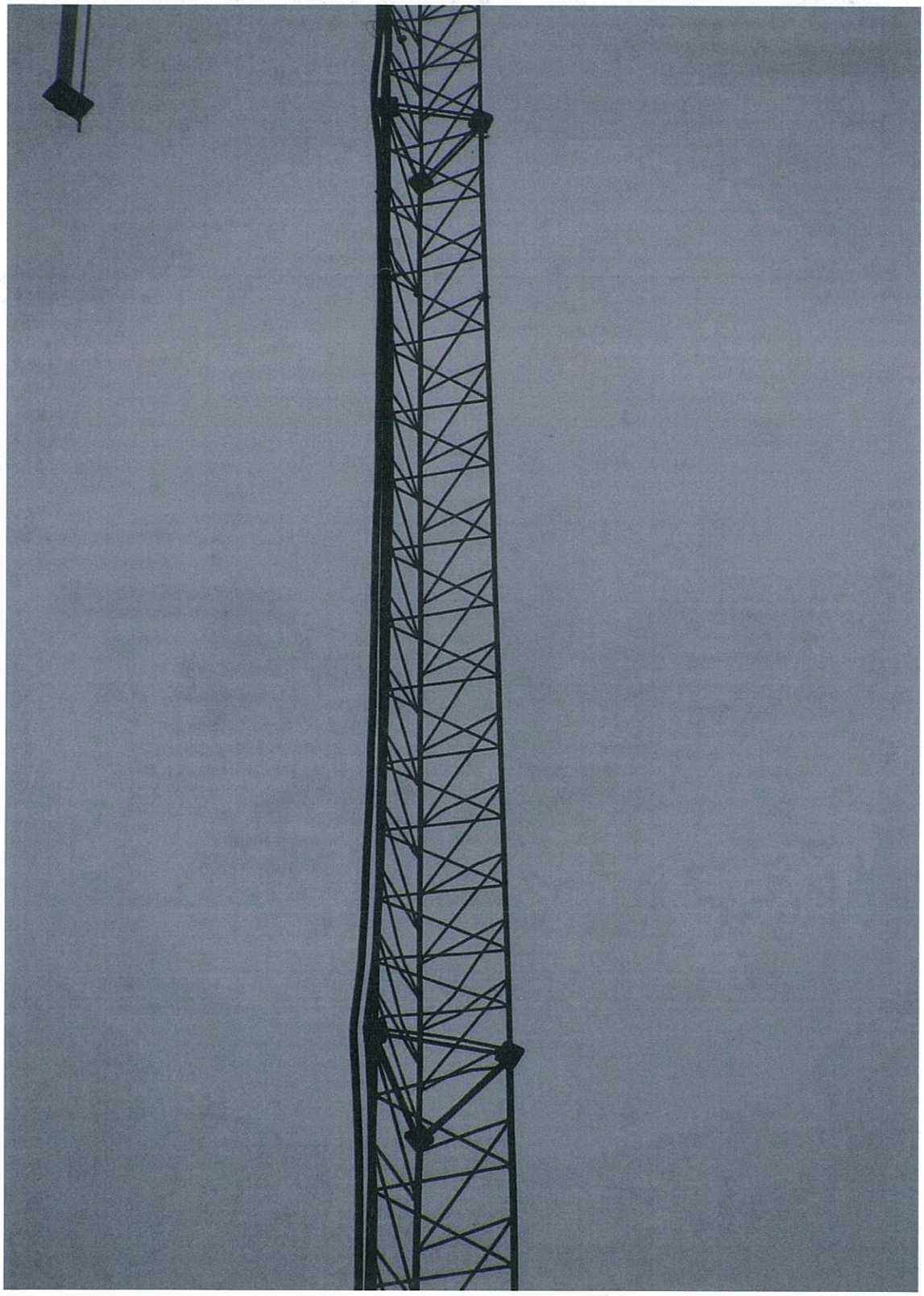
2.0 Base

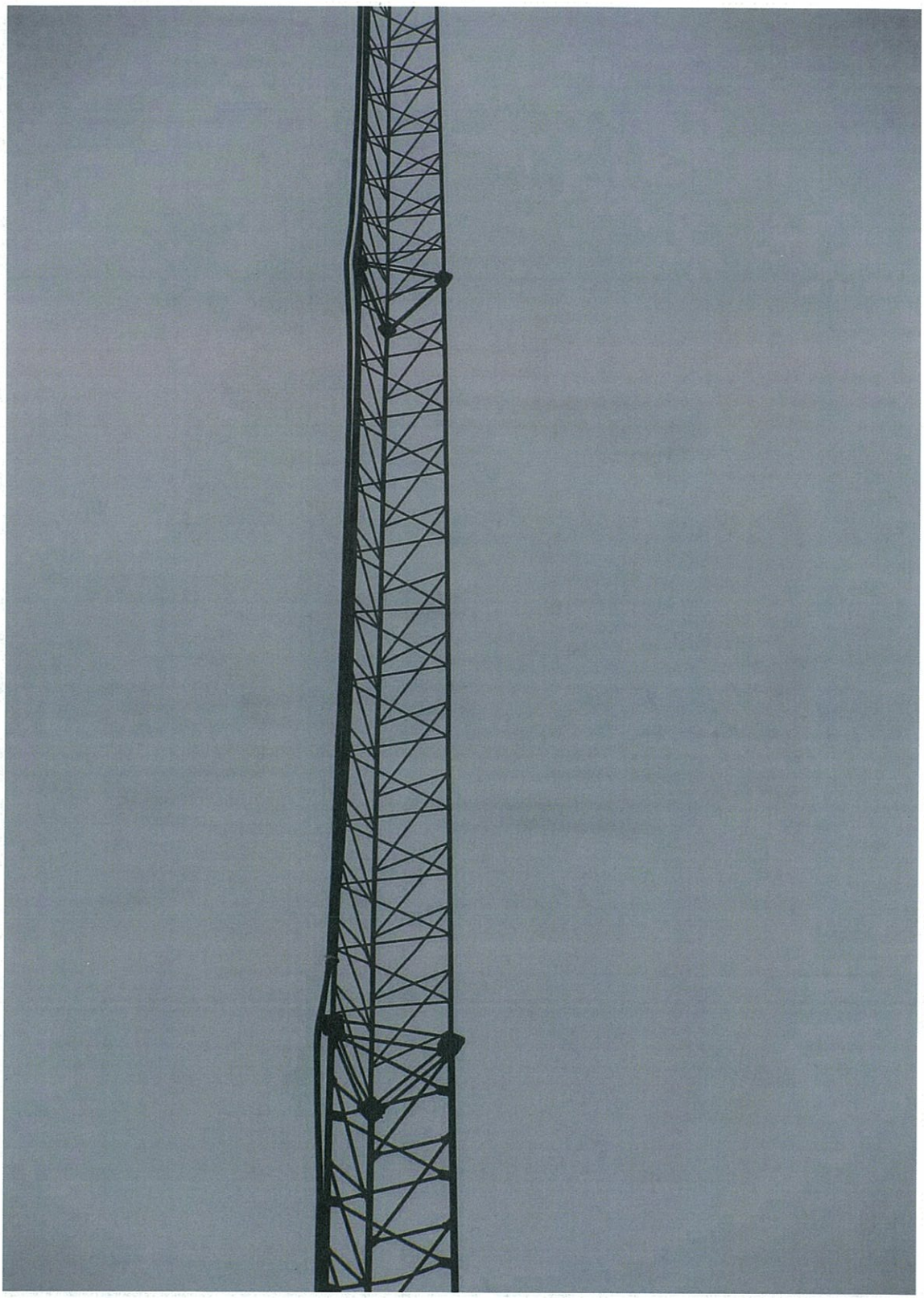
3.1 Bent Members

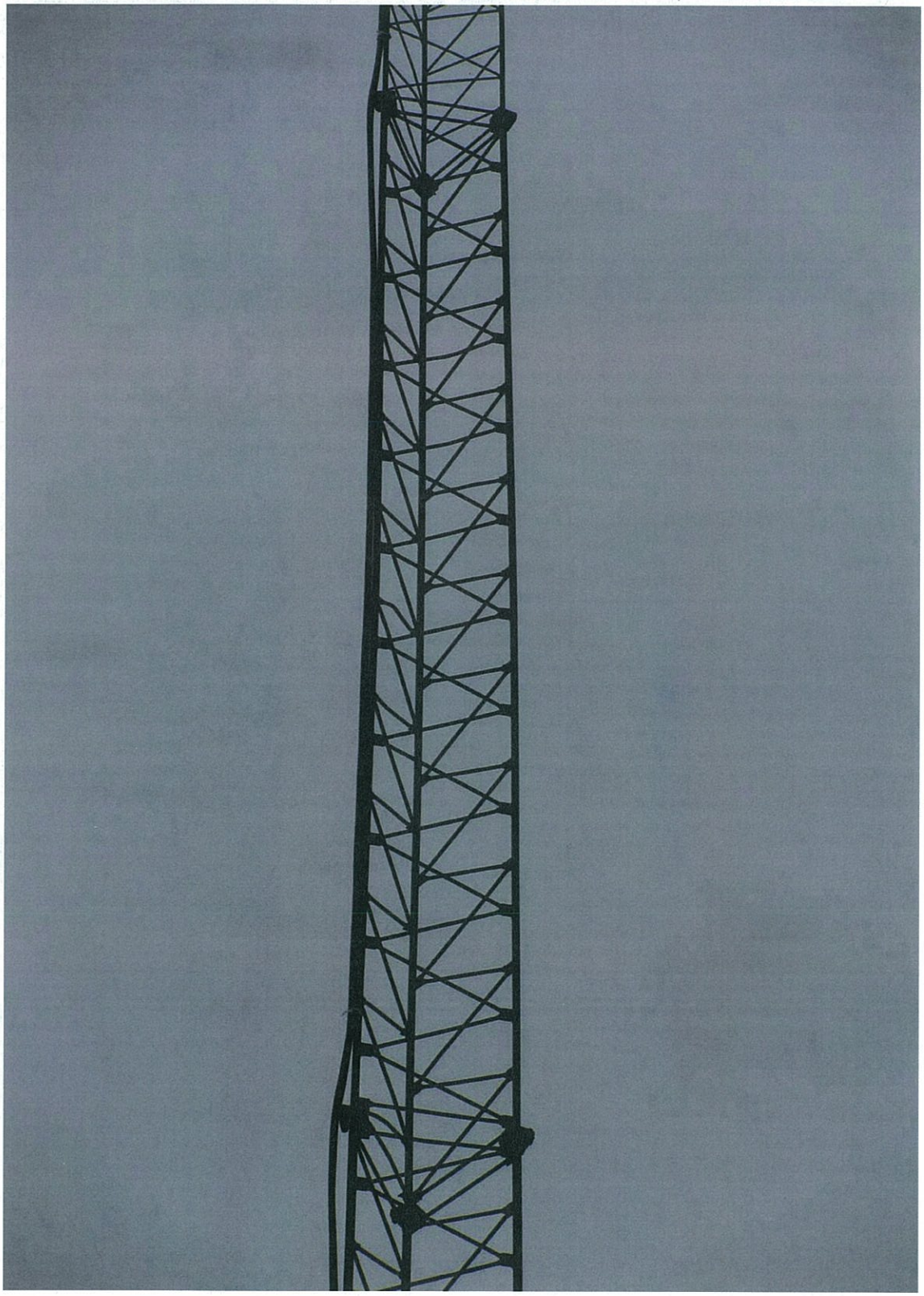
3.2 Bent Members

4.0 Verizon Coax










Non-poisonous ivy
and grape vines

11.0 Compound