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Also admitted in Massachusetts

January 17, 2014

Via Hand Delivery

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Request of Cellco Partnership d/b/a Verizon Wireless for an Order to Approve the Shared Use of an Existing Tower at 812 Providence Pike, Killingly, Connecticut**

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, Cellco Partnership d/b/a Verizon Wireless ("Cellco") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by Cellco of an existing telecommunications tower at 812 Providence Pike in Danielson (Town of Killingly), Connecticut. The tower that Cellco intends to share and the underlying property are owned by the Quinebaug Valley Emergency Communications, Inc. ("QVEC"). Cellco requests that the Council find that the proposed shared use of the QVEC tower satisfies the criteria of C.G.S § 16-50aa and issue an order approving the proposed shared use. In accordance with Council requirements, a copy of this letter is being sent to Killingly's Town Manager, Bruce E. Benway and QVEC.

Background

QVEC owns an approximately one-acre parcel at 812 Providence Pike (Route 6) in Danielson, Connecticut ("Property"). At the Property, QVEC maintains a 190-foot guyed-lattice tower. The existing tower is currently shared by T-Mobile, with antennas at the 140-foot level and QVEC with antennas at various levels. QVEC recently received Killingly Planning and Zoning Commission approval to construct a

new 240-foot self-supporting lattice tower on the Property. Once constructed, the new tower will be used exclusively by QVEC.

Cellco is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. Cellco and QVEC have agreed to the proposed shared use of the existing guyed-lattice tower at the Property pursuant to mutually acceptable terms and conditions, and QVEC has authorized Cellco to apply for all necessary permits and approvals that may be required to share the existing tower. (*See* Owner's authorization letter included in Attachment 1).

Cellco proposes to install twelve (12) antennas at a centerline height of 187-foot level on the existing tower. T-Mobile antennas will remain at the 140-foot level on the tower. Equipment associated with Cellco's antennas and a propane-fueled back-up generator will be located inside a 12' x 24' shelter. Cellco's shelter and a 1,000 gallon propane tank will be installed within the existing fenced facility compound to the north of the 190-foot tower. Included in Attachment 2 are Cellco's Project Plans showing the location of all site improvements.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such shared use." Cellco respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing 190-foot guyed lattice tower, with certain structural modifications, is capable of supporting Cellco's proposed and T-Mobile's existing antennas and related equipment. The proposed shared use of this tower therefore is technically feasible. A Structural Analysis and Modification Report is included in Attachment 3.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue orders approving the shared use of an existing tower such as the QVEC tower in Killingly. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower

facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the 190-foot QVEC tower would have a minimal environmental effect, for the following reasons:

1. The proposed installation of twelve (12) antennas at the 187-foot level on the tower would have an insignificant, incremental visual impact and would not cause any significant change or alteration in the physical or environmental characteristics of the existing site. Cellco's shelter and related improvements would be installed within the limits of the existing fenced compound area.

2. Noise associated with the equipment shelter's air conditioning units was evaluated for compliance with State and/or local noise standards. According to the Noise Compliance Study included in Attachment 4 ("Study"), noise from the shelter's air conditioning units will comply with State and/or local noise limits. Noise associated with Cellco's emergency back-up generator is exempt from State and local noise standards.

3. Operation of Cellco's antennas at this site will not exceed the RF emissions limits adopted by the Federal Communications Commission. Included in Attachment 5 is a cumulative worst-case RF emissions calculation for Cellco's proposed antennas.

4. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the Property other than periodic (monthly) maintenance visits to the cell site.

The proposed use of the existing QVEC tower would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, QVEC and Cellco have entered into a lease for the shared use of the existing tower on mutually agreeable terms. The proposed shared use of the existing tower is, therefore, economically feasible. (*See* Attachment 1).

E. Public Safety Concerns. As stated above, the QVEC tower is structurally capable of supporting, with certain structural modifications, Cellco's proposed antennas and related equipment and T-Mobile's existing installation. Cellco is not aware of any public safety concerns relative to the proposed sharing of the existing QVEC tower. In fact, the provision of new and improved wireless service through shared use of the existing tower is expected to enhance the safety and welfare of area residents and members of the general public traveling through Killingly.

Conclusion

For the reasons discussed above, the proposed shared use of the existing QVEC tower at the Property satisfies the criteria stated in C.G.S. § 16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use of the QVEC tower.

Thank you for your consideration of this matter.

Very truly yours,

Kenneth C. Baldwin

Enclosures
Copy to:
Bruce E. Benway, Town Manager
Quinebaug Valley Emergency Communications, Inc.
Sandy M. Carter

ATTACHMENT 1

December 18, 2013

Sandy Carter, Regulatory Manager
Cellco Partnership d/b/a Verizon Wireless
99 East River Drive, 9th Floor
East Hartford, CT 06108

Re: Cellco Partnership d/b/a Verizon Wireless
Proposed Shared Use of the Existing Telecommunications
Facility at 812 Providence Pike, Killingly, CT

Dear Ms. Carter:

Quinebaug Valley Emergency Communications, Inc. is the owner of the existing tower and the property at 812 Providence Pike, in Killingly, Connecticut (the "Property"). This letter authorizes Verizon Wireless and/or its authorized agent to file for all necessary federal, state or local permits and approvals for the proposed installation of a wireless telecommunication facility at the Property.

Sincerely,

Charles Kelleher
Associate Director
Quinebaug Valley Emergency
Communications Inc.

ATTACHMENT 2

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

DANIELSON 2
812 PROVIDENCE PIKE
DANIELSON, CT 06239

SITE DIRECTIONS

FROM: 99 EAST RIVER DRIVE, EAST HARTFORD, CT 06108 **TO:** 812 PROVIDENCE PIKE, DANIELSON, CT 06239

1.	Head east on E River Dr.	246 ft
2.	Turn left onto the CT-2 E ramp to Norwich	0.2 mi
3.	Merge onto I-84 E	3.4 mi
4.	Take exit 59 to merge onto I-384 E toward Providence	8.8 mi
5.	Continue onto US-44 E/US-44 Alt E/US-6 E	0.2 mi
6.	Slight right onto US-6 E/Grand Army of the Republic Hwy/Hop River Rd.	15.7 mi
7.	Take the ramp to US-6 E/Boston Post Rd.	0.5 mi
8.	Keep right at the fork, follow signs for US-6/Providence	141 ft
9.	Turn right onto US-6 E/Boston Post Rd., and the destination will be on the left	21.5 mi

GENERAL NOTES

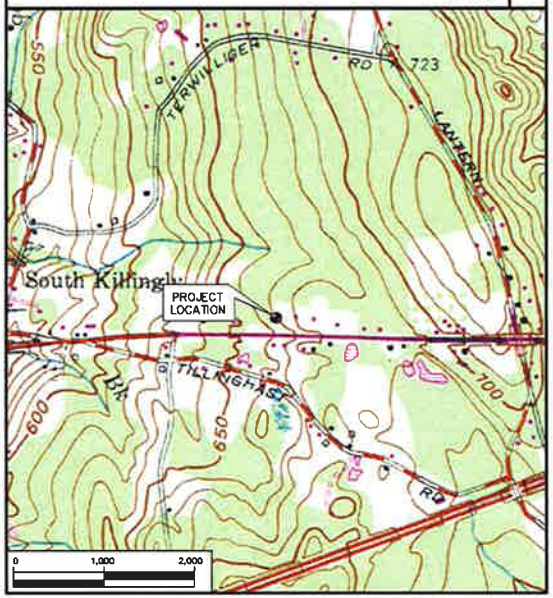
1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELLCO PARTNERSHIP.

PROJECT SCOPE

1. THE SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF (12) PANEL ANTENNAS MOUNTED TO AN EXISTING 190'-0" TALL GUY TOWER AT A CENTERLINE ELEVATION OF 187' ABOVE GRADE.
2. AN EQUIPMENT SHELTER WITH PROPANE FUELED EMERGENCY POWER GENERATOR AND ACCOMPANYING 1000 GALLON PROPANE TANK WILL BE INSTALLED AT GRADE.

VICINITY MAP

SCALE: 1" = 2000'



PROJECT SUMMARY

SITE NAME:	DANIELSON 2
SITE ADDRESS:	812 PROVIDENCE PIKE DANIELSON, CT 06239
LESSEE/TENANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
CONTACT PERSON:	SANDY CARTER CELLCO PARTNERSHIP (860) 803-8219
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT 06405 (203) 488-0580
TOWER COORDINATES:	LATITUDE: 41°-47'-29.048" LONGITUDE: 71°-49'-20.430" GROUND ELEVATION: ±658.5' A.M.S.L. COORDINATES AND GROUND ELEVATION BASED ON FAA 2-C SURVEY CERTIFICATION AS PREPARED FOR VERIZON WIRELESS, BY MARTINEZ COUCH AND ASSOCIATES DATED DECEMBER 6, 2013.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	0
C-1	SITE PLAN	0
C-2	ELEVATION, PLAN AND ANTENNA CONFIG.	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/03/14	HMR	DMD	ISSUED FOR CSC - CLIENT REVIEW

Cellco Partnership d.b.a. verizon wireless

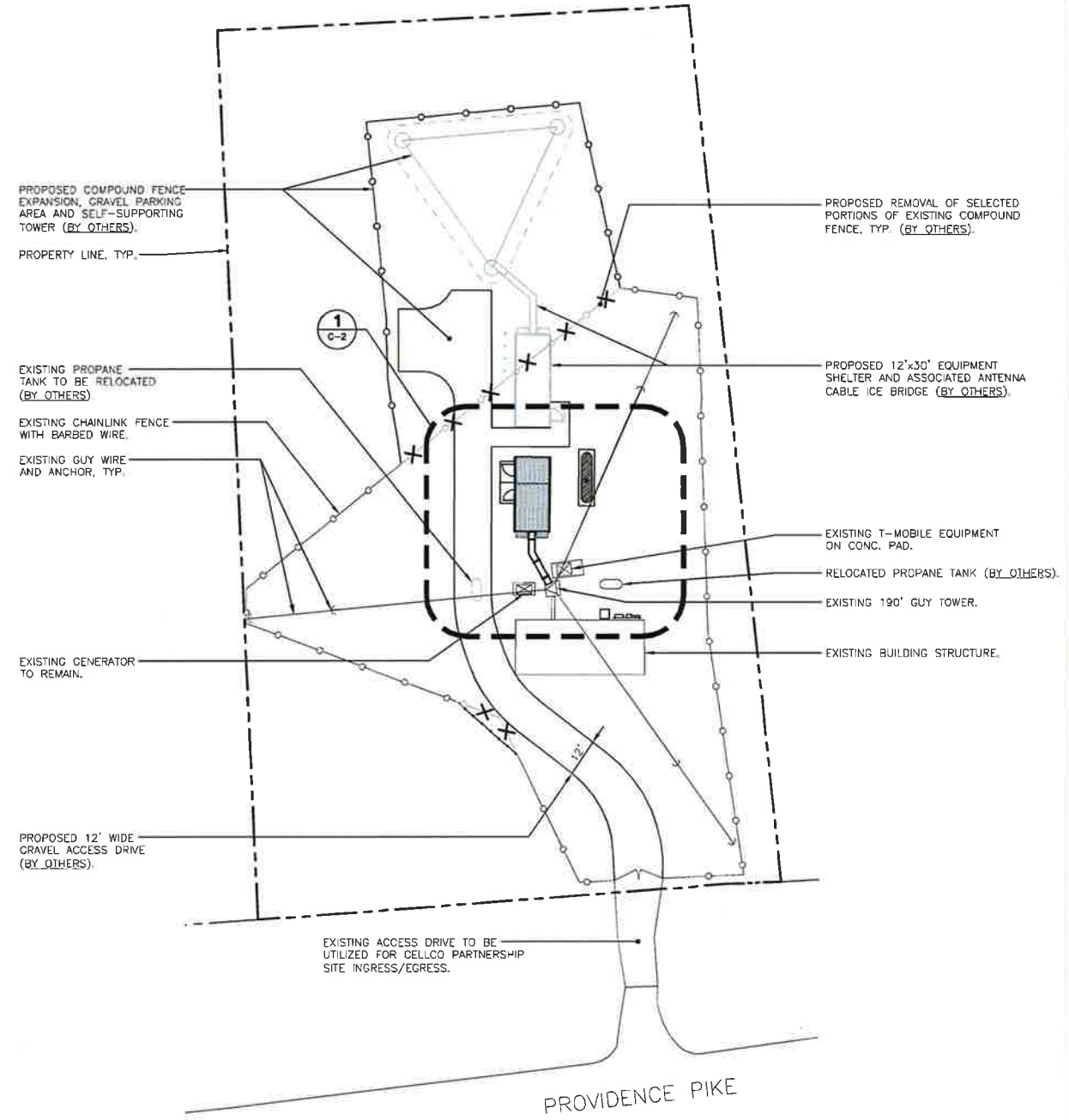
CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless
DANIELSON 2
812 PROVIDENCE PIKE
DANIELSON, CT 06239
DATE: 01/03/14
SCALE: AS NOTED
JOB NO. 09059.000

TITLE SHEET

T-1

DWG. 1 OF 3



1 C-1 SITE PLAN - PROPOSED
SCALE: 1" = 50'-0"

APPROXIMATE NORTH

GRAPHIC SCALE
0 25 50
(IN FEET)
1 inch = 50 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/03/14	HNR	DMD	ISSUED FOR CSC - CLIENT REVIEW

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
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63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless

DANIELSON 2

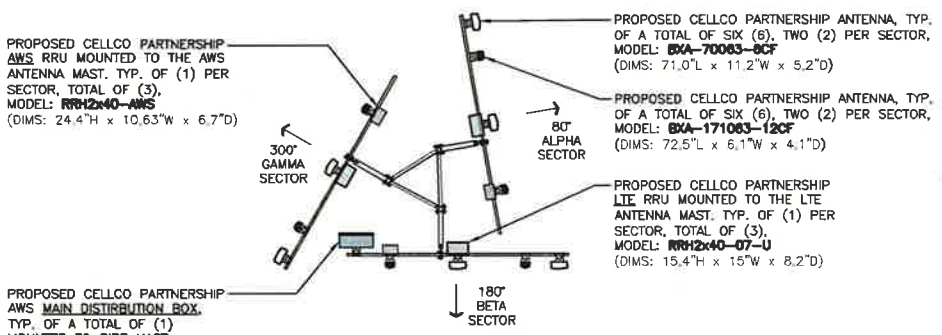
812 PROVIDENCE PIKE
DANIELSON, CT 06239

DATE: 01/03/14
SCALE: AS NOTED
JOB NO. 09059.000

SITE PLAN

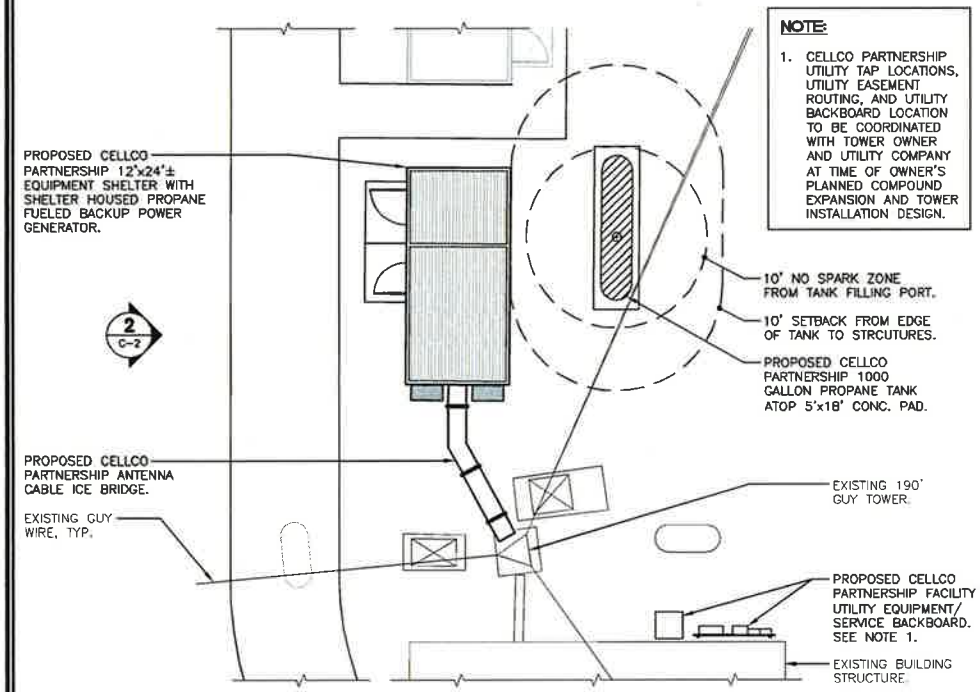
C-1

DWG. 2 OF 3



3 C-2 ANTENNA CONFIGURATION - PLAN (PROPOSED)
SCALE: 3/32" = 1'-0"

APPROXIMATE NORTH



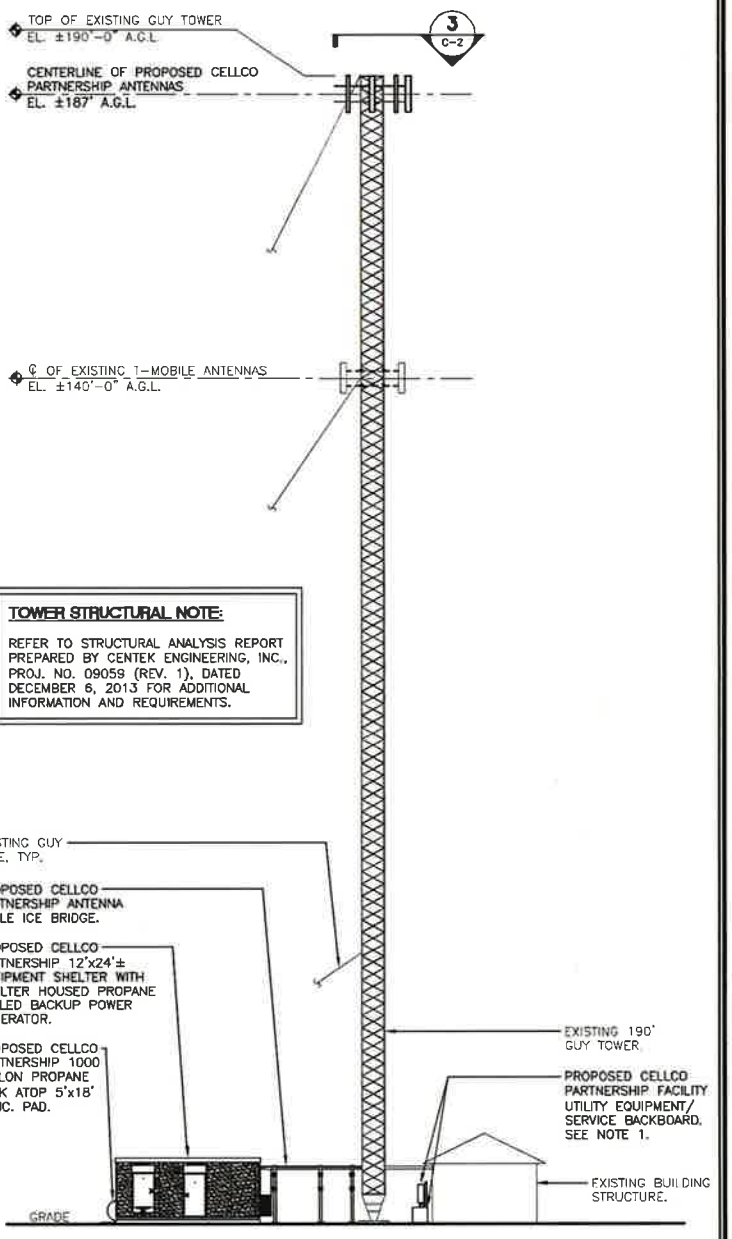
NOTE:

1. CELLCO PARTNERSHIP UTILITY TAP LOCATIONS, UTILITY EASEMENT ROUTING, AND UTILITY BACKBOARD LOCATION TO BE COORDINATED WITH TOWER OWNER AND UTILITY COMPANY AT TIME OF OWNER'S PLANNED COMPOUND EXPANSION AND TOWER INSTALLATION DESIGN.

1 C-2 COMPOUND PLAN - PROPOSED
SCALE: 1" = 20'-0"

APPROXIMATE NORTH

GRAPHIC SCALE
0 10 20
(IN FEET)
1 inch = 20 ft.



TOWER STRUCTURAL NOTE:

REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 09059 (REV. 1), DATED DECEMBER 6, 2013 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

2 C-2 WEST ELEVATION - PROPOSED
SCALE: 1" = 30'-0"

GRAPHIC SCALE
0 15 30
(IN FEET)
1 inch = 30 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/03/14	HMR	DMD	ISSUED FOR CSC - CLIENT REVIEW

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
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63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless
DANIELSON 2
812 PROVIDENCE PIKE
DANIELSON, CT 06239

DATE: 01/03/14
SCALE: AS NOTED
JOB NO. 09059.000

ELEVATION, PLAN AND ANTENNA CONFIG.

C-2
DWG. 3 OF 3

ATTACHMENT 3

CENTEK engineering

Centered on Solutions℠

Structural Analysis and Modification Report

190-ft Existing ROHN Guyed Lattice Tower

Proposed Verizon Wireless
Antenna Installation

Verizon Site Ref: Danielson 2

812 Providence Pike
Danielson, CT

Centek Project No. 09059.000

~~Date: November 12, 2013~~

Rev 1: December 6, 2013

Prepared for:

Verizon Wireless
99 East River Road, 9th Floor
East Hartford, CT 06108

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

SECTION 5 – TOWER REINFORCEMENT DRAWINGS

SECTION 6 – REFERENCE MATERIAL

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna installation proposed by Verizon Wireless on the existing guyed lattice tower located in Danielson, CT.

The host tower is a 190-ft tall, eleven-section, Rohn model 80 guyed lattice tower. The manufacturer's drawings and calculations were unavailable for use in this report. The tower geometry, structure member sizes and foundation system information were obtained from a tower mapping report prepared by CSB Communications; dated October 26, 2013.

Antenna and appurtenance information were obtained from the aforementioned tower mapping report and a RF data sheet provided by Verizon Wireless.

The tower consists of eleven (11) vertical sections constructed of steel pipe legs conforming to ASTM A572-50. Diagonal and horizontal lateral support bracing consists of steel pipe construction conforming to ASTM A53-B-42. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 3.42-ft throughout its length with the exception of a 5'-0" high tapered base section.

Verizon proposes the installation of twelve (12) panel antennas, three (3) remote radio heads and one (1) main distribution box mounted on three (3) T-frames. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- T-MOBILE (Existing):
  Antennas: Six (6) EMS RR90-17-02DP panel antennas and six (6) Remec S20057A1 TMA's mounted on three (3) side arms with a RAD center elevation of 140-ft above the existing tower base.
  Coax Cables: Six (6) 1-1/4" ∅ coax cables running on the exterior of the existing tower.
- **VERIZON (Proposed):**
  Antennas: Six (6) Antel BXA-70063-6CF panel antennas, six (6) BXA-171063-12CF panel antennas, three (3) Alcatel-Lucent RRH2x40-AWS Remote Radio Heads, three (3) Alcatel-Lucent RRH2x40-07-U Remote Radio Heads and one (1) RFS DB-T1-6Z-8AB-0Z main distribution box mounted on three (3) Valmont 13-ft lightweight T-Frames p/n 806109 with a RAD center elevation of 187-ft above the existing tower base.
  Cables: Two (2) 1-5/8" dia. Hybriflex Fiber feeder cables running on the exterior 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 or reinforcement drawings.
- 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 existing coax cables to be installed as indicated in this report.

Analysis

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

The existing tower was analyzed for the controlling basic wind speed (fastest mile) with no ice and a 75% reduction of wind force 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).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix K of the CSBC[1] and the wind speed data available in the TIA/EIA-222-F-96 Standard. The higher of the two wind speeds is utilized in preparation on the tower analysis.

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 on the tower structure and its components.

Basic Wind Speed:	Windham; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Danielson (Killingly); v = 105 mph (3 second gust) equivalent to v = 85 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA and Appendix K wind speeds are equal.	
Load Cases:	Load Case 1; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[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. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

[1] The 2005 Connecticut State Building Code as amended by the 2009 CT State Supplement. (CSBC)

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. 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.

Calculated stresses **with the proposed tower reinforcements outlined in Section 5 of this report** were found to be within allowable limits. In Load Case 2, per tnxTower "Section Capacity Table", this tower was found to be at **148.7%** (leg) of its total capacity without reinforcement and **93.7%** (leg) with the proposed reinforcements.

Proposed Loading - Without Reinforcements					
	Percentage of Capacity				
Elevation	Leg	Diagonal	Bolts	Girt	Guy Wire
173.35' – 190.6'	16.2	42.2	51.1	8.2	120.4
160.1' – 173.35'	37.0	56.3	69.7	16.7	-
140.1' – 160.1'	134.3	34.4	60.8	29.4	-
120.1' – 140.1'	139.8	29.4	63.5	45.3	87.2
100.1' – 120.1'	148.7	22.9	28.1	9.2	-
80.1' – 100.1'	107.7	24.1	26.0	4.4	55.4
60.1' – 80.1'	72.5	16.8	16.0	4.8	-
40.1' – 60.1'	63.2	27.1	27.4	5.8	50.9
20.1' – 40.1'	59.4	24.3	25.6	4.9	-
4.85' – 20.1'	49.1	12.1	78.9	38.1	-
0'-4.85'	32.3	-	-	5.6	-

Proposed Loading - With Reinforcements					
	Percentage of Capacity				
Elevation	Leg	Diagonal	Bolts	Girt	Guy Wire
173.35' – 190.6'	21.7	41.9	51.8	5.1	90.0
160.1' – 173.35'	21.7	38.6	47.3	11.5	-
140.1' – 160.1'	88.7	26.6	49.1	23.7	-
120.1' – 140.1'	93.7	25.5	50.1	36.3	74.4
100.1' – 120.1'	75.6	12.1	11.5	3.8	-
80.1' – 100.1'	86.6	19.9	21.7	4.3	62.7
60.1' – 80.1'	59.7	12.4	11.8	4.1	-
40.1' – 60.1'	63.2	26.7	27.2	5.9	56.4
20.1' – 40.1'	59.6	24.2	25.1	4.8	-
4.85' – 20.1'	50.2	11.6	80.9	39.1	-
0'-4.85'	33.2	-	-	5.0	-

Foundation and Anchors

The existing tower base foundation consists of a 2.0-ft square x 3.75-ft long reinforced concrete pedestal with a 4.0-ft square x 1.75-ft thick reinforced concrete pad bearing directly on the existing sub grade. Additionally, guy wire loading is transferred to six (6) existing 7-ft x 4-ft x 2-ft reinforced concrete anchor support blocks. The foundation information was obtained from the original design documents prepared by ROHN dated September 27, 1979.

- The worst case tower base and guy anchor reactions developed from the governing Load Case 2 were used in the verification of the anchorage foundations:

Tower Guy Max Reactions	
Vector	**Existing Guy Anchor C (Radius = 89-ft)**
Horizontal (In Plane of GW)	**17.0 kips**
Horizontal (Out of Plane of GW)	**1.0 kips**
Vertical	**26.0 kips**
Tower Base Reactions	
Vector	**Reaction**
Horizontal Shear	**1.0 kips**
Axial Compression	**75 kips**
Torque	**1 ft-kips**

- The tower base and guy anchor foundations were found to be within allowable limits.

Foundation	**Design Limit**	**IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS)[1]**	**Existing Condition (FS)[1]**	**Result**
Reinf. Conc. Anchor Block (B) at 253-ft radius.	Uplift	2.0	3.3	**PASS**
	Sliding	1.5	1.9	**PASS**
		Allowable	**Proposed**	
Base Foundation	Bearing	20 ksf [2]	9.7 ksf	**PASS**

Note 1: FS denotes 'Factor of Safety'.
Note 2: Per geotechnical report prepared by Dr. Clarence Welti dated March 10, 2011.

Conclusion

This analysis shows that with the implementation of the proposed reinforcements outlined within drawings N-1 thru N-2 and S-1 through S-2, dated 12/04/13 located within Section 5 of this report, the subject tower **is adequate** to support the proposed modified Verizon antenna configuration.

The analysis 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

STATE OF CONNECTICUT
CARLO F. CENTORE
No. 16884
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Timothy J. Lynn, PE
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

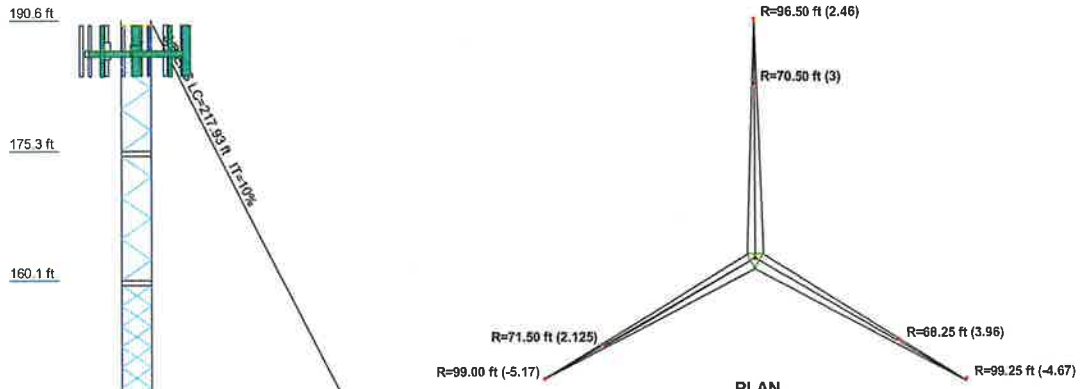
tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower 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.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Un-reinforced Tower

Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	A	ROHN 2.5 STD			ROHN 2 EH		ROHN 2 STD			ROHN 2.5 X-STR	
Leg Grade		A572-50									3.458
Diagonals	N.A.						P1.5x.058				
Diagonal Grade	N.A.						A53-B-42				
Top Girts	B						P1.5x.058				N.A.
Mid Girts	B						N.A.				
Bottom Girts	B						P1.5x.058				
Top Guy Pull-Offs			N.A.	C4x5.4	N.A.			N.A.		4 1/2x3/8	
Face Width (ft)				C4x5.4							
# Panels @ (ft)	C	6 @ 2.43857			56 @ 2.42318					12 @ 2.43924	
Weight (K)	5.0	0.4	0.5	0.5	0.5	0.5	0.3	0.7	0.4	0.4	0.5



PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
BXA-70063/6CF (Verizon - Proposed)	187	DB-T1-6Z-8AB-0Z (Verizon - Proposed)	187
BXA-171063-12CF (Verizon - Proposed)	187	Pirod 12' T-Frame Sector Mount (1) (Verizon - proposed)	187
BXA-70063/6CF (Verizon - Proposed)	187	Pirod 12' T-Frame Sector Mount (1) (Verizon - proposed)	187
BXA-171063-12CF (Verizon - Proposed)	187	Pirod 12' T-Frame Sector Mount (1) (Verizon - proposed)	187
BXA-70063/6CF (Verizon - Proposed)	187	(2) RR90-17-02DP (T-Mobile - Existing)	140
BXA-171063-12CF (Verizon - Proposed)	187	(2) RR90-17-02DP (T-Mobile - Existing)	140
BXA-70063/6CF (Verizon - Proposed)	187	(2) RR90-17-02DP (T-Mobile - Existing)	140
BXA-171063-12CF (Verizon - Proposed)	187	(2) S20057A1 PCS MHA (T-Mobile - Existing)	140
BXA-70063/6CF (Verizon - Proposed)	187	(2) S20057A1 PCS MHA (T-Mobile - Existing)	140
BXA-171063-12CF (Verizon - Proposed)	187	(2) S20057A1 PCS MHA (T-Mobile - Existing)	140
BXA-70063/6CF (Verizon - Proposed)	187	ROHN 4-ft Side Arm (T-Mobile - Existing)	140
BXA-171063-12CF (Verizon - Proposed)	187	ROHN 4-ft Side Arm (T-Mobile - Existing)	140
RRH2x40-07-U (Verizon - Proposed)	187	ROHN 4-ft Side Arm (T-Mobile - Existing)	140
RRH2x40-AWS (Verizon - Proposed)	187		
RRH2x40-07-U (Verizon - Proposed)	187		
RRH2x40-AWS (Verizon - Proposed)	187		
RRH2x40-07-U (Verizon - Proposed)	187		
RRH2x40-AWS (Verizon - Proposed)	187		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 X-STR	C	4 @ 1.17356
B	14x3/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 148.7%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: 09059 - Danielson 2		
Project: 190-ft Guyed Tower - 812 Providence Pike, Danielson, CT		
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 12/04/13	Scale: NTS
Path:		Dwg No. E-1

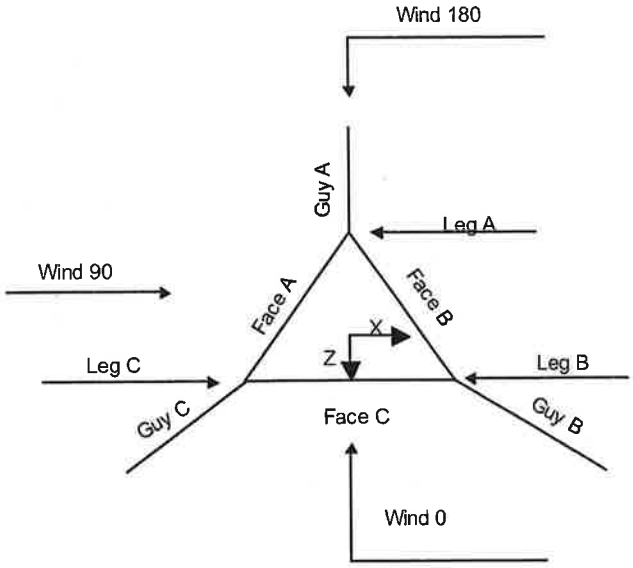
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 190.60 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 3.46 ft at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

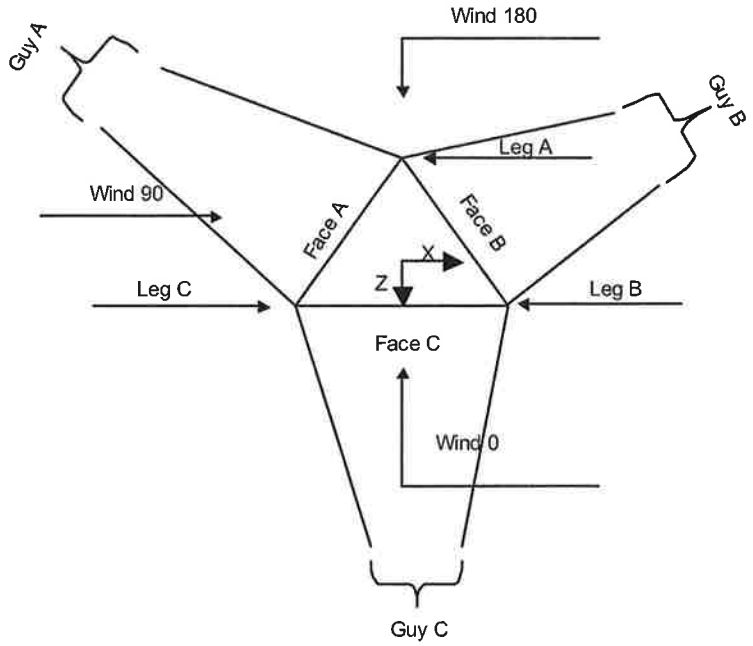
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 2.
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		



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	190.60-175.35			3.46	1	15.25
T2	175.35-160.10			3.46	1	15.25
T3	160.10-140.10			3.46	1	20.00
T4	140.10-120.10			3.46	1	20.00
T5	120.10-100.10			3.46	1	20.00
T6	100.10-80.10			3.46	1	20.00
T7	80.10-60.10			3.46	1	20.00
T8	60.10-40.10			3.46	1	20.00
T9	40.10-20.10			3.46	1	20.00
T10	20.10-4.85			3.46	1	15.25
T11	4.85-0.00			3.46	1	4.85

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	190.60-175.35	2.44	K Brace Left	No	Yes	7.3750	0.0000
T2	175.35-160.10	2.44	K Brace Left	No	Yes	7.3750	0.0000
T3	160.10-140.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T4	140.10-120.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T5	120.10-100.10	2.42	K Brace Left	No	Yes	7.3750	0.0000
T6	100.10-80.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T7	80.10-60.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T8	60.10-40.10	2.42	K Brace Left	No	Yes	7.3750	0.0000
T9	40.10-20.10	2.42	K Brace Left	No	Yes	7.3750	0.0000
T10	20.10-4.85	2.44	K Brace Left	No	Yes	7.3750	0.0000
T11	4.85-0.00	1.17	X Brace	No	Yes	8.0000	8.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 190.60-175.35	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T2 175.35-160.10	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T3 160.10-140.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T4 140.10-120.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T5 120.10-100.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T6 100.10-80.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T7 80.10-60.10	Pipe	ROHN 2 EH	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T8 60.10-40.10	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T9 40.10-20.10	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T10 20.10-4.85	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T11 4.85-0.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe		A53-B-42 (42 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 190.60-175.35	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T2 175.35-160.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T3 160.10-140.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T4 140.10-120.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T5 120.10-100.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T6 100.10-80.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T7 80.10-60.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T8 60.10-40.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T9 40.10-20.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T10 20.10-4.85	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T11 4.85-0.00	Flat Bar	14x3/16	A36 (36 ksi)	Flat Bar	14x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T11 4.85-0.00	2	Flat Bar	14x3/16	A36 (36 ksi)	Flat Bar		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 190.60-175.35	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 175.35-160.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 160.10-140.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 140.10-120.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 120.10-100.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 100.10-80.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 80.10-60.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 60.10-40.10	0.00	0.0000	A36 (36 ksi)	1	1	1	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
T9 40.10-20.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.10-4.85	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T11 4.85-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	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	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
190.60-175.35				1	1	1	1	1	1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
175.35-160.10				1	1	1	1	1	1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
160.10-140.10				1	1	1	1	1	1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
140.10-120.10				1	1	1	1	1	1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
120.10-100.10				1	1	1	1	1	1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
100.10-80.10				1	1	1	1	1	1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
80.10-60.10				1	1	1	1	1	1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
60.10-40.10				1	1	1	1	1	1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
40.10-20.10				1	1	1	1	1	1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
20.10-4.85				1	1	1	1	1	1	1	1	1	1	1	1
T11 4.85-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	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	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	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
190.60-175.35														

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
T2 175.35-160.10	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 160.10-140.10	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 140.10-120.10	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 120.10-100.10	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 100.10-80.10	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 80.10-60.10	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
T8 60.10-40.10	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
T9 40.10-20.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.10-4.85	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 4.85-0.00	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	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 190.60-175.35	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T2 175.35-160.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T3 160.10-140.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T4 140.10-120.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T5 120.10-100.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T6 100.10-80.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T7 80.10-60.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T8 60.10-40.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T9 40.10-20.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T10 20.10-4.85	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T11 4.85-0.00	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000

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 190.60-175.35	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 175.35-160.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.10-140.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.10-120.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.10-100.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 100.10-80.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.10-60.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.10-40.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.10-20.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.10-4.85	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 4.85-0.00	Flange	0.7500 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
189.985	EHS	A	3/8	1.54	10%	21000	0.273	209.80	96.50	0.0000	2.46	100%
		B	3/8	1.54	10%	21000	0.273	217.40	99.25	0.0000	-4.67	100%
		C	3/8	1.54	10%	21000	0.273	217.73	99.00	0.0000	-5.17	100%
139.485	EHS	A	1/2	2.69	10%	21000	0.517	166.31	96.50	0.0000	2.46	100%
		B	1/2	2.69	10%	21000	0.517	173.74	99.25	0.0000	-4.67	100%
		C	1/2	2.69	10%	21000	0.517	174.02	99.00	0.0000	-5.17	100%
87.3695	EHS	A	7/16	2.08	10%	21000	0.399	108.59	70.50	0.0000	3.00	100%
		B	7/16	2.08	10%	21000	0.399	106.43	68.25	0.0000	3.96	100%
		C	7/16	2.08	10%	21000	0.399	109.89	71.50	0.0000	2.13	100%
44.9464	EHS	A	3/8	1.54	10%	21000	0.273	80.25	70.50	0.0000	3.00	100%
		B	3/8	1.54	10%	21000	0.273	77.83	68.25	0.0000	3.96	100%
		C	3/8	1.54	10%	21000	0.273	81.56	71.50	0.0000	2.13	100%

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
189.985	Corner						
139.485	Torque Arm	7.17	0.0000	Channel	A36	Channel	C10x15.3

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
					(36 ksi)		
87.3695	Corner						
44.9464	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
189.99	A53-B-42 (42 ksi)	Pipe			No	A36 (36 ksi)	Flat Bar	4 1/2x3/8
139.49	A53-B-42 (42 ksi)	Pipe				A36 (36 ksi)	Flat Bar	
87.37	A53-B-42 (42 ksi)	Pipe			No	A36 (36 ksi)	Channel	C4x5.4
44.95	A53-B-42 (42 ksi)	Pipe			Yes	A36 (36 ksi)	Channel	C4x5.4

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
189.985	0.06	0.06	0.06		3.84 3.4 sec/pulse	4.12 3.5 sec/pulse	4.13 3.5 sec/pulse	
139.485	0.09	0.09	0.09		2.63 2.8 sec/pulse	2.86 2.9 sec/pulse	2.87 2.9 sec/pulse	
87.3695	0.04	0.04	0.04		1.12 1.8 sec/pulse	1.08 1.8 sec/pulse	1.15 1.9 sec/pulse	
44.9464	0.02	0.02	0.02		0.57 1.3 sec/pulse	0.54 1.3 sec/pulse	0.59 1.3 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
189.985	Yes	No			1	1	1	1
139.485	Yes	No	1	1	1	1	1	1
87.3695	Yes	No			1	1	1	1
44.9464	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
189.985	0.6250 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
139.485	0.6250 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
87.3695	0.6250 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
44.9464	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
189.985	A	96.22	25	19	0.5000
	B	92.66	25	19	0.5000
	C	92.41	25	19	0.5000
139.485	A	70.97	23	17	0.5000
	B	67.41	23	17	0.5000
	C	67.16	23	17	0.5000
87.3695	A	45.18	20	15	0.5000
	B	45.66	20	15	0.5000
	C	44.75	20	15	0.5000
44.9464	A	23.97	18	14	0.5000
	B	24.45	18	14	0.5000
	C	23.54	18	14	0.5000

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top / Bottom K	F_x K	F_y K	F_z K	M_x kip-ft	M_y kip-ft	M_z kip-ft
189.985	A	63.2542	1.59 1.54	0.00	1.43	-0.70	-2.85	0.00	0.00
	B	63.4524	1.59 1.54	0.61	1.43	0.35	1.43	0.00	-2.47
	C	63.5700	1.59 1.54	-0.60	1.43	0.35	1.43	0.00	2.48
			Sum:	0.00	4.29	-0.01	0.01	0.00	0.00
139.485	A	55.4083	2.76 2.69	-0.06	2.29	-1.55	-4.73	5.66	-8.20
	A	55.4083	2.76 2.69	0.06	2.29	-1.55	-4.73	-5.66	8.20
	B	55.9967	2.76 2.69	1.35	2.31	0.71	9.54	5.58	0.00
	B	55.9967	2.76 2.69	1.29	2.31	0.81	-4.77	-5.58	-8.27

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
	C	56.1568	2.76 2.69	-1.29	2.31	0.81	-4.78	5.56	8.28
	C	56.1568	2.76 2.69	-1.34	2.31	0.71	9.56	-5.56	0.00
			Sum:	0.01	13.80	-0.05	0.09	0.00	0.02
87.3695	A	50.9253	2.11 2.08	0.00	1.65	-1.32	-3.29	0.00	0.00
	B	51.5393	2.11 2.08	1.13	1.66	0.65	1.66	0.00	-2.88
	C	50.8082	2.11 2.08	-1.15	1.65	0.66	1.64	0.00	2.85
			Sum:	-0.02	4.96	-0.01	0.01	0.00	-0.03
44.9464	A	31.4801	1.55 1.54	0.00	0.82	-1.32	-1.63	0.00	0.00
	B	31.7421	1.55 1.54	1.14	0.82	0.66	0.82	0.00	-1.42
	C	31.6374	1.55 1.54	-1.14	0.82	0.66	0.82	0.00	1.42
			Sum:	-0.00	2.46	-0.00	0.01	0.00	-0.00

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
189.985	A	63.2542	2.25 2.10	0.00	2.03	-0.98	-4.04	0.00	0.00
	B	63.4524	2.26 2.10	0.84	2.04	0.49	2.03	0.00	-3.52
	C	63.5700	2.26 2.10	-0.84	2.04	0.48	2.03	0.00	3.52
			Sum:	0.00	6.10	-0.01	0.02	0.00	0.00
139.485	A	55.4083	3.89 3.73	-0.08	3.23	-2.16	-6.68	7.92	-11.58
	A	55.4083	3.89 3.73	0.08	3.23	-2.16	-6.68	-7.92	11.58
	B	55.9967	3.90 3.73	1.88	3.26	1.00	13.50	7.80	0.00
	B	55.9967	3.90 3.73	1.81	3.26	1.13	-6.75	-7.80	-11.69
	C	56.1568	3.90 3.73	-1.80	3.27	1.13	-6.76	7.77	11.71
	C	56.1568	3.90 3.73	-1.88	3.27	0.99	13.52	-7.77	0.00
			Sum:	0.02	19.51	-0.07	0.14	0.00	0.02
87.3695	A	50.9253	2.96 2.88	0.00	2.32	-1.84	-4.63	0.00	0.00
	B	51.5393	2.96 2.88	1.57	2.34	0.91	2.33	0.00	-4.04
	C	50.8082	2.96 2.88	-1.60	2.32	0.92	2.31	0.00	4.01
			Sum:	-0.03	6.98	-0.01	0.01	0.00	-0.03

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
44.9464	A	31.4801	2.14 2.11	0.00	1.14	-1.81	-2.28	0.00	0.00
	B	31.7421	2.14 2.10	1.56	1.15	0.90	1.15	0.00	-1.98
	C	31.6374	2.14 2.11	-1.57	1.15	0.90	1.15	0.00	1.98
			Sum:	**-0.00**	3.44	**-0.00**	**0.01**	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
189.985	A	63.2542	1.59 1.54	0.00	1.43	-0.70	-2.85	0.00	0.00
	B	63.4524	1.59 1.54	0.61	1.43	0.35	1.43	0.00	-2.47
	C	63.5700	1.59 1.54	-0.60	1.43	0.35	1.43	0.00	2.48
			Sum:	**0.00**	4.29	**-0.01**	**0.01**	0.00	**0.00**
139.485	A	55.4083	2.76 2.69	-0.06	2.29	-1.55	-4.73	5.66	-8.20
	A	55.4083	2.76 2.69	0.06	2.29	-1.55	-4.73	-5.66	8.20
	B	55.9967	2.76 2.69	1.35	2.31	0.71	9.54	5.58	0.00
	B	55.9967	2.76 2.69	1.29	2.31	0.81	-4.77	-5.58	-8.27
	C	56.1568	2.76 2.69	-1.29	2.31	0.81	-4.78	5.56	8.28
	C	56.1568	2.76 2.69	-1.34	2.31	0.71	9.56	-5.56	0.00
			Sum:	**0.01**	13.80	**-0.05**	**0.09**	0.00	**0.02**
87.3695	A	50.9253	2.11 2.08	0.00	1.65	-1.32	-3.29	0.00	0.00
	B	51.5393	2.11 2.08	1.13	1.66	0.65	1.66	0.00	-2.88
	C	50.8082	2.11 2.08	-1.15	1.65	0.66	1.64	0.00	2.85
			Sum:	**-0.02**	4.96	**-0.01**	**0.01**	0.00	**-0.03**
44.9464	A	31.4801	1.55 1.54	0.00	0.82	-1.32	-1.63	0.00	0.00
	B	31.7421	1.55 1.54	1.14	0.82	0.66	0.82	0.00	-1.42
	C	31.6374	1.55 1.54	-1.14	0.82	0.66	0.82	0.00	1.42
			Sum:	**-0.00**	2.46	**-0.00**	**0.01**	0.00	**-0.00**

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension K	0 F Intercept ft	20 F Initial Tension K	20 F Intercept ft	40 F Initial Tension K	40 F Intercept ft	60 F Initial Tension K	60 F Intercept ft	80 F Initial Tension K	80 F Intercept ft	100 F Initial Tension K	100 F Intercept ft	120 F Initial Tension K	120 F Intercept ft
189.985	A	94.50	187.53	1.669	3.55	1.626	3.64	1.583	3.74	1.540	3.84	1.497	3.95	1.455	4.06	1.412	4.18
	B	97.25	194.66	1.667	3.81	1.625	3.91	1.582	4.01	1.540	4.12	1.498	4.24	1.456	4.36	1.414	4.48
	C	97.00	195.16	1.666	3.83	1.624	3.92	1.582	4.03	1.540	4.13	1.498	4.25	1.457	4.37	1.415	4.49
139.485	A	94.50	137.03	3.076	2.30	2.947	2.40	2.818	2.51	2.690	2.63	2.562	2.76	2.435	2.90	2.310	3.05
	B	97.25	144.16	3.064	2.52	2.939	2.62	2.814	2.74	2.690	2.86	2.566	3.00	2.443	3.15	2.321	3.31
	C	97.00	144.66	3.061	2.53	2.937	2.63	2.813	2.75	2.690	2.87	2.567	3.01	2.445	3.16	2.324	3.32
87.3695	A	68.50	84.37	2.452	0.95	2.328	1.00	2.204	1.06	2.080	1.12	1.957	1.19	1.834	1.27	1.712	1.36
	B	66.25	83.41	2.442	0.92	2.321	0.97	2.201	1.02	2.080	1.08	1.960	1.14	1.840	1.22	1.721	1.30
	C	69.50	85.24	2.454	0.98	2.329	1.03	2.204	1.09	2.080	1.15	1.956	1.22	1.833	1.30	1.710	1.40
44.9464	A	68.50	41.95	2.008	0.44	1.852	0.47	1.696	0.52	1.540	0.57	1.385	0.63	1.231	0.71	1.078	0.81
	B	66.25	40.99	2.006	0.41	1.850	0.45	1.695	0.49	1.540	0.54	1.386	0.60	1.232	0.67	1.080	0.76
	C	69.50	42.82	2.007	0.45	1.851	0.49	1.695	0.53	1.540	0.59	1.386	0.65	1.232	0.73	1.080	0.84

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 1/4 (T-Mobile - Existing)	A	Yes	Ar (CfAe)	140.00 - 8.00	0.5000	-0.2	6	6	1.5500	1.5500		0.66
HYBRIFLEX 1-5/8" (Verizon - Proposed)	C	Yes	Ar (CfAe)	186.00 - 8.00	0.5000	-0.3	2	2	1.9800	1.9800		1.90

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
T1	190.60-175.35	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	3.515	0.000	0.000	0.000	0.04
T2	175.35-160.10	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	5.032	0.000	0.000	0.000	0.06
T3	160.10-140.10	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T4	140.10-120.10	A	15.422	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T5	120.10-100.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T6	100.10-80.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T7	80.10-60.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00

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	6.600	0.000	0.000	0.000	0.08
T8	60.10-40.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T9	40.10-20.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T10	20.10-4.85	A	9.377	0.000	0.000	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	3.993	0.000	0.000	0.000	0.05
T11	4.85-0.00	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

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	190.60-175.35	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		5.290	0.000	0.000	0.000	0.07
T2	175.35-160.10	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		7.574	0.000	0.000	0.000	0.10
T3	160.10-140.10	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T4	140.10-120.10	A	0.500	25.372	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T5	120.10-100.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T6	100.10-80.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T7	80.10-60.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T8	60.10-40.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T9	40.10-20.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T10	20.10-4.85	A	0.500	15.428	0.000	0.000	0.000	0.14
		B		0.000	0.000	0.000	0.000	0.00
		C		6.010	0.000	0.000	0.000	0.08
T11	4.85-0.00	A	0.500	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

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	190.60-175.35	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.240	0.632	0.086	0.130
T2	175.35-160.10	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.385	0.967	0.000	0.000
T3	160.10-140.10	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.888	2.229	0.000	0.000
T4	140.10-120.10	A	2.076	5.692	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.888	2.229	0.000	0.000
T5	120.10-100.10	A	1.140	3.126	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.485	1.218	0.000	0.000
T6	100.10-80.10	A	2.086	5.827	0.258	0.425
		B	0.000	0.000	0.000	0.000
		C	0.888	2.270	0.110	0.166
T7	80.10-60.10	A	2.086	5.721	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.888	2.229	0.000	0.000
T8	60.10-40.10	A	1.140	3.232	0.258	0.425
		B	0.000	0.000	0.000	0.000
		C	0.485	1.259	0.110	0.166
T9	40.10-20.10	A	1.140	3.126	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.485	1.218	0.000	0.000
T10	20.10-4.85	A	0.718	1.969	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.306	0.767	0.000	0.000
T11	4.85-0.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	190.60-175.35	1.0228	1.1066	1.0196	1.1031
T2	175.35-160.10	1.5287	1.6539	1.4970	1.6197
T3	160.10-140.10	1.2744	1.3789	1.1239	1.2160
T4	140.10-120.10	-1.9884	1.2209	-2.0153	1.0932
T5	120.10-100.10	-2.5301	1.5424	-2.7151	1.4628
T6	100.10-80.10	-1.8843	1.1487	-1.9129	1.0306
T7	80.10-60.10	-2.0003	1.2194	-2.0272	1.0922
T8	60.10-40.10	-2.1972	1.3395	-2.4322	1.3104
T9	40.10-20.10	-2.3380	1.4253	-2.5789	1.3894
T10	20.10-4.85	-1.9638	1.1971	-2.1640	1.1659
T11	4.85-0.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-70063/6CF	A	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			-6.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	A	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	A	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	A	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	B	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			-6.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	B	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	B	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	B	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	C	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			-6.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	C	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	C	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	C	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
RRH2x40-07-U	A	From Face	3.00	0.0000	187.00	No Ice	2.25	1.23	0.05
(Verizon - Proposed)			0.00			1/2" Ice	2.45	1.39	0.07
			0.00						
RRH2x40-AWS	A	From Face	3.00	0.0000	187.00	No Ice	2.52	1.59	0.04
(Verizon - Proposed)			-6.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RRH2x40-07-U	B	From Face	3.00	0.0000	187.00	No Ice	2.25	1.23	0.05
(Verizon - Proposed)			0.00			1/2" Ice	2.45	1.39	0.07
			0.00						
RRH2x40-AWS	B	From Face	3.00	0.0000	187.00	No Ice	2.52	1.59	0.04
(Verizon - Proposed)			-6.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RRH2x40-07-U	C	From Face	3.00	0.0000	187.00	No Ice	2.25	1.23	0.05
(Verizon - Proposed)			0.00			1/2" Ice	2.45	1.39	0.07
			0.00						
RRH2x40-AWS	C	From Face	3.00	0.0000	187.00	No Ice	2.52	1.59	0.04
(Verizon - Proposed)			-6.00			1/2" Ice	2.75	1.80	0.06
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB-T1-6Z-8AB-0Z	A	From Face	3.00	0.0000	187.00	No Ice	5.60	2.33	0.04
(Verizon - Proposed)			0.00			1/2" Ice	5.92	2.56	0.08
			0.00						
Pirod 12' T-Frame Sector Mount (1)	A	From Leg	1.00	0.0000	187.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon - proposed)			0.00						
Pirod 12' T-Frame Sector Mount (1)	B	From Leg	1.00	0.0000	187.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon - proposed)			0.00						
Pirod 12' T-Frame Sector Mount (1)	C	From Leg	1.00	0.0000	187.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon - proposed)			0.00						
(2) RR90-17-02DP	A	From Leg	3.50	0.0000	140.00	No Ice	4.36	1.97	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	4.77	2.31	0.04
			0.00						
(2) RR90-17-02DP	B	From Leg	3.50	0.0000	140.00	No Ice	4.36	1.97	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	4.77	2.31	0.04
			0.00						
(2) RR90-17-02DP	C	From Leg	3.50	0.0000	140.00	No Ice	4.36	1.97	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	4.77	2.31	0.04
			0.00						
(2) S20057A1 PCS MHA	A	From Leg	2.00	0.0000	140.00	No Ice	0.82	0.39	0.01
(T-Mobile - Existing)			0.00			1/2" Ice	0.95	0.49	0.02
			0.00						
(2) S20057A1 PCS MHA	B	From Leg	2.00	0.0000	140.00	No Ice	0.82	0.39	0.01
(T-Mobile - Existing)			0.00			1/2" Ice	0.95	0.49	0.02
			0.00						
(2) S20057A1 PCS MHA	C	From Leg	2.00	0.0000	140.00	No Ice	0.82	0.39	0.01
(T-Mobile - Existing)			0.00			1/2" Ice	0.95	0.49	0.02
			0.00						
ROHN 4-ft Side Arm	A	From Leg	2.00	0.0000	140.00	No Ice	5.28	5.28	0.07
(T-Mobile - Existing)			0.00			1/2" Ice	7.88	7.88	0.08
			0.00						
ROHN 4-ft Side Arm	B	From Leg	2.00	0.0000	140.00	No Ice	5.28	5.28	0.07
(T-Mobile - Existing)			0.00			1/2" Ice	7.88	7.88	0.08
			0.00						
ROHN 4-ft Side Arm	C	From Leg	2.00	0.0000	140.00	No Ice	5.28	5.28	0.07
(T-Mobile - Existing)			0.00			1/2" Ice	7.88	7.88	0.08
			0.00						

Tower Pressures - No Ice

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	182.98	1.631	30	56.388	A	1.207	10.664	7.307	61.56	0.000	0.000
190.60-175.35					B	1.207	10.664		61.56	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	1.120	13.938		48.53	0.000	0.000
T2 175.35-160.10	167.73	1.591	29	56.388	A	0.000	11.066	7.307	66.03	0.000	0.000
					B	0.000	11.066		66.03	0.000	0.000
					C	0.000	15.713		46.50	0.000	0.000
T3 160.10-140.10	150.10	1.542	29	73.118	A	0.000	16.693	7.917	47.42	0.000	0.000
					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T4 140.10-120.10	130.10	1.48	27	73.118	A	0.000	30.040	7.917	26.35	0.000	0.000
					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T5 120.10-100.10	110.10	1.411	26	73.118	A	0.000	27.072	7.917	29.24	0.000	0.000
					B	0.000	12.713		62.27	0.000	0.000
					C	0.000	18.827		42.05	0.000	0.000
T6 100.10-80.10	90.10	1.332	25	73.118	A	0.828	30.107	7.917	25.59	0.000	0.000
					B	1.087	16.693		44.53	0.000	0.000
					C	0.977	22.405		33.86	0.000	0.000
T7 80.10-60.10	70.10	1.24	23	73.127	A	0.000	30.122	7.933	26.34	0.000	0.000
					B	0.000	16.709		47.48	0.000	0.000
					C	0.000	22.420		35.38	0.000	0.000
T8 60.10-40.10	50.10	1.127	21	73.952	A	0.814	28.678	9.583	32.49	0.000	0.000
					B	1.073	14.318		62.27	0.000	0.000
					C	0.963	20.432		44.79	0.000	0.000
T9 40.10-20.10	30.10	1	18	73.952	A	0.000	28.678	9.583	33.42	0.000	0.000
					B	0.000	14.318		66.93	0.000	0.000
					C	0.000	20.432		46.90	0.000	0.000
T10 20.10-4.85	12.48	1	18	56.373	A	0.000	19.723	7.305	37.04	0.000	0.000
					B	0.000	11.064		66.03	0.000	0.000
					C	0.000	14.751		49.53	0.000	0.000
T11 4.85-0.00	2.43	1	18	9.627	A	6.951	2.515	2.515	26.57	0.000	0.000
					B	6.951	2.515		26.57	0.000	0.000
					C	6.951	2.515		26.57	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.117$

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 190.60-175.35	182.98	1.631	23	0.5000	57.659	A	1.207	15.711	9.849	58.22	0.000	0.000
						B	1.207	15.711		58.22	0.000	0.000
						C	1.077	20.369		45.93	0.000	0.000
T2 175.35-160.10	167.73	1.591	22	0.5000	57.659	A	0.000	16.113	9.849	61.12	0.000	0.000
						B	0.000	16.113		61.12	0.000	0.000
						C	0.000	22.721		43.35	0.000	0.000
T3 160.10-140.10	150.10	1.542	21	0.5000	74.785	A	0.000	25.878	11.250	43.47	0.000	0.000
						B	0.000	25.878		43.47	0.000	0.000
						C	0.000	33.583		33.50	0.000	0.000
T4 140.10-120.10	130.10	1.48	21	0.5000	74.785	A	0.000	45.558	11.250	24.69	0.000	0.000
						B	0.000	25.878		43.47	0.000	0.000
						C	0.000	33.583		33.50	0.000	0.000
T5 120.10-100.10	110.10	1.411	20	0.5000	74.785	A	0.000	41.617	11.250	27.03	0.000	0.000
						B	0.000	19.243		58.46	0.000	0.000
						C	0.000	27.959		40.24	0.000	0.000
T6 100.10-80.10	90.10	1.332	18	0.5000	74.785	A	0.662	45.822	11.250	24.20	0.000	0.000

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
						B	1.087	26.149		41.31	0.000	0.000
						C	0.921	33.813		32.39	0.000	0.000
T7 80.10-60.10	70.10	1.24	17	0.5000	74.793	A	0.000	45.672	11.267	24.67	0.000	0.000
						B	0.000	25.893		43.51	0.000	0.000
						C	0.000	33.597		33.53	0.000	0.000
T8 60.10-40.10	50.10	1.127	16	0.5000	75.618	A	0.648	43.343	12.917	29.36	0.000	0.000
						B	1.073	21.076		58.32	0.000	0.000
						C	0.907	29.750		42.13	0.000	0.000
T9 40.10-20.10	30.10	1	14	0.5000	75.618	A	0.000	43.182	12.917	29.91	0.000	0.000
						B	0.000	20.808		62.08	0.000	0.000
						C	0.000	29.523		43.75	0.000	0.000
T10 20.10-4.85	12.48	1	14	0.5000	57.644	A	0.000	29.568	9.846	33.30	0.000	0.000
						B	0.000	16.110		61.12	0.000	0.000
						C	0.000	21.353		46.11	0.000	0.000
T11 4.85-0.00	2.43	1	14	0.5000	10.056	A	6.951	3.886	3.390	31.28	0.000	0.000
						B	6.951	3.886		31.28	0.000	0.000
						C	6.951	3.886		31.28	0.000	0.000

Tower Pressure - Service

$G_H = 1.117$

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	182.98	1.631	10	56.388	A	1.207	10.664	7.307	61.56	0.000	0.000
190.60-175.35					B	1.207	10.664		61.56	0.000	0.000
					C	1.120	13.938		48.53	0.000	0.000
T2	167.73	1.591	10	56.388	A	0.000	11.066	7.307	66.03	0.000	0.000
175.35-160.10					B	0.000	11.066		66.03	0.000	0.000
					C	0.000	15.713		46.50	0.000	0.000
T3	150.10	1.542	10	73.118	A	0.000	16.693	7.917	47.42	0.000	0.000
160.10-140.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T4	130.10	1.48	9	73.118	A	0.000	30.040	7.917	26.35	0.000	0.000
140.10-120.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T5	110.10	1.411	9	73.118	A	0.000	27.072	7.917	29.24	0.000	0.000
120.10-100.10					B	0.000	12.713		62.27	0.000	0.000
					C	0.000	18.827		42.05	0.000	0.000
T6	90.10	1.332	9	73.118	A	0.828	30.107	7.917	25.59	0.000	0.000
100.10-80.10					B	1.087	16.693		44.53	0.000	0.000
					C	0.977	22.405		33.86	0.000	0.000
T7 80.10-60.10	70.10	1.24	8	73.127	A	0.000	30.122	7.933	26.34	0.000	0.000
					B	0.000	16.709		47.48	0.000	0.000
					C	0.000	22.420		35.38	0.000	0.000
T8 60.10-40.10	50.10	1.127	7	73.952	A	0.814	28.678	9.583	32.49	0.000	0.000
					B	1.073	14.318		62.27	0.000	0.000
					C	0.963	20.432		44.79	0.000	0.000
T9 40.10-20.10	30.10	1	6	73.952	A	0.000	28.678	9.583	33.42	0.000	0.000
					B	0.000	14.318		66.93	0.000	0.000
					C	0.000	20.432		46.90	0.000	0.000
T10 20.10-4.85	12.48	1	6	56.373	A	0.000	19.723	7.305	37.04	0.000	0.000
					B	0.000	11.064		66.03	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
T11 4.85-0.00	2.43	1	6	9.627	C	0.000	14.751		49.53	0.000	0.000
					A	6.951	2.515	2.515	26.57	0.000	0.000
					B	6.951	2.515		26.57	0.000	0.000
					C	6.951	2.515		26.57	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	0.04	0.49	A	0.211	2.561	0.593	1	1	7.526	0.77	50.50	C
190.60-175.35			B	0.211	2.561	0.593	1	1	7.526			
			C	0.267	2.387	0.606	1	1	9.572			
T2	0.06	0.44	A	0.196	2.609	0.59	1	1	6.525	0.74	48.62	C
175.35-160.10			B	0.196	2.609	0.59	1	1	6.525			
			C	0.279	2.354	0.61	1	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	1	1	9.959	1.00	50.24	C
160.10-140.10			B	0.228	2.504	0.597	1	1	9.959			
			C	0.306	2.279	0.618	1	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	1	1	19.709	1.23	61.55	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	1	1	9.959			
			C	0.306	2.279	0.618	1	1	13.844			
T5	0.16	0.33	A	0.37	2.126	0.64	1	1	17.324	1.07	53.68	A
120.10-100.10			B	0.174	2.686	0.585	1	1	7.442			
			C	0.257	2.415	0.604	1	1	11.368			
T6	0.16	0.48	A	0.423	2.02	0.661	1	1	20.738	1.15	57.66	A
100.10-80.10			B	0.243	2.458	0.6	1	1	11.105			
			C	0.32	2.245	0.622	1	1	14.916			
T7	0.16	0.50	A	0.412	2.041	0.657	1	1	19.777	1.03	51.71	A
80.10-60.10			B	0.228	2.504	0.597	1	1	9.969			
			C	0.307	2.279	0.618	1	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	1	1	19.487	0.94	46.87	A
60.10-40.10			B	0.208	2.569	0.592	1	1	9.550			
			C	0.289	2.325	0.613	1	1	13.482			
T9	0.16	0.46	A	0.388	2.089	0.647	1	1	18.546	0.80	40.02	A
40.10-20.10			B	0.194	2.617	0.589	1	1	8.435			
			C	0.276	2.361	0.609	1	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	1	1	12.473	0.56	36.71	A
20.10-4.85			B	0.196	2.609	0.59	1	1	6.524			
			C	0.262	2.403	0.605	1	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	1	1	9.466	0.40*	81.95	C
			B	0.983	2.066	1	1	1	9.466			
			C	0.983	2.066	1	1	1	9.466			
Sum Weight:	1.20	5.03			*2A_g limit					9.70		

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

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	0.04	0.49	A	0.211	2.561	0.593	0.8	1	7.285	0.75	49.32	C
190.60-175.35			B	0.211	2.561	0.593	0.8	1	7.285			
			C	0.267	2.387	0.606	0.8	1	9.348			
T2	0.06	0.44	A	0.196	2.609	0.59	0.8	1	6.525	0.74	48.62	C
175.35-160.10			B	0.196	2.609	0.59	0.8	1	6.525			
			C	0.279	2.354	0.61	0.8	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	0.8	1	9.959	1.00	50.24	C
160.10-140.10			B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	0.8	1	19.709	1.23	61.55	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T5	0.16	0.33	A	0.37	2.126	0.64	0.8	1	17.324	1.07	53.68	A
120.10-100.10			B	0.174	2.686	0.585	0.8	1	7.442			
			C	0.257	2.415	0.604	0.8	1	11.368			
T6	0.16	0.48	A	0.423	2.02	0.661	0.8	1	20.572	1.14	57.20	A
100.10-80.10			B	0.243	2.458	0.6	0.8	1	10.888			
			C	0.32	2.245	0.622	0.8	1	14.721			
T7	0.16	0.50	A	0.412	2.041	0.657	0.8	1	19.777	1.03	51.71	A
80.10-60.10			B	0.228	2.504	0.597	0.8	1	9.969			
			C	0.307	2.279	0.618	0.8	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	0.8	1	19.324	0.93	46.48	A
60.10-40.10			B	0.208	2.569	0.592	0.8	1	9.336			
			C	0.289	2.325	0.613	0.8	1	13.289			
T9	0.16	0.46	A	0.388	2.089	0.647	0.8	1	18.546	0.80	40.02	A
40.10-20.10			B	0.194	2.617	0.589	0.8	1	8.435			
			C	0.276	2.361	0.609	0.8	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	0.8	1	12.473	0.56	36.71	A
20.10-4.85			B	0.196	2.609	0.59	0.8	1	6.524			
			C	0.262	2.403	0.605	0.8	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	0.8	1	8.075	0.34	71.00	C
			B	0.983	2.066	1	0.8	1	8.075			
			C	0.983	2.066	1	0.8	1	8.075			
Sum Weight:	1.20	5.03								9.62		

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	0.04	0.49	A	0.211	2.561	0.593	0.85	1	7.345	0.76	49.62	C
190.60-175.35			B	0.211	2.561	0.593	0.85	1	7.345			
			C	0.267	2.387	0.606	0.85	1	9.404			
T2	0.06	0.44	A	0.196	2.609	0.59	0.85	1	6.525	0.74	48.62	C
175.35-160.10			B	0.196	2.609	0.59	0.85	1	6.525			
			C	0.279	2.354	0.61	0.85	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	0.85	1	9.959	1.00	50.24	C
160.10-140.10			B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	0.85	1	19.709	1.23	61.55	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			
T5	0.16	0.33	A	0.37	2.126	0.64	0.85	1	17.324	1.07	53.68	A
120.10-100.10			B	0.174	2.686	0.585	0.85	1	7.442			
			C	0.257	2.415	0.604	0.85	1	11.368			

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
T6	0.16	0.48	A	0.423	2.02	0.661	0.85	1	20.614	1.15	57.32	A
100.10-80.10			B	0.243	2.458	0.6	0.85	1	10.942			
			C	0.32	2.245	0.622	0.85	1	14.769			
T7	0.16	0.50	A	0.412	2.041	0.657	0.85	1	19.777	1.03	51.71	A
80.10-60.10			B	0.228	2.504	0.597	0.85	1	9.969			
			C	0.307	2.279	0.618	0.85	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	0.85	1	19.365	0.93	46.57	A
60.10-40.10			B	0.208	2.569	0.592	0.85	1	9.389			
			C	0.289	2.325	0.613	0.85	1	13.337			
T9	0.16	0.46	A	0.388	2.089	0.647	0.85	1	18.546	0.80	40.02	A
40.10-20.10			B	0.194	2.617	0.589	0.85	1	8.435			
			C	0.276	2.361	0.609	0.85	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	0.85	1	12.473	0.56	36.71	A
20.10-4.85			B	0.196	2.609	0.59	0.85	1	6.524			
			C	0.262	2.403	0.605	0.85	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	0.85	1	8.423	0.36	74.06	C
			B	0.983	2.066	1	0.85	1	8.423			
			C	0.983	2.066	1	0.85	1	8.423			
Sum Weight:	1.20	5.03								9.64		

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 ft²	F K	w plf	Ctrl. Face
T1	0.07	0.71	A	0.293	2.314	0.614	1	1	10.852	0.76	49.69	C
190.60-175.35			B	0.293	2.314	0.614	1	1	10.852			
			C	0.372	2.122	0.641	1	1	14.124			
T2	0.10	0.65	A	0.279	2.352	0.61	1	1	9.826	0.75	49.51	C
175.35-160.10			B	0.279	2.352	0.61	1	1	9.826			
			C	0.394	2.076	0.649	1	1	14.750			
T3	0.14	0.80	A	0.346	2.181	0.631	1	1	16.331	1.07	53.30	C
160.10-140.10			B	0.346	2.181	0.631	1	1	16.331			
			C	0.449	1.975	0.673	1	1	22.596			
T4	0.36	0.80	A	0.609	1.799	0.759	1	1	34.591	1.43	71.33	A
140.10-120.10		TA 0.47	B	0.346	2.181	0.631	1	1	16.331			
			C	0.449	1.975	0.673	1	1	22.596			
T5	0.37	0.58	A	0.556	1.837	0.728	1	1	30.295	1.22	60.85	A
120.10-100.10			B	0.257	2.416	0.604	1	1	11.618			
			C	0.374	2.118	0.641	1	1	17.929			
T6	0.37	0.89	A	0.622	1.792	0.767	1	1	35.809	1.33	66.25	A
100.10-80.10			B	0.364	2.139	0.638	1	1	17.761			
			C	0.464	1.951	0.68	1	1	23.914			
T7	0.37	0.88	A	0.611	1.798	0.76	1	1	34.718	1.20	59.97	A
80.10-60.10			B	0.346	2.18	0.631	1	1	16.341			
			C	0.449	1.975	0.673	1	1	22.608			
T8	0.37	0.82	A	0.582	1.816	0.743	1	1	32.835	1.04	52.06	A
60.10-40.10			B	0.293	2.315	0.614	1	1	14.008			
			C	0.405	2.053	0.654	1	1	20.359			
T9	0.37	0.73	A	0.571	1.825	0.736	1	1	31.795	0.90	44.95	A
40.10-20.10			B	0.275	2.364	0.609	1	1	12.664			
			C	0.39	2.083	0.648	1	1	19.123			
T10	0.22	0.56	A	0.513	1.884	0.704	1	1	20.822	0.61	39.86	A
20.10-4.85			B	0.279	2.352	0.61	1	1	9.825			
			C	0.37	2.126	0.64	1	1	13.665			

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
T11 4.85-0.00	0.00	0.46	A	1	2.1	1	1	1	10.837	0.31*	64.21	C
			B	1	2.1	1	1	1	10.837			
			C	1	2.1	1	1	1	10.837			
Sum Weight:	2.73	8.35			*$2A_g$ limit					10.61		

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 ft²	F K	w plf	Ctrl. Face
T1	0.07	0.71	A	0.293	2.314	0.614	0.8	1	10.611	0.75	48.93	C
190.60-175.35			B	0.293	2.314	0.614	0.8	1	10.611			
			C	0.372	2.122	0.641	0.8	1	13.909			
T2	0.10	0.65	A	0.279	2.352	0.61	0.8	1	9.826	0.75	49.51	C
175.35-160.10			B	0.279	2.352	0.61	0.8	1	9.826			
			C	0.394	2.076	0.649	0.8	1	14.750			
T3	0.14	0.80	A	0.346	2.181	0.631	0.8	1	16.331	1.07	53.30	C
160.10-140.10			B	0.346	2.181	0.631	0.8	1	16.331			
			C	0.449	1.975	0.673	0.8	1	22.596			
T4	0.36	0.80	A	0.609	1.799	0.759	0.8	1	34.591	1.43	71.33	A
140.10-120.10		TA 0.47	B	0.346	2.181	0.631	0.8	1	16.331			
			C	0.449	1.975	0.673	0.8	1	22.596			
T5	0.37	0.58	A	0.556	1.837	0.728	0.8	1	30.295	1.22	60.85	A
120.10-100.10			B	0.257	2.416	0.604	0.8	1	11.618			
			C	0.374	2.118	0.641	0.8	1	17.929			
T6	0.37	0.89	A	0.622	1.792	0.767	0.8	1	35.677	1.32	66.01	A
100.10-80.10			B	0.364	2.139	0.638	0.8	1	17.543			
			C	0.464	1.951	0.68	0.8	1	23.730			
T7	0.37	0.88	A	0.611	1.798	0.76	0.8	1	34.718	1.20	59.97	A
80.10-60.10			B	0.346	2.18	0.631	0.8	1	16.341			
			C	0.449	1.975	0.673	0.8	1	22.608			
T8	0.37	0.82	A	0.582	1.816	0.743	0.8	1	32.705	1.04	51.86	A
60.10-40.10			B	0.293	2.315	0.614	0.8	1	13.794			
			C	0.405	2.053	0.654	0.8	1	20.177			
T9	0.37	0.73	A	0.571	1.825	0.736	0.8	1	31.795	0.90	44.95	A
40.10-20.10			B	0.275	2.364	0.609	0.8	1	12.664			
			C	0.39	2.083	0.648	0.8	1	19.123			
T10	0.22	0.56	A	0.513	1.884	0.704	0.8	1	20.822	0.61	39.86	A
20.10-4.85			B	0.279	2.352	0.61	0.8	1	9.825			
			C	0.37	2.126	0.64	0.8	1	13.665			
T11 4.85-0.00	0.00	0.46	A	1	2.1	1	0.8	1	9.447	0.31	63.33	C
			B	1	2.1	1	0.8	1	9.447			
			C	1	2.1	1	0.8	1	9.447			
Sum Weight:	2.73	8.35								10.58		

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 ft²	F K	w plf	Ctrl. Face
T1	0.07	0.71	A	0.293	2.314	0.614	0.85	1	10.671	0.75	49.12	C
190.60-175.35			B	0.293	2.314	0.614	0.85	1	10.671			
			C	0.372	2.122	0.641	0.85	1	13.962			
T2	0.10	0.65	A	0.279	2.352	0.61	0.85	1	9.826	0.75	49.51	C
175.35-160.10			B	0.279	2.352	0.61	0.85	1	9.826			
			C	0.394	2.076	0.649	0.85	1	14.750			
T3	0.14	0.80	A	0.346	2.181	0.631	0.85	1	16.331	1.07	53.30	C
160.10-140.10			B	0.346	2.181	0.631	0.85	1	16.331			
			C	0.449	1.975	0.673	0.85	1	22.596			
T4	0.36	0.80	A	0.609	1.799	0.759	0.85	1	34.591	1.43	71.33	A
140.10-120.10		TA 0.47	B	0.346	2.181	0.631	0.85	1	16.331			
			C	0.449	1.975	0.673	0.85	1	22.596			
T5	0.37	0.58	A	0.556	1.837	0.728	0.85	1	30.295	1.22	60.85	A
120.10-100.10			B	0.257	2.416	0.604	0.85	1	11.618			
			C	0.374	2.118	0.641	0.85	1	17.929			
T6	0.37	0.89	A	0.622	1.792	0.767	0.85	1	35.710	1.32	66.07	A
100.10-80.10			B	0.364	2.139	0.638	0.85	1	17.598			
			C	0.464	1.951	0.68	0.85	1	23.776			
T7	0.37	0.88	A	0.611	1.798	0.76	0.85	1	34.718	1.20	59.97	A
80.10-60.10			B	0.346	2.18	0.631	0.85	1	16.341			
			C	0.449	1.975	0.673	0.85	1	22.608			
T8	0.37	0.82	A	0.582	1.816	0.743	0.85	1	32.738	1.04	51.91	A
60.10-40.10			B	0.293	2.315	0.614	0.85	1	13.847			
			C	0.405	2.053	0.654	0.85	1	20.223			
T9	0.37	0.73	A	0.571	1.825	0.736	0.85	1	31.795	0.90	44.95	A
40.10-20.10			B	0.275	2.364	0.609	0.85	1	12.664			
			C	0.39	2.083	0.648	0.85	1	19.123			
T10	0.22	0.56	A	0.513	1.884	0.704	0.85	1	20.822	0.61	39.86	A
20.10-4.85			B	0.279	2.352	0.61	0.85	1	9.825			
			C	0.37	2.126	0.64	0.85	1	13.665			
T11 4.85-0.00	0.00	0.46	A	1	2.1	1	0.85	1	9.794	0.31*	64.21	C
			B	1	2.1	1	0.85	1	9.794			
			C	1	2.1	1	0.85	1	9.794			
Sum Weight:	2.73	8.35			*2A_g limit					10.59		

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 ft²	F K	w plf	Ctrl. Face
T1	0.04	0.49	A	0.211	2.561	0.593	1	1	7.526	0.27	17.48	C
190.60-175.35			B	0.211	2.561	0.593	1	1	7.526			
			C	0.267	2.387	0.606	1	1	9.572			
T2	0.06	0.44	A	0.196	2.609	0.59	1	1	6.525	0.26	16.82	C
175.35-160.10			B	0.196	2.609	0.59	1	1	6.525			
			C	0.279	2.354	0.61	1	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	1	1	9.959	0.35	17.39	C
160.10-140.10			B	0.228	2.504	0.597	1	1	9.959			
			C	0.306	2.279	0.618	1	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	1	1	19.709	0.43	21.30	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	1	1	9.959			
			C	0.306	2.279	0.618	1	1	13.844			
T5	0.16	0.33	A	0.37	2.126	0.64	1	1	17.324	0.37	18.57	A
120.10-100.10			B	0.174	2.686	0.585	1	1	7.442			

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
			C	0.257	2.415	0.604	1	1	11.368			
T6	0.16	0.48	A	0.423	2.02	0.661	1	1	20.738	0.40	19.95	A
100.10-80.10			B	0.243	2.458	0.6	1	1	11.105			
			C	0.32	2.245	0.622	1	1	14.916			
T7	0.16	0.50	A	0.412	2.041	0.657	1	1	19.777	0.36	17.89	A
80.10-60.10			B	0.228	2.504	0.597	1	1	9.969			
			C	0.307	2.279	0.618	1	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	1	1	19.487	0.32	16.22	A
60.10-40.10			B	0.208	2.569	0.592	1	1	9.550			
			C	0.289	2.325	0.613	1	1	13.482			
T9	0.16	0.46	A	0.388	2.089	0.647	1	1	18.546	0.28	13.85	A
40.10-20.10			B	0.194	2.617	0.589	1	1	8.435			
			C	0.276	2.361	0.609	1	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	1	1	12.473	0.19	12.70	A
20.10-4.85			B	0.196	2.609	0.59	1	1	6.524			
			C	0.262	2.403	0.605	1	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	1	1	9.466	0.14*	28.36	C
			B	0.983	2.066	1	1	1	9.466			
			C	0.983	2.066	1	1	1	9.466			
Sum Weight:	1.20	5.03			*$2A_g$ limit					3.36		

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	0.04	0.49	A	0.211	2.561	0.593	0.8	1	7.285	0.26	17.07	C
190.60-175.35			B	0.211	2.561	0.593	0.8	1	7.285			
			C	0.267	2.387	0.606	0.8	1	9.348			
T2	0.06	0.44	A	0.196	2.609	0.59	0.8	1	6.525	0.26	16.82	C
175.35-160.10			B	0.196	2.609	0.59	0.8	1	6.525			
			C	0.279	2.354	0.61	0.8	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	0.8	1	9.959	0.35	17.39	C
160.10-140.10			B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	0.8	1	19.709	0.43	21.30	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T5	0.16	0.33	A	0.37	2.126	0.64	0.8	1	17.324	0.37	18.57	A
120.10-100.10			B	0.174	2.686	0.585	0.8	1	7.442			
			C	0.257	2.415	0.604	0.8	1	11.368			
T6	0.16	0.48	A	0.423	2.02	0.661	0.8	1	20.572	0.40	19.79	A
100.10-80.10			B	0.243	2.458	0.6	0.8	1	10.888			
			C	0.32	2.245	0.622	0.8	1	14.721			
T7	0.16	0.50	A	0.412	2.041	0.657	0.8	1	19.777	0.36	17.89	A
80.10-60.10			B	0.228	2.504	0.597	0.8	1	9.969			
			C	0.307	2.279	0.618	0.8	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	0.8	1	19.324	0.32	16.08	A
60.10-40.10			B	0.208	2.569	0.592	0.8	1	9.336			
			C	0.289	2.325	0.613	0.8	1	13.289			
T9	0.16	0.46	A	0.388	2.089	0.647	0.8	1	18.546	0.28	13.85	A
40.10-20.10			B	0.194	2.617	0.589	0.8	1	8.435			
			C	0.276	2.361	0.609	0.8	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	0.8	1	12.473	0.19	12.70	A

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
20.10-4.85			B	0.196	2.609	0.59	0.8	1	6.524			
			C	0.262	2.403	0.605	0.8	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	0.8	1	8.075	0.12	24.57	C
			B	0.983	2.066	1	0.8	1	8.075			
			C	0.983	2.066	1	0.8	1	8.075			
Sum Weight:	1.20	5.03								3.33		

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	0.04	0.49	A	0.211	2.561	0.593	0.85	1	7.345	0.26	17.17	C
190.60-175.35			B	0.211	2.561	0.593	0.85	1	7.345			
			C	0.267	2.387	0.606	0.85	1	9.404			
T2	0.06	0.44	A	0.196	2.609	0.59	0.85	1	6.525	0.26	16.82	C
175.35-160.10			B	0.196	2.609	0.59	0.85	1	6.525			
			C	0.279	2.354	0.61	0.85	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	0.85	1	9.959	0.35	17.39	C
160.10-140.10			B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	0.85	1	19.709	0.43	21.30	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			
T5	0.16	0.33	A	0.37	2.126	0.64	0.85	1	17.324	0.37	18.57	A
120.10-100.10			B	0.174	2.686	0.585	0.85	1	7.442			
			C	0.257	2.415	0.604	0.85	1	11.368			
T6	0.16	0.48	A	0.423	2.02	0.661	0.85	1	20.614	0.40	19.83	A
100.10-80.10			B	0.243	2.458	0.6	0.85	1	10.942			
			C	0.32	2.245	0.622	0.85	1	14.769			
T7	0.16	0.50	A	0.412	2.041	0.657	0.85	1	19.777	0.36	17.89	A
80.10-60.10			B	0.228	2.504	0.597	0.85	1	9.969			
			C	0.307	2.279	0.618	0.85	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	0.85	1	19.365	0.32	16.12	A
60.10-40.10			B	0.208	2.569	0.592	0.85	1	9.389			
			C	0.289	2.325	0.613	0.85	1	13.337			
T9	0.16	0.46	A	0.388	2.089	0.647	0.85	1	18.546	0.28	13.85	A
40.10-20.10			B	0.194	2.617	0.589	0.85	1	8.435			
			C	0.276	2.361	0.609	0.85	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	0.85	1	12.473	0.19	12.70	A
20.10-4.85			B	0.196	2.609	0.59	0.85	1	6.524			
			C	0.262	2.403	0.605	0.85	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	0.85	1	8.423	0.12	25.63	C
			B	0.983	2.066	1	0.85	1	8.423			
			C	0.983	2.066	1	0.85	1	8.423			
Sum Weight:	1.20	5.03								3.34		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	2.96			
Bracing Weight	2.06			
Total Member Self-Weight	5.03			
Guy Weight	0.90			
Total Weight	9.45			
Wind 0 deg - No Ice		-0.05	-15.38	-1.21
Wind 30 deg - No Ice		7.64	-13.24	-0.62
Wind 60 deg - No Ice		13.26	-7.60	0.14
Wind 90 deg - No Ice		15.37	0.05	0.86
Wind 120 deg - No Ice		13.39	7.73	1.35
Wind 150 deg - No Ice		7.73	13.29	1.48
Wind 180 deg - No Ice		0.05	15.29	1.21
Wind 210 deg - No Ice		-7.64	13.24	0.62
Wind 240 deg - No Ice		-13.34	7.65	-0.14
Wind 270 deg - No Ice		-15.37	-0.05	-0.86
Wind 300 deg - No Ice		-13.31	-7.69	-1.35
Wind 330 deg - No Ice		-7.73	-13.29	-1.48
Member Ice	3.32			
Guy Ice	1.29			
Total Weight Ice	16.74			
Wind 0 deg - Ice		-0.04	-15.69	-1.41
Wind 30 deg - Ice		7.82	-13.55	-0.76
Wind 60 deg - Ice		13.58	-7.80	0.10
Wind 90 deg - Ice		15.71	0.04	0.93
Wind 120 deg - Ice		13.64	7.88	1.51
Wind 150 deg - Ice		7.89	13.59	1.68
Wind 180 deg - Ice		0.04	15.66	1.41
Wind 210 deg - Ice		-7.82	13.55	0.76
Wind 240 deg - Ice		-13.60	7.81	-0.10
Wind 270 deg - Ice		-15.71	-0.04	-0.93
Wind 300 deg - Ice		-13.62	-7.86	-1.51
Wind 330 deg - Ice		-7.89	-13.59	-1.68
Total Weight	9.45			
Wind 0 deg - Service		-0.02	-5.32	-0.42
Wind 30 deg - Service		2.64	-4.58	-0.21
Wind 60 deg - Service		4.59	-2.63	0.05
Wind 90 deg - Service		5.32	0.02	0.30
Wind 120 deg - Service		4.63	2.67	0.47
Wind 150 deg - Service		2.67	4.60	0.51
Wind 180 deg - Service		0.02	5.29	0.42
Wind 210 deg - Service		-2.64	4.58	0.21
Wind 240 deg - Service		-4.62	2.65	-0.05
Wind 270 deg - Service		-5.32	-0.02	-0.30
Wind 300 deg - Service		-4.61	-2.66	-0.47
Wind 330 deg - Service		-2.67	-4.60	-0.51

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 60 deg - No Ice+Guy

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

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	190.6 - 175.35	Leg	Max Tension	2	0.91	0.50	-0.20
			Max. Compression	21	-10.77	0.20	-0.19
			Max. Mx	6	-6.93	1.23	0.29
			Max. My	2	-6.86	-0.29	-1.28
			Max. Vy	11	1.25	0.27	-0.00
			Max. Vx	2	1.22	-0.74	0.04
		Diagonal	Max Tension	22	2.18	0.00	0.00
			Max. Compression	16	-2.24	0.00	0.00
			Max. Mx	19	2.06	0.00	0.00
			Max. My	15	0.42	0.00	0.00
			Max. Vy	19	-0.00	0.00	0.00
			Max. Vx	15	-0.00	0.00	0.00
		Bottom Girt	Max Tension	15	0.59	0.00	0.00
			Max. Compression	22	-0.51	0.00	0.00
			Max. Mx	14	0.01	0.00	0.00
			Max. My	26	-0.49	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Guy A	Bottom Tension	21	9.06		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Tension	21	9.21		
			Top Cable Vert	21	8.31		
			Top Cable Norm	21	3.96		
			Top Cable Tan	21	0.00		
			Bot Cable Vert	21	-7.92		
			Bot Cable Norm	21	4.39		
			Bot Cable Tan	21	0.00		
		Guy B	Bottom Tension	25	9.12		
			Top Tension	25	9.27		
			Top Cable Vert	25	8.38		
			Top Cable Norm	25	3.96		
			Top Cable Tan	25	0.00		
			Bot Cable Vert	25	-7.99		
			Bot Cable Norm	25	4.40		
			Bot Cable Tan	25	0.00		
		Guy C	Bottom Tension	17	9.07		
			Top Tension	17	9.22		
			Top Cable Vert	17	8.35		
			Top Cable Norm	17	3.92		
			Top Cable Tan	17	0.00		
			Bot Cable Vert	17	-7.95		
			Bot Cable Norm	17	4.36		
			Bot Cable Tan	17	0.00		
		Top Guy Pull-Off	Max Tension	26	2.55	0.00	0.00
			Max. Compression	3	-0.04	0.00	0.00
			Max. Mx	14	0.45	0.01	0.00
			Max. My	26	0.52	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T2	175.35 - 160.1	Leg	Max Tension	25	8.51	0.04	-0.09
			Max. Compression	19	-24.62	0.35	0.25
			Max. Mx	24	-10.29	0.42	-0.05
			Max. My	15	-24.21	0.05	-0.43
			Max. Vy	24	-1.25	0.42	-0.05
			Max. Vx	15	-1.19	-0.11	0.40
		Diagonal	Max Tension	18	2.97	0.00	0.00
			Max. Compression	24	-2.98	0.00	0.00
			Max. Mx	19	2.18	0.00	0.00
			Max. My	15	0.07	0.00	0.00
			Max. Vy	19	0.00	0.00	0.00
			Max. Vx	15	-0.00	0.00	0.00
		Top Girt	Max Tension	22	0.56	0.00	0.00
			Max. Compression	15	-0.63	0.00	0.00
			Max. Mx	14	0.01	0.00	0.00
			Max. My	26	0.55	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	19	1.16	0.00	0.00
			Max. Compression	18	-1.04	0.00	0.00
			Max. Mx	14	0.00	0.00	0.00
			Max. My	26	-1.02	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T3	160.1 - 140.1	Leg	Max Tension	25	31.08	0.06	0.03
			Max. Compression	19	-50.49	-0.23	-0.13
			Max. Mx	24	-23.81	0.46	-0.10
			Max. My	15	-25.78	-0.05	0.49
			Max. Vy	24	-1.41	0.46	-0.10
			Max. Vx	15	-1.49	-0.05	0.49
		Diagonal	Max Tension	18	1.69	0.00	0.00
			Max. Compression	18	-1.81	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. Mx	19	1.26	0.00	0.00
			Max. My	19	0.12	0.00	-0.00
			Max. Vy	19	-0.00	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Top Girt	Max Tension	26	0.31	0.00	0.00
			Max. Compression	6	-0.22	0.00	0.00
			Max. Mx	14	0.04	0.00	0.00
			Max. My	26	-0.14	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	25	2.59	0.00	0.00
			Max. Compression	6	-1.77	0.00	0.00
			Max. Mx	14	0.26	0.00	0.00
			Max. My	26	0.58	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T4	140.1 - 120.1	Leg	Max Tension	25	32.64	0.13	0.08
			Max. Compression	19	-52.56	-0.10	-0.04
			Max. Mx	18	-1.87	-1.75	-0.50
			Max. My	15	15.96	-0.09	1.80
			Max. Vy	18	2.85	-1.75	-0.50
			Max. Vx	16	-2.89	-0.45	1.77
		Diagonal	Max Tension	21	1.12	0.00	0.00
			Max. Compression	22	-1.54	0.00	0.00
			Max. Mx	19	-1.39	0.00	0.00
			Max. My	15	-0.43	0.00	0.00
			Max. Vy	19	-0.00	0.00	0.00
			Max. Vx	15	-0.00	0.00	0.00
		Top Girt	Max Tension	25	2.71	0.00	0.00
			Max. Compression	19	-2.78	0.00	0.00
			Max. Mx	14	-0.04	0.00	0.00
			Max. My	26	-0.26	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	19	0.28	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.11	0.00	0.00
			Max. My	26	0.25	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Guy A	Bottom Tension	20	11.53		
			Top Tension	20	11.68		
			Top Cable Vert	20	9.70		
			Top Cable Norm	20	6.50		
			Top Cable Tan	20	0.06		
			Bot Cable Vert	20	-9.35		
			Bot Cable Norm	20	6.74		
			Bot Cable Tan	20	0.17		
		Guy B	Bottom Tension	26	11.57		
			Top Tension	26	11.73		
			Top Cable Vert	26	9.81		
			Top Cable Norm	26	6.42		
			Top Cable Tan	26	0.06		
			Bot Cable Vert	26	-9.45		
			Bot Cable Norm	26	6.68		
			Bot Cable Tan	26	0.17		
		Guy C	Bottom Tension	18	11.52		
			Top Tension	18	11.68		
			Top Cable Vert	18	9.80		
			Top Cable Norm	18	6.37		
			Top Cable Tan	18	0.06		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Vert	18	-9.43		
			Bot Cable Norm	18	6.62		
			Bot Cable Tan	18	0.17		
		Torque Arm Top	Max Tension	24	6.28	0.00	0.00
			Max. Compression	11	-2.70	0.00	0.00
			Max. Mx	18	0.26	-34.98	-0.00
			Max. My	26	-0.90	-19.58	-0.00
			Max. Vy	18	9.79	-34.98	-0.00
			Max. Vx	26	-0.00	-19.58	-0.00
T5	120.1 - 100.1	Leg	Max Tension	12	4.73	0.18	0.10
			Max. Compression	19	-43.04	-0.01	0.00
			Max. Mx	24	-37.50	0.28	-0.07
			Max. My	15	-42.42	-0.02	0.29
			Max. Vy	25	0.52	0.18	0.10
			Max. Vx	21	-0.58	0.08	-0.22
		Diagonal	Max Tension	21	1.19	0.00	0.00
			Max. Compression	25	-1.20	0.00	0.00
			Max. Mx	15	-0.97	0.00	0.00
			Max. My	19	-0.21	0.00	-0.00
			Max. Vy	15	-0.00	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Top Girt	Max Tension	24	0.49	0.00	0.00
			Max. Compression	21	-0.56	0.00	0.00
			Max. Mx	14	0.02	0.00	0.00
			Max. My	26	-0.30	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	21	0.16	0.00	0.00
			Max. Compression	11	-0.07	0.00	0.00
			Max. Mx	14	0.01	0.00	0.00
			Max. My	26	-0.00	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T6	100.1 - 80.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-40.45	0.04	0.02
			Max. Mx	19	-37.35	-0.22	-0.12
			Max. My	15	-37.31	-0.01	0.24
			Max. Vy	12	0.15	0.09	-0.02
			Max. Vx	8	-0.14	0.03	-0.03
		Diagonal	Max Tension	15	1.11	0.00	0.00
			Max. Compression	15	-1.26	0.00	0.00
			Max. Mx	15	-0.48	0.00	0.00
			Max. My	15	-0.19	0.00	0.00
			Max. Vy	15	-0.00	0.00	0.00
			Max. Vx	15	-0.00	0.00	0.00
		Top Girt	Max Tension	19	0.38	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.13	0.00	0.00
			Max. My	26	0.28	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	20	0.37	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.20	0.00	0.00
			Max. My	26	0.36	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Guy A	Bottom Tension	21	5.54		
			Top Tension	21	5.63		
			Top Cable Vert	21	4.43		
			Top Cable Norm	21	3.47		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Cable Tan	21	0.00		
			Bot Cable Vert	21	-4.23		
			Bot Cable Norm	21	3.59		
			Bot Cable Tan	21	0.00		
		Guy B	Bottom Tension	25	5.68		
			Top Tension	25	5.76		
			Top Cable Vert	25	4.57		
			Top Cable Norm	25	3.50		
			Top Cable Tan	25	0.00		
			Bot Cable Vert	25	-4.37		
			Bot Cable Norm	25	3.63		
			Bot Cable Tan	25	0.00		
		Guy C	Bottom Tension	17	5.65		
			Top Tension	17	5.73		
			Top Cable Vert	17	4.50		
			Top Cable Norm	17	3.54		
			Top Cable Tan	17	0.00		
			Bot Cable Vert	17	-4.30		
			Bot Cable Norm	17	3.66		
			Bot Cable Tan	17	0.00		
		Top Guy Pull-Off	Max Tension	15	1.98	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1.22	0.01	0.00
			Max. My	26	1.88	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T7	80.1 - 60.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-37.39	0.06	0.03
			Max. Mx	24	-12.87	-0.22	-0.04
			Max. My	15	-37.36	-0.01	0.24
			Max. Vy	24	0.56	0.13	-0.01
			Max. Vx	21	-0.57	0.00	-0.12
		Diagonal	Max Tension	16	0.59	0.00	0.00
			Max. Compression	16	-0.88	0.00	0.00
			Max. Mx	15	-0.77	0.00	0.00
			Max. My	26	-0.40	0.00	0.00
			Max. Vy	15	-0.00	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	18	0.42	0.00	0.00
			Max. Compression	6	-0.06	0.00	0.00
			Max. Mx	14	0.14	0.00	0.00
			Max. My	26	0.29	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	19	0.23	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	0.19	0.00	0.00
			Max. My	26	0.21	0.00	-0.00
			Max. Vy	17	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T8	60.1 - 40.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-32.27	0.14	0.25
			Max. Mx	19	-30.74	-0.30	-0.16
			Max. My	15	-30.79	0.04	0.33
			Max. Vy	19	0.22	-0.30	-0.16
			Max. Vx	15	-0.21	0.04	0.33
		Diagonal	Max Tension	20	1.17	0.00	0.00
			Max. Compression	26	-1.44	0.00	0.00
			Max. Mx	15	-0.24	0.00	0.00
			Max. My	26	0.07	0.00	0.00
			Max. Vy	15	-0.00	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. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.23	0.00	0.00
			Max. Compression	2	-0.08	0.00	0.00
			Max. Mx	17	0.07	0.00	0.00
			Max. My	26	-0.03	0.00	-0.00
			Max. Vy	17	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	26	0.51	0.00	0.00
			Max. Compression	19	-0.27	0.00	0.00
			Max. Mx	14	0.08	0.00	0.00
			Max. My	26	0.51	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Guy A	Bottom Tension	21	3.84		
			Top Tension	21	3.88		
			Top Cable Vert	21	2.06		
			Top Cable Norm	21	3.28		
			Top Cable Tan	21	0.00		
			Bot Cable Vert	21	-1.96		
			Bot Cable Norm	21	3.30		
			Bot Cable Tan	21	0.00		
		Guy B	Bottom Tension	25	3.88		
			Top Tension	25	3.92		
			Top Cable Vert	25	2.10		
			Top Cable Norm	25	3.31		
			Top Cable Tan	25	0.00		
			Bot Cable Vert	25	-2.00		
			Bot Cable Norm	25	3.33		
			Bot Cable Tan	25	0.00		
		Guy C	Bottom Tension	17	3.81		
			Top Tension	17	3.84		
			Top Cable Vert	17	2.06		
			Top Cable Norm	17	3.24		
			Top Cable Tan	17	0.00		
			Bot Cable Vert	17	-1.95		
			Bot Cable Norm	17	3.27		
			Bot Cable Tan	17	0.00		
		Top Guy Pull-Off	Max Tension	25	1.98	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1.08	0.01	0.00
			Max. My	26	0.76	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T9	40.1 - 20.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-30.31	0.10	-0.06
			Max. Mx	19	-30.13	-0.30	-0.16
			Max. My	15	-30.31	0.04	0.33
			Max. Vy	23	0.65	0.28	-0.19
			Max. Vx	15	0.64	0.04	0.33
		Diagonal	Max Tension	26	1.09	0.00	0.00
			Max. Compression	20	-1.29	0.00	0.00
			Max. Mx	16	-1.08	0.00	0.00
			Max. My	26	-0.28	0.00	0.00
			Max. Vy	16	-0.00	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	19	0.43	0.00	0.00
			Max. Compression	26	-0.29	0.00	0.00
			Max. Mx	14	0.03	0.00	0.00
			Max. My	26	-0.29	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	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
		Bottom Girt	Max Tension	15	0.22	0.00	0.00
			Max. Compression	19	-0.14	0.00	0.00
			Max. Mx	23	0.11	0.00	0.00
			Max. My	26	0.22	0.00	-0.00
			Max. Vy	23	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T10	20.1 - 4.854	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	20	-24.99	-0.03	0.01
			Max. Mx	19	-24.02	0.59	0.14
			Max. My	23	-24.65	-0.10	-0.61
			Max. Vy	19	-0.29	-0.11	0.10
			Max. Vx	22	0.28	-0.13	-0.61
		Diagonal	Max Tension	20	0.88	0.00	0.00
			Max. Compression	19	-0.64	0.00	0.00
			Max. Mx	21	0.87	0.00	0.00
			Max. My	26	0.26	0.00	0.00
			Max. Vy	21	-0.00	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	19	0.24	0.00	0.00
			Max. Compression	15	-0.09	0.00	0.00
			Max. Mx	23	0.03	0.00	0.00
			Max. My	26	-0.08	0.00	-0.00
			Max. Vy	23	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	15	3.36	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1.93	0.00	0.00
			Max. My	26	3.17	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T11	4.854 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-26.69	0.04	0.15
			Max. Mx	15	-24.90	-2.14	-0.12
			Max. My	26	-24.39	-0.47	-0.51
			Max. Vy	15	3.77	-2.14	-0.12
			Max. Vx	26	1.10	-0.47	-0.51
		Top Girt	Max Tension	15	2.38	-0.96	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	26	2.34	-1.58	-0.01
			Max. My	26	2.16	-1.46	-0.01
			Max. Vy	26	0.26	-1.58	-0.01
			Max. Vx	26	0.01	-1.46	-0.01
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-0.76	-0.82	-0.00
			Max. Mx	26	-0.73	-1.05	-0.01
			Max. My	26	-0.66	-0.98	-0.01
			Max. Vy	26	2.82	-1.05	-0.01
			Max. Vx	26	0.04	-0.98	-0.01
		Mid Girt	Max Tension	20	0.05	0.00	0.00
			Max. Compression	19	-0.13	0.00	0.00
			Max. Mx	21	0.05	0.01	0.00
			Max. My	25	0.03	0.00	0.00
			Max. Vy	21	-0.02	0.00	0.00
			Max. Vx	25	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	19	73.29	-0.28	-0.17
	Max. H_x	12	45.51	0.69	0.41
	Max. H_z	2	57.74	-0.00	0.50
	Max. M_x	1	0.00	-0.00	0.00
	Max. M_z	1	0.00	-0.00	0.00
	Max. Torsion	26	0.65	0.40	0.33
	Min. Vert	1	34.06	-0.00	0.00
	Min. H_x	4	45.31	-0.70	0.42
	Min. H_z	8	45.48	0.00	-0.83
	Min. M_x	1	0.00	-0.00	0.00
	Min. M_z	1	0.00	-0.00	0.00
	Min. Torsion	20	-0.75	-0.09	-0.54
Guy C @ 99 ft Elev -5.17 ft Azimuth 240 deg	Max. Vert	10	-1.00	-0.34	0.19
	Max. H_x	10	-1.00	-0.34	0.19
	Max. H_z	16	-25.56	-14.27	8.83
	Min. Vert	18	-25.84	-14.93	8.03
	Min. H_x	18	-25.84	-14.93	8.03
	Min. H_z	9	-1.35	-0.63	0.19
Guy B @ 99.25 ft Elev -4.67 ft Azimuth 120 deg	Max. Vert	6	-0.98	0.33	0.19
	Max. H_x	24	-25.76	14.96	8.05
	Max. H_z	26	-25.60	14.37	8.88
	Min. Vert	24	-25.76	14.96	8.05
	Min. H_x	6	-0.98	0.33	0.19
	Min. H_z	7	-1.32	0.62	0.18
Guy A @ 96.5 ft Elev 2.46 ft Azimuth 0 deg	Max. Vert	2	-0.90	-0.00	-0.35
	Max. H_x	24	-14.00	0.89	-9.10
	Max. H_z	2	-0.90	-0.00	-0.35
	Min. Vert	20	-25.38	-0.50	-17.01
	Min. H_x	18	-14.12	-0.90	-9.17
	Min. H_z	21	-25.33	0.00	-17.02
Guy C @ 71.5 ft Elev 2.125 ft Azimuth 240 deg	Max. Vert	10	-0.33	-0.30	0.17
	Max. H_x	10	-0.33	-0.30	0.17
	Max. H_z	17	-6.24	-6.00	3.47
	Min. Vert	17	-6.24	-6.00	3.47
	Min. H_x	17	-6.24	-6.00	3.47
	Min. H_z	10	-0.33	-0.30	0.17
Guy B @ 68.25 ft Elev 3.96 ft Azimuth 120 deg	Max. Vert	6	-0.33	0.30	0.17
	Max. H_x	25	-6.37	6.03	3.48
	Max. H_z	25	-6.37	6.03	3.48
	Min. Vert	25	-6.37	6.03	3.48
	Min. H_x	6	-0.33	0.30	0.17
	Min. H_z	6	-0.33	0.30	0.17
Guy A @ 70.5 ft Elev 3 ft Azimuth 0 deg	Max. Vert	2	-0.31	-0.00	-0.33
	Max. H_x	24	-3.58	0.23	-3.89
	Max. H_z	2	-0.31	-0.00	-0.33
	Min. Vert	21	-6.18	0.00	-6.89
	Min. H_x	18	-3.54	-0.23	-3.84
	Min. H_z	21	-6.18	0.00	-6.89

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	34.06	0.00	-0.00	0.00	0.00	0.03
Dead+Wind 0 deg - No Ice+Guy	57.74	0.00	-0.50	0.00	0.00	-0.43
Dead+Wind 30 deg - No Ice+Guy	53.34	0.43	-0.45	0.00	0.00	-0.15
Dead+Wind 60 deg - No Ice+Guy	45.31	0.70	-0.42	0.00	0.00	0.08
Dead+Wind 90 deg - No Ice+Guy	53.68	0.61	-0.14	0.00	0.00	0.28
Dead+Wind 120 deg - No Ice+Guy	57.84	0.44	0.27	0.00	0.00	0.53
Dead+Wind 150 deg - No Ice+Guy	53.50	0.19	0.63	0.00	0.00	0.65
Dead+Wind 180 deg - No Ice+Guy	45.48	-0.00	0.83	0.00	0.00	0.52
Dead+Wind 210 deg - No Ice+Guy	53.19	-0.19	0.63	0.00	0.00	0.25
Dead+Wind 240 deg - No Ice+Guy	57.55	-0.45	0.27	0.00	0.00	0.03
Dead+Wind 270 deg - No Ice+Guy	53.55	-0.61	-0.14	0.00	0.00	-0.18
Dead+Wind 300 deg - No Ice+Guy	45.51	-0.69	-0.41	0.00	0.00	-0.51
Dead+Wind 330 deg - No Ice+Guy	53.52	-0.43	-0.45	0.00	0.00	-0.59
Dead+Ice+Temp+Guy	44.06	0.01	-0.01	0.00	0.00	0.04
Dead+Wind 0 deg+Ice+Temp+Guy	73.10	0.01	-0.31	0.00	0.00	-0.50
Dead+Wind 30 deg+Ice+Temp+Guy	69.68	0.41	-0.33	0.00	0.00	-0.20
Dead+Wind 60 deg+Ice+Temp+Guy	64.08	0.62	-0.37	0.00	0.00	0.08
Dead+Wind 90 deg+Ice+Temp+Guy	70.08	0.49	-0.19	0.00	0.00	0.32
Dead+Wind 120 deg+Ice+Temp+Guy	73.29	0.28	0.17	0.00	0.00	0.60
Dead+Wind 150 deg+Ice+Temp+Guy	69.95	0.09	0.54	0.00	0.00	0.75
Dead+Wind 180 deg+Ice+Temp+Guy	64.35	0.00	0.73	0.00	0.00	0.62
Dead+Wind 210 deg+Ice+Temp+Guy	69.80	-0.09	0.54	0.00	0.00	0.32
Dead+Wind 240 deg+Ice+Temp+Guy	73.13	-0.27	0.17	0.00	0.00	0.07
Dead+Wind 270 deg+Ice+Temp+Guy	70.09	-0.47	-0.18	0.00	0.00	-0.20
Dead+Wind 300 deg+Ice+Temp+Guy	64.30	-0.60	-0.37	0.00	0.00	-0.55
Dead+Wind 330 deg+Ice+Temp+Guy	69.84	-0.40	-0.33	0.00	0.00	-0.65
Dead+Wind 0 deg - Service+Guy	34.72	0.00	-0.34	0.00	0.00	-0.13
Dead+Wind 30 deg - Service+Guy	34.79	0.15	-0.28	0.00	0.00	-0.05
Dead+Wind 60 deg -	34.83	0.26	-0.15	0.00	0.00	0.04

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
Service+Guy						
Dead+Wind 90 deg - Service+Guy	34.93	0.31	0.00	0.00	0.00	0.12
Dead+Wind 120 deg - Service+Guy	34.94	0.29	0.17	0.00	0.00	0.19
Dead+Wind 150 deg - Service+Guy	35.07	0.16	0.27	0.00	0.00	0.22
Dead+Wind 180 deg - Service+Guy	35.08	0.00	0.30	0.00	0.00	0.18
Dead+Wind 210 deg - Service+Guy	35.07	-0.16	0.27	0.00	0.00	0.10
Dead+Wind 240 deg - Service+Guy	34.96	-0.29	0.17	0.00	0.00	0.02
Dead+Wind 270 deg - Service+Guy	34.97	-0.31	0.00	0.00	0.00	-0.06
Dead+Wind 300 deg - Service+Guy	34.89	-0.26	-0.15	0.00	0.00	-0.13
Dead+Wind 330 deg - Service+Guy	34.83	-0.15	-0.28	0.00	0.00	-0.17

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	-9.45	0.00	0.00	9.45	-0.00	0.010%
2	-0.05	-9.51	-17.31	0.05	9.51	17.30	0.007%
3	8.61	-9.45	-14.91	-8.61	9.45	14.90	0.005%
4	14.93	-9.40	-8.57	-14.93	9.40	8.57	0.005%
5	17.30	-9.45	0.05	-17.30	9.45	-0.05	0.006%
6	15.06	-9.50	8.70	-15.06	9.50	-8.69	0.006%
7	8.69	-9.44	14.96	-8.69	9.44	-14.95	0.006%
8	0.05	-9.39	17.22	-0.05	9.39	-17.22	0.003%
9	-8.61	-9.44	14.91	8.60	9.44	-14.90	0.006%
10	-15.01	-9.50	8.61	15.01	9.50	-8.61	0.005%
11	-17.30	-9.45	-0.05	17.30	9.45	0.05	0.006%
12	-14.98	-9.40	-8.65	14.98	9.40	8.65	0.003%
13	-8.69	-9.45	-14.96	8.69	9.45	14.95	0.005%
14	0.00	-16.74	0.00	-0.00	16.74	-0.00	0.006%
15	-0.04	-16.88	-20.41	0.04	16.88	20.41	0.005%
16	10.18	-16.75	-17.64	-10.18	16.75	17.64	0.004%
17	17.68	-16.62	-10.16	-17.67	16.62	10.16	0.005%
18	20.44	-16.74	0.04	-20.44	16.74	-0.04	0.005%
19	17.74	-16.86	10.24	-17.74	16.86	-10.24	0.006%
20	10.25	-16.73	17.68	-10.25	16.73	-17.68	0.005%
21	0.04	-16.59	20.39	-0.04	16.59	-20.39	0.004%
22	-10.18	-16.72	17.64	10.18	16.72	-17.64	0.004%
23	-17.70	-16.86	10.17	17.70	16.86	-10.17	0.006%
24	-20.44	-16.73	-0.04	20.44	16.73	0.04	0.005%
25	-17.72	-16.61	-10.23	17.72	16.61	10.23	0.004%
26	-10.25	-16.75	-17.68	10.25	16.75	17.68	0.004%
27	-0.02	-9.47	-5.99	0.02	9.47	5.99	0.002%
28	2.98	-9.45	-5.16	-2.98	9.45	5.16	0.003%
29	5.17	-9.43	-2.96	-5.17	9.43	2.96	0.005%
30	5.98	-9.45	0.02	-5.98	9.45	-0.02	0.003%
31	5.21	-9.47	3.01	-5.21	9.47	-3.01	0.002%
32	3.01	-9.45	5.17	-3.01	9.45	-5.17	0.003%
33	0.02	-9.43	5.96	-0.02	9.43	-5.96	0.003%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
34	-2.98	-9.45	5.16	2.98	9.45	-5.16	0.002%
35	-5.19	-9.46	2.98	5.19	9.46	-2.98	0.004%
36	-5.98	-9.45	-0.02	5.98	9.45	0.02	0.003%
37	-5.18	-9.43	-2.99	5.18	9.43	2.99	0.004%
38	-3.01	-9.45	-5.17	3.01	9.45	5.17	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	10	0.00000001	0.00007683
2	Yes	25	0.00007494	0.00009225
3	Yes	25	0.00005857	0.00006816
4	Yes	19	0.00009495	0.00007075
5	Yes	24	0.00007638	0.00009119
6	Yes	25	0.00006016	0.00007502
7	Yes	24	0.00007593	0.00008820
8	Yes	19	0.00000001	0.00005134
9	Yes	24	0.00007162	0.00008294
10	Yes	25	0.00005650	0.00007034
11	Yes	24	0.00007296	0.00008680
12	Yes	16	0.00000001	0.00005916
13	Yes	25	0.00005935	0.00006898
14	Yes	6	0.00000001	0.00005865
15	Yes	26	0.00006828	0.00007853
16	Yes	26	0.00006372	0.00006715
17	Yes	18	0.00009917	0.00006909
18	Yes	25	0.00007665	0.00008387
19	Yes	25	0.00008503	0.00009921
20	Yes	25	0.00007930	0.00008372
21	Yes	17	0.00008731	0.00005991
22	Yes	25	0.00007545	0.00007940
23	Yes	25	0.00008065	0.00009399
24	Yes	25	0.00007406	0.00008070
25	Yes	16	0.00008156	0.00008320
26	Yes	26	0.00006487	0.00006824
27	Yes	17	0.00000001	0.00004909
28	Yes	16	0.00000001	0.00006775
29	Yes	13	0.00000001	0.00008572
30	Yes	16	0.00000001	0.00007217
31	Yes	17	0.00000001	0.00004883
32	Yes	16	0.00000001	0.00006693
33	Yes	13	0.00000001	0.00006583
34	Yes	16	0.00000001	0.00005912
35	Yes	16	0.00000001	0.00009437
36	Yes	16	0.00000001	0.00006619
37	Yes	13	0.00000001	0.00008173
38	Yes	16	0.00000001	0.00007050

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190.6 - 175.35	6.653	31	0.4637	0.0587
T2	175.35 - 160.1	5.147	31	0.4712	0.0562
T3	160.1 - 140.1	3.625	30	0.4538	0.0517
T4	140.1 - 120.1	2.049	30	0.2902	0.0498
T5	120.1 - 100.1	1.239	29	0.1517	0.0665
T6	100.1 - 80.1	0.795	37	0.0823	0.0925
T7	80.1 - 60.1	0.560	37	0.0378	0.1021
T8	60.1 - 40.1	0.427	37	0.0316	0.1043
T9	40.1 - 20.1	0.300	37	0.0284	0.0966
T10	20.1 - 4.854	0.177	33	0.0361	0.0818
T11	4.854 - 0	0.045	33	0.0431	0.0474

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.99	Guy	31	6.593	0.4640	0.0586	93074
187.00	BXA-70063/6CF	31	6.301	0.4655	0.0582	93074
140.00	(2) RR90-17-02DP	30	2.043	0.2893	0.0498	5090
139.49	Guy	30	2.012	0.2847	0.0500	5104
87.37	Guy	37	0.628	0.0503	0.1001	30117
44.95	Guy	37	0.329	0.0286	0.0986	214144

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190.6 - 175.35	39.223	15	2.3691	0.2322
T2	175.35 - 160.1	31.632	15	2.3820	0.2333
T3	160.1 - 140.1	24.032	15	2.3068	0.2323
T4	140.1 - 120.1	15.373	15	1.7160	0.2356
T5	120.1 - 100.1	9.450	15	1.1806	0.2877
T6	100.1 - 80.1	5.412	15	0.7765	0.3603
T7	80.1 - 60.1	2.965	15	0.4140	0.3831
T8	60.1 - 40.1	1.786	25	0.2491	0.3841
T9	40.1 - 20.1	1.197	21	0.1416	0.3467
T10	20.1 - 4.854	0.678	21	0.1444	0.2795
T11	4.854 - 0	0.171	21	0.1643	0.1704

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.99	Guy	15	38.919	2.3697	0.2323	33651
187.00	BXA-70063/6CF	15	37.439	2.3721	0.2326	33651
140.00	(2) RR90-17-02DP	15	15.337	1.7127	0.2357	1468

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.49	Guy	15	15.150	1.6961	0.2363	1469
87.37	Guy	15	3.692	0.5285	0.3790	3558
44.95	Guy	21	1.328	0.1619	0.3577	10605

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	190.6	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2.18	3.20	0.681 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.59	3.20	0.186 ✓	1.333	Member Bearing
T2	175.35	Leg	A325N	0.7500	4	2.13	19.44	0.109 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2.97	3.20	0.929 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.56	3.20	0.176 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	1.16	3.20	0.363 ✓	1.333	Member Bearing
T3	160.1	Leg	A325N	0.7500	4	7.77	19.44	0.400 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.69	3.20	0.528 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.31	3.20	0.098 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	2.59	3.20	0.811 ✓	1.333	Member Bearing
T4	140.1	Leg	A325N	0.7500	4	1.36	19.44	0.070 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.54	4.12	0.374 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	2.71	3.20	0.846 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.28	3.20	0.086 ✓	1.333	Member Bearing
T5	120.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.19	3.20	0.374 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.49	3.20	0.154 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.16	3.20	0.049 ✓	1.333	Member Bearing
T6	100.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.11	3.20	0.347 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.38	3.20	0.120 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.37	3.20	0.115 ✓	1.333	Member Bearing
T7	80.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	0.88	4.12	0.213 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	0.42	3.20	0.133 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.23	3.20	0.072 ✓	1.333	Member Bearing
T8	60.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.17	3.20	0.365 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.23	3.20	0.072 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.51	3.20	0.161 ✓	1.333	Member Bearing

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
T9	40.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.09	3.20	0.341 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.43	3.20	0.135 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.22	3.20	0.068 ✓	1.333	Member Bearing
T10	20.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	0.88	3.20	0.275 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.24	3.20	0.074 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	3.36	3.20	1.052 ✓	1.333	Member Bearing

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T K	Allowable T_a K	Required S.F.	Actual S.F.
T1	189.99 (A) (426)	3/8 EHS	1.54	15.40	9.21	7.70	2.000	1.673 ✗
	189.99 (B) (425)	3/8 EHS	1.54	15.40	9.27	7.70	2.000	1.661 ✗
	189.99 (C) (424)	3/8 EHS	1.54	15.40	9.22	7.70	2.000	1.670 ✗
T4	139.49 (A) (435)	1/2 EHS	2.69	26.90	11.48	13.45	2.000	2.343 ✓
	139.49 (A) (436)	1/2 EHS	2.69	26.90	11.68	13.45	2.000	2.303 ✓
	139.49 (B) (431)	1/2 EHS	2.69	26.90	11.73	13.45	2.000	2.294 ✓
	139.49 (B) (432)	1/2 EHS	2.69	26.90	11.64	13.45	2.000	2.312 ✓
	139.49 (C) (427)	1/2 EHS	2.69	26.90	11.68	13.45	2.000	2.302 ✓
	139.49 (C) (428)	1/2 EHS	2.69	26.90	11.55	13.45	2.000	2.329 ✓
T6	87.37 (A) (444)	7/16 EHS	2.08	20.80	5.63	10.40	2.000	3.697 ✓
	87.37 (B) (443)	7/16 EHS	2.08	20.80	5.76	10.40	2.000	3.612 ✓
	87.37 (C) (439)	7/16 EHS	2.08	20.80	5.73	10.40	2.000	3.632 ✓
T8	44.95 (A) (450)	3/8 EHS	1.54	15.40	3.88	7.70	2.000	3.974 ✓
	44.95 (B) (449)	3/8 EHS	1.54	15.40	3.92	7.70	2.000	3.933 ✓
	44.95 (C) (445)	3/8 EHS	1.54	15.40	3.84	7.70	2.000	4.010 ✓

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190.6 - 175.35	ROHN 2.5 X-STR	15.25	2.44	63.4 K=2.00	1.00	22.137	2.2535	-10.77	49.89	0.216 ✓
T2	175.35 - 160.1	ROHN 2.5 X-STR	15.25	2.44	63.4 K=2.00	1.00	22.137	2.2535	-24.62	49.89	0.493 ✓
T3	160.1 - 140.1	ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.00	26.254	1.0745	-50.49	28.21	1.790 ✗
T4	140.1 - 120.1	H1-3 (1.79 CR) - 56 ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.00	26.245	1.0745	-52.56	28.20	1.864 ✗
T5	120.1 - 100.1	H1-3 (1.86 CR) - 113/8 ROHN 2 STD	20.00	2.42	73.9 K=2.00	1.00	20.207	1.0745	-43.04	21.71	1.982 ✗
T6	100.1 - 80.1	H1-3 (1.98 CR) - 170/8 ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.00	26.223	1.0745	-40.45	28.18	1.436 ✗
T7	80.1 - 60.1	H1-3 (1.44 CR) - 203/4 ROHN 2 EH	20.00	2.42	37.8 K=1.00	1.00	26.130	1.4807	-37.39	38.69	0.966 ✓
T8	60.1 - 40.1	ROHN 2.5 STD	20.00	2.42	61.4 K=2.00	1.00	22.480	1.7040	-32.27	38.31	0.842 ✓
T9	40.1 - 20.1	ROHN 2.5 STD	20.00	2.42	61.4 K=2.00	1.00	22.480	1.7040	-30.31	38.31	0.791 ✓
T10	20.1 - 4.854	ROHN 2.5 STD	15.25	2.44	61.8 K=2.00	1.00	22.412	1.7040	-24.99	38.19	0.654 ✓
T11	4.854 - 0	ROHN 2.5 X-STR	5.25	1.27	16.5 K=1.00	0.96	27.541	2.2535	-26.69	62.06	0.430 ✓

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	190.6 - 175.35	P1.5x.058	4.23	3.94	92.6 K=1.00	15.133	0.2627	-2.24	3.98	0.562 ✓
T2	175.35 - 160.1	P1.5x.058	4.23	3.94	92.6 K=1.00	15.133	0.2627	-2.98	3.98	0.750 ✓
T3	160.1 - 140.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.974	0.2627	-1.81	3.93	0.459 ✓
T4	140.1 - 120.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.974	0.2627	-1.54	3.93	0.392 ✓
T5	120.1 - 100.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.974	0.2627	-1.20	3.93	0.305 ✓
T6	100.1 - 80.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.974	0.2627	-1.26	3.93	0.321 ✓

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 $\frac{P}{P_a}$
T7	80.1 - 60.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.976	0.2627	-0.88	3.93	0.223 ✔
T8	60.1 - 40.1	P1.5x.058	4.22	3.93	92.4 K=1.00	15.166	0.2627	-1.44	3.98	0.361 ✔
T9	40.1 - 20.1	P1.5x.058	4.22	3.93	92.4 K=1.00	15.166	0.2627	-1.29	3.98	0.323 ✔
T10	20.1 - 4.854	P1.5x.058	4.23	3.94	92.6 K=1.00	15.135	0.2627	-0.64	3.98	0.161 ✔

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 $\frac{P}{P_a}$
T2	175.35 - 160.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.63	4.65	0.135 ✔
T3	160.1 - 140.1	P1.5x.058	3.46	3.26	76.7 K=1.00	17.546	0.2627	-0.22	4.61	0.047 ✔
T4	140.1 - 120.1	P1.5x.058	3.46	3.26	76.7 K=1.00	17.546	0.2627	-2.78	4.61	0.603 ✔
T5	120.1 - 100.1	P1.5x.058	3.46	3.26	76.7 K=1.00	17.546	0.2627	-0.56	4.61	0.122 ✔
T7	80.1 - 60.1	P1.5x.058	3.46	3.26	76.7 K=1.00	17.547	0.2627	-0.06	4.61	0.013 ✔
T8	60.1 - 40.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.08	4.65	0.017 ✔
T9	40.1 - 20.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.29	4.65	0.062 ✔
T10	20.1 - 4.854	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.09	4.65	0.020 ✔

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	190.6 - 175.35	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.51	4.65	0.109 ✔
T2	175.35 - 160.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-1.04	4.65	0.223 ✔
T3	160.1 - 140.1	P1.5x.058	3.46	3.26	76.7 K=1.00	17.546	0.2627	-1.77	4.61	0.385 ✔
T5	120.1 - 100.1	P1.5x.058	3.46	3.26	76.7 K=1.00	17.546	0.2627	-0.07	4.61	0.016 ✔
T8	60.1 - 40.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.27	4.65	0.058 ✔
T9	40.1 - 20.1	P1.5x.058	3.46	3.22	75.7	17.685	0.2627	-0.14	4.65	0.030

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 $\frac{P}{P_a}$
					K=1.00					✔
T11	4.854 - 0	14x3/16	0.47	0.24	52.2 K=1.00	18.157	2.6250	-0.76	47.66	0.016 ✔

Mid 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 $\frac{P}{P_a}$
T11	4.854 - 0	14x3/16	1.31	1.07	237.5 K=1.00	2.647	2.6250	-0.13	6.95	0.019 ✔
		KL/R > 200 (C) - 420								

Top Guy Pull-Off 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	190.6 - 175.35	4 1/2x3/8	3.46	3.22	356.8 K=1.00	1.173	1.6875	-0.04	1.98	0.022
		KL/R > 200 (C) - 5								
T6	100.1 - 80.1	C4x5.4	3.46	3.26	87.1 K=1.00	21.600	1.5900	0.00	23.12	0.000*
T8	60.1 - 40.1	C4x5.4	3.46	3.22	86.0 K=1.00	21.600	1.5900	0.00	23.33	0.000*

* DL controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	190.6 - 175.35	4 1/2x3/8	0.01	-0.081	27.000	0.003	-0.00	-0.000	27.000	0.000
T6	100.1 - 80.1	C4x5.4	0.01	-0.080	21.600	0.004	0.00	0.000	21.600	0.000
T8	60.1 - 40.1	C4x5.4	0.01	-0.080	21.600	0.004	0.00	0.000	21.600	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	190.6 - 175.35	4 1/2x3/8	0.022	0.003	0.000	0.025 ✔	1.333	H1-3 ✔
T6	100.1 - 80.1	C4x5.4	0.000	0.004	0.000	0.004* ✔	1.000	H1-3 ✔
T8	60.1 - 40.1	C4x5.4	0.000	0.004	0.000	0.004* ✔	1.000	H1-3 ✔

* DL controls

Torque-Arm Top Design Data

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	140.1 - 120.1 (429)	C10x15.3 H2-1 (1.44 CR) - 429	3.59	3.49	58.7 K=1.00	21.600	4.4900	0.00	57.15	0.000
T4	140.1 - 120.1 (430)	C10x15.3 H1-3 (1.39 CR) - 430	3.59	3.49	102.0 K=1.00	12.729	4.4900	-2.68	57.15	0.047
T4	140.1 - 120.1 (433)	C10x15.3 H1-3 (1.44 CR) - 433	3.59	3.49	102.0 K=1.00	12.729	4.4900	-2.67	57.15	0.047
T4	140.1 - 120.1 (434)	C10x15.3 H1-3 (1.43 CR) - 434	3.59	3.49	102.0 K=1.00	12.729	4.4900	-2.68	57.15	0.047
T4	140.1 - 120.1 (437)	C10x15.3 H2-1 (1.44 CR) - 437	3.59	3.49	58.7 K=1.00	21.600	4.4900	0.00	57.15	0.000
T4	140.1 - 120.1 (438)	C10x15.3 H2-1 (1.40 CR) - 438	3.59	3.49	58.7 K=1.00	21.600	4.4900	0.00	57.15	0.000

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T4	140.1 - 120.1 (429)	C10x15.3	-34.98	-31.093	21.600	1.440	-0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (430)	C10x15.3	-32.76	-29.116	21.600	1.348	-0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (433)	C10x15.3	-33.74	-29.994	21.600	1.389	0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (434)	C10x15.3	-33.61	-29.872	21.600	1.383	-0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (437)	C10x15.3	-34.82	-30.948	21.600	1.433	0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (438)	C10x15.3	-33.94	-30.171	21.600	1.397	-0.00	-0.000	21.600	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T4	140.1 - 120.1 (429)	C10x15.3	0.000	1.440	0.000	1.440 ✗	1.333	H1-3 ✗
T4	140.1 - 120.1 (430)	C10x15.3	0.047	1.348	0.000	1.395 ✗	1.333	H1-3 ✗
T4	140.1 - 120.1 (433)	C10x15.3	0.047	1.389	0.000	1.435 ✗	1.333	H1-3 ✗
T4	140.1 - 120.1 (434)	C10x15.3	0.047	1.383	0.000	1.430 ✗	1.333	H1-3 ✗
T4	140.1 - 120.1 (437)	C10x15.3	0.000	1.433	0.000	1.433 ✗	1.333	H1-3 ✗
T4	140.1 - 120.1 (438)	C10x15.3	0.000	1.397	0.000	1.397 ✗	1.333	H1-3 ✗

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	190.6 - 175.35	ROHN 2.5 X-STR	15.25	2.44	31.7	30.000	2.2535	0.91	67.61	0.013 ✓
T2	175.35 - 160.1	ROHN 2.5 X-STR	15.25	2.44	31.7	30.000	2.2535	8.51	67.61	0.126 ✓
T3	160.1 - 140.1	ROHN 2 STD	20.00	2.42	36.9	30.000	1.0745	31.08	32.24	0.964 ✓
T4	140.1 - 120.1	H1-3 (1.79 CR) - 56 ROHN 2 STD	20.00	2.42	36.9	30.000	1.0745	32.64	32.24	1.013 ✓
T5	120.1 - 100.1	H1-3 (1.86 CR) - 113/7 ROHN 2 STD	20.00	2.42	36.9	30.000	1.0745	4.73	32.24	0.147 ✓
		H1-3 (1.98 CR) - 170/7								

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	190.6 - 175.35	P1.5x.058	4.23	3.94	92.6	25.200	0.2627	2.18	6.62	0.329 ✓
T2	175.35 - 160.1	P1.5x.058	4.23	3.94	92.6	25.200	0.2627	2.97	6.62	0.449 ✓
T3	160.1 - 140.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	1.69	6.62	0.255

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	140.1 - 120.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	1.12	6.62	0.170 ✓
T5	120.1 - 100.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	1.19	6.62	0.180 ✓
T6	100.1 - 80.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	1.11	6.62	0.168 ✓
T7	80.1 - 60.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	0.59	6.62	0.089 ✓
T8	60.1 - 40.1	P1.5x.058	4.22	3.93	92.4	25.200	0.2627	1.17	6.62	0.176 ✓
T9	40.1 - 20.1	P1.5x.058	4.22	3.93	92.4	25.200	0.2627	1.09	6.62	0.164 ✓
T10	20.1 - 4.854	P1.5x.058	4.23	3.94	92.6	25.200	0.2627	0.88	6.62	0.133 ✓

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 $\frac{P}{P_a}$
T2	175.35 - 160.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.56	6.62	0.085 ✓
T3	160.1 - 140.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.31	6.62	0.048 ✓
T4	140.1 - 120.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	2.71	6.62	0.409 ✓
T5	120.1 - 100.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.49	6.62	0.075 ✓
T6	100.1 - 80.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.38	6.62	0.058 ✓
T7	80.1 - 60.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.42	6.62	0.064 ✓
T8	60.1 - 40.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.23	6.62	0.035 ✓
T9	40.1 - 20.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.43	6.62	0.065 ✓
T10	20.1 - 4.854	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.24	6.62	0.036 ✓
T11	4.854 - 0	14x3/16	2.98	2.74	608.2	21.600	2.6250	2.38	56.70	0.042 ✓
		L/R > 500 (T) - 412								

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	190.6 - 175.35	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.59	6.62	0.090 ✓
T2	175.35 - 160.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	1.16	6.62	0.175 ✓
T3	160.1 - 140.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	2.59	6.62	0.392 ✓
T4	140.1 - 120.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.28	6.62	0.042 ✓
T5	120.1 - 100.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.16	6.62	0.024 ✓
T6	100.1 - 80.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.37	6.62	0.056 ✓
T7	80.1 - 60.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.23	6.62	0.035 ✓
T8	60.1 - 40.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.51	6.62	0.078 ✓
T9	40.1 - 20.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.22	6.62	0.033 ✓
T10	20.1 - 4.854	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	3.36	6.62	0.508 ✓

Mid 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 $\frac{P}{P_a}$
T11	4.854 - 0	14x3/16	2.15	1.91	422.9	21.600	2.6250	0.05	56.70	0.001 ✓

Top Guy Pull-Off 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	190.6 - 175.35	4 1/2x3/8	3.46	3.22	356.8	21.600	1.6875	2.55	36.45	0.070
T6	100.1 - 80.1	C4x5.4	3.46	3.26	87.1	21.600	1.5900	1.98	34.34	0.058
T8	60.1 - 40.1	C4x5.4	3.46	3.22	86.0	21.600	1.5900	1.98	34.34	0.058

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	190.6 - 175.35	4 1/2x3/8	0.01	0.113	27.000	0.004	0.00	0.000	27.000	0.000
T6	100.1 - 80.1	C4x5.4	0.01	0.080	21.600	0.004	0.00	0.000	27.000	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T8	60.1 - 40.1	C4x5.4	0.01	0.080	21.600	0.004	0.00	0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	190.6 - 175.35	4 1/2x3/8	0.070	0.004	0.000	0.074 ✓	1.333	H2-1 ✓
T6	100.1 - 80.1	C4x5.4	0.058	0.004	0.000	0.061 ✓	1.333	H2-1 ✓
T8	60.1 - 40.1	C4x5.4	0.058	0.004	0.000	0.061 ✓	1.333	H2-1 ✓

Torque-Arm Top Design Data

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	140.1 - 120.1 (429)	C10x15.3 H2-1 (1.44 CR) - 429	3.59	3.49	58.7	21.600	4.4900	0.26	96.98	0.003
T4	140.1 - 120.1 (430)	C10x15.3 H1-3 (1.39 CR) - 430	3.59	3.49	58.7	21.600	4.4900	0.04	96.98	0.000
T4	140.1 - 120.1 (433)	C10x15.3 H1-3 (1.44 CR) - 433	3.59	3.49	58.7	21.600	4.4900	0.18	96.98	0.002
T4	140.1 - 120.1 (434)	C10x15.3 H1-3 (1.43 CR) - 434	3.59	3.49	58.7	21.600	4.4900	2.57	96.98	0.026
T4	140.1 - 120.1 (437)	C10x15.3 H2-1 (1.44 CR) - 437	3.59	3.49	58.7	21.600	4.4900	0.23	96.98	0.002
T4	140.1 - 120.1 (438)	C10x15.3 H2-1 (1.40 CR) - 438	3.59	3.49	58.7	21.600	4.4900	0.18	96.98	0.002

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T4	140.1 - 120.1 (429)	C10x15.3	-34.98	31.093	21.600	1.440	-0.00	0.000	27.000	0.000
T4	140.1 - 120.1 (430)	C10x15.3	-33.86	30.093	21.600	1.393	-0.00	0.000	27.000	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T4	140.1 - 120.1 (433)	C10x15.3	-34.48	30.650	21.600	1.419	0.00	0.000	27.000	0.000
T4	140.1 - 120.1 (434)	C10x15.3	-30.93	27.493	21.600	1.273	0.00	0.000	27.000	0.000
T4	140.1 - 120.1 (437)	C10x15.3	-34.82	30.948	21.600	1.433	0.00	0.000	27.000	0.000
T4	140.1 - 120.1 (438)	C10x15.3	-33.94	30.171	21.600	1.397	-0.00	0.000	27.000	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T4	140.1 - 120.1 (429)	C10x15.3	0.003	1.440	0.000	1.442 ✗	1.333	H2-1 ✗
T4	140.1 - 120.1 (430)	C10x15.3	0.000	1.393	0.000	1.394 ✗	1.333	H2-1 ✗
T4	140.1 - 120.1 (433)	C10x15.3	0.002	1.419	0.000	1.421 ✗	1.333	H2-1 ✗
T4	140.1 - 120.1 (434)	C10x15.3	0.026	1.273	0.000	1.299 ✓	1.333	H2-1 ✓
T4	140.1 - 120.1 (437)	C10x15.3	0.002	1.433	0.000	1.435 ✗	1.333	H2-1 ✗
T4	140.1 - 120.1 (438)	C10x15.3	0.002	1.397	0.000	1.399 ✗	1.333	H2-1 ✗

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	190.6 - 175.35	Leg	ROHN 2.5 X-STR	3	-10.77	66.50	16.2	Pass
T2	175.35 - 160.1	Leg	ROHN 2.5 X-STR	29	-24.62	66.50	37.0	Pass
T3	160.1 - 140.1	Leg	ROHN 2 STD	56	-50.49	37.60	134.3	Fail ✗
T4	140.1 - 120.1	Leg	ROHN 2 STD	113	-52.56	37.59	139.8	Fail ✗
T5	120.1 - 100.1	Leg	ROHN 2 STD	170	-43.04	28.94	148.7	Fail ✗
T6	100.1 - 80.1	Leg	ROHN 2 STD	203	-40.45	37.56	107.7	Fail ✗
T7	80.1 - 60.1	Leg	ROHN 2 EH	260	-37.39	51.57	72.5	Pass
T8	60.1 - 40.1	Leg	ROHN 2.5 STD	318	-32.27	51.06	63.2	Pass
T9	40.1 - 20.1	Leg	ROHN 2.5 STD	351	-30.31	51.06	59.4	Pass
T10	20.1 - 4.854	Leg	ROHN 2.5 STD	384	-24.99	50.91	49.1	Pass
T11	4.854 - 0	Leg	ROHN 2.5 X-STR	411	-26.69	82.73	32.3	Pass
T1	190.6 - 175.35	Diagonal	P1.5x.058	12	-2.24	5.30	42.2 51.1 (b)	Pass
T2	175.35 - 160.1	Diagonal	P1.5x.058	37	-2.98	5.30	56.3 69.7 (b)	Pass
T3	160.1 - 140.1	Diagonal	P1.5x.058	65	-1.81	5.24	34.4 39.6 (b)	Pass
T4	140.1 - 120.1	Diagonal	P1.5x.058	167	-1.54	5.24	29.4	Pass
T5	120.1 - 100.1	Diagonal	P1.5x.058	199	-1.20	5.24	22.9 28.0 (b)	Pass

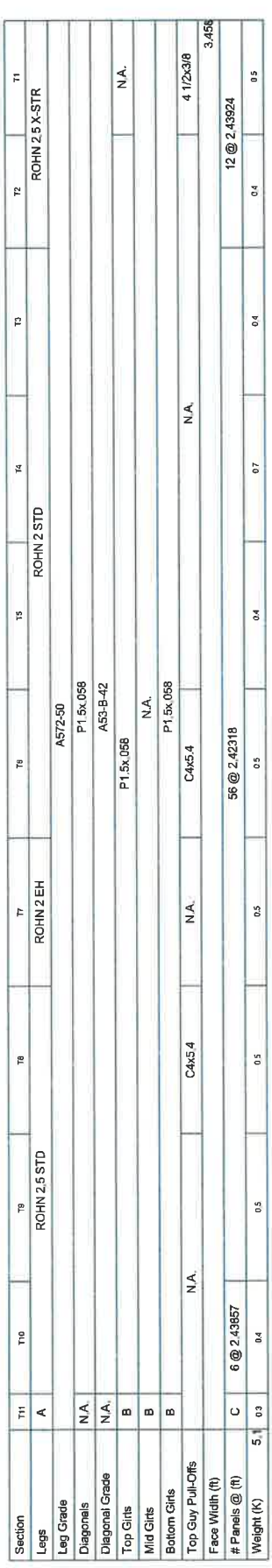
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T6	100.1 - 80.1	Diagonal	P1.5x.058	228	-1.26	5.24	24.1 26.0 (b)	Pass
T7	80.1 - 60.1	Diagonal	P1.5x.058	315	-0.88	5.25	16.8	Pass
T8	60.1 - 40.1	Diagonal	P1.5x.058	326	-1.44	5.31	27.1 27.4 (b)	Pass
T9	40.1 - 20.1	Diagonal	P1.5x.058	380	-1.29	5.31	24.3 25.5 (b)	Pass
T10	20.1 - 4.854	Diagonal	P1.5x.058	407	-0.64	5.30	12.1 20.6 (b)	Pass
T2	175.35 - 160.1	Top Girt	P1.5x.058	33	-0.63	6.19	10.1 13.2 (b)	Pass
T3	160.1 - 140.1	Top Girt	P1.5x.058	58	0.31	8.83	3.6 7.4 (b)	Pass
T4	140.1 - 120.1	Top Girt	P1.5x.058	117	-2.78	6.15	45.3 63.5 (b)	Pass
T5	120.1 - 100.1	Top Girt	P1.5x.058	174	-0.56	6.15	9.2 11.6 (b)	Pass
T6	100.1 - 80.1	Top Girt	P1.5x.058	205	0.38	8.83	4.4 9.0 (b)	Pass
T7	80.1 - 60.1	Top Girt	P1.5x.058	263	0.42	8.83	4.8 10.0 (b)	Pass
T8	60.1 - 40.1	Top Girt	P1.5x.058	320	0.23	8.83	2.6 5.4 (b)	Pass
T9	40.1 - 20.1	Top Girt	P1.5x.058	353	0.43	8.83	4.9 10.1 (b)	Pass
T10	20.1 - 4.854	Top Girt	P1.5x.058	386	0.24	8.83	2.7 5.6 (b)	Pass
T11	4.854 - 0	Top Girt	14x3/16	412	2.38	75.58	3.1	Pass
T1	190.6 - 175.35	Bottom Girt	P1.5x.058	9	-0.51	6.19	8.2 14.0 (b)	Pass
T2	175.35 - 160.1	Bottom Girt	P1.5x.058	34	-1.04	6.19	16.7 27.3 (b)	Pass
T3	160.1 - 140.1	Bottom Girt	P1.5x.058	63	2.59	8.83	29.4 60.8 (b)	Pass
T4	140.1 - 120.1	Bottom Girt	P1.5x.058	119	0.28	8.83	3.1 6.5 (b)	Pass
T5	120.1 - 100.1	Bottom Girt	P1.5x.058	177	0.16	8.83	1.8 3.7 (b)	Pass
T6	100.1 - 80.1	Bottom Girt	P1.5x.058	209	0.37	8.83	4.2 8.6 (b)	Pass
T7	80.1 - 60.1	Bottom Girt	P1.5x.058	266	0.23	8.83	2.6 5.4 (b)	Pass
T8	60.1 - 40.1	Bottom Girt	P1.5x.058	323	0.51	8.83	5.8 12.0 (b)	Pass
T9	40.1 - 20.1	Bottom Girt	P1.5x.058	356	0.22	8.83	2.5 5.1 (b)	Pass
T10	20.1 - 4.854	Bottom Girt	P1.5x.058	388	3.36	8.83	38.1 78.9 (b)	Pass
T11	4.854 - 0	Bottom Girt	14x3/16	415	-0.76	63.53	5.6	Pass
T11	4.854 - 0	Mid Girt	14x3/16	420	-0.13	9.26	1.5	Pass
T1	190.6 - 175.35	Guy A@189.985	3/8	426	9.21	7.70	119.6	Fail ✗
T4	140.1 - 120.1	Guy A@139.485	1/2	436	11.68	13.45	86.8	Pass
T6	100.1 - 80.1	Guy A@87.3695	7/16	444	5.63	10.40	54.1	Pass
T8	60.1 - 40.1	Guy A@44.9464	3/8	450	3.88	7.70	50.3	Pass
T1	190.6 - 175.35	Guy B@189.985	3/8	425	9.27	7.70	120.4	Fail ✗
T4	140.1 - 120.1	Guy B@139.485	1/2	431	11.73	13.45	87.2	Pass
T6	100.1 - 80.1	Guy B@87.3695	7/16	443	5.76	10.40	55.4	Pass
T8	60.1 - 40.1	Guy B@44.9464	3/8	449	3.92	7.70	50.9	Pass
T1	190.6 - 175.35	Guy C@189.985	3/8	424	9.22	7.70	119.8	Fail ✗
T4	140.1 - 120.1	Guy C@139.485	1/2	427	11.68	13.45	86.9	Pass
T6	100.1 - 80.1	Guy C@87.3695	7/16	439	5.73	10.40	55.1	Pass

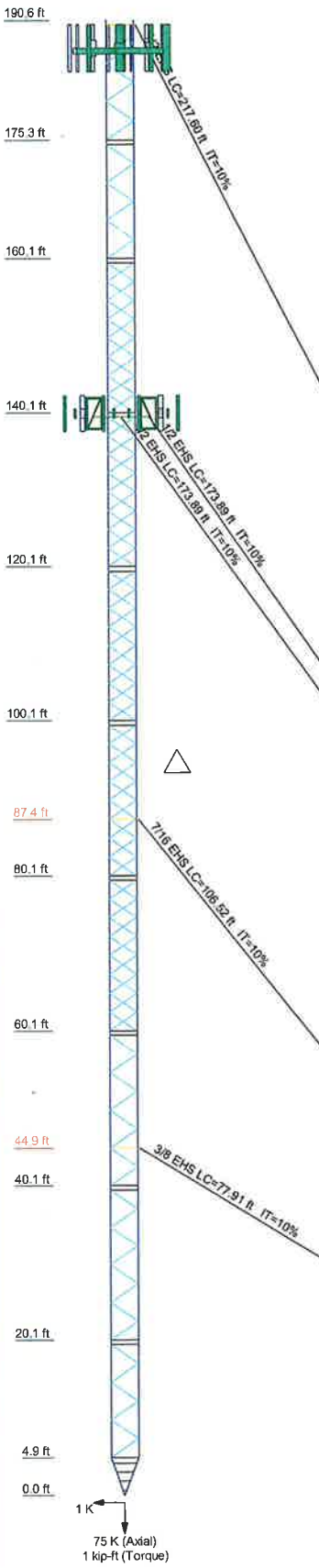
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T8	60.1 - 40.1	Guy C@44.9464	3/8	445	3.84	7.70	49.9	Pass
T1	190.6 - 175.35	Top Guy Pull-Off@189.985	4 1/2x3/8	4	2.55	48.59	5.6	Pass
T6	100.1 - 80.1	Top Guy Pull-Off@87.3695	C4x5.4	440	1.98	45.78	4.6	Pass
T8	60.1 - 40.1	Top Guy Pull-Off@44.9464	C4x5.4	446	1.98	45.78	4.6	Pass
T4	140.1 - 120.1	Torque Arm Top@139.485	C10x15.3	429	0.26	129.28	108.2	Fail ✗

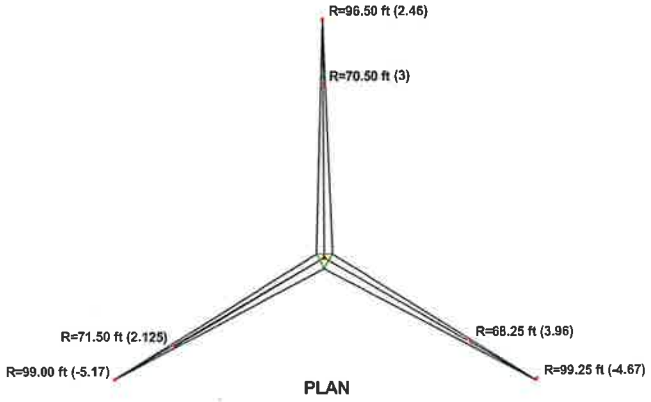
Summary

Leg (T5)	148.7	Fail ✗
Diagonal (T2)	69.7	Pass
Top Girt (T4)	63.5	Pass
Bottom Girt (T10)	78.9	Pass
Mid Girt (T11)	1.5	Pass
Guy A (T1)	119.6	Fail ✗
Guy B (T1)	120.4	Fail ✗
Guy C (T1)	119.8	Fail ✗
Top Guy Pull-Off (T1)	5.6	Pass
Torque Arm Top (T4)	108.2	Fail ✗
Bolt Checks	78.9	Pass
RATING =	**148.7**	**Fail ✗**

Reinforced Tower







DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
BXA-70063/6CF (Verizon - Proposed)	187	DB-T1-6Z-8AB-0Z (Verizon - Proposed)	187
BXA-171063-12CF (Verizon - Proposed)	187	Pirod 12' T-Frame Sector Mount (1) (Verizon - proposed)	187
BXA-70063/6CF (Verizon - Proposed)	187	Pirod 12' T-Frame Sector Mount (1) (Verizon - proposed)	187
BXA-171063-12CF (Verizon - Proposed)	187	Pirod 12' T-Frame Sector Mount (1) (Verizon - proposed)	187
BXA-70063/6CF (Verizon - Proposed)	187	(2) RR90-17-02DP (T-Mobile - Existing)	140
BXA-171063-12CF (Verizon - Proposed)	187	(2) RR90-17-02DP (T-Mobile - Existing)	140
BXA-70063/6CF (Verizon - Proposed)	187	(2) RR90-17-02DP (T-Mobile - Existing)	140
BXA-171063-12CF (Verizon - Proposed)	187	(2) S20057A1 PCS MHA (T-Mobile - Existing)	140
BXA-70063/6CF (Verizon - Proposed)	187	(2) S20057A1 PCS MHA (T-Mobile - Existing)	140
BXA-171063-12CF (Verizon - Proposed)	187	(2) S20057A1 PCS MHA (T-Mobile - Existing)	140
BXA-70063/6CF (Verizon - Proposed)	187	(2) S20057A1 PCS MHA (T-Mobile - Existing)	140
BXA-171063-12CF (Verizon - Proposed)	187	ROHN 4-ft Side Arm (T-Mobile - Existing)	140
RRH2x40-07-U (Verizon - Proposed)	187	ROHN 4-ft Side Arm (T-Mobile - Existing)	140
RRH2x40-AWS (Verizon - Proposed)	187	ROHN 4-ft Side Arm (T-Mobile - Existing)	140
RRH2x40-07-U (Verizon - Proposed)	187		
RRH2x40-AWS (Verizon - Proposed)	187		
RRH2x40-07-U (Verizon - Proposed)	187		
RRH2x40-AWS (Verizon - Proposed)	187		

SYMBOL LIST

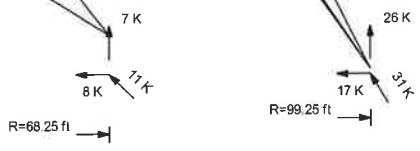
MARK	SIZE	MARK	SIZE
A	ROHN 2.5 X-STR	C	4 @ 1.17356
B	14x3/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 93.7%

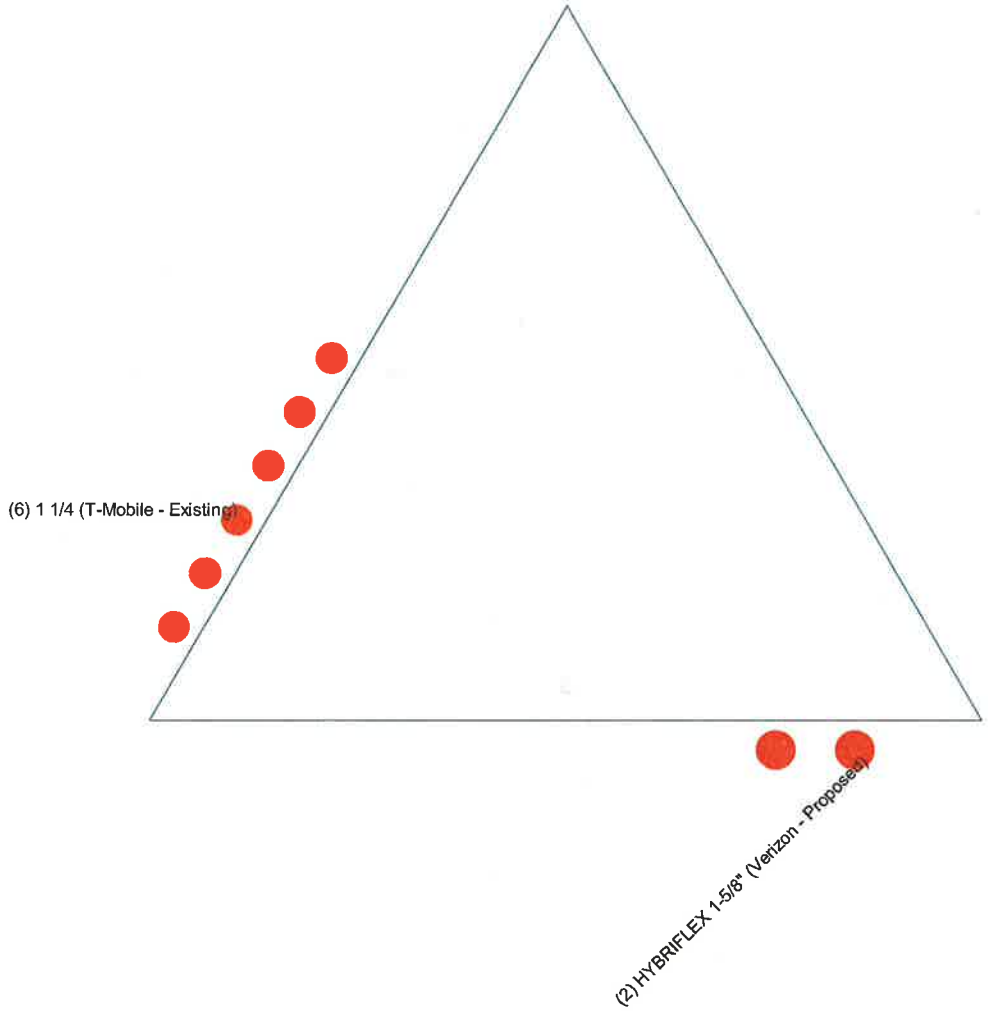


Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: 09059 - Danielson 2			
Project: 190-ft Guyed Tower - 812 Providence Pike, Danielson, CT			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 12/04/13	Scale: NTS	
Path:		Dwg No. E-1	

Feedline Plan

Round Flat App In Face App Out Face



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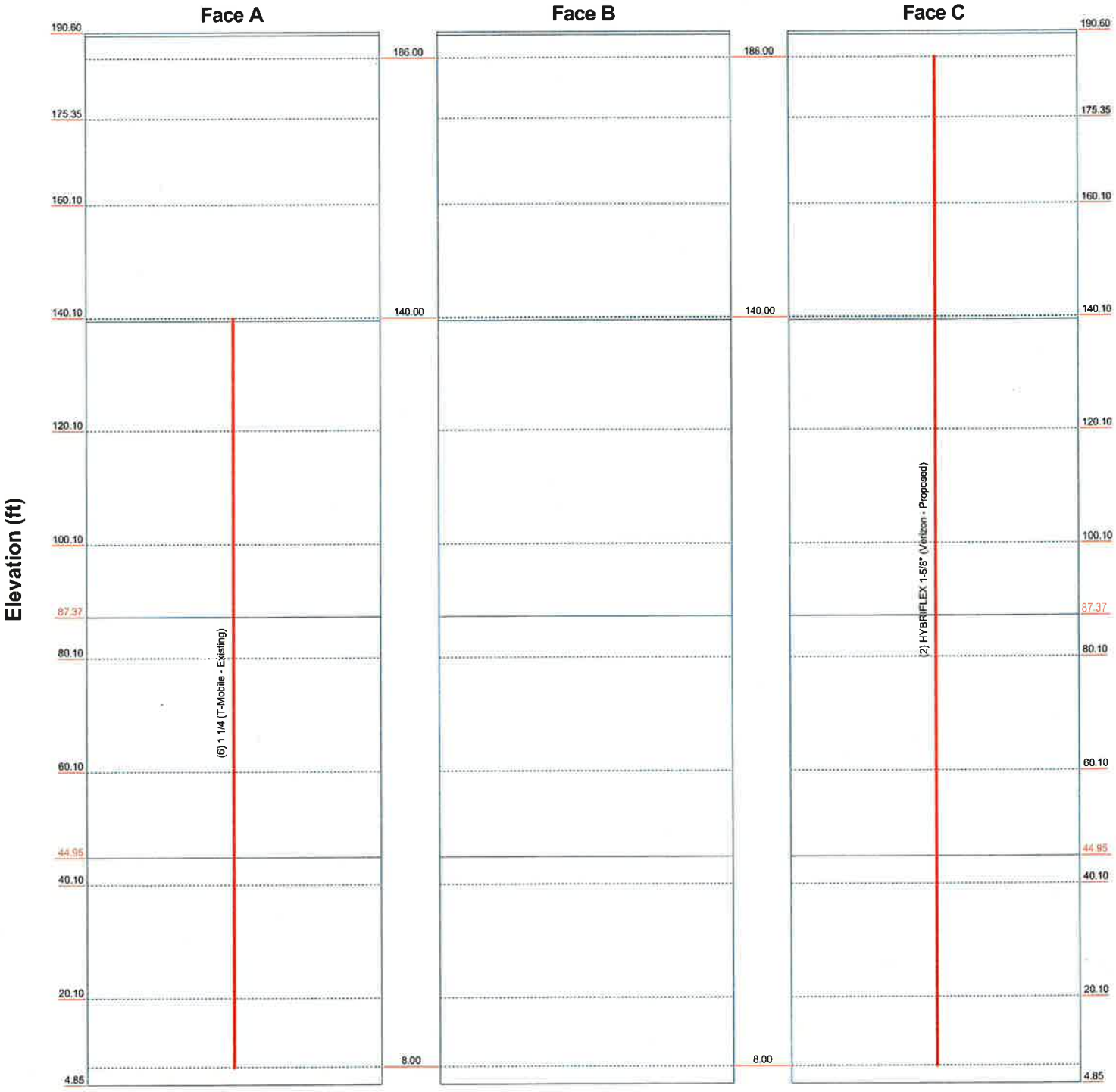
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 12/04/13	Scale: NTS
Path:		Dwg No. E-7

Feedline Distribution Chart
4'10-3/16" - 190'7-3/16"

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



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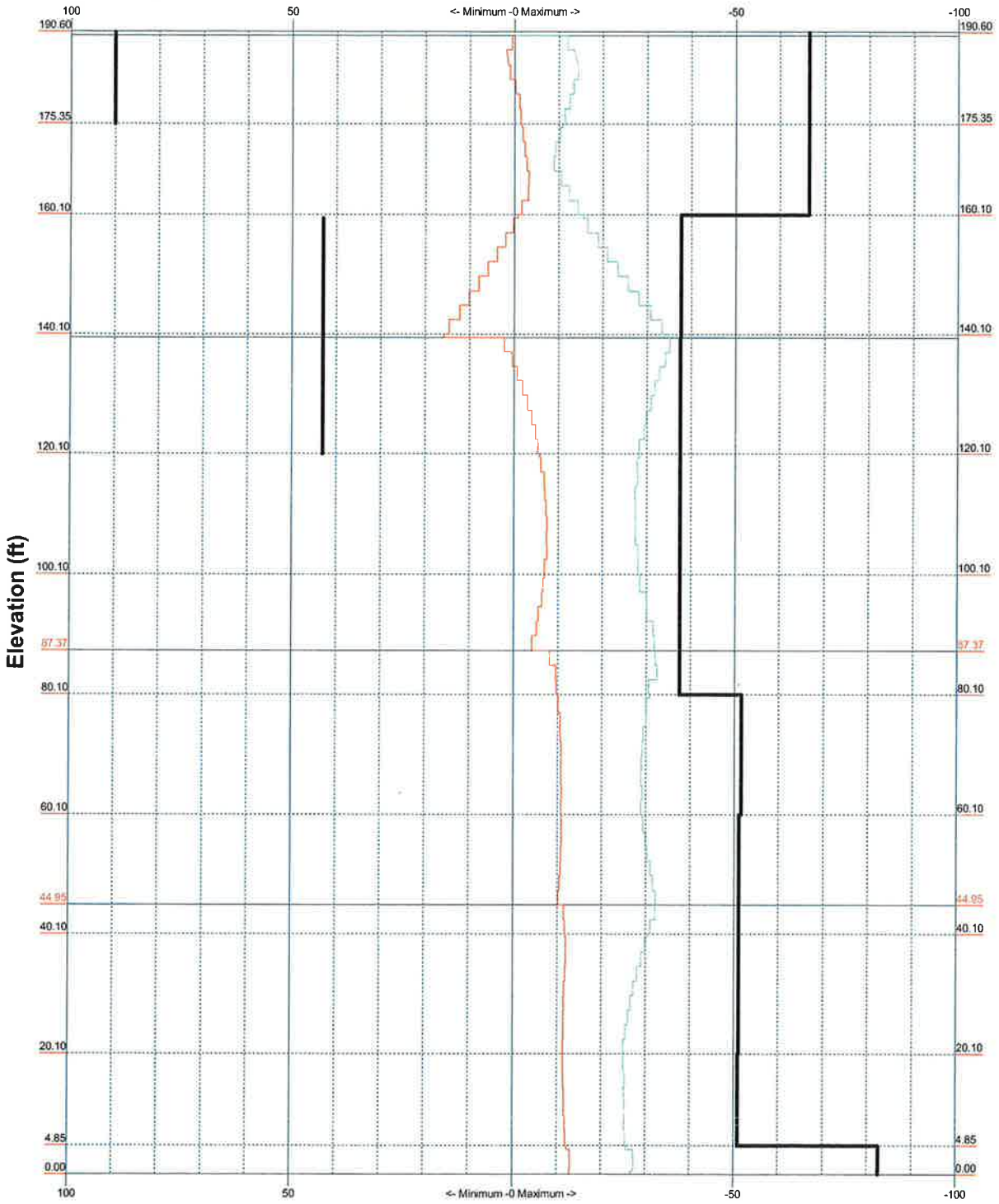
Job: *09059 - Danielson 2*			
Project: *190-ft Guyed Tower - 812 Providence Pike, Danielson, CT*			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 12/04/13	Scale: NTS	
Path:		Dwg No. E-7	

TIA/EIA-222-F - 85 mph/74 mph 0.5000 in Ice

Leg Capacity ——— Leg Compression (K)



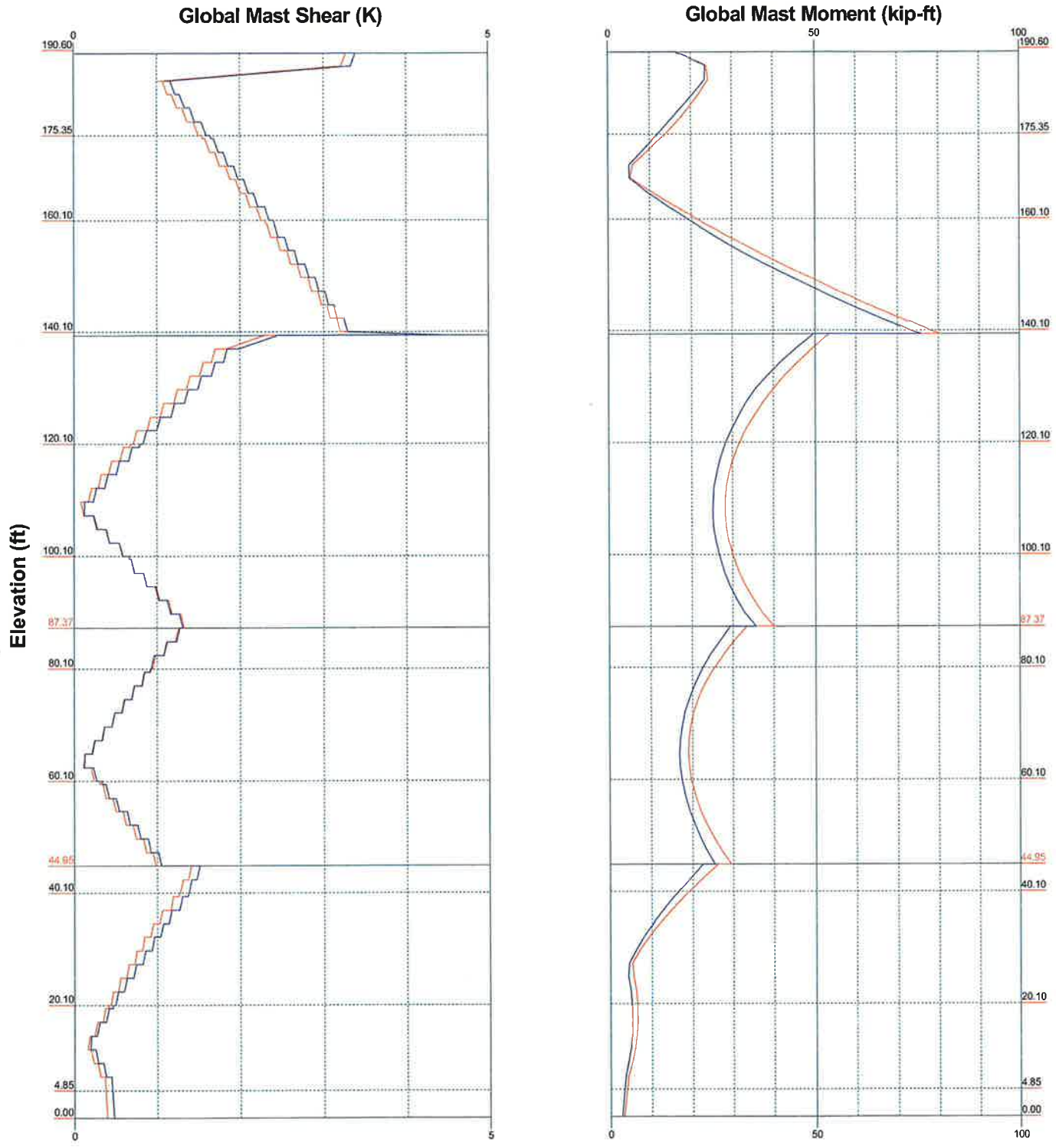
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: **09059 - Danielson 2**		
	Project: **190-ft Guyed Tower - 812 Providence Pike, Danielson, CT**		
	Client: Verizon Wireless	Drawn by: TJL	App'd:
	Code: TIA/EIA-222-F	Date: 12/04/13	Scale: NTS
	Path:		Dwg No. E-3

TIA/EIA-222-F - 85 mph/74 mph 0.5000 in Ice

Vx Vz

Maximum Values

Mx Mz



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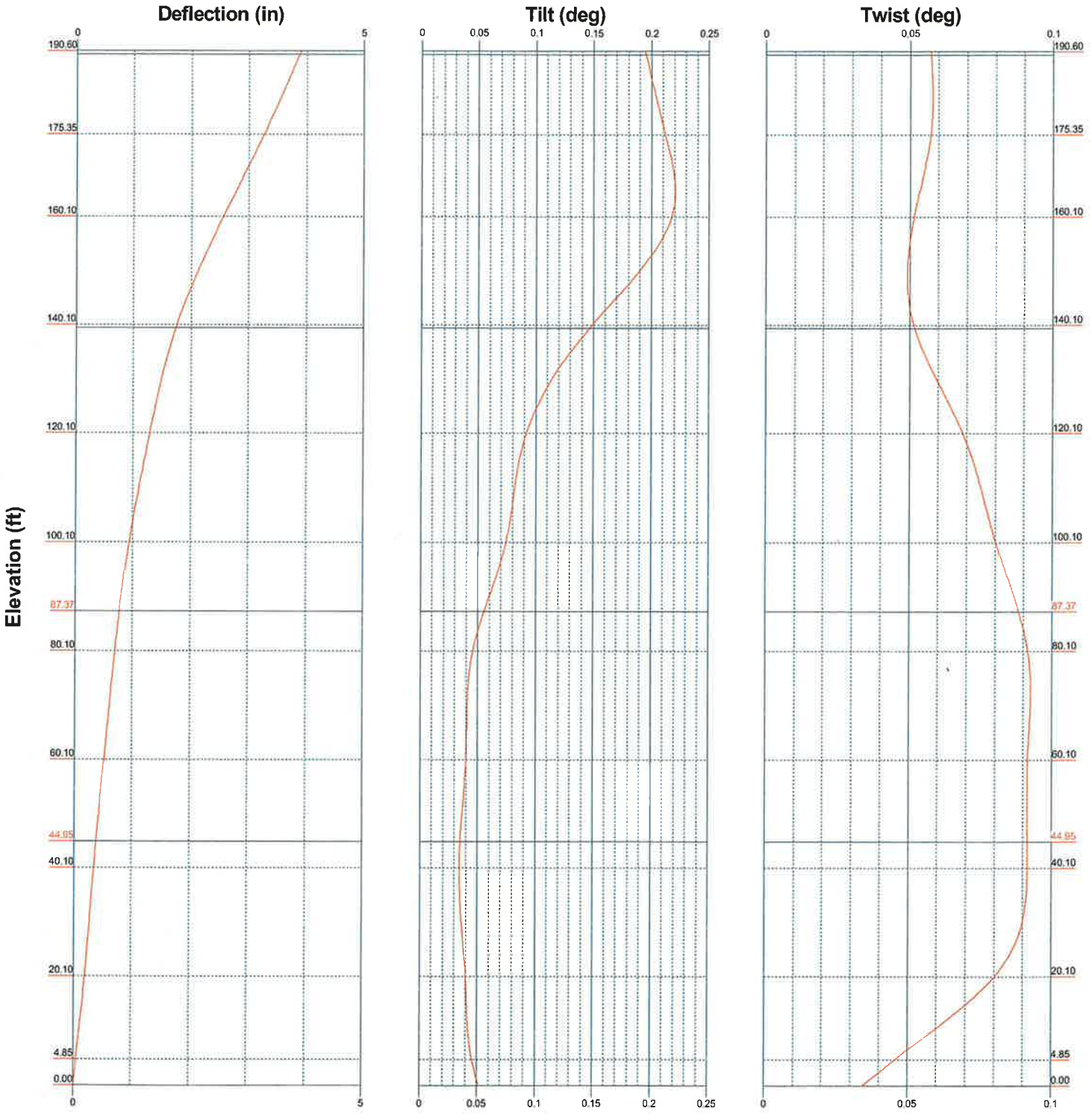
Job: *09059 - Danielson 2*			
Project: *190-ft Guyed Tower - 812 Providence Pike, Danielson, CT*			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 12/04/13	Scale: NTS	
Path:		Dwg No. E-4	

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

Maximum Values



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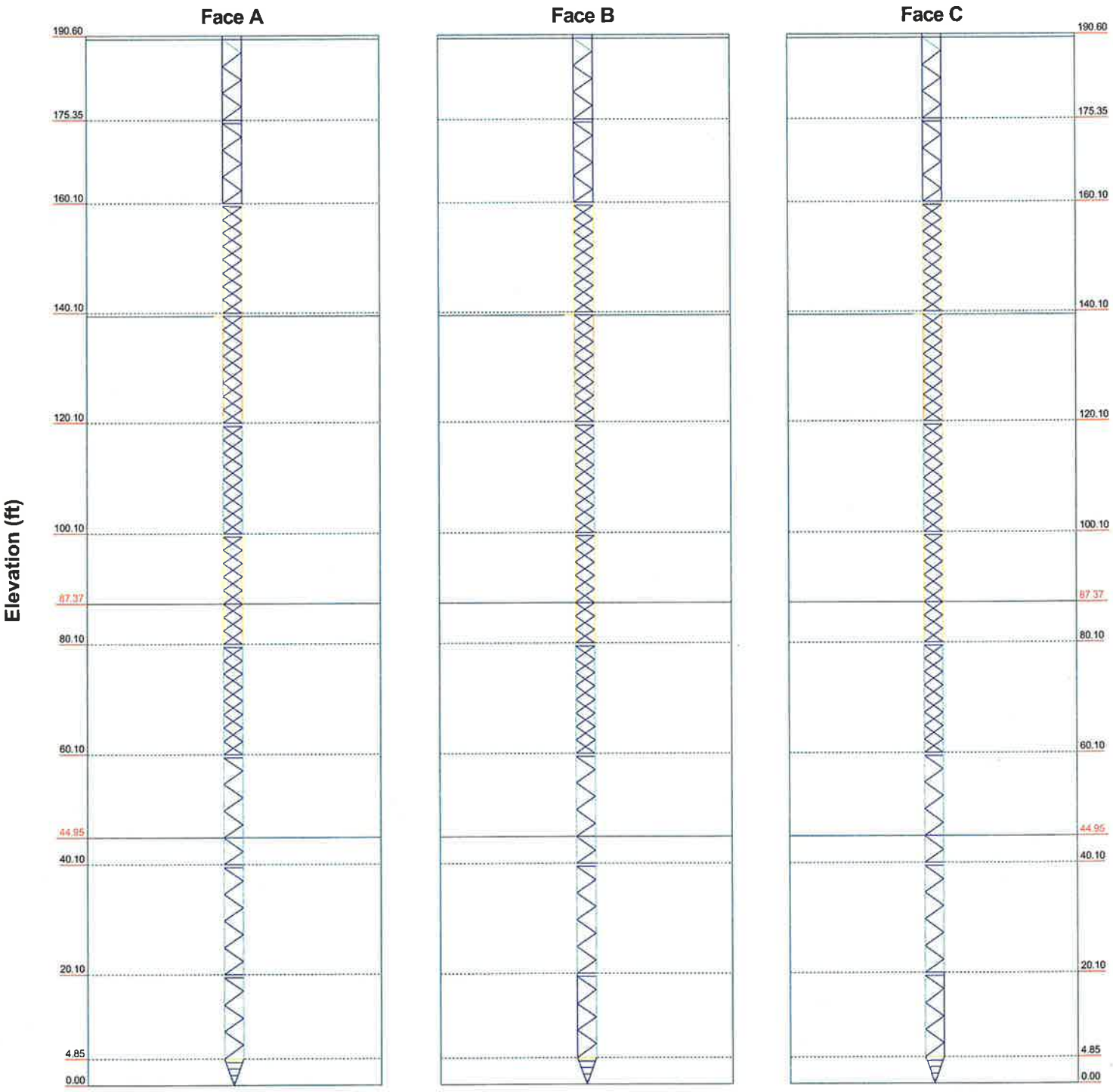
Job: ***09059 - Danielson 2***			
Project: ***190-ft Guyed Tower - 812 Providence Pike, Danielson, CT***			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 12/04/13	Scale: NTS	
Path:		Dwg No. E-5	

Stress Distribution Chart
0' - 190'7-3/16"

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



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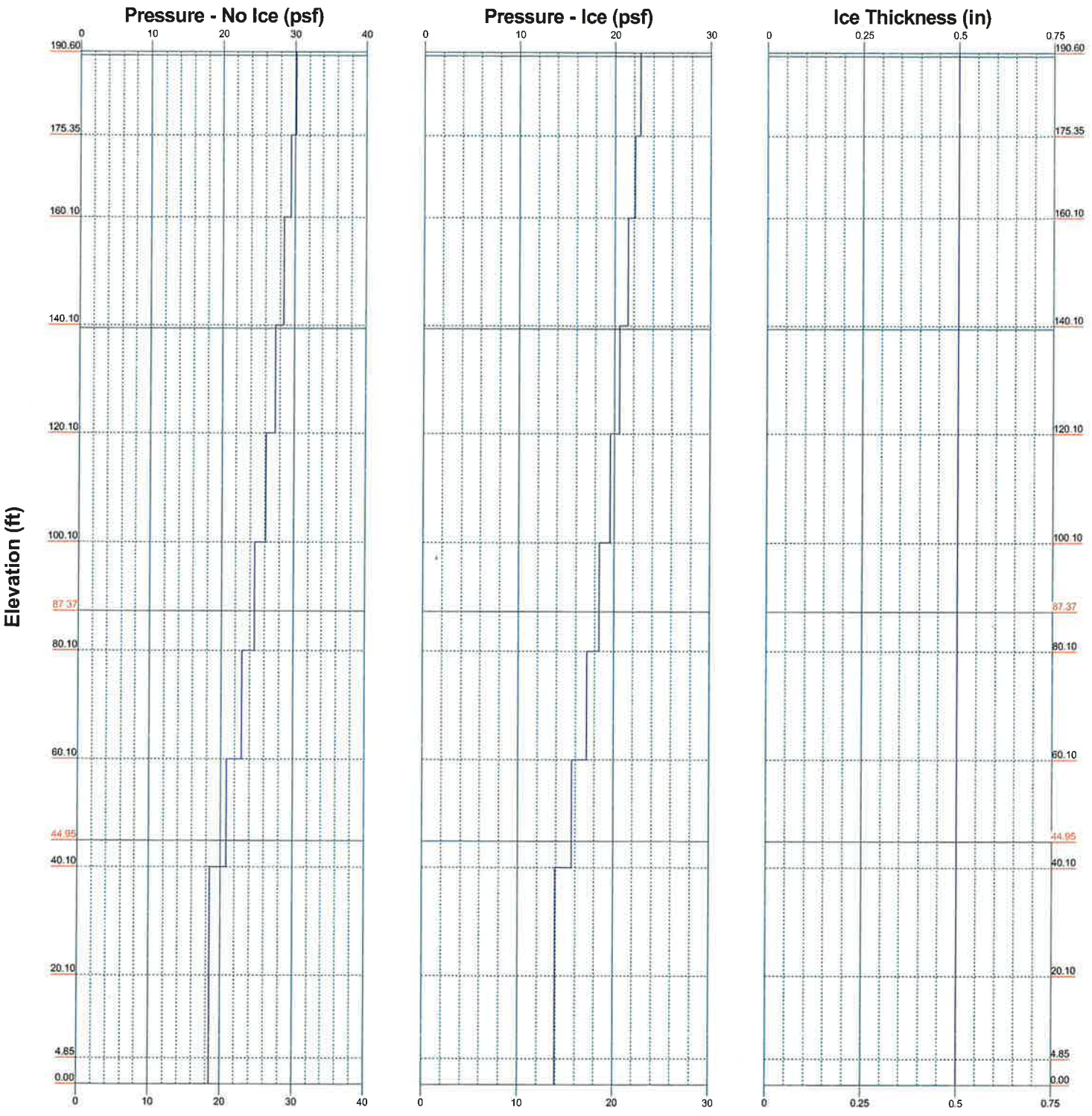
Job: *09059 - Danielson 2*			
Project: *190-ft Guyed Tower - 812 Providence Pike, Danielson, CT*			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 12/04/13	Scale: NTS	
Path:		Dwg No. E-8	

Wind Pressures and Ice Thickness

TIA/EIA-222-F - 85 mph/74 mph 0.5000 in Ice



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: ***09059 - Danielson 2***		
	Project: ***190-ft Guyed Tower - 812 Providence Pike, Danielson, CT***		
	Client: Verizon Wireless	Drawn by: TJL	App'd:
	Code: TIA/EIA-222-F	Date: 12/04/13	Scale: NTS
	Path:		Dwg No. E-9

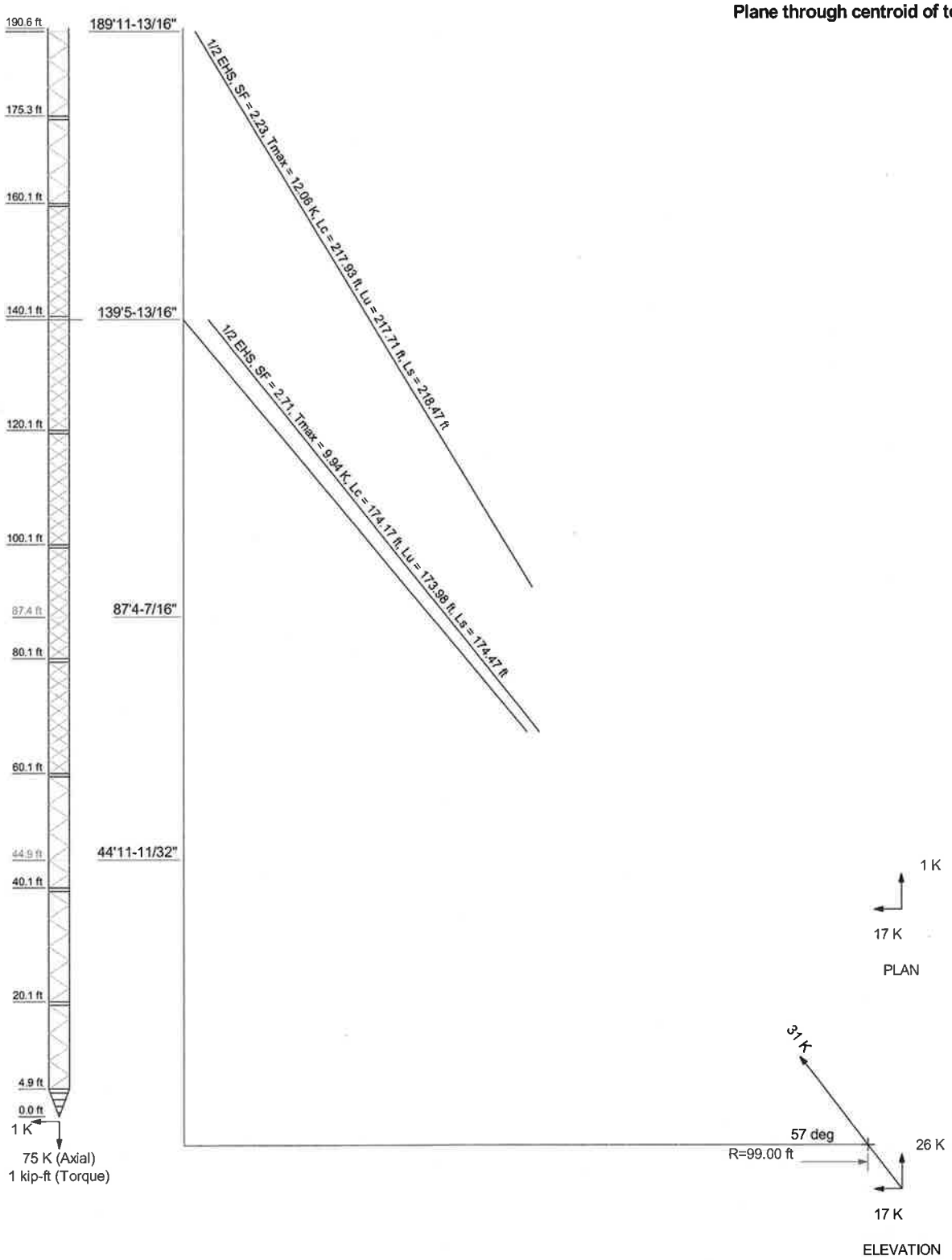
Guy Tensions and Tower Reactions

TIA/EIA-222-F - 85 mph/74 mph 0.5000 in Ice

Maximum Values

Anchor 'C'@99 ft Azimuth 240 deg Elev -5.17 ft

Plane through centroid of tower



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: ***09059 - Danielson 2*** Project: ***190-ft Guyed Tower - 812 Providence Pike, Danielson, CT*** Client: Verizon Wireless — Drawn by: TJL — App'd: Code: TIA/EIA-222-F — Date: 12/04/13 — Scale: NTS Path: — Dwg No. E-6

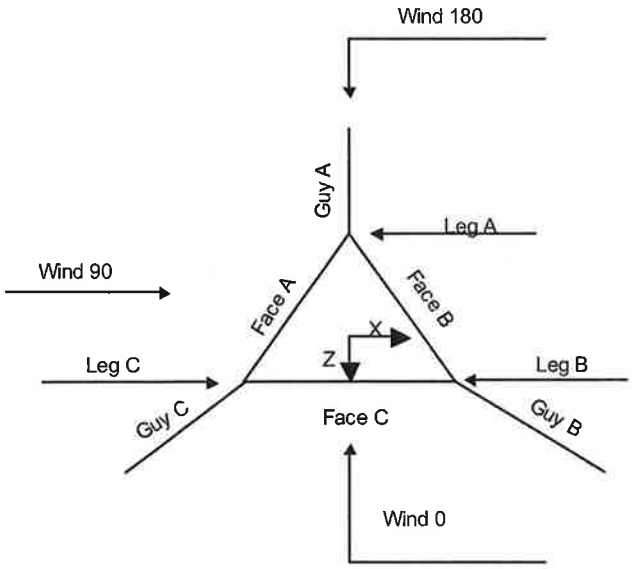
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 190.60 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 3.46 ft at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

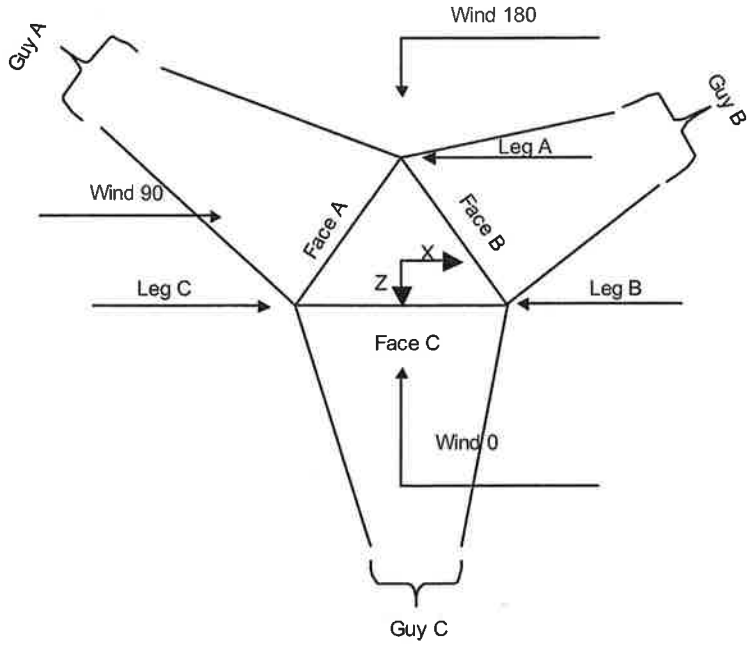
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 2.
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				



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	190.60-175.35			3.46	1	15.25
T2	175.35-160.10			3.46	1	15.25
T3	160.10-140.10			3.46	1	20.00
T4	140.10-120.10			3.46	1	20.00
T5	120.10-100.10			3.46	1	20.00
T6	100.10-80.10			3.46	1	20.00
T7	80.10-60.10			3.46	1	20.00
T8	60.10-40.10			3.46	1	20.00
T9	40.10-20.10			3.46	1	20.00
T10	20.10-4.85			3.46	1	15.25
T11	4.85-0.00			3.46	1	4.85

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	190.60-175.35	2.44	K Brace Left	No	Yes	7.3750	0.0000
T2	175.35-160.10	2.44	K Brace Left	No	Yes	7.3750	0.0000
T3	160.10-140.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T4	140.10-120.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T5	120.10-100.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T6	100.10-80.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T7	80.10-60.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T8	60.10-40.10	2.42	K Brace Left	No	Yes	7.3750	0.0000
T9	40.10-20.10	2.42	K Brace Left	No	Yes	7.3750	0.0000
T10	20.10-4.85	2.44	K Brace Left	No	Yes	7.3750	0.0000
T11	4.85-0.00	1.17	X Brace	No	Yes	8.0000	8.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 190.60-175.35	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T2 175.35-160.10	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T3 160.10-140.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T4 140.10-120.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T5 120.10-100.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T6 100.10-80.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T7 80.10-60.10	Pipe	ROHN 2 EH	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T8 60.10-40.10	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T9 40.10-20.10	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T10 20.10-4.85	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T11 4.85-0.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe		A53-B-42 (42 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 190.60-175.35	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T2 175.35-160.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T3 160.10-140.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T4 140.10-120.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T5 120.10-100.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T6 100.10-80.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T7 80.10-60.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T8 60.10-40.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T9 40.10-20.10	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T10 20.10-4.85	Pipe	P1.5x.058	A53-B-42 (42 ksi)	Pipe	P1.5x.058	A53-B-42 (42 ksi)
T11 4.85-0.00	Flat Bar	14x3/16	A36 (36 ksi)	Flat Bar	14x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T11 4.85-0.00	2	Flat Bar	14x3/16	A36 (36 ksi)	Flat Bar		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 190.60-175.35	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 175.35-160.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 160.10-140.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 140.10-120.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 120.10-100.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 100.10-80.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 80.10-60.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 60.10-40.10	0.00	0.0000	A36 (36 ksi)	1	1	1	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
T9 40.10-20.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.10-4.85	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T11 4.85-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	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	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
190.60-175.35				1	1	1	1	1	1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
175.35-160.10				1	1	1	1	1	1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
160.10-140.10				1	1	1	1	1	1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
140.10-120.10				1	1	1	1	1	1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
120.10-100.10				1	1	1	1	1	1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
100.10-80.10				1	1	1	1	1	1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
80.10-60.10				1	1	1	1	1	1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
60.10-40.10				1	1	1	1	1	1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
40.10-20.10				1	1	1	1	1	1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
20.10-4.85				1	1	1	1	1	1	1	1	1	1	1	1
T11 4.85-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	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	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	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
190.60-175.35														

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
T2 175.35-160.10	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 160.10-140.10	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 140.10-120.10	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 120.10-100.10	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 100.10-80.10	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 80.10-60.10	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
T8 60.10-40.10	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
T9 40.10-20.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.10-4.85	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 4.85-0.00	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	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 190.60-175.35	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T2 175.35-160.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T3 160.10-140.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T4 140.10-120.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T5 120.10-100.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T6 100.10-80.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T7 80.10-60.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T8 60.10-40.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T9 40.10-20.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T10 20.10-4.85	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T11 4.85-0.00	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000

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 190.60-175.35	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 175.35-160.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.10-140.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.10-120.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.10-100.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 100.10-80.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.10-60.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.10-40.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.10-20.10	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.10-4.85	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 4.85-0.00	Flange	0.7500 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
189.985	EHS	A	1/2	2.69	10%	21000	0.517	209.81	96.50	0.0000	2.46	100%
		B	1/2	2.69	10%	21000	0.517	217.41	99.25	0.0000	-4.67	100%
		C	1/2	2.69	10%	21000	0.517	217.75	99.00	0.0000	-5.17	100%
139.485	EHS	A	1/2	2.69	10%	21000	0.517	166.31	96.50	0.0000	2.46	100%
		B	1/2	2.69	10%	21000	0.517	173.74	99.25	0.0000	-4.67	100%
		C	1/2	2.69	10%	21000	0.517	174.02	99.00	0.0000	-5.17	100%
87.3695	EHS	A	7/16	2.08	10%	21000	0.399	108.59	70.50	0.0000	3.00	100%
		B	7/16	2.08	10%	21000	0.399	106.43	68.25	0.0000	3.96	100%
		C	7/16	2.08	10%	21000	0.399	109.89	71.50	0.0000	2.13	100%
44.9464	EHS	A	3/8	1.54	10%	21000	0.273	80.25	70.50	0.0000	3.00	100%
		B	3/8	1.54	10%	21000	0.273	77.83	68.25	0.0000	3.96	100%
		C	3/8	1.54	10%	21000	0.273	81.56	71.50	0.0000	2.13	100%

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
189.985 139.485	Corner Torque Arm	7.17	0.0000	Channel	A36	Channel	C10x15.3

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
					(36 ksi)		
87.3695	Corner						
44.9464	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
189.99	A53-B-42 (42 ksi)	Pipe			No	A36 (36 ksi)	Flat Bar	4 1/2x3/8
139.49	A53-B-42 (42 ksi)	Pipe				A36 (36 ksi)	Flat Bar	
87.37	A53-B-42 (42 ksi)	Pipe			No	A36 (36 ksi)	Channel	C4x5.4
44.95	A53-B-42 (42 ksi)	Pipe			Yes	A36 (36 ksi)	Channel	C4x5.4

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
189.985	0.11	0.11	0.11		4.16 3.5 sec/pulse	4.46 3.6 sec/pulse	4.48 3.7 sec/pulse	
139.485	0.09	0.09	0.09		2.63 2.8 sec/pulse	2.86 2.9 sec/pulse	2.87 2.9 sec/pulse	
87.3695	0.04	0.04	0.04		1.12 1.8 sec/pulse	1.08 1.8 sec/pulse	1.15 1.9 sec/pulse	
44.9464	0.02	0.02	0.02		0.57 1.3 sec/pulse	0.54 1.3 sec/pulse	0.59 1.3 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
189.985	Yes	No			1	1	1	1
139.485	Yes	No	1	1	1	1	1	1
87.3695	Yes	No			1	1	1	1
44.9464	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
189.985	0.6250 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
139.485	0.6250 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
87.3695	0.6250 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
44.9464	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
189.985	A	96.22	25	19	0.5000
	B	92.66	25	19	0.5000
	C	92.41	25	19	0.5000
139.485	A	70.97	23	17	0.5000
	B	67.41	23	17	0.5000
	C	67.16	23	17	0.5000
87.3695	A	45.18	20	15	0.5000
	B	45.66	20	15	0.5000
	C	44.75	20	15	0.5000
44.9464	A	23.97	18	14	0.5000
	B	24.45	18	14	0.5000
	C	23.54	18	14	0.5000

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom K	F_x K	F_y K	F_z K	M_x kip-ft	M_y kip-ft	M_z kip-ft
189.985	A	63.2542	2.79 2.69	0.00	2.50	-1.23	-4.99	0.00	0.00
	B	63.4524	2.79 2.69	1.06	2.51	0.61	2.50	0.00	-4.34
	C	63.5700	2.79 2.69	-1.06	2.51	0.61	2.51	0.00	4.34
			Sum:	**0.00**	7.52	**-0.01**	**0.02**	0.00	**0.00**
139.485	A	55.4083	2.76 2.69	-0.06	2.29	-1.55	-4.73	5.66	-8.20
	A	55.4083	2.76 2.69	0.06	2.29	-1.55	-4.73	-5.66	8.20
	B	55.9967	2.76 2.69	1.35	2.31	0.71	9.54	5.58	0.00
	B	55.9967	2.76 2.69	1.29	2.31	0.81	-4.77	-5.58	-8.27

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
	C	56.1568	2.76 2.69	-1.29	2.31	0.81	-4.78	5.56	8.28
	C	56.1568	2.76 2.69	-1.34	2.31	0.71	9.56	-5.56	0.00
			Sum:	**0.01**	13.80	**-0.05**	**0.09**	0.00	**0.02**
87.3695	A	50.9253	2.11 2.08	0.00	1.65	-1.32	-3.29	0.00	0.00
	B	51.5393	2.11 2.08	1.13	1.66	0.65	1.66	0.00	-2.88
	C	50.8082	2.11 2.08	-1.15	1.65	0.66	1.64	0.00	2.85
			Sum:	**-0.02**	4.96	**-0.01**	**0.01**	0.00	**-0.03**
44.9464	A	31.4801	1.55 1.54	0.00	0.82	-1.32	-1.63	0.00	0.00
	B	31.7421	1.55 1.54	1.14	0.82	0.66	0.82	0.00	-1.42
	C	31.6374	1.55 1.54	-1.14	0.82	0.66	0.82	0.00	1.42
			Sum:	**-0.00**	2.46	**-0.00**	**0.01**	0.00	**-0.00**

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
189.985	A	63.2542	3.93 3.72	0.00	3.53	-1.72	-7.05	0.00	0.00
	B	63.4524	3.94 3.72	1.48	3.55	0.85	3.54	0.00	-6.13
	C	63.5700	3.94 3.72	-1.47	3.55	0.85	3.54	0.00	6.14
			Sum:	**0.01**	10.63	**-0.01**	**0.03**	0.00	**0.01**
139.485	A	55.4083	3.89 3.73	-0.08	3.23	-2.16	-6.68	7.92	-11.58
	A	55.4083	3.89 3.73	0.08	3.23	-2.16	-6.68	-7.92	11.58
	B	55.9967	3.90 3.73	1.88	3.26	1.00	13.50	7.80	0.00
	B	55.9967	3.90 3.73	1.81	3.26	1.13	-6.75	-7.80	-11.69
	C	56.1568	3.90 3.73	-1.80	3.27	1.13	-6.76	7.77	11.71
	C	56.1568	3.90 3.73	-1.88	3.27	0.99	13.52	-7.77	0.00
			Sum:	**0.02**	19.51	**-0.07**	**0.14**	0.00	**0.02**
87.3695	A	50.9253	2.96 2.88	0.00	2.32	-1.84	-4.63	0.00	0.00
	B	51.5393	2.96 2.88	1.57	2.34	0.91	2.33	0.00	-4.04
	C	50.8082	2.96 2.88	-1.60	2.32	0.92	2.31	0.00	4.01
			Sum:	**-0.03**	6.98	**-0.01**	**0.01**	0.00	**-0.03**

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
44.9464	A	31.4801	2.14 2.11	0.00	1.14	-1.81	-2.28	0.00	0.00
	B	31.7421	2.14 2.10	1.56	1.15	0.90	1.15	0.00	-1.98
	C	31.6374	2.14 2.11	-1.57	1.15	0.90	1.15	0.00	1.98
			Sum:	**-0.00**	3.44	**-0.00**	**0.01**	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
189.985	A	63.2542	2.79 2.69	0.00	2.50	-1.23	-4.99	0.00	0.00
	B	63.4524	2.79 2.69	1.06	2.51	0.61	2.50	0.00	-4.34
	C	63.5700	2.79 2.69	-1.06	2.51	0.61	2.51	0.00	4.34
			Sum:	**0.00**	7.52	**-0.01**	**0.02**	0.00	**0.00**
139.485	A	55.4083	2.76 2.69	-0.06	2.29	-1.55	-4.73	5.66	-8.20
	A	55.4083	2.76 2.69	0.06	2.29	-1.55	-4.73	-5.66	8.20
	B	55.9967	2.76 2.69	1.35	2.31	0.71	9.54	5.58	0.00
	B	55.9967	2.76 2.69	1.29	2.31	0.81	-4.77	-5.58	-8.27
	C	56.1568	2.76 2.69	-1.29	2.31	0.81	-4.78	5.56	8.28
	C	56.1568	2.76 2.69	-1.34	2.31	0.71	9.56	-5.56	0.00
			Sum:	**0.01**	13.80	**-0.05**	**0.09**	0.00	**0.02**
87.3695	A	50.9253	2.11 2.08	0.00	1.65	-1.32	-3.29	0.00	0.00
	B	51.5393	2.11 2.08	1.13	1.66	0.65	1.66	0.00	-2.88
	C	50.8082	2.11 2.08	-1.15	1.65	0.66	1.64	0.00	2.85
			Sum:	**-0.02**	4.96	**-0.01**	**0.01**	0.00	**-0.03**
44.9464	A	31.4801	1.55 1.54	0.00	0.82	-1.32	-1.63	0.00	0.00
	B	31.7421	1.55 1.54	1.14	0.82	0.66	0.82	0.00	-1.42
	C	31.6374	1.55 1.54	-1.14	0.82	0.66	0.82	0.00	1.42
			Sum:	**-0.00**	2.46	**-0.00**	**0.01**	0.00	**-0.00**

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension K	0 F Intercept ft	20 F Initial Tension K	20 F Intercept ft	40 F Initial Tension K	40 F Intercept ft	60 F Initial Tension K	60 F Intercept ft	80 F Initial Tension K	80 F Intercept ft	100 F Initial Tension K	100 F Intercept ft	120 F Initial Tension K	120 F Intercept ft
189.985	A	94.50	187.53	2.932	3.82	2.851	3.93	2.771	4.04	2.690	4.16	2.610	4.29	2.530	4.42	2.450	4.56
	B	97.25	194.66	2.929	4.10	2.849	4.22	2.769	4.34	2.690	4.46	2.611	4.60	2.532	4.74	2.454	4.89
	C	97.00	195.16	2.927	4.12	2.848	4.23	2.769	4.35	2.690	4.48	2.612	4.61	2.533	4.75	2.456	4.90
139.485	A	94.50	137.03	3.076	2.30	2.947	2.40	2.818	2.51	2.690	2.63	2.562	2.76	2.435	2.90	2.310	3.05
	B	97.25	144.16	3.064	2.52	2.939	2.62	2.814	2.74	2.690	2.86	2.566	3.00	2.443	3.15	2.321	3.31
	C	97.00	144.66	3.061	2.53	2.937	2.63	2.813	2.75	2.690	2.87	2.567	3.01	2.445	3.16	2.324	3.32
87.3695	A	68.50	84.37	2.452	0.95	2.328	1.00	2.204	1.06	2.080	1.12	1.957	1.19	1.834	1.27	1.712	1.36
	B	66.25	83.41	2.442	0.92	2.321	0.97	2.201	1.02	2.080	1.08	1.960	1.14	1.840	1.22	1.721	1.30
	C	69.50	85.24	2.454	0.98	2.329	1.03	2.204	1.09	2.080	1.15	1.956	1.22	1.833	1.30	1.710	1.40
44.9464	A	68.50	41.95	2.008	0.44	1.852	0.47	1.696	0.52	1.540	0.57	1.385	0.63	1.231	0.71	1.078	0.81
	B	66.25	40.99	2.006	0.41	1.850	0.45	1.695	0.49	1.540	0.54	1.386	0.60	1.232	0.67	1.080	0.76
	C	69.50	42.82	2.007	0.45	1.851	0.49	1.695	0.53	1.540	0.59	1.386	0.65	1.232	0.73	1.080	0.84

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 1/4 (T-Mobile - Existing)	A	Yes	Ar (CfAe)	140.00 - 8.00	0.5000	-0.2	6	6	1.5500	1.5500		0.66
HYBRIFLEX 1-5/8" (Verizon - Proposed)	C	Yes	Ar (CfAe)	186.00 - 8.00	0.5000	-0.3	2	2	1.9800	1.9800		1.90

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	190.60-175.35	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	3.515	0.000	0.000	0.000	0.04
T2	175.35-160.10	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	5.032	0.000	0.000	0.000	0.06
T3	160.10-140.10	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T4	140.10-120.10	A	15.422	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T5	120.10-100.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T6	100.10-80.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T7	80.10-60.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00

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	6.600	0.000	0.000	0.000	0.08
T8	60.10-40.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T9	40.10-20.10	A	15.500	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.08
T10	20.10-4.85	A	9.377	0.000	0.000	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	3.993	0.000	0.000	0.000	0.05
T11	4.85-0.00	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

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	190.60-175.35	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		5.290	0.000	0.000	0.000	0.07
T2	175.35-160.10	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		7.574	0.000	0.000	0.000	0.10
T3	160.10-140.10	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T4	140.10-120.10	A	0.500	25.372	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T5	120.10-100.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T6	100.10-80.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T7	80.10-60.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T8	60.10-40.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T9	40.10-20.10	A	0.500	25.500	0.000	0.000	0.000	0.23
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	0.000	0.000	0.000	0.14
T10	20.10-4.85	A	0.500	15.428	0.000	0.000	0.000	0.14
		B		0.000	0.000	0.000	0.000	0.00
		C		6.010	0.000	0.000	0.000	0.08
T11	4.85-0.00	A	0.500	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

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	190.60-175.35	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.240	0.632	0.086	0.130
T2	175.35-160.10	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.385	0.967	0.000	0.000
T3	160.10-140.10	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.888	2.229	0.000	0.000
T4	140.10-120.10	A	2.076	5.692	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.888	2.229	0.000	0.000
T5	120.10-100.10	A	2.086	5.721	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.888	2.229	0.000	0.000
T6	100.10-80.10	A	2.086	5.827	0.258	0.425
		B	0.000	0.000	0.000	0.000
		C	0.888	2.270	0.110	0.166
T7	80.10-60.10	A	2.086	5.721	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.888	2.229	0.000	0.000
T8	60.10-40.10	A	1.140	3.232	0.258	0.425
		B	0.000	0.000	0.000	0.000
		C	0.485	1.259	0.110	0.166
T9	40.10-20.10	A	1.140	3.126	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.485	1.218	0.000	0.000
T10	20.10-4.85	A	0.718	1.969	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.306	0.767	0.000	0.000
T11	4.85-0.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	190.60-175.35	1.0228	1.1066	1.0196	1.1031
T2	175.35-160.10	1.5287	1.6539	1.4970	1.6197
T3	160.10-140.10	1.2744	1.3789	1.1239	1.2160
T4	140.10-120.10	-1.9884	1.2209	-2.0153	1.0932
T5	120.10-100.10	-2.0016	1.2202	-2.0281	1.0927
T6	100.10-80.10	-1.8843	1.1487	-1.9129	1.0306
T7	80.10-60.10	-2.0003	1.2194	-2.0272	1.0922
T8	60.10-40.10	-2.1972	1.3395	-2.4322	1.3104
T9	40.10-20.10	-2.3380	1.4253	-2.5789	1.3894
T10	20.10-4.85	-1.9638	1.1971	-2.1640	1.1659
T11	4.85-0.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-70063/6CF	A	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			-6.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	A	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	A	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	A	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	B	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			-6.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	B	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	B	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	B	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	C	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			-6.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	C	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-70063/6CF	C	From Face	3.00	0.0000	187.00	No Ice	7.73	4.16	0.02
(Verizon - Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	C	From Face	3.00	0.0000	187.00	No Ice	4.79	3.62	0.02
(Verizon - Proposed)			4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
RRH2x40-07-U	A	From Face	3.00	0.0000	187.00	No Ice	2.25	1.23	0.05
(Verizon - Proposed)			0.00			1/2" Ice	2.45	1.39	0.07
			0.00						
RRH2x40-AWS	A	From Face	3.00	0.0000	187.00	No Ice	2.52	1.59	0.04
(Verizon - Proposed)			-6.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RRH2x40-07-U	B	From Face	3.00	0.0000	187.00	No Ice	2.25	1.23	0.05
(Verizon - Proposed)			0.00			1/2" Ice	2.45	1.39	0.07
			0.00						
RRH2x40-AWS	B	From Face	3.00	0.0000	187.00	No Ice	2.52	1.59	0.04
(Verizon - Proposed)			-6.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RRH2x40-07-U	C	From Face	3.00	0.0000	187.00	No Ice	2.25	1.23	0.05
(Verizon - Proposed)			0.00			1/2" Ice	2.45	1.39	0.07
			0.00						
RRH2x40-AWS	C	From Face	3.00	0.0000	187.00	No Ice	2.52	1.59	0.04
(Verizon - Proposed)			-6.00			1/2" Ice	2.75	1.80	0.06
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB-T1-6Z-8AB-0Z	A	From Face	3.00	0.0000	187.00	No Ice	5.60	2.33	0.04
(Verizon - Proposed)			0.00			1/2" Ice	5.92	2.56	0.08
			0.00						
Pirod 12' T-Frame Sector Mount (1)	A	From Leg	1.00	0.0000	187.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon - proposed)			0.00						
Pirod 12' T-Frame Sector Mount (1)	B	From Leg	1.00	0.0000	187.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon - proposed)			0.00						
Pirod 12' T-Frame Sector Mount (1)	C	From Leg	1.00	0.0000	187.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon - proposed)			0.00						
(2) RR90-17-02DP	A	From Leg	3.50	0.0000	140.00	No Ice	4.36	1.97	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	4.77	2.31	0.04
			0.00						
(2) RR90-17-02DP	B	From Leg	3.50	0.0000	140.00	No Ice	4.36	1.97	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	4.77	2.31	0.04
			0.00						
(2) RR90-17-02DP	C	From Leg	3.50	0.0000	140.00	No Ice	4.36	1.97	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	4.77	2.31	0.04
			0.00						
(2) S20057A1 PCS MHA	A	From Leg	2.00	0.0000	140.00	No Ice	0.82	0.39	0.01
(T-Mobile - Existing)			0.00			1/2" Ice	0.95	0.49	0.02
			0.00						
(2) S20057A1 PCS MHA	B	From Leg	2.00	0.0000	140.00	No Ice	0.82	0.39	0.01
(T-Mobile - Existing)			0.00			1/2" Ice	0.95	0.49	0.02
			0.00						
(2) S20057A1 PCS MHA	C	From Leg	2.00	0.0000	140.00	No Ice	0.82	0.39	0.01
(T-Mobile - Existing)			0.00			1/2" Ice	0.95	0.49	0.02
			0.00						
ROHN 4-ft Side Arm	A	From Leg	2.00	0.0000	140.00	No Ice	5.28	5.28	0.07
(T-Mobile - Existing)			0.00			1/2" Ice	7.88	7.88	0.08
			0.00						
ROHN 4-ft Side Arm	B	From Leg	2.00	0.0000	140.00	No Ice	5.28	5.28	0.07
(T-Mobile - Existing)			0.00			1/2" Ice	7.88	7.88	0.08
			0.00						
ROHN 4-ft Side Arm	C	From Leg	2.00	0.0000	140.00	No Ice	5.28	5.28	0.07
(T-Mobile - Existing)			0.00			1/2" Ice	7.88	7.88	0.08
			0.00						

Tower Pressures - No Ice

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	182.98	1.631	30	56.388	A	1.207	10.664	7.307	61.56	0.000	0.000
190.60-175.35					B	1.207	10.664		61.56	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	1.120	13.938		48.53	0.000	0.000
T2 175.35-160.10	167.73	1.591	29	56.388	A	0.000	11.066	7.307	66.03	0.000	0.000
					B	0.000	11.066		66.03	0.000	0.000
					C	0.000	15.713		46.50	0.000	0.000
T3 160.10-140.10	150.10	1.542	29	73.118	A	0.000	16.693	7.917	47.42	0.000	0.000
					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T4 140.10-120.10	130.10	1.48	27	73.118	A	0.000	30.040	7.917	26.35	0.000	0.000
					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T5 120.10-100.10	110.10	1.411	26	73.118	A	0.000	30.107	7.917	26.30	0.000	0.000
					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T6 100.10-80.10	90.10	1.332	25	73.118	A	0.828	30.107	7.917	25.59	0.000	0.000
					B	1.087	16.693		44.53	0.000	0.000
					C	0.977	22.405		33.86	0.000	0.000
T7 80.10-60.10	70.10	1.24	23	73.127	A	0.000	30.122	7.933	26.34	0.000	0.000
					B	0.000	16.709		47.48	0.000	0.000
					C	0.000	22.420		35.38	0.000	0.000
T8 60.10-40.10	50.10	1.127	21	73.952	A	0.814	28.678	9.583	32.49	0.000	0.000
					B	1.073	14.318		62.27	0.000	0.000
					C	0.963	20.432		44.79	0.000	0.000
T9 40.10-20.10	30.10	1	18	73.952	A	0.000	28.678	9.583	33.42	0.000	0.000
					B	0.000	14.318		66.93	0.000	0.000
					C	0.000	20.432		46.90	0.000	0.000
T10 20.10-4.85	12.48	1	18	56.373	A	0.000	19.723	7.305	37.04	0.000	0.000
					B	0.000	11.064		66.03	0.000	0.000
					C	0.000	14.751		49.53	0.000	0.000
T11 4.85-0.00	2.43	1	18	9.627	A	6.951	2.515	2.515	26.57	0.000	0.000
					B	6.951	2.515		26.57	0.000	0.000
					C	6.951	2.515		26.57	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.117$

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 190.60-175.35	182.98	1.631	23	0.5000	57.659	A	1.207	15.711	9.849	58.22	0.000	0.000
						B	1.207	15.711		58.22	0.000	0.000
						C	1.077	20.369		45.93	0.000	0.000
T2 175.35-160.10	167.73	1.591	22	0.5000	57.659	A	0.000	16.113	9.849	61.12	0.000	0.000
						B	0.000	16.113		61.12	0.000	0.000
						C	0.000	22.721		43.35	0.000	0.000
T3 160.10-140.10	150.10	1.542	21	0.5000	74.785	A	0.000	25.878	11.250	43.47	0.000	0.000
						B	0.000	25.878		43.47	0.000	0.000
						C	0.000	33.583		33.50	0.000	0.000
T4 140.10-120.10	130.10	1.48	21	0.5000	74.785	A	0.000	45.558	11.250	24.69	0.000	0.000
						B	0.000	25.878		43.47	0.000	0.000
						C	0.000	33.583		33.50	0.000	0.000
T5 120.10-100.10	110.10	1.411	20	0.5000	74.785	A	0.000	45.657	11.250	24.64	0.000	0.000
						B	0.000	25.878		43.47	0.000	0.000
						C	0.000	33.583		33.50	0.000	0.000
T6 100.10-80.10	90.10	1.332	18	0.5000	74.785	A	0.662	45.822	11.250	24.20	0.000	0.000

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
						B	1.087	26.149		41.31	0.000	0.000
						C	0.921	33.813		32.39	0.000	0.000
T7 80.10-60.10	70.10	1.24	17	0.5000	74.793	A	0.000	45.672	11.267	24.67	0.000	0.000
						B	0.000	25.893		43.51	0.000	0.000
						C	0.000	33.597		33.53	0.000	0.000
T8 60.10-40.10	50.10	1.127	16	0.5000	75.618	A	0.648	43.343	12.917	29.36	0.000	0.000
						B	1.073	21.076		58.32	0.000	0.000
						C	0.907	29.750		42.13	0.000	0.000
T9 40.10-20.10	30.10	1	14	0.5000	75.618	A	0.000	43.182	12.917	29.91	0.000	0.000
						B	0.000	20.808		62.08	0.000	0.000
						C	0.000	29.523		43.75	0.000	0.000
T10 20.10-4.85	12.48	1	14	0.5000	57.644	A	0.000	29.568	9.846	33.30	0.000	0.000
						B	0.000	16.110		61.12	0.000	0.000
						C	0.000	21.353		46.11	0.000	0.000
T11 4.85-0.00	2.43	1	14	0.5000	10.056	A	6.951	3.886	3.390	31.28	0.000	0.000
						B	6.951	3.886		31.28	0.000	0.000
						C	6.951	3.886		31.28	0.000	0.000

Tower Pressure - Service

$G_H = 1.117$

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	182.98	1.631	10	56.388	A	1.207	10.664	7.307	61.56	0.000	0.000
190.60-175.35					B	1.207	10.664		61.56	0.000	0.000
					C	1.120	13.938		48.53	0.000	0.000
T2	167.73	1.591	10	56.388	A	0.000	11.066	7.307	66.03	0.000	0.000
175.35-160.10					B	0.000	11.066		66.03	0.000	0.000
					C	0.000	15.713		46.50	0.000	0.000
T3	150.10	1.542	10	73.118	A	0.000	16.693	7.917	47.42	0.000	0.000
160.10-140.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T4	130.10	1.48	9	73.118	A	0.000	30.040	7.917	26.35	0.000	0.000
140.10-120.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T5	110.10	1.411	9	73.118	A	0.000	30.107	7.917	26.30	0.000	0.000
120.10-100.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	22.405		35.33	0.000	0.000
T6	90.10	1.332	9	73.118	A	0.828	30.107	7.917	25.59	0.000	0.000
100.10-80.10					B	1.087	16.693		44.53	0.000	0.000
					C	0.977	22.405		33.86	0.000	0.000
T7 80.10-60.10	70.10	1.24	8	73.127	A	0.000	30.122	7.933	26.34	0.000	0.000
					B	0.000	16.709		47.48	0.000	0.000
					C	0.000	22.420		35.38	0.000	0.000
T8 60.10-40.10	50.10	1.127	7	73.952	A	0.814	28.678	9.583	32.49	0.000	0.000
					B	1.073	14.318		62.27	0.000	0.000
					C	0.963	20.432		44.79	0.000	0.000
T9 40.10-20.10	30.10	1	6	73.952	A	0.000	28.678	9.583	33.42	0.000	0.000
					B	0.000	14.318		66.93	0.000	0.000
					C	0.000	20.432		46.90	0.000	0.000
T10 20.10-4.85	12.48	1	6	56.373	A	0.000	19.723	7.305	37.04	0.000	0.000
					B	0.000	11.064		66.03	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
T11 4.85-0.00	2.43	1	6	9.627	C	0.000	14.751		49.53	0.000	0.000
					A	6.951	2.515	2.515	26.57	0.000	0.000
					B	6.951	2.515		26.57	0.000	0.000
					C	6.951	2.515		26.57	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	0.04	0.49	A	0.211	2.561	0.593	1	1	7.526	0.77	50.50	C
190.60-175.35			B	0.211	2.561	0.593	1	1	7.526			
			C	0.267	2.387	0.606	1	1	9.572			
T2	0.06	0.44	A	0.196	2.609	0.59	1	1	6.525	0.74	48.62	C
175.35-160.10			B	0.196	2.609	0.59	1	1	6.525			
			C	0.279	2.354	0.61	1	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	1	1	9.959	1.00	50.24	C
160.10-140.10			B	0.228	2.504	0.597	1	1	9.959			
			C	0.306	2.279	0.618	1	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	1	1	19.709	1.23	61.55	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	1	1	9.959			
			C	0.306	2.279	0.618	1	1	13.844			
T5	0.16	0.42	A	0.412	2.041	0.656	1	1	19.764	1.18	58.80	A
120.10-100.10			B	0.228	2.504	0.597	1	1	9.959			
			C	0.306	2.279	0.618	1	1	13.844			
T6	0.16	0.48	A	0.423	2.02	0.661	1	1	20.738	1.15	57.66	A
100.10-80.10			B	0.243	2.458	0.6	1	1	11.105			
			C	0.32	2.245	0.622	1	1	14.916			
T7	0.16	0.50	A	0.412	2.041	0.657	1	1	19.777	1.03	51.71	A
80.10-60.10			B	0.228	2.504	0.597	1	1	9.969			
			C	0.307	2.279	0.618	1	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	1	1	19.487	0.94	46.87	A
60.10-40.10			B	0.208	2.569	0.592	1	1	9.550			
			C	0.289	2.325	0.613	1	1	13.482			
T9	0.16	0.46	A	0.388	2.089	0.647	1	1	18.546	0.80	40.02	A
40.10-20.10			B	0.194	2.617	0.589	1	1	8.435			
			C	0.276	2.361	0.609	1	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	1	1	12.473	0.56	36.71	A
20.10-4.85			B	0.196	2.609	0.59	1	1	6.524			
			C	0.262	2.403	0.605	1	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	1	1	9.466	0.40*	81.95	C
			B	0.983	2.066	1	1	1	9.466			
			C	0.983	2.066	1	1	1	9.466			
Sum Weight:	1.20	5.12			*2A_g limit					9.81		

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

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	0.04	0.49	A	0.211	2.561	0.593	0.8	1	7.285	0.75	49.32	C
190.60-175.35			B	0.211	2.561	0.593	0.8	1	7.285			
			C	0.267	2.387	0.606	0.8	1	9.348			
T2	0.06	0.44	A	0.196	2.609	0.59	0.8	1	6.525	0.74	48.62	C
175.35-160.10			B	0.196	2.609	0.59	0.8	1	6.525			
			C	0.279	2.354	0.61	0.8	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	0.8	1	9.959	1.00	50.24	C
160.10-140.10			B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	0.8	1	19.709	1.23	61.55	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T5	0.16	0.42	A	0.412	2.041	0.656	0.8	1	19.764	1.18	58.80	A
120.10-100.10			B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T6	0.16	0.48	A	0.423	2.02	0.661	0.8	1	20.572	1.14	57.20	A
100.10-80.10			B	0.243	2.458	0.6	0.8	1	10.888			
			C	0.32	2.245	0.622	0.8	1	14.721			
T7	0.16	0.50	A	0.412	2.041	0.657	0.8	1	19.777	1.03	51.71	A
80.10-60.10			B	0.228	2.504	0.597	0.8	1	9.969			
			C	0.307	2.279	0.618	0.8	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	0.8	1	19.324	0.93	46.48	A
60.10-40.10			B	0.208	2.569	0.592	0.8	1	9.336			
			C	0.289	2.325	0.613	0.8	1	13.289			
T9	0.16	0.46	A	0.388	2.089	0.647	0.8	1	18.546	0.80	40.02	A
40.10-20.10			B	0.194	2.617	0.589	0.8	1	8.435			
			C	0.276	2.361	0.609	0.8	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	0.8	1	12.473	0.56	36.71	A
20.10-4.85			B	0.196	2.609	0.59	0.8	1	6.524			
			C	0.262	2.403	0.605	0.8	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	0.8	1	8.075	0.34	71.00	C
			B	0.983	2.066	1	0.8	1	8.075			
			C	0.983	2.066	1	0.8	1	8.075			
Sum Weight:	1.20	5.12								9.72		

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	0.04	0.49	A	0.211	2.561	0.593	0.85	1	7.345	0.76	49.62	C
190.60-175.35			B	0.211	2.561	0.593	0.85	1	7.345			
			C	0.267	2.387	0.606	0.85	1	9.404			
T2	0.06	0.44	A	0.196	2.609	0.59	0.85	1	6.525	0.74	48.62	C
175.35-160.10			B	0.196	2.609	0.59	0.85	1	6.525			
			C	0.279	2.354	0.61	0.85	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	0.85	1	9.959	1.00	50.24	C
160.10-140.10			B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	0.85	1	19.709	1.23	61.55	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			
T5	0.16	0.42	A	0.412	2.041	0.656	0.85	1	19.764	1.18	58.80	A
120.10-100.10			B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			

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
T6	0.16	0.48	A	0.423	2.02	0.661	0.85	1	20.614	1.15	57.32	A
100.10-80.10			B	0.243	2.458	0.6	0.85	1	10.942			
			C	0.32	2.245	0.622	0.85	1	14.769			
T7	0.16	0.50	A	0.412	2.041	0.657	0.85	1	19.777	1.03	51.71	A
80.10-60.10			B	0.228	2.504	0.597	0.85	1	9.969			
			C	0.307	2.279	0.618	0.85	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	0.85	1	19.365	0.93	46.57	A
60.10-40.10			B	0.208	2.569	0.592	0.85	1	9.389			
			C	0.289	2.325	0.613	0.85	1	13.337			
T9	0.16	0.46	A	0.388	2.089	0.647	0.85	1	18.546	0.80	40.02	A
40.10-20.10			B	0.194	2.617	0.589	0.85	1	8.435			
			C	0.276	2.361	0.609	0.85	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	0.85	1	12.473	0.56	36.71	A
20.10-4.85			B	0.196	2.609	0.59	0.85	1	6.524			
			C	0.262	2.403	0.605	0.85	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	0.85	1	8.423	0.36	74.06	C
			B	0.983	2.066	1	0.85	1	8.423			
			C	0.983	2.066	1	0.85	1	8.423			
Sum Weight:	1.20	5.12								9.74		

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 ft²	F K	w plf	Ctrl. Face
T1	0.07	0.71	A	0.293	2.314	0.614	1	1	10.852	0.76	49.69	C
190.60-175.35			B	0.293	2.314	0.614	1	1	10.852			
			C	0.372	2.122	0.641	1	1	14.124			
T2	0.10	0.65	A	0.279	2.352	0.61	1	1	9.826	0.75	49.51	C
175.35-160.10			B	0.279	2.352	0.61	1	1	9.826			
			C	0.394	2.076	0.649	1	1	14.750			
T3	0.14	0.80	A	0.346	2.181	0.631	1	1	16.331	1.07	53.30	C
160.10-140.10			B	0.346	2.181	0.631	1	1	16.331			
			C	0.449	1.975	0.673	1	1	22.596			
T4	0.36	0.80	A	0.609	1.799	0.759	1	1	34.591	1.43	71.33	A
140.10-120.10		TA 0.47	B	0.346	2.181	0.631	1	1	16.331			
			C	0.449	1.975	0.673	1	1	22.596			
T5	0.37	0.80	A	0.611	1.798	0.76	1	1	34.703	1.36	68.20	A
120.10-100.10			B	0.346	2.181	0.631	1	1	16.331			
			C	0.449	1.975	0.673	1	1	22.596			
T6	0.37	0.89	A	0.622	1.792	0.767	1	1	35.809	1.33	66.25	A
100.10-80.10			B	0.364	2.139	0.638	1	1	17.761			
			C	0.464	1.951	0.68	1	1	23.914			
T7	0.37	0.88	A	0.611	1.798	0.76	1	1	34.718	1.20	59.97	A
80.10-60.10			B	0.346	2.18	0.631	1	1	16.341			
			C	0.449	1.975	0.673	1	1	22.608			
T8	0.37	0.82	A	0.582	1.816	0.743	1	1	32.835	1.04	52.06	A
60.10-40.10			B	0.293	2.315	0.614	1	1	14.008			
			C	0.405	2.053	0.654	1	1	20.359			
T9	0.37	0.73	A	0.571	1.825	0.736	1	1	31.795	0.90	44.95	A
40.10-20.10			B	0.275	2.364	0.609	1	1	12.664			
			C	0.39	2.083	0.648	1	1	19.123			
T10	0.22	0.56	A	0.513	1.884	0.704	1	1	20.822	0.61	39.86	A
20.10-4.85			B	0.279	2.352	0.61	1	1	9.825			
			C	0.37	2.126	0.64	1	1	13.665			

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
T11 4.85-0.00	0.00	0.46	A	1	2.1	1	1	1	10.837	0.31*	64.21	C
			B	1	2.1	1	1	1	10.837			
			C	1	2.1	1	1	1	10.837			
Sum Weight:	2.73	8.56			*$2A_g$ limit					10.75		

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	0.07	0.71	A	0.293	2.314	0.614	0.8	1	10.611	0.75	48.93	C
190.60-175.35			B	0.293	2.314	0.614	0.8	1	10.611			
			C	0.372	2.122	0.641	0.8	1	13.909			
T2	0.10	0.65	A	0.279	2.352	0.61	0.8	1	9.826	0.75	49.51	C
175.35-160.10			B	0.279	2.352	0.61	0.8	1	9.826			
			C	0.394	2.076	0.649	0.8	1	14.750			
T3	0.14	0.80	A	0.346	2.181	0.631	0.8	1	16.331	1.07	53.30	C
160.10-140.10			B	0.346	2.181	0.631	0.8	1	16.331			
			C	0.449	1.975	0.673	0.8	1	22.596			
T4	0.36	0.80	A	0.609	1.799	0.759	0.8	1	34.591	1.43	71.33	A
140.10-120.10		TA 0.47	B	0.346	2.181	0.631	0.8	1	16.331			
			C	0.449	1.975	0.673	0.8	1	22.596			
T5	0.37	0.80	A	0.611	1.798	0.76	0.8	1	34.703	1.36	68.20	A
120.10-100.10			B	0.346	2.181	0.631	0.8	1	16.331			
			C	0.449	1.975	0.673	0.8	1	22.596			
T6	0.37	0.89	A	0.622	1.792	0.767	0.8	1	35.677	1.32	66.01	A
100.10-80.10			B	0.364	2.139	0.638	0.8	1	17.543			
			C	0.464	1.951	0.68	0.8	1	23.730			
T7	0.37	0.88	A	0.611	1.798	0.76	0.8	1	34.718	1.20	59.97	A
80.10-60.10			B	0.346	2.18	0.631	0.8	1	16.341			
			C	0.449	1.975	0.673	0.8	1	22.608			
T8	0.37	0.82	A	0.582	1.816	0.743	0.8	1	32.705	1.04	51.86	A
60.10-40.10			B	0.293	2.315	0.614	0.8	1	13.794			
			C	0.405	2.053	0.654	0.8	1	20.177			
T9	0.37	0.73	A	0.571	1.825	0.736	0.8	1	31.795	0.90	44.95	A
40.10-20.10			B	0.275	2.364	0.609	0.8	1	12.664			
			C	0.39	2.083	0.648	0.8	1	19.123			
T10	0.22	0.56	A	0.513	1.884	0.704	0.8	1	20.822	0.61	39.86	A
20.10-4.85			B	0.279	2.352	0.61	0.8	1	9.825			
			C	0.37	2.126	0.64	0.8	1	13.665			
T11 4.85-0.00	0.00	0.46	A	1	2.1	1	0.8	1	9.447	0.31	63.33	C
			B	1	2.1	1	0.8	1	9.447			
			C	1	2.1	1	0.8	1	9.447			
Sum Weight:	2.73	8.56								10.73		

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 ft²	F K	w plf	Ctrl. Face
T1	0.07	0.71	A	0.293	2.314	0.614	0.85	1	10.671	0.75	49.12	C
190.60-175.35			B	0.293	2.314	0.614	0.85	1	10.671			
			C	0.372	2.122	0.641	0.85	1	13.962			
T2	0.10	0.65	A	0.279	2.352	0.61	0.85	1	9.826	0.75	49.51	C
175.35-160.10			B	0.279	2.352	0.61	0.85	1	9.826			
			C	0.394	2.076	0.649	0.85	1	14.750			
T3	0.14	0.80	A	0.346	2.181	0.631	0.85	1	16.331	1.07	53.30	C
160.10-140.10			B	0.346	2.181	0.631	0.85	1	16.331			
			C	0.449	1.975	0.673	0.85	1	22.596			
T4	0.36	0.80	A	0.609	1.799	0.759	0.85	1	34.591	1.43	71.33	A
140.10-120.10		TA 0.47	B	0.346	2.181	0.631	0.85	1	16.331			
			C	0.449	1.975	0.673	0.85	1	22.596			
T5	0.37	0.80	A	0.611	1.798	0.76	0.85	1	34.703	1.36	68.20	A
120.10-100.10			B	0.346	2.181	0.631	0.85	1	16.331			
			C	0.449	1.975	0.673	0.85	1	22.596			
T6	0.37	0.89	A	0.622	1.792	0.767	0.85	1	35.710	1.32	66.07	A
100.10-80.10			B	0.364	2.139	0.638	0.85	1	17.598			
			C	0.464	1.951	0.68	0.85	1	23.776			
T7	0.37	0.88	A	0.611	1.798	0.76	0.85	1	34.718	1.20	59.97	A
80.10-60.10			B	0.346	2.18	0.631	0.85	1	16.341			
			C	0.449	1.975	0.673	0.85	1	22.608			
T8	0.37	0.82	A	0.582	1.816	0.743	0.85	1	32.738	1.04	51.91	A
60.10-40.10			B	0.293	2.315	0.614	0.85	1	13.847			
			C	0.405	2.053	0.654	0.85	1	20.223			
T9	0.37	0.73	A	0.571	1.825	0.736	0.85	1	31.795	0.90	44.95	A
40.10-20.10			B	0.275	2.364	0.609	0.85	1	12.664			
			C	0.39	2.083	0.648	0.85	1	19.123			
T10	0.22	0.56	A	0.513	1.884	0.704	0.85	1	20.822	0.61	39.86	A
20.10-4.85			B	0.279	2.352	0.61	0.85	1	9.825			
			C	0.37	2.126	0.64	0.85	1	13.665			
T11 4.85-0.00	0.00	0.46	A	1	2.1	1	0.85	1	9.794	0.31*	64.21	C
			B	1	2.1	1	0.85	1	9.794			
			C	1	2.1	1	0.85	1	9.794			
Sum Weight:	2.73	8.56			*2A_g limit					10.74		

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 ft²	F K	w plf	Ctrl. Face
T1	0.04	0.49	A	0.211	2.561	0.593	1	1	7.526	0.27	17.48	C
190.60-175.35			B	0.211	2.561	0.593	1	1	7.526			
			C	0.267	2.387	0.606	1	1	9.572			
T2	0.06	0.44	A	0.196	2.609	0.59	1	1	6.525	0.26	16.82	C
175.35-160.10			B	0.196	2.609	0.59	1	1	6.525			
			C	0.279	2.354	0.61	1	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	1	1	9.959	0.35	17.39	C
160.10-140.10			B	0.228	2.504	0.597	1	1	9.959			
			C	0.306	2.279	0.618	1	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	1	1	19.709	0.43	21.30	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	1	1	9.959			
			C	0.306	2.279	0.618	1	1	13.844			
T5	0.16	0.42	A	0.412	2.041	0.656	1	1	19.764	0.41	20.35	A
120.10-100.10			B	0.228	2.504	0.597	1	1	9.959			

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
			C	0.306	2.279	0.618	1	1	13.844			
T6	0.16	0.48	A	0.423	2.02	0.661	1	1	20.738	0.40	19.95	A
100.10-80.10			B	0.243	2.458	0.6	1	1	11.105			
			C	0.32	2.245	0.622	1	1	14.916			
T7	0.16	0.50	A	0.412	2.041	0.657	1	1	19.777	0.36	17.89	A
80.10-60.10			B	0.228	2.504	0.597	1	1	9.969			
			C	0.307	2.279	0.618	1	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	1	1	19.487	0.32	16.22	A
60.10-40.10			B	0.208	2.569	0.592	1	1	9.550			
			C	0.289	2.325	0.613	1	1	13.482			
T9	0.16	0.46	A	0.388	2.089	0.647	1	1	18.546	0.28	13.85	A
40.10-20.10			B	0.194	2.617	0.589	1	1	8.435			
			C	0.276	2.361	0.609	1	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	1	1	12.473	0.19	12.70	A
20.10-4.85			B	0.196	2.609	0.59	1	1	6.524			
			C	0.262	2.403	0.605	1	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	1	1	9.466	0.14*	28.36	C
			B	0.983	2.066	1	1	1	9.466			
			C	0.983	2.066	1	1	1	9.466			
Sum Weight:	1.20	5.12			*$2A_g$ limit					3.39		

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 ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.49	A	0.211	2.561	0.593	0.8	1	7.285	0.26	17.07	C
190.60-175.35			B	0.211	2.561	0.593	0.8	1	7.285			
			C	0.267	2.387	0.606	0.8	1	9.348			
T2	0.06	0.44	A	0.196	2.609	0.59	0.8	1	6.525	0.26	16.82	C
175.35-160.10			B	0.196	2.609	0.59	0.8	1	6.525			
			C	0.279	2.354	0.61	0.8	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	0.8	1	9.959	0.35	17.39	C
160.10-140.10			B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	0.8	1	19.709	0.43	21.30	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T5	0.16	0.42	A	0.412	2.041	0.656	0.8	1	19.764	0.41	20.35	A
120.10-100.10			B	0.228	2.504	0.597	0.8	1	9.959			
			C	0.306	2.279	0.618	0.8	1	13.844			
T6	0.16	0.48	A	0.423	2.02	0.661	0.8	1	20.572	0.40	19.79	A
100.10-80.10			B	0.243	2.458	0.6	0.8	1	10.888			
			C	0.32	2.245	0.622	0.8	1	14.721			
T7	0.16	0.50	A	0.412	2.041	0.657	0.8	1	19.777	0.36	17.89	A
80.10-60.10			B	0.228	2.504	0.597	0.8	1	9.969			
			C	0.307	2.279	0.618	0.8	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	0.8	1	19.324	0.32	16.08	A
60.10-40.10			B	0.208	2.569	0.592	0.8	1	9.336			
			C	0.289	2.325	0.613	0.8	1	13.289			
T9	0.16	0.46	A	0.388	2.089	0.647	0.8	1	18.546	0.28	13.85	A
40.10-20.10			B	0.194	2.617	0.589	0.8	1	8.435			
			C	0.276	2.361	0.609	0.8	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	0.8	1	12.473	0.19	12.70	A

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
20.10-4.85			B	0.196	2.609	0.59	0.8	1	6.524			
			C	0.262	2.403	0.605	0.8	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	0.8	1	8.075	0.12	24.57	C
			B	0.983	2.066	1	0.8	1	8.075			
			C	0.983	2.066	1	0.8	1	8.075			
Sum Weight:	1.20	5.12								3.36		

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	0.04	0.49	A	0.211	2.561	0.593	0.85	1	7.345	0.26	17.17	C
190.60-175.35			B	0.211	2.561	0.593	0.85	1	7.345			
			C	0.267	2.387	0.606	0.85	1	9.404			
T2	0.06	0.44	A	0.196	2.609	0.59	0.85	1	6.525	0.26	16.82	C
175.35-160.10			B	0.196	2.609	0.59	0.85	1	6.525			
			C	0.279	2.354	0.61	0.85	1	9.579			
T3	0.08	0.42	A	0.228	2.504	0.597	0.85	1	9.959	0.35	17.39	C
160.10-140.10			B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			
T4	0.15	0.42	A	0.411	2.043	0.656	0.85	1	19.709	0.43	21.30	A
140.10-120.10		TA 0.33	B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			
T5	0.16	0.42	A	0.412	2.041	0.656	0.85	1	19.764	0.41	20.35	A
120.10-100.10			B	0.228	2.504	0.597	0.85	1	9.959			
			C	0.306	2.279	0.618	0.85	1	13.844			
T6	0.16	0.48	A	0.423	2.02	0.661	0.85	1	20.614	0.40	19.83	A
100.10-80.10			B	0.243	2.458	0.6	0.85	1	10.942			
			C	0.32	2.245	0.622	0.85	1	14.769			
T7	0.16	0.50	A	0.412	2.041	0.657	0.85	1	19.777	0.36	17.89	A
80.10-60.10			B	0.228	2.504	0.597	0.85	1	9.969			
			C	0.307	2.279	0.618	0.85	1	13.855			
T8	0.16	0.51	A	0.399	2.066	0.651	0.85	1	19.365	0.32	16.12	A
60.10-40.10			B	0.208	2.569	0.592	0.85	1	9.389			
			C	0.289	2.325	0.613	0.85	1	13.337			
T9	0.16	0.46	A	0.388	2.089	0.647	0.85	1	18.546	0.28	13.85	A
40.10-20.10			B	0.194	2.617	0.589	0.85	1	8.435			
			C	0.276	2.361	0.609	0.85	1	12.442			
T10	0.09	0.35	A	0.35	2.172	0.632	0.85	1	12.473	0.19	12.70	A
20.10-4.85			B	0.196	2.609	0.59	0.85	1	6.524			
			C	0.262	2.403	0.605	0.85	1	8.923			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	1	0.85	1	8.423	0.12	25.63	C
			B	0.983	2.066	1	0.85	1	8.423			
			C	0.983	2.066	1	0.85	1	8.423			
Sum Weight:	1.20	5.12								3.37		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	2.96			
Bracing Weight	2.15			
Total Member Self-Weight	5.12			
Guy Weight	1.06			
Total Weight	9.70			
Wind 0 deg - No Ice		-0.05	-15.48	-1.18
Wind 30 deg - No Ice		7.69	-13.33	-0.60
Wind 60 deg - No Ice		13.35	-7.65	0.14
Wind 90 deg - No Ice		15.47	0.05	0.84
Wind 120 deg - No Ice		13.48	7.78	1.32
Wind 150 deg - No Ice		7.78	13.37	1.44
Wind 180 deg - No Ice		0.05	15.39	1.18
Wind 210 deg - No Ice		-7.69	13.33	0.60
Wind 240 deg - No Ice		-13.43	7.70	-0.14
Wind 270 deg - No Ice		-15.47	-0.05	-0.84
Wind 300 deg - No Ice		-13.40	-7.74	-1.32
Wind 330 deg - No Ice		-7.78	-13.37	-1.44
Member Ice	3.44			
Guy Ice	1.34			
Total Weight Ice	17.16			
Wind 0 deg - Ice		-0.04	-15.83	-1.36
Wind 30 deg - Ice		7.90	-13.68	-0.73
Wind 60 deg - Ice		13.71	-7.87	0.10
Wind 90 deg - Ice		15.86	0.04	0.90
Wind 120 deg - Ice		13.77	7.95	1.46
Wind 150 deg - Ice		7.96	13.72	1.63
Wind 180 deg - Ice		0.04	15.81	1.36
Wind 210 deg - Ice		-7.90	13.68	0.73
Wind 240 deg - Ice		-13.73	7.88	-0.10
Wind 270 deg - Ice		-15.86	-0.04	-0.90
Wind 300 deg - Ice		-13.75	-7.94	-1.46
Wind 330 deg - Ice		-7.96	-13.72	-1.63
Total Weight	9.70			
Wind 0 deg - Service		-0.02	-5.36	-0.41
Wind 30 deg - Service		2.66	-4.61	-0.21
Wind 60 deg - Service		4.62	-2.65	0.05
Wind 90 deg - Service		5.35	0.02	0.29
Wind 120 deg - Service		4.66	2.69	0.46
Wind 150 deg - Service		2.69	4.63	0.50
Wind 180 deg - Service		0.02	5.33	0.41
Wind 210 deg - Service		-2.66	4.61	0.21
Wind 240 deg - Service		-4.65	2.66	-0.05
Wind 270 deg - Service		-5.35	-0.02	-0.29
Wind 300 deg - Service		-4.64	-2.68	-0.46
Wind 330 deg - Service		-2.69	-4.63	-0.50

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 60 deg - No Ice+Guy

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

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	190.6 - 175.35	Leg	Max Tension	2	1.88	0.49	-0.21
			Max. Compression	17	-14.42	-0.24	-0.09
			Max. Mx	6	-9.50	1.23	0.29
			Max. My	2	-9.40	-0.29	-1.28
			Max. Vy	11	1.24	0.26	-0.00
			Max. Vx	2	1.21	-0.74	0.03
		Diagonal	Max Tension	5	2.21	0.00	0.00
			Max. Compression	11	-2.22	0.00	0.00
			Max. Mx	19	1.19	0.00	0.00
			Max. My	15	0.40	0.00	0.00
			Max. Vy	19	-0.00	0.00	0.00
			Max. Vx	15	-0.00	0.00	0.00
		Bottom Girt	Max Tension	3	0.37	0.00	0.00
			Max. Compression	9	-0.32	0.00	0.00
			Max. Mx	14	0.01	0.00	0.00
			Max. My	26	-0.28	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Guy A	Bottom Tension	21	11.80		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Tension	21	12.01		
			Top Cable Vert	21	10.83		
			Top Cable Norm	21	5.18		
			Top Cable Tan	21	0.00		
			Bot Cable Vert	21	-10.36		
			Bot Cable Norm	21	5.65		
			Bot Cable Tan	21	0.00		
		Guy B	Bottom Tension	25	11.89		
			Top Tension	25	12.11		
			Top Cable Vert	25	10.95		
			Top Cable Norm	25	5.18		
			Top Cable Tan	25	0.00		
			Bot Cable Vert	25	-10.46		
			Bot Cable Norm	25	5.67		
			Bot Cable Tan	25	0.00		
		Guy C	Bottom Tension	17	11.85		
			Top Tension	17	12.06		
			Top Cable Vert	17	10.92		
			Top Cable Norm	17	5.14		
			Top Cable Tan	17	0.00		
			Bot Cable Vert	17	-10.43		
			Bot Cable Norm	17	5.62		
			Bot Cable Tan	17	0.00		
		Top Guy Pull-Off	Max Tension	26	3.26	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.77	0.01	0.00
			Max. My	26	0.65	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T2	175.35 - 160.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-14.46	0.25	0.18
			Max. Mx	18	-4.21	0.31	-0.05
			Max. My	21	-3.22	-0.01	0.31
			Max. Vy	11	-0.75	0.24	-0.02
			Max. Vx	2	-0.73	-0.08	0.23
		Diagonal	Max Tension	5	2.02	0.00	0.00
			Max. Compression	3	-2.04	0.00	0.00
			Max. Mx	19	1.35	0.00	0.00
			Max. My	19	0.01	0.00	-0.00
			Max. Vy	19	0.00	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	9	0.37	0.00	0.00
			Max. Compression	2	-0.40	0.00	0.00
			Max. Mx	14	0.01	0.00	0.00
			Max. My	26	0.35	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	2	0.80	0.00	0.00
			Max. Compression	5	-0.72	0.00	0.00
			Max. Mx	14	0.01	0.00	0.00
			Max. My	26	-0.70	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T3	160.1 - 140.1	Leg	Max Tension	12	14.77	0.05	0.02
			Max. Compression	19	-33.36	-0.16	-0.09
			Max. Mx	24	-14.56	0.31	-0.06
			Max. My	15	-15.23	-0.03	0.33
			Max. Vy	11	-0.97	0.31	-0.06
			Max. Vx	2	-1.03	-0.03	0.33
		Diagonal	Max Tension	18	1.32	0.00	0.00
			Max. Compression	18	-1.40	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. Mx	19	0.87	0.00	0.00
			Max. My	19	-0.01	0.00	-0.00
			Max. Vy	19	-0.00	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Top Girt	Max Tension	18	0.30	0.00	0.00
			Max. Compression	7	-0.15	0.00	0.00
			Max. Mx	14	0.05	0.00	0.00
			Max. My	26	-0.04	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	25	2.09	0.00	0.00
			Max. Compression	6	-1.31	0.00	0.00
			Max. Mx	14	0.28	0.00	0.00
			Max. My	26	0.53	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T4	140.1 - 120.1	Leg	Max Tension	12	15.92	0.06	0.04
			Max. Compression	19	-35.18	0.02	0.01
			Max. Mx	18	-5.16	-1.41	-0.43
			Max. My	16	-5.45	-0.34	1.46
			Max. Vy	18	2.35	-1.41	-0.43
			Max. Vx	16	-2.43	-0.34	1.46
		Diagonal	Max Tension	21	1.01	0.00	0.00
			Max. Compression	22	-1.34	0.00	0.00
			Max. Mx	19	-1.19	0.00	0.00
			Max. My	19	-0.53	0.00	-0.00
			Max. Vy	19	-0.00	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Top Girt	Max Tension	21	2.13	0.00	0.00
			Max. Compression	19	-2.23	0.00	0.00
			Max. Mx	14	-0.02	0.00	0.00
			Max. My	26	-0.10	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	20	0.24	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.13	0.00	0.00
			Max. My	26	0.23	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Guy A	Bottom Tension	20	9.83		
			Top Tension	20	9.98		
			Top Cable Vert	20	8.31		
			Top Cable Norm	20	5.53		
			Top Cable Tan	20	0.08		
			Bot Cable Vert	20	-7.96		
			Bot Cable Norm	20	5.77		
			Bot Cable Tan	20	0.15		
		Guy B	Bottom Tension	26	9.85		
			Top Tension	26	10.01		
			Top Cable Vert	26	8.39		
			Top Cable Norm	26	5.45		
			Top Cable Tan	26	0.08		
			Bot Cable Vert	26	-8.03		
			Bot Cable Norm	26	5.70		
			Bot Cable Tan	26	0.15		
		Guy C	Bottom Tension	18	9.78		
			Top Tension	18	9.94		
			Top Cable Vert	18	8.35		
			Top Cable Norm	18	5.39		
			Top Cable Tan	18	0.08		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Vert	18	-7.98		
			Bot Cable Norm	18	5.64		
			Bot Cable Tan	18	0.15		
		Torque Arm Top	Max Tension	22	5.51	0.00	0.00
			Max. Compression	11	-2.33	0.00	0.00
			Max. Mx	18	0.25	-29.54	-0.00
			Max. My	26	-0.74	-17.02	-0.00
			Max. Vy	18	8.28	-29.54	-0.00
			Max. Vx	26	-0.00	-17.02	-0.00
T5	120.1 - 100.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-28.38	-0.01	-0.03
			Max. Mx	19	-28.38	-0.17	-0.07
			Max. My	15	-27.81	-0.03	0.18
			Max. Vy	25	0.31	0.05	-0.00
			Max. Vx	21	-0.33	0.03	-0.05
		Diagonal	Max Tension	21	0.40	0.00	0.00
			Max. Compression	15	-0.63	0.00	0.00
			Max. Mx	19	-0.60	0.00	0.00
			Max. My	15	-0.29	0.00	0.00
			Max. Vy	19	-0.00	0.00	0.00
			Max. Vx	15	-0.00	0.00	0.00
		Top Girt	Max Tension	20	0.33	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.13	0.00	0.00
			Max. My	26	0.22	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	18	0.34	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.14	0.00	0.00
			Max. My	26	0.25	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T6	100.1 - 80.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-32.51	0.03	0.02
			Max. Mx	24	-27.74	0.15	-0.04
			Max. My	15	-28.30	0.02	0.17
			Max. Vy	18	0.27	-0.04	-0.00
			Max. Vx	15	-0.26	-0.04	0.05
		Diagonal	Max Tension	16	0.93	0.00	0.00
			Max. Compression	15	-1.04	0.00	0.00
			Max. Mx	19	-0.11	0.00	0.00
			Max. My	15	-0.29	0.00	0.00
			Max. Vy	19	-0.00	0.00	0.00
			Max. Vx	15	-0.00	0.00	0.00
		Top Girt	Max Tension	18	0.26	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.14	0.00	0.00
			Max. My	26	0.25	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	23	0.38	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.22	0.00	0.00
			Max. My	26	0.37	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Guy A	Bottom Tension	21	6.30		
			Top Tension	21	6.38		
			Top Cable Vert	21	5.02		
			Top Cable Norm	21	3.95		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Cable Tan	21	0.00		
			Bot Cable Vert	21	-4.81		
			Bot Cable Norm	21	4.07		
			Bot Cable Tan	21	0.00		
		Guy B	Bottom Tension	25	6.44		
			Top Tension	25	6.52		
			Top Cable Vert	25	5.17		
			Top Cable Norm	25	3.98		
			Top Cable Tan	25	0.00		
			Bot Cable Vert	25	-4.97		
			Bot Cable Norm	25	4.11		
			Bot Cable Tan	25	0.00		
		Guy C	Bottom Tension	17	6.40		
			Top Tension	17	6.48		
			Top Cable Vert	17	5.08		
			Top Cable Norm	17	4.02		
			Top Cable Tan	17	0.00		
			Bot Cable Vert	17	-4.87		
			Bot Cable Norm	17	4.14		
			Bot Cable Tan	17	0.00		
		Top Guy Pull-Off	Max Tension	15	2.35	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1.26	0.01	0.00
			Max. My	26	1.94	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T7	80.1 - 60.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-30.77	0.01	-0.00
			Max. Mx	24	-17.07	-0.17	-0.05
			Max. My	21	-16.87	-0.00	0.19
			Max. Vy	24	0.39	0.07	-0.01
			Max. Vx	21	-0.42	0.00	-0.07
		Diagonal	Max Tension	16	0.41	0.00	0.00
			Max. Compression	16	-0.65	0.00	0.00
			Max. Mx	15	-0.51	0.00	0.00
			Max. My	26	-0.39	0.00	0.00
			Max. Vy	15	-0.00	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	18	0.37	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.15	0.00	0.00
			Max. My	26	0.27	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	19	0.29	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	0.23	0.00	0.00
			Max. My	26	0.25	0.00	-0.00
			Max. Vy	17	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T8	60.1 - 40.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-32.29	-0.31	0.01
			Max. Mx	19	-32.00	-0.31	0.01
			Max. My	15	-30.92	0.04	0.33
			Max. Vy	19	-0.22	-0.31	0.01
			Max. Vx	15	-0.21	0.04	0.33
		Diagonal	Max Tension	20	1.16	0.00	0.00
			Max. Compression	26	-1.42	0.00	0.00
			Max. Mx	24	0.27	0.00	0.00
			Max. My	26	0.18	0.00	0.00
			Max. Vy	24	-0.00	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. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	21	0.18	0.00	0.00
			Max. Compression	15	-0.02	0.00	0.00
			Max. Mx	17	0.04	0.00	0.00
			Max. My	26	0.15	0.00	-0.00
			Max. Vy	17	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	26	0.52	0.00	0.00
			Max. Compression	20	-0.26	0.00	0.00
			Max. Mx	14	0.09	0.00	0.00
			Max. My	26	0.52	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Guy A	Bottom Tension	21	4.25		
			Top Tension	21	4.28		
			Top Cable Vert	21	2.28		
			Top Cable Norm	21	3.63		
			Top Cable Tan	21	0.00		
			Bot Cable Vert	21	-2.17		
			Bot Cable Norm	21	3.65		
			Bot Cable Tan	21	0.00		
		Guy B	Bottom Tension	25	4.31		
			Top Tension	25	4.34		
			Top Cable Vert	25	2.32		
			Top Cable Norm	25	3.67		
			Top Cable Tan	25	0.00		
			Bot Cable Vert	25	-2.22		
			Bot Cable Norm	25	3.70		
			Bot Cable Tan	25	0.00		
		Guy C	Bottom Tension	17	4.22		
			Top Tension	17	4.26		
			Top Cable Vert	17	2.27		
			Top Cable Norm	17	3.60		
			Top Cable Tan	17	0.00		
			Bot Cable Vert	17	-2.17		
			Bot Cable Norm	17	3.62		
			Bot Cable Tan	17	0.00		
		Top Guy Pull-Off	Max Tension	25	2.18	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1.09	0.01	0.00
			Max. My	26	0.66	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T9	40.1 - 20.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-30.45	0.10	-0.06
			Max. Mx	19	-30.43	-0.30	-0.15
			Max. My	15	-30.45	0.04	0.33
			Max. Vy	23	0.64	0.28	-0.19
			Max. Vx	15	0.63	0.04	0.33
		Diagonal	Max Tension	26	1.07	0.00	0.00
			Max. Compression	20	-1.28	0.00	0.00
			Max. Mx	16	-1.10	0.00	0.00
			Max. My	26	-0.38	0.00	0.00
			Max. Vy	16	-0.00	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	19	0.43	0.00	0.00
			Max. Compression	26	-0.29	0.00	0.00
			Max. Mx	14	0.03	0.00	0.00
			Max. My	26	-0.29	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	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
		Bottom Girt	Max Tension	26	0.22	0.00	0.00
			Max. Compression	19	-0.13	0.00	0.00
			Max. Mx	23	0.11	0.00	0.00
			Max. My	26	0.22	0.00	-0.00
			Max. Vy	23	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T10	20.1 - 4.854	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-25.55	-0.47	0.46
			Max. Mx	19	-24.64	0.60	0.15
			Max. My	23	-25.38	-0.10	-0.63
			Max. Vy	19	-0.30	-0.11	0.10
			Max. Vx	22	0.28	-0.13	-0.62
		Diagonal	Max Tension	21	0.80	0.00	0.00
			Max. Compression	19	-0.61	0.00	0.00
			Max. Mx	22	0.58	0.00	0.00
			Max. My	26	0.16	0.00	0.00
			Max. Vy	22	-0.00	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	19	0.23	0.00	0.00
			Max. Compression	15	-0.08	0.00	0.00
			Max. Mx	23	0.03	0.00	0.00
			Max. My	26	-0.08	0.00	-0.00
			Max. Vy	23	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	15	3.45	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2.09	0.00	0.00
			Max. My	26	3.25	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T11	4.854 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-27.45	0.04	0.14
			Max. Mx	15	-25.63	-2.20	-0.12
			Max. My	26	-25.30	-0.48	-0.46
			Max. Vy	15	3.87	-2.20	-0.12
			Max. Vx	26	1.00	-0.48	-0.46
		Top Girt	Max Tension	15	2.44	-1.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	26	2.40	-1.59	-0.01
			Max. My	26	2.24	-1.48	-0.01
			Max. Vy	26	0.24	-1.59	-0.01
			Max. Vx	26	0.01	-1.48	-0.01
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-0.78	-0.81	-0.00
			Max. Mx	26	-0.75	-0.99	-0.01
			Max. My	26	-0.75	-0.99	-0.01
			Max. Vy	26	2.54	-0.99	-0.01
			Max. Vx	26	0.04	-0.99	-0.01
		Mid Girt	Max Tension	19	0.06	0.00	0.00
			Max. Compression	19	-0.14	0.00	0.00
			Max. Mx	21	0.05	0.01	0.00
			Max. My	25	0.04	0.00	0.00
			Max. Vy	21	-0.02	0.00	0.00
			Max. Vx	25	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	19	75.35	-0.22	-0.14
	Max. H_x	12	48.25	0.61	0.36
	Max. H_z	2	59.19	-0.00	0.47
	Max. M_x	1	0.00	-0.00	0.00
	Max. M_z	1	0.00	-0.00	0.00
	Max. Torsion	26	0.58	0.31	0.28
	Min. Vert	1	37.37	-0.00	0.00
	Min. H_x	4	48.03	-0.61	0.37
	Min. H_z	8	48.30	0.00	-0.72
	Min. M_x	1	0.00	-0.00	0.00
	Min. M_z	1	0.00	-0.00	0.00
	Min. Torsion	20	-0.69	-0.08	-0.44
Guy C @ 99 ft Elev -5.17 ft Azimuth 240 deg	Max. Vert	10	-1.30	-0.47	0.27
	Max. H_x	10	-1.30	-0.47	0.27
	Max. H_z	16	-25.71	-14.00	8.65
	Min. Vert	17	-26.11	-14.52	8.37
	Min. H_x	18	-25.99	-14.64	7.88
	Min. H_z	10	-1.30	-0.47	0.27
Guy B @ 99.25 ft Elev -4.67 ft Azimuth 120 deg	Max. Vert	6	-1.27	0.46	0.26
	Max. H_x	24	-25.92	14.68	7.90
	Max. H_z	26	-25.74	14.09	8.70
	Min. Vert	25	-26.13	14.60	8.42
	Min. H_x	6	-1.27	0.46	0.26
	Min. H_z	6	-1.27	0.46	0.26
Guy A @ 96.5 ft Elev 2.46 ft Azimuth 0 deg	Max. Vert	2	-1.18	-0.00	-0.49
	Max. H_x	24	-14.47	0.91	-9.15
	Max. H_z	2	-1.18	-0.00	-0.49
	Min. Vert	21	-25.87	0.00	-16.95
	Min. H_x	18	-14.58	-0.91	-9.21
	Min. H_z	21	-25.87	0.00	-16.95
Guy C @ 71.5 ft Elev 2.125 ft Azimuth 240 deg	Max. Vert	10	-0.18	-0.11	0.07
	Max. H_x	10	-0.18	-0.11	0.07
	Max. H_z	17	-7.04	-6.73	3.88
	Min. Vert	17	-7.04	-6.73	3.88
	Min. H_x	17	-7.04	-6.73	3.88
	Min. H_z	10	-0.18	-0.11	0.07
Guy B @ 68.25 ft Elev 3.96 ft Azimuth 120 deg	Max. Vert	6	-0.18	0.11	0.06
	Max. H_x	25	-7.19	6.76	3.90
	Max. H_z	25	-7.19	6.76	3.90
	Min. Vert	25	-7.19	6.76	3.90
	Min. H_x	6	-0.18	0.11	0.06
	Min. H_z	6	-0.18	0.11	0.06
Guy A @ 70.5 ft Elev 3 ft Azimuth 0 deg	Max. Vert	2	-0.18	-0.00	-0.13
	Max. H_x	24	-3.74	0.23	-4.11
	Max. H_z	2	-0.18	-0.00	-0.13
	Min. Vert	21	-6.98	0.00	-7.72
	Min. H_x	18	-3.70	-0.23	-4.06
	Min. H_z	21	-6.98	0.00	-7.72

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	37.37	0.00	-0.00	0.00	0.00	0.03
Dead+Wind 0 deg - No Ice+Guy	59.19	0.00	-0.47	0.00	0.00	-0.39
Dead+Wind 30 deg - No Ice+Guy	54.96	0.38	-0.43	0.00	0.00	-0.16
Dead+Wind 60 deg - No Ice+Guy	48.03	0.61	-0.37	0.00	0.00	0.09
Dead+Wind 90 deg - No Ice+Guy	55.33	0.56	-0.11	0.00	0.00	0.31
Dead+Wind 120 deg - No Ice+Guy	59.35	0.42	0.25	0.00	0.00	0.51
Dead+Wind 150 deg - No Ice+Guy	55.19	0.19	0.56	0.00	0.00	0.58
Dead+Wind 180 deg - No Ice+Guy	48.30	-0.00	0.72	0.00	0.00	0.49
Dead+Wind 210 deg - No Ice+Guy	54.94	-0.19	0.56	0.00	0.00	0.26
Dead+Wind 240 deg - No Ice+Guy	59.08	-0.42	0.25	0.00	0.00	0.03
Dead+Wind 270 deg - No Ice+Guy	55.24	-0.55	-0.11	0.00	0.00	-0.21
Dead+Wind 300 deg - No Ice+Guy	48.25	-0.61	-0.36	0.00	0.00	-0.46
Dead+Wind 330 deg - No Ice+Guy	55.13	-0.38	-0.43	0.00	0.00	-0.50
Dead+Ice+Temp+Guy	47.64	0.01	-0.01	0.00	0.00	0.04
Dead+Wind 0 deg+Ice+Temp+Guy	75.09	0.01	-0.25	0.00	0.00	-0.45
Dead+Wind 30 deg+Ice+Temp+Guy	72.02	0.34	-0.28	0.00	0.00	-0.19
Dead+Wind 60 deg+Ice+Temp+Guy	67.45	0.50	-0.30	0.00	0.00	0.09
Dead+Wind 90 deg+Ice+Temp+Guy	72.45	0.40	-0.15	0.00	0.00	0.34
Dead+Wind 120 deg+Ice+Temp+Guy	75.35	0.22	0.14	0.00	0.00	0.58
Dead+Wind 150 deg+Ice+Temp+Guy	72.37	0.08	0.44	0.00	0.00	0.69
Dead+Wind 180 deg+Ice+Temp+Guy	67.79	0.00	0.59	0.00	0.00	0.58
Dead+Wind 210 deg+Ice+Temp+Guy	72.27	-0.08	0.44	0.00	0.00	0.32
Dead+Wind 240 deg+Ice+Temp+Guy	75.23	-0.21	0.14	0.00	0.00	0.06
Dead+Wind 270 deg+Ice+Temp+Guy	72.50	-0.38	-0.14	0.00	0.00	-0.21
Dead+Wind 300 deg+Ice+Temp+Guy	67.69	-0.48	-0.30	0.00	0.00	-0.50
Dead+Wind 330 deg+Ice+Temp+Guy	72.18	-0.31	-0.28	0.00	0.00	-0.58
Dead+Wind 0 deg - Service+Guy	37.67	0.00	-0.30	0.00	0.00	-0.11
Dead+Wind 30 deg - Service+Guy	37.84	0.14	-0.25	0.00	0.00	-0.03
Dead+Wind 60 deg -	38.00	0.24	-0.14	0.00	0.00	0.04

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
Service+Guy						
Dead+Wind 90 deg - Service+Guy	37.96	0.28	0.00	0.00	0.00	0.12
Dead+Wind 120 deg - Service+Guy	37.86	0.26	0.15	0.00	0.00	0.18
Dead+Wind 150 deg - Service+Guy	38.11	0.14	0.24	0.00	0.00	0.21
Dead+Wind 180 deg - Service+Guy	38.26	0.00	0.27	0.00	0.00	0.18
Dead+Wind 210 deg - Service+Guy	38.13	-0.14	0.24	0.00	0.00	0.10
Dead+Wind 240 deg - Service+Guy	37.92	-0.25	0.15	0.00	0.00	0.02
Dead+Wind 270 deg - Service+Guy	38.02	-0.28	0.00	0.00	0.00	-0.05
Dead+Wind 300 deg - Service+Guy	38.07	-0.23	-0.14	0.00	0.00	-0.12
Dead+Wind 330 deg - Service+Guy	37.89	-0.13	-0.25	0.00	0.00	-0.15

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	-9.70	0.00	0.00	9.70	-0.00	0.019%
2	-0.05	-9.76	-17.60	0.05	9.76	17.60	0.005%
3	8.75	-9.70	-15.16	-8.75	9.70	15.16	0.006%
4	15.19	-9.64	-8.71	-15.19	9.64	8.71	0.004%
5	17.59	-9.70	0.05	-17.59	9.70	-0.05	0.005%
6	15.32	-9.75	8.84	-15.31	9.75	-8.84	0.007%
7	8.84	-9.69	15.21	-8.84	9.69	-15.21	0.005%
8	0.05	-9.63	17.51	-0.05	9.63	-17.51	0.005%
9	-8.75	-9.69	15.16	8.75	9.69	-15.16	0.004%
10	-15.27	-9.75	8.76	15.26	9.75	-8.76	0.007%
11	-17.59	-9.69	-0.05	17.59	9.69	0.05	0.005%
12	-15.24	-9.64	-8.80	15.24	9.64	8.80	0.004%
13	-8.84	-9.70	-15.21	8.84	9.70	15.21	0.006%
14	0.00	-17.16	0.00	-0.00	17.16	-0.00	0.007%
15	-0.04	-17.30	-20.70	0.04	17.30	20.70	0.005%
16	10.33	-17.17	-17.89	-10.33	17.17	17.89	0.004%
17	17.93	-17.04	-10.30	-17.93	17.04	10.31	0.003%
18	20.73	-17.16	0.04	-20.73	17.16	-0.04	0.003%
19	17.99	-17.29	10.39	-17.99	17.29	-10.39	0.004%
20	10.40	-17.15	17.94	-10.40	17.15	-17.94	0.003%
21	0.04	-17.01	20.68	-0.04	17.01	-20.68	0.003%
22	-10.33	-17.14	17.89	10.33	17.14	-17.89	0.005%
23	-17.95	-17.28	10.32	17.95	17.28	-10.32	0.004%
24	-20.73	-17.15	-0.04	20.73	17.15	0.04	0.005%
25	-17.97	-17.03	-10.37	17.97	17.03	10.38	0.003%
26	-10.40	-17.17	-17.94	10.40	17.17	17.94	0.004%
27	-0.02	-9.72	-6.09	0.02	9.72	6.09	0.003%
28	3.03	-9.70	-5.25	-3.03	9.70	5.25	0.004%
29	5.26	-9.68	-3.01	-5.26	9.68	3.01	0.006%
30	6.09	-9.70	0.02	-6.09	9.70	-0.02	0.005%
31	5.30	-9.71	3.06	-5.30	9.71	-3.06	0.004%
32	3.06	-9.69	5.26	-3.06	9.69	-5.26	0.005%
33	0.02	-9.67	6.06	-0.02	9.67	-6.06	0.005%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
34	-3.03	-9.69	5.25	3.03	9.69	-5.25	0.004%
35	-5.28	-9.71	3.03	5.28	9.71	-3.03	0.004%
36	-6.09	-9.70	-0.02	6.09	9.70	0.02	0.005%
37	-5.27	-9.68	-3.04	5.27	9.68	3.04	0.006%
38	-3.06	-9.70	-5.26	3.06	9.70	5.26	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	9	0.00000001	0.00008684
2	Yes	22	0.00000001	0.00006771
3	Yes	21	0.00008517	0.00008631
4	Yes	16	0.00000001	0.00005662
5	Yes	21	0.00000001	0.00007073
6	Yes	21	0.00008785	0.00009978
7	Yes	21	0.00000001	0.00006781
8	Yes	15	0.00000001	0.00006053
9	Yes	21	0.00000001	0.00006308
10	Yes	21	0.00008283	0.00009339
11	Yes	21	0.00000001	0.00006685
12	Yes	14	0.00000001	0.00006227
13	Yes	21	0.00008640	0.00008759
14	Yes	6	0.00000001	0.00005483
15	Yes	22	0.00008132	0.00008149
16	Yes	22	0.00007350	0.00006328
17	Yes	16	0.00008407	0.00004914
18	Yes	22	0.00000001	0.00005039
19	Yes	22	0.00006332	0.00006532
20	Yes	22	0.00000001	0.00004985
21	Yes	15	0.00000001	0.00004508
22	Yes	21	0.00009837	0.00008395
23	Yes	22	0.00005994	0.00006133
24	Yes	21	0.00009670	0.00008637
25	Yes	15	0.00000001	0.00004698
26	Yes	22	0.00007495	0.00006444
27	Yes	12	0.00000001	0.00005498
28	Yes	12	0.00000001	0.00005929
29	Yes	11	0.00000001	0.00007379
30	Yes	12	0.00000001	0.00006857
31	Yes	12	0.00000001	0.00005977
32	Yes	12	0.00000001	0.00006330
33	Yes	11	0.00000001	0.00005972
34	Yes	12	0.00000001	0.00005676
35	Yes	12	0.00000001	0.00005373
36	Yes	12	0.00000001	0.00006322
37	Yes	11	0.00000001	0.00007116
38	Yes	12	0.00000001	0.00006117

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190.6 - 175.35	3.901	37	0.1969	0.0578
T2	175.35 - 160.1	3.261	37	0.2129	0.0556
T3	160.1 - 140.1	2.559	29	0.2160	0.0511
T4	140.1 - 120.1	1.752	29	0.1464	0.0491
T5	120.1 - 100.1	1.287	29	0.0940	0.0667
T6	100.1 - 80.1	0.944	37	0.0740	0.0813
T7	80.1 - 60.1	0.696	37	0.0459	0.0905
T8	60.1 - 40.1	0.517	37	0.0429	0.0942
T9	40.1 - 20.1	0.343	37	0.0367	0.0893
T10	20.1 - 4.854	0.195	27	0.0413	0.0776
T11	4.854 - 0	0.049	27	0.0475	0.0441

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.99	Guy	37	3.876	0.1976	0.0578	74012
187.00	BXA-70063/6CF	37	3.754	0.2007	0.0575	74012
140.00	(2) RR90-17-02DP	29	1.749	0.1461	0.0492	10142
139.49	Guy	29	1.733	0.1441	0.0494	10194
87.37	Guy	37	0.775	0.0547	0.0876	48201
44.95	Guy	37	0.383	0.0379	0.0906	109179

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190.6 - 175.35	25.370	19	1.2609	0.2127
T2	175.35 - 160.1	21.273	19	1.2990	0.2120
T3	160.1 - 140.1	17.082	15	1.2867	0.2080
T4	140.1 - 120.1	12.175	15	0.9855	0.2087
T5	120.1 - 100.1	8.697	15	0.7382	0.2623
T6	100.1 - 80.1	5.945	15	0.5801	0.3041
T7	80.1 - 60.1	3.915	15	0.3876	0.3281
T8	60.1 - 40.1	2.504	15	0.2961	0.3353
T9	40.1 - 20.1	1.491	16	0.2059	0.3102
T10	20.1 - 4.854	0.781	22	0.1793	0.2552
T11	4.854 - 0	0.195	22	0.1891	0.1547

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.99	Guy	19	25.207	1.2624	0.2127	26348
187.00	BXA-70063/6CF	19	24.414	1.2698	0.2126	26348
140.00	(2) RR90-17-02DP	15	12.154	0.9839	0.2088	2591

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.49	Guy	15	12.047	0.9755	0.2096	2598
87.37	Guy	15	4.568	0.4517	0.3207	6480
44.95	Guy	16	1.699	0.2254	0.3180	10923

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	190.6	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2.21	3.20	0.691 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.37	3.20	0.115 ✓	1.333	Member Bearing
T2	175.35	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2.02	3.20	0.631 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.37	3.20	0.117 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.80	3.20	0.250 ✓	1.333	Member Bearing
T3	160.1	Leg	A325N	0.7500	4	3.69	19.44	0.190 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.32	3.20	0.411 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.30	3.20	0.095 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	2.09	3.20	0.655 ✓	1.333	Member Bearing
T4	140.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.34	4.12	0.324 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	2.13	3.20	0.668 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.24	3.20	0.075 ✓	1.333	Member Bearing
T5	120.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	0.63	4.12	0.154 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	0.33	3.20	0.103 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.34	3.20	0.106 ✓	1.333	Member Bearing
T6	100.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	0.93	3.20	0.290 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.26	3.20	0.082 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.38	3.20	0.118 ✓	1.333	Member Bearing
T7	80.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	0.65	4.12	0.157 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	0.37	3.20	0.114 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.29	3.20	0.089 ✓	1.333	Member Bearing
T8	60.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.16	3.20	0.363 ✓	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.18	3.20	0.055 ✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.52	3.20	0.163 ✓	1.333	Member Bearing

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
T9	40.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.07	3.20	0.334 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.43	3.20	0.133 ✔	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.22	3.20	0.067 ✔	1.333	Member Bearing
T10	20.1	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	0.80	3.20	0.250 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.23	3.20	0.072 ✔	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	3.45	3.20	1.079 ✔	1.333	Member Bearing

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T K	Allowable T_a K	Required S.F.	Actual S.F.
T1	189.99 (A) (450)	1/2 EHS	2.69	26.90	12.01	13.45	2.000	2.240 ✔
	189.99 (B) (449)	1/2 EHS	2.69	26.90	12.11	13.45	2.000	2.221 ✔
	189.99 (C) (448)	1/2 EHS	2.69	26.90	12.06	13.45	2.000	2.230 ✔
T4	139.49 (A) (459)	1/2 EHS	2.69	26.90	9.81	13.45	2.000	2.741 ✔
	139.49 (A) (460)	1/2 EHS	2.69	26.90	9.98	13.45	2.000	2.695 ✔
	139.49 (B) (455)	1/2 EHS	2.69	26.90	10.01	13.45	2.000	2.688 ✔
	139.49 (B) (456)	1/2 EHS	2.69	26.90	9.90	13.45	2.000	2.716 ✔
	139.49 (C) (451)	1/2 EHS	2.69	26.90	9.94	13.45	2.000	2.707 ✔
	139.49 (C) (452)	1/2 EHS	2.69	26.90	9.84	13.45	2.000	2.734 ✔
T6	87.37 (A) (468)	7/16 EHS	2.08	20.80	6.38	10.40	2.000	3.258 ✔
	87.37 (B) (467)	7/16 EHS	2.08	20.80	6.52	10.40	2.000	3.188 ✔
	87.37 (C) (463)	7/16 EHS	2.08	20.80	6.48	10.40	2.000	3.211 ✔
T8	44.95 (A) (474)	3/8 EHS	1.54	15.40	4.28	7.70	2.000	3.595 ✔
	44.95 (B) (473)	3/8 EHS	1.54	15.40	4.34	7.70	2.000	3.544 ✔
	44.95 (C) (469)	3/8 EHS	1.54	15.40	4.26	7.70	2.000	3.617 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190.6 - 175.35	ROHN 2.5 X-STR	15.25	2.44	63.4 K=2.00	1.00	22.137	2.2535	-14.42	49.89	0.289 ✓
T2	175.35 - 160.1	ROHN 2.5 X-STR	15.25	2.44	63.4 K=2.00	1.00	22.137	2.2535	-14.46	49.89	0.290 ✓
T3	160.1 - 140.1	ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.00	26.254	1.0745	-33.36	28.21	1.182 ✓
T4	140.1 - 120.1	ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.00	26.219	1.0745	-35.18	28.17	1.249 ✓
T5	120.1 - 100.1	ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.00	26.208	1.0745	-28.38	28.16	1.008 ✓
T6	100.1 - 80.1	ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.00	26.203	1.0745	-32.51	28.16	1.155 ✓
T7	80.1 - 60.1	ROHN 2 EH	20.00	2.42	37.8 K=1.00	1.00	26.130	1.4807	-30.77	38.69	0.795 ✓
T8	60.1 - 40.1	ROHN 2.5 STD	20.00	2.42	61.4 K=2.00	1.00	22.480	1.7040	-32.29	38.31	0.843 ✓
T9	40.1 - 20.1	ROHN 2.5 STD	20.00	2.42	61.4 K=2.00	1.00	22.480	1.7040	-30.45	38.31	0.795 ✓
T10	20.1 - 4.854	ROHN 2.5 STD	15.25	2.44	61.8 K=2.00	1.00	22.412	1.7040	-25.55	38.19	0.669 ✓
T11	4.854 - 0	ROHN 2.5 X-STR	5.25	1.27	16.5 K=1.00	0.96	27.485	2.2535	-27.45	61.94	0.443 ✓

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	190.6 - 175.35	P1.5x.058	4.23	3.94	92.6 K=1.00	15.133	0.2627	-2.22	3.98	0.559 ✓
T2	175.35 - 160.1	P1.5x.058	4.23	3.94	92.6 K=1.00	15.133	0.2627	-2.04	3.98	0.514 ✓
T3	160.1 - 140.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.974	0.2627	-1.40	3.93	0.355 ✓
T4	140.1 - 120.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.974	0.2627	-1.34	3.93	0.340 ✓
T5	120.1 - 100.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.974	0.2627	-0.63	3.93	0.161 ✓
T6	100.1 - 80.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.974	0.2627	-1.04	3.93	0.265 ✓
T7	80.1 - 60.1	P1.5x.058	4.22	3.98	93.6 K=1.00	14.976	0.2627	-0.65	3.93	0.165 ✓
T8	60.1 - 40.1	P1.5x.058	4.22	3.93	92.4 K=1.00	15.166	0.2627	-1.42	3.98	0.356 ✓
T9	40.1 - 20.1	P1.5x.058	4.22	3.93	92.4	15.166	0.2627	-1.28	3.98	0.322

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 $\frac{P}{P_a}$
					K=1.00					✓
T10	20.1 - 4.854	P1.5x.058	4.23	3.94	92.6 K=1.00	15.135	0.2627	-0.61	3.98	0.154 ✓

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 $\frac{P}{P_a}$
T2	175.35 - 160.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.40	4.65	0.085 ✓
T3	160.1 - 140.1	P1.5x.058	3.46	3.26	76.7 K=1.00	17.546	0.2627	-0.15	4.61	0.033 ✓
T4	140.1 - 120.1	P1.5x.058	3.46	3.26	76.7 K=1.00	17.546	0.2627	-2.23	4.61	0.484 ✓
T8	60.1 - 40.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.02	4.65	0.005 ✓
T9	40.1 - 20.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.29	4.65	0.062 ✓
T10	20.1 - 4.854	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.08	4.65	0.017 ✓

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	190.6 - 175.35	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.32	4.65	0.068 ✓
T2	175.35 - 160.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.72	4.65	0.154 ✓
T3	160.1 - 140.1	P1.5x.058	3.46	3.26	76.7 K=1.00	17.546	0.2627	-1.31	4.61	0.284 ✓
T8	60.1 - 40.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.26	4.65	0.057 ✓
T9	40.1 - 20.1	P1.5x.058	3.46	3.22	75.7 K=1.00	17.685	0.2627	-0.13	4.65	0.028 ✓
T11	4.854 - 0	14x3/16	0.47	0.24	52.2 K=1.00	18.157	2.6250	-0.78	47.66	0.016 ✓

Mid 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 $\frac{P}{P_a}$
T11	4.854 - 0	14x3/16	1.31	1.07	237.5 K=1.00	2.647	2.6250	-0.14	6.95	0.020 ✔
		KL/R > 200 (C) - 444								

Top Guy Pull-Off 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	190.6 - 175.35	4 1/2x3/8	3.46	3.22	356.8 K=1.00	21.600	1.6875	0.00	1.98	0.000*
T6	100.1 - 80.1	C4x5.4	3.46	3.26	87.1 K=1.00	21.600	1.5900	0.00	23.12	0.000*
T8	60.1 - 40.1	C4x5.4	3.46	3.22	86.0 K=1.00	21.600	1.5900	0.00	23.33	0.000*

* DL controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	190.6 - 175.35	4 1/2x3/8	0.01	-0.113	27.000	0.004	0.00	0.000	27.000	0.000
T6	100.1 - 80.1	C4x5.4	0.01	-0.080	21.600	0.004	0.00	0.000	21.600	0.000
T8	60.1 - 40.1	C4x5.4	0.01	-0.080	21.600	0.004	0.00	0.000	21.600	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	190.6 - 175.35	4 1/2x3/8	0.000	0.004	0.000	0.004* ✔	1.000	H1-3 ✔
T6	100.1 - 80.1	C4x5.4	0.000	0.004	0.000	0.004* ✔	1.000	H1-3 ✔
T8	60.1 - 40.1	C4x5.4	0.000	0.004	0.000	0.004* ✔	1.000	H1-3 ✔

* DL controls

Torque-Arm Top Design Data

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	140.1 - 120.1 (453)	C10x15.3	3.59	3.49	58.7 K=1.00	21.600	4.4900	0.00	57.15	0.000
T4	140.1 - 120.1 (454)	C10x15.3	3.59	3.49	102.0 K=1.00	12.729	4.4900	-1.71	57.15	0.030
T4	140.1 - 120.1 (457)	C10x15.3	3.59	3.49	102.0 K=1.00	12.729	4.4900	-2.25	57.15	0.039
T4	140.1 - 120.1 (458)	C10x15.3	3.59	3.49	102.0 K=1.00	12.729	4.4900	-2.27	57.15	0.040
T4	140.1 - 120.1 (461)	C10x15.3	3.59	3.49	58.7 K=1.00	21.600	4.4900	0.00	57.15	0.000
T4	140.1 - 120.1 (462)	C10x15.3	3.59	3.49	58.7 K=1.00	21.600	4.4900	0.00	57.15	0.000

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T4	140.1 - 120.1 (453)	C10x15.3	-29.54	-26.259	21.600	1.216	-0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (454)	C10x15.3	-28.14	-25.016	21.600	1.158	0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (457)	C10x15.3	-28.62	-25.439	21.600	1.178	0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (458)	C10x15.3	-28.53	-25.363	21.600	1.174	-0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (461)	C10x15.3	-29.44	-26.165	21.600	1.211	0.00	-0.000	21.600	0.000
T4	140.1 - 120.1 (462)	C10x15.3	-28.79	-25.590	21.600	1.185	-0.00	-0.000	21.600	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T4	140.1 - 120.1 (453)	C10x15.3	0.000	1.216	0.000	1.216 ✔	1.333	H1-3 ✔
T4	140.1 - 120.1 (454)	C10x15.3	0.030	1.158	0.000	1.188 ✔	1.333	H1-3 ✔
T4	140.1 - 120.1 (457)	C10x15.3	0.039	1.178	0.000	1.217 ✔	1.333	H1-3 ✔
T4	140.1 - 120.1 (458)	C10x15.3	0.040	1.174	0.000	1.214 ✔	1.333	H1-3 ✔
T4	140.1 - 120.1 (461)	C10x15.3	0.000	1.211	0.000	1.211 ✔	1.333	H1-3 ✔
T4	140.1 - 120.1 (462)	C10x15.3	0.000	1.185	0.000	1.185 ✔	1.333	H1-3 ✔

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	190.6 - 175.35	ROHN 2.5 X-STR	15.25	2.44	31.7	30.000	2.2535	1.88	67.61	0.028 ✓
T3	160.1 - 140.1	ROHN 2 STD	20.00	2.42	36.9	30.000	1.0745	14.77	32.24	0.458 ✓
T4	140.1 - 120.1	ROHN 2 STD	20.00	2.42	36.9	30.000	1.0745	15.92	32.24	0.494 ✓

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	190.6 - 175.35	P1.5x.058	4.23	3.94	92.6	25.200	0.2627	2.21	6.62	0.334 ✓
T2	175.35 - 160.1	P1.5x.058	4.23	3.94	92.6	25.200	0.2627	2.02	6.62	0.305 ✓
T3	160.1 - 140.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	1.32	6.62	0.199 ✓
T4	140.1 - 120.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	1.01	6.62	0.152 ✓
T5	120.1 - 100.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	0.40	6.62	0.060 ✓
T6	100.1 - 80.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	0.93	6.62	0.140 ✓
T7	80.1 - 60.1	P1.5x.058	4.22	3.98	93.6	25.200	0.2627	0.41	6.62	0.062 ✓
T8	60.1 - 40.1	P1.5x.058	4.22	3.93	92.4	25.200	0.2627	1.16	6.62	0.175 ✓
T9	40.1 - 20.1	P1.5x.058	4.22	3.93	92.4	25.200	0.2627	1.07	6.62	0.161 ✓
T10	20.1 - 4.854	P1.5x.058	4.23	3.94	92.6	25.200	0.2627	0.80	6.62	0.121 ✓

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 $\frac{P}{P_a}$
T2	175.35 - 160.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.37	6.62	0.056 ✓

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 $\frac{P}{P_a}$
T3	160.1 - 140.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.30	6.62	0.046 ✓
T4	140.1 - 120.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	2.13	6.62	0.322 ✓
T5	120.1 - 100.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.33	6.62	0.050 ✓
T6	100.1 - 80.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.26	6.62	0.040 ✓
T7	80.1 - 60.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.37	6.62	0.055 ✓
T8	60.1 - 40.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.18	6.62	0.026 ✓
T9	40.1 - 20.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.43	6.62	0.064 ✓
T10	20.1 - 4.854	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.23	6.62	0.035 ✓
T11	4.854 - 0	14x3/16	2.98	2.74	608.2	21.600	2.6250	2.44	56.70	0.043 ✓
		L/R > 500 (T) - 436								

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	190.6 - 175.35	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.37	6.62	0.055 ✓
T2	175.35 - 160.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.80	6.62	0.121 ✓
T3	160.1 - 140.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	2.09	6.62	0.316 ✓
T4	140.1 - 120.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.24	6.62	0.036 ✓
T5	120.1 - 100.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.34	6.62	0.051 ✓
T6	100.1 - 80.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.38	6.62	0.057 ✓
T7	80.1 - 60.1	P1.5x.058	3.46	3.26	76.7	25.200	0.2627	0.29	6.62	0.043 ✓
T8	60.1 - 40.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.52	6.62	0.078 ✓
T9	40.1 - 20.1	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	0.22	6.62	0.032 ✓
T10	20.1 - 4.854	P1.5x.058	3.46	3.22	75.7	25.200	0.2627	3.45	6.62	0.521 ✓

Mid 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 $\frac{P}{P_a}$
T11	4.854 - 0	14x3/16	2.15	1.91	422.9	21.600	2.6250	0.06	56.70	0.001 ✔

Top Guy Pull-Off 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	190.6 - 175.35	4 1/2x3/8	3.46	3.22	356.8	21.600	1.6875	3.26	36.45	0.089
T6	100.1 - 80.1	C4x5.4	3.46	3.26	87.1	21.600	1.5900	2.35	34.34	0.068
T8	60.1 - 40.1	C4x5.4	3.46	3.22	86.0	21.600	1.5900	2.18	34.34	0.063

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	190.6 - 175.35	4 1/2x3/8	0.01	0.113	27.000	0.004	0.00	0.000	27.000	0.000
T6	100.1 - 80.1	C4x5.4	0.01	0.080	21.600	0.004	0.00	0.000	27.000	0.000
T8	60.1 - 40.1	C4x5.4	0.01	0.080	21.600	0.004	0.00	0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	190.6 - 175.35	4 1/2x3/8	0.089	0.004	0.000	0.094 ✔	1.333	H2-1 ✔
T6	100.1 - 80.1	C4x5.4	0.068	0.004	0.000	0.072 ✔	1.333	H2-1 ✔
T8	60.1 - 40.1	C4x5.4	0.063	0.004	0.000	0.067 ✔	1.333	H2-1 ✔

Torque-Arm Top Design Data

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	140.1 - 120.1 (453)	C10x15.3	3.59	3.49	58.7	21.600	4.4900	0.25	96.98	0.003
T4	140.1 - 120.1 (454)	C10x15.3	3.59	3.49	58.7	21.600	4.4900	0.05	96.98	0.000

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	140.1 - 120.1 (457)	C10x15.3	3.59	3.49	58.7	21.600	4.4900	0.20	96.98	0.002
T4	140.1 - 120.1 (458)	C10x15.3	3.59	3.49	58.7	21.600	4.4900	0.01	96.98	0.000
T4	140.1 - 120.1 (461)	C10x15.3	3.59	3.49	58.7	21.600	4.4900	0.24	96.98	0.002
T4	140.1 - 120.1 (462)	C10x15.3	3.59	3.49	58.7	21.600	4.4900	0.18	96.98	0.002

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T4	140.1 - 120.1 (453)	C10x15.3	-29.54	26.259	21.600	1.216	-0.00	0.000	27.000	0.000
T4	140.1 - 120.1 (454)	C10x15.3	-28.66	25.477	21.600	1.179	-0.00	0.000	27.000	0.000
T4	140.1 - 120.1 (457)	C10x15.3	-29.17	25.929	21.600	1.200	0.00	0.000	27.000	0.000
T4	140.1 - 120.1 (458)	C10x15.3	-28.88	25.670	21.600	1.188	0.00	0.000	27.000	0.000
T4	140.1 - 120.1 (461)	C10x15.3	-29.44	26.165	21.600	1.211	0.00	0.000	27.000	0.000
T4	140.1 - 120.1 (462)	C10x15.3	-28.79	25.590	21.600	1.185	-0.00	0.000	27.000	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T4	140.1 - 120.1 (453)	C10x15.3	0.003	1.216	0.000	1.218 ✔	1.333	H2-1 ✔
T4	140.1 - 120.1 (454)	C10x15.3	0.000	1.179	0.000	1.180 ✔	1.333	H2-1 ✔
T4	140.1 - 120.1 (457)	C10x15.3	0.002	1.200	0.000	1.202 ✔	1.333	H2-1 ✔
T4	140.1 - 120.1 (458)	C10x15.3	0.000	1.188	0.000	1.189 ✔	1.333	H2-1 ✔
T4	140.1 - 120.1 (461)	C10x15.3	0.002	1.211	0.000	1.214 ✔	1.333	H2-1 ✔
T4	140.1 - 120.1 (462)	C10x15.3	0.002	1.185	0.000	1.187 ✔	1.333	H2-1 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	190.6 - 175.35	Leg	ROHN 2.5 X-STR	1	-14.42	66.50	21.7	Pass
T2	175.35 - 160.1	Leg	ROHN 2.5 X-STR	29	-14.46	66.50	21.7	Pass
T3	160.1 - 140.1	Leg	ROHN 2 STD	56	-33.36	37.60	88.7	Pass
T4	140.1 - 120.1	Leg	ROHN 2 STD	113	-35.18	37.55	93.7	Pass
T5	120.1 - 100.1	Leg	ROHN 2 STD	170	-28.38	37.54	75.6	Pass
T6	100.1 - 80.1	Leg	ROHN 2 STD	227	-32.51	37.53	86.6	Pass
T7	80.1 - 60.1	Leg	ROHN 2 EH	284	-30.77	51.57	59.7	Pass
T8	60.1 - 40.1	Leg	ROHN 2.5 STD	341	-32.29	51.06	63.2	Pass
T9	40.1 - 20.1	Leg	ROHN 2.5 STD	375	-30.45	51.06	59.6	Pass
T10	20.1 - 4.854	Leg	ROHN 2.5 STD	406	-25.55	50.91	50.2	Pass
T11	4.854 - 0	Leg	ROHN 2.5 X-STR	435	-27.45	82.57	33.2	Pass
T1	190.6 - 175.35	Diagonal	P1.5x.058	25	-2.22	5.30	41.9 51.9 (b)	Pass
T2	175.35 - 160.1	Diagonal	P1.5x.058	39	-2.04	5.30	38.6 47.3 (b)	Pass
T3	160.1 - 140.1	Diagonal	P1.5x.058	65	-1.40	5.24	26.6 30.9 (b)	Pass
T4	140.1 - 120.1	Diagonal	P1.5x.058	167	-1.34	5.24	25.5	Pass
T5	120.1 - 100.1	Diagonal	P1.5x.058	225	-0.63	5.24	12.1	Pass
T6	100.1 - 80.1	Diagonal	P1.5x.058	252	-1.04	5.24	19.9 21.7 (b)	Pass
T7	80.1 - 60.1	Diagonal	P1.5x.058	339	-0.65	5.25	12.4	Pass
T8	60.1 - 40.1	Diagonal	P1.5x.058	350	-1.42	5.31	26.7 27.2 (b)	Pass
T9	40.1 - 20.1	Diagonal	P1.5x.058	404	-1.28	5.31	24.2 25.0 (b)	Pass
T10	20.1 - 4.854	Diagonal	P1.5x.058	431	-0.61	5.30	11.6 18.7 (b)	Pass
T2	175.35 - 160.1	Top Girt	P1.5x.058	33	-0.40	6.19	6.4 8.8 (b)	Pass
T3	160.1 - 140.1	Top Girt	P1.5x.058	60	0.30	8.83	3.5 7.2 (b)	Pass
T4	140.1 - 120.1	Top Girt	P1.5x.058	117	-2.23	6.15	36.3 50.1 (b)	Pass
T5	120.1 - 100.1	Top Girt	P1.5x.058	172	0.33	8.83	3.7 7.8 (b)	Pass
T6	100.1 - 80.1	Top Girt	P1.5x.058	229	0.26	8.83	3.0 6.1 (b)	Pass
T7	80.1 - 60.1	Top Girt	P1.5x.058	287	0.37	8.83	4.1 8.6 (b)	Pass
T8	60.1 - 40.1	Top Girt	P1.5x.058	345	0.18	8.83	2.0 4.1 (b)	Pass
T9	40.1 - 20.1	Top Girt	P1.5x.058	377	0.43	8.83	4.8 10.0 (b)	Pass
T10	20.1 - 4.854	Top Girt	P1.5x.058	410	0.23	8.83	2.6 5.4 (b)	Pass
T11	4.854 - 0	Top Girt	14x3/16	436	2.44	75.58	3.2	Pass
T1	190.6 - 175.35	Bottom Girt	P1.5x.058	9	-0.32	6.19	5.1 8.6 (b)	Pass
T2	175.35 - 160.1	Bottom Girt	P1.5x.058	34	-0.72	6.19	11.5 18.7 (b)	Pass
T3	160.1 - 140.1	Bottom Girt	P1.5x.058	63	2.09	8.83	23.7 49.2 (b)	Pass
T4	140.1 - 120.1	Bottom Girt	P1.5x.058	119	0.24	8.83	2.7 5.6 (b)	Pass
T5	120.1 - 100.1	Bottom Girt	P1.5x.058	176	0.34	8.83	3.8 7.9 (b)	Pass
T6	100.1 - 80.1	Bottom Girt	P1.5x.058	233	0.38	8.83	4.3 8.9 (b)	Pass
T7	80.1 - 60.1	Bottom Girt	P1.5x.058	289	0.29	8.83	3.2 6.7 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T8	60.1 - 40.1	Bottom Girt	P1.5x.058	347	0.52	8.83	5.9 12.2 (b)	Pass
T9	40.1 - 20.1	Bottom Girt	P1.5x.058	380	0.22	8.83	2.4 5.0 (b)	Pass
T10	20.1 - 4.854	Bottom Girt	P1.5x.058	412	3.45	8.83	39.1 80.9 (b)	Pass
T11	4.854 - 0	Bottom Girt	14x3/16	439	-0.78	63.53	5.0	Pass
T11	4.854 - 0	Mid Girt	14x3/16	444	-0.14	9.26	1.5	Pass
T1	190.6 - 175.35	Guy A@189.985	1/2	450	12.01	13.45	89.3	Pass
T4	140.1 - 120.1	Guy A@139.485	1/2	460	9.98	13.45	74.2	Pass
T6	100.1 - 80.1	Guy A@87.3695	7/16	468	6.38	10.40	61.4	Pass
T8	60.1 - 40.1	Guy A@44.9464	3/8	474	4.28	7.70	55.6	Pass
T1	190.6 - 175.35	Guy B@189.985	1/2	449	12.11	13.45	90.0	Pass
T4	140.1 - 120.1	Guy B@139.485	1/2	455	10.01	13.45	74.4	Pass
T6	100.1 - 80.1	Guy B@87.3695	7/16	467	6.52	10.40	62.7	Pass
T8	60.1 - 40.1	Guy B@44.9464	3/8	473	4.34	7.70	56.4	Pass
T1	190.6 - 175.35	Guy C@189.985	1/2	448	12.06	13.45	89.7	Pass
T4	140.1 - 120.1	Guy C@139.485	1/2	451	9.94	13.45	73.9	Pass
T6	100.1 - 80.1	Guy C@87.3695	7/16	463	6.48	10.40	62.3	Pass
T8	60.1 - 40.1	Guy C@44.9464	3/8	469	4.26	7.70	55.3	Pass
T1	190.6 - 175.35	Top Guy Pull-Off@189.985	4 1/2x3/8	4	3.26	48.59	7.0	Pass
T6	100.1 - 80.1	Top Guy Pull-Off@87.3695	C4x5.4	464	2.35	45.78	5.4	Pass
T8	60.1 - 40.1	Top Guy Pull-Off@44.9464	C4x5.4	470	2.18	45.78	5.0	Pass
T4	140.1 - 120.1	Torque Arm Top@139.485	C10x15.3	453	0.25	129.28	91.4	Pass

	Summary	
Leg (T4)	93.7	Pass
Diagonal (T1)	51.9	Pass
Top Girt (T4)	50.1	Pass
Bottom Girt (T10)	80.9	Pass
Mid Girt (T11)	1.5	Pass
Guy A (T1)	89.3	Pass
Guy B (T1)	90.0	Pass
Guy C (T1)	89.7	Pass
Top Guy Pull-Off (T1)	7.0	Pass
Torque Arm Top (T4)	91.4	Pass
Bolt Checks	80.9	Pass
RATING =	**93.7**	**Pass**

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Job :	Verizon - Danielson 2: 190-ft Guyed Lattice Tower	**Project No.**	09059	**Page**	of
Address:	812 Providence Pike., Danielson, CT.	**Computed by**	TJL	**Sheet**	1 of 2
Description:	Guy Anchor Evaluation - 2005 CSBC 3108.4.2/TIA Req	**Checked by**	CFC	**Date**	12/4/13

CHECK UPLIFT RESISTANCE

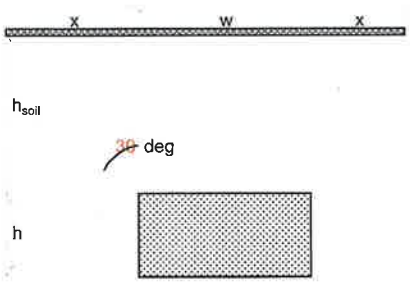
ANCHOR AT 89.00-ft RADIUS

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	26	kips
Sliding =	17	kips

CONCRETE PARAMETERS:

γ conc =	150	pcf
w =	4	ft
h =	2	ft
d =	7	ft
Vol. =	*56.00*	ft^3
Wc =	*8.40*	kips



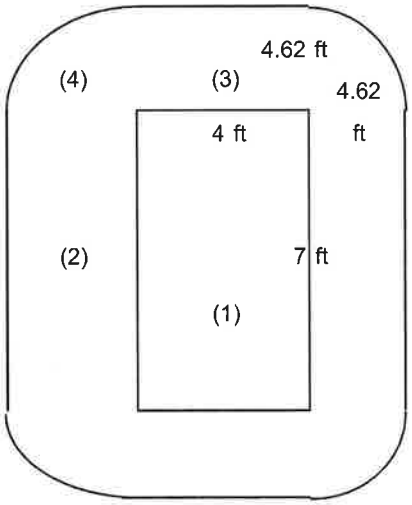
Foundation Section

SOIL PARAMETERS:

γ_{soil} =	68	pcf
h_{soil} =	8	ft
x =	*4.62*	ft

Soil Weight (Wr):

(1) =	15.23	kips
(2) =	17.59	kips
(3) =	10.05	kips
(4) =	12.15	kips
*(5) Anchor Reinf. =	0	kips
Total =	55.02	kips



Foundation Plan View

CHECK UPLIFT (PER EIA/TIA-222-F STANDARD):

Wr / 2.0 + Wc / 1.25 > UPLIFT

34.23 > *26* ***OK***

(Wr + Wc) / 1.5 > UPLIFT

42.28 > *26* ***OK***

CHECK UPLIFT (PER 2005 CT BUILDING CODE):

(Wr + Wc) / 2.0 > UPLIFT

31.71 > *26* ***OK***

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				Page	of
Job :	Verizon - Danielson 2: 190-ft Guyed Lattice Tower	**Project No.**	13048	**Sheet** 2	of 2
Address:	812 Providence Pike., Danielson, CT.	**Computed by**	TJL	**Date**	12/4/13
Description:	Guy Anchor Evaluation - 2005 CSBC 3108.4.2/TIA Req	**Checked by**	CFC	**Date**	

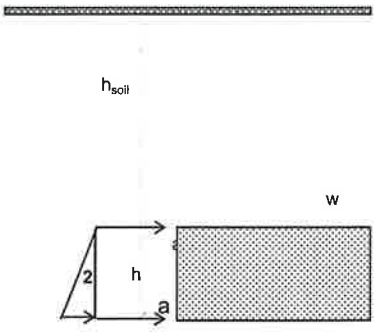
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

γ soil =	68	pcf
γ soil2 =	68	pcf
h_{soil} =	8	ft
h =	2	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	4.0	ft
h =	2.0	ft
d =	7.0	ft



Foundation Elevation View

K_a = 0.33

K_p = 3.00

Δ = 2.67

HORIZONTAL FORCES

1 =		20.31 k
2 =		2.54 k
RESIST TO SLIDING =		22.85 k
SOIL & CONCRETE WEIGHT =	Wr + Wc =	63.42 k
UPLIFT REACTIONS =		-26 k
SUM =		37.42 k
COEF. OF FRICTION, (0.45) =		16.84 k
RESIST TO SLIDING =		22.85 k
SUM =		39.69 k

SF AGAINST SLIDING

SF = 2.3 > 1.5 OK

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Subject:	Base Foundation Analysis
Location:	190-ft Guyed Lattice Tower Danielson, CT
Rev. 0: 12/4/13	Prepared by: T.J.L. Checked by: C.F.C. Job No. 09059

Standard Monopole Foundation:

Input Data:

Tower Data

Shear Force =	$Shear := 1.0 \cdot kip$	(User Input from RISATower)	
Axial Force =	$Axial := 75 \cdot kip$	(User Input from RISATower)	
Base Moment =	$Moment := 0 \cdot kip \cdot ft$	(User Input from RISATower)	
Tower Height =	$H_t := 190 \cdot ft$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 4.0 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 3.75 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 1.0 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 2.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 1.25 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 4.0 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 6000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 68 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Calculated Factors:

Coefficient of Lateral Soil Pressure =

$$K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$$

Load Factor =

$$LF := \begin{cases} 1.333 & \text{if } H_t \le 700 \cdot ft \\ 1.7 & \text{if } H_t \ge 1200 \cdot ft \\ 1.333 + \left(\frac{H_t - 700ft}{1200ft - 700ft}\right) \cdot 0.4 & \text{otherwise} \end{cases} = 1.333$$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 68 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 0.561 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 0.561 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 0.816 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0.688 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 1.25$

$A_p := W_f \cdot T_p = 5$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 3.442 \cdot kip$

Weight of Concrete = $WT_c := \left[\left(W_f^2 \cdot T_f\right) + d_p^2 L_p\right] \cdot \gamma_c = 5.25 \cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left[\left(W_f^2 - d_p^2\right) \cdot \begin{cases} (L_p - L_{pag} - n) & \text{if } (L_p - L_{pag} - n) \geq 0 \\ 0 & \text{if } (L_p - L_{pag} - n) \leq 0 \end{cases}\right] \cdot \gamma_s = 2.24 \cdot kip$

Weight of Soil Wedge at Back Face = $WT_{s2} := \left(\frac{D_f^2 \cdot \tan(\Phi_s)}{2} \cdot W_f\right) \cdot \gamma_s = 1.256 \cdot kip$

Weight of Soil Wedge at back face Corners = $WT_{s3} := 2 \cdot \left[(D_f)^3 \cdot \frac{\tan(\Phi_s)}{3}\right] \cdot \gamma_s = 1.675 \cdot kips$

Total Weight = $WT_{tot} := WT_c + WT_{s1} + Axial = 82.494 \cdot kip$

Resisting Moment = $M_r := (WT_{tot}) \cdot \frac{W_f}{2} + S_u \cdot \frac{T_f}{3} + \left[\left(WT_{s2} + WT_{s3}\right) \cdot \left(W_f + \frac{D_f \tan(\Phi_s)}{3}\right)\right] = 180 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := Moment + Shear \cdot (L_p + T_f) = 5 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 36.08$

Factor of Safety Required = $FS_{req} := 2$

$OverTurning\_Moment\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

OverTurning_Moment_Check = "Okay"

Check Sliding:

Soil/Concrete Friction Resistance = $Sl_2 := \mu \cdot WT_{tot} = 37.12 \cdot kips$

Total Sliding Resistance = $Sl_{tot} := S_u + Sl_2 = 40.56 \cdot kips$

Factor of Safety Actual = $FS := \frac{Sl_{tot}}{Shear} = 40.56$

Factor of Safety Required = $FS_{req} := 1.5$

$Sliding\_Resistance\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

Sliding_Resistance_Check = "Okay"

Concrete Bearing Capacity:

Strength Reduction Factor = $\Phi_c := 0.65$ (ACI-2008 9.3.2.2)

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot d_p^2 = 954.72 \cdot kips$ (ACI-2008 10.14)

$Bearing\_Check := if(P_b > LF \cdot Axial, "Okay", "No Good")$

Bearing_Check = "Okay"

Bearing Pressure Caused by Footing:

Area of the Mat = $A_{mat} := W_f^2 = 16$

Section Modulus of Mat = $S := \frac{W_f^3}{6} = 10.67 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{WT_c + Axial}{A_{mat}} + \frac{M_{ot}}{S} = 5.484 \cdot ksf$

$Max\_Pressure\_Check := if(P_{max} < q_s, "Okay", "No Good")$

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{WT_c + Axial}{A_{mat}} - \frac{M_{ot}}{S} = 4.547 \cdot ksf$

$Min\_Pressure\_Check := if[(P_{min} \geq 0) \cdot (P_{min} < q_s), "Okay", "No Good"]$

Min_Pressure_Check = "Okay"

Tower Reinforcement Drawings

verizonwireless

TOWER REINFORCEMENT DESIGN

DANIELSON 2
812 PROVIDENCE PIKE
DANIELSON, CT 06239

VICINITY MAP

NORTH

PROJECT SUMMARY

SITE ADDRESS:	812 PROVIDENCE PIKE DANIELSON, CT 06239
PROJECT COORDINATES:	LAT: 41°-47'-29.44N LON: 71°-49'-20.66W ELEV:±680' AMSL
VERIZON SITE REF.:	DANIELSON 2
VERIZON CONTACT:	BRIAN RAGOZZINE 860.837.3121
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	CARLO F. CENTORE, PE 203.488.0580 ext. 122

SHEET INDEX

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N-2	STRUCTURAL STEEL NOTES	1
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REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	12/06/13	MS	CFC	ISSUED FOR CONSTRUCTION
0	11/19/13	MS	CFC	ISSUED FOR CONSTRUCTION

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VERIZON WIRELESS

DANIELSON 2

DATE:	11/11/13
SCALE:	AS SHOWN
JOB NO.	09050.000

TITLE SHEET

SHEET NO. T-1

Sheet No. 1 of 6

DESIGN BASIS

1. GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

2. TIA/EIA-222-F-1996 "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".

3. DESIGN CRITERIA

   WIND LOAD: (TIA/EIA-222-F-1996)
   BASIC WIND SPEED (V) = 85 MPH (FASTEST MILE)

   WIND LOAD: (2005 CT STATE BUILDING CODE APPENDIX K)
   BASIC WIND SPEED (V) = 105 MPH (3-SECOND GUST)
   EQUIVALENT TO (V) = 85 MPH (FASTEST MILE)

   TIA/EIA-222-F-1996 AND APPENDIX K WIND SPEEDS EQUAL

GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS AND REINFORCEMENT DESIGN PREPARED BY CENTEK ENGINEERING, INC., MARKED REV 1 DATED 12/06/13.

2. TOWER GEOMETRY AND STRUCTURE MEMBER SIZES WERE OBTAINED FROM A TOWER MAPPING REPORT PREPARED BY CSB COMMUNICATIONS, DATED OCTOBER 26, 2013.

3. PROVIDE TEMPORARY ANCHORS, GUYING AND/OR BRACING AS REQUIRED TO SAFELY CONDUCT THE WORK.

4. ALL WORK SHALL BE IN ACCORDANCE WITH TIA-222-F "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".

5. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE TOWER STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIE-DOWNS, WHICH MIGHT BE NECESSARY.

6. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS SCOPE OF WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.

7. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.

8. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.

11. TOWER REINFORCING SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS AND SUPPORT STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.

12. EXISTING COAXIAL CABLES AND ALL ACCESSORIES SHALL BE RELOCATED AS NECESSARY AND REINSTALLED BY THE CONTRACTOR WITHOUT INTERRUPTION IN SERVICE WHERE THEY ARE IN CONFLICT WITH TOWER REINFORCEMENT.

13. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

REV.	DATE	DRAWN BY	DESCRIPTION
1	12/09/13	MG	CFC ISSUED FOR CONSTRUCTION
0	11/27/13	TA	CFC ISSUED FOR CONSTRUCTION

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VERIZON WIRELESS

DANIELSON 2

DATE:	11/11/13
SCALE:	AS SHOWN
JOB NO.	09050.000

DESIGN BASIS & GENERAL NOTES

SHEET NO.
N-1

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD).

2. MATERIAL SPECIFICATIONS

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI).
   C. STRUCTURAL STEEL (TOWER REINF. PLATES)--- ASTM A572 GR50 (FY = 50 KSI)
   D. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   E. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   F. PIPE ---ASTM A53 GRADE B (FY = 35 KSI)

3. FASTENER SPECIFICATIONS

   A. CONNECTION BOLTS---ASTM A325-N, UNLESS OTHERWISE SCHEDULED.
   B. U-BOLTS---ASTM A307
   C. ANCHOR RODS---ASTM F1554
   D. WELDING ELECTRODES---ASTM E70XX FOR A36 & A572_GR50 STEELS, ASTM E80XX FOR A572_GR65 STEEL.
   E. BLIND BOLTS---AS1252 PROPERTY CLASS 8.8 (FU=120 KSI).

4. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.

5. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.

6. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.

7. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.

8. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.

9. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.

10. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.

11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".

12. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING THE SCHEDULED ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.

13. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

14. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

15. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.

16. LOCK WASHER ARE NOT PERMITTED FOR A325 BOLTED STEEL ASSEMBLIES.

17. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.

18. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

19. FABRICATE BEAMS WITH MILL CAMBER UP.

20. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.

21. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

NO.	DATE	BY	DESCRIPTION
1	12/04/13	TA	ISSUED FOR CONSTRUCTION
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DANIELSON 2

DATE: 11/11/13
SCALE: AS SHOWN
JOB NO. 00030.000

STRUCTURAL STEEL NOTES

SHEET NO.
N-2

MODIFICATION INSPECTION REPORT REQUIREMENTS

PRE-CONSTUCTION		DURING CONSTRUCTION		POST-CONSTRUCTION	
SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM
X	EOR MODIFICATION INSPECTION DRAWING	–	FOUNDATIONS	X	MODIFICATION INSPECTOR RECORD REDLINE DRAWING
X	EOR APPROVED SHOP DRAWINGS	–	EARTHWORK: BACKFILL MATERIAL & COMPACTION	–	POST-INSTALLED ANCHOR ROD PULL-OUT TEST
–	EOR APPROVED POST-INSTALLED ANCHOR MPII	–	CONCRETE TESTING	X	PHOTOGRAPHS
–	FABRICATION INSPECTION	X	STEEL INSPECTION		
–	FABRICATOR CERTIFIED WELDER INSPECTION	–	POST INSTALLED ANCHOR ROD VERIFICATION		
X	MATERIAL CERTIFICATIONS	–	BASE PLATE GROUT VERIFICATION		
		–	CONTRACTOR'S CERTIFIED WELD INSPECTION		
		X	ON-SITE COLD GALVANIZING VERIFICATION		
		X	GUY WIRE TENSION REPORT		
		X	CONTRACTOR AS-BUILT REDLINE DRAWINGS		

NOTES:
1. REFER TO MODIFICATION INSPECTION NOTES FOR ADDITIONAL REQUIREMENTS
2. "X" DENOTES DOCUMENT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
3. "–" DENOTES DOCUMENT NOT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
4. EOR – ENGINEER OF RECORD
4. MPII – "MANUFACTURER'S PRINTED INSTALLATION GUIDELINES"

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF STRUCTURAL MODIFICATIONS, TO INCLUDE A REVIEW AND COMPILATION OF SPECIFIED SUBMITTALS AND CONSTRUCTION INSPECTIONS, AS AN ASSURANCE OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS PREPARED UNDER THE DIRECTION OF THE ENGINEER OF RECORD (EOR).

2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND GENERAL WORKMANSHIP AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. OWNERSHIP OF THE MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD.

3. TO ENSURE COMPLIANCE WITH THE MODIFICATION INSPECTION REQUIREMENTS THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR (MI) COMMENCE COMMUNICATION UPON AUTHORIZATION TO PROCEED BY THE CLIENT. EACH PARTY SHALL BE PROACTIVE IN CONTACTING THE OTHER. THE EOR SHALL BE CONTACTED IF SPECIFIC GC/MI CONTACT INFORMATION IS NOT MADE AVAILABLE.

4. THE GC SHALL PROVIDE THE MI WITH A MINIMUM OF 5 BUSINESS DAYS NOTICE OF IMPENDING INSPECTIONS.

5. WHEN POSSIBLE, THE GC AND MI SHALL BE ON SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY NOTED DEFICIENCIES ADDRESSED DURING THE INITIAL MODIFICATION INSPECTION.

MODIFICATION INSPECTOR (MI)

1. THE MI SHALL CONTACT THE GC UPON AUTHORIZATION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE GC IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE MI IS RESPONSIBLE FOR COLLECTION OF ALL INSPECTION AND TEST REPORTS, REVIEWING REPORTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING ON-SITE INSPECTIONS AND COMPILATION & SUBMISSION OF THE MODIFICATION INSPECTION REPORT TO THE CLIENT AND THE EOR.

GENERAL CONTRACTOR (GC)

1. THE GC IS REQUIRED TO CONTACT THE GC UPON AUTHORIZATION TO PROCEED WITH CONSTRUCTION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE MI IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE GC IS RESPONSIBLE FOR COORDINATING AND SCHEDULING IN ADVANCE ALL REQUIRED INSPECTIONS AND TESTS WITH THE MI.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. SHOULD THE STRUCTURAL MODIFICATION NOT COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS, THE GC SHALL WORK WITH THE MODIFICATION INSPECTOR IN A VIABLE REMEDIATION PLAN AS FOLLOWS:

   – CORRECT ALL DEFICIENCIES TO COMPLY WITH THE CONTRACT DOCUMENTS AND COORDINATE WITH THE MI FOR A FOLLOW UP INSPECTION.
   – WITH CLIENT AUTHORIZATION, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION USING THE AS-BUILT CONDITION.

REQUIRED PHOTOGRAPHS

1. THE GC AND MI SHALL AT MINIMUM PHOTO DOCUMENT THE FOLLOWING FOR INCLUSION IN THE MODIFICATION INSPECTION REPORT:

   – PRE-CONSTRUCTION: GENERAL CONDITION OF THE SITE.
   – DURING CONSTRUCTION: RAW MATERIALS, CRITICAL DETAILS, WELD PREPARATION, BOLT INSTALLATION & TORQUE, FINAL INSTALLED CONDITION & SURFACE COATING REPAIRS.
   – POST-CONSTRUCTION: FINAL CONDITION OF THE SITE

REV.	DATE	DRAWN BY	CHK'D	ISSUED FOR CONSTRUCTION
1	12/04/13	LH	CFC	REVISED PER COMMENTS
0	11/11/13	LH	CFC	ISSUED FOR CONSTRUCTION

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VERIZON WIRELESS

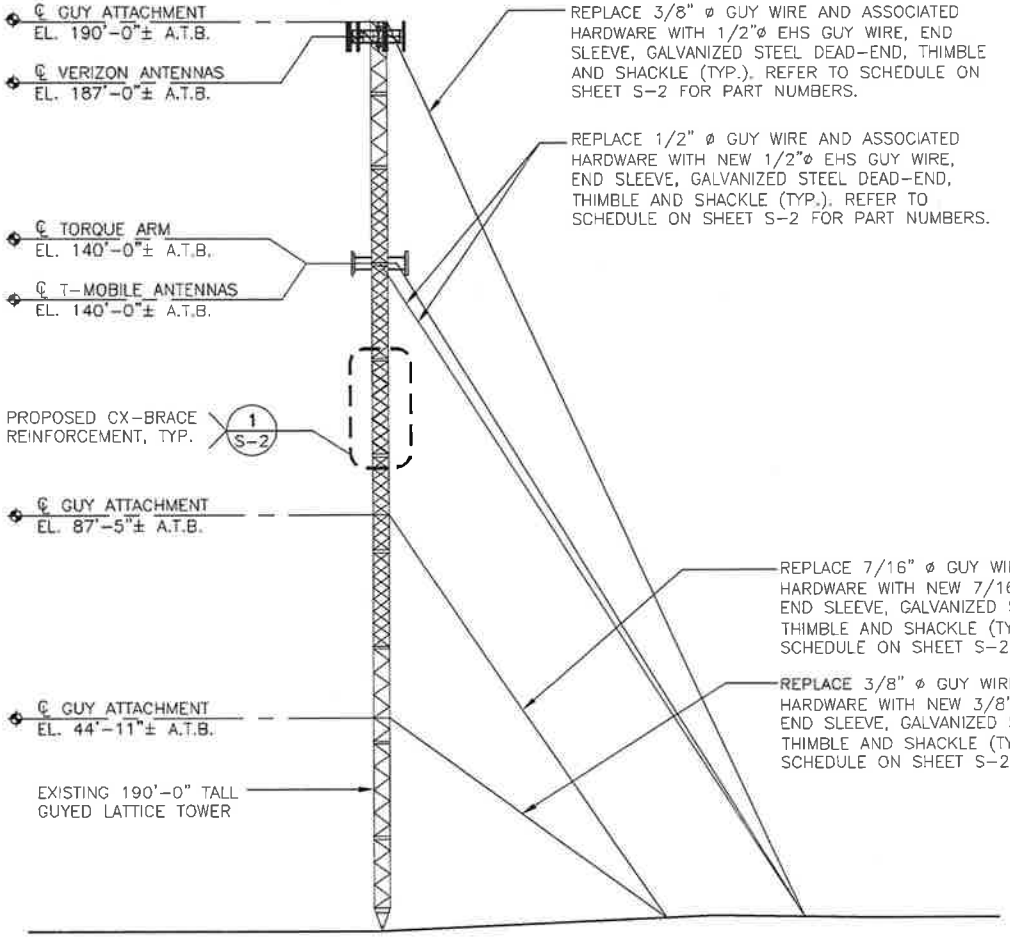
DANIELSON 2

DATE: 11/11/13
SCALE: AS SHOWN
JOB NO. 09059.000

MODIFICATION INSPECTION REQUIREMENTS

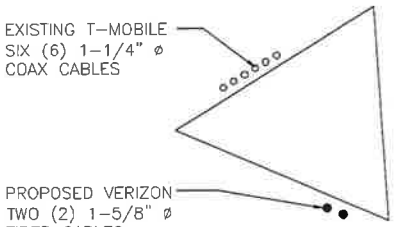
SHEET NO.
MI-1

AGL DENOTES ABOVE GRADE LEVEL
ATB DENOTES ABOVE TOWER BASE



NOTES

1. REMOVE ALL QVEC EQUIPMENT BEFORE INSTALLATION OF VERIZON WIRELESS ANTENNAS
2. WHERE REINFORCEMENT INSTALLATION COINCIDES WITH EXIST. EXTERIOR COAX CABLE PLACEMENT. GC. TO TEMPORARILY DETACH COAX TO PERMIT THE INSTALLATION OF THE REINFORCEMENT THEN REINSTATE COAX PRE-EXISTING CONDITION
3. REPLACE ALL EXISTING GUY WIRES AND ASSOCIATED HARDWARE. REFER TO SHEET S-2 FOR PART NUMBERS.



APPROX TRUE NORTH

1 / S-1 **TOWER ELEVATION - PROPOSED**
SCALE: 1" = 25'-0"

2 / S-1 **FEEDLINE PLAN - PROPOSED**
NOT TO SCALE

NO.	DATE	DRAWN BY/CHK'D BY	DESCRIPTION
1	11/04/13	LIL CFC	ISSUED FOR CONSTRUCTION
0	11/01/13	LIL CFC	ISSUED FOR CONSTRUCTION

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VERIZON WIRELESS
DANIELSON 2
DATE: 11/11/13
SCALE: AS SHOWN
JOB NO. 09058.000

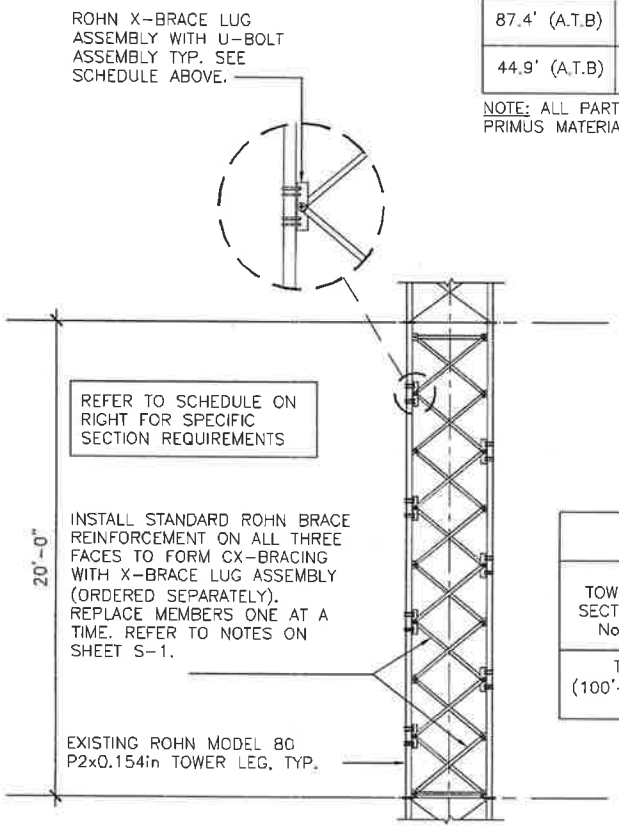
TOWER REINFORCEMENT ELEVATION & PLAN

SHEET NO. S-1

TOWER GUY WIRE COMPONENT SCHEDULE

ELEVATION	GUY WIRE SIZE	GUY WIRE ATTACHMENT/ TORQUE ARM P/N	BOLT TYPE SHACKLE P/N	END SLEEVE (ICE CLIP) P/N	GALV. DEAD END (BIG GRIP) P/N	THIMBLE P/N	TURNBUCKLE P/N	ANCHOR ROD P/N
190' (A.T.B)	1/2" (12AEHS)	EXIST.	5/8" (1019490)	1/2" (GC65266)	1/2" (BG2115)	5/8" (1037755)	7/8" JAW EYE (1032135)	EXIST.
140' (A.T.B)	1/2" (12AEHS)	EXIST.	5/8" (1019490)	1/2" (GC65266)	1/2" (BG2115)	5/8" (1037755)	7/8" JAW EYE (1032135)	EXIST.
87.4' (A.T.B)	7/16" (716AEHS)	EXIST.	1/2" (1019472)	7/16" (GC65265)	7/16" (BG2148)	1/2" (1037719)	3/4" JAW EYE (1032091)	EXIST.
44.9' (A.T.B)	3/8" (38AEHS)	EXIST.	1/2" (1019472)	3/8" (GC65264)	3/8" (BG2147)	1/2" (1037719)	5/8" JAW EYE (1032037)	EXIST.

NOTE: ALL PART NUMBERS SHOWN ABOVE ARE BASED ON PRIMUS MATERIALS UNLESS OTHERWISE SPECIFIED.



TOWER SECTION REINFORCEMENT SCHEDULE

TOWER SECTION No.	BOLTS	CX-BRACE REINFORCEMENT	ASSEMBLY PT. No.	CX-BRACE LUG PT. No. (QTY. - 1)	U-BOLT ASSY. (QTY. -4)	COMMENTS
T5 (100'-120')	1/2"ø A325	TS1.5x16ga.	KB497A	KB299	JR83A	REPLACE EXISTING 1/2" ø A325 BOLTS WITH NEW 1/2" ø A325 BOLTS @ PROPOSED DIAGONAL / EXIST. HORIZONTAL CONNECTION

1 / S-2 TYPICAL X-BRACE REINFORCEMENT DETAILS

SCALE: 1" = 5'-0"

NO.	DATE	DESCRIPTION
1	12/04/13	ISSUED FOR CONSTRUCTION
0	11/12/13	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405
www.CentekEng.com

VERIZON WIRELESS

DANIELSON 2

DATE: 11/11/13
SCALE: AS SHOWN
JOB NO. 09059.000

TOWER REINFORCEMENT DETAILS

SHEET NO. S-2

Reference Material

Site Name	DANIELSON 2, CT	Site #	2-0556
Latitude	41-47-29.44 N	Longitude	71-49-20.66 W
		GEL (Feet)	677

700 MHz LTE Site Info	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	ALU 700MHz BBU		ALU 700MHz BBU		ALU 700MHz BBU	
ANTENNA TYPE	BXA-70063-6CF		BXA-70063-6CF		BXA-70063-6CF	
QUANTITY PER FACE	1		1		1	
ORIENTATION	80		180		300	
DOWN TILT (DEG.)	0° Mech + 0° Elec		4° Mech + 0° Elec		6° Mech + 0° Elec	
RAD CTR (FT AGL)	190		190		190	
TOWER MOUNTED AMPS (QTY)	N/A		N/A		N/A	
DIPLEXER - QTY/MODEL						
RRH - QTY/MODEL	1	ALU RRH_2X40-700U	1	ALU RRH_2X40-700U	1	ALU RRH_2X40-700U
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX						

850 MHz Cellular Site Info	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	N/A	N/A	N/A
ANTENNA TYPE	BXA-70063-6CF	BXA-70063-6CF	BXA-70063-6CF
QUANTITY PER FACE	1	1	1
ORIENTATION	80	180	300
DOWN TILT (DEG.)	0° Mech + 0° Elec	4° Mech + 0° Elec	6° Mech + 0° Elec
RAD CTR (FT AGL)	190	190	190
TOWER MOUNTED AMPS (QTY)	N/A	N/A	N/A
DIPLEXER - QTY/MODEL			

1900 MHz PCS Site Info	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	N/A	N/A	N/A
ANTENNA TYPE	BXA-171063-12CF_2	BXA-171063-12CF_2	BXA-171063-12CF
QUANTITY PER FACE	1	1	1
ORIENTATION	80	180	300
DOWN TILT (DEG.)	0° Mech + 0° Elec	0° Mech + 0° Elec	0° Mech + 0° Elec
RAD CTR (FT AGL)	190	190	190
TOWER MOUNTED AMPS (QTY)	N/A	N/A	N/A
DIPLEXER - QTY/MODEL			

2100 MHz LTE Site Info	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	2100 MHz BBU		2100 MHz BBU		2100 MHz BBU	
ANTENNA TYPE	BXA-171063-12CF_2		BXA-171063-12CF_2		BXA-171063-12CF	
QUANTITY PER FACE	1		1		1	
ORIENTATION	80		180		300	
DOWN TILT (DEG.)	0° Mech + 0° Elec		0° Mech + 0° Elec		0° Mech + 0° Elec	
RAD CTR (FT AGL)	190		190		190	
TOWER MOUNTED AMPS (QTY)	N/A		N/A		N/A	
DIPLEXER - QTY/MODEL						
RRH - QTY/MODEL	1	ALU RRH_2X40-AWS	1	ALU RRH_2X40-AWS	1	ALU RRH_2X40-AWS
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX	1		DB-T1-6Z-8AB-0Z			

Coax Cable Ordering					
MAINLINE SIZE	1 5/8"	TOTAL # OF MAIN LINES	0	COAX LINE MODEL #	
JUMPER SIZE	1/2 "	TOTAL # OF TOP JUMPERS	12	TOP JUMPER MODEL #	
Fiber Cable Ordering					
FIBER LINE SIZE	1 5/8"	TOTAL # OF FIBER LINES	2	FIBER LINE MODEL #	HB158-1-08U8-S8J18
JUMPER SIZE	5/8"	TOTAL # OF TOP JUMPERS	6	TOP JUMPER MODEL #	HB058-1-08U1-S1J

TX / RX FREQUENCIES			TX POWER OUTPUT
Cellular A-Band	**PCS F / AWS-Band**	**700 Mhz C - Block**	Cellular (Watts)
TX - 869-880,890-891.5 MHz	TX - 1970-1975 / 2145-2155	TX - 746-757	PCS (Watts)
RX - 824-835,845-846.5 MHz	RX - 1890-1895 / 1745-1755	RX - 776-787	700 MHz / 2100 MHz (Watts)

ALPHA				**BETA**				**GAMMA**		
Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color	Ant.	Freq.	Func.
A1-A	800	Tx1/Rx0	RED	A5-A	800	Tx2/Rx0	BLUE	A9-A	800	Tx3/Rx0
A1-B	1900	Tx1/Rx0	RED/ WHITE	A5-B	1900	Tx2/Rx0	BLUE/ WHITE	A9-B	1900	Tx3/Rx0
A2	700	Tx1/Rx0	RED/ ORANGE	A6	700	Tx2/Rx0	BLUE/ ORANGE	A10	700	Tx3/Rx0
A3	700	Tx4/Rx1	RED/RED/ ORANGE	A7	700	Tx5/Rx1	BLUE/BLUE/ ORANGE	A11	700	Tx6/Rx1
A4-B	1900	Tx4/Rx1	RED/RED/ WHITE	A8-B	1900	Tx5/Rx1	BLUE/BLUE/ WHITE	A12-B	1900	Tx6/Rx1
A4-A	800	Tx4/Rx1	RED/RED	A8-A	800	Tx5/Rx1	BLUE/BLUE	A12-A	800	Tx6/Rx1
F1-A	1700	Tx/Rx	RED/ BROWN	F1-B	1700	Tx/Rx	BLUE/BROWN	F1-C	1700	Tx/Rx
F1-D	1700	Tx/Rx	RED/RED/ BROWN	F1-E	1700	Tx/Rx	BLUE/BLUE/BROWN	F1-F	1700	Tx/Rx

RF ENGINEER	RF MANAGER	RF INITIALS
Prepared By: Mark Brauer	Robert Hesselbach	MB

Amphenol ANTENNA SOLUTIONS

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

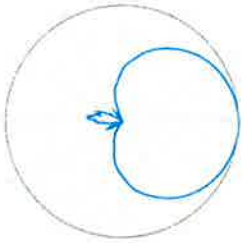
Replace "X" with desired electrical downtilt

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	13°	11°
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm	6.8 in
Weight without mounting brackets	7.9 kg	17 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.51 m² Side: 0.24 m²	Front: 5.5 ft² Side: 2.6 ft²
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

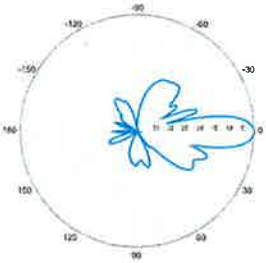
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



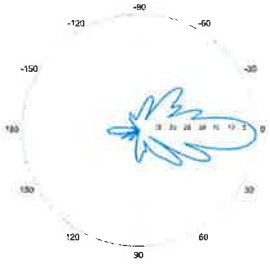
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

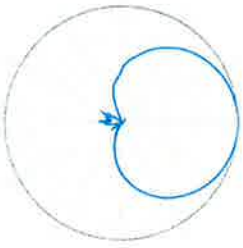


0° | Vertical | 750 MHz

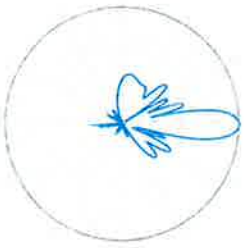
BXA-70063-6CF-EDIN-2



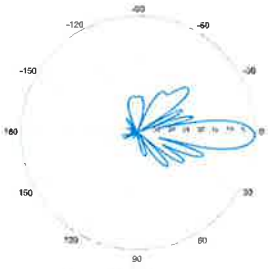
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

BXA-171063-12CF-EDIN-X

X-Pol | FET Panel | 63° | 19.0 dBi

Replace "X" with desired electrical downtilt.

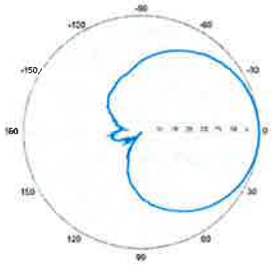
Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		

Mechanical Characteristics		
Dimensions Length x Width x Depth	1842 x 154 x 105 mm	72.5 x 6.1 x 4.1 in
Depth with z-brackets	133 mm	5.2 in
Weight without mounting brackets	5.8 kg	12.8 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.28 m² Side: 0.19 m²	Front: 3.1 ft² Side: 2.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N	Front: 103 lbf Side: 68 lbf

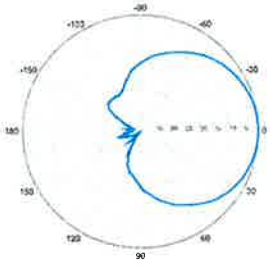
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12CF-EDIN-X-FP		

BXA-171063-12CF-EDIN-X



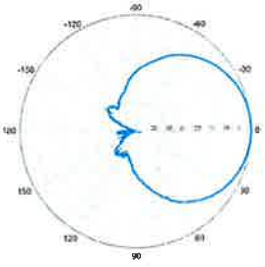
Horizontal | 1710-1880 MHz

BXA-171063-12CF-EDIN-X



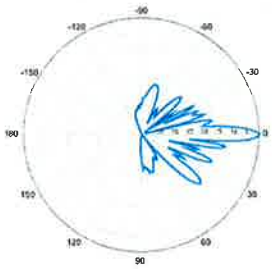
Horizontal | 1850-1990 MHz

BXA-171063-12CF-EDIN-X



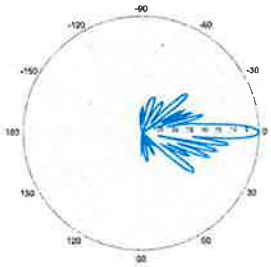
Horizontal | 1920-2170 MHz

BXA-171063-12CF-EDIN-0



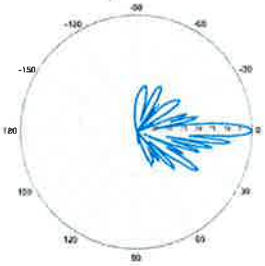
0° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-0



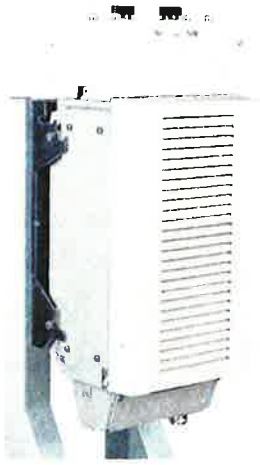
0° | Vertical | 1920-2170 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

Alcatel-Lucent RRH2x40-AWS

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-AWS is a high-power, small form-factor Remote Radio Head (RRH) operating in the AWS frequency band (1700/2100MHz - 3GPP Band 4). The Alcatel-Lucent RRH2x40-AWS is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



A distributed eNodeB expands deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-AWS has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to four-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 20 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-AWS is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-AWS is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-AWS is compact and weighs less than 20 kg (44 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

Excellent RF performance

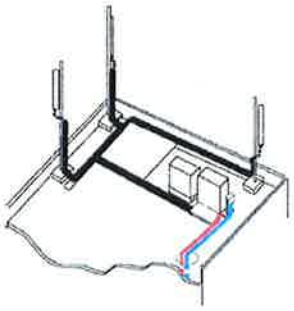
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced.
The Alcatel-Lucent RRH2x40-AWS provides more RF power while at the same time consuming less electricity.

Features

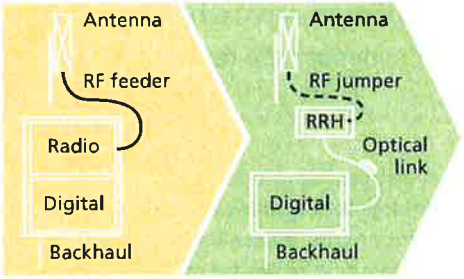
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

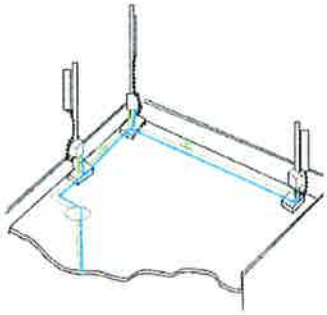
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170m (6.7 in.)
- Weight (without mounting kit): less than 20 kg (44 lb)

Power

- Power supply: -48VDC

Operating environment

- Outdoor temperature range:
  - ¬ With solar load: -40°C to +50°C (-40°F to +122°F)
  - ¬ Without solar load: -40°C to +55°C (-40°F to +131°F)
- Passive convection cooling (no fans)
- Enclosure protection
  - ¬ IP65 (International Protection rating)

RF characteristics

- Frequency band: 1700/2100 MHz (AWS); 3GPP Band 4
- Bandwidth: up to 20 MHz
- RF output power at antenna port: 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way with optional Rx Diversity module
- Noise figure: below 2.0 dB typical
- Antenna Line Device features
  - ¬ TMA and Remote electrical tilt (RET) support via AISG v2.0

Optical characteristics

Type/number of fibers

- Single-mode variant
  - ¬ One Single Mode Single Fiber per RRH2x, carrying UL and DL using CWDM
  - ¬ Single mode dual fiber (SM/DF)
- Multi-mode variant
  - ¬ Two Multi-mode fibers per RRH2x: one carrying UL, the other carrying DL

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Digital Ports and Alarms

- Two optical ports to support daisy-chaining
- Six external alarms

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CPG2809100912 (09)

Alcatel·Lucent

Alcatel-Lucent RRH2x40-07-U

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-07-U is a high-power, small form-factor Remote Radio Head (RRH) operating in the North American Digital Dividend / 700MHz frequency band (3GPP Band 13). The Alcatel-Lucent RRH2x40-07-U is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.

A distributed eNodeB expands deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-07-U is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-07-U has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to two-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 10 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-07-U is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-07-U installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-07-U is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-07-U is compact and weights less than 23 kg (50 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

Excellent RF performance

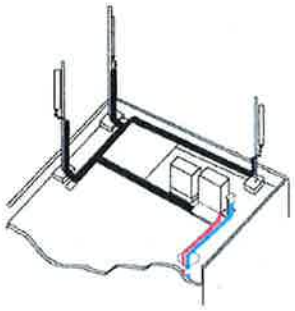
Because of its small size and weight, the Alcatel-Lucent RRH2x40-07-U can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-07-U where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-07-U provides more RF power while at the same time consuming less electricity.

Features

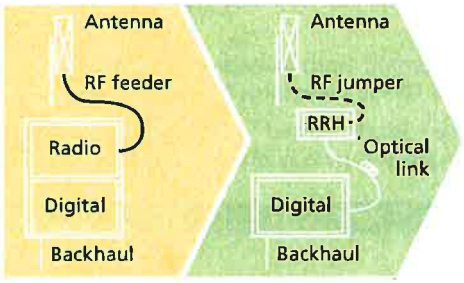
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless), noise-free, and heaterless unit
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

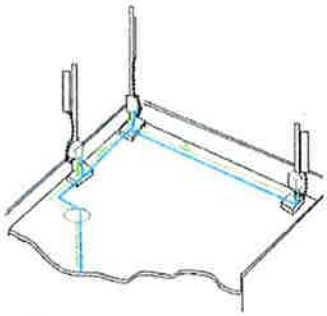
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 390 mm (15.4 in.)
- Width: 380 mm (15 in.)
- Depth: 210 mm (8.2 in.)
- Weight (without mounting kit): less than 23 kg (50 lb)

Power

- Power supply: -48V

Operating environment

- Outdoor temperature range:
  - ¬ With solar load: -40°C to +50°C (-40°F to +122°F)
  - ¬ Without solar load: -40°C to +55°C (-40°F to +131°F)
- Passive convection cooling (no fans)
- Enclosure protection
  - ¬ IP65 (International Protection rating)

RF characteristics

- Frequency band: 700 MHz; 3GPP Band 13
- Bandwidth: up to 10 MHz
- RF output power at antenna port:
  - ¬ 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way
- Noise figure: below 2.5 dB typical
- ALD features
  - ¬ TMA
  - ¬ Remote electrical tilt (RET) support (AISG v2.0)

Optical characteristics

Type/number of fibers

- Up to 3.12 Gb/s line bit rate
- Single-mode variant
  - ¬ One SM fiber (9/125 µm) per RRH2x, carrying UL and DL using CWDM (at 1550/1310 nm)
- Multi-mode variant
  - ¬ Two MM fibers (50/125 µm) per RRH2x: one carrying UL, the other carrying DL (at 850 nm)

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Alarms and ports

- Six external alarms
- Two optical ports to support daisy-chaining

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CPG2809100913 (09)

Alcatel·Lucent

Product Data Sheet DB-B1 and DB-T1 Series

DC and Fiber Management Distribution Boxes for HYBRIFLEX™ Cable

Product Description

The RFS Distribution Box design comes with the option for pluggable over voltage protection (OVP) for up to 6 remote radios and the connection for 6 pairs of optical fiber with LC optical fiber cable management. There is a hybrid cable input with a jumper configuration for power and optical fiber to the remote radio heads (RRHs). A custom wall, a 2-inch pole, and an H-Frame mounting bracket are included. Both the compact and standard design are available with lightening protection.

Features/Benefits

- Designed to accommodate varying diameters of HYBRIFLEX™ (combined power and fiber optic) cables – up to 2 inches
- Supports Single- and Multi-Mode Optical fiber
- NEMA 4x rated enclosure – allows **flexibility for indoor or outdoor installation** on a roof or tower top
- Weatherproof enclosure and ports – **improves system reliability**
- Modular design – makes replacement or addition of OVP easy without removal of other components within the box
- Strikesorb OVP technology – protects equipment from damaging surges up to 60 kA on an 8/20 waveform and up to 5 kA on a 10/350 waveform (certain models only)
- Low residual voltage and high impedance – **ideally suited for RRH technology** – won't shut down the RRH the way spark gap technology does (certain models only)

Technical Specifications

Mechanical Specifications

Model Number	DB-B1-6C-8AB-0Z	DB-T1-6Z-8AB-0Z
Enclosure Design	Standard, 6 OVP's	Standard without OVP
Dimensions - H x W x D, mm (in)	610 x 610 x 254 (24 x 24 x 10)	610 x 610 x 254 (24 x 24 x 10)
Weight, kg (lb)	20 (44)	20 (44)
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum	
Fiber Connection Method	LC-LC Single- or Multi-mode duplex	
Environmental Rating	NEMA 4x	
Operating Temperature, °C (°F)	-40 to +80 (-40 to +176)	
UV Protection	ISO 4892-2 Method A Xenon-Arc 2160 hrs	

Electrical Specifications

Nominal Operating Voltage	48 VDC	
Nominal Discharge Current (I_n) per UL 1449 3rd Ed	20 kA 8/20 µs	N/A
Maximum Discharge Current (I_{max}) per NEMA LS-1	60 kA 8/20 µs	N/A
Maximum Impulse (Lightning) Current (I_{imp}) per IEC 61643-1	5 kA 10/350 µs	N/A
Maximum Continuous Operating Voltage (U_c)	75 VDC	N/A
Voltage Protection Rating per UL1449 3rd Ed	400 V	N/A
Protection Class as per IEC 61643-1	Class 1	N/A
Strikesorb OVP Compliance	ANSI/UL 1449-3rd Ed	N/A
	IEEE C62.41	N/A
	NEMA LS-1	N/A
	IEC 61643-1	N/A
	IEC 61643-12	N/A
	EN 61643-11	N/A

* This data is provisional and subject to change.

All information contained in the present datasheet is subject to confirmation at time of ordering.

ATTACHMENT 4

HMB

HMB Acoustics LLC 3 Cherry Tree Lane, Avon, Ct. 06001 860-677-5955

January 15, 2014

Doug Drost
Project Engineer, Wireless
Centek Engineering, Inc.
63-2 North Branford Road
Branford, Ct. 06405

Subject: Danielson 2 - Noise Compliance Study

Dear Mr. Drost:

The noise levels for the V1 and V2 wall mounted HVAC units were calculated while they were operating separately. Typically only one of the two air-conditioner units operates at any one time. The noise level was then projected to each property line. The resultant noise level was compared to the State of Ct. Noise Regulation. The Regulation allows a noise level of 55 dBA (daytime) and 45 dBA (nighttime), when measured at a Residential Receptor's property line. I found that the V1 and V2 units meet the conditions for compliance as set forth in the Regulation at all property lines.

Allan Smardin
HMB Acoustics LLC

PROJECT INFORMATION:	Centek Job #: 09059.000
Applicant:	Cellco Partnership d.b.a. Verizon Wireless
Applicant Site ID:	Danielson 2
Site Owner:	Quinebaug Valley Emergency Communications (QVEC)
Site Address:	812 Providence Pike, Danielson, CT
Subject Zoning District:	RD: Rural Development
Abutting Zoning District(s):	RD: Rural Development (All abutters)

APPLICANT EQUIPMENT:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West
V-1	Wall Mounted HVAC	Bard / W61A1-105EPXXXJ	165	116	71	89
V-2	Wall Mounted HVAC	Bard / W61A1-105EPXXXJ	166	116	63	95

EXISTING COLOCATORS:

☐ AT&T	☐ Metro PCS	☐ Other:
☐ Sprint	☒ T Mobile	☐ Other:
☐ Nextel	☐ None	☐ Other:

EXISTING COLOCATOR EQUIPMENT OWNER: QVEC

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:						
ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:						
ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:						
ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

CONCLUSION:			
Daytime Regulation:	55 dBA	**Nighttime Regulation:**	45 dBA
Compliance:	☒ Yes ☐ No	**Compliance:**	☒ Yes ☐ No

BASIS OF FINDINGS:

North property line: V-1 = 36 dBA; V-2 = 36 dBA;

South property line: V-1 = 40 dBA; V-2 = 40 dBA;

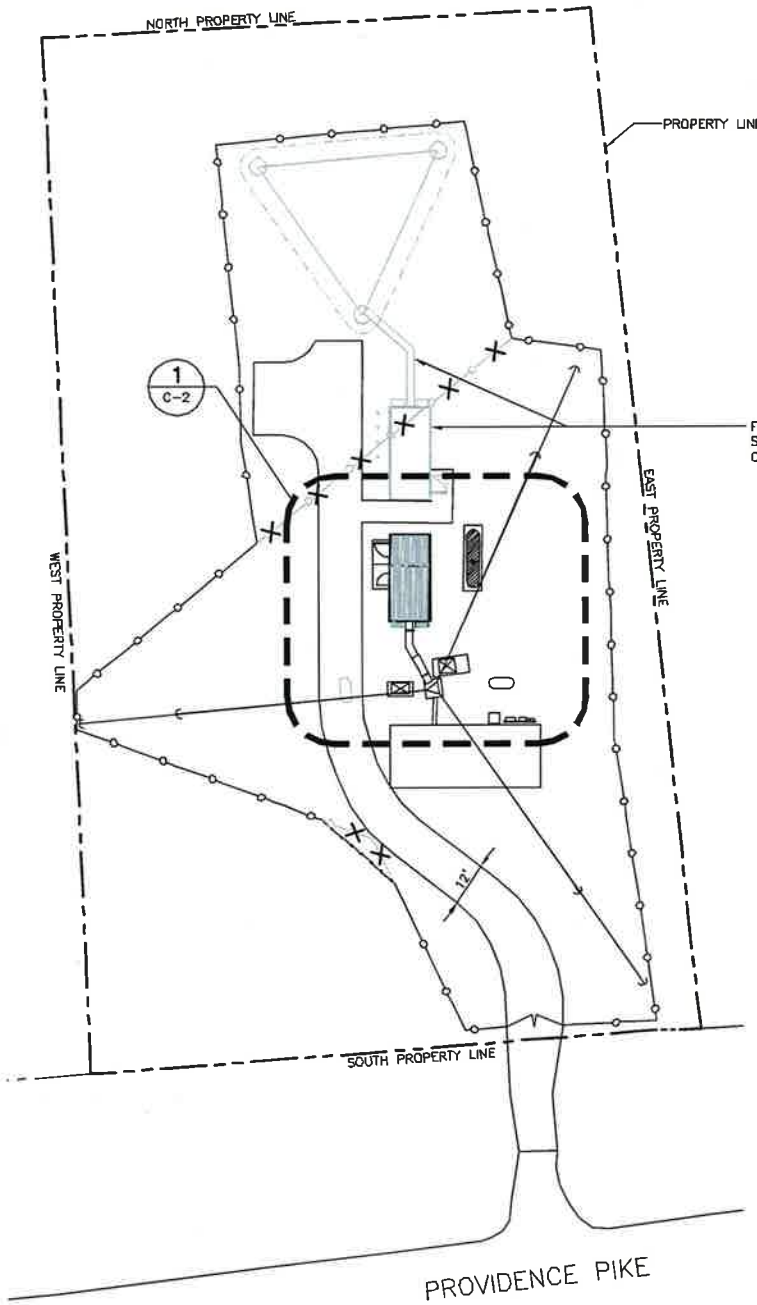
East property line: V-1 = 39 dBA; V-2 = 38 dBA;

West property line: V-1 = 43 dBA; V-2 = 44 dBA;

The dBA level at the North property line takes into account the acoustical shielding effect provided by the equipment shelter where the V-1 and V-2 HVAC units are mounted.

The existing pad mounted T-Mobile equipment is inaudible at a distance of 20 feet.

Prepared By: Alan Smardin, HMB ACOUSTICS LLC Date: 01/16/14



1 / C-1 SITE PLAN - PROPOSED
SCALE: 1" = 50'-0"

APPROXIMATE NORTH

GRAPHIC SCALE
0 25 50
(IN FEET)
1 inch = 50 ft.

REV.	DATE	DWD DRAWN BY	CFC CHK'D BY	NOISE EMITTER INFORMATION DESCRIPTION
0	01/15/14			

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions
www.Centekeng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless

DANIELSON 2

812 PROVIDENCE PIKE
DANIELSON, CT 06239

DATE: 01/03/14
SCALE: AS NOTED
JOB NO. 09059.000

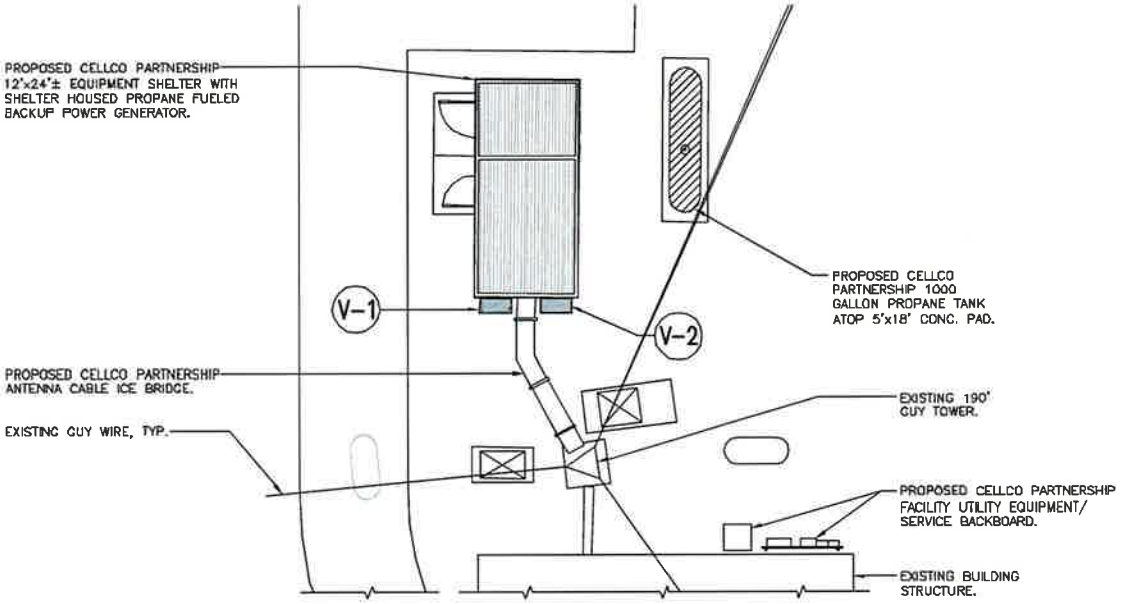
SITE PLAN

C-1

DWG. 1 OF 2

NOISE EMMITTER INFORMATION

(V-1)	WALL MOUNTED HVAC UNIT, MAKE: BARD, MODEL: W61A1-A05EPXXXJ
(V-2)	WALL MOUNTED HVAC UNIT, MAKE: BARD, MODEL: W61A1-A05EPXXXJ
(Q-1)	WALL MOUNTED HVAC UNIT, MAKE: MARVAIR, COMPAC 4, MODEL: UNKNOWN
(Q-2)	WALL MOUNTED HVAC UNIT, MAKE: MARVAIR, COMPAC 4, MODEL: UNKNOWN



1 C-2 COMPOUND PLAN - PROPOSED
SCALE: 1" = 20'-0"

APPROXIMATE NORTH

GRAPHIC SCALE
0 10 20
(IN FEET)
1 inch = 20 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/15/14	DMD	CFC	NOISE EMITTER INFORMATION

Cellco Partnership d.b.a. verizon wireless

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Cellco Partnership d/b/a Verizon Wireless

DANIELSON 2

812 PROVIDENCE PIKE
DANIELSON, CT 06239

DATE: 01/03/14
SCALE: AS NOTED
JOB NO. 09059.000

COMPOUND PLAN

C-2

DWG. 2 OF 2

ATTACHMENT 5

Site Name: DANIELSON 2 CT
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW PCS	1970	11	372	4089.9	187	0.0421	1.0	4.21%
VZW Cellular	869	9	364	3273.124	187	0.0337	0.579333333	5.81%
VZW AWS	2145	1	1750	1750	187	0.0180	1.0	1.80%
VZW 700	746	1	1050	1050	187	0.0108	0.497333333	2.17%

Total Percentage of Maximum Permissible Exposure 13.99%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used.