Robinson+Cole

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Also admitted in Massachusetts

June 9, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
889 Colonel Ledyard Highway, Ledyard, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 180-foot level on an existing 347-foot guyed lattice tower at 889 Colonel Ledyard Highway in Ledyard, Connecticut (the "Property"). The tower is owned by Red Wolf Broadcasting. Cellco's use of the tower was approved by the Council in 2000. Cellco now intends to modify its facility by replacing all of its existing antennas with three (3) model LNX-6514DS-VTM, 700 MHz antennas; three (3) model LNX-6514DS-VTM, 850 MHz antennas; three (3) model HBXX-6517DS-VTM, 1900 MHz antennas; and three (3) model HBXX-6517DS-VTM, 2100 MHz antennas, all at the same 180-foot level on the tower. Cellco also intends to add six (6) remote radio heads ("RRHs"), one (1) each behind its 1900 MHz and 2100 MHz antennas and two (2) HYBRIFLEX™ antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to John Rodolico, Mayor of the Town of Ledyard. The Town of Ledyard is the owner of the Property.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. The replacement antennas and RRHs will be installed on Cellco's existing antenna mounting structure at the 180-foot level on the tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table with Cellco's modified facility is included in Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
John Rodolico, Ledyard Mayor
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

LNX-6514DS-VTM

Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Excellent solution for site sharing and maximizing capacity
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**
Gain, dBi	15.8	15.9
Beamwidth, Horizontal, degrees	65	64
Beamwidth, Vertical, degrees	12.4	11.2
Beam Tilt, degrees	0–10	0–10
USLS, dB	17	18
Front-to-Back Ratio at 180°, dB	32	30
CPR at Boresight, dB	23	23
CPR at Sector, dB	12	10
Isolation, dB	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°
Impedance	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	**698–806**	**806–896**
Gain by all Beam Tilts, average, dBi	15.6	15.7
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.5
Gain by Beam Tilt, average, dBi	0 ° | 15.7	0 ° | 15.9
	5 ° | 15.7	5 ° | 15.8
	10 ° | 15.3	10 ° | 15.3
Beamwidth, Horizontal Tolerance, degrees	±0.9	±1.4
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.6
USLS, dB	18	20
Front-to-Back Total Power at 180° ± 30°, dB	25	23
CPR at Boresight, dB	25	24
CPR at Sector, dB	15	12

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol® | Teletilt®

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Product Specifications

LNX-6514DS-VTM

Operating Frequency Band	698 – 896 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum
Radome Material	Fiberglass, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	2
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	180.5 mm | 7.1 in
Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Net Weight	14.2 kg | 31.3 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	LNX-6514DS-A1M
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

DB380 — Pipe Mounting Kit for 2.4"-4.5" (60-115mm) OD round members on wide panel antennas. Includes 2 clamp sets and double nuts.

DB5083 — Downtilt Mounting Kit for 2.4"-4.5" (60 - 115 mm) OD round members. Includes a heavy-duty, galvanized steel downtilt mounting bracket assembly and associated hardware. This kit is compatible with the DB380 pipe mount kit for panel antennas that are equipped with two mounting brackets.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

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Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBXX-6517DS-VTM

Andrew® Quad Port Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	21	22	21
CPR at Sector, dB	10	11	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 18.4 3 ° | 18.7 6 ° | 18.4	0 ° | 18.4 3 ° | 18.7 6 ° | 18.5	0 ° | 18.7 3 ° | 18.9 6 ° | 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® quad
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz

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All specifications are subject to change without notice. See www.commscope.com for the most current information. Revised: April 14, 2015

Product Specifications

HBXX-6517DS-VTM

Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1903.0 mm | 74.9 in
Width	305.0 mm | 12.0 in
Net Weight	19.5 kg | 43.0 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	HBXX-6517DS-A2M
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

600899A-2 — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

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PCS RF MODULES
RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

		RRH2x60
RF Output Power		2x60W
Instantaneous Bandwidth		20MHz
Transmitter		2 TX
Receiver	1900 HW version	2 Branch RX – LA6.0.1
	1900A HW version	4 Branch RX – LR13.3
Features		AISG 2.0 for RET/TMA
		Internal Smart Bias-T
Power		-48VDC
CPRI Ports		2 CPRI Rate 3 Ports
External Alarms		4 External User Alarms
Monitor Ports		TX
Environmental		GR487 Compliance
RF Connectors		7/16 DIN (top mounted)

** Not a Verizon Wireless deployed product

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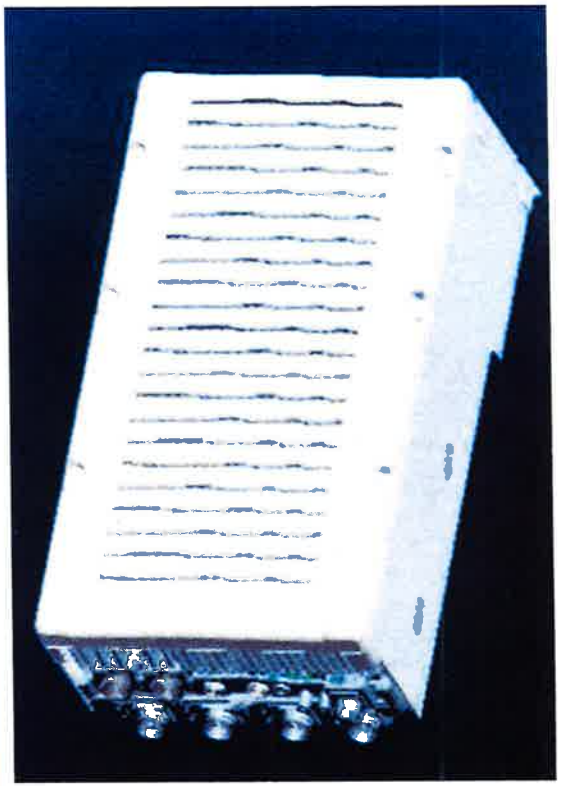
NEW PCS RF MODULES FOR VZW
RRH2X60 - HW CHARACTERISTICS

LR14.3

	RRH2x60
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w)x 9.4" (d)**
Weight	55lb**



**- Includes solar shield but not mounting brackets (8 lbs.)

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ALCATEL-LUCENT WIRELESS PRODUCT DATASHEET

RRH2x60-AWS FOR BAND 4 APPLICATIONS

The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.

A distributed Node B expands the 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 a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-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 RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

The Alcatel-Lucent RRH2x60-AWS is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

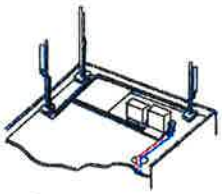
The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

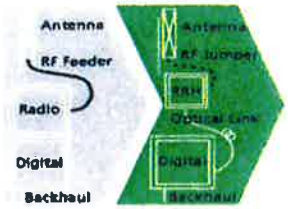
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

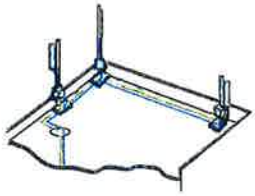
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control
- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights
- HxWxD : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data
- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics
- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity
- Two CPRI optical ports for daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications
- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data
- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

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Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Figure 1: HYBRIFLEX Series

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics – minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding – Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH – Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable – Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket – Ensures long-lasting cable protection

Technical Specifications

Outer Conductor Armor:	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket:	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection:	Individual and External Jacket		Yes
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm²(8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

* This data is provisional and subject to change

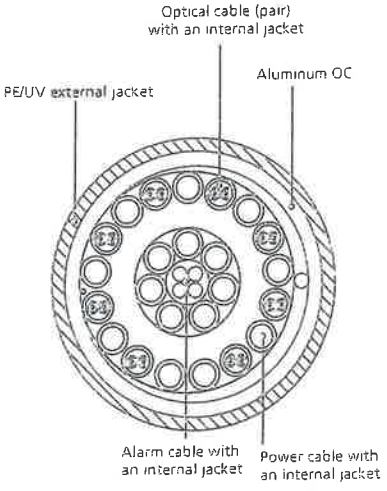


Figure 2: Construction Detail

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

ATTACHMENT 2

	General	Power	Density					
Site Name: Ledyard								
Tower Height: 347ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Red Wolf, WERI	1	3100	320	0.0109	106.5	0.2000	5.44%	
*Marcus	5	100	286	0.0022	490	0.3267	0.67%	
*Marcus	5	100	286	0.0022	490	0.3267	0.67%	
*Marcus	1	0.1	270	0.0000	5800	1.0000	0.00%	
*Marcus	1	0.1	270	0.0000	5800	1.0000	0.00%	
*Nextel	9	100	235	0.0059	851	0.5673	1.03%	
*Sprint	11	133	225	0.0104	1962.5	1.0000	1.04%	
*Arch	1	300	207	0.0025	454	0.3027	0.83%	
*AT&T UMTS	2	565	200	0.0102	880	0.5867	1.73%	
*AT&T UMTS	2	875	200	0.0157	1900	1.0000	1.57%	
*AT&T GSM	1	647	200	0.0058	880	0.5867	0.99%	
*AT&T GSM	4	777	200	0.0279	1900	1.0000	2.79%	
*AT&T LTE	1	1615	200	0.0145	734	0.4893	2.97%	
*T-Mobile LTE-AWS	2	2335	185	0.0491	2100	1.0000	4.91%	
*T-Mobile GSM/UMTS	4	1167	185	0.0490	1950	1.0000	4.90%	
*T-Mobile LTE	1	865	185	0.0091	700	0.4667	1.95%	
Verizon	**11**	**410**	**180**	**0.0501**	**1970**	**1.0000**	**5.01%**	
Verizon	**9**	**365**	**180**	**0.0365**	**869**	**0.5793**	**6.29%**	
Verizon	**1**	**2762**	**180**	**0.0307**	**2145**	**1.0000**	**3.07%**	
Verizon	**1**	**661**	**180**	**0.0073**	**746**	**0.4973**	**1.48%**	
								47.35%
* Source: Siting Council								

ATTACHMENT 3

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

347' Existing PiROD Guyed Lattice Tower

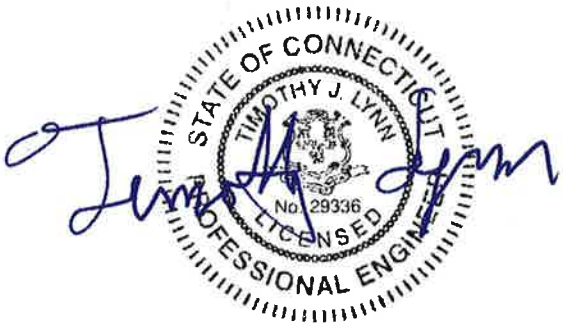
Proposed Verizon Wireless
Antenna Upgrade

Verizon Site Ref: Ledyard

889 Colonel Ledyard Highway
Ledyard, CT

Centek Project No. 15001.044

Date: May 14, 2015



Prepared for:

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

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Table of Contents

Introduction

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

The host tower is a 347-ft, three legged, guyed lattice tower originally designed and manufactured by PiROD Inc.; eng file no: A-117547 dated December 5, 2000. The tower geometry, structure member sizes, tower reinforcement and foundation system information were taken from a previous structural report prepared by Centek job no.; 12001.CO12 dated November 8, 2012.

Antenna and appurtenance information were obtained from the aforementioned Centek structural report, a T-Mobile Lease Exhibit and a Verizon RF data sheet.

The tower consists of nineteen (19) vertical sections consisting of solid round pipe legs conforming to ASTM A572-50. Diagonal and horizontal lateral support bracing consists of solid round pipe conforming to ASTM A572-50. The vertical tower sections are connected by bolted sleeves with the diagonal and horizontal bracing to pipe legs consisting of welded connections. The width of the tower face is 5.0-ft throughout its length with the exception of a 5'-4" tapered base section and a 17' long x 2.5-ft wide top section attached by rigid index plate.

Verizon Wireless proposes the removal of twelve (12) existing panel antennas and the installation of twelve (12) panel antennas, six (6) RRH's and two (2) distribution boxes mounted to the three (3) existing boom gates. 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 and proposed loads considered in the analysis consist of the following:

- UNKNOWN (Existing):
  Antenna: One (1) flash beacon light with lighting canopy mounted with an elevation of ±348-ft above grade.
  Coax Cable: One (1) 1" ∅ rigid conduit running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) LP-3E Radome mounted with an elevation of 339-ft above grade.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) 10-ft dish mounted on a 4-ft sidearm with a RAD center elevation of 320-ft above grade.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) DCRL antenna leg mounted with a RAD center elevation of 320-ft above grade.
  Coax Cables: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKOWN (EXISTING):
  Antennas: One (1) DCRL antenna mounted leg mounted with a RAD center elevation of 310-ft above grade.
  Coax Cables: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) LP-3C Radome mounted with an elevation of 311-ft above grade.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) 10-ft dish leg mounted with a RAD center elevation of 310-ft above grade.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: Three (3) Decibel DB810KE-Y whips mounted on two (2) 10-ft candelabra arms with an elevation of 295-ft above grade.
  Coax Cables: Three (3) 1-1/4" ∅ coax cables on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) PD220 whip mounted on a 4-ft side arm with an elevation of 295-ft above grade.
  Coax Cables: One (1) 2-1/4" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) DCRL antenna leg mounted with a RAD center elevation of 290-ft above grade.
  Coax Cables: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) DCRL antenna leg mounted with a RAD center elevation of 280-ft above grade.
  Coax Cables: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) 6-ft dish pipe mounted with a RAD center elevation of 275-ft above grade.
  Coax Cables: One (1) 1-1/4" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) PD220 whip mounted on a 6-ft side arm with an elevation of 260-ft above grade.
  Coax Cables: One (1) 1-1/4" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKOWN (EXISTING):
  Antennas: One (1) PD220 whip mounted on a 6-ft side arm with an elevation of 250-ft above grade.
  Coax Cables: One (1) 1-1/4" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- SPRINT (EXISTING):
  Antennas: Six (6) Decibel DB980H90E-M panel antennas mounted on three (3) 12-ft T-Frames with a RAD center elevation of 225-ft above grade.
  Coax Cables: Six (6) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) PD1142 whip mounted on a 6-ft side arm with an elevation of 207-ft above grade.
  Coax Cables: One (1) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) PD1150 whip mounted on a 6-ft side arm with an elevation of 205-ft above grade.
  Coax Cables: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (EXISTING/RESERVED):
  Antennas: Three (3) Powerwave 7770 panel antennas, two (2) KMW AM-X-CD-14-65-00T-RET panel antennas, four (4) Powerwave P65-17-XLH-RR panel antennas, six (6) CCI DTMABP7819VG12A TMA's, six (6) Ericsson RRUS-11 and one (1) Raycap DC6-48-60-18-8F surge arrestor mounted on three (3) 12-ft T-Frames with a RAD center elevation of 200-ft above grade.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cable One (1) fiber cable and two (2) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- T-MOBILE (EXISTING/RESERVED):
  Antennas: Three (3) Ericsson AIR21 B2A/B4P panel antennas, three (3) Ericsson AIR21 B4A/B2P, three (3) Andrew LNX-6515DS panel antennas, three (3) TMA's and three (3) Ericsson RRUS-11 remote radio heads mounted on three (3) 10-ft T-frames with a RAD center elevation of 185-ft above grade.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cable and one 1-5/8" ∅ fiber cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: Three (3) obstruction lights mounted with an elevation of ±173-ft above grade.
  Coax Cable: One (1) 1" ∅ rigid conduit running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1)10-ft dipole leg mounted with an elevation of 150-ft above grade.
  Coax Cables: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKOWN (EXISTING):
  Antennas: One (1) 20-ft whip mounted on a 4-ft side arm with an elevation of 147-ft above grade.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) 6-ft dish pipe mounted with a RAD center elevation of 130-ft above grade.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) empty 4-ft sidearm mounted at 112-ft above grade.
- UNKOWN (EXISTING):
  Antennas: One (1) PR-450 paraflector antenna leg mounted with a RAD center elevation of 112-ft above grade.
  Coax Cables: One (1) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) PR-450 paraflector antenna leg mounted with a RAD center elevation of 90-ft above grade.
  Coax Cables: One (1) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) 1105-3A Radome mounted with an elevation of 68-ft above grade.
  Coax Cables: One (1) 1-1/4" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- VERIZON (EXISTING TO REMAIN):
  Antennas: Six (6) RFS FD9R6004/2C-3L diplexers mounted on three (3) Nudd 14-ft booms with a RAD center elevation of 170-ft above grade.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- VERIZON (EXISTING TO REMOVE):
  Antennas: Four (4) Antel LPA-80063-4CF, two (2) Antel LPA-80080-4CF, three (3) Antel BXA-70063-6CF, one (1) Antel BXA-171085-12BF and two (2) Antel BXA-171063-12BF panel antennas mounted on three (3) Nudd 14-ft booms with a RAD center elevation of 170-ft above grade.
- **VERIZON (Proposed):**
  Antennas: Six (6) Andrew HBXX-6517DS panel antennas, six (6) Andrew LNX-6514DS, three (3) Alcatel-Lucent RRH2x60-PCS remote radio heads, three (3) Alcatel-Lucent RRH2x60-AWS remote radio heads and two (2) RFS DB-T1-6Z-8AB-0Z main distribution boxes mounted on three (3) Nudd 14-ft booms with a RAD center elevation of 170-ft above grade.
  Coax Cables: Two (2) 1-5/8" ∅ Hybriflex fiber cables running on the face of the existing tower as specified in Section 3 of this report.

Primary Assumptions Used in the Analysis

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

Analysis

The existing tower was analyzed using a comprehensive computer program entitled 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:	New London; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Ledyard; v = 115 mph (3 second gust) equivalent to v = 95 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	Appendix K wind speed controls.	
Load Cases:	Load Case 1; 95 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; 82 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 82 mph wind speed velocity represents 75% of the wind pressure generated by the 95 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 were found to be within allowable limits. In Load Case 2, per tnxTower "Section Capacity Table", this tower was found to be at **95.2%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T16)	20'-0"-40'-0"	92.9%	**PASS**
Diagonal (T4)	260'-0"-280'-0"	89.7%	**PASS**
Guy A @ 220-ft radius (T2)	300'-3"	95.2%	**PASS**

Foundation and Anchors

The existing tower base foundation consists of a 3.5-ft ∅ x 2.0-ft long reinforced concrete pier on a 9.5-ft square x 2.5-ft thick reinforced concrete pad bearing directly on existing sub grade. The guy anchor foundation consists of three (3) 4.5-ft square x 20.5-ft long concrete blocks. The sub-grade conditions used in the analysis of the existing tower base foundation and guy anchor foundations were obtained from the aforementioned structural report prepared by Centek job no.; 12001.CO12 dated November 8, 2012.

- 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 Reactions	
Vector	**Proposed Reactions Guy Anchor A @ Radius of 220-ft**
Horizontal (In Plane of GW)	**133 kips**
Horizontal (Out of Plane of GW)	**5 kips**
Vertical	**132 kips**
Resultant Force at end of Guy Wire	**187 kips**
Tower Base Reactions	
Vector	**Proposed Reaction**
Horizontal Shear	**7.21 kips**
Axial Compression	**317.3 kips**
Moment	**0 kip-ft**

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS)[1]	Proposed Loading (FS)[1]	Result
Reinf. Conc. Anchor Block (A) at 220-ft radius.	Uplift	2.0	2.02	**PASS**
	Sliding	2.0	2.8	**PASS**
		Allowable	**Proposed**	
Base Foundation	Bearing	10.0 ksf	4.2 ksf	**PASS**
	Overturning	2.0	52.55	**PASS**
	Sliding	2.0	25.41	**PASS**

Note 1: FS denotes 'Factor of Safety'.

Conclusion and Recommendations

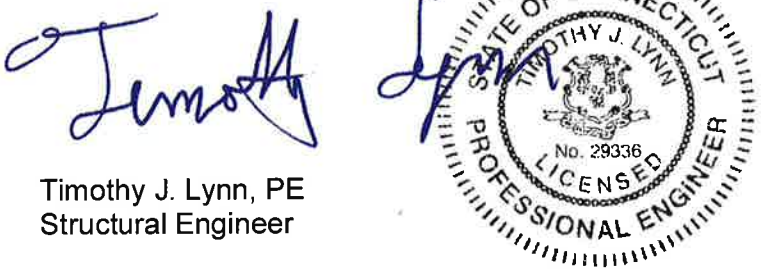
This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration with the below recommendations.

- **All coax cables routed as specified in Section 3 of this report.**

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:



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:

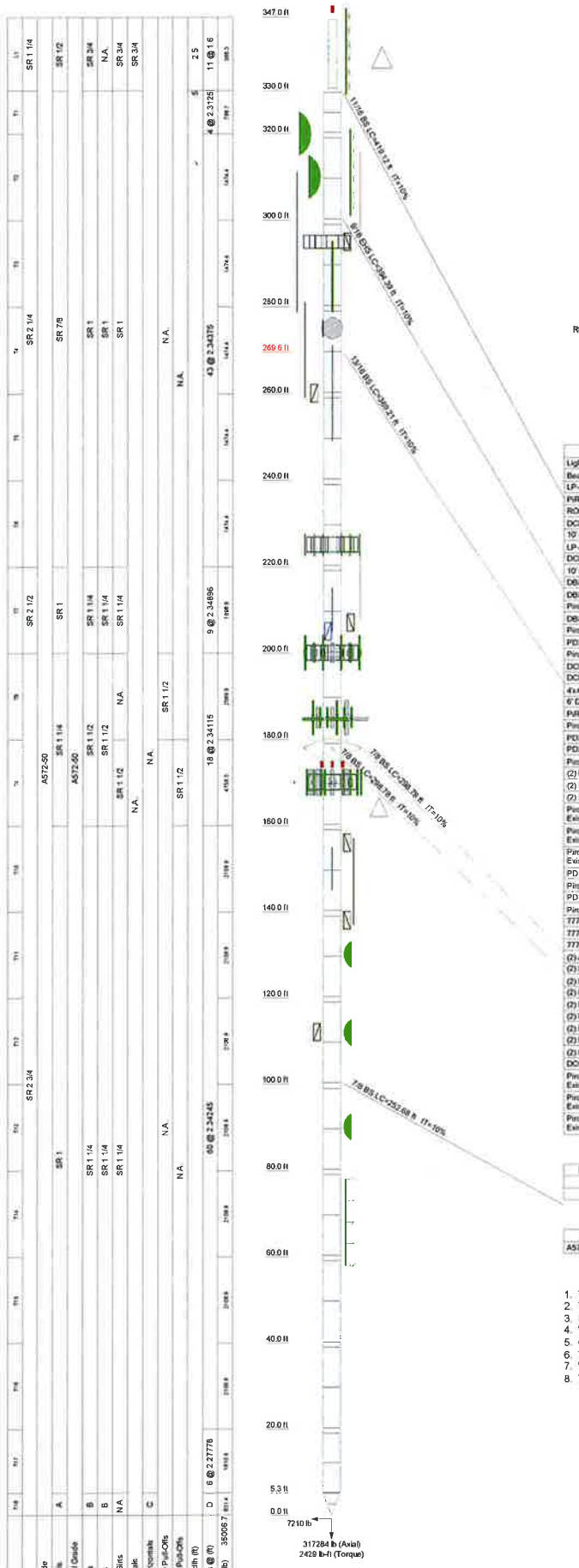
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or 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.

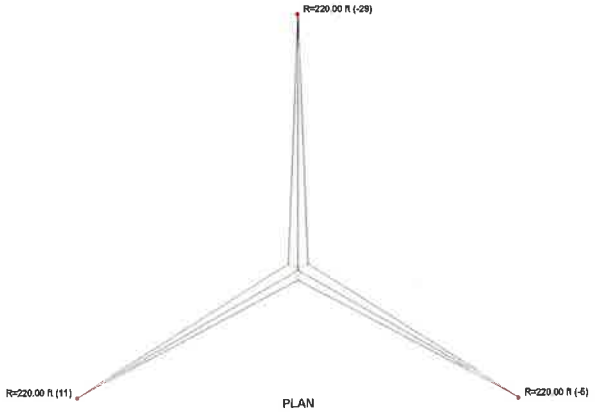
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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.





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Canopy	350	AIR21 B2A/B4P (T-Mobile - Existing)	185
Beacon	348	AIR21 B4A/B2P (T-Mobile - Existing)	185
LP-3E-Radomes	339	LNX-6515DS (T-Mobile - Existing)	185
PIROD Junction Box	330	AIR21 B2A/B4P (T-Mobile - Existing)	185
ROHN 4-ft Side Arm	320	AIR21 B4A/B2P (T-Mobile - Existing)	185
DCR-L2	320	LNX-6515DS (T-Mobile - Existing)	185
10' dish	320	AIR21 B2A/B4P (T-Mobile - Existing)	185
LP-3C-Radomes	311	AIR21 B4A/B2P (T-Mobile - Existing)	185
DCR-L2	310	LNX-6515DS (T-Mobile - Existing)	185
10' dish	310	TMA 10"x8"x3" (T-Mobile - Existing)	185
DB810KE-Y	295	TMA 10"x8"x3" (T-Mobile - Existing)	185
DB810KE-Y	295	TMA 10"x8"x3" (T-Mobile - Existing)	185
Pirod Candelabra Arm (1)	295	RRUS-11 (T-Mobile - Existing)	185
DB810KE-Y	295	RRUS-11 (T-Mobile - Existing)	185
Pirod Candelabra Arm (1)	295	RRUS-11 (T-Mobile - Existing)	185
PD220	295	10-ft T-Frame (T-Mobile - Existing)	185
Pirod 4' Side Mount Standoff (1)	295	10-ft T-Frame (T-Mobile - Existing)	185
DCR-L2	290	10-ft T-Frame (T-Mobile - Existing)	185
DCR-L2	280	Obstruction Light	173.5
4'x4' Pipe Mount	275	Obstruction Light	173.5
6' Dish	275	PIROD Junction Box	173.5
PIROD Junction Box	260.25	Obstruction Light	173.5
Pirod 6' Side Mount Standoff (1)	260	RRH2x60-AWS (Verizon - Proposed)	170
PD220	260	RRH2x60-AWS (Verizon - Proposed)	170
PD220	250	RRH2x60-PCS (Verizon - Proposed)	170
Pirod 6' Side Mount Standoff (1)	250	RRH2x50-PCS (Verizon - Proposed)	170
(2) DB980H90E-M (Sprint - Existing)	225	RRH2x50-PCS (Verizon - Proposed)	170
(2) DB980H90E-M (Sprint - Existing)	225	DB-T1-6Z-8AB-0Z (Verizon - Proposed)	170
(2) DB980H90E-M (Sprint - Existing)	225	DB-T1-6Z-8AB-0Z (Verizon - Proposed)	170
Pirod 12' T-Frame Sector Mount (1) (Sprint - Existing)	225	Nuvid 14' Boom (3) (Verizon - Existing)	170
Pirod 12' T-Frame Sector Mount (1) (Sprint - Existing)	225	(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	170
Pirod 12' T-Frame Sector Mount (1) (Sprint - Existing)	225	(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	170
PD1142-1	207	(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	170
Pirod 6' Side Mount Standoff (1)	207	LNX-6514DS-VTM (Verizon - Proposed)	170
PD1150	205	HBXX-6517DS (Verizon - Proposed)	170
Pirod 6' Side Mount Standoff (1)	205	LNX-6514DS-VTM (Verizon - Proposed)	170
7770.00 (ATT - Existing)	200	HBXX-6517DS (Verizon - Proposed)	170
7770.00 (ATT - Existing)	200	LNX-6514DS-VTM (Verizon - Proposed)	170
7770.00 (ATT - Existing)	200	HBXX-6517DS (Verizon - Proposed)	170
(2) AM-X-CD-14-65-00T-RET (ATT - Existing)	200	LNX-6514DS-VTM (Verizon - Proposed)	170
(2) P65-17-XLH-RR (ATT - Existing)	200	HBXX-6517DS (Verizon - Proposed)	170
(2) P65-17-XLH-RR (ATT - Existing)	200	LNX-6514DS-VTM (Verizon - Proposed)	170
(2) DTMABP7819VG12A TMA (ATT - Existing)	200	HBXX-6517DS (Verizon - Proposed)	170
(2) DTMABP7819VG12A TMA (ATT - Existing)	200	RRH2x60-AWS (Verizon - Proposed)	170
(2) DTMABP7819VG12A TMA (ATT - Existing)	200	Pirod 4' Side Mount Standoff (1)	170
(2) RRUS-11 (ATT - Existing)	200	10' Dipole	150
(2) RRUS-11 (ATT - Existing)	200	20' x 3" Dia Omni	147
(2) RRUS-11 (ATT - Existing)	200	Pirod 4' Side Mount Standoff (1)	138
DC6-48-60-18-8F Surge Arrestor (ATT - Existing)	200	6' Dish	130
Pirod 12' T-Frame Sector Mount (1) (ATT - Existing)	200	PR-450	112
Pirod 12' T-Frame Sector Mount (1) (ATT - Existing)	200	Pirod 4' Side Mount Standoff (1)	112
Pirod 12' T-Frame Sector Mount (1) (ATT - Existing)	200	PR-450	90
		PIROD Junction Box	86.75
		1105-3A-Radomes	68

SYMBOL LIST

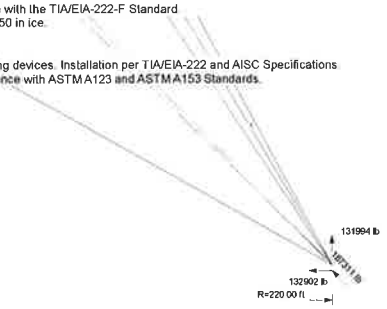
MARK	SIZE	MARK	SIZE
A	SR 1 1/4	C	SR 3/4
B	6 x 3/4	D	2 @ 2.58333

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

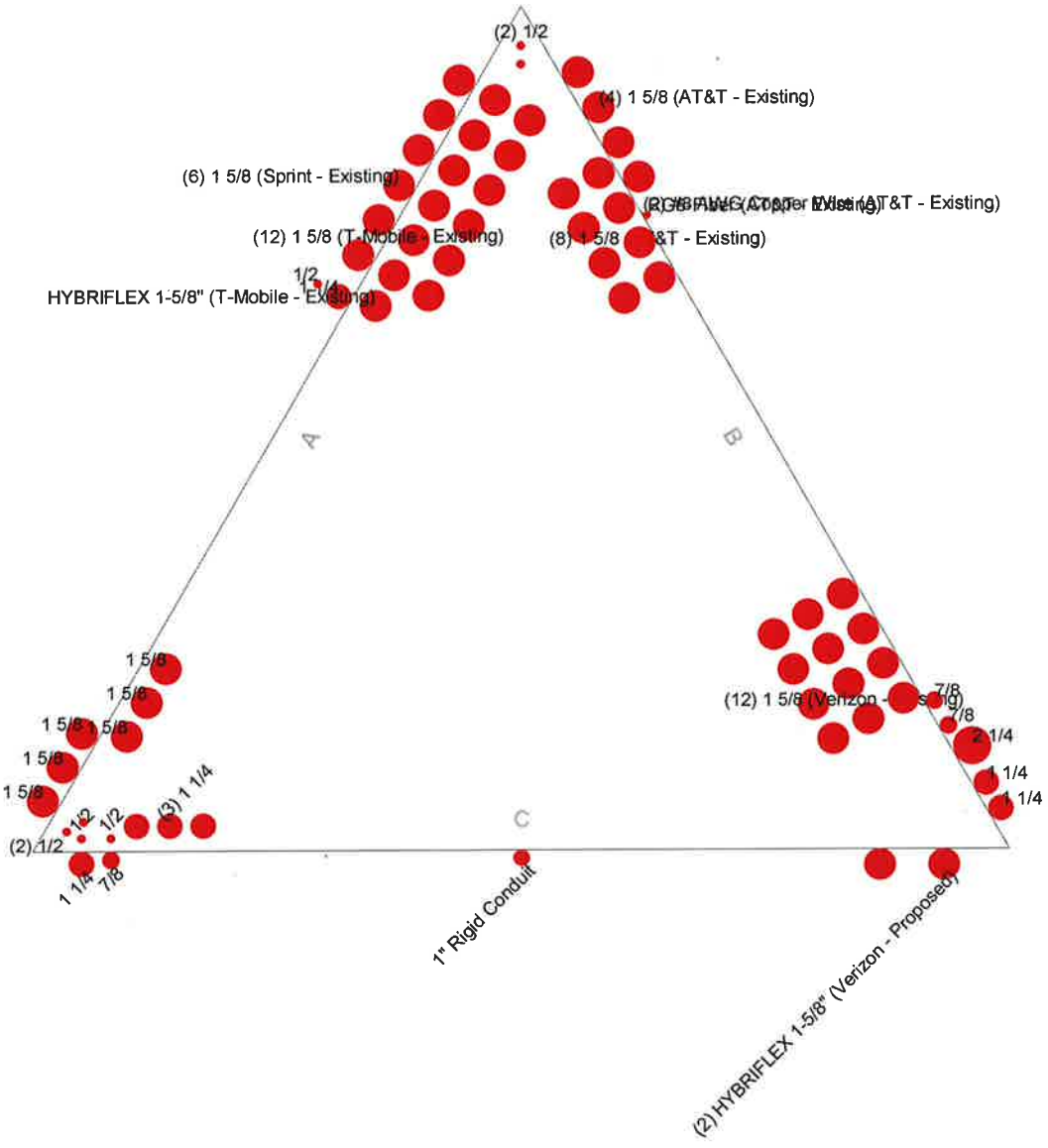
1. Tower designed for a 95 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 82 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. Weld together tower sections have flange connections.
5. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
6. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
7. Welds are fabricated with ER-70S-6 electrodes.
8. TOWER RATING: 95.2%



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

Job: 15001.037 - Ledyard			
Project: 347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard, CT			
Client: Verizon Wireless	Drawn by: TJL	Appd:	
Code: TIA/EIA-222-F	Date: 05/14/15	Scale: NTS	
Path:		Dwg No.: E-1	

Round Flat App In Face App Out Face



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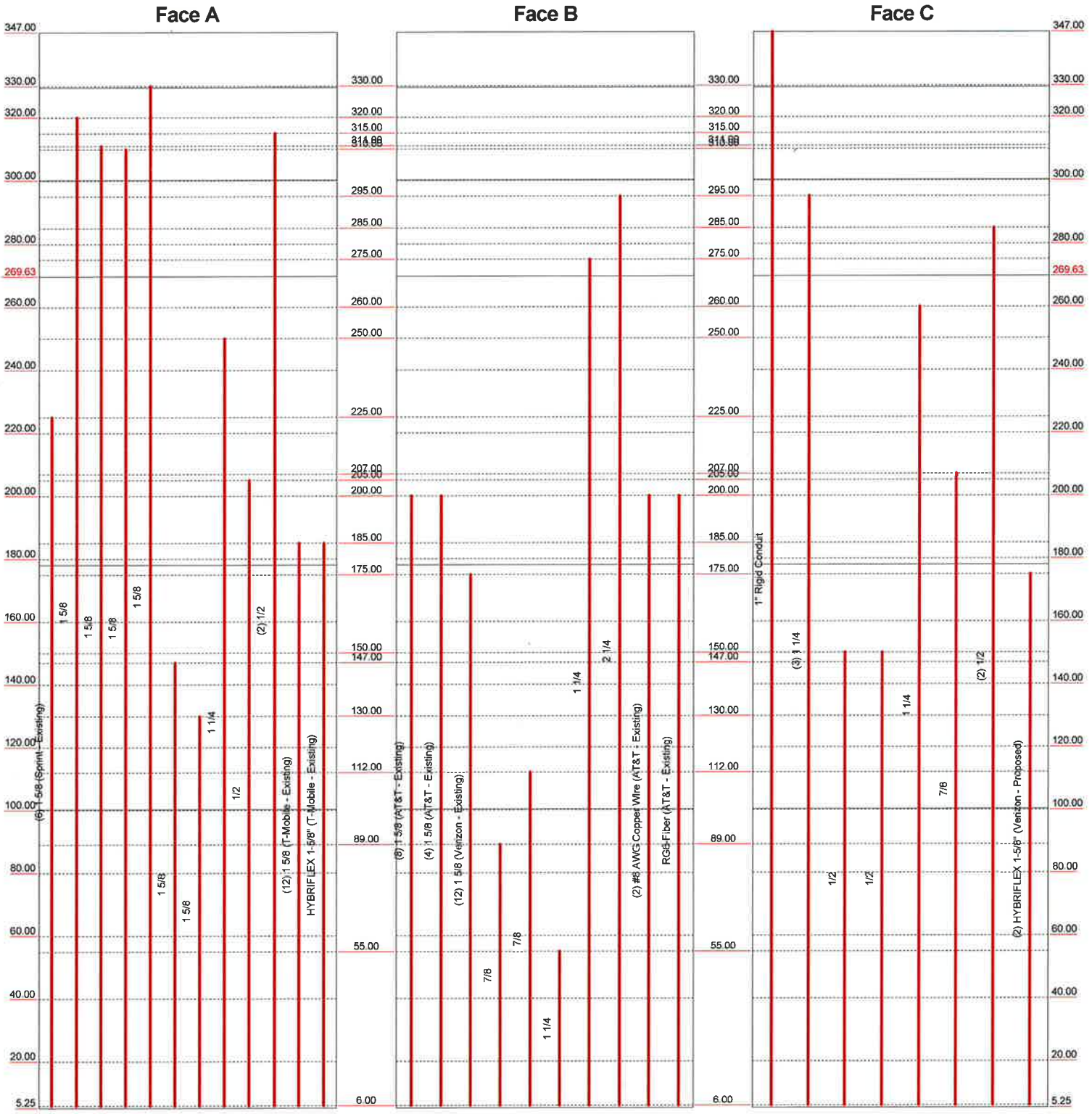
Job: 15001.037 - Ledyard			
Project: 347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard,			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 05/14/15	Scale: NTS	
Path:		Dwg No. E-7	

5'3" - 347'

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



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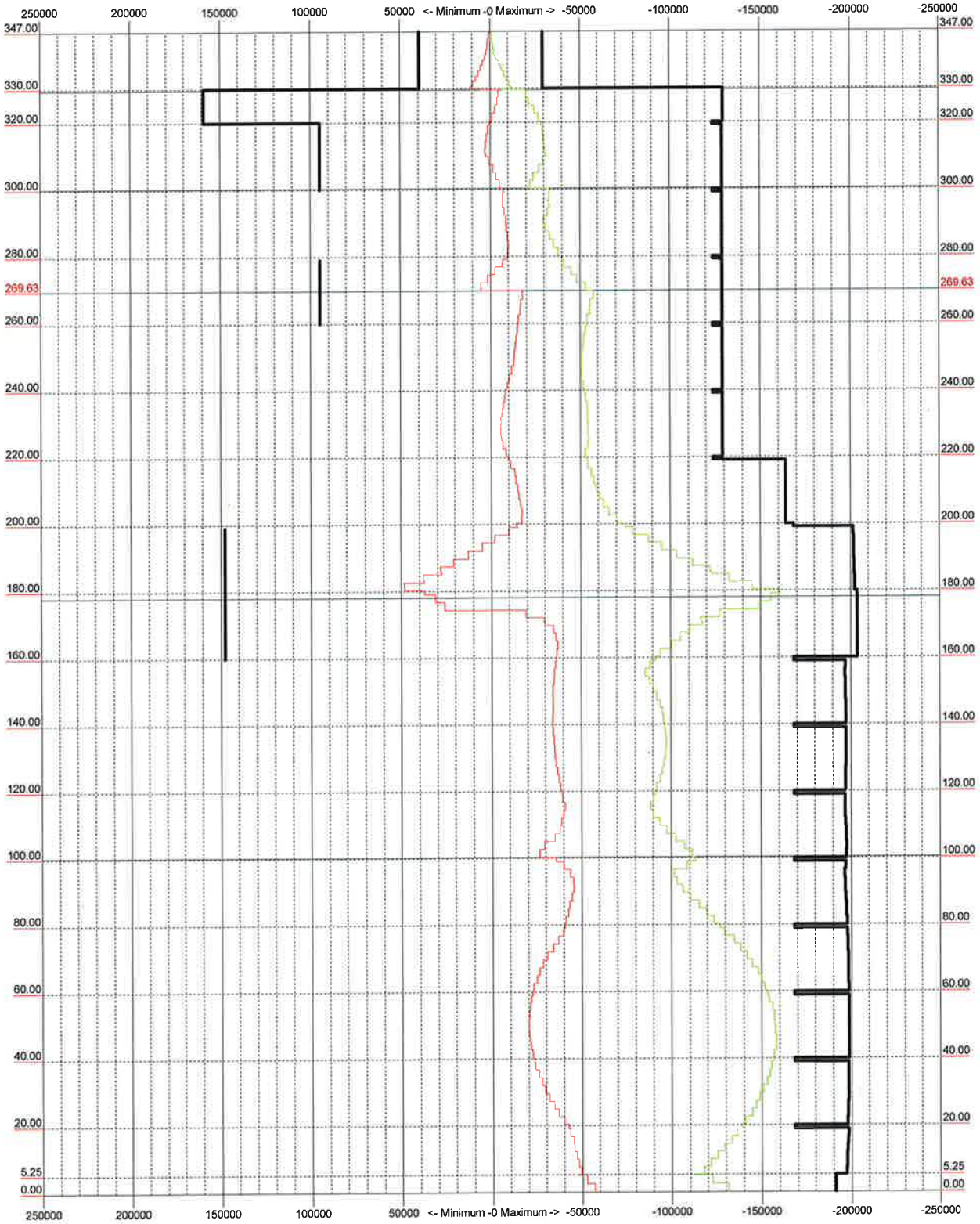
Job:	15001.037 - Ledyard		
Project:	347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard,		
Client:	Verizon Wireless	Drawn by: TJL	App'd:
Code:	TIA/EIA-222-F	Date: 05/14/15	Scale: NTS
Path:			Dwg No. E-7

TIA/EIA-222-F - 95 mph/82 mph 0.5000 in Ice

Leg Capacity ——— **Leg Compression (lb)**



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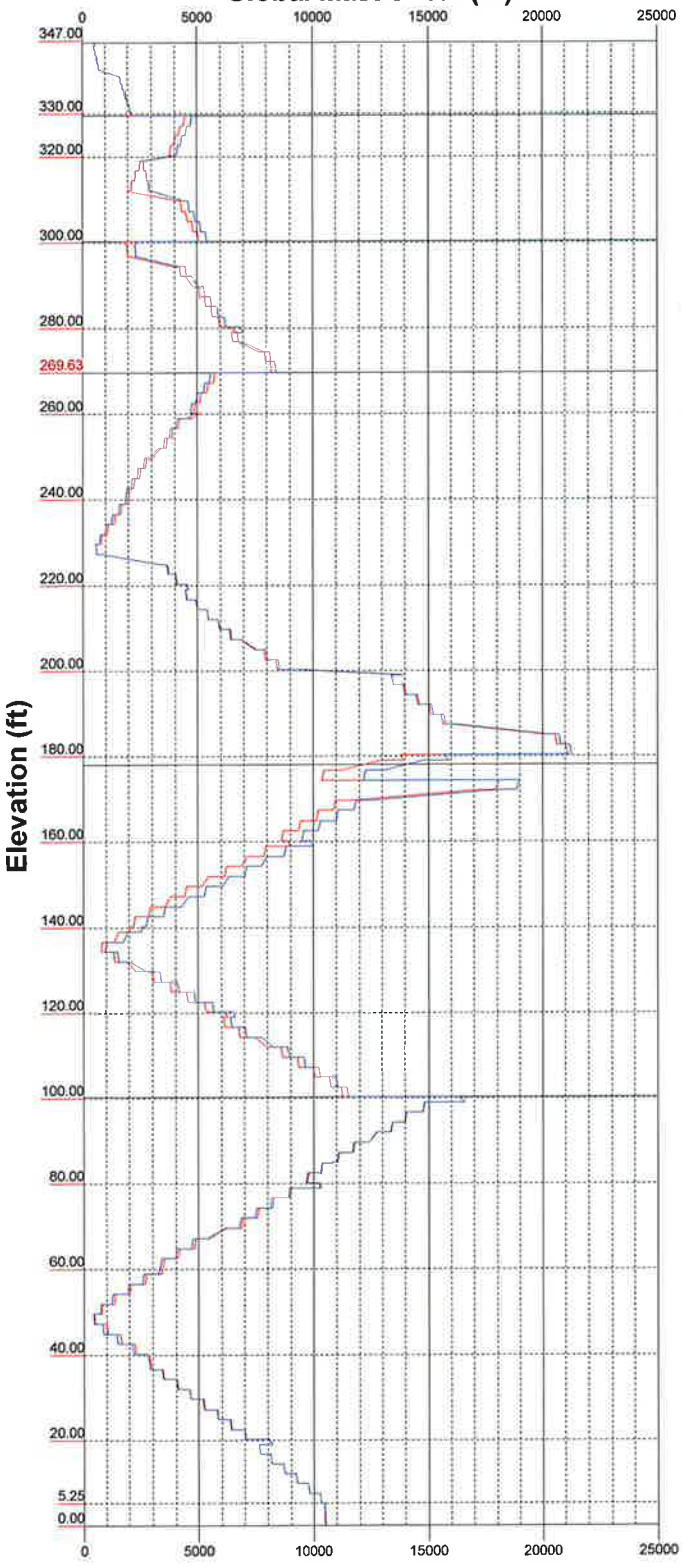
Job: 15001.037 - Ledyard			
Project: 347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard,			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 05/14/15	Scale: NTS	
Path:		Dwg No. E-3	

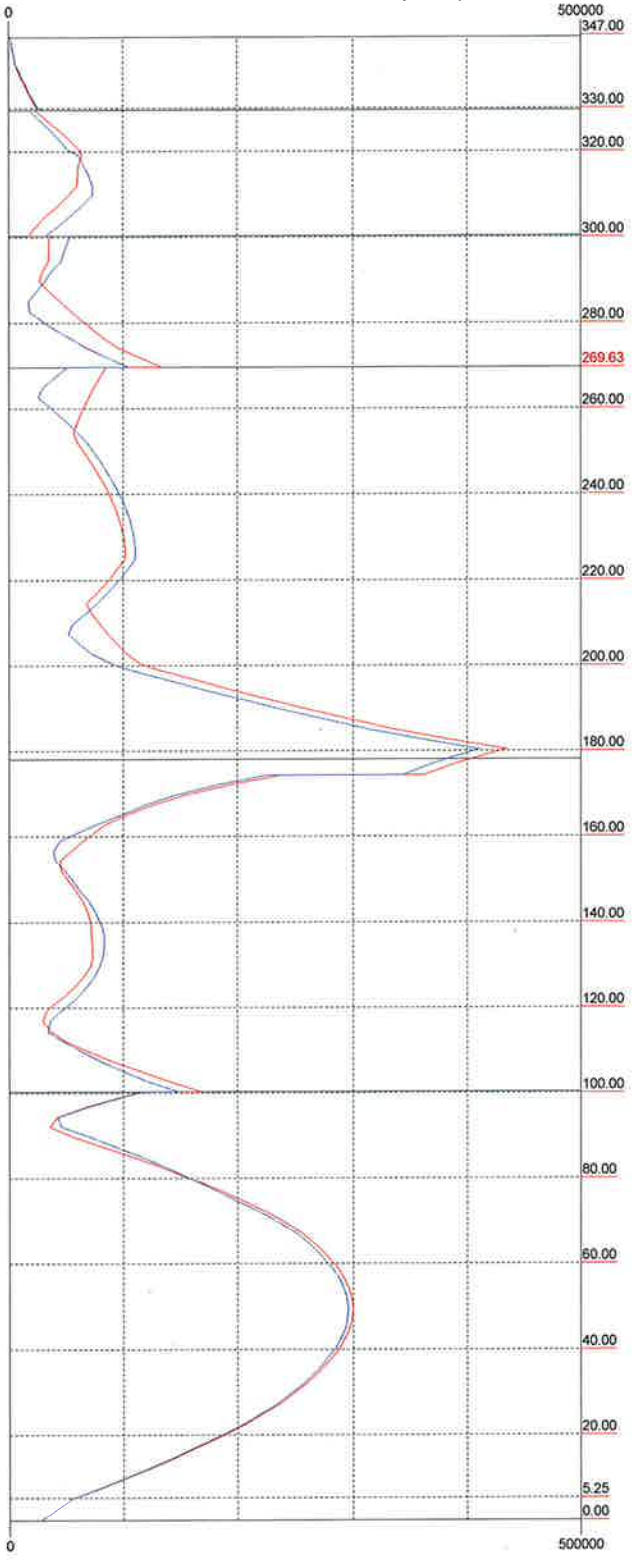
Vx Vz

Mx Mz

Global Mast Shear (lb)



Global Mast Moment (lb-ft)



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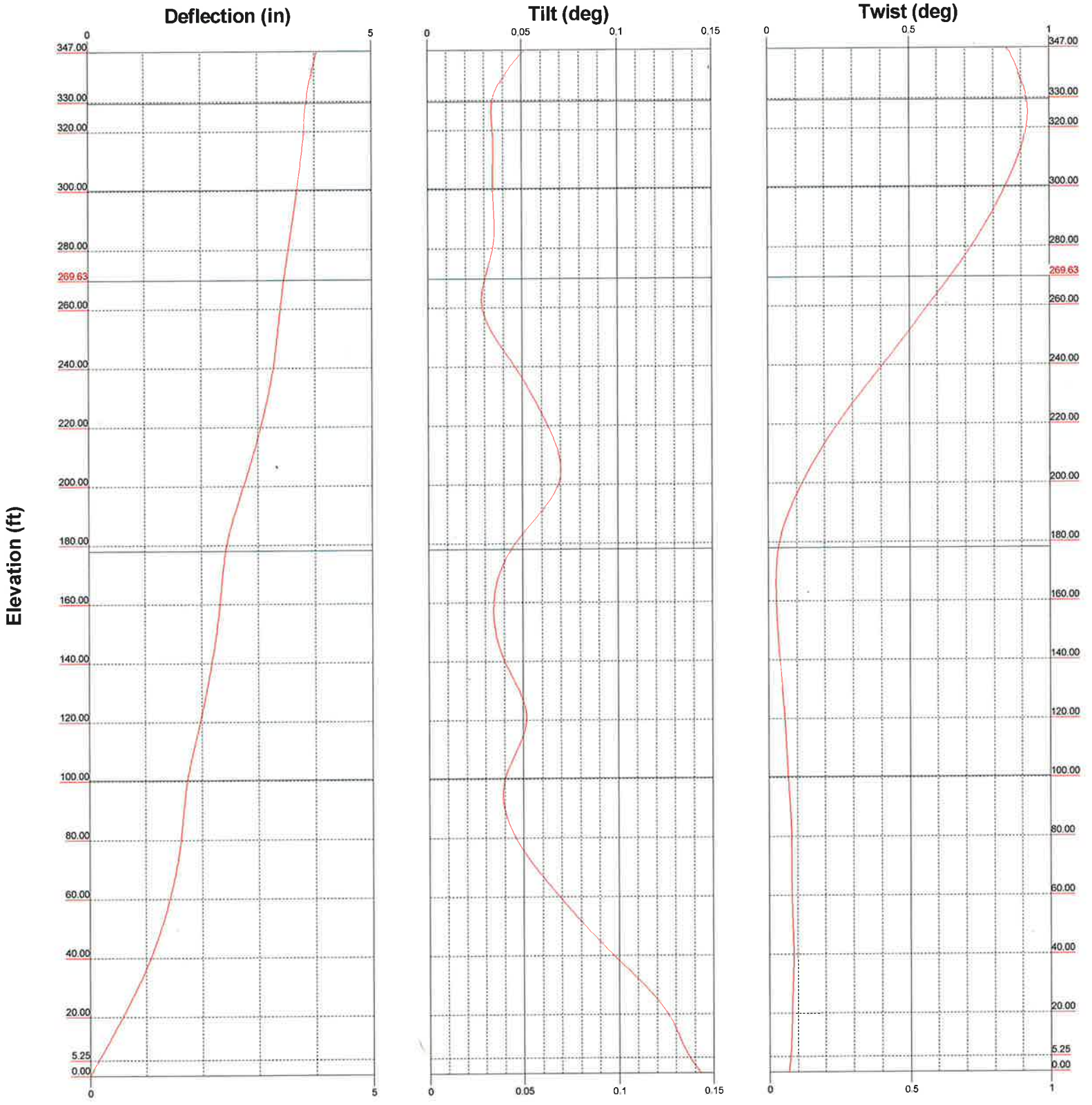
Job:	***15001.037 - Ledyard***		
Project:	***347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard,***		
Client: Verizon Wireless		Drawn by: TJL	App'd:
Code: TIA/EIA-222-F		Date: 05/14/15	Scale: NTS
Path:			Dwg No. E-4

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

Maximum Values



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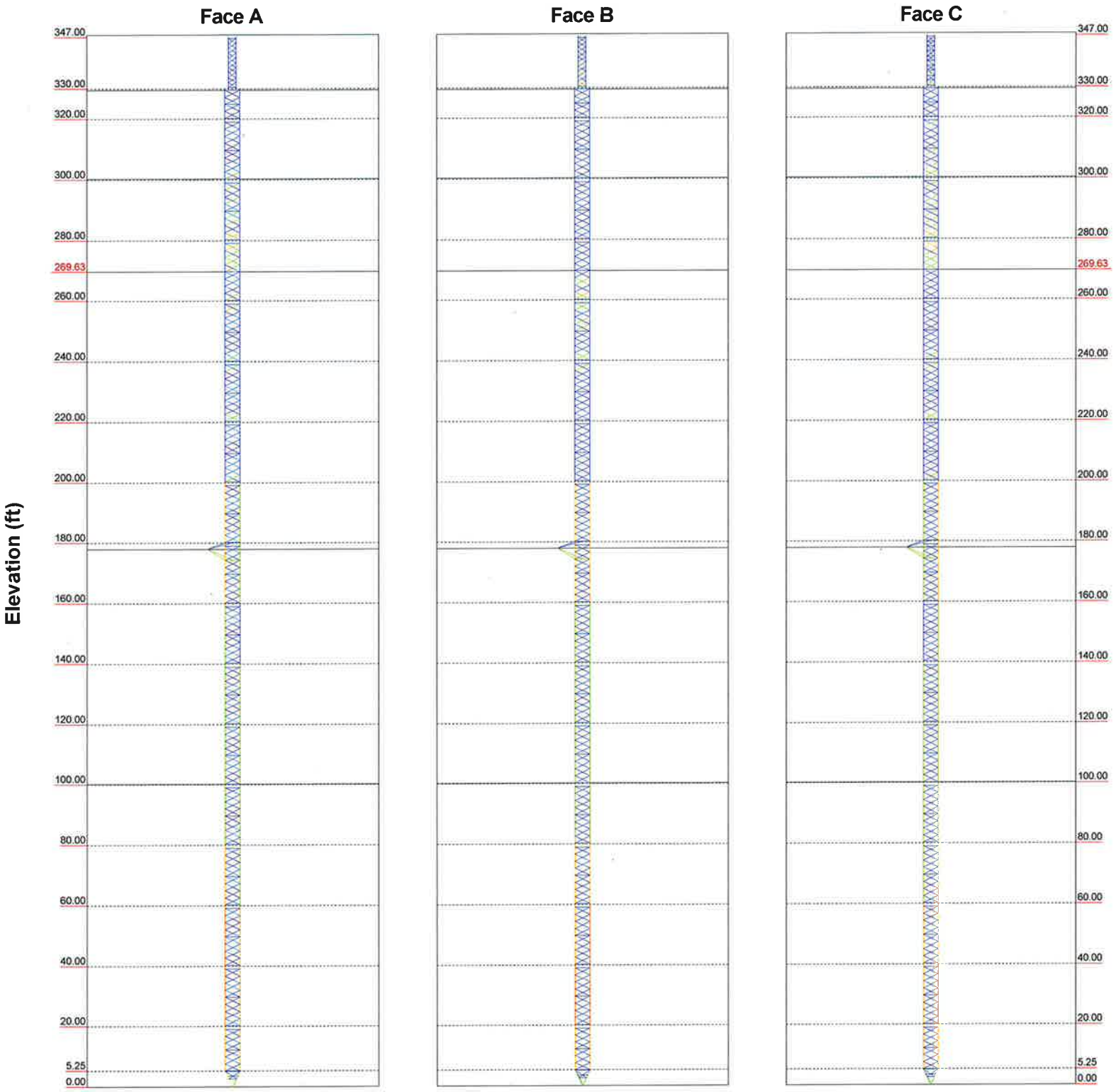
Job: *15001.037 - Ledyard*			
Project: *347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard,*			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 05/14/15	Scale: NTS	
Path:		Dwg No. E-5	

0' - 347'

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



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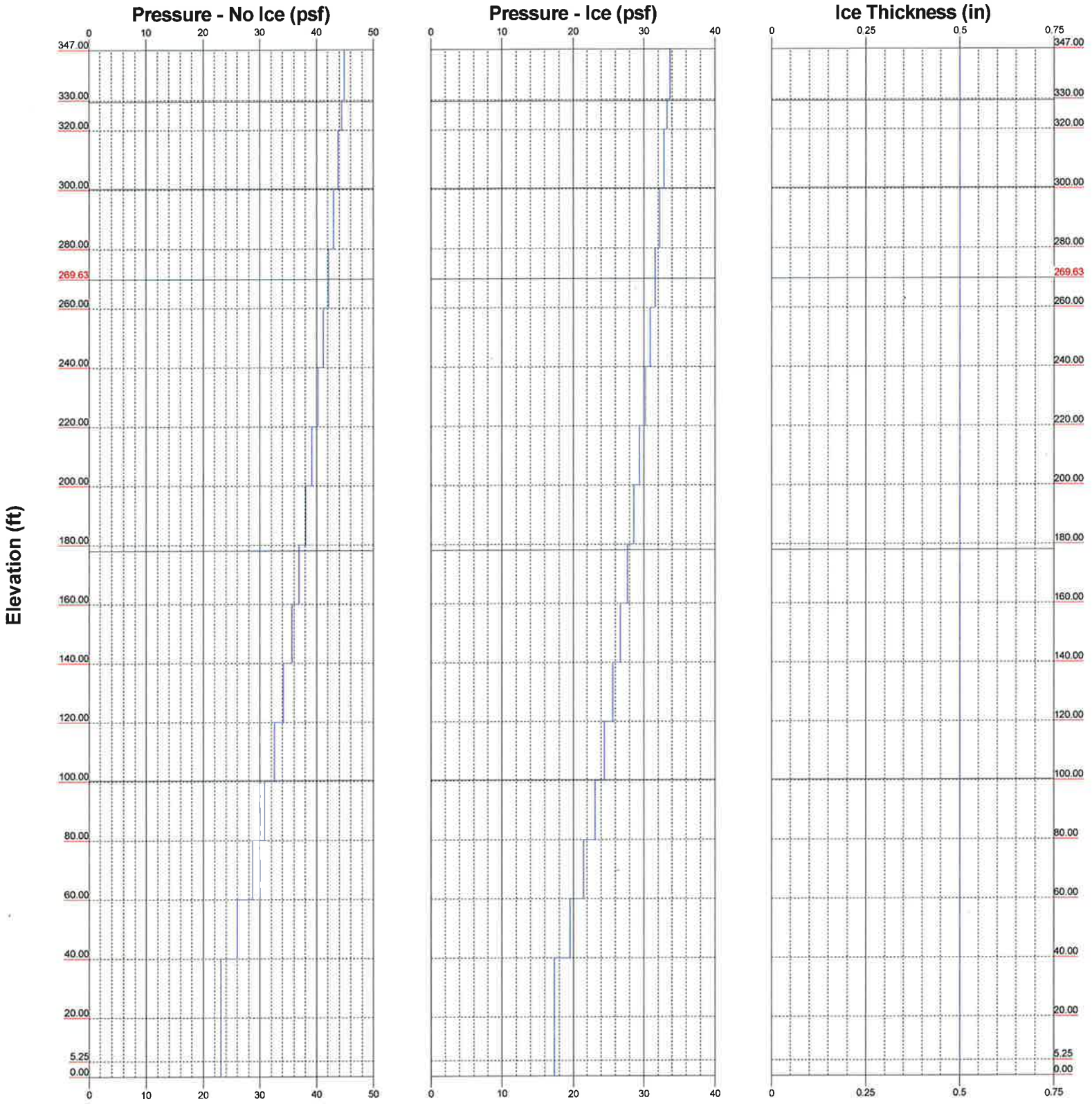
Job: *15001.037 - Ledyard*			
Project: *347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard,*			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 05/14/15	Scale: NTS	
Path:		Dwg No. E-8	

Wind Pressures and Ice Thickness

TIA/EIA-222-F - 95 mph/82 mph 0.5000 in Ice



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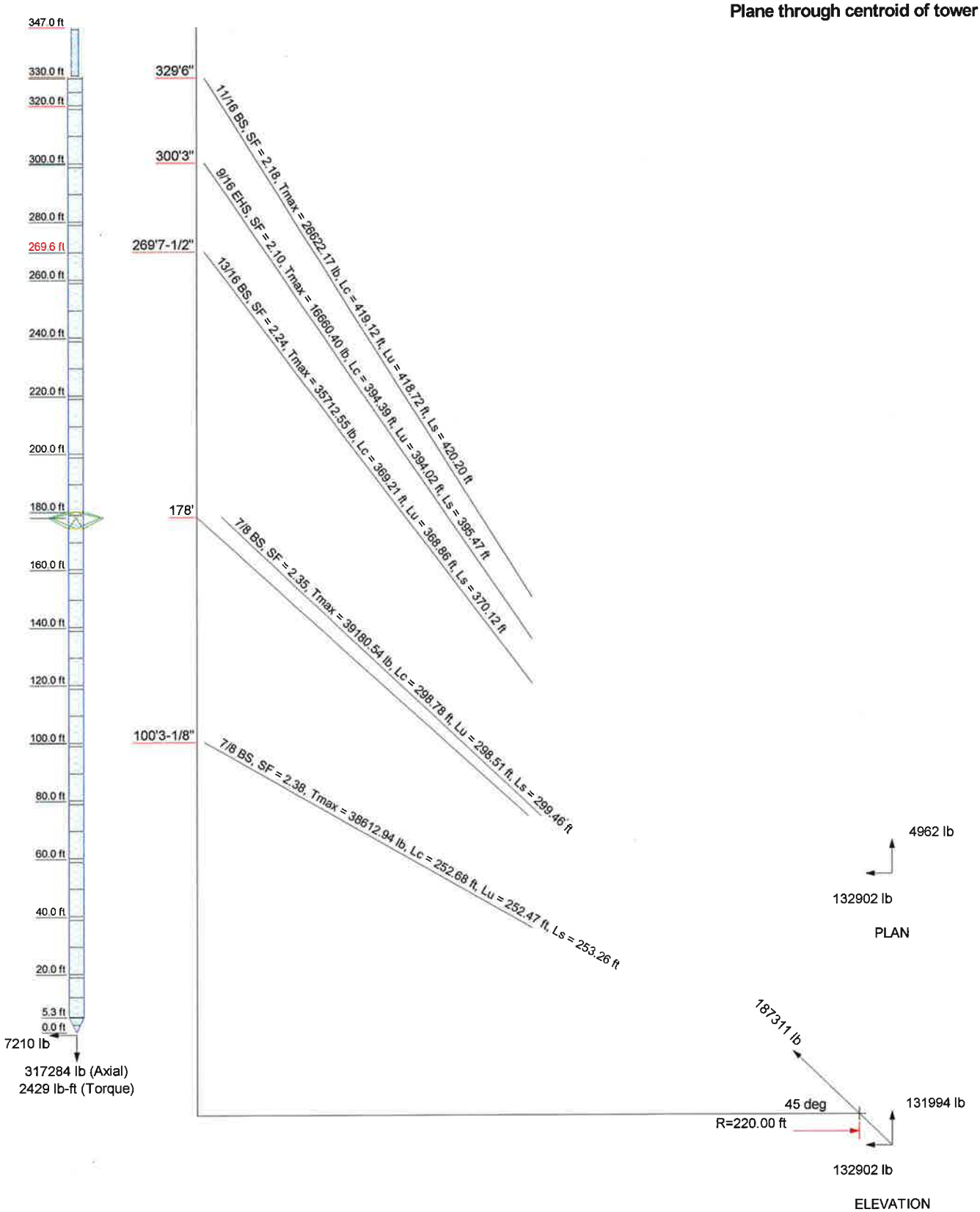
Job:	***15001.037 - Ledyard***		
Project:	***347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard,***		
Client: Verizon Wireless		Drawn by: TJL	App'd:
Code: TIA/EIA-222-F		Date: 05/14/15	Scale: NTS
Path:			Dwg No. E-9

Guy Tensions and Tower Reactions

TIA/EIA-222-F - 95 mph/82 mph 0.5000 in Ice

Maximum Values
Anchor 'A'@220 ft Azimuth 0 deg Elev -29 ft
Plane through centroid of tower



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FAX: (203) 488-8587

Job: *15001.037 - Ledyard*			
Project: *347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard,*			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 05/14/15	Scale: NTS	
Path:		Dwg No. E-6	

tnxTower	Job	Page
	15001.037 - Ledyard	1 of 75
Centek Engineering Inc. 63-2 North Branford Rd.	**Project** 347' Pirod Guyed Tower - 889 Colonel Ledyard Hwy, Ledyard, CT	**Date** 09:38:58 05/14/15
Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	**Client** Verizon Wireless	**Designed by** TJL

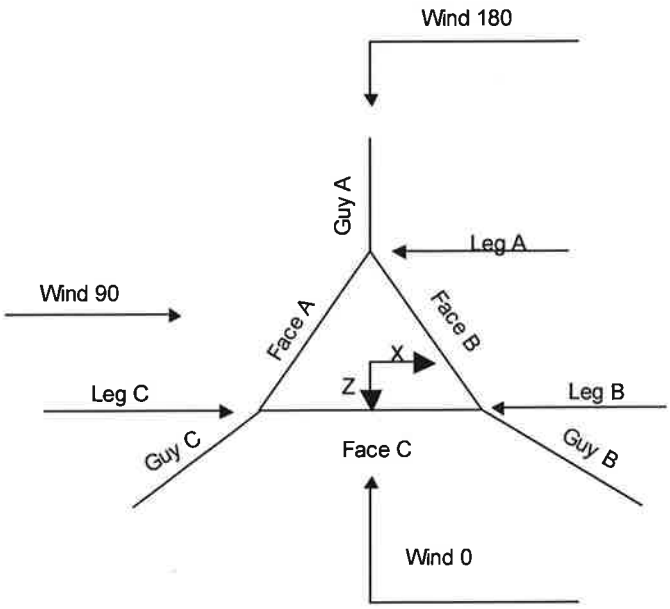
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 347.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and tapered at the base.
An index plate is provided at the 3 sided -tower connection.
There is a 3 sided latticed pole with a face width of 2.50 ft.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

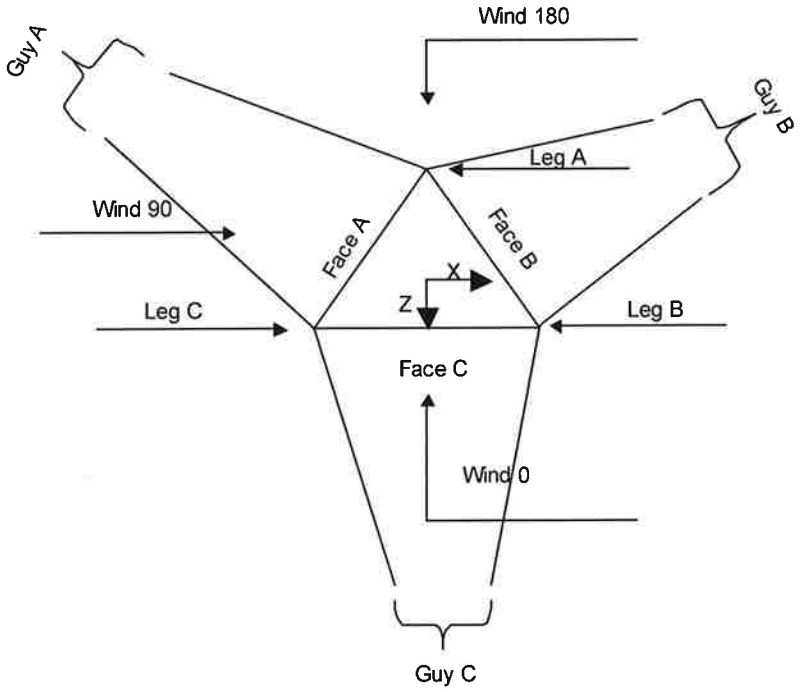
Basic wind speed of 95 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 82 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
Pressures are calculated at each section.
Stress ratio used in latticed pole member design is 1.0664.
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

3 Sided Latticed Pole Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
L1	347.00-330.00			2.50	1	17.00

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
L1	347.00-330.00	1.60	X Brace	No	Steps	6.0000	6.0000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
L1 347.00-330.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1/2	A572-50 (50 ksi)

3 Sided Latticed Pole 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
L1 347.00-330.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)

3 Sided Latticed Pole 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
L1 347.00-330.00	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)

3 Sided Latticed Pole Section Geometry *(cont'd)*

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
L1 347.00-330.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
L1 347.00-330.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

3 Sided Latticed Pole Section Geometry *(cont'd)*

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
L1 347.00-330.00	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

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	330.00-320.00		#60 109900	5.00	1	10.00
T2-T6	320.00-220.00		#60 109900	5.00	5	20.00
T7	220.00-200.00		#60 110091	5.00	1	20.00
T8	200.00-180.00		#60 130640	5.00	1	20.00
T9	180.00-160.00		#60 130640	5.00	1	20.00
T10-T16	160.00-20.00		#60 110092	5.00	7	20.00
T17	20.00-5.25		#60 130638	5.00	1	14.75
T18	5.25-0.00		#60 130638	5.00	1	5.25

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	330.00-320.00	2.31	X Brace	No	Steps	6.0000	3.0000
T2-T6	320.00-220.00	2.34	X Brace	No	Steps	12.0000	3.0000
T7	220.00-200.00	2.35	X Brace	No	Steps	11.3750	3.1250
T8	200.00-180.00	2.34	X Brace	No	Steps	12.0000	3.2500
T9	180.00-160.00	2.34	X Brace	No	Steps	12.0000	3.2500
T10-T16	160.00-20.00	2.34	X Brace	No	Steps	12.0000	3.1250
T17	20.00-5.25	2.28	X Brace	No	Yes	12.0000	1.0000
T18	5.25-0.00	2.58	X Brace	No	Yes	1.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 330.00-320.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2-T6 320.00-220.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T7 220.00-200.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T8 200.00-180.00	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T9 180.00-160.00	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T10-T16 160.00-20.00	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T17 20.00-5.25	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T18 5.25-0.00	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 330.00-320.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T2-T6 320.00-220.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 220.00-200.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T8 200.00-180.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	1 1/2	A572-50 (50 ksi)
T9 180.00-160.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	1 1/2	A572-50 (50 ksi)
T10-T16 160.00-20.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T17 20.00-5.25	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T18 5.25-0.00	Flat Bar	6 x 3/4	A36 (36 ksi)	Flat Bar	6 x 3/4	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
T1 330.00-320.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T2-T6 320.00-220.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T7 220.00-200.00	1	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T8 200.00-180.00	1	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T9 180.00-160.00	1	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T10-T16 160.00-20.00	1	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T17 20.00-5.25	1	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T18 5.25-0.00	1	Flat Bar	6 x 3/4	A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T18 5.25-0.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

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
T1 330.00-320.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2-T6 320.00-220.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 220.00-200.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 200.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10-T16 160.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T17 20.00-5.25	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T18 5.25-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

K Factors[1]

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
330.00-320.00				1	1	1	1	1	1	1
T2-T6	Yes	Yes	1	1	1	1	1	1	1	1
320.00-220.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
220.00-200.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
200.00-180.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T10-T16	Yes	Yes	1	1	1	1	1	1	1	1
160.00-20.00				1	1	1	1	1	1	1
T17	Yes	Yes	1	1	1	1	1	1	1	1
20.00-5.25				1	1	1	1	1	1	1
T18 5.25-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		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
T1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
330.00-320.00														
T2-T6	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
320.00-220.00														
T7	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
220.00-200.00														
T8	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
200.00-180.00														
T9	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
180.00-160.00														
T10-T16	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
160.00-20.00														
T17 20.00-5.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 5.25-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1	Flange	0.0000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
330.00-320.00		A325N		A325X		A325X		A325X		A325X		A325X		A325X	
T2-T6	Sleeve DS	0.7500	5	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
320.00-220.00		A325N		A325X		A325X		A325X		A325X		A325X		A325X	
T7	Sleeve DS	0.7500	5	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
220.00-200.00		A325N		A325X		A325X		A325X		A325X		A325X		A325X	
T8	Sleeve DS	0.8750	5	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
200.00-180.00		A325N		A325X		A325X		A325X		A325X		A325X		A325X	
T9	Sleeve DS	0.8750	5	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
180.00-160.00		A490N		A325X		A325X		A325X		A325X		A325X		A325X	
T10-T16	Sleeve DS	0.8750	5	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
160.00-20.00		A325N		A325X		A325X		A325X		A325X		A325X		A325X	
T17 20.00-5.25	Sleeve DS	0.8750	5	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325X		A325X		A325X		A325X		A325X		A325X	
T18 5.25-0.00	Sleeve DS	0.0000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325X		A325X		A325X		A325X		A325X		A325X	

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
329.5	BS	A	11/16	5800.00	10%	24000	0.990	418.77	220.00	0.0000	-29.00	100%
		B	11/16	5800.00	10%	24000	0.990	398.46	220.00	0.0000	-5.00	100%
		C	11/16	5800.00	10%	24000	0.990	385.15	220.00	0.0000	11.00	100%
269.625	BS	A	13/16	8000.00	10%	24000	1.390	368.91	220.00	0.0000	-29.00	100%
		B	13/16	8000.00	10%	24000	1.390	349.80	220.00	0.0000	-5.00	100%
		C	13/16	8000.00	10%	24000	1.390	337.40	220.00	0.0000	11.00	100%
178	BS	A	7/8	9200.00	10%	24000	1.610	298.54	220.00	0.0000	-29.00	100%
		B	7/8	9200.00	10%	24000	1.610	282.46	220.00	0.0000	-5.00	100%
		C	7/8	9200.00	10%	24000	1.610	272.38	220.00	0.0000	11.00	100%
100.26	BS	A	7/8	9200.00	10%	24000	1.610	252.48	220.00	0.0000	-29.00	100%
		B	7/8	9200.00	10%	24000	1.610	241.09	220.00	0.0000	-5.00	100%
		C	7/8	9200.00	10%	24000	1.610	234.56	220.00	0.0000	11.00	100%
300.25	EHS	A	9/16	3500.00	10%	21000	0.671	394.07	220.00	0.0000	-29.00	100%
		B	9/16	3500.00	10%	21000	0.671	374.28	220.00	0.0000	-5.00	100%
		C	9/16	3500.00	10%	21000	0.671	361.37	220.00	0.0000	11.00	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
329.5	Corner						
269.625	Corner						
178	Torque Arm	16.30	15.0000	Wing	A36 (36 ksi)	Double Equal Angle	2L4x4x3/8
100.26	Corner						

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
300.25	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
329.50	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Flat Bar	
269.63	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Flat Bar	
178.00	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	1 1/2
100.26	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Flat Bar	
300.25	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Flat Bar	

Guy Data (cont'd)

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
329.5	414.59	394.47	381.29		14.54 6.6 sec/pulse	13.19 6.3 sec/pulse	12.34 6.1 sec/pulse	
269.625	512.79	486.22	468.99		11.54 5.9 sec/pulse	10.39 5.6 sec/pulse	9.68 5.4 sec/pulse	
178	480.65	454.75	438.53		7.67 4.8 sec/pulse	6.88 4.5 sec/pulse	6.40 4.4 sec/pulse	
100.26	406.49	388.16	377.65		5.52 4.1 sec/pulse	5.04 3.9 sec/pulse	4.78 3.8 sec/pulse	
300.25	264.42	251.14	242.48		14.45 6.6 sec/pulse	13.06 6.2 sec/pulse	12.19 6.0 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
329.5	No	No			1	1	1	1
269.625	No	No			1	1	1	1
178	Yes	Yes	1	1	1	1	1	1
100.26	No	No			1	1	1	1
300.25	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
329.5	1.0000 A325N	2	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
269.625	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
178	1.0000 A325N	2	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
100.26	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
300.25	0.6250 A325N	0	0.0000	0.75	0.6250 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
329.5	A	150.25	36	27	0.5000
	B	162.25	36	27	0.5000
	C	170.25	37	28	0.5000
269.625	A	120.31	33	25	0.5000
	B	132.31	34	26	0.5000
	C	140.31	35	26	0.5000
178	A	74.50	29	22	0.5000
	B	86.50	30	23	0.5000
	C	94.50	31	23	0.5000
100.26	A	35.63	24	18	0.5000
	B	47.63	26	19	0.5000
	C	55.63	27	20	0.5000
300.25	A	135.63	35	26	0.5000
	B	147.63	35	27	0.5000
	C	155.63	36	27	0.5000

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
329.5	A	217.11	358.50	6446	13.11	6229	13.56	6013	14.03	5800	14.54	5589	15.07	5382	15.64	5177	16.24
	B	217.11	334.50	6514	11.77	6274	12.21	6035	12.68	5800	13.19	5568	13.72	5339	14.30	5114	14.91
	C	217.11	318.50	6565	10.93	6307	11.37	6052	11.83	5800	12.34	5552	12.88	5307	13.45	5067	14.07
269.625	A	217.11	298.63	9159	10.10	8768	10.55	8381	11.02	8000	11.54	7625	12.09	7257	12.69	6897	13.33
	B	217.11	274.63	9292	8.97	8855	9.41	8424	9.88	8000	10.39	7583	10.95	7176	11.56	6778	12.22
	C	217.11	258.63	9390	8.27	8920	8.70	8456	9.17	8000	9.68	7553	10.24	7116	10.86	6691	11.53
178	A	215.45	207.00	11232	6.30	10543	6.70	9865	7.16	9200	7.67	8552	8.24	7924	8.88	7306	9.62
	B	215.45	183.00	11476	5.53	10703	5.92	9943	6.37	9200	6.88	8478	7.45	7782	8.11	7118	8.85
	C	215.45	167.00	11651	5.07	10818	5.46	9999	5.90	9200	6.40	8425	6.99	7680	7.65	6974	8.41
100.26	A	217.11	129.26	12104	4.21	11115	4.58	10144	5.01	9200	5.52	8290	6.12	7425	6.82	6619	7.64

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
	B	217.11	105.26	12393	3.75	11304	4.11	10237	4.54	9200	5.04	8205	5.65	7266	6.37	6402	7.22
	C	217.11	89.26	12578	3.50	11425	3.85	10296	4.28	9200	4.78	8151	5.39	7166	6.13	6266	7.00
300.25	A	217.11	329.25	3927	12.91	3783	13.39	3641	13.90	3500	14.45	3362	15.02	3226	15.64	3092	16.29
	B	217.11	305.25	3974	11.54	3814	12.01	3656	12.52	3500	13.06	3347	13.64	3197	14.26	3050	14.93
	C	217.11	289.25	4009	10.68	3837	11.15	3667	11.65	3500	12.19	3336	12.78	3175	13.41	3019	14.08

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" Rigid Conduit	C	Yes	Ar (CfAe)	347.00 - 6.00	0.0000	0	1	1	1.0000	1.0000		0.70
1 5/8 (Sprint - Existing)	A	Yes	Ar (CfAe)	225.00 - 6.00	0.0000	0.3	6	6	0.5000	1.9800		1.04
1 5/8 (AT&T - Existing)	B	Yes	Ar (CfAe)	200.00 - 6.00	-2.5000	-0.25	8	4	0.5000	1.9800		1.04
1 5/8 (AT&T - Existing)	B	Yes	Ar (CfAe)	200.00 - 6.00	0.0000	-0.35	4	4	0.5000	1.9800		1.04
1 5/8 (Verizon - Existing)	B	Yes	Ar (CfAe)	175.00 - 6.00	-5.0000	0.25	12	4	0.5000	1.9800		1.04
1 5/8	A	Yes	Ar (CfAe)	320.00 - 6.00	0.0000	-0.45	1	1	0.5000	1.9800		1.04
1 5/8	A	Yes	Ar (CfAe)	311.00 - 6.00	0.0000	-0.41	1	1	0.5000	1.9800		1.04
1 5/8	A	Yes	Ar (CfAe)	310.00 - 6.00	0.0000	-0.37	1	1	0.5000	1.9800		1.04
1 5/8	A	Yes	Ar (CfAe)	330.00 - 6.00	-0.5000	-0.35	1	1	0.5000	1.9800		1.04
1 5/8	A	Yes	Ar (CfAe)	147.00 - 6.00	-0.5000	-0.31	1	1	0.5000	1.9800		1.04
1 5/8	A	Yes	Ar (CfAe)	130.00 - 6.00	-0.5000	-0.27	1	1	0.5000	1.9800		1.04
1 1/4	A	Yes	Ar (CfAe)	250.00 - 6.00	0.0000	0.15	1	1	1.5500	1.5500		0.66
1/2	A	Yes	Ar (CfAe)	205.00 - 6.00	2.0000	0.15	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	89.00 - 6.00	0.0000	0.36	1	1	1.1100	1.1100		0.54
7/8	B	Yes	Ar (CfAe)	112.00 - 6.00	0.0000	0.33	1	1	1.1100	1.1100		0.54
1 1/4	B	Yes	Ar (CfAe)	55.00 - 6.00	0.0000	0.46	1	1	1.5500	1.5500		0.66
1 1/4	B	Yes	Ar (CfAe)	275.00 - 6.00	0.0000	0.43	1	1	1.5500	1.5500		0.66
2 1/4	B	Yes	Ar (CfAe)	295.00 - 6.00	0.0000	0.39	1	1	2.3800	2.3800		1.16
1 1/4	C	Yes	Ar (CfAe)	295.00 - 6.00	-0.7500	0.36	3	3	0.5000	1.5500		0.66
1/2	C	Yes	Ar (CfAe)	150.00 - 6.00	-0.5000	0.42	1	1	0.5800	0.5800		0.25
1/2	C	Yes	Ar (CfAe)	150.00 - 6.00	-0.5000	0.45	1	1	0.5800	0.5800		0.25
1 1/4	C	Yes	Ar (CfAe)	260.00 - 6.00	0.0000	0.45	1	1	0.5000	1.5500		0.66
7/8	C	Yes	Ar (CfAe)	207.00 - 6.00	0.0000	0.42	1	1	1.1100	1.1100		0.54
1/2	A	No	Ar (Leg)	315.00 - 6.00	0.0000	0.05	2	2	0.5800	0.5800		0.25
1/2	C	No	Ar (Leg)	285.00 - 6.00	0.0000	0.05	2	2	0.5800	0.5800		0.25
#8 AWG Copper Wire (AT&T - Existing)	B	Yes	Ar (CfAe)	200.00 - 6.00	0.0000	-0.25	2	2	0.2500	0.1285		0.05
RG6-Fiber (AT&T - Existing)	B	Yes	Ar (CfAe)	200.00 - 6.00	0.0000	-0.25	1	1	0.5000	0.5000		1.00
HYBRIFLEX 1-5/8" (Verizon - Proposed)	C	Yes	Ar (CfAe)	175.00 - 6.00	0.0000	-0.4	2	2	1.9800	1.9800		1.90

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 5/8 (T-Mobile - Existing)	A	Yes	Ar (CfAe)	185.00 - 6.00	-3.0000	0.3	12	6	0.5000	1.9800		1.04
HYBRIFLEX 1-5/8" (T-Mobile - Existing)	A	Yes	Ar (CfAe)	185.00 - 6.00	-0.5000	0.16	1	1	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 lb
L1	347.00-330.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	1.417	0.000	0.000	0.000	11.90
T1	330.00-320.00	A	1.650	0.000	0.000	0.000	10.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.833	0.000	0.000	0.000	7.00
T2	320.00-300.00	A	11.515	0.000	0.000	0.000	70.94
		B	1.450	0.000	0.000	0.000	0.00
		C	1.667	0.000	0.000	0.000	14.00
T3	300.00-280.00	A	15.617	0.000	0.000	0.000	93.20
		B	4.908	0.000	0.000	0.000	17.40
		C	7.962	0.000	0.000	0.000	46.20
T4	280.00-260.00	A	17.067	0.000	0.000	0.000	93.20
		B	7.837	0.000	0.000	0.000	33.10
		C	11.350	0.000	0.000	0.000	63.60
T5	260.00-240.00	A	18.358	0.000	0.000	0.000	99.80
		B	8.483	0.000	0.000	0.000	36.40
		C	13.933	0.000	0.000	0.000	76.80
T6	240.00-220.00	A	24.600	0.000	0.000	0.000	137.60
		B	8.483	0.000	0.000	0.000	36.40
		C	13.933	0.000	0.000	0.000	76.80
T7	220.00-200.00	A	39.692	0.000	0.000	0.000	232.45
		B	8.483	0.000	0.000	0.000	36.40
		C	14.581	0.000	0.000	0.000	80.58
T8	200.00-180.00	A	46.192	0.000	0.000	0.000	308.10
		B	36.145	0.000	0.000	0.000	308.00
		C	15.783	0.000	0.000	0.000	87.60
T9	180.00-160.00	A	63.517	0.000	0.000	0.000	523.80
		B	46.045	0.000	0.000	0.000	495.20
		C	20.733	0.000	0.000	0.000	144.60
T10	160.00-140.00	A	64.672	0.000	0.000	0.000	531.08
		B	49.345	0.000	0.000	0.000	557.60
		C	23.350	0.000	0.000	0.000	168.60
T11	140.00-120.00	A	68.467	0.000	0.000	0.000	555.00
		B	49.345	0.000	0.000	0.000	557.60
		C	24.317	0.000	0.000	0.000	173.60
T12	120.00-100.00	A	70.117	0.000	0.000	0.000	565.40
		B	50.455	0.000	0.000	0.000	564.08
		C	24.317	0.000	0.000	0.000	173.60
T13	100.00-80.00	A	70.117	0.000	0.000	0.000	565.40
		B	52.028	0.000	0.000	0.000	573.26
		C	24.317	0.000	0.000	0.000	173.60
T14	80.00-60.00	A	70.117	0.000	0.000	0.000	565.40
		B	53.045	0.000	0.000	0.000	579.20

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 lb
		C	24.317	0.000	0.000	0.000	173.60
T15	60.00-40.00	A	70.117	0.000	0.000	0.000	565.40
		B	54.983	0.000	0.000	0.000	589.10
		C	24.317	0.000	0.000	0.000	173.60
T16	40.00-20.00	A	70.117	0.000	0.000	0.000	565.40
		B	55.628	0.000	0.000	0.000	592.40
		C	24.317	0.000	0.000	0.000	173.60
T17	20.00-5.25	A	49.082	0.000	0.000	0.000	395.78
		B	38.940	0.000	0.000	0.000	414.68
		C	17.022	0.000	0.000	0.000	121.52
T18	5.25-0.00	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 lb
L1	347.00-330.00	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		2.833	0.000	0.000	0.000	27.48
T1	330.00-320.00	A	0.500	2.483	0.000	0.000	0.000	25.55
		B		0.000	0.000	0.000	0.000	0.00
		C		1.667	0.000	0.000	0.000	16.16
T2	320.00-300.00	A	0.500	17.123	1.450	0.000	0.000	182.40
		B		1.975	1.450	0.000	0.000	0.00
		C		3.333	0.000	0.000	0.000	32.33
T3	300.00-280.00	A	0.500	23.158	2.417	0.000	0.000	239.79
		B		6.858	1.933	0.000	0.000	43.79
		C		7.179	5.608	0.000	0.000	128.63
T4	280.00-260.00	A	0.500	25.133	3.867	0.000	0.000	239.79
		B		11.454	1.933	0.000	0.000	87.07
		C		10.217	8.767	0.000	0.000	184.33
T5	260.00-240.00	A	0.500	27.258	3.867	0.000	0.000	258.91
		B		12.517	1.933	0.000	0.000	96.63
		C		14.467	8.767	0.000	0.000	222.58
T6	240.00-220.00	A	0.500	30.625	9.033	0.000	0.000	358.73
		B		12.517	1.933	0.000	0.000	96.63
		C		14.467	8.767	0.000	0.000	222.58
T7	220.00-200.00	A	0.500	35.008	24.533	0.000	0.000	605.35
		B		12.517	1.933	0.000	0.000	96.63
		C		15.698	8.767	0.000	0.000	233.24
T8	200.00-180.00	A	0.500	39.467	29.700	0.000	0.000	786.20
		B		26.831	27.364	0.000	0.000	758.34
		C		17.983	8.767	0.000	0.000	253.05
T9	180.00-160.00	A	0.500	46.917	45.200	0.000	0.000	1287.83
		B		30.556	36.664	0.000	0.000	1201.51
		C		25.433	8.767	0.000	0.000	355.49
T10	160.00-140.00	A	0.500	48.655	45.200	0.000	0.000	1305.71
		B		31.797	39.764	0.000	0.000	1349.23
		C		30.550	8.767	0.000	0.000	407.84
T11	140.00-120.00	A	0.500	54.367	45.200	0.000	0.000	1364.47
		B		31.797	39.764	0.000	0.000	1349.23
		C		33.183	8.767	0.000	0.000	426.03
T12	120.00-100.00	A	0.500	56.850	45.200	0.000	0.000	1390.02
		B		33.907	39.764	0.000	0.000	1367.51
		C		33.183	8.767	0.000	0.000	426.03

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 lb
T13	100.00-80.00	A	0.500	56.850	45.200	0.000	0.000	1390.02
		B		36.897	39.764	0.000	0.000	1393.41
		C		33.183	8.767	0.000	0.000	426.03
T14	80.00-60.00	A	0.500	56.850	45.200	0.000	0.000	1390.02
		B		38.831	39.764	0.000	0.000	1410.17
		C		33.183	8.767	0.000	0.000	426.03
T15	60.00-40.00	A	0.500	56.850	45.200	0.000	0.000	1390.02
		B		42.018	39.764	0.000	0.000	1438.85
		C		33.183	8.767	0.000	0.000	426.03
T16	40.00-20.00	A	0.500	56.850	45.200	0.000	0.000	1390.02
		B		43.081	39.764	0.000	0.000	1448.41
		C		33.183	8.767	0.000	0.000	426.03
T17	20.00-5.25	A	0.500	39.795	31.640	0.000	0.000	973.02
		B		30.157	27.835	0.000	0.000	1013.89
		C		23.228	6.137	0.000	0.000	298.22
T18	5.25-0.00	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 ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
L1	347.00-330.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.140	0.762	0.000	0.000
T1	330.00-320.00	A	0.147	0.466	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.074	0.313	0.000	0.000
T2	320.00-300.00	A	0.774	2.470	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.128	0.544	0.000	0.000
T3	300.00-280.00	A	1.015	3.239	0.000	0.000
		B	0.229	0.689	0.000	0.000
		C	0.575	1.899	0.000	0.000
T4	280.00-260.00	A	1.015	3.239	0.000	0.000
		B	0.454	1.438	0.000	0.000
		C	0.724	2.351	0.000	0.000
T5	260.00-240.00	A	1.115	3.586	0.000	0.000
		B	0.504	1.611	0.000	0.000
		C	0.923	3.044	0.000	0.000
T6	240.00-220.00	A	1.595	4.977	0.000	0.000
		B	0.504	1.611	0.000	0.000
		C	0.923	3.044	0.000	0.000
T7	220.00-200.00	A	3.199	8.844	0.000	0.000
		B	0.585	1.734	0.000	0.000
		C	1.129	3.491	0.000	0.000
T8	200.00-180.00	A	4.688	11.819	0.000	0.000
		B	3.789	9.771	0.000	0.000
		C	1.534	4.367	0.000	0.000
T9	180.00-160.00	A	6.980	17.202	0.000	0.000
		B	5.162	12.988	0.000	0.000
		C	2.200	6.143	0.000	0.000
T10	160.00-140.00	A	5.427	14.857	0.000	0.000
		B	4.231	11.749	0.000	0.000
		C	1.911	6.094	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T11	140.00-120.00	A	5.765	15.859	0.000	0.000
		B	4.231	11.749	0.000	0.000
		C	1.998	6.556	0.000	0.000
T12	120.00-100.00	A	5.912	16.294	0.000	0.000
		B	4.330	12.119	0.000	0.000
		C	1.998	6.556	0.000	0.000
T13	100.00-80.00	A	5.912	16.294	0.000	0.000
		B	4.471	12.643	0.000	0.000
		C	1.998	6.556	0.000	0.000
T14	80.00-60.00	A	5.912	16.294	0.000	0.000
		B	4.561	12.982	0.000	0.000
		C	1.998	6.556	0.000	0.000
T15	60.00-40.00	A	5.912	16.294	0.000	0.000
		B	4.734	13.541	0.000	0.000
		C	1.998	6.556	0.000	0.000
T16	40.00-20.00	A	5.912	16.294	0.000	0.000
		B	4.792	13.727	0.000	0.000
		C	1.998	6.556	0.000	0.000
T17	20.00-5.25	A	4.437	12.172	0.000	0.000
		B	3.597	10.254	0.000	0.000
		C	1.499	4.897	0.000	0.000
T18	5.25-0.00	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
L1	347.00-330.00	0.0000	0.5502	0.0000	0.3972
T1	330.00-320.00	-1.3780	1.0969	-1.0452	0.9598
T2	320.00-300.00	-4.3019	1.5718	-3.3668	1.5150
T3	300.00-280.00	-5.3803	3.2388	-3.7085	2.3891
T4	280.00-260.00	-4.8993	4.0145	-3.0342	2.8382
T5	260.00-240.00	-5.3842	4.1862	-3.5452	3.0420
T6	240.00-220.00	-5.5379	2.4134	-3.7001	1.9987
T7	220.00-200.00	-5.4900	-1.0797	-3.8376	-0.0144
T8	200.00-180.00	-3.4195	-5.4726	-2.7864	-2.6553
T9	180.00-160.00	-1.6529	-5.6678	-1.5638	-2.8739
T10	160.00-140.00	-1.4126	-5.3931	-1.5642	-2.6028
T11	140.00-120.00	-1.9289	-5.0484	-2.1337	-2.2722
T12	120.00-100.00	-1.9412	-4.8859	-2.1056	-2.1412
T13	100.00-80.00	-1.7284	-4.7794	-1.8530	-2.0403
T14	80.00-60.00	-1.5904	-4.7077	-1.6895	-1.9716
T15	60.00-40.00	-1.3016	-4.5258	-1.3939	-1.8120
T16	40.00-20.00	-1.2066	-4.4659	-1.2966	-1.7595
T17	20.00-5.25	-1.1761	-4.3472	-1.2558	-1.6795
T18	5.25-0.00	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 lb
Lighting Canopy	C	None		0.0000	350.00	No Ice	6.80	4.00	20.00
						1/2" Ice	7.38	4.92	50.00
Beacon	C	None		0.0000	348.00	No Ice	3.60	3.60	100.00
						1/2" Ice	4.00	4.00	150.00
Obstruction Light	A	From Leg	0.50 0.00 0.00	0.0000	173.50	No Ice 1/2" Ice	0.18 0.25	0.18 0.25	10.00 15.00
Obstruction Light	B	From Leg	0.50 0.00 0.00	0.0000	173.50	No Ice 1/2" Ice	0.18 0.25	0.18 0.25	10.00 15.00
Obstruction Light	C	From Leg	0.50 0.00 0.00	0.0000	173.50	No Ice 1/2" Ice	0.18 0.25	0.18 0.25	10.00 15.00
PiROD Junction Box	C	From Face	0.25 0.00 0.00	0.0000	330.00	No Ice 1/2" Ice	0.16 0.21	0.16 0.21	20.00 21.98
PiROD Junction Box	C	From Face	0.25 0.00 0.00	0.0000	260.25	No Ice 1/2" Ice	0.16 0.21	0.16 0.21	20.00 21.98
PiROD Junction Box	C	From Face	0.25 0.00 0.00	0.0000	173.50	No Ice 1/2" Ice	0.16 0.21	0.16 0.21	20.00 21.98
PiROD Junction Box	C	From Face	0.25 0.00 0.00	0.0000	86.75	No Ice 1/2" Ice	0.16 0.21	0.16 0.21	20.00 21.98
ROHN 4-ft Side Arm	A	From Leg	2.00 0.00 0.00	0.0000	320.00	No Ice 1/2" Ice	5.28 7.88	5.28 7.88	65.00 84.50
4'x4" Pipe Mount	C	From Leg	0.25 0.00 0.00	0.0000	275.00	No Ice 1/2" Ice	1.32 1.58	1.32 1.58	44.00 56.99
LP-3E-Radomes	B	From Leg	3.00 0.00 0.00	0.0000	339.00	No Ice 1/2" Ice	16.00 21.00	16.00 21.00	320.00 530.00
LP-3C-Radomes	B	From Leg	3.00 0.00 0.00	0.0000	311.00	No Ice 1/2" Ice	17.00 24.00	17.00 24.00	360.00 585.00
DB810KE-Y	A	From Face	10.00 0.00 8.00	0.0000	295.00	No Ice 1/2" Ice	4.89 6.55	4.89 6.55	35.00 70.26
DB810KE-Y	A	From Face	10.00 0.00 -8.00	0.0000	295.00	No Ice 1/2" Ice	4.89 6.55	4.89 6.55	35.00 70.26
Pirod Candelabra Arm (1)	A	From Face	5.00 0.00 0.00	0.0000	295.00	No Ice 1/2" Ice	11.58 16.25	11.58 16.25	250.00 350.00
DB810KE-Y	C	From Face	10.00 0.00 -8.00	0.0000	295.00	No Ice 1/2" Ice	4.89 6.55	4.89 6.55	35.00 70.26
Pirod Candelabra Arm (1)	C	From Face	5.00 0.00 0.00	0.0000	295.00	No Ice 1/2" Ice	11.58 16.25	11.58 16.25	250.00 350.00
PD220	B	From Leg	6.00 0.00 10.00	0.0000	295.00	No Ice 1/2" Ice	3.08 5.30	3.08 5.30	23.00 48.68
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00 0.00	0.0000	295.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00

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 lb
			0.00						
PD220	C	From Leg	6.00	0.0000	260.00	No Ice	3.08	3.08	23.00
			0.00			1/2" Ice	5.30	5.30	48.68
			10.00						
Pirod 6' Side Mount Standoff (1)	C	From Leg	3.00	0.0000	260.00	No Ice	4.97	4.97	70.00
			0.00			1/2" Ice	6.12	6.12	130.00
			0.00						
PD220	A	From Leg	6.00	0.0000	250.00	No Ice	3.08	3.08	23.00
			0.00			1/2" Ice	5.30	5.30	48.68
			10.00						
Pirod 6' Side Mount Standoff (1)	A	From Leg	3.00	0.0000	250.00	No Ice	4.97	4.97	70.00
			0.00			1/2" Ice	6.12	6.12	130.00
			0.00						
PD1142-1	B	From Leg	6.00	0.0000	207.00	No Ice	1.32	1.32	10.00
			0.00			1/2" Ice	3.21	3.21	23.85
			10.00						
Pirod 6' Side Mount Standoff (1)	B	From Leg	3.00	0.0000	207.00	No Ice	4.97	4.97	70.00
			0.00			1/2" Ice	6.12	6.12	130.00
			0.00						
PD1150	A	From Leg	2.00	0.0000	205.00	No Ice	1.22	1.22	8.00
			0.00			1/2" Ice	2.43	2.43	16.00
			5.00						
Pirod 6' Side Mount Standoff (1)	A	From Face	0.00	0.0000	205.00	No Ice	4.97	4.97	70.00
			0.00			1/2" Ice	6.12	6.12	130.00
			0.00						
10' Dipole	A	From Leg	3.00	0.0000	150.00	No Ice	4.00	4.00	50.00
			0.00			1/2" Ice	6.00	6.00	71.79
			0.00						
20' x 3" Dia Omni	B	From Leg	4.00	0.0000	147.00	No Ice	6.00	6.00	50.00
			0.00			1/2" Ice	8.03	8.03	93.17
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	156.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	138.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
PR-450	B	From Leg	1.00	0.0000	112.00	No Ice	6.35	6.35	38.00
			0.00			1/2" Ice	11.43	11.43	49.40
			0.00						
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00	0.0000	112.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
PR-450	B	From Leg	1.00	0.0000	90.00	No Ice	6.35	6.35	38.00
			0.00			1/2" Ice	11.43	11.43	49.40
			0.00						
1105-3A-Radomes	B	From Leg	2.00	0.0000	68.00	No Ice	23.00	23.00	175.00
			0.00			1/2" Ice	29.00	29.00	350.00
			0.00						
(2) DB980H90E-M (Sprint - Existing)	A	From Leg	3.00	0.0000	225.00	No Ice	3.80	2.19	8.50
			0.00			1/2" Ice	4.18	2.56	28.62
			0.00						
(2) DB980H90E-M (Sprint - Existing)	B	From Leg	3.00	0.0000	225.00	No Ice	3.80	2.19	8.50
			0.00			1/2" Ice	4.18	2.56	28.62
			0.00						
(2) DB980H90E-M (Sprint - Existing)	C	From Leg	3.00	0.0000	225.00	No Ice	3.80	2.19	8.50
			0.00			1/2" Ice	4.18	2.56	28.62

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 lb
			0.00						
Pirod 12' T-Frame Sector Mount (1)	A	From Leg	2.00	0.0000	225.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
(Sprint - Existing)			0.00						
Pirod 12' T-Frame Sector Mount (1)	B	From Leg	2.00	0.0000	225.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
(Sprint - Existing)			0.00						
Pirod 12' T-Frame Sector Mount (1)	C	From Leg	2.00	0.0000	225.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
(Sprint - Existing)			0.00						
7770.00	A	From Leg	3.00	0.0000	200.00	No Ice	5.88	2.93	35.00
(AT&T - Existing)			0.00			1/2" Ice	6.31	3.27	67.63
			0.00						
7770.00	B	From Leg	3.00	0.0000	200.00	No Ice	5.88	2.93	35.00
(AT&T - Existing)			0.00			1/2" Ice	6.31	3.27	67.63
			0.00						
7770.00	C	From Leg	3.00	0.0000	200.00	No Ice	5.88	2.93	35.00
(AT&T - Existing)			0.00			1/2" Ice	6.31	3.27	67.63
			0.00						
(2) AM-X-CD-14-65-00T-RET	A	From Leg	3.00	0.0000	200.00	No Ice	5.51	2.83	37.00
			0.00			1/2" Ice	5.90	3.14	68.95
(AT&T - Existing)			0.00						
(2) P65-17-XLH-RR	B	From Leg	3.00	0.0000	200.00	No Ice	11.47	6.80	62.00
(AT&T - Existing)			0.00			1/2" Ice	12.08	7.38	124.06
			0.00						
(2) P65-17-XLH-RR	C	From Leg	3.00	0.0000	200.00	No Ice	11.47	6.80	62.00
(AT&T - Existing)			0.00			1/2" Ice	12.08	7.38	124.06
			0.00						
(2) DTMABP7819VG12A TMA	A	From Leg	3.00	0.0000	200.00	No Ice	1.59	0.58	20.00
			0.00			1/2" Ice	1.76	0.70	29.77
(AT&T - Existing)			0.00						
(2) DTMABP7819VG12A TMA	B	From Leg	3.00	0.0000	200.00	No Ice	1.59	0.58	20.00
			0.00			1/2" Ice	1.76	0.70	29.77
(AT&T - Existing)			0.00						
(2) DTMABP7819VG12A TMA	C	From Leg	3.00	0.0000	200.00	No Ice	1.59	0.58	20.00
			0.00			1/2" Ice	1.76	0.70	29.77
(AT&T - Existing)			0.00						
(2) RRUS-11	A	From Leg	3.00	0.0000	200.00	No Ice	2.99	1.25	50.00
(AT&T - Existing)			0.00			1/2" Ice	3.23	1.41	69.57
			0.00						
(2) RRUS-11	B	From Leg	3.00	0.0000	200.00	No Ice	2.99	1.25	50.00
(AT&T - Existing)			0.00			1/2" Ice	3.23	1.41	69.57
			0.00						
(2) RRUS-11	C	From Leg	3.00	0.0000	200.00	No Ice	2.99	1.25	50.00
(AT&T - Existing)			0.00			1/2" Ice	3.23	1.41	69.57
			0.00						
DC6-48-60-18-8F Surge Arrestor	A	From Leg	3.00	0.0000	200.00	No Ice	2.23	2.23	20.00
			0.00			1/2" Ice	2.45	2.45	39.36
(AT&T - Existing)			0.00						
Pirod 12' T-Frame Sector Mount (1)	A	From Leg	2.00	0.0000	200.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T - Existing)			0.00						
Pirod 12' T-Frame Sector Mount (1)	B	From Leg	2.00	0.0000	200.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T - Existing)			0.00						
Pirod 12' T-Frame Sector Mount (1)	C	From Leg	2.00	0.0000	200.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00

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 lb
(AT&T - Existing)			0.00						
LNX-6514DS-VTM	A	From Leg	3.00	0.0000	170.00	No Ice	8.41	5.41	39.00
(Verizon - Proposed)			-6.00			1/2" Ice	8.96	5.86	89.51
			0.00						
HBXX-6517DS	A	From Leg	3.00	0.0000	170.00	No Ice	8.74	5.24	50.00
(Verizon - Proposed)			-4.00			1/2" Ice	9.31	5.71	100.49
			0.00						
LNX-6514DS-VTM	A	From Leg	3.00	0.0000	170.00	No Ice	8.41	5.41	39.00
(Verizon - Proposed)			0.00			1/2" Ice	8.96	5.86	89.51
			0.00						
HBXX-6517DS	A	From Leg	3.00	0.0000	170.00	No Ice	8.74	5.24	50.00
(Verizon - Proposed)			4.00			1/2" Ice	9.31	5.71	100.49
			0.00						
LNX-6514DS-VTM	B	From Leg	3.00	0.0000	170.00	No Ice	8.41	5.41	39.00
(Verizon - Proposed)			-6.00			1/2" Ice	8.96	5.86	89.51
			0.00						
HBXX-6517DS	B	From Leg	3.00	0.0000	170.00	No Ice	8.74	5.24	50.00
(Verizon - Proposed)			-4.00			1/2" Ice	9.31	5.71	100.49
			0.00						
LNX-6514DS-VTM	B	From Leg	3.00	0.0000	170.00	No Ice	8.41	5.41	39.00
(Verizon - Proposed)			0.00			1/2" Ice	8.96	5.86	89.51
			0.00						
HBXX-6517DS	B	From Leg	3.00	0.0000	170.00	No Ice	8.74	5.24	50.00
(Verizon - Proposed)			4.00			1/2" Ice	9.31	5.71	100.49
			0.00						
LNX-6514DS-VTM	C	From Leg	3.00	0.0000	170.00	No Ice	8.41	5.41	39.00
(Verizon - Proposed)			-6.00			1/2" Ice	8.96	5.86	89.51
			0.00						
HBXX-6517DS	C	From Leg	3.00	0.0000	170.00	No Ice	8.74	5.24	50.00
(Verizon - Proposed)			-4.00			1/2" Ice	9.31	5.71	100.49
			0.00						
LNX-6514DS-VTM	C	From Leg	3.00	0.0000	170.00	No Ice	8.41	5.41	39.00
(Verizon - Proposed)			0.00			1/2" Ice	8.96	5.86	89.51
			0.00						
HBXX-6517DS	C	From Leg	3.00	0.0000	170.00	No Ice	8.74	5.24	50.00
(Verizon - Proposed)			4.00			1/2" Ice	9.31	5.71	100.49
			0.00						
(2) FD9R6004/2C-3L	A	From Leg	3.00	0.0000	170.00	No Ice	0.37	0.08	3.00
Diplexer			6.00			1/2" Ice	0.45	0.14	5.30
(Verizon - Existing)			0.00						
(2) FD9R6004/2C-3L	B	From Leg	3.00	0.0000	170.00	No Ice	0.37	0.08	3.00
Diplexer			6.00			1/2" Ice	0.45	0.14	5.30
(Verizon - Existing)			0.00						
(2) FD9R6004/2C-3L	C	From Leg	3.00	0.0000	170.00	No Ice	0.37	0.08	3.00
Diplexer			6.00			1/2" Ice	0.45	0.14	5.30
(Verizon - Existing)			0.00						
RRH2x60-AWS	A	From Leg	3.00	0.0000	170.00	No Ice	3.78	2.07	55.00
(Verizon - Proposed)			-4.00			1/2" Ice	4.09	2.35	78.25
			0.00						
RRH2x60-AWS	B	From Leg	3.00	0.0000	170.00	No Ice	3.78	2.07	55.00
(Verizon - Proposed)			-4.00			1/2" Ice	4.09	2.35	78.25
			0.00						
RRH2x60-AWS	C	From Leg	3.00	0.0000	170.00	No Ice	3.78	2.07	55.00
(Verizon - Proposed)			-4.00			1/2" Ice	4.09	2.35	78.25
			0.00						
RRH2x60-PCS	A	From Leg	3.00	0.0000	170.00	No Ice	2.51	1.55	55.00
(Verizon - Proposed)			4.00			1/2" Ice	2.73	1.74	72.75

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 lb
			0.00						
RRH2x60-PCS	B	From Leg	3.00	0.0000	170.00	No Ice	2.51	1.55	55.00
(Verizon - Proposed)			4.00			1/2" Ice	2.73	1.74	72.75
			0.00						
RRH2x60-PCS	C	From Leg	3.00	0.0000	170.00	No Ice	2.51	1.55	55.00
(Verizon - Proposed)			4.00			1/2" Ice	2.73	1.74	72.75
			0.00						
DB-T1-6Z-8AB-0Z	A	From Leg	3.00	0.0000	170.00	No Ice	5.60	2.33	44.00
(Verizon - Proposed)			0.00			1/2" Ice	5.92	2.56	80.13
			0.00						
DB-T1-6Z-8AB-0Z	B	From Leg	3.00	0.0000	170.00	No Ice	5.60	2.33	44.00
(Verizon - Proposed)			0.00			1/2" Ice	5.92	2.56	80.13
			0.00						
Nudd 14' Boom (3)	C	None		0.0000	170.00	No Ice	47.00	47.00	1600.00
(Verizon - Existing)						1/2" Ice	67.00	67.00	2050.00
DCR-L2	A	From Leg	1.00	0.0000	320.00	No Ice	6.30	6.30	0.05
			0.00			1/2" Ice	7.25	7.25	0.06
			0.00						
DCR-L2	A	From Leg	1.00	0.0000	310.00	No Ice	6.30	6.30	0.05
			0.00			1/2" Ice	7.25	7.25	0.06
			0.00						
DCR-L2	C	From Leg	1.00	0.0000	290.00	No Ice	6.30	6.30	0.05
			0.00			1/2" Ice	7.25	7.25	0.06
			0.00						
DCR-L2	C	From Leg	1.00	0.0000	280.00	No Ice	6.30	6.30	0.05
			0.00			1/2" Ice	7.25	7.25	0.06
			0.00						
AIR21 B2A/B4P	A	From Leg	1.00	0.0000	185.00	No Ice	6.53	4.36	83.00
(T-Mobile - Existing)			-4.00			1/2" Ice	6.98	4.77	124.90
			0.00						
AIR21 B4A/B2P	A	From Leg	1.00	0.0000	185.00	No Ice	6.53	4.36	83.00
(T-Mobile - Existing)			0.00			1/2" Ice	6.98	4.77	124.90
			0.00						
LNX-6515DS	A	From Leg	1.00	0.0000	185.00	No Ice	11.45	7.70	55.00
(T-Mobile - Existing)			4.00			1/2" Ice	12.06	8.29	120.87
			0.00						
AIR21 B2A/B4P	B	From Leg	1.00	0.0000	185.00	No Ice	6.53	4.36	83.00
(T-Mobile - Existing)			-4.00			1/2" Ice	6.98	4.77	124.90
			0.00						
AIR21 B4A/B2P	B	From Leg	1.00	0.0000	185.00	No Ice	6.53	4.36	83.00
(T-Mobile - Existing)			0.00			1/2" Ice	6.98	4.77	124.90
			0.00						
LNX-6515DS	B	From Leg	1.00	0.0000	185.00	No Ice	11.45	7.70	55.00
(T-Mobile - Existing)			4.00			1/2" Ice	12.06	8.29	120.87
			0.00						
AIR21 B2A/B4P	C	From Leg	1.00	0.0000	185.00	No Ice	6.53	4.36	83.00
(T-Mobile - Existing)			-4.00			1/2" Ice	6.98	4.77	124.90
			0.00						
AIR21 B4A/B2P	C	From Leg	1.00	0.0000	185.00	No Ice	6.53	4.36	83.00
(T-Mobile - Existing)			0.00			1/2" Ice	6.98	4.77	124.90
			0.00						
LNX-6515DS	C	From Leg	1.00	0.0000	185.00	No Ice	11.45	7.70	55.00
(T-Mobile - Existing)			4.00			1/2" Ice	12.06	8.29	120.87
			0.00						
TMA 10"x8"x3"	A	From Leg	1.00	0.0000	185.00	No Ice	0.78	0.29	15.00
(T-Mobile - Existing)			-4.00			1/2" Ice	0.90	0.38	20.06
			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 lb
TMA 10"x8"x3" (T-Mobile - Existing)	B	From Leg	1.00 -4.00 0.00	0.0000	185.00	No Ice 1/2" Ice	0.78 0.90	0.29 0.38	15.00 20.06
TMA 10"x8"x3" (T-Mobile - Existing)	C	From Leg	1.00 -4.00 0.00	0.0000	185.00	No Ice 1/2" Ice	0.78 0.90	0.29 0.38	15.00 20.06
RRUS-11 (T-Mobile - Existing)	A	From Leg	1.00 4.00 0.00	0.0000	185.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	50.00 69.57
RRUS-11 (T-Mobile - Existing)	B	From Leg	1.00 4.00 0.00	0.0000	185.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	50.00 69.57
RRUS-11 (T-Mobile - Existing)	C	From Leg	1.00 4.00 0.00	0.0000	185.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	50.00 69.57
10-ft T-Frame (T-Mobile - Existing)	A	From Leg	1.00 4.00 0.00	0.0000	185.00	No Ice 1/2" Ice	13.60 17.50	13.60 17.50	378.00 530.00
10-ft T-Frame (T-Mobile - Existing)	B	From Leg	1.00 4.00 0.00	0.0000	185.00	No Ice 1/2" Ice	13.60 17.50	13.60 17.50	378.00 530.00
10-ft T-Frame (T-Mobile - Existing)	C	From Leg	1.00 4.00 0.00	0.0000	185.00	No Ice 1/2" Ice	13.60 17.50	13.60 17.50	378.00 530.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
10' dish	C	Grid	From Leg	4.00 0.00 0.00	-60.0000		320.00	10.00	No Ice 1/2" Ice	78.54 79.85	500.00 910.00
10' dish	C	Grid	From Leg	1.00 0.00 0.00	45.0000		310.00	10.00	No Ice 1/2" Ice	78.54 79.85	500.00 910.00
6' Dish	A	Paraboloid w/Radome	From Leg	1.50 0.00 0.00	-45.0000		275.00	6.00	No Ice 1/2" Ice	28.27 29.07	80.00 100.00
6' Dish	B	Grid	From Leg	1.00 0.00 0.00	45.0000		130.00	6.00	No Ice 1/2" Ice	28.27 29.07	80.00 100.00

Tower Pressures - No Ice

G_H = 1.079 (base tower), 1.079 (upper structure)

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
L1 347.00-330.00	338.50	1.945	45	44.271	A	0.000	6.212	3.542	57.02	0.000	0.000
					B	0.000	6.212		57.02	0.000	0.000
					C	0.000	8.836		40.08	0.000	0.000
T1 330.00-320.00	325.00	1.922	44	51.875	A	0.000	9.549	3.750	39.27	0.000	0.000
					B	0.000	8.046		46.61	0.000	0.000
					C	0.000	8.805		42.59	0.000	0.000
T2 320.00-300.00	310.00	1.897	44	103.750	A	0.000	25.645	7.500	29.25	0.000	0.000
					B	0.000	16.354		45.86	0.000	0.000
					C	0.000	16.442		45.61	0.000	0.000
T3 300.00-280.00	290.00	1.861	43	103.750	A	0.000	29.505	7.500	25.42	0.000	0.000
					B	0.000	19.583		38.30	0.000	0.000
					C	0.000	22.291		33.65	0.000	0.000
T4 280.00-260.00	270.00	1.823	42	103.750	A	0.000	30.955	7.500	24.23	0.000	0.000
					B	0.000	22.287		33.65	0.000	0.000
					C	0.000	25.530		29.38	0.000	0.000
T5 260.00-240.00	250.00	1.783	41	103.750	A	0.000	32.148	7.500	23.33	0.000	0.000
					B	0.000	22.883		32.77	0.000	0.000
					C	0.000	27.914		26.87	0.000	0.000
T6 240.00-220.00	230.00	1.741	40	103.750	A	0.000	37.909	7.500	19.78	0.000	0.000
					B	0.000	22.883		32.77	0.000	0.000
					C	0.000	27.914		26.87	0.000	0.000
T7 220.00-200.00	210.00	1.697	39	104.167	A	0.000	53.383	8.333	15.61	0.000	0.000
					B	0.000	24.788		33.62	0.000	0.000
					C	0.000	30.341		27.47	0.000	0.000
T8 200.00-180.00	190.00	1.649	38	104.583	A	0.000	61.239	9.167	14.97	0.000	0.000
					B	0.000	52.091		17.60	0.000	0.000
					C	0.000	33.985		26.97	0.000	0.000
T9 180.00-160.00	170.00	1.597	37	104.583	A	0.000	76.869	9.167	11.93	0.000	0.000
					B	0.000	61.215		14.97	0.000	0.000
					C	0.000	38.865		23.59	0.000	0.000
T10 160.00-140.00	150.00	1.541	36	104.583	A	0.000	76.927	9.167	11.92	0.000	0.000
					B	0.000	62.796		14.60	0.000	0.000
					C	0.000	39.121		23.43	0.000	0.000
T11 140.00-120.00	130.00	1.48	34	104.583	A	0.000	80.384	9.167	11.40	0.000	0.000
					B	0.000	62.796		14.60	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T12 120.00-100.00	110.00	1.411	33	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
					B	0.000	63.807		14.37	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T13 100.00-80.00	90.00	1.332	31	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
					B	0.000	65.239		14.05	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T14 80.00-60.00	70.00	1.24	29	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
					B	0.000	66.166		13.85	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T15 60.00-40.00	50.00	1.126	26	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
					B	0.000	67.930		13.49	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T16 40.00-20.00	30.00	1	23	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
					B	0.000	68.518		13.38	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T17 20.00-5.25	12.63	1	23	77.130	A	0.000	58.138	6.760	11.63	0.000	0.000
					B	0.000	48.837		13.84	0.000	0.000
					C	0.000	29.016		23.30	0.000	0.000
T18 5.25-0.00	2.63	1	23	14.458	A	0.433	3.829	2.746	64.44	0.000	0.000
					B	0.433	3.829		64.44	0.000	0.000
					C	0.433	3.829		64.44	0.000	0.000

Tower Pressure - With Ice

G_H = 1.079 (base tower), 1.079 (upper structure)

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
L1 347.00-330.00	338.50	1.945	34	0.5000	45.688	A	0.000	14.185	6.375	44.94	0.000	0.000
						B	0.000	14.185		44.94	0.000	0.000
						C	0.000	19.401		32.86	0.000	0.000
T1 330.00-320.00	325.00	1.922	33	0.5000	52.708	A	0.000	16.468	5.417	32.89	0.000	0.000
						B	0.000	14.451		37.48	0.000	0.000
						C	0.000	15.805		34.27	0.000	0.000
T2 320.00-300.00	310.00	1.897	33	0.5000	105.417	A	1.450	41.180	10.833	25.41	0.000	0.000
						B	1.450	28.502		36.17	0.000	0.000
						C	0.000	29.317		36.95	0.000	0.000
T3 300.00-280.00	290.00	1.861	32	0.5000	105.417	A	2.417	46.446	10.833	22.17	0.000	0.000
						B	1.933	32.696		31.28	0.000	0.000
						C	5.608	31.807		28.95	0.000	0.000
T4 280.00-260.00	270.00	1.823	32	0.5000	105.417	A	3.867	48.421	10.833	20.72	0.000	0.000
						B	1.933	36.543		28.16	0.000	0.000
						C	8.767	34.393		25.10	0.000	0.000
T5 260.00-240.00	250.00	1.783	31	0.5000	105.417	A	3.867	50.200	10.833	20.04	0.000	0.000
						B	1.933	37.432		27.52	0.000	0.000
						C	8.767	37.950		23.19	0.000	0.000
T6 240.00-220.00	230.00	1.741	30	0.5000	105.417	A	9.033	52.175	10.833	17.70	0.000	0.000
						B	1.933	37.432		27.52	0.000	0.000
						C	8.767	37.950		23.19	0.000	0.000
T7 220.00-200.00	210.00	1.697	29	0.5000	105.833	A	24.533	54.644	11.667	14.73	0.000	0.000
						B	1.933	39.262		28.32	0.000	0.000
						C	8.767	40.686		23.59	0.000	0.000
T8 200.00-180.00	190.00	1.649	29	0.5000	106.250	A	29.700	58.933	12.500	14.10	0.000	0.000
						B	27.364	48.346		16.51	0.000	0.000
						C	8.767	44.901		23.29	0.000	0.000
T9 180.00-160.00	170.00	1.597	28	0.5000	106.250	A	45.200	61.994	12.500	11.66	0.000	0.000
						B	36.664	49.848		14.45	0.000	0.000
						C	8.767	51.570		20.72	0.000	0.000
T10 160.00-140.00	150.00	1.541	27	0.5000	106.250	A	45.200	63.031	12.500	11.55	0.000	0.000
						B	39.764	49.282		14.04	0.000	0.000
						C	8.767	53.689		20.01	0.000	0.000
T11 140.00-120.00	130.00	1.48	26	0.5000	106.250	A	45.200	67.741	12.500	11.07	0.000	0.000
						B	39.764	49.282		14.04	0.000	0.000
						C	8.767	55.860		19.34	0.000	0.000
T12 120.00-100.00	110.00	1.411	24	0.5000	106.250	A	45.200	69.788	12.500	10.87	0.000	0.000
						B	39.764	51.022		13.77	0.000	0.000
						C	8.767	55.860		19.34	0.000	0.000
T13 100.00-80.00	90.00	1.332	23	0.5000	106.250	A	45.200	69.788	12.500	10.87	0.000	0.000
						B	39.764	53.487		13.40	0.000	0.000
						C	8.767	55.860		19.34	0.000	0.000
T14 80.00-60.00	70.00	1.24	21	0.5000	106.250	A	45.200	69.788	12.500	10.87	0.000	0.000
						B	39.764	55.082		13.18	0.000	0.000
						C	8.767	55.860		19.34	0.000	0.000
T15 60.00-40.00	50.00	1.126	20	0.5000	106.250	A	45.200	69.788	12.500	10.87	0.000	0.000
						B	39.764	57.710		12.82	0.000	0.000
						C	8.767	55.860		19.34	0.000	0.000
T16 40.00-20.00	30.00	1	17	0.5000	106.250	A	45.200	69.788	12.500	10.87	0.000	0.000
						B	39.764	58.586		12.71	0.000	0.000
						C	8.767	55.860		19.34	0.000	0.000
T17 20.00-5.25	12.63	1	17	0.5000	78.359	A	31.640	50.011	9.219	11.29	0.000	0.000
						B	27.835	42.290		13.15	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
T18 5.25-0.00	2.63	1	17	0.5000	14.942	C	6.137	40.719		19.67	0.000	0.000
						A	0.433	6.372	3.745	55.03	0.000	0.000
						B	0.433	6.372		55.03	0.000	0.000
						C	0.433	6.372		55.03	0.000	0.000

Tower Pressure - Service

G_H = 1.079 (base tower), 1.079 (upper structure)

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
L1	338.50	1.945	12	44.271	A	0.000	6.212	3.542	57.02	0.000	0.000
347.00-330.00					B	0.000	6.212		57.02	0.000	0.000
					C	0.000	8.836		40.08	0.000	0.000
T1	325.00	1.922	12	51.875	A	0.000	9.549	3.750	39.27	0.000	0.000
330.00-320.00					B	0.000	8.046		46.61	0.000	0.000
					C	0.000	8.805		42.59	0.000	0.000
T2	310.00	1.897	12	103.750	A	0.000	25.645	7.500	29.25	0.000	0.000
320.00-300.00					B	0.000	16.354		45.86	0.000	0.000
					C	0.000	16.442		45.61	0.000	0.000
T3	290.00	1.861	12	103.750	A	0.000	29.505	7.500	25.42	0.000	0.000
300.00-280.00					B	0.000	19.583		38.30	0.000	0.000
					C	0.000	22.291		33.65	0.000	0.000
T4	270.00	1.823	12	103.750	A	0.000	30.955	7.500	24.23	0.000	0.000
280.00-260.00					B	0.000	22.287		33.65	0.000	0.000
					C	0.000	25.530		29.38	0.000	0.000
T5	250.00	1.783	11	103.750	A	0.000	32.148	7.500	23.33	0.000	0.000
260.00-240.00					B	0.000	22.883		32.77	0.000	0.000
					C	0.000	27.914		26.87	0.000	0.000
T6	230.00	1.741	11	103.750	A	0.000	37.909	7.500	19.78	0.000	0.000
240.00-220.00					B	0.000	22.883		32.77	0.000	0.000
					C	0.000	27.914		26.87	0.000	0.000
T7	210.00	1.697	11	104.167	A	0.000	53.383	8.333	15.61	0.000	0.000
220.00-200.00					B	0.000	24.788		33.62	0.000	0.000
					C	0.000	30.341		27.47	0.000	0.000
T8	190.00	1.649	11	104.583	A	0.000	61.239	9.167	14.97	0.000	0.000
200.00-180.00					B	0.000	52.091		17.60	0.000	0.000
					C	0.000	33.985		26.97	0.000	0.000
T9	170.00	1.597	10	104.583	A	0.000	76.869	9.167	11.93	0.000	0.000
180.00-160.00					B	0.000	61.215		14.97	0.000	0.000
					C	0.000	38.865		23.59	0.000	0.000
T10	150.00	1.541	10	104.583	A	0.000	76.927	9.167	11.92	0.000	0.000
160.00-140.00					B	0.000	62.796		14.60	0.000	0.000
					C	0.000	39.121		23.43	0.000	0.000
T11	130.00	1.48	9	104.583	A	0.000	80.384	9.167	11.40	0.000	0.000
140.00-120.00					B	0.000	62.796		14.60	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T12	110.00	1.411	9	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
120.00-100.00					B	0.000	63.807		14.37	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T13	90.00	1.332	9	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
100.00-80.00					B	0.000	65.239		14.05	0.000	0.000
					C	0.000	40.001		22.92	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
T14	70.00	1.24	8	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
80.00-60.00					B	0.000	66.166		13.85	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T15	50.00	1.126	7	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
60.00-40.00					B	0.000	67.930		13.49	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T16	30.00	1	6	104.583	A	0.000	81.886	9.167	11.19	0.000	0.000
40.00-20.00					B	0.000	68.518		13.38	0.000	0.000
					C	0.000	40.001		22.92	0.000	0.000
T17 20.00-5.25	12.63	1	6	77.130	A	0.000	58.138	6.760	11.63	0.000	0.000
					B	0.000	48.837		13.84	0.000	0.000
					C	0.000	29.016		23.30	0.000	0.000
T18 5.25-0.00	2.63	1	6	14.458	A	0.433	3.829	2.746	64.44	0.000	0.000
					B	0.433	3.829		64.44	0.000	0.000
					C	0.433	3.829		64.44	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	11.90	388.33	A	0.14	2.807	0.58	1	1	3.603	656.67	38.63	C
347.00-330.00			B	0.14	2.807	0.58	1	1	3.603			
			C	0.2	2.597	0.59	1	1	5.216			
T1	17.40	796.69	A	0.184	2.65	0.587	1	1	5.608	711.98	71.20	A
330.00-320.00			B	0.155	2.753	0.582	1	1	4.685			
			C	0.17	2.7	0.585	1	1	5.148			
T2	84.94	1474.41	A	0.247	2.446	0.601	1	1	15.417	1782.36	89.12	A
320.00-300.00			B	0.158	2.744	0.583	1	1	9.529			
			C	0.158	2.741	0.583	1	1	9.583			
T3	156.80	1474.41	A	0.284	2.338	0.611	1	1	18.035	1955.71	97.79	A
300.00-280.00			B	0.189	2.634	0.588	1	1	11.518			
			C	0.215	2.547	0.594	1	1	13.231			
T4	189.90	1474.41	A	0.298	2.3	0.615	1	1	19.050	1991.13	99.56	A
280.00-260.00			B	0.215	2.547	0.594	1	1	13.228			
			C	0.246	2.449	0.601	1	1	15.340			
T5	213.00	1474.41	A	0.31	2.27	0.619	1	1	19.898	2007.81	100.39	A
260.00-240.00			B	0.221	2.529	0.595	1	1	13.611			
			C	0.269	2.382	0.607	1	1	16.942			
T6	250.80	1474.41	A	0.365	2.137	0.638	1	1	24.189	2243.18	112.16	A
240.00-220.00			B	0.221	2.529	0.595	1	1	13.611			
			C	0.269	2.382	0.607	1	1	16.942			
T7	349.43	1898.78	A	0.512	1.884	0.704	1	1	37.578	2994.45	149.72	A
220.00-200.00			B	0.238	2.474	0.599	1	1	14.845			
			C	0.291	2.319	0.613	1	1	18.607			
T8	703.70	2589.89	A	0.586	1.814	0.745	1	1	45.615	3399.95	170.00	A
200.00-180.00			B	0.498	1.903	0.697	1	1	36.283			
			C	0.325	2.232	0.624	1	1	21.202			
T9	1163.60	2680.09	A	0.735	1.782	0.846	1	1	64.993	4611.57	230.58	A
180.00-160.00		TA	B	0.585	1.814	0.745	1	1	45.589			
		2076.41	C	0.372	2.123	0.64	1	1	24.891			
T10	1257.28	2108.89	A	0.736	1.782	0.846	1	1	65.075	4455.61	222.78	A
160.00-140.00			B	0.6	1.804	0.754	1	1	47.340			
			C	0.374	2.118	0.641	1	1	25.091			
T11	1286.20	2108.89	A	0.769	1.796	0.871	1	1	70.037	4638.57	231.93	A
140.00-120.00			B	0.6	1.804	0.754	1	1	47.340			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.382	2.1	0.645	1	1	25.785			
T12	1303.08	2108.89	A	0.783	1.804	0.883	1	1	72.278	4584.84	229.24	A
120.00-100.00			B	0.61	1.798	0.76	1	1	48.483			
			C	0.382	2.1	0.645	1	1	25.785			
T13	1312.26	2108.89	A	0.783	1.804	0.883	1	1	72.278	4329.37	216.47	A
100.00-80.00			B	0.624	1.791	0.768	1	1	50.133			
			C	0.382	2.1	0.645	1	1	25.785			
T14	1318.20	2108.89	A	0.783	1.804	0.883	1	1	72.278	4029.40	201.47	A
80.00-60.00			B	0.633	1.787	0.774	1	1	51.221			
			C	0.382	2.1	0.645	1	1	25.785			
T15	1328.10	2108.89	A	0.783	1.804	0.883	1	1	72.278	3660.07	183.00	A
60.00-40.00			B	0.65	1.782	0.785	1	1	53.336			
			C	0.382	2.1	0.645	1	1	25.785			
T16	1331.40	2108.89	A	0.783	1.804	0.883	1	1	72.278	3250.35	162.52	A
40.00-20.00			B	0.655	1.78	0.789	1	1	54.055			
			C	0.382	2.1	0.645	1	1	25.785			
T17	931.98	1610.88	A	0.754	1.789	0.86	1	1	49.985	2228.74	151.10	A
20.00-5.25			B	0.633	1.787	0.774	1	1	37.823			
			C	0.376	2.113	0.642	1	1	18.634			
T18 5.25-0.00	0.00	831.39	A	0.295	2.31	0.614	1	1	2.785	160.33	30.54	C
			B	0.295	2.31	0.614	1	1	2.785			
			C	0.295	2.31	0.614	1	1	2.785			
Sum Weight:	13209.97	35006.73								53692.10		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	11.90	388.33	A	0.14	2.807	0.58	0.825	1	3.603	656.67	38.63	C
347.00-330.00			B	0.14	2.807	0.58	0.825	1	3.603			
			C	0.2	2.597	0.59	0.825	1	5.216			
T1	17.40	796.69	A	0.184	2.65	0.587	0.825	1	5.608	711.98	71.20	A
330.00-320.00			B	0.155	2.753	0.582	0.825	1	4.685			
			C	0.17	2.7	0.585	0.825	1	5.148			
T2	84.94	1474.41	A	0.247	2.446	0.601	0.825	1	15.417	1782.36	89.12	A
320.00-300.00			B	0.158	2.744	0.583	0.825	1	9.529			
			C	0.158	2.741	0.583	0.825	1	9.583			
T3	156.80	1474.41	A	0.284	2.338	0.611	0.825	1	18.035	1955.71	97.79	A
300.00-280.00			B	0.189	2.634	0.588	0.825	1	11.518			
			C	0.215	2.547	0.594	0.825	1	13.231			
T4	189.90	1474.41	A	0.298	2.3	0.615	0.825	1	19.050	1991.13	99.56	A
280.00-260.00			B	0.215	2.547	0.594	0.825	1	13.228			
			C	0.246	2.449	0.601	0.825	1	15.340			
T5	213.00	1474.41	A	0.31	2.27	0.619	0.825	1	19.898	2007.81	100.39	A
260.00-240.00			B	0.221	2.529	0.595	0.825	1	13.611			
			C	0.269	2.382	0.607	0.825	1	16.942			
T6	250.80	1474.41	A	0.365	2.137	0.638	0.825	1	24.189	2243.18	112.16	A
240.00-220.00			B	0.221	2.529	0.595	0.825	1	13.611			
			C	0.269	2.382	0.607	0.825	1	16.942			
T7	349.43	1898.78	A	0.512	1.884	0.704	0.825	1	37.578	2994.45	149.72	A
220.00-200.00			B	0.238	2.474	0.599	0.825	1	14.845			
			C	0.291	2.319	0.613	0.825	1	18.607			
T8	703.70	2589.89	A	0.586	1.814	0.745	0.825	1	45.615	3399.95	170.00	A
200.00-180.00			B	0.498	1.903	0.697	0.825	1	36.283			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.325	2.232	0.624	0.825	1	21.202			
T9	1163.60	2680.09	A	0.735	1.782	0.846	0.825	1	64.993	4611.57	230.58	A
180.00-160.00		TA	B	0.585	1.814	0.745	0.825	1	45.589			
		2076.41	C	0.372	2.123	0.64	0.825	1	24.891			
T10	1257.28	2108.89	A	0.736	1.782	0.846	0.825	1	65.075	4455.61	222.78	A
160.00-140.00			B	0.6	1.804	0.754	0.825	1	47.340			
			C	0.374	2.118	0.641	0.825	1	25.091			
T11	1286.20	2108.89	A	0.769	1.796	0.871	0.825	1	70.037	4638.57	231.93	A
140.00-120.00			B	0.6	1.804	0.754	0.825	1	47.340			
			C	0.382	2.1	0.645	0.825	1	25.785			
T12	1303.08	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	4584.84	229.24	A
120.00-100.00			B	0.61	1.798	0.76	0.825	1	48.483			
			C	0.382	2.1	0.645	0.825	1	25.785			
T13	1312.26	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	4329.37	216.47	A
100.00-80.00			B	0.624	1.791	0.768	0.825	1	50.133			
			C	0.382	2.1	0.645	0.825	1	25.785			
T14	1318.20	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	4029.40	201.47	A
80.00-60.00			B	0.633	1.787	0.774	0.825	1	51.221			
			C	0.382	2.1	0.645	0.825	1	25.785			
T15	1328.10	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	3660.07	183.00	A
60.00-40.00			B	0.65	1.782	0.785	0.825	1	53.336			
			C	0.382	2.1	0.645	0.825	1	25.785			
T16	1331.40	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	3250.35	162.52	A
40.00-20.00			B	0.655	1.78	0.789	0.825	1	54.055			
			C	0.382	2.1	0.645	0.825	1	25.785			
T17	931.98	1610.88	A	0.754	1.789	0.86	0.825	1	49.985	2228.74	151.10	A
20.00-5.25			B	0.633	1.787	0.774	0.825	1	37.823			
			C	0.376	2.113	0.642	0.825	1	18.634			
T18 5.25-0.00	0.00	831.39	A	0.295	2.31	0.614	0.825	1	2.709	155.97	29.71	C
			B	0.295	2.31	0.614	0.825	1	2.709			
			C	0.295	2.31	0.614	0.825	1	2.709			
Sum Weight:	13209.97	35006.73								53687.74		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	11.90	388.33	A	0.14	2.807	0.58	0.8	1	3.603	656.67	38.63	C
347.00-330.00			B	0.14	2.807	0.58	0.8	1	3.603			
			C	0.2	2.597	0.59	0.8	1	5.216			
T1	17.40	796.69	A	0.184	2.65	0.587	0.8	1	5.608	711.98	71.20	A
330.00-320.00			B	0.155	2.753	0.582	0.8	1	4.685			
			C	0.17	2.7	0.585	0.8	1	5.148			
T2	84.94	1474.41	A	0.247	2.446	0.601	0.8	1	15.417	1782.36	89.12	A
320.00-300.00			B	0.158	2.744	0.583	0.8	1	9.529			
			C	0.158	2.741	0.583	0.8	1	9.583			
T3	156.80	1474.41	A	0.284	2.338	0.611	0.8	1	18.035	1955.71	97.79	A
300.00-280.00			B	0.189	2.634	0.588	0.8	1	11.518			
			C	0.215	2.547	0.594	0.8	1	13.231			
T4	189.90	1474.41	A	0.298	2.3	0.615	0.8	1	19.050	1991.13	99.56	A
280.00-260.00			B	0.215	2.547	0.594	0.8	1	13.228			
			C	0.246	2.449	0.601	0.8	1	15.340			
T5	213.00	1474.41	A	0.31	2.27	0.619	0.8	1	19.898	2007.81	100.39	A
260.00-240.00			B	0.221	2.529	0.595	0.8	1	13.611			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.269	2.382	0.607	0.8	1	16.942			
T6	250.80	1474.41	A	0.365	2.137	0.638	0.8	1	24.189	2243.18	112.16	A
240.00-220.00			B	0.221	2.529	0.595	0.8	1	13.611			
			C	0.269	2.382	0.607	0.8	1	16.942			
T7	349.43	1898.78	A	0.512	1.884	0.704	0.8	1	37.578	2994.45	149.72	A
220.00-200.00			B	0.238	2.474	0.599	0.8	1	14.845			
			C	0.291	2.319	0.613	0.8	1	18.607			
T8	703.70	2589.89	A	0.586	1.814	0.745	0.8	1	45.615	3399.95	170.00	A
200.00-180.00			B	0.498	1.903	0.697	0.8	1	36.283			
			C	0.325	2.232	0.624	0.8	1	21.202			
T9	1163.60	2680.09	A	0.735	1.782	0.846	0.8	1	64.993	4611.57	230.58	A
180.00-160.00		TA	B	0.585	1.814	0.745	0.8	1	45.589			
		2076.41	C	0.372	2.123	0.64	0.8	1	24.891			
T10	1257.28	2108.89	A	0.736	1.782	0.846	0.8	1	65.075	4455.61	222.78	A
160.00-140.00			B	0.6	1.804	0.754	0.8	1	47.340			
			C	0.374	2.118	0.641	0.8	1	25.091			
T11	1286.20	2108.89	A	0.769	1.796	0.871	0.8	1	70.037	4638.57	231.93	A
140.00-120.00			B	0.6	1.804	0.754	0.8	1	47.340			
			C	0.382	2.1	0.645	0.8	1	25.785			
T12	1303.08	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	4584.84	229.24	A
120.00-100.00			B	0.61	1.798	0.76	0.8	1	48.483			
			C	0.382	2.1	0.645	0.8	1	25.785			
T13	1312.26	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	4329.37	216.47	A
100.00-80.00			B	0.624	1.791	0.768	0.8	1	50.133			
			C	0.382	2.1	0.645	0.8	1	25.785			
T14	1318.20	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	4029.40	201.47	A
80.00-60.00			B	0.633	1.787	0.774	0.8	1	51.221			
			C	0.382	2.1	0.645	0.8	1	25.785			
T15	1328.10	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	3660.07	183.00	A
60.00-40.00			B	0.65	1.782	0.785	0.8	1	53.336			
			C	0.382	2.1	0.645	0.8	1	25.785			
T16	1331.40	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	3250.35	162.52	A
40.00-20.00			B	0.655	1.78	0.789	0.8	1	54.055			
			C	0.382	2.1	0.645	0.8	1	25.785			
T17	931.98	1610.88	A	0.754	1.789	0.86	0.8	1	49.985	2228.74	151.10	A
20.00-5.25			B	0.633	1.787	0.774	0.8	1	37.823			
			C	0.376	2.113	0.642	0.8	1	18.634			
T18 5.25-0.00	0.00	831.39	A	0.295	2.31	0.614	0.8	1	2.698	155.35	29.59	C
			B	0.295	2.31	0.614	0.8	1	2.698			
			C	0.295	2.31	0.614	0.8	1	2.698			
Sum Weight:	13209.97	35006.73								53687.12		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	11.90	388.33	A	0.14	2.807	0.58	0.85	1	3.603	656.67	38.63	C
347.00-330.00			B	0.14	2.807	0.58	0.85	1	3.603			
			C	0.2	2.597	0.59	0.85	1	5.216			
T1	17.40	796.69	A	0.184	2.65	0.587	0.85	1	5.608	711.98	71.20	A
330.00-320.00			B	0.155	2.753	0.582	0.85	1	4.685			
			C	0.17	2.7	0.585	0.85	1	5.148			
T2	84.94	1474.41	A	0.247	2.446	0.601	0.85	1	15.417	1782.36	89.12	A
320.00-300.00			B	0.158	2.744	0.583	0.85	1	9.529			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.158	2.741	0.583	0.85	1	9.583			
T3	156.80	1474.41	A	0.284	2.338	0.611	0.85	1	18.035	1955.71	97.79	A
300.00-280.00			B	0.189	2.634	0.588	0.85	1	11.518			
			C	0.215	2.547	0.594	0.85	1	13.231			
T4	189.90	1474.41	A	0.298	2.3	0.615	0.85	1	19.050	1991.13	99.56	A
280.00-260.00			B	0.215	2.547	0.594	0.85	1	13.228			
			C	0.246	2.449	0.601	0.85	1	15.340			
T5	213.00	1474.41	A	0.31	2.27	0.619	0.85	1	19.898	2007.81	100.39	A
260.00-240.00			B	0.221	2.529	0.595	0.85	1	13.611			
			C	0.269	2.382	0.607	0.85	1	16.942			
T6	250.80	1474.41	A	0.365	2.137	0.638	0.85	1	24.189	2243.18	112.16	A
240.00-220.00			B	0.221	2.529	0.595	0.85	1	13.611			
			C	0.269	2.382	0.607	0.85	1	16.942			
T7	349.43	1898.78	A	0.512	1.884	0.704	0.85	1	37.578	2994.45	149.72	A
220.00-200.00			B	0.238	2.474	0.599	0.85	1	14.845			
			C	0.291	2.319	0.613	0.85	1	18.607			
T8	703.70	2589.89	A	0.586	1.814	0.745	0.85	1	45.615	3399.95	170.00	A
200.00-180.00			B	0.498	1.903	0.697	0.85	1	36.283			
			C	0.325	2.232	0.624	0.85	1	21.202			
T9	1163.60	2680.09	A	0.735	1.782	0.846	0.85	1	64.993	4611.57	230.58	A
180.00-160.00		TA	B	0.585	1.814	0.745	0.85	1	45.589			
		2076.41	C	0.372	2.123	0.64	0.85	1	24.891			
T10	1257.28	2108.89	A	0.736	1.782	0.846	0.85	1	65.075	4455.61	222.78	A
160.00-140.00			B	0.6	1.804	0.754	0.85	1	47.340			
			C	0.374	2.118	0.641	0.85	1	25.091			
T11	1286.20	2108.89	A	0.769	1.796	0.871	0.85	1	70.037	4638.57	231.93	A
140.00-120.00			B	0.6	1.804	0.754	0.85	1	47.340			
			C	0.382	2.1	0.645	0.85	1	25.785			
T12	1303.08	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	4584.84	229.24	A
120.00-100.00			B	0.61	1.798	0.76	0.85	1	48.483			
			C	0.382	2.1	0.645	0.85	1	25.785			
T13	1312.26	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	4329.37	216.47	A
100.00-80.00			B	0.624	1.791	0.768	0.85	1	50.133			
			C	0.382	2.1	0.645	0.85	1	25.785			
T14	1318.20	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	4029.40	201.47	A
80.00-60.00			B	0.633	1.787	0.774	0.85	1	51.221			
			C	0.382	2.1	0.645	0.85	1	25.785			
T15	1328.10	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	3660.07	183.00	A
60.00-40.00			B	0.65	1.782	0.785	0.85	1	53.336			
			C	0.382	2.1	0.645	0.85	1	25.785			
T16	1331.40	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	3250.35	162.52	A
40.00-20.00			B	0.655	1.78	0.789	0.85	1	54.055			
			C	0.382	2.1	0.645	0.85	1	25.785			
T17	931.98	1610.88	A	0.754	1.789	0.86	0.85	1	49.985	2228.74	151.10	A
20.00-5.25			B	0.633	1.787	0.774	0.85	1	37.823			
			C	0.376	2.113	0.642	0.85	1	18.634			
T18 5.25-0.00	0.00	831.39	A	0.295	2.31	0.614	0.85	1	2.720	156.59	29.83	C
			B	0.295	2.31	0.614	0.85	1	2.720			
			C	0.295	2.31	0.614	0.85	1	2.720			
Sum Weight:	13209.97	35006.73								53688.37		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	27.48	580.27	A	0.31	2.268	0.619	1	1	8.783	941.78	55.40	C
347.00-330.00			B	0.31	2.268	0.619	1	1	8.783			
			C	0.425	2.017	0.662	1	1	12.843			
T1	41.71	999.37	A	0.312	2.263	0.62	1	1	10.207	830.10	83.01	A
330.00-320.00			B	0.274	2.367	0.608	1	1	8.791			
			C	0.3	2.296	0.616	1	1	9.733			
T2	214.72	1839.07	A	0.404	2.055	0.653	1	1	28.357	2066.19	103.31	A
320.00-300.00			B	0.284	2.339	0.611	1	1	18.870			
			C	0.278	2.356	0.609	1	1	17.867			
T3	412.21	1839.07	A	0.464	1.952	0.68	1	1	33.980	2306.93	115.35	A
300.00-280.00			B	0.329	2.223	0.625	1	1	22.370			
			C	0.355	2.16	0.634	1	1	25.782			
T4	511.19	1839.07	A	0.496	1.905	0.695	1	1	37.542	2437.49	121.87	A
280.00-260.00			B	0.365	2.137	0.638	1	1	25.246			
			C	0.409	2.046	0.655	1	1	31.311			
T5	578.12	1839.07	A	0.513	1.884	0.704	1	1	39.215	2462.71	123.14	A
260.00-240.00			B	0.373	2.119	0.641	1	1	25.932			
			C	0.443	1.985	0.67	1	1	34.199			
T6	677.93	1839.07	A	0.581	1.817	0.742	1	1	47.744	2824.34	141.22	A
240.00-220.00			B	0.373	2.119	0.641	1	1	25.932			
			C	0.443	1.985	0.67	1	1	34.199			
T7	935.22	2299.82	A	0.748	1.787	0.855	1	1	71.279	4039.40	201.97	A
220.00-200.00			B	0.389	2.086	0.647	1	1	27.347			
			C	0.467	1.946	0.681	1	1	36.488			
T8	1797.59	3047.28	A	0.834	1.845	0.925	1	1	84.207	4789.37	239.47	A
200.00-180.00			B	0.713	1.777	0.829	1	1	67.440			
			C	0.505	1.893	0.7	1	1	40.203			
T9	2844.83	3155.80	A	1	2.1	1	1	1	107.194	6344.94*	317.25	A
180.00-160.00		TA	B	0.814	1.827	0.908	1	1	81.931			
		2623.13	C	0.568	1.827	0.734	1	1	46.643			
T10	3062.78	2518.97	A	1	2.1	1	1	1	108.231	6122.05*	306.10	A
160.00-140.00			B	0.838	1.849	0.928	1	1	85.508			
			C	0.588	1.812	0.746	1	1	48.830			
T11	3139.74	2518.97	A	1	2.1	1	1	1	112.941	5876.79*	293.84	A
140.00-120.00			B	0.838	1.849	0.928	1	1	85.508			
			C	0.608	1.799	0.759	1	1	51.147			
T12	3183.57	2518.97	A	1	2.1	1	1	1	114.988	5602.88*	280.14	A
120.00-100.00			B	0.854	1.866	0.942	1	1	87.844			
			C	0.608	1.799	0.759	1	1	51.147			
T13	3209.47	2518.97	A	1	2.1	1	1	1	114.988	5290.68*	264.53	A
100.00-80.00			B	0.878	1.894	0.963	1	1	91.263			
			C	0.608	1.799	0.759	1	1	51.147			
T14	3226.22	2518.97	A	1	2.1	1	1	1	114.988	4924.10*	246.21	A
80.00-60.00			B	0.893	1.914	0.976	1	1	93.546			
			C	0.608	1.799	0.759	1	1	51.147			
T15	3254.91	2518.97	A	1	2.1	1	1	1	114.988	4472.77*	223.64	A
60.00-40.00			B	0.917	1.95	0.999	1	1	97.430			
			C	0.608	1.799	0.759	1	1	51.147			
T16	3264.47	2518.97	A	1	2.1	1	1	1	114.988	3972.08*	198.60	A
40.00-20.00			B	0.926	1.963	1	1	1	98.350			
			C	0.608	1.799	0.759	1	1	51.147			
T17	2285.13	1928.08	A	1	2.1	1	1	1	81.651	2929.41*	198.60	A
20.00-5.25			B	0.895	1.917	0.978	1	1	69.213			
			C	0.598	1.805	0.752	1	1	36.771			
T18 5.25-0.00	0.00	968.73	A	0.455	1.965	0.676	1	1	4.739	174.04	33.15	C
			B	0.455	1.965	0.676	1	1	4.739			
			C	0.455	1.965	0.676	1	1	4.739			
Sum Weight:	32667.28	42430.56			*2A_g limit					68408.03		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	27.48	580.27	A	0.31	2.268	0.619	0.825	1	8.783	941.78	55.40	C
347.00-330.00			B	0.31	2.268	0.619	0.825	1	8.783			
			C	0.425	2.017	0.662	0.825	1	12.843			
T1	41.71	999.37	A	0.312	2.263	0.62	0.825	1	10.207	830.10	83.01	A
330.00-320.00			B	0.274	2.367	0.608	0.825	1	8.791			
			C	0.3	2.296	0.616	0.825	1	9.733			
T2	214.72	1839.07	A	0.404	2.055	0.653	0.825	1	28.104	2047.70	102.38	A
320.00-300.00			B	0.284	2.339	0.611	0.825	1	18.616			
			C	0.278	2.356	0.609	0.825	1	17.867			
T3	412.21	1839.07	A	0.464	1.952	0.68	0.825	1	33.557	2278.22	113.91	A
300.00-280.00			B	0.329	2.223	0.625	0.825	1	22.032			
			C	0.355	2.16	0.634	0.825	1	24.801			
T4	511.19	1839.07	A	0.496	1.905	0.695	0.825	1	36.866	2393.56	119.68	A
280.00-260.00			B	0.365	2.137	0.638	0.825	1	24.907			
			C	0.409	2.046	0.655	0.825	1	29.777			
T5	578.12	1839.07	A	0.513	1.884	0.704	0.825	1	38.538	2420.22	121.01	A
260.00-240.00			B	0.373	2.119	0.641	0.825	1	25.593			
			C	0.443	1.985	0.67	0.825	1	32.665			
T6	677.93	1839.07	A	0.581	1.817	0.742	0.825	1	46.163	2730.83	136.54	A
240.00-220.00			B	0.373	2.119	0.641	0.825	1	25.593			
			C	0.443	1.985	0.67	0.825	1	32.665			
T7	935.22	2299.82	A	0.748	1.787	0.855	0.825	1	66.985	3796.10	189.80	A
220.00-200.00			B	0.389	2.086	0.647	0.825	1	27.008			
			C	0.467	1.946	0.681	0.825	1	34.954			
T8	1797.59	3047.28	A	0.834	1.845	0.925	0.825	1	79.009	4493.76	224.69	A
200.00-180.00			B	0.713	1.777	0.829	0.825	1	62.652			
			C	0.505	1.893	0.7	0.825	1	38.669			
T9	2844.83	3155.80	A	1	2.1	1	0.825	1	99.284	6225.40	311.27	A
180.00-160.00		TA	B	0.814	1.827	0.908	0.825	1	75.515			
		2623.13	C	0.568	1.827	0.734	0.825	1	45.109			
T10	3062.78	2518.97	A	1	2.1	1	0.825	1	100.321	6069.42	303.47	A
160.00-140.00			B	0.838	1.849	0.928	0.825	1	78.549			
			C	0.588	1.812	0.746	0.825	1	47.296			
T11	3139.74	2518.97	A	1	2.1	1	0.825	1	105.031	5876.79*	293.84	A
140.00-120.00			B	0.838	1.849	0.928	0.825	1	78.549			
			C	0.608	1.799	0.759	0.825	1	49.613			
T12	3183.57	2518.97	A	1	2.1	1	0.825	1	107.078	5602.88*	280.14	A
120.00-100.00			B	0.854	1.866	0.942	0.825	1	80.886			
			C	0.608	1.799	0.759	0.825	1	49.613			
T13	3209.47	2518.97	A	1	2.1	1	0.825	1	107.078	5290.68*	264.53	A
100.00-80.00			B	0.878	1.894	0.963	0.825	1	84.305			
			C	0.608	1.799	0.759	0.825	1	49.613			
T14	3226.22	2518.97	A	1	2.1	1	0.825	1	107.078	4924.10*	246.21	A
80.00-60.00			B	0.893	1.914	0.976	0.825	1	86.587			
			C	0.608	1.799	0.759	0.825	1	49.613			
T15	3254.91	2518.97	A	1	2.1	1	0.825	1	107.078	4472.77*	223.64	A
60.00-40.00			B	0.917	1.95	0.999	0.825	1	90.471			
			C	0.608	1.799	0.759	0.825	1	49.613			
T16	3264.47	2518.97	A	1	2.1	1	0.825	1	107.078	3972.08*	198.60	A
40.00-20.00			B	0.926	1.963	1	0.825	1	91.392			
			C	0.608	1.799	0.759	0.825	1	49.613			
T17	2285.13	1928.08	A	1	2.1	1	0.825	1	76.114	2929.41*	198.60	A
20.00-5.25			B	0.895	1.917	0.978	0.825	1	64.342			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.598	1.805	0.752	0.825	1	35.698			
T18 5.25-0.00	0.00	968.73	A	0.455	1.965	0.676	0.825	1	4.663	171.25	32.62	C
			B	0.455	1.965	0.676	0.825	1	4.663			
			C	0.455	1.965	0.676	0.825	1	4.663			
Sum Weight:	32667.28	42430.56			*2A_g limit					67467.02		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	27.48	580.27	A	0.31	2.268	0.619	0.8	1	8.783	941.78	55.40	C
347.00-330.00			B	0.31	2.268	0.619	0.8	1	8.783			
			C	0.425	2.017	0.662	0.8	1	12.843			
T1	41.71	999.37	A	0.312	2.263	0.62	0.8	1	10.207	830.10	83.01	A
330.00-320.00			B	0.274	2.367	0.608	0.8	1	8.791			
			C	0.3	2.296	0.616	0.8	1	9.733			
T2	214.72	1839.07	A	0.404	2.055	0.653	0.8	1	28.067	2045.06	102.25	A
320.00-300.00			B	0.284	2.339	0.611	0.8	1	18.580			
			C	0.278	2.356	0.609	0.8	1	17.867			
T3	412.21	1839.07	A	0.464	1.952	0.68	0.8	1	33.497	2274.12	113.71	A
300.00-280.00			B	0.329	2.223	0.625	0.8	1	21.983			
			C	0.355	2.16	0.634	0.8	1	24.660			
T4	511.19	1839.07	A	0.496	1.905	0.695	0.8	1	36.769	2387.28	119.36	A
280.00-260.00			B	0.365	2.137	0.638	0.8	1	24.859			
			C	0.409	2.046	0.655	0.8	1	29.558			
T5	578.12	1839.07	A	0.513	1.884	0.704	0.8	1	38.442	2414.15	120.71	A
260.00-240.00			B	0.373	2.119	0.641	0.8	1	25.545			
			C	0.443	1.985	0.67	0.8	1	32.446			
T6	677.93	1839.07	A	0.581	1.817	0.742	0.8	1	45.937	2717.47	135.87	A
240.00-220.00			B	0.373	2.119	0.641	0.8	1	25.545			
			C	0.443	1.985	0.67	0.8	1	32.446			
T7	935.22	2299.82	A	0.748	1.787	0.855	0.8	1	66.372	3761.34	188.07	A
220.00-200.00			B	0.389	2.086	0.647	0.8	1	26.960			
			C	0.467	1.946	0.681	0.8	1	34.735			
T8	1797.59	3047.28	A	0.834	1.845	0.925	0.8	1	78.267	4451.53	222.58	A
200.00-180.00			B	0.713	1.777	0.829	0.8	1	61.967			
			C	0.505	1.893	0.7	0.8	1	38.450			
T9	2844.83	3155.80	A	1	2.1	1	0.8	1	98.154	6154.55	307.73	A
180.00-160.00		TA	B	0.814	1.827	0.908	0.8	1	74.599			
		2623.13	C	0.568	1.827	0.734	0.8	1	44.890			
T10	3062.78	2518.97	A	1	2.1	1	0.8	1	99.191	6001.05	300.05	A
160.00-140.00			B	0.838	1.849	0.928	0.8	1	77.555			
			C	0.588	1.812	0.746	0.8	1	47.077			
T11	3139.74	2518.97	A	1	2.1	1	0.8	1	103.901	5876.79*	293.84	A
140.00-120.00			B	0.838	1.849	0.928	0.8	1	77.555			
			C	0.608	1.799	0.759	0.8	1	49.394			
T12	3183.57	2518.97	A	1	2.1	1	0.8	1	105.948	5602.88*	280.14	A
120.00-100.00			B	0.854	1.866	0.942	0.8	1	79.891			
			C	0.608	1.799	0.759	0.8	1	49.394			
T13	3209.47	2518.97	A	1	2.1	1	0.8	1	105.948	5290.68*	264.53	A
100.00-80.00			B	0.878	1.894	0.963	0.8	1	83.310			
			C	0.608	1.799	0.759	0.8	1	49.394			
T14	3226.22	2518.97	A	1	2.1	1	0.8	1	105.948	4924.10*	246.21	A

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
80.00-60.00			B	0.893	1.914	0.976	0.8	1	85.593			
			C	0.608	1.799	0.759	0.8	1	49.394			
T15	3254.91	2518.97	A	1	2.1	1	0.8	1	105.948	4472.77*	223.64	A
60.00-40.00			B	0.917	1.95	0.999	0.8	1	89.477			
			C	0.608	1.799	0.759	0.8	1	49.394			
T16	3264.47	2518.97	A	1	2.1	1	0.8	1	105.948	3972.08*	198.60	A
40.00-20.00			B	0.926	1.963	1	0.8	1	90.398			
			C	0.608	1.799	0.759	0.8	1	49.394			
T17	2285.13	1928.08	A	1	2.1	1	0.8	1	75.323	2929.41*	198.60	A
20.00-5.25			B	0.895	1.917	0.978	0.8	1	63.646			
			C	0.598	1.805	0.752	0.8	1	35.544			
T18 5.25-0.00	0.00	968.73	A	0.455	1.965	0.676	0.8	1	4.652	170.86	32.54	C
			B	0.455	1.965	0.676	0.8	1	4.652			
			C	0.455	1.965	0.676	0.8	1	4.652			
Sum Weight:	32667.28	42430.56			*$2A_g$ limit					67217.96		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	27.48	580.27	A	0.31	2.268	0.619	0.85	1	8.783	941.78	55.40	C
347.00-330.00			B	0.31	2.268	0.619	0.85	1	8.783			
			C	0.425	2.017	0.662	0.85	1	12.843			
T1	41.71	999.37	A	0.312	2.263	0.62	0.85	1	10.207	830.10	83.01	A
330.00-320.00			B	0.274	2.367	0.608	0.85	1	8.791			
			C	0.3	2.296	0.616	0.85	1	9.733			
T2	214.72	1839.07	A	0.404	2.055	0.653	0.85	1	28.140	2050.34	102.52	A
320.00-300.00			B	0.284	2.339	0.611	0.85	1	18.652			
			C	0.278	2.356	0.609	0.85	1	17.867			
T3	412.21	1839.07	A	0.464	1.952	0.68	0.85	1	33.618	2282.32	114.12	A
300.00-280.00			B	0.329	2.223	0.625	0.85	1	22.080			
			C	0.355	2.16	0.634	0.85	1	24.941			
T4	511.19	1839.07	A	0.496	1.905	0.695	0.85	1	36.962	2399.83	119.99	A
280.00-260.00			B	0.365	2.137	0.638	0.85	1	24.956			
			C	0.409	2.046	0.655	0.85	1	29.996			
T5	578.12	1839.07	A	0.513	1.884	0.704	0.85	1	38.635	2426.29	121.31	A
260.00-240.00			B	0.373	2.119	0.641	0.85	1	25.642			
			C	0.443	1.985	0.67	0.85	1	32.884			
T6	677.93	1839.07	A	0.581	1.817	0.742	0.85	1	46.389	2744.18	137.21	A
240.00-220.00			B	0.373	2.119	0.641	0.85	1	25.642			
			C	0.443	1.985	0.67	0.85	1	32.884			
T7	935.22	2299.82	A	0.748	1.787	0.855	0.85	1	67.599	3830.85	191.54	A
220.00-200.00			B	0.389	2.086	0.647	0.85	1	27.057			
			C	0.467	1.946	0.681	0.85	1	35.173			
T8	1797.59	3047.28	A	0.834	1.845	0.925	0.85	1	79.752	4535.99	226.80	A
200.00-180.00			B	0.713	1.777	0.829	0.85	1	63.336			
			C	0.505	1.893	0.7	0.85	1	38.888			
T9	2844.83	3155.80	A	1	2.1	1	0.85	1	100.414	6296.25	314.81	A
180.00-160.00		TA	B	0.814	1.827	0.908	0.85	1	76.432			
		2623.13	C	0.568	1.827	0.734	0.85	1	45.328			
T10	3062.78	2518.97	A	1	2.1	1	0.85	1	101.451	6122.05*	306.10	A
160.00-140.00			B	0.838	1.849	0.928	0.85	1	79.543			
			C	0.588	1.812	0.746	0.85	1	47.515			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T11	3139.74	2518.97	A	1	2.1	1	0.85	1	106.161	5876.79*	293.84	A
140.00-120.00			B	0.838	1.849	0.928	0.85	1	79.543			
			C	0.608	1.799	0.759	0.85	1	49.832			
T12	3183.57	2518.97	A	1	2.1	1	0.85	1	108.208	5602.88*	280.14	A
120.00-100.00			B	0.854	1.866	0.942	0.85	1	81.880			
			C	0.608	1.799	0.759	0.85	1	49.832			
T13	3209.47	2518.97	A	1	2.1	1	0.85	1	108.208	5290.68*	264.53	A
100.00-80.00			B	0.878	1.894	0.963	0.85	1	85.299			
			C	0.608	1.799	0.759	0.85	1	49.832			
T14	3226.22	2518.97	A	1	2.1	1	0.85	1	108.208	4924.10*	246.21	A
80.00-60.00			B	0.893	1.914	0.976	0.85	1	87.581			
			C	0.608	1.799	0.759	0.85	1	49.832			
T15	3254.91	2518.97	A	1	2.1	1	0.85	1	108.208	4472.77*	223.64	A
60.00-40.00			B	0.917	1.95	0.999	0.85	1	91.465			
			C	0.608	1.799	0.759	0.85	1	49.832			
T16	3264.47	2518.97	A	1	2.1	1	0.85	1	108.208	3972.08*	198.60	A
40.00-20.00			B	0.926	1.963	1	0.85	1	92.386			
			C	0.608	1.799	0.759	0.85	1	49.832			
T17	2285.13	1928.08	A	1	2.1	1	0.85	1	76.905	2929.41*	198.60	A
20.00-5.25			B	0.895	1.917	0.978	0.85	1	65.038			
			C	0.598	1.805	0.752	0.85	1	35.851			
T18 5.25-0.00	0.00	968.73	A	0.455	1.965	0.676	0.85	1	4.674	171.65	32.70	C
			B	0.455	1.965	0.676	0.85	1	4.674			
			C	0.455	1.965	0.676	0.85	1	4.674			
Sum Weight:	32667.28	42430.56			*$2A_g$ limit					67700.34		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	11.90	388.33	A	0.14	2.807	0.58	1	1	3.603	181.90	10.70	C
347.00-330.00			B	0.14	2.807	0.58	1	1	3.603			
			C	0.2	2.597	0.59	1	1	5.216			
T1	17.40	796.69	A	0.184	2.65	0.587	1	1	5.608	197.22	19.72	A
330.00-320.00			B	0.155	2.753	0.582	1	1	4.685			
			C	0.17	2.7	0.585	1	1	5.148			
T2	84.94	1474.41	A	0.247	2.446	0.601	1	1	15.417	493.73	24.69	A
320.00-300.00			B	0.158	2.744	0.583	1	1	9.529			
			C	0.158	2.741	0.583	1	1	9.583			
T3	156.80	1474.41	A	0.284	2.338	0.611	1	1	18.035	541.75	27.09	A
300.00-280.00			B	0.189	2.634	0.588	1	1	11.518			
			C	0.215	2.547	0.594	1	1	13.231			
T4	189.90	1474.41	A	0.298	2.3	0.615	1	1	19.050	551.56	27.58	A
280.00-260.00			B	0.215	2.547	0.594	1	1	13.228			
			C	0.246	2.449	0.601	1	1	15.340			
T5	213.00	1474.41	A	0.31	2.27	0.619	1	1	19.898	556.18	27.81	A
260.00-240.00			B	0.221	2.529	0.595	1	1	13.611			
			C	0.269	2.382	0.607	1	1	16.942			
T6	250.80	1474.41	A	0.365	2.137	0.638	1	1	24.189	621.38	31.07	A
240.00-220.00			B	0.221	2.529	0.595	1	1	13.611			
			C	0.269	2.382	0.607	1	1	16.942			
T7	349.43	1898.78	A	0.512	1.884	0.704	1	1	37.578	829.49	41.47	A
220.00-200.00			B	0.238	2.474	0.599	1	1	14.845			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.291	2.319	0.613	1	1	18.607			
T8	703.70	2589.89	A	0.586	1.814	0.745	1	1	45.615	941.81	47.09	A
200.00-180.00			B	0.498	1.903	0.697	1	1	36.283			
			C	0.325	2.232	0.624	1	1	21.202			
T9	1163.60	2680.09	A	0.735	1.782	0.846	1	1	64.993	1277.44	63.87	A
180.00-160.00		TA	B	0.585	1.814	0.745	1	1	45.589			
		2076.41	C	0.372	2.123	0.64	1	1	24.891			
T10	1257.28	2108.89	A	0.736	1.782	0.846	1	1	65.075	1234.24	61.71	A
160.00-140.00			B	0.6	1.804	0.754	1	1	47.340			
			C	0.374	2.118	0.641	1	1	25.091			
T11	1286.20	2108.89	A	0.769	1.796	0.871	1	1	70.037	1284.92	64.25	A
140.00-120.00			B	0.6	1.804	0.754	1	1	47.340			
			C	0.382	2.1	0.645	1	1	25.785			
T12	1303.08	2108.89	A	0.783	1.804	0.883	1	1	72.278	1270.04	63.50	A
120.00-100.00			B	0.61	1.798	0.76	1	1	48.483			
			C	0.382	2.1	0.645	1	1	25.785			
T13	1312.26	2108.89	A	0.783	1.804	0.883	1	1	72.278	1199.27	59.96	A
100.00-80.00			B	0.624	1.791	0.768	1	1	50.133			
			C	0.382	2.1	0.645	1	1	25.785			
T14	1318.20	2108.89	A	0.783	1.804	0.883	1	1	72.278	1116.18	55.81	A
80.00-60.00			B	0.633	1.787	0.774	1	1	51.221			
			C	0.382	2.1	0.645	1	1	25.785			
T15	1328.10	2108.89	A	0.783	1.804	0.883	1	1	72.278	1013.87	50.69	A
60.00-40.00			B	0.65	1.782	0.785	1	1	53.336			
			C	0.382	2.1	0.645	1	1	25.785			
T16	1331.40	2108.89	A	0.783	1.804	0.883	1	1	72.278	900.37	45.02	A
40.00-20.00			B	0.655	1.78	0.789	1	1	54.055			
			C	0.382	2.1	0.645	1	1	25.785			
T17	931.98	1610.88	A	0.754	1.789	0.86	1	1	49.985	617.38	41.86	A
20.00-5.25			B	0.633	1.787	0.774	1	1	37.823			
			C	0.376	2.113	0.642	1	1	18.634			
T18 5.25-0.00	0.00	831.39	A	0.295	2.31	0.614	1	1	2.785	44.41	8.46	C
			B	0.295	2.31	0.614	1	1	2.785			
			C	0.295	2.31	0.614	1	1	2.785			
Sum Weight:	13209.97	35006.73								14873.16		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	11.90	388.33	A	0.14	2.807	0.58	0.825	1	3.603	181.90	10.70	C
347.00-330.00			B	0.14	2.807	0.58	0.825	1	3.603			
			C	0.2	2.597	0.59	0.825	1	5.216			
T1	17.40	796.69	A	0.184	2.65	0.587	0.825	1	5.608	197.22	19.72	A
330.00-320.00			B	0.155	2.753	0.582	0.825	1	4.685			
			C	0.17	2.7	0.585	0.825	1	5.148			
T2	84.94	1474.41	A	0.247	2.446	0.601	0.825	1	15.417	493.73	24.69	A
320.00-300.00			B	0.158	2.744	0.583	0.825	1	9.529			
			C	0.158	2.741	0.583	0.825	1	9.583			
T3	156.80	1474.41	A	0.284	2.338	0.611	0.825	1	18.035	541.75	27.09	A
300.00-280.00			B	0.189	2.634	0.588	0.825	1	11.518			
			C	0.215	2.547	0.594	0.825	1	13.231			
T4	189.90	1474.41	A	0.298	2.3	0.615	0.825	1	19.050	551.56	27.58	A
280.00-260.00			B	0.215	2.547	0.594	0.825	1	13.228			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.246	2.449	0.601	0.825	1	15.340			
T5	213.00	1474.41	A	0.31	2.27	0.619	0.825	1	19.898	556.18	27.81	A
260.00-240.00			B	0.221	2.529	0.595	0.825	1	13.611			
			C	0.269	2.382	0.607	0.825	1	16.942			
T6	250.80	1474.41	A	0.365	2.137	0.638	0.825	1	24.189	621.38	31.07	A
240.00-220.00			B	0.221	2.529	0.595	0.825	1	13.611			
			C	0.269	2.382	0.607	0.825	1	16.942			
T7	349.43	1898.78	A	0.512	1.884	0.704	0.825	1	37.578	829.49	41.47	A
220.00-200.00			B	0.238	2.474	0.599	0.825	1	14.845			
			C	0.291	2.319	0.613	0.825	1	18.607			
T8	703.70	2589.89	A	0.586	1.814	0.745	0.825	1	45.615	941.81	47.09	A
200.00-180.00			B	0.498	1.903	0.697	0.825	1	36.283			
			C	0.325	2.232	0.624	0.825	1	21.202			
T9	1163.60	2680.09	A	0.735	1.782	0.846	0.825	1	64.993	1277.44	63.87	A
180.00-160.00		TA	B	0.585	1.814	0.745	0.825	1	45.589			
		2076.41	C	0.372	2.123	0.64	0.825	1	24.891			
T10	1257.28	2108.89	A	0.736	1.782	0.846	0.825	1	65.075	1234.24	61.71	A
160.00-140.00			B	0.6	1.804	0.754	0.825	1	47.340			
			C	0.374	2.118	0.641	0.825	1	25.091			
T11	1286.20	2108.89	A	0.769	1.796	0.871	0.825	1	70.037	1284.92	64.25	A
140.00-120.00			B	0.6	1.804	0.754	0.825	1	47.340			
			C	0.382	2.1	0.645	0.825	1	25.785			
T12	1303.08	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	1270.04	63.50	A
120.00-100.00			B	0.61	1.798	0.76	0.825	1	48.483			
			C	0.382	2.1	0.645	0.825	1	25.785			
T13	1312.26	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	1199.27	59.96	A
100.00-80.00			B	0.624	1.791	0.768	0.825	1	50.133			
			C	0.382	2.1	0.645	0.825	1	25.785			
T14	1318.20	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	1116.18	55.81	A
80.00-60.00			B	0.633	1.787	0.774	0.825	1	51.221			
			C	0.382	2.1	0.645	0.825	1	25.785			
T15	1328.10	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	1013.87	50.69	A
60.00-40.00			B	0.65	1.782	0.785	0.825	1	53.336			
			C	0.382	2.1	0.645	0.825	1	25.785			
T16	1331.40	2108.89	A	0.783	1.804	0.883	0.825	1	72.278	900.37	45.02	A
40.00-20.00			B	0.655	1.78	0.789	0.825	1	54.055			
			C	0.382	2.1	0.645	0.825	1	25.785			
T17	931.98	1610.88	A	0.754	1.789	0.86	0.825	1	49.985	617.38	41.86	A
20.00-5.25			B	0.633	1.787	0.774	0.825	1	37.823			
			C	0.376	2.113	0.642	0.825	1	18.634			
T18 5.25-0.00	0.00	831.39	A	0.295	2.31	0.614	0.825	1	2.709	43.20	8.23	C
			B	0.295	2.31	0.614	0.825	1	2.709			
			C	0.295	2.31	0.614	0.825	1	2.709			
Sum Weight:	13209.97	35006.73								14871.95		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	11.90	388.33	A	0.14	2.807	0.58	0.8	1	3.603	181.90	10.70	C
347.00-330.00			B	0.14	2.807	0.58	0.8	1	3.603			
			C	0.2	2.597	0.59	0.8	1	5.216			
T1	17.40	796.69	A	0.184	2.65	0.587	0.8	1	5.608	197.22	19.72	A
330.00-320.00			B	0.155	2.753	0.582	0.8	1	4.685			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.17	2.7	0.585	0.8	1	5.148			
T2	84.94	1474.41	A	0.247	2.446	0.601	0.8	1	15.417	493.73	24.69	A
320.00-300.00			B	0.158	2.744	0.583	0.8	1	9.529			
			C	0.158	2.741	0.583	0.8	1	9.583			
T3	156.80	1474.41	A	0.284	2.338	0.611	0.8	1	18.035	541.75	27.09	A
300.00-280.00			B	0.189	2.634	0.588	0.8	1	11.518			
			C	0.215	2.547	0.594	0.8	1	13.231			
T4	189.90	1474.41	A	0.298	2.3	0.615	0.8	1	19.050	551.56	27.58	A
280.00-260.00			B	0.215	2.547	0.594	0.8	1	13.228			
			C	0.246	2.449	0.601	0.8	1	15.340			
T5	213.00	1474.41	A	0.31	2.27	0.619	0.8	1	19.898	556.18	27.81	A
260.00-240.00			B	0.221	2.529	0.595	0.8	1	13.611			
			C	0.269	2.382	0.607	0.8	1	16.942			
T6	250.80	1474.41	A	0.365	2.137	0.638	0.8	1	24.189	621.38	31.07	A
240.00-220.00			B	0.221	2.529	0.595	0.8	1	13.611			
			C	0.269	2.382	0.607	0.8	1	16.942			
T7	349.43	1898.78	A	0.512	1.884	0.704	0.8	1	37.578	829.49	41.47	A
220.00-200.00			B	0.238	2.474	0.599	0.8	1	14.845			
			C	0.291	2.319	0.613	0.8	1	18.607			
T8	703.70	2589.89	A	0.586	1.814	0.745	0.8	1	45.615	941.81	47.09	A
200.00-180.00			B	0.498	1.903	0.697	0.8	1	36.283			
			C	0.325	2.232	0.624	0.8	1	21.202			
T9	1163.60	2680.09	A	0.735	1.782	0.846	0.8	1	64.993	1277.44	63.87	A
180.00-160.00		TA	B	0.585	1.814	0.745	0.8	1	45.589			
		2076.41	C	0.372	2.123	0.64	0.8	1	24.891			
T10	1257.28	2108.89	A	0.736	1.782	0.846	0.8	1	65.075	1234.24	61.71	A
160.00-140.00			B	0.6	1.804	0.754	0.8	1	47.340			
			C	0.374	2.118	0.641	0.8	1	25.091			
T11	1286.20	2108.89	A	0.769	1.796	0.871	0.8	1	70.037	1284.92	64.25	A
140.00-120.00			B	0.6	1.804	0.754	0.8	1	47.340			
			C	0.382	2.1	0.645	0.8	1	25.785			
T12	1303.08	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	1270.04	63.50	A
120.00-100.00			B	0.61	1.798	0.76	0.8	1	48.483			
			C	0.382	2.1	0.645	0.8	1	25.785			
T13	1312.26	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	1199.27	59.96	A
100.00-80.00			B	0.624	1.791	0.768	0.8	1	50.133			
			C	0.382	2.1	0.645	0.8	1	25.785			
T14	1318.20	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	1116.18	55.81	A
80.00-60.00			B	0.633	1.787	0.774	0.8	1	51.221			
			C	0.382	2.1	0.645	0.8	1	25.785			
T15	1328.10	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	1013.87	50.69	A
60.00-40.00			B	0.65	1.782	0.785	0.8	1	53.336			
			C	0.382	2.1	0.645	0.8	1	25.785			
T16	1331.40	2108.89	A	0.783	1.804	0.883	0.8	1	72.278	900.37	45.02	A
40.00-20.00			B	0.655	1.78	0.789	0.8	1	54.055			
			C	0.382	2.1	0.645	0.8	1	25.785			
T17	931.98	1610.88	A	0.754	1.789	0.86	0.8	1	49.985	617.38	41.86	A
20.00-5.25			B	0.633	1.787	0.774	0.8	1	37.823			
			C	0.376	2.113	0.642	0.8	1	18.634			
T18 5.25-0.00	0.00	831.39	A	0.295	2.31	0.614	0.8	1	2.698	43.03	8.20	C
			B	0.295	2.31	0.614	0.8	1	2.698			
			C	0.295	2.31	0.614	0.8	1	2.698			
Sum Weight:	13209.97	35006.73								14871.78		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	11.90	388.33	A	0.14	2.807	0.58	0.85	1	3.603	181.90	10.70	C
347.00-330.00			B	0.14	2.807	0.58	0.85	1	3.603			
			C	0.2	2.597	0.59	0.85	1	5.216			
T1	17.40	796.69	A	0.184	2.65	0.587	0.85	1	5.608	197.22	19.72	A
330.00-320.00			B	0.155	2.753	0.582	0.85	1	4.685			
			C	0.17	2.7	0.585	0.85	1	5.148			
T2	84.94	1474.41	A	0.247	2.446	0.601	0.85	1	15.417	493.73	24.69	A
320.00-300.00			B	0.158	2.744	0.583	0.85	1	9.529			
			C	0.158	2.741	0.583	0.85	1	9.583			
T3	156.80	1474.41	A	0.284	2.338	0.611	0.85	1	18.035	541.75	27.09	A
300.00-280.00			B	0.189	2.634	0.588	0.85	1	11.518			
			C	0.215	2.547	0.594	0.85	1	13.231			
T4	189.90	1474.41	A	0.298	2.3	0.615	0.85	1	19.050	551.56	27.58	A
280.00-260.00			B	0.215	2.547	0.594	0.85	1	13.228			
			C	0.246	2.449	0.601	0.85	1	15.340			
T5	213.00	1474.41	A	0.31	2.27	0.619	0.85	1	19.898	556.18	27.81	A
260.00-240.00			B	0.221	2.529	0.595	0.85	1	13.611			
			C	0.269	2.382	0.607	0.85	1	16.942			
T6	250.80	1474.41	A	0.365	2.137	0.638	0.85	1	24.189	621.38	31.07	A
240.00-220.00			B	0.221	2.529	0.595	0.85	1	13.611			
			C	0.269	2.382	0.607	0.85	1	16.942			
T7	349.43	1898.78	A	0.512	1.884	0.704	0.85	1	37.578	829.49	41.47	A
220.00-200.00			B	0.238	2.474	0.599	0.85	1	14.845			
			C	0.291	2.319	0.613	0.85	1	18.607			
T8	703.70	2589.89	A	0.586	1.814	0.745	0.85	1	45.615	941.81	47.09	A
200.00-180.00			B	0.498	1.903	0.697	0.85	1	36.283			
			C	0.325	2.232	0.624	0.85	1	21.202			
T9	1163.60	2680.09	A	0.735	1.782	0.846	0.85	1	64.993	1277.44	63.87	A
180.00-160.00		TA	B	0.585	1.814	0.745	0.85	1	45.589			
		2076.41	C	0.372	2.123	0.64	0.85	1	24.891			
T10	1257.28	2108.89	A	0.736	1.782	0.846	0.85	1	65.075	1234.24	61.71	A
160.00-140.00			B	0.6	1.804	0.754	0.85	1	47.340			
			C	0.374	2.118	0.641	0.85	1	25.091			
T11	1286.20	2108.89	A	0.769	1.796	0.871	0.85	1	70.037	1284.92	64.25	A
140.00-120.00			B	0.6	1.804	0.754	0.85	1	47.340			
			C	0.382	2.1	0.645	0.85	1	25.785			
T12	1303.08	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	1270.04	63.50	A
120.00-100.00			B	0.61	1.798	0.76	0.85	1	48.483			
			C	0.382	2.1	0.645	0.85	1	25.785			
T13	1312.26	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	1199.27	59.96	A
100.00-80.00			B	0.624	1.791	0.768	0.85	1	50.133			
			C	0.382	2.1	0.645	0.85	1	25.785			
T14	1318.20	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	1116.18	55.81	A
80.00-60.00			B	0.633	1.787	0.774	0.85	1	51.221			
			C	0.382	2.1	0.645	0.85	1	25.785			
T15	1328.10	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	1013.87	50.69	A
60.00-40.00			B	0.65	1.782	0.785	0.85	1	53.336			
			C	0.382	2.1	0.645	0.85	1	25.785			
T16	1331.40	2108.89	A	0.783	1.804	0.883	0.85	1	72.278	900.37	45.02	A
40.00-20.00			B	0.655	1.78	0.789	0.85	1	54.055			
			C	0.382	2.1	0.645	0.85	1	25.785			
T17	931.98	1610.88	A	0.754	1.789	0.86	0.85	1	49.985	617.38	41.86	A
20.00-5.25			B	0.633	1.787	0.774	0.85	1	37.823			
			C	0.376	2.113	0.642	0.85	1	18.634			
T18 5.25-0.00	0.00	831.39	A	0.295	2.31	0.614	0.85	1	2.720	43.38	8.26	C
			B	0.295	2.31	0.614	0.85	1	2.720			
			C	0.295	2.31	0.614	0.85	1	2.720			
Sum Weight:	13209.97	35006.73								14872.12		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	17851.62			
Bracing Weight	17155.11			
Total Member Self-Weight	35006.73			
Guy Weight	7336.56			
Total Weight	67525.47			
Wind 0 deg - No Ice		-367.42	-86759.62	-23438.98
Wind 30 deg - No Ice		43137.44	-74764.88	-18864.58
Wind 45 deg - No Ice		61149.91	-61003.13	-15894.27
Wind 60 deg - No Ice		75005.48	-42966.92	-10794.20
Wind 90 deg - No Ice		86772.47	403.14	-296.83
Wind 120 deg - No Ice		75586.40	44135.53	13621.25
Wind 135 deg - No Ice		61886.31	62205.85	18229.58
Wind 150 deg - No Ice		44005.84	76035.93	21374.34
Wind 180 deg - No Ice		224.27	87303.23	22329.68
Wind 210 deg - No Ice		-43110.77	75104.03	17594.39
Wind 225 deg - No Ice		-60930.15	61217.40	14517.06
Wind 240 deg - No Ice		-74669.18	43261.40	10621.73
Wind 270 deg - No Ice		-86487.70	-25.69	1181.52
Wind 300 deg - No Ice		-75593.60	-43832.90	-13448.66
Wind 315 deg - No Ice		-61908.16	-61957.40	-19231.90
Wind 330 deg - No Ice		-43958.50	-75622.51	-22960.56
Member Ice	7423.82			
Guy Ice	4497.35			
Total Weight Ice	105177.98			
Wind 0 deg - Ice		-1318.18	-102657.93	-40268.44
Wind 30 deg - Ice		50309.75	-88141.89	-27364.50
Wind 45 deg - Ice		71696.10	-72227.50	-17458.67
Wind 60 deg - Ice		87216.75	-51639.74	-14811.24
Wind 90 deg - Ice		100879.78	1660.50	19768.95
Wind 120 deg - Ice		89271.90	50667.92	29430.29
Wind 135 deg - Ice		73360.14	70328.85	30443.03
Wind 150 deg - Ice		53629.61	86768.37	33809.63
Wind 180 deg - Ice		2733.73	100446.74	33251.89
Wind 210 deg - Ice		-50188.40	85771.01	12306.46
Wind 225 deg - Ice		-69989.64	69831.04	6533.52
Wind 240 deg - Ice		-86023.15	50392.82	4084.40
Wind 270 deg - Ice		-99164.02	-842.91	-8096.75
Wind 300 deg - Ice		-85430.75	-54562.36	-36683.63
Wind 315 deg - Ice		-69462.85	-74646.73	-38187.82
Wind 330 deg - Ice		-48898.45	-89681.60	-37633.47
Total Weight	67525.47			
Wind 0 deg - Service		-101.78	-24033.14	-6492.79
Wind 30 deg - Service		11949.43	-20710.49	-5225.64
Wind 45 deg - Service		16939.03	-16898.37	-4402.84
Wind 60 deg - Service		20777.14	-11902.19	-2990.08
Wind 90 deg - Service		24036.69	111.67	-82.22
Wind 120 deg - Service		20938.06	12225.91	3773.20
Wind 135 deg - Service		17143.02	17231.54	5049.74
Wind 150 deg - Service		12189.98	21062.58	5920.87
Wind 180 deg - Service		62.13	24183.72	6185.51
Wind 210 deg - Service		-11942.04	20804.44	4873.79
Wind 225 deg - Service		-16878.16	16957.73	4021.35
Wind 240 deg - Service		-20683.98	11983.77	2942.31
Wind 270 deg - Service		-23957.81	-7.12	327.29

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 300 deg - Service		-20940.05	-12142.08	-3725.39
Wind 315 deg - Service		-17149.07	-17162.71	-5327.40
Wind 330 deg - Service		-12176.87	-20948.06	-6360.27

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 45 deg - No Ice+Guy
5	Dead+Wind 60 deg - No Ice+Guy
6	Dead+Wind 90 deg - No Ice+Guy
7	Dead+Wind 120 deg - No Ice+Guy
8	Dead+Wind 135 deg - No Ice+Guy
9	Dead+Wind 150 deg - No Ice+Guy
10	Dead+Wind 180 deg - No Ice+Guy
11	Dead+Wind 210 deg - No Ice+Guy
12	Dead+Wind 225 deg - No Ice+Guy
13	Dead+Wind 240 deg - No Ice+Guy
14	Dead+Wind 270 deg - No Ice+Guy
15	Dead+Wind 300 deg - No Ice+Guy
16	Dead+Wind 315 deg - No Ice+Guy
17	Dead+Wind 330 deg - No Ice+Guy
18	Dead+Ice+Temp+Guy
19	Dead+Wind 0 deg+Ice+Temp+Guy
20	Dead+Wind 30 deg+Ice+Temp+Guy
21	Dead+Wind 45 deg+Ice+Temp+Guy
22	Dead+Wind 60 deg+Ice+Temp+Guy
23	Dead+Wind 90 deg+Ice+Temp+Guy
24	Dead+Wind 120 deg+Ice+Temp+Guy
25	Dead+Wind 135 deg+Ice+Temp+Guy
26	Dead+Wind 150 deg+Ice+Temp+Guy
27	Dead+Wind 180 deg+Ice+Temp+Guy
28	Dead+Wind 210 deg+Ice+Temp+Guy
29	Dead+Wind 225 deg+Ice+Temp+Guy
30	Dead+Wind 240 deg+Ice+Temp+Guy
31	Dead+Wind 270 deg+Ice+Temp+Guy
32	Dead+Wind 300 deg+Ice+Temp+Guy
33	Dead+Wind 315 deg+Ice+Temp+Guy
34	Dead+Wind 330 deg+Ice+Temp+Guy
35	Dead+Wind 0 deg - Service+Guy
36	Dead+Wind 30 deg - Service+Guy
37	Dead+Wind 45 deg - Service+Guy
38	Dead+Wind 60 deg - Service+Guy
39	Dead+Wind 90 deg - Service+Guy
40	Dead+Wind 120 deg - Service+Guy
41	Dead+Wind 135 deg - Service+Guy
42	Dead+Wind 150 deg - Service+Guy
43	Dead+Wind 180 deg - Service+Guy
44	Dead+Wind 210 deg - Service+Guy
45	Dead+Wind 225 deg - Service+Guy
46	Dead+Wind 240 deg - Service+Guy

Comb. No.	Description
47	Dead+Wind 270 deg - Service+Guy
48	Dead+Wind 300 deg - Service+Guy
49	Dead+Wind 315 deg - Service+Guy
50	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	347 - 330	Latticed Pole Leg	Max Tension	27	11002.64	292.04	419.30
			Max. Compression	24	-11997.20	0.00	0.00
			Max. Mx	30	3128.82	-525.61	425.94
			Max. My	20	-1136.81	289.37	-691.57
			Max. Vy	30	-1052.58	0.00	0.00
			Max. Vx	20	-1384.04	0.00	0.00
		Latticed Pole Diagonal	Max Tension	22	2191.80	0.00	0.00
			Max. Compression	19	-2277.41	0.00	0.00
			Max. Mx	32	30.15	-2.26	-0.09
			Max. My	20	-2146.15	0.43	2.55
			Max. Vy	32	2.32	-2.26	-0.09
			Max. Vx	20	1.74	0.00	0.00
		Latticed Pole Horizontal	Max Tension	27	266.75	0.00	0.00
			Max. Compression	2	-191.66	0.00	0.00
			Max. Mx	18	30.00	1.77	0.00
			Max. My	24	31.68	0.00	0.00
			Max. Vy	18	-2.83	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Latticed Pole Top Girt	Max Tension	13	162.40	0.00	0.00
			Max. Compression	5	-166.90	0.00	0.00
			Max. Mx	18	0.64	1.77	0.00
			Max. My	32	82.66	0.00	-0.00
			Max. Vy	18	-2.83	0.00	0.00
			Max. Vx	32	0.00	0.00	0.00
		Latticed Pole Bottom Girt	Max Tension	22	753.50	0.00	0.00
			Max. Compression	7	-644.73	0.00	0.00
			Max. Mx	18	76.75	1.77	0.00
			Max. My	33	-64.14	0.00	-0.00
			Max. Vy	18	-2.83	0.00	0.00
			Max. Vx	33	0.00	0.00	0.00
T1	330 - 320	Leg	Max Tension	22	5960.45	-83.81	238.50
			Max. Compression	32	-28242.87	-382.80	723.59
			Max. Mx	29	-5426.24	-1573.05	624.33
			Max. My	22	-26928.50	-1091.19	-1798.55
			Max. Vy	29	-3843.24	347.76	-174.82
			Max. Vx	19	-3931.99	14.86	366.54
		Diagonal	Max Tension	20	3319.39	0.00	0.00
			Max. Compression	20	-3266.48	0.00	0.00
			Max. Mx	33	2802.96	-12.63	-0.06
			Max. My	19	-3054.11	4.47	2.27
			Max. Vy	33	8.19	-12.63	-0.06
			Max. Vx	19	0.93	0.00	0.00
		Top Girt	Max Tension	19	6348.36	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	3853.59	11.22	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	33	5301.97	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Bottom Girt	Max Tension	24	851.02	0.00	0.00
			Max. Compression	22	-707.63	0.00	0.00
			Max. Mx	18	69.60	11.22	0.00
			Max. My	33	233.16	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Mid Girt	Max Tension	24	737.36	0.00	0.00
			Max. Compression	15	-17.61	0.00	0.00
			Max. Mx	18	447.17	11.22	0.00
			Max. My	33	608.38	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	26017.03		
			Top Tension	27	26622.17		
			Top Cable Vert	27	23178.79		
			Top Cable Norm	27	13095.16		
			Top Cable Tan	27	20.43		
			Bot Cable Vert	27	-21688.61		
			Bot Cable Norm	27	14369.74		
			Bot Cable Tan	27	20.43		
		Guy B	Bottom Tension	32	25729.02		
			Top Tension	32	26294.06		
			Top Cable Vert	32	22463.62		
			Top Cable Norm	32	13666.10		
			Top Cable Tan	32	33.64		
			Bot Cable Vert	32	-21021.43		
			Bot Cable Norm	32	14835.12		
			Bot Cable Tan	32	33.64		
		Guy C	Bottom Tension	22	25154.21		
			Top Tension	22	25692.66		
			Top Cable Vert	22	21638.87		
			Top Cable Norm	22	13851.78		
			Top Cable Tan	22	17.20		
			Bot Cable Vert	22	-20231.79		
			Bot Cable Norm	22	14946.86		
			Bot Cable Tan	22	17.20		
T2	320 - 300	Leg	Max Tension	24	3171.33	-161.75	6.78
			Max. Compression	23	-33000.79	442.31	772.24
			Max. Mx	32	-16124.79	1824.11	-727.89
			Max. My	32	-14935.24	-1426.74	-2135.29
			Max. Vy	32	2822.45	1808.69	-732.62
			Max. Vx	32	-3432.31	-845.44	-1277.42
		Diagonal	Max Tension	32	7069.99	0.00	0.00
			Max. Compression	32	-6030.53	0.00	0.00
			Max. Mx	33	1930.02	-10.51	-0.47
			Max. My	32	-5905.02	-7.90	-12.61
			Max. Vy	33	7.40	-10.51	-0.47
			Max. Vx	32	4.69	-7.90	-12.61
		Top Girt	Max Tension	22	643.11	0.00	0.00
			Max. Compression	22	-597.37	0.00	0.00
			Max. Mx	18	8.16	11.22	0.00
			Max. My	33	-292.42	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Bottom Girt	Max Tension	30	3999.05	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	1268.12	11.22	0.00
			Max. My	33	2886.38	0.00	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Mid Girt	Max Tension	26	874.54	0.00	0.00
			Max. Compression	21	-441.16	0.00	0.00
			Max. Mx	18	81.86	11.22	0.00
			Max. My	33	347.35	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	16233.12		
			Top Tension	27	16660.40		
			Top Cable Vert	27	14267.26		
			Top Cable Norm	27	8603.13		
			Top Cable Tan	27	9.91		
			Bot Cable Vert	27	-13085.95		
			Bot Cable Norm	27	9605.83		
			Bot Cable Tan	27	9.91		
		Guy B	Bottom Tension	33	16000.73		
			Top Tension	33	16396.37		
			Top Cable Vert	33	13712.83		
			Top Cable Norm	33	8987.75		
			Top Cable Tan	33	139.66		
			Bot Cable Vert	33	-12584.91		
			Bot Cable Norm	33	9879.01		
			Bot Cable Tan	33	219.97		
		Guy C	Bottom Tension	22	15650.30		
			Top Tension	22	16026.33		
			Top Cable Vert	22	13173.47		
			Top Cable Norm	22	9127.04		
			Top Cable Tan	22	7.50		
			Bot Cable Vert	22	-12065.37		
			Bot Cable Norm	22	9967.88		
			Bot Cable Tan	22	7.50		
T3	300 - 280	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	32	-39568.71	1021.89	-729.21
			Max. Mx	32	-9506.72	-2493.42	1270.84
			Max. My	33	-22504.02	-2225.44	-3252.46
			Max. Vy	32	-3979.05	-1498.96	779.00
			Max. Vx	33	-5065.29	-1337.85	-1986.45
		Diagonal	Max Tension	32	8469.03	0.00	0.00
			Max. Compression	32	-8244.50	0.00	0.00
			Max. Mx	33	3617.27	-8.67	1.48
			Max. My	32	-8217.72	-7.83	-19.88
			Max. Vy	33	6.76	-8.67	1.48
			Max. Vx	32	7.29	-7.83	-19.88
		Top Girt	Max Tension	32	954.30	0.00	0.00
			Max. Compression	21	-357.70	0.00	0.00
			Max. Mx	18	92.08	11.22	0.00
			Max. My	33	299.32	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Bottom Girt	Max Tension	22	1566.79	0.00	0.00
			Max. Compression	19	-1345.00	0.00	0.00
			Max. Mx	18	76.08	11.22	0.00
			Max. My	33	-280.32	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Mid Girt	Max Tension	24	292.36	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	91.23	11.22	0.00
			Max. My	33	237.76	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	33	-0.00	0.00	0.00
T4	280 - 260	Leg	Max Tension	32	5146.65	-288.84	-65.94
			Max. Compression	32	-57431.10	108.64	52.17
			Max. Mx	32	-53748.31	3278.02	346.00
			Max. My	33	-22515.44	2236.35	3239.53
			Max. Vy	32	4984.43	3268.47	343.31
			Max. Vx	33	-5235.65	2236.35	3239.53
		Diagonal	Max Tension	32	8332.28	0.00	0.00
			Max. Compression	32	-8982.73	0.00	0.00
			Max. Mx	34	3261.14	-9.21	-0.82
			Max. My	32	-8956.63	-6.41	-24.93
			Max. Vy	34	6.95	-9.21	-0.82
			Max. Vx	32	9.11	-6.41	-24.93
		Top Girt	Max Tension	19	1677.04	0.00	0.00
			Max. Compression	22	-1257.43	0.00	0.00
			Max. Mx	18	93.35	11.22	0.00
			Max. My	33	625.54	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Bottom Girt	Max Tension	30	1311.03	0.00	0.00
			Max. Compression	32	-836.55	0.00	0.00
			Max. Mx	18	153.03	11.22	0.00
			Max. My	33	469.30	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Mid Girt	Max Tension	19	8429.69	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	2774.86	11.22	0.00
			Max. My	33	5694.26	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	35065.51		
			Top Tension	27	35712.55		
			Top Cable Vert	27	29283.78		
			Top Cable Norm	27	20441.29		
			Top Cable Tan	27	15.81		
			Bot Cable Vert	27	-27779.60		
			Bot Cable Norm	27	21398.21		
			Bot Cable Tan	27	15.81		
		Guy B	Bottom Tension	33	34659.26		
			Top Tension	33	35253.86		
			Top Cable Vert	33	28048.38		
			Top Cable Norm	33	21356.77		
			Top Cable Tan	33	104.61		
			Bot Cable Vert	33	-26618.80		
			Bot Cable Norm	33	22195.40		
			Bot Cable Tan	33	260.55		
		Guy C	Bottom Tension	22	33782.06		
			Top Tension	22	34343.10		
			Top Cable Vert	22	26702.29		
			Top Cable Norm	22	21597.13		
			Top Cable Tan	22	10.50		
			Bot Cable Vert	22	-25311.03		
			Bot Cable Norm	22	22373.62		
			Bot Cable Tan	22	10.50		
T5	260 - 240	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	32	-53425.40	-3290.64	-245.08
			Max. Mx	32	-52800.21	-3293.62	-247.40
			Max. My	34	-39090.94	351.67	-2902.66
			Max. Vy	32	5301.61	-3290.64	-245.08
			Max. Vx	34	4662.62	354.81	-2902.15

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Diagonal	Max Tension	33	7291.95	0.00	0.00
			Max. Compression	33	-7448.32	0.00	0.00
			Max. Mx	32	-4494.58	-6.50	-6.98
			Max. My	33	-7429.21	-4.71	-17.56
			Max. Vy	32	5.98	-6.50	-6.98
			Max. Vx	33	6.43	-4.71	-17.56
		Top Girt	Max Tension	32	1152.50	0.00	0.00
			Max. Compression	13	-757.57	0.00	0.00
			Max. Mx	18	76.86	11.22	0.00
			Max. My	33	7.75	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Bottom Girt	Max Tension	13	582.92	0.00	0.00
			Max. Compression	16	-380.20	0.00	0.00
			Max. Mx	18	91.78	11.22	0.00
			Max. My	33	185.03	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Mid Girt	Max Tension	30	382.10	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	153.81	11.22	0.00
			Max. My	33	341.47	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T6	240 - 220	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-54922.06	153.13	-1.24
			Max. Mx	33	-44439.93	-2653.97	-47.16
			Max. My	33	-48286.27	775.46	-2384.64
			Max. Vy	33	4252.49	1600.95	111.66
			Max. Vx	19	-4577.52	-417.58	-1198.76
		Diagonal	Max Tension	19	6472.10	0.00	0.00
			Max. Compression	19	-6685.09	0.00	0.00
			Max. Mx	32	-3586.03	-5.49	-8.80
			Max. My	33	-6512.14	-5.25	-14.84
			Max. Vy	32	5.61	-5.49	-8.80
			Max. Vx	33	5.40	-5.25	-14.84
		Top Girt	Max Tension	33	469.79	0.00	0.00
			Max. Compression	13	-212.23	0.00	0.00
			Max. Mx	18	67.15	11.22	0.00
			Max. My	33	143.48	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Bottom Girt	Max Tension	27	854.00	0.00	0.00
			Max. Compression	24	-685.59	0.00	0.00
			Max. Mx	18	96.49	11.22	0.00
			Max. My	33	-88.77	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Mid Girt	Max Tension	30	410.01	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	160.74	11.22	0.00
			Max. My	33	360.44	0.00	-0.00
			Max. Vy	18	8.97	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T7	220 - 200	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-73436.73	1264.39	463.30
			Max. Mx	32	-16065.13	-3026.97	570.03
			Max. My	19	-33528.75	-764.46	-3806.69
			Max. Vy	24	4682.35	1752.49	108.03
			Max. Vx	19	-5985.76	-354.09	-2248.47
		Diagonal	Max Tension	32	8758.97	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	19	-9102.89	0.00	0.00
			Max. Mx	32	-1391.86	-7.67	-5.71
			Max. My	19	-9098.60	-1.22	-16.93
			Max. Vy	32	7.28	-7.67	-5.71
			Max. Vx	19	6.16	-5.05	-16.93
		Top Girt	Max Tension	24	1287.43	0.00	0.00
			Max. Compression	27	-774.61	0.00	0.00
			Max. Mx	18	89.84	16.39	0.00
			Max. My	33	535.19	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Bottom Girt	Max Tension	27	2051.30	0.00	0.00
			Max. Compression	24	-1909.63	0.00	0.00
			Max. Mx	18	122.59	16.39	0.00
			Max. My	33	-298.57	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Mid Girt	Max Tension	27	447.83	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	211.73	16.39	0.00
			Max. My	33	413.94	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T8	200 - 180	Leg	Max Tension	27	48283.93	-57.78	774.51
			Max. Compression	24	-160595.95	-1579.67	-1053.98
			Max. Mx	24	-78159.53	-4347.78	-136.02
			Max. My	19	-32100.79	1202.35	5243.50
			Max. Vy	24	6098.94	-4346.21	-138.70
			Max. Vx	19	-7500.46	1206.71	5243.32
		Diagonal	Max Tension	19	11046.21	0.00	0.00
			Max. Compression	19	-11697.47	0.00	0.00
			Max. Mx	26	6035.96	-15.91	1.79
			Max. My	32	-11456.74	-5.51	-21.00
			Max. Vy	26	12.34	-15.91	1.79
			Max. Vx	32	7.62	-5.51	-21.00
		Top Girt	Max Tension	24	3268.62	0.00	0.00
			Max. Compression	27	-2537.32	0.00	0.00
			Max. Mx	18	123.09	22.61	0.00
			Max. My	33	1045.72	0.00	-0.00
			Max. Vy	18	18.09	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Mid Girt	Max Tension	33	770.88	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	345.96	22.61	0.00
			Max. My	33	603.22	0.00	-0.00
			Max. Vy	18	18.09	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Top Guy Pull-Off	Max Tension	22	17450.37	0.00	0.00
			Max. Compression	19	-7848.52	0.00	0.00
			Max. Mx	18	3374.30	22.61	0.00
			Max. My	26	5281.05	0.00	-0.00
			Max. Vy	18	18.09	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T9	180 - 160	Leg	Max Tension	27	37384.79	107.56	-2204.10
			Max. Compression	24	-160601.66	1861.93	1547.14
			Max. Mx	31	17096.12	-2805.53	-80.26
			Max. My	27	31075.01	107.65	3327.30
			Max. Vy	31	4870.65	2061.14	-311.90
			Max. Vx	27	-5535.63	107.56	-2204.10
		Diagonal	Max Tension	33	7637.72	0.00	0.00
			Max. Compression	33	-8467.39	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	29	-3406.29	-24.91	-1.49
			Max. My	33	-8446.51	-2.73	-11.19
			Max. Vy	28	15.59	-24.91	-3.36
			Max. Vx	33	4.07	-2.73	-11.19
		Top Girt	Max Tension	27	5375.90	0.00	0.00
			Max. Compression	24	-4935.48	0.00	0.00
			Max. Mx	18	24.59	22.61	0.00
			Max. My	26	395.54	0.00	-0.00
			Max. Vy	18	18.09	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	19	2355.88	0.00	0.00
			Max. Compression	32	-1312.12	0.00	0.00
			Max. Mx	18	256.86	22.61	0.00
			Max. My	26	297.29	0.00	-0.00
			Max. Vy	18	18.09	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Mid Girt	Max Tension	33	598.93	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	294.38	22.61	0.00
			Max. My	26	492.00	0.00	-0.00
			Max. Vy	18	18.09	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Guy A	Bottom Tension	26	38678.55		
			Top Tension	26	39180.54		
			Top Cable Vert	26	27480.20		
			Top Cable Norm	26	27927.15		
			Top Cable Tan	26	166.16		
			Bot Cable Vert	26	-26306.63		
			Bot Cable Norm	26	28352.06		
			Bot Cable Tan	26	390.60		
		Guy B	Bottom Tension	33	37616.22		
			Top Tension	33	38061.12		
			Top Cable Vert	33	24982.14		
			Top Cable Norm	33	28714.76		
			Top Cable Tan	33	67.79		
			Bot Cable Vert	33	-23869.04		
			Bot Cable Norm	33	29072.50		
			Bot Cable Tan	33	195.92		
		Guy C	Bottom Tension	21	35827.42		
			Top Tension	21	36233.64		
			Top Cable Vert	21	22535.83		
			Top Cable Norm	21	28372.73		
			Top Cable Tan	21	40.01		
			Bot Cable Vert	21	-21480.70		
			Bot Cable Norm	21	28673.39		
			Bot Cable Tan	21	142.47		
		Bottom Guy Pull-Off	Max Tension	27	14211.20	0.00	0.00
			Max. Compression	24	-19641.19	0.00	0.00
			Max. Mx	18	-1595.14	22.61	0.00
			Max. My	26	-2613.40	0.00	-0.00
			Max. Vy	18	18.09	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Torque Arm Top	Max Tension	30	39673.33	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	26	36863.38	222.42	0.00
			Max. My	27	27628.21	0.00	0.35
			Max. Vy	26	-102.81	0.00	0.00
			Max. Vx	27	0.16	0.00	0.00
		Torque Arm Bottom	Max Tension	26	20487.65	0.00	0.00
			Max. Compression	26	-57974.85	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	26	-27377.42	234.76	0.00
			Max. My	33	1806.35	0.00	0.50
			Max. Vy	26	-102.89	0.00	0.00
			Max. Vx	33	-0.22	0.00	0.00
T10	160 - 140	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	29	-96667.52	41.72	51.06
			Max. Mx	23	-66873.07	1978.56	-375.25
			Max. My	19	-74546.06	-236.83	-2306.02
			Max. Vy	23	-3045.21	-1267.38	-342.86
			Max. Vx	19	3752.64	295.18	1555.68
		Diagonal	Max Tension	34	4911.42	0.00	0.00
			Max. Compression	34	-5536.78	0.00	0.00
			Max. Mx	30	572.88	-7.85	0.01
			Max. My	33	-5349.07	-3.71	-3.65
			Max. Vy	30	7.33	-7.85	0.01
			Max. Vx	33	1.33	-3.71	-3.65
		Top Girt	Max Tension	32	1911.20	0.00	0.00
			Max. Compression	19	-1489.83	0.00	0.00
			Max. Mx	18	237.53	16.39	0.00
			Max. My	26	510.58	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	19	882.70	0.00	0.00
			Max. Compression	32	-11.44	0.00	0.00
			Max. Mx	18	213.45	16.39	0.00
			Max. My	26	229.97	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Mid Girt	Max Tension	30	852.74	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	458.89	16.39	0.00
			Max. My	26	742.50	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T11	140 - 120	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	29	-97545.50	20.44	238.15
			Max. Mx	31	-86083.56	-1543.23	-266.90
			Max. My	27	-77874.67	-180.88	1684.08
			Max. Vy	31	-2229.06	-962.92	-187.35
			Max. Vx	27	2444.87	-109.14	1047.77
		Diagonal	Max Tension	14	2651.75	0.00	0.00
			Max. Compression	28	-3169.25	0.00	0.00
			Max. Mx	30	-455.51	-8.39	-0.24
			Max. My	15	-2809.02	-5.46	-1.47
			Max. Vy	30	7.53	-8.39	-0.24
			Max. Vx	15	0.54	0.00	0.00
		Top Girt	Max Tension	24	563.51	0.00	0.00
			Max. Compression	19	-11.84	0.00	0.00
			Max. Mx	18	251.58	16.39	0.00
			Max. My	13	303.88	0.00	0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
		Bottom Girt	Max Tension	27	1474.44	0.00	0.00
			Max. Compression	30	-585.49	0.00	0.00
			Max. Mx	18	218.70	16.39	0.00
			Max. My	14	277.98	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Mid Girt	Max Tension	19	999.27	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	470.85	16.39	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	14	512.37	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
T12	120 - 100	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-113526.04	-1321.32	-1905.25
			Max. Mx	23	-67642.85	-4491.80	975.35
			Max. My	27	-44842.10	-104.38	-4821.03
			Max. Vy	23	-6636.62	-4491.80	975.35
			Max. Vx	27	-7107.51	-104.76	-4820.62
		Diagonal	Max Tension	28	4167.74	0.00	0.00
			Max. Compression	28	-4950.04	0.00	0.00
			Max. Mx	27	82.90	-8.68	0.31
			Max. My	26	-1067.24	-2.73	2.88
			Max. Vy	27	7.63	-8.68	0.31
			Max. Vx	26	-1.04	-2.73	2.88
		Top Girt	Max Tension	30	1451.56	0.00	0.00
			Max. Compression	27	-860.07	0.00	0.00
			Max. Mx	18	257.79	16.39	0.00
			Max. My	14	236.46	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Bottom Girt	Max Tension	30	16577.73	0.00	0.00
			Max. Compression	10	-135.41	0.00	0.00
			Max. Mx	18	5500.08	16.39	0.00
			Max. My	13	4948.47	0.00	0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
		Mid Girt	Max Tension	26	859.71	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	531.65	16.39	0.00
			Max. My	14	585.69	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Guy A	Bottom Tension	28	38298.64		
			Top Tension	28	38612.94		
			Top Cable Vert	28	20038.00		
			Top Cable Norm	28	33006.57		
			Top Cable Tan	28	61.36		
			Bot Cable Vert	28	-19189.48		
			Bot Cable Norm	28	33143.50		
			Bot Cable Tan	28	240.74		
		Guy B	Bottom Tension	33	36697.30		
			Top Tension	33	36953.78		
			Top Cable Vert	33	16400.87		
			Top Cable Norm	33	33114.85		
			Top Cable Tan	33	17.38		
			Bot Cable Vert	33	-15634.28		
			Bot Cable Norm	33	33200.15		
			Bot Cable Tan	33	102.72		
		Guy C	Bottom Tension	21	35619.93		
			Top Tension	21	35837.45		
			Top Cable Vert	21	13904.86		
			Top Cable Norm	21	33029.94		
			Top Cable Tan	21	10.49		
			Bot Cable Vert	21	-13184.56		
			Bot Cable Norm	21	33089.83		
			Bot Cable Tan	21	100.49		
T13	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	28	-126741.20	497.77	-1036.23
			Max. Mx	23	-67644.77	3950.06	-821.80
			Max. My	27	-67687.58	123.36	4216.54

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	23	-6717.38	-2763.83	607.69
			Max. Vx	27	-7190.67	-59.13	-2969.57
		Diagonal	Max Tension	34	7242.77	0.00	0.00
			Max. Compression	26	-8015.66	0.00	0.00
			Max. Mx	24	4018.62	-9.05	-0.04
			Max. My	26	-8011.50	0.75	3.10
			Max. Vy	24	7.75	-9.05	-0.04
			Max. Vx	26	-1.13	-4.59	3.10
		Top Girt	Max Tension	22	3263.57	0.00	0.00
			Max. Compression	19	-1400.94	0.00	0.00
			Max. Mx	18	651.17	16.39	0.00
			Max. My	14	759.02	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Bottom Girt	Max Tension	19	2355.10	0.00	0.00
			Max. Compression	22	-1569.24	0.00	0.00
			Max. Mx	18	271.94	16.39	0.00
			Max. My	14	394.81	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Mid Girt	Max Tension	30	1082.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	574.21	16.39	0.00
			Max. My	14	618.91	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
T14	80 - 60	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-153263.29	-172.26	-148.36
			Max. Mx	23	-118778.46	2491.48	-409.37
			Max. My	27	-120726.47	142.68	2630.43
			Max. Vy	23	-3696.73	-1201.95	96.45
			Max. Vx	19	3890.71	67.52	1533.88
		Diagonal	Max Tension	34	4411.01	0.00	0.00
			Max. Compression	34	-5162.08	0.00	0.00
			Max. Mx	25	1123.15	-9.69	0.37
			Max. My	26	-5146.64	2.72	2.25
			Max. Vy	25	8.00	-9.69	0.37
			Max. Vx	26	0.82	2.72	2.25
		Top Girt	Max Tension	22	2077.78	0.00	0.00
			Max. Compression	19	-1233.46	0.00	0.00
			Max. Mx	18	289.50	16.39	0.00
			Max. My	14	203.52	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Bottom Girt	Max Tension	19	1228.46	0.00	0.00
			Max. Compression	22	-459.27	0.00	0.00
			Max. Mx	32	-443.57	16.39	0.00
			Max. My	14	384.60	0.00	-0.00
			Max. Vy	32	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Mid Girt	Max Tension	30	1292.95	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	32	425.12	16.39	0.00
			Max. My	14	608.45	0.00	-0.00
			Max. Vy	32	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
T15	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-158008.68	-8.97	377.71
			Max. Mx	23	-146071.30	933.03	-331.47
			Max. My	27	-151539.34	-17.65	1023.85
			Max. Vy	23	-1158.29	-222.16	19.92

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	27	-1247.03	5.18	-219.03
		Diagonal	Max Tension	21	1328.10	0.00	0.00
			Max. Compression	21	-2079.47	0.00	0.00
			Max. Mx	28	-1149.88	-10.42	-0.70
			Max. My	21	-2075.32	3.36	1.05
			Max. Vy	28	8.25	-10.42	-0.70
			Max. Vx	21	0.38	0.00	0.00
		Top Girt	Max Tension	22	794.20	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	32	784.11	16.39	0.00
			Max. My	14	225.90	0.00	-0.00
			Max. Vy	32	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Bottom Girt	Max Tension	28	664.34	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	328.57	16.39	0.00
			Max. My	14	348.07	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Mid Girt	Max Tension	30	1380.25	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	576.66	16.39	0.00
			Max. My	14	624.71	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
T16	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-156443.27	-237.68	-341.01
			Max. Mx	31	-136310.31	-1985.81	-266.20
			Max. My	27	-137844.69	-86.09	2095.25
			Max. Vy	31	-2856.48	-1242.02	-194.38
			Max. Vx	19	-2999.37	-12.95	-1044.24
		Diagonal	Max Tension	29	3220.06	0.00	0.00
			Max. Compression	29	-4068.32	0.00	0.00
			Max. Mx	25	-1314.37	-10.34	0.58
			Max. My	26	-3926.80	-3.53	-1.22
			Max. Vy	25	8.23	-10.34	0.58
			Max. Vx	26	-0.44	0.00	0.00
		Top Girt	Max Tension	30	1264.47	0.00	0.00
			Max. Compression	27	-301.13	0.00	0.00
			Max. Mx	18	255.14	16.39	0.00
			Max. My	14	277.58	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Bottom Girt	Max Tension	27	1682.38	0.00	0.00
			Max. Compression	30	-843.30	0.00	0.00
			Max. Mx	18	369.81	16.39	0.00
			Max. My	14	373.52	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Mid Girt	Max Tension	30	1308.85	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	595.66	16.39	0.00
			Max. My	14	642.68	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
T17	20 - 5.25	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-138995.15	-720.87	-1579.93
			Max. Mx	31	-111050.21	2622.39	1328.57
			Max. My	26	-115156.96	-7.45	-3042.79
			Max. Vy	31	-19383.97	2622.39	1328.57
			Max. Vx	26	22817.97	-7.45	-3042.79

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Diagonal	Max Tension	28	4627.78	0.00	0.00
			Max. Compression	28	-4502.25	0.00	0.00
			Max. Mx	26	-2152.30	-8.15	0.48
			Max. My	6	-1282.14	-3.01	-0.77
			Max. Vy	26	7.44	-8.15	0.48
			Max. Vx	6	0.28	-3.01	-0.77
		Top Girt	Max Tension	30	2233.07	0.00	0.00
			Max. Compression	27	-1034.58	0.00	0.00
			Max. Mx	18	332.01	16.39	0.00
			Max. My	14	381.15	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Bottom Girt	Max Tension	24	9948.09	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	6276.60	16.39	0.00
			Max. My	14	6773.05	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Mid Girt	Max Tension	24	1250.22	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	743.70	16.39	0.00
			Max. My	14	804.87	0.00	-0.00
			Max. Vy	18	13.11	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
T18	5.25 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-131480.99	-355.53	158.90
			Max. Mx	26	-111894.40	3044.22	19.36
			Max. My	6	-84981.28	-218.43	-1450.16
			Max. Vy	25	35834.86	-391.86	-66.14
			Max. Vx	31	-1476.81	-585.77	46.53
		Diagonal	Max Tension	1	0.00	0.00	0.00
			Max. Compression	30	-7512.77	0.00	0.00
			Max. Mx	26	-6817.09	18.79	-1.18
			Max. My	26	-6853.99	-16.94	12.39
			Max. Vy	26	15.67	0.00	0.00
			Max. Vx	26	-4.08	0.00	0.00
		Secondary Horizontal	Max Tension	19	62.18	0.00	0.00
			Max. Compression	27	-109.63	0.00	0.00
			Max. Mx	18	1.08	3.05	0.00
			Max. My	14	4.41	0.00	-0.00
			Max. Vy	18	-3.72	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Top Girt	Max Tension	24	28781.05	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	22106.60	53.24	0.00
			Max. My	31	27163.54	0.00	14.64
			Max. Vy	22	-43.28	0.00	0.00
			Max. Vx	31	-11.90	0.00	0.00
		Mid Girt	Max Tension	24	7641.37	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	6042.76	13.31	0.00
			Max. My	31	7214.04	0.00	3.66
			Max. Vy	22	-21.64	0.00	0.00
			Max. Vx	31	-5.95	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	24	317283.52	-5498.04	-3102.01
	Max. H_x	31	301209.08	6778.56	196.26
	Max. H_z	19	309372.75	-25.52	6452.15
	Max. M_x	1	0.00	21.05	-42.19
	Max. M_z	1	0.00	21.05	-42.19
	Max. Torsion	6	2429.25	-5783.26	197.59
	Min. Vert	1	155776.39	21.05	-42.19
	Min. H_x	23	300537.20	-6761.62	311.82
	Min. H_z	27	289915.90	222.86	-7031.91
	Min. M_x	1	0.00	21.05	-42.19
	Min. M_z	1	0.00	21.05	-42.19
	Min. Torsion	14	-2398.90	5739.52	165.55
Guy C @ 220 ft Elev 11 ft Azimuth 240 deg	Max. Vert	13	-4071.37	-2695.30	1553.95
	Max. H_x	13	-4071.37	-2695.30	1553.95
	Max. H_z	21	-112785.81	-117660.38	69295.83
	Min. Vert	21	-112785.81	-117660.38	69295.83
	Min. H_x	21	-112785.81	-117660.38	69295.83
	Min. H_z	13	-4071.37	-2695.30	1553.95
Guy B @ 220 ft Elev -5 ft Azimuth 120 deg	Max. Vert	7	-4590.53	2686.49	1549.26
	Max. H_x	33	-122171.40	117686.88	69283.54
	Max. H_z	33	-122171.40	117686.88	69283.54
	Min. Vert	33	-122171.40	117686.88	69283.54
	Min. H_x	7	-4590.53	2686.49	1549.26
	Min. H_z	7	-4590.53	2686.49	1549.26
Guy A @ 220 ft Elev -29 ft Azimuth 0 deg	Max. Vert	2	-6005.26	-0.53	-3621.89
	Max. H_x	31	-70082.57	4962.47	-68536.20
	Max. H_z	2	-6005.26	-0.53	-3621.89
	Min. Vert	27	-132006.40	15.87	-132511.92
	Min. H_x	23	-74883.98	-4957.28	-72382.26
	Min. H_z	26	-131994.16	-2428.70	-132902.22

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	155776.39	-21.05	42.19	0.00	0.00	-1.31
Dead+Wind 0 deg - No Ice+Guy	229912.72	14.57	-5665.51	0.00	0.00	13.90
Dead+Wind 30 deg - No Ice+Guy	218800.67	3062.83	-4962.64	0.00	0.00	-913.93
Dead+Wind 45 deg - No Ice+Guy	208293.70	4331.39	-4130.07	0.00	0.00	-1478.49
Dead+Wind 60 deg - No Ice+Guy	202133.04	5265.18	-3004.64	0.00	0.00	-1999.81
Dead+Wind 90 deg - No Ice+Guy	222869.59	5783.26	-197.59	0.00	0.00	-2429.25
Dead+Wind 120 deg - No Ice+Guy	238646.52	4789.64	2696.80	0.00	0.00	-1890.68
Dead+Wind 135 deg - No	238778.10	3781.81	3904.59	0.00	0.00	-1427.89

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Ice+Guy Dead+Wind 150 deg - No Ice+Guy	232103.39	2582.42	4904.36	0.00	0.00	-926.70
Dead+Wind 180 deg - No Ice+Guy	210867.71	-64.85	5910.18	0.00	0.00	325.98
Dead+Wind 210 deg - No Ice+Guy	231899.72	-2669.70	4942.33	0.00	0.00	1078.05
Dead+Wind 225 deg - No Ice+Guy	239680.80	-3836.07	3941.41	0.00	0.00	1551.25
Dead+Wind 240 deg - No Ice+Guy	241112.32	-4797.36	2723.11	0.00	0.00	2000.39
Dead+Wind 270 deg - No Ice+Guy	227286.26	-5739.52	-165.55	0.00	0.00	2398.90
Dead+Wind 300 deg - No Ice+Guy	206081.59	-5245.76	-2909.12	0.00	0.00	1686.27
Dead+Wind 315 deg - No Ice+Guy	213279.98	-4306.63	-4004.41	0.00	0.00	1241.58
Dead+Wind 330 deg - No Ice+Guy	223429.69	-3031.00	-4842.65	0.00	0.00	816.72
Dead+Ice+Temp+Guy	210579.96	-35.44	100.23	0.00	0.00	-0.17
Dead+Wind 0 deg+Ice+Temp+Guy	309372.75	25.52	-6452.15	0.00	0.00	-442.71
Dead+Wind 30 deg+Ice+Temp+Guy	296940.60	3682.49	-5720.92	0.00	0.00	-319.24
Dead+Wind 45 deg+Ice+Temp+Guy	286665.62	5191.51	-4801.01	0.00	0.00	-302.87
Dead+Wind 60 deg+Ice+Temp+Guy	280547.71	6282.21	-3538.97	0.00	0.00	-665.48
Dead+Wind 90 deg+Ice+Temp+Guy	300537.20	6761.62	-311.82	0.00	0.00	-523.95
Dead+Wind 120 deg+Ice+Temp+Guy	317283.52	5498.04	3102.01	0.00	0.00	-91.61
Dead+Wind 135 deg+Ice+Temp+Guy	316944.35	4346.75	4577.95	0.00	0.00	105.34
Dead+Wind 150 deg+Ice+Temp+Guy	312730.21	2859.57	5726.26	0.00	0.00	321.94
Dead+Wind 180 deg+Ice+Temp+Guy	289915.90	-222.86	7031.91	0.00	0.00	614.87
Dead+Wind 210 deg+Ice+Temp+Guy	308095.28	-3052.95	5841.80	0.00	0.00	223.42
Dead+Wind 225 deg+Ice+Temp+Guy	314135.68	-4478.83	4673.65	0.00	0.00	303.74
Dead+Wind 240 deg+Ice+Temp+Guy	316351.40	-5567.71	3170.44	0.00	0.00	572.76
Dead+Wind 270 deg+Ice+Temp+Guy	301209.08	-6778.56	-196.26	0.00	0.00	994.06
Dead+Wind 300 deg+Ice+Temp+Guy	285753.19	-6310.87	-3285.48	0.00	0.00	208.47
Dead+Wind 315 deg+Ice+Temp+Guy	294209.61	-5156.76	-4540.72	0.00	0.00	-33.93
Dead+Wind 330 deg+Ice+Temp+Guy	303359.32	-3622.02	-5524.76	0.00	0.00	-170.73
Dead+Wind 0 deg - Service+Guy	158215.22	-17.45	-1779.35	0.00	0.00	0.17
Dead+Wind 30 deg - Service+Guy	158394.51	870.27	-1528.19	0.00	0.00	-260.63
Dead+Wind 45 deg - Service+Guy	158555.80	1240.41	-1232.09	0.00	0.00	-405.70
Dead+Wind 60 deg - Service+Guy	158620.58	1527.21	-852.97	0.00	0.00	-530.17
Dead+Wind 90 deg -	158374.43	1784.09	54.83	0.00	0.00	-644.19

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Service+Guy						
Dead+Wind 120 deg - Service+Guy	158201.44	1558.61	946.76	0.00	0.00	-498.83
Dead+Wind 135 deg - Service+Guy	158241.61	1271.46	1308.96	0.00	0.00	-378.39
Dead+Wind 150 deg - Service+Guy	158375.50	892.85	1584.02	0.00	0.00	-248.39
Dead+Wind 180 deg - Service+Guy	158656.68	-26.57	1814.86	0.00	0.00	-0.40
Dead+Wind 210 deg - Service+Guy	158525.97	-945.92	1589.68	0.00	0.00	268.41
Dead+Wind 225 deg - Service+Guy	158495.90	-1323.32	1316.15	0.00	0.00	408.69
Dead+Wind 240 deg - Service+Guy	158509.97	-1608.50	955.33	0.00	0.00	531.16
Dead+Wind 270 deg - Service+Guy	158597.46	-1828.19	65.35	0.00	0.00	644.22
Dead+Wind 300 deg - Service+Guy	158795.68	-1564.52	-842.47	0.00	0.00	497.57
Dead+Wind 315 deg - Service+Guy	158698.12	-1275.52	-1222.55	0.00	0.00	367.22
Dead+Wind 330 deg - Service+Guy	158486.17	-905.25	-1518.65	0.00	0.00	234.54

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	-0.00	-67524.64	0.00	-1.09	67524.69	3.78	0.006%
2	-420.74	-67916.15	-97544.92	417.46	67913.58	97456.51	0.074%
3	48405.70	-67390.26	-84038.97	-48416.84	67388.74	83975.96	0.054%
4	68606.73	-67028.04	-68553.83	-68624.68	67027.16	68499.48	0.049%
5	84105.56	-66885.59	-48314.25	-84108.88	66886.54	48397.93	0.071%
6	97249.59	-67461.11	430.61	-97193.12	67459.33	-378.91	0.065%
7	84735.37	-68047.16	49572.66	-84672.09	68044.91	-49527.55	0.065%
8	69409.46	-67927.28	69861.32	-69346.24	67925.14	-69820.86	0.063%
9	49358.95	-67595.49	85402.03	-49277.90	67593.12	-85359.23	0.077%
10	277.59	-67133.13	98088.53	-323.88	67131.54	-98028.84	0.064%
11	-48379.04	-67659.02	84378.12	48307.22	67657.08	-84344.11	0.067%
12	-68386.97	-68021.23	68768.11	68306.41	68018.69	-68721.05	0.079%
13	-83769.26	-68163.68	48608.74	83687.47	68160.95	-48554.79	0.083%
14	-96964.82	-67588.16	-53.17	96909.15	67586.46	101.17	0.062%
15	-84742.56	-67002.11	-49270.02	84731.88	67002.66	49337.30	0.057%
16	-69431.32	-67121.99	-69612.87	69449.08	67120.81	69546.50	0.058%
17	-49311.61	-67453.78	-84988.61	49318.94	67451.99	84917.64	0.060%
18	-0.00	-105176.62	0.00	-4.38	105176.63	10.09	0.010%
19	-1408.40	-105844.18	-121641.68	1405.16	105840.59	121530.39	0.069%
20	59588.96	-104953.18	-104470.30	-59606.74	104950.95	104383.72	0.055%
21	84829.16	-104339.34	-85522.62	-84857.62	104338.06	85444.00	0.052%
22	103247.58	-104097.81	-61052.76	-103298.27	104098.64	61037.24	0.033%
23	119341.18	-105070.82	1707.97	-119287.97	105068.96	-1658.31	0.046%
24	105387.18	-106061.52	60233.88	-105309.63	106058.50	-60178.05	0.059%
25	86607.28	-105857.50	83801.53	-86530.94	105854.64	-83752.46	0.057%
26	63053.56	-105294.26	103252.52	-62951.17	105290.72	-103196.83	0.073%
27	2823.95	-104509.07	119430.49	-2740.49	104508.22	-119418.43	0.053%
28	-59467.61	-105400.06	102099.42	59383.77	105397.83	-102063.21	0.058%
29	-83122.71	-106013.90	83126.16	83033.65	106011.13	-83076.81	0.064%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
30	-102053.98	-106255.44	59805.84	101963.90	106252.42	-59747.01	0.068%
31	-117625.42	-105282.43	-890.39	117565.86	105280.65	946.60	0.052%
32	-101546.03	-104291.73	-64128.32	101572.99	104290.75	64059.30	0.047%
33	-82710.00	-104495.75	-88119.41	82725.63	104493.87	88042.82	0.049%
34	-58322.40	-105058.99	-106165.75	58331.32	105056.19	106070.82	0.059%
35	-116.55	-67633.09	-27020.75	114.36	67632.91	26993.04	0.038%
36	13408.78	-67487.41	-23279.49	-13409.76	67487.31	23254.11	0.035%
37	19004.64	-67387.08	-18989.98	-18994.53	67386.92	18958.40	0.046%
38	23297.94	-67347.62	-13383.45	-23266.85	67347.48	13386.25	0.043%
39	26938.94	-67507.04	119.28	-26924.07	67507.00	-105.60	0.028%
40	23470.58	-67670.90	13730.98	-23435.49	67670.58	-13703.03	0.062%
41	19227.00	-67636.17	19352.17	-19191.81	67635.88	-19324.39	0.061%
42	13672.84	-67544.26	23657.07	-13641.27	67544.05	-23625.76	0.061%
43	76.89	-67416.18	27171.34	-80.46	67416.10	-27151.25	0.028%
44	-13401.40	-67561.86	23373.44	13359.37	67561.63	-23341.61	0.072%
45	-18943.76	-67662.20	19049.34	18897.66	67661.83	-19019.20	0.076%
46	-23204.78	-67701.66	13465.02	23158.89	67701.22	-13433.30	0.077%
47	-26860.06	-67542.23	-14.73	26841.33	67542.18	29.85	0.033%
48	-23474.39	-67379.89	-13648.20	23449.33	67379.80	13652.16	0.035%
49	-19233.05	-67413.10	-19283.34	19210.00	67412.91	19253.39	0.052%
50	-13659.73	-67505.01	-23542.55	13652.52	67504.73	23489.93	0.073%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	13	0.00093413	0.00005272
2	Yes	20	0.00137532	0.00106429
3	Yes	20	0.00118909	0.00073663
4	Yes	19	0.00123877	0.00061375
5	Yes	13	0.00148697	0.00064251
6	Yes	21	0.00139765	0.00084860
7	Yes	22	0.00113246	0.00091126
8	Yes	22	0.00108159	0.00090995
9	Yes	21	0.00138665	0.00111450
10	Yes	11	0.00081593	0.00136393
11	Yes	22	0.00125857	0.00086366
12	Yes	22	0.00137313	0.00098056
13	Yes	22	0.00143256	0.00101658
14	Yes	22	0.00128755	0.00080071
15	Yes	14	0.00116632	0.00053831
16	Yes	19	0.00131321	0.00081854
17	Yes	20	0.00120732	0.00092685
18	Yes	11	0.00099215	0.00009976
19	Yes	21	0.00141400	0.00126078
20	Yes	21	0.00134972	0.00089819
21	Yes	20	0.00147704	0.00075916
22	Yes	12	0.00113904	0.00075749
23	Yes	23	0.00110521	0.00071299
24	Yes	23	0.00116609	0.00095949
25	Yes	23	0.00110207	0.00093027
26	Yes	22	0.00143631	0.00121884
27	Yes	19	0.00133506	0.00076932
28	Yes	23	0.00125565	0.00079719
29	Yes	23	0.00133053	0.00086941
30	Yes	23	0.00138499	0.00090991

31	Yes	23	0.00127668	0.00072930
32	Yes	19	0.00128162	0.00080329
33	Yes	21	0.00118081	0.00092935
34	Yes	21	0.00129696	0.00112123
35	Yes	10	0.00078582	0.00042453
36	Yes	10	0.00090077	0.00026240
37	Yes	9	0.00122605	0.00030678
38	Yes	9	0.00143180	0.00023274
39	Yes	11	0.00091326	0.00017608
40	Yes	10	0.00116448	0.00062956
41	Yes	10	0.00110277	0.00058012
42	Yes	10	0.00126979	0.00043542
43	Yes	11	0.00094356	0.00020146
44	Yes	10	0.00149155	0.00049444
45	Yes	10	0.00137297	0.00067568
46	Yes	10	0.00144868	0.00075214
47	Yes	11	0.00097702	0.00021263
48	Yes	10	0.00121155	0.00021876
49	Yes	9	0.00137815	0.00035915
50	Yes	9	0.00142310	0.00058278

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	347 - 330	4.047	43	0.0487	0.8471
T1	330 - 320	3.871	43	0.0336	0.9144
T2	320 - 300	3.826	43	0.0330	0.9181
T3	300 - 280	3.696	43	0.0336	0.8448
T4	280 - 260	3.537	43	0.0354	0.7196
T5	260 - 240	3.395	43	0.0304	0.5680
T6	240 - 220	3.270	43	0.0431	0.4071
T7	220 - 200	3.050	43	0.0628	0.2453
T8	200 - 180	2.743	43	0.0692	0.1196
T9	180 - 160	2.446	43	0.0472	0.0388
T10	160 - 140	2.329	43	0.0343	0.0301
T11	140 - 120	2.183	43	0.0428	0.0413
T12	120 - 100	1.973	43	0.0508	0.0588
T13	100 - 80	1.744	43	0.0425	0.0714
T14	80 - 60	1.629	45	0.0445	0.0785
T15	60 - 40	1.429	45	0.0680	0.0821
T16	40 - 20	1.080	45	0.0998	0.0839
T17	20 - 5.25	0.586	45	0.1269	0.0800
T18	5.25 - 0	0.153	45	0.1371	0.0731

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
350.00	Lighting Canopy	43	4.047	0.0487	0.8471	53102
348.00	Beacon	43	4.047	0.0487	0.8471	53102
339.00	LP-3E-Radomes	43	3.952	0.0335	0.8848	33189
330.00	PiROD Junction Box	43	3.871	0.0336	0.9144	18651
329.50	Guy	43	3.868	0.0337	0.9154	19204

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
320.00	10' dish	43	3.826	0.0330	0.9181	55910
311.00	LP-3C-Radomes	43	3.776	0.0316	0.8955	60802
310.00	10' dish	43	3.770	0.0315	0.8918	63790
300.25	Guy	43	3.698	0.0335	0.8461	109091
295.00	DB810KE-Y	43	3.656	0.0347	0.8168	162923
290.00	DCR-L2	43	3.616	0.0355	0.7865	214220
280.00	DCR-L2	43	3.537	0.0354	0.7196	266169
275.00	6' Dish	43	3.499	0.0340	0.6834	183339
269.63	Guy	43	3.459	0.0320	0.6429	136563
260.25	PiROD Junction Box	43	3.397	0.0304	0.5699	104409
260.00	PD220	43	3.395	0.0304	0.5680	106396
250.00	PD220	43	3.338	0.0346	0.4885	79236
225.00	(2) DB980H90E-M	43	3.115	0.0582	0.2835	35762
207.00	PD1142-1	43	2.857	0.0703	0.1593	51717
205.00	PD1150	43	2.825	0.0705	0.1476	54719
200.00	7770.00	43	2.743	0.0692	0.1196	76300
185.00	AIR21 B2A/B4P	43	2.505	0.0534	0.0518	21881
178.00	Guy	43	2.428	0.0449	0.0355	18697
173.50	Obstruction Light	43	2.395	0.0405	0.0314	27544
170.00	LNX-6514DS-VTM	43	2.375	0.0378	0.0306	42349
156.00	Pirod 4' Side Mount Standoff (1)	43	2.307	0.0347	0.0293	45897
150.00	10' Dipole	43	2.266	0.0369	0.0329	53153
147.00	20' x 3" Dia Omni	43	2.243	0.0385	0.0348	57488
138.00	Pirod 4' Side Mount Standoff (1)	43	2.164	0.0441	0.0434	69128
130.00	6' Dish	43	2.085	0.0486	0.0509	65988
112.00	PR-450	43	1.874	0.0484	0.0644	106525
100.26	Guy	43	1.746	0.0426	0.0713	27240
90.00	PR-450	45	1.683	0.0409	0.0756	120972
86.75	PiROD Junction Box	45	1.667	0.0414	0.0767	150265
68.00	1105-3A-Radomes	45	1.526	0.0568	0.0809	32876

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	347 - 330	37.136	26	0.6394	4.4480
T1	330 - 320	34.841	26	0.5592	4.4463
T2	320 - 300	33.704	26	0.5756	4.4726
T3	300 - 280	31.244	25	0.6158	3.9932
T4	280 - 260	28.730	25	0.6234	3.2985
T5	260 - 240	26.333	25	0.5755	2.5544
T6	240 - 220	24.139	25	0.5818	1.8283
T7	220 - 200	21.746	25	0.6001	1.1172
T8	200 - 180	19.337	30	0.5649	0.5745
T9	180 - 160	17.426	30	0.4200	0.2482
T10	160 - 140	16.384	30	0.3140	0.2180
T11	140 - 120	15.331	30	0.3196	0.1755
T12	120 - 100	13.972	30	0.3467	0.2345
T13	100 - 80	12.436	30	0.3365	0.2758
T14	80 - 60	11.195	30	0.3771	0.3007
T15	60 - 40	9.463	30	0.5147	0.3124
T16	40 - 20	6.964	30	0.6828	0.3177
T17	20 - 5.25	3.714	30	0.8211	0.3018
T18	5.25 - 0	0.972	30	0.8731	0.2755

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
350.00	Lighting Canopy	26	37.136	0.6394	4.4480	15260
348.00	Beacon	26	37.136	0.6394	4.4480	15260
339.00	LP-3E-Radomes	26	36.009	0.5855	4.4327	9537
330.00	PiROD Junction Box	26	34.841	0.5592	4.4463	5438
329.50	Guy	26	34.781	0.5591	4.4498	5629
320.00	10' dish	26	33.704	0.5756	4.4726	10906
311.00	LP-3C-Radomes	26	32.625	0.5953	4.3264	11733
310.00	10' dish	26	32.500	0.5971	4.3010	12277
300.25	Guy	25	31.275	0.6153	4.0015	18155
295.00	DB810KE-Y	25	30.622	0.6233	3.8248	28209
290.00	DCR-L2	25	29.992	0.6279	3.6533	55079
280.00	DCR-L2	25	28.730	0.6234	3.2985	17353
275.00	6' Dish	25	28.109	0.6128	3.1145	13912
269.63	Guy	25	27.455	0.5981	2.9136	11642
260.25	PiROD Junction Box	25	26.361	0.5758	2.5636	9742
260.00	PD220	25	26.333	0.5755	2.5544	9802
250.00	PD220	25	25.236	0.5719	2.1909	25884
225.00	(2) DB980H90E-M	25	22.365	0.5975	1.2841	11370
207.00	PD1142-1	25	20.109	0.5899	0.7449	18447
205.00	PD1150	30	19.869	0.5845	0.6945	19937
200.00	7770.00	30	19.337	0.5649	0.5745	29388
185.00	AIR21 B2A/B4P	30	17.829	0.4594	0.2919	4174
178.00	Guy	30	17.287	0.4051	0.2370	3683
173.50	Obstruction Light	30	17.016	0.3745	0.2232	5040
170.00	LNX-6514DS-VTM	30	16.836	0.3538	0.2199	7205
156.00	Pirod 4' Side Mount Standoff (1)	30	16.197	0.3076	0.2100	14997
150.00	10' Dipole	30	15.894	0.3067	0.1894	16209
147.00	20' x 3" Dia Omni	30	15.733	0.3092	0.1771	16219
138.00	Pirod 4' Side Mount Standoff (1)	30	15.210	0.3231	0.1829	15810
130.00	6' Dish	30	14.693	0.3364	0.2087	14426
112.00	PR-450	30	13.341	0.3429	0.2527	23168
100.26	Guy	30	12.453	0.3365	0.2754	6192
90.00	PR-450	30	11.816	0.3450	0.2904	30428
86.75	PiROD Junction Box	30	11.623	0.3525	0.2942	20264
68.00	1105-3A-Radomes	30	10.246	0.4514	0.3086	6352

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	320	Leg	A325N	0.7500	5	5724.30	18555.00	0.309 ✔	1.333	Bolt DS
T3	300	Leg	A325N	0.7500	5	6604.27	18555.00	0.356 ✔	1.333	Bolt DS
T4	280	Leg	A325N	0.7500	5	7914.96	18555.00	0.427 ✔	1.333	Bolt DS
T5	260	Leg	A325N	0.7500	5	10685.10	18555.00	0.576 ✔	1.333	Bolt DS
T6	240	Leg	A325N	0.7500	5	10500.30	18555.00	0.566 ✔	1.333	Bolt DS
T7	220	Leg	A325N	0.7500	5	10708.10	18555.00	0.577 ✔	1.333	Bolt DS

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T8	200	Leg	A325N	0.8750	5	14912.10	25255.50	0.590 ✔	1.333	Bolt DS
T9	180	Leg	A490N	0.8750	5	32120.30	33673.90	0.954 ✔	1.333	Bolt DS
		Torque Arm Top@178	A325N	1.0000	2	19836.70	32986.70	0.601 ✔	1.333	Bolt Shear
		Torque Arm Bottom@178	A325N	1.0000	2	28987.40	32986.70	0.879 ✔	1.333	Bolt Shear
T10	160	Leg	A325N	0.8750	5	18285.50	25255.50	0.724 ✔	1.333	Bolt DS
T11	140	Leg	A325N	0.8750	5	19342.70	25255.50	0.766 ✔	1.333	Bolt DS
T12	120	Leg	A325N	0.8750	5	18253.00	25255.50	0.723 ✔	1.333	Bolt DS
T13	100	Leg	A325N	0.8750	5	22706.60	25255.50	0.899 ✔	1.333	Bolt DS
T14	80	Leg	A325N	0.8750	5	25357.10	25255.50	1.004 ✔	1.333	Bolt DS
T15	60	Leg	A325N	0.8750	5	30661.70	25255.50	1.214 ✔	1.333	Bolt DS
T16	40	Leg	A325N	0.8750	5	31288.70	25255.50	1.239 ✔	1.333	Bolt DS
T17	20	Leg	A325N	0.8750	5	27799.00	25255.50	1.101 ✔	1.333	Bolt DS

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T1	329.50 (A) (1083)	11/16 BS	5800.00	57999.90	26622.20	29000.00	2.000	2.179 ✔
	329.50 (B) (1082)	11/16 BS	5800.00	57999.90	26294.10	29000.00	2.000	2.206 ✔
	329.50 (C) (1081)	11/16 BS	5800.00	57999.90	25692.70	29000.00	2.000	2.257 ✔
T2	300.25 (A) (1113)	9/16 EHS	3500.00	35000.04	16660.40	17500.00	2.000	2.101 ✔
	300.25 (B) (1112)	9/16 EHS	3500.00	35000.04	16396.40	17500.00	2.000	2.135 ✔
	300.25 (C) (1111)	9/16 EHS	3500.00	35000.04	16026.30	17500.00	2.000	2.184 ✔
T4	269.63 (A) (1086)	13/16 BS	8000.00	79999.92	35712.60	40000.00	2.000	2.240 ✔
	269.63 (B) (1085)	13/16 BS	8000.00	79999.92	35253.90	40000.00	2.000	2.269 ✔
	269.63 (C) (1084)	13/16 BS	8000.00	79999.92	34343.10	40000.00	2.000	2.329 ✔
T9	178.00 (A) (1102)	7/8 BS	9200.00	92000.13	37622.60	46000.00	2.000	2.445 ✔
	178.00 (A) (1103)	7/8 BS	9200.00	92000.13	39180.50	46000.00	2.000	2.348 ✔
	178.00 (B) (1096)	7/8 BS	9200.00	92000.13	38061.10	46000.00	2.000	2.417 ✔
	178.00 (B) (1097)	7/8 BS	9200.00	92000.13	35997.70	46000.00	2.000	2.556 ✔
	178.00 (C) (1087)	7/8 BS	9200.00	92000.13	36233.60	46000.00	2.000	2.539 ✔
	178.00 (C)	7/8 BS	9200.00	92000.13	35552.00	46000.00	2.000	2.588 ✔

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T12	(1088) 100.26 (A) (1110)	7/8 BS	9200.00	92000.13	38612.90	46000.00	2.000	2.383 ✔
	100.26 (B) (1109)	7/8 BS	9200.00	92000.13	36953.80	46000.00	2.000	2.490 ✔
	100.26 (C) (1108)	7/8 BS	9200.00	92000.13	35837.40	46000.00	2.000	2.567 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	1 1/4	17.00	1.60	61.4 K=1.00	1.00	22.470	1.2272	-11997.20	27575.10	0.435 ✔
T1	330 - 320	2 1/4	10.00	2.31	49.3 K=1.00	1.00	24.454	3.9761	-28242.90	97231.80	0.290 ✔
T2	320 - 300	2 1/4	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-33000.80	96820.00	0.341 ✔
T3	300 - 280	2 1/4	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-39568.70	96820.00	0.409 ✔
T4	280 - 260	2 1/4	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-57431.10	96820.00	0.593 ✔
T5	260 - 240	2 1/4	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-53425.40	96820.00	0.552 ✔
T6	240 - 220	2 1/4	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-54922.10	96820.00	0.567 ✔
T7	220 - 200	2 1/2	20.00	2.35	45.1 K=1.00	1.00	25.047	4.9087	-73436.70	122948.00	0.597 ✔
T8	200 - 180	2 3/4	20.00	2.34	40.9 K=1.00	0.99	25.532	5.9396	-160596.00	151652.00	1.059 ✔
T9	180 - 160	2 3/4	20.00	2.34	40.9 K=1.00	1.00	25.710	5.9396	-160602.00	152708.00	1.052 ✔
T10	160 - 140	2 3/4	20.00	2.34	40.9 K=1.00	0.97	24.925	5.9396	-96667.50	148046.00	0.653 ✔
T11	140 - 120	2 3/4	20.00	2.34	40.9 K=1.00	0.97	24.926	5.9396	-97545.50	148052.00	0.659 ✔
T12	120 - 100	2 3/4	20.00	2.34	40.9 K=1.00	0.97	24.934	5.9396	-113526.00	148099.00	0.767 ✔
T13	100 - 80	2 3/4	20.00	2.34	40.9 K=1.00	0.97	24.977	5.9396	-126741.00	148352.00	0.854 ✔
T14	80 - 60	2 3/4	20.00	2.34	40.9 K=1.00	0.98	25.084	5.9396	-153263.00	148990.00	1.029 ✔
T15	60 - 40	2 3/4	20.00	2.34	40.9 K=1.00	0.98	25.091	5.9396	-158009.00	149028.00	1.060 ✔
T16	40 - 20	2 3/4	20.00	2.34	40.9 K=1.00	0.98	25.080	5.9396	-156443.00	148966.00	1.050

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T17	20 - 5.25	2 3/4	14.75	2.28	39.8 K=1.00	0.97	25.062	5.9396	-138995.00	148856.00	0.934 ✓
T18	5.25 - 0	2 3/4	5.99	2.95	51.5 K=1.00	1.00	24.122	5.9396	-131481.00	143273.00	0.918 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	1/2	2.97	1.42	102.4 K=0.75	14.145	0.1963	-2277.41	2777.41	0.820 ✓
T1	330 - 320	7/8	5.51	2.65	109.1 K=0.75	12.552	0.6013	-3266.48	7547.47	0.433 ✓
T2	320 - 300	7/8	5.52	2.66	109.3 K=0.75	12.492	0.6013	-6030.53	7511.46	0.803 ✓
T3	300 - 280	7/8	5.52	2.66	109.3 K=0.75	12.492	0.6013	-8244.50	7511.46	1.098 ✓
T4	280 - 260	7/8	5.52	2.66	109.3 K=0.75	12.492	0.6013	-8982.73	7511.46	1.196 ✓
T5	260 - 240	7/8	5.52	2.66	109.3 K=0.75	12.492	0.6013	-7448.32	7511.46	0.992 ✓
T6	240 - 220	7/8	5.52	2.66	109.3 K=0.75	12.492	0.6013	-6685.09	7511.46	0.890 ✓
T7	220 - 200	1	5.52	2.65	95.3 K=0.75	15.777	0.7854	-9102.89	12391.00	0.735 ✓
T8	200 - 180	1 1/4	5.52	2.63	87.8 K=0.87	17.412	1.2272	-11697.50	21367.90	0.547 ✓
T9	180 - 160	1 1/4	5.52	2.63	87.8 K=0.87	17.412	1.2272	-8467.39	21367.90	0.396 ✓
T10	160 - 140	1	5.52	2.63	94.8 K=0.75	15.880	0.7854	-5536.78	12472.00	0.444 ✓
T11	140 - 120	1	5.52	2.63	94.8 K=0.75	15.880	0.7854	-3169.25	12472.00	0.254 ✓
T12	120 - 100	1	5.52	2.63	94.8 K=0.75	15.880	0.7854	-4950.04	12472.00	0.397 ✓
T13	100 - 80	1	5.52	2.63	94.8 K=0.75	15.880	0.7854	-8015.66	12472.00	0.643 ✓
T14	80 - 60	1	5.52	2.63	94.8 K=0.75	15.880	0.7854	-5162.08	12472.00	0.414 ✓
T15	60 - 40	1	5.52	2.63	94.8 K=0.75	15.880	0.7854	-2079.47	12472.00	0.167 ✓
T16	40 - 20	1	5.52	2.63	94.8 K=0.75	15.880	0.7854	-4068.32	12472.00	0.326 ✓
T17	20 - 5.25	1	5.49	2.62	94.4 K=0.75	15.983	0.7854	-4502.25	12553.40	0.359 ✓
T18	5.25 - 0	1 1/4	4.56	2.90	89.5	17.037	1.2272	-7512.77	20907.50	0.359

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
					K=0.80					✔

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	3/4	2.50	2.40	107.3 K=0.70	12.962	0.4418	-191.66	5726.57	0.033 ✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T18	5.25 - 0	3/4	3.28	3.05	136.7 K=0.70	7.992	0.4418	-109.63	3530.61	0.031 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	3/4	2.50	2.40	107.3 K=0.70	12.962	0.4418	-166.90	5726.57	0.029 ✔
T2	320 - 300	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-597.37	4485.60	0.133 ✔
T3	300 - 280	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-357.70	4485.60	0.080 ✔
T4	280 - 260	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-1257.43	4485.60	0.280 ✔
T5	260 - 240	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-757.57	4485.60	0.169 ✔
T6	240 - 220	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-212.23	4485.60	0.047 ✔
T7	220 - 200	1 1/4	5.00	4.79	128.8 K=0.70	9.002	1.2272	-774.61	11046.60	0.070 ✔
T8	200 - 180	1 1/2	5.00	4.77	106.9 K=0.70	13.076	1.7672	-2537.32	23106.60	0.110 ✔
T9	180 - 160	1 1/2	5.00	4.77	106.9 K=0.70	13.076	1.7672	-4935.48	23106.60	0.214 ✔
T10	160 - 140	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-1489.83	11143.30	0.134 ✔
T11	140 - 120	1 1/4	5.00	4.77	128.2	9.080	1.2272	-11.84	11143.30	0.001

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
					K=0.70					✓
T12	120 - 100	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-860.07	11143.30	0.077 ✓
T13	100 - 80	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-1400.94	11143.30	0.126 ✓
T14	80 - 60	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-1233.46	11143.30	0.111 ✓
T16	40 - 20	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-301.13	11143.30	0.027 ✓
T17	20 - 5.25	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-1034.58	11143.30	0.093 ✓

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 lb	Allow. P_a lb	Ratio P / P_a
L1	347 - 330	3/4	2.50	2.40	107.3 K=0.70	12.962	0.4418	-644.73	5726.57	0.113 ✓
T1	330 - 320	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-707.63	4485.60	0.158 ✓
T3	300 - 280	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-1345.00	4485.60	0.300 ✓
T4	280 - 260	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-836.55	4485.60	0.186 ✓
T5	260 - 240	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-380.20	4485.60	0.085 ✓
T6	240 - 220	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-685.59	4485.60	0.153 ✓
T7	220 - 200	1 1/4	5.00	4.79	128.8 K=0.70	9.002	1.2272	-1909.63	11046.60	0.173 ✓
T9	180 - 160	1 1/2	5.00	4.77	106.9 K=0.70	13.076	1.7672	-1312.12	23106.60	0.057 ✓
T10	160 - 140	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-11.44	11143.30	0.001 ✓
T11	140 - 120	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-585.49	11143.30	0.053 ✓
T12	120 - 100	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-135.41	11143.30	0.012 ✓
T13	100 - 80	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-1569.24	11143.30	0.141 ✓
T14	80 - 60	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-459.27	11143.30	0.041 ✓
T16	40 - 20	1 1/4	5.00	4.77	128.2 K=0.70	9.080	1.2272	-843.30	11143.30	0.076 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	330 - 320	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-17.61	4485.60	0.004 ✔
T2	320 - 300	1	5.00	4.81	161.7 K=0.70	5.711	0.7854	-441.16	4485.60	0.098 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T8	200 - 180	1 1/2	5.00	4.77	106.9 K=0.70	13.076	1.7672	-7848.52	23106.60	0.340 ✔

Bottom 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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160	1 1/2	5.00	4.77	106.9 K=0.70	13.076	1.7672	-19641.20	23106.60	0.850 ✔

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160 (1091)	2L4x4x3/8	9.13	8.38	100.9 K=1.23	12.869	5.7200	-50584.80	73609.40	0.687 ✔
T9	180 - 160 (1092)	2L4x4x3/8	9.13	8.38	100.9 K=1.23	12.869	5.7200	-57266.60	73609.40	0.778 ✔
T9	180 - 160 (1100)	2L4x4x3/8	9.13	8.38	100.9 K=1.23	12.869	5.7200	-52391.70	73609.40	0.712 ✔
T9	180 - 160 (1101)	2L4x4x3/8	9.13	8.38	100.9 K=1.23	12.869	5.7200	-50123.90	73609.40	0.681 ✔
T9	180 - 160 (1106)	2L4x4x3/8	9.13	8.38	100.9 K=1.23	12.869	5.7200	-53807.80	73609.40	0.731 ✔
T9	180 - 160 (1107)	2L4x4x3/8	9.13	8.38	100.9 K=1.23	12.869	5.7200	-57974.90	73609.40	0.788 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	lb	lb	
L1	347 - 330	1 1/4	17.00	1.60	61.4	30.000	1.2272	11002.60	36815.50	0.299 ✓
T1	330 - 320	2 1/4	10.00	2.31	49.3	30.000	3.9761	5960.45	119282.00	0.050 ✓
T2	320 - 300	2 1/4	20.00	2.34	50.0	32.500	2.1885	3171.33	71126.30	0.045 ✓
T4	280 - 260	2 1/4	20.00	2.34	50.0	32.500	2.1885	5146.65	71126.30	0.072 ✓
T8	200 - 180	2 3/4	20.00	2.34	40.9	32.500	3.4123	48283.90	110900.00	0.435 ✓
T9	180 - 160	2 3/4	20.00	2.34	40.9	32.500	3.4123	37384.80	110900.00	0.337 ✓

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	lb	lb	
L1	347 - 330	1/2	2.97	1.42	136.5	30.000	0.1963	2191.80	5890.49	0.372 ✓
T1	330 - 320	7/8	5.51	2.65	145.4	30.000	0.6013	3319.39	18039.60	0.184 ✓
T2	320 - 300	7/8	5.52	2.66	145.8	30.000	0.6013	7069.99	18039.60	0.392 ✓
T3	300 - 280	7/8	5.52	2.66	145.8	30.000	0.6013	8469.03	18039.60	0.469 ✓
T4	280 - 260	7/8	5.52	2.66	145.8	30.000	0.6013	8332.28	18039.60	0.462 ✓
T5	260 - 240	7/8	5.52	2.66	145.8	30.000	0.6013	7291.95	18039.60	0.404 ✓
T6	240 - 220	7/8	5.52	2.66	145.8	30.000	0.6013	6472.10	18039.60	0.359 ✓
T7	220 - 200	1	5.52	2.65	127.1	30.000	0.7854	8758.97	23561.90	0.372 ✓
T8	200 - 180	1 1/4	5.52	2.63	101.1	30.000	1.2272	11046.20	36815.50	0.300 ✓
T9	180 - 160	1 1/4	5.52	2.63	101.1	30.000	1.2272	7637.72	36815.50	0.207 ✓
T10	160 - 140	1	5.52	2.63	126.4	30.000	0.7854	4911.42	23561.90	0.208 ✓
T11	140 - 120	1	5.52	2.63	126.4	30.000	0.7854	2651.75	23561.90	0.113 ✓
T12	120 - 100	1	5.52	2.63	126.4	30.000	0.7854	4167.74	23561.90	0.177 ✓
T13	100 - 80	1	5.52	2.63	126.4	30.000	0.7854	7242.77	23561.90	0.307 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T14	80 - 60	1	5.52	2.63	126.4	30.000	0.7854	4411.01	23561.90	0.187 ✔
T15	60 - 40	1	5.52	2.63	126.4	30.000	0.7854	1328.10	23561.90	0.056 ✔
T16	40 - 20	1	5.52	2.63	126.4	30.000	0.7854	3220.06	23561.90	0.137 ✔
T17	20 - 5.25	1	5.49	2.62	125.8	30.000	0.7854	4627.78	23561.90	0.196 ✔

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	3/4	2.50	2.40	153.3	30.000	0.4418	266.75	13253.60	0.020 ✔

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T18	5.25 - 0	3/4	3.28	3.05	195.3	30.000	0.4418	62.18	13253.60	0.005 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	3/4	2.50	2.40	153.3	30.000	0.4418	162.40	13253.60	0.012 ✔
T1	330 - 320	1	5.00	4.81	231.0	30.000	0.7854	6348.36	23561.90	0.269 ✔
T2	320 - 300	1	5.00	4.81	231.0	30.000	0.7854	643.11	23561.90	0.027 ✔
T3	300 - 280	1	5.00	4.81	231.0	30.000	0.7854	954.30	23561.90	0.041 ✔
T4	280 - 260	1	5.00	4.81	231.0	30.000	0.7854	1677.04	23561.90	0.071 ✔
T5	260 - 240	1	5.00	4.81	231.0	30.000	0.7854	1152.50	23561.90	0.049 ✔
T6	240 - 220	1	5.00	4.81	231.0	30.000	0.7854	469.79	23561.90	0.020 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T7	220 - 200	1 1/4	5.00	4.79	184.0	30.000	1.2272	1287.43	36815.50	0.035 ✔
T8	200 - 180	1 1/2	5.00	4.77	152.7	30.000	1.7672	3268.62	53014.40	0.062 ✔
T9	180 - 160	1 1/2	5.00	4.77	152.7	30.000	1.7672	5375.90	53014.40	0.101 ✔
T10	160 - 140	1 1/4	5.00	4.77	183.2	30.000	1.2272	1911.20	36815.50	0.052 ✔
T11	140 - 120	1 1/4	5.00	4.77	183.2	30.000	1.2272	563.51	36815.50	0.015 ✔
T12	120 - 100	1 1/4	5.00	4.77	183.2	30.000	1.2272	1451.56	36815.50	0.039 ✔
T13	100 - 80	1 1/4	5.00	4.77	183.2	30.000	1.2272	3263.57	36815.50	0.089 ✔
T14	80 - 60	1 1/4	5.00	4.77	183.2	30.000	1.2272	2077.78	36815.50	0.056 ✔
T15	60 - 40	1 1/4	5.00	4.77	183.2	30.000	1.2272	794.20	36815.50	0.022 ✔
T16	40 - 20	1 1/4	5.00	4.77	183.2	30.000	1.2272	1264.47	36815.50	0.034 ✔
T17	20 - 5.25	1 1/4	5.00	4.77	183.2	30.000	1.2272	2233.07	36815.50	0.061 ✔
T18	5.25 - 0	6 x 3/4	4.92	4.69	260.0	21.600	4.5000	28781.10	97200.00	0.296 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	3/4	2.50	2.40	153.3	30.000	0.4418	753.50	13253.60	0.057 ✔
T1	330 - 320	1	5.00	4.81	231.0	30.000	0.7854	851.02	23561.90	0.036 ✔
T2	320 - 300	1	5.00	4.81	231.0	30.000	0.7854	3999.05	23561.90	0.170 ✔
T3	300 - 280	1	5.00	4.81	231.0	30.000	0.7854	1566.79	23561.90	0.066 ✔
T4	280 - 260	1	5.00	4.81	231.0	30.000	0.7854	1311.03	23561.90	0.056 ✔
T5	260 - 240	1	5.00	4.81	231.0	30.000	0.7854	582.92	23561.90	0.025 ✔
T6	240 - 220	1	5.00	4.81	231.0	30.000	0.7854	854.00	23561.90	0.036 ✔
T7	220 - 200	1 1/4	5.00	4.79	184.0	30.000	1.2272	2051.30	36815.50	0.056 ✔
T9	180 - 160	1 1/2	5.00	4.77	152.7	30.000	1.7672	2355.88	53014.40	0.044 ✔
T10	160 - 140	1 1/4	5.00	4.77	183.2	30.000	1.2272	882.70	36815.50	0.024 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	140 - 120	1 1/4	5.00	4.77	183.2	30.000	1.2272	1474.44	36815.50	0.040 ✓
T12	120 - 100	1 1/4	5.00	4.77	183.2	30.000	1.2272	16577.70	36815.50	0.450 ✓
T13	100 - 80	1 1/4	5.00	4.77	183.2	30.000	1.2272	2355.10	36815.50	0.064 ✓
T14	80 - 60	1 1/4	5.00	4.77	183.2	30.000	1.2272	1228.46	36815.50	0.033 ✓
T15	60 - 40	1 1/4	5.00	4.77	183.2	30.000	1.2272	664.34	36815.50	0.018 ✓
T16	40 - 20	1 1/4	5.00	4.77	183.2	30.000	1.2272	1682.38	36815.50	0.046 ✓
T17	20 - 5.25	1 1/4	5.00	4.77	183.2	30.000	1.2272	9948.09	36815.50	0.270 ✓

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	330 - 320	1	5.00	4.81	231.0	30.000	0.7854	737.36	23561.90	0.031 ✓
T2	320 - 300	1	5.00	4.81	231.0	30.000	0.7854	874.54	23561.90	0.037 ✓
T3	300 - 280	1	5.00	4.81	231.0	30.000	0.7854	292.36	23561.90	0.012 ✓
T4	280 - 260	1	5.00	4.81	231.0	30.000	0.7854	8429.69	23561.90	0.358 ✓
T5	260 - 240	1	5.00	4.81	231.0	30.000	0.7854	382.11	23561.90	0.016 ✓
T6	240 - 220	1	5.00	4.81	231.0	30.000	0.7854	410.01	23561.90	0.017 ✓
T7	220 - 200	1 1/4	5.00	4.79	184.0	30.000	1.2272	447.83	36815.50	0.012 ✓
T8	200 - 180	1 1/2	5.00	4.77	152.7	30.000	1.7672	770.88	53014.40	0.015 ✓
T9	180 - 160	1 1/2	5.00	4.77	152.7	30.000	1.7672	598.93	53014.40	0.011 ✓
T10	160 - 140	1 1/4	5.00	4.77	183.2	30.000	1.2272	852.74	36815.50	0.023 ✓
T11	140 - 120	1 1/4	5.00	4.77	183.2	30.000	1.2272	999.27	36815.50	0.027 ✓
T12	120 - 100	1 1/4	5.00	4.77	183.2	30.000	1.2272	859.71	36815.50	0.023 ✓
T13	100 - 80	1 1/4	5.00	4.77	183.2	30.000	1.2272	1082.46	36815.50	0.029 ✓
T14	80 - 60	1 1/4	5.00	4.77	183.2	30.000	1.2272	1292.95	36815.50	0.035 ✓
T15	60 - 40	1 1/4	5.00	4.77	183.2	30.000	1.2272	1380.25	36815.50	0.037 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T16	40 - 20	1 1/4	5.00	4.77	183.2	30.000	1.2272	1308.85	36815.50	0.036 ✔
T17	20 - 5.25	1 1/4	5.00	4.77	183.2	30.000	1.2272	1250.22	36815.50	0.034 ✔
T18	5.25 - 0	6 x 3/4	2.46	2.23	123.7	21.600	4.5000	7641.37	97200.00	0.079 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T8	200 - 180	1 1/2	5.00	4.77	152.7	30.000	1.7672	17450.40	53014.40	0.329 ✔

Bottom 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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160	1 1/2	5.00	4.77	152.7	30.000	1.7672	14211.20	53014.40	0.268 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160 (1089)	2L4x4x3/8	8.65	7.91	83.3	21.600	5.7200	37194.80	123552.00	0.301 ✔
T9	180 - 160 (1090)	2L4x4x3/8	8.65	7.91	83.3	21.600	5.7200	37680.80	123552.00	0.305 ✔
T9	180 - 160 (1098)	2L4x4x3/8	8.65	7.91	83.3	21.600	5.7200	37606.30	123552.00	0.304 ✔
T9	180 - 160 (1099)	2L4x4x3/8	8.65	7.91	83.3	21.600	5.7200	33582.40	123552.00	0.272 ✔
T9	180 - 160 (1104)	2L4x4x3/8	8.65	7.91	83.3	21.600	5.7200	35179.20	123552.00	0.285 ✔
T9	180 - 160 (1105)	2L4x4x3/8	8.65	7.91	83.3	21.600	5.7200	39673.30	123552.00	0.321 ✔

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160 (1091)	2L4x4x3/8	9.13	8.38	87.8	21.600	5.7200	19493.90	123552.00	0.158 ✔
T9	180 - 160 (1092)	2L4x4x3/8	9.13	8.38	87.8	21.600	5.7200	18819.50	123552.00	0.152 ✔
T9	180 - 160 (1100)	2L4x4x3/8	9.13	8.38	87.8	21.600	5.7200	19256.60	123552.00	0.156 ✔
T9	180 - 160 (1101)	2L4x4x3/8	9.13	8.38	87.8	21.600	5.7200	19189.00	123552.00	0.155 ✔
T9	180 - 160 (1106)	2L4x4x3/8	9.13	8.38	87.8	21.600	5.7200	20487.60	123552.00	0.166 ✔
T9	180 - 160 (1107)	2L4x4x3/8	9.13	8.38	87.8	21.600	5.7200	20182.40	123552.00	0.163 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	347 - 330	Latticed Pole Leg	1 1/4	2	-11997.20	29406.09	40.8	Pass
L1	347 - 330	Latticed Pole Diagonal	1/2	13	-2277.41	2961.83	76.9	Pass
L1	347 - 330	Latticed Pole Horizontal	3/4	23	-191.66	6106.81	3.1	Pass
L1	347 - 330	Latticed Pole Top Girt	3/4	5	-166.90	6106.81	2.7	Pass
L1	347 - 330	Latticed Pole Bottom Girt	3/4	9	-644.73	6106.81	10.6	Pass
T1	330 - 320	Leg	2 1/4	80	-28242.90	129609.98	21.8	Pass
T2	320 - 300	Leg	2 1/4	115	-33000.80	129061.05	25.6	Pass
T3	300 - 280	Leg	2 1/4	177	-39568.70	129061.05	30.7	Pass
T4	280 - 260	Leg	2 1/4	237	-57431.10	129061.05	44.5	Pass
T5	260 - 240	Leg	2 1/4	297	-53425.40	129061.05	41.4 43.2 (b)	Pass
T6	240 - 220	Leg	2 1/4	355	-54922.10	129061.05	42.6	Pass
T7	220 - 200	Leg	2 1/2	416	-73436.70	163889.68	44.8	Pass
T8	200 - 180	Leg	2 3/4	476	-160596.00	202152.11	79.4	Pass
T9	180 - 160	Leg	2 3/4	536	-160602.00	203559.76	78.9	Pass
T10	160 - 140	Leg	2 3/4	597	-96667.50	197345.31	49.0 54.3 (b)	Pass
T11	140 - 120	Leg	2 3/4	657	-97545.50	197353.31	49.4 57.5 (b)	Pass
T12	120 - 100	Leg	2 3/4	716	-113526.00	197415.96	57.5	Pass
T13	100 - 80	Leg	2 3/4	777	-126741.00	197753.21	64.1 67.4 (b)	Pass
T14	80 - 60	Leg	2 3/4	837	-153263.00	198603.66	77.2	Pass
T15	60 - 40	Leg	2 3/4	897	-158009.00	198654.32	79.5 91.1 (b)	Pass
T16	40 - 20	Leg	2 3/4	957	-156443.00	198571.67	78.8 92.9 (b)	Pass
T17	20 - 5.25	Leg	2 3/4	1017	-138995.00	198425.04	70.0 82.6 (b)	Pass
T18	5.25 - 0	Leg	2 3/4	1065	-131481.00	190982.90	68.8	Pass
T1	330 - 320	Diagonal	7/8	108	-3266.48	10060.78	32.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T2	320 - 300	Diagonal	7/8	127	-6030.53	10012.78	60.2	Pass
T3	300 - 280	Diagonal	7/8	187	-8244.50	10012.78	82.3	Pass
T4	280 - 260	Diagonal	7/8	289	-8982.73	10012.78	89.7	Pass
T5	260 - 240	Diagonal	7/8	351	-7448.32	10012.78	74.4	Pass
T6	240 - 220	Diagonal	7/8	371	-6685.09	10012.78	66.8	Pass
T7	220 - 200	Diagonal	1	431	-9102.89	16517.20	55.1	Pass
T8	200 - 180	Diagonal	1 1/4	497	-11697.50	28483.41	41.1	Pass
T9	180 - 160	Diagonal	1 1/4	579	-8467.39	28483.41	29.7	Pass
T10	160 - 140	Diagonal	1	651	-5536.78	16625.18	33.3	Pass
T11	140 - 120	Diagonal	1	672	-3169.25	16625.18	19.1	Pass
T12	120 - 100	Diagonal	1	738	-4950.04	16625.18	29.8	Pass
T13	100 - 80	Diagonal	1	832	-8015.66	16625.18	48.2	Pass
T14	80 - 60	Diagonal	1	891	-5162.08	16625.18	31.0	Pass
T15	60 - 40	Diagonal	1	954	-2079.47	16625.18	12.5	Pass
T16	40 - 20	Diagonal	1	972	-4068.32	16625.18	24.5	Pass
T17	20 - 5.25	Diagonal	1	1062	-4502.25	16733.68	26.9	Pass
T18	5.25 - 0	Diagonal	1 1/4	1075	-7512.77	27869.70	27.0	Pass
T18	5.25 - 0	Secondary Horizontal	3/4	1078	-109.63	4706.30	2.3	Pass
T1	330 - 320	Top Girt	1	82	6348.36	31408.01	20.2	Pass
T2	320 - 300	Top Girt	1	120	-597.37	5979.30	10.0	Pass
T3	300 - 280	Top Girt	1	179	-357.70	5979.30	6.0	Pass
T4	280 - 260	Top Girt	1	239	-1257.43	5979.30	21.0	Pass
T5	260 - 240	Top Girt	1	299	-757.57	5979.30	12.7	Pass
T6	240 - 220	Top Girt	1	359	-212.23	5979.30	3.5	Pass
T7	220 - 200	Top Girt	1 1/4	418	-774.61	14725.12	5.3	Pass
T8	200 - 180	Top Girt	1 1/2	478	-2537.32	30801.10	8.2	Pass
T9	180 - 160	Top Girt	1 1/2	540	-4935.48	30801.10	16.0	Pass
T10	160 - 140	Top Girt	1 1/4	598	-1489.83	14854.02	10.0	Pass
T11	140 - 120	Top Girt	1 1/4	659	563.51	49075.06	1.1	Pass
T12	120 - 100	Top Girt	1 1/4	718	-860.07	14854.02	5.8	Pass
T13	100 - 80	Top Girt	1 1/4	778	-1400.94	14854.02	9.4	Pass
T14	80 - 60	Top Girt	1 1/4	838	-1233.46	14854.02	8.3	Pass
T15	60 - 40	Top Girt	1 1/4	899	794.20	49075.06	1.6	Pass
T16	40 - 20	Top Girt	1 1/4	959	1264.47	49075.06	2.6	Pass
T17	20 - 5.25	Top Girt	1 1/4	1018	-1034.58	14854.02	7.0	Pass
T18	5.25 - 0	Top Girt	6 x 3/4	1068	28781.10	129567.59	22.2	Pass
T1	330 - 320	Bottom Girt	1	86	-707.63	5979.30	11.8	Pass
T2	320 - 300	Bottom Girt	1	122	3999.05	31408.01	12.7	Pass
T3	300 - 280	Bottom Girt	1	181	-1345.00	5979.30	22.5	Pass
T4	280 - 260	Bottom Girt	1	243	-836.55	5979.30	14.0	Pass
T5	260 - 240	Bottom Girt	1	303	-380.20	5979.30	6.4	Pass
T6	240 - 220	Bottom Girt	1	363	-685.59	5979.30	11.5	Pass
T7	220 - 200	Bottom Girt	1 1/4	423	-1909.63	14725.12	13.0	Pass
T9	180 - 160	Bottom Girt	1 1/2	543	-1312.12	30801.10	4.3	Pass
T10	160 - 140	Bottom Girt	1 1/4	601	882.70	49075.06	1.8	Pass
T11	140 - 120	Bottom Girt	1 1/4	662	-585.49	14854.02	3.9	Pass
T12	120 - 100	Bottom Girt	1 1/4	722	16577.70	49075.06	33.8	Pass
T13	100 - 80	Bottom Girt	1 1/4	782	-1569.24	14854.02	10.6	Pass
T14	80 - 60	Bottom Girt	1 1/4	842	-459.27	14854.02	3.1	Pass
T15	60 - 40	Bottom Girt	1 1/4	901	664.34	49075.06	1.4	Pass
T16	40 - 20	Bottom Girt	1 1/4	962	-843.30	14854.02	5.7	Pass
T17	20 - 5.25	Bottom Girt	1 1/4	1023	9948.09	49075.06	20.3	Pass
T1	330 - 320	Mid Girt	1	90	737.36	31408.01	2.3	Pass
T2	320 - 300	Mid Girt	1	125	-441.16	5979.30	7.4	Pass
T3	300 - 280	Mid Girt	1	186	292.36	31408.01	0.9	Pass
T4	280 - 260	Mid Girt	1	244	8429.69	31408.01	26.8	Pass
T5	260 - 240	Mid Girt	1	305	382.11	31408.01	1.2	Pass
T6	240 - 220	Mid Girt	1	365	410.01	31408.01	1.3	Pass
T7	220 - 200	Mid Girt	1 1/4	424	447.83	49075.06	0.9	Pass
T8	200 - 180	Mid Girt	1 1/2	486	770.88	70668.19	1.1	Pass
T9	180 - 160	Mid Girt	1 1/2	546	598.93	70668.19	0.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
T10	160 - 140	Mid Girt	1 1/4	605	852.74	49075.06	1.7	Pass
T11	140 - 120	Mid Girt	1 1/4	664	999.27	49075.06	2.0	Pass
T12	120 - 100	Mid Girt	1 1/4	724	859.71	49075.06	1.8	Pass
T13	100 - 80	Mid Girt	1 1/4	785	1082.46	49075.06	2.2	Pass
T14	80 - 60	Mid Girt	1 1/4	845	1292.95	49075.06	2.6	Pass
T15	60 - 40	Mid Girt	1 1/4	905	1380.25	49075.06	2.8	Pass
T16	40 - 20	Mid Girt	1 1/4	965	1308.85	49075.06	2.7	Pass
T17	20 - 5.25	Mid Girt	1 1/4	1026	1250.22	49075.06	2.5	Pass
T18	5.25 - 0	Mid Girt	6 x 3/4	1071	7641.37	129567.59	5.9	Pass
T1	330 - 320	Guy A@329.5	11/16	1083	26622.20	29000.00	91.8	Pass
T2	320 - 300	Guy A@300.25	9/16	1113	16660.40	17500.00	95.2	Pass
T4	280 - 260	Guy A@269.625	13/16	1086	35712.60	40000.00	89.3	Pass
T9	180 - 160	Guy A@178	7/8	1103	39180.50	46000.00	85.2	Pass
T12	120 - 100	Guy A@100.26	7/8	1110	38612.90	46000.00	83.9	Pass
T1	330 - 320	Guy B@329.5	11/16	1082	26294.10	29000.00	90.7	Pass
T2	320 - 300	Guy B@300.25	9/16	1112	16396.40	17500.00	93.7	Pass
T4	280 - 260	Guy B@269.625	13/16	1085	35253.90	40000.00	88.1	Pass
T9	180 - 160	Guy B@178	7/8	1096	38061.10	46000.00	82.7	Pass
T12	120 - 100	Guy B@100.26	7/8	1109	36953.80	46000.00	80.3	Pass
T1	330 - 320	Guy C@329.5	11/16	1081	25692.70	29000.00	88.6	Pass
T2	320 - 300	Guy C@300.25	9/16	1111	16026.30	17500.00	91.6	Pass
T4	280 - 260	Guy C@269.625	13/16	1084	34343.10	40000.00	85.9	Pass
T9	180 - 160	Guy C@178	7/8	1087	36233.60	46000.00	78.8	Pass
T12	120 - 100	Guy C@100.26	7/8	1108	35837.40	46000.00	77.9	Pass
T8	200 - 180	Top Guy Pull-Off@178	1 1/2	481	-7848.52	30801.10	25.5	Pass
T9	180 - 160	Bottom Guy Pull-Off@178	1 1/2	1095	-19641.20	30801.10	63.8	Pass
T9	180 - 160	Torque Arm Top@178	2L4x4x3/8	1105	39673.30	164694.81	24.1 45.1 (b)	Pass
T9	180 - 160	Torque Arm Bottom@178	2L4x4x3/8	1107	-57974.90	98121.32	59.1 65.9 (b)	Pass
						Summary		
						Latticed Pole Leg (L1)	40.8	Pass
						Latticed Pole Diagonal (L1)	76.9	Pass
						Latticed Pole Horizontal (L1)	3.1	Pass
						Latticed Pole Top Girt (L1)	2.7	Pass
						Latticed Pole Bottom Girt (L1)	10.6	Pass
						Leg (T16)	92.9	Pass
						Diagonal (T4)	89.7	Pass
						Secondary Horizontal (T18)	2.3	Pass
						Top Girt (T18)	22.2	Pass
						Bottom Girt (T12)	33.8	Pass
						Mid Girt	26.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
						(T4)		
						Guy A (T2)	95.2	Pass
						Guy B (T2)	93.7	Pass
						Guy C (T2)	91.6	Pass
						Top Guy Pull-Off (T8)	25.5	Pass
						Bottom Guy Pull-Off (T9)	63.8	Pass
						Torque Arm Top (T9)	45.1	Pass
						Torque Arm Bottom (T9)	65.9	Pass
						Bolt Checks	92.9	Pass
						RATING =	**95.2**	**Pass**

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Job :	Verizon ~ Ledyard: 347-ft Guyed Lattice Tower	**Project No.**	15001.037	**Sheet**	1	of	2
Address:	889 Colonel Ledyard Hwy., Ledyard, CT	**Computed by**	TJL	**Date**		5/14/15	
Description:	Guy Anchor Evaluation - 2005 CSBC 3108.4.2/TIA Req	**Checked by**	CFC	**Date**			

CHECK UPLIFT RESISTANCE

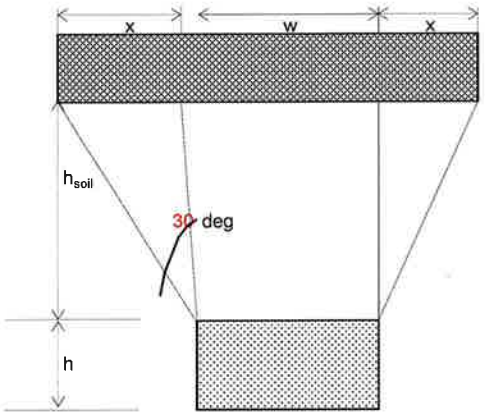
ANCHOR (A) AT 220.0ft RADIUS

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	132	kips
Sliding =	133	kips
Wdepth =	50	ft

CONCRETE PARAMETERS:

γ conc =	150	pcf
γ conc.sub =	87.6	pcf
w =	4.5	ft
h =	4.5	ft
d =	20.5	ft
Vol. =	*415.13*	ft^3
Vol.sub =	*0.00*	ft^3
Wc =	*62.27*	kips



Foundation Section

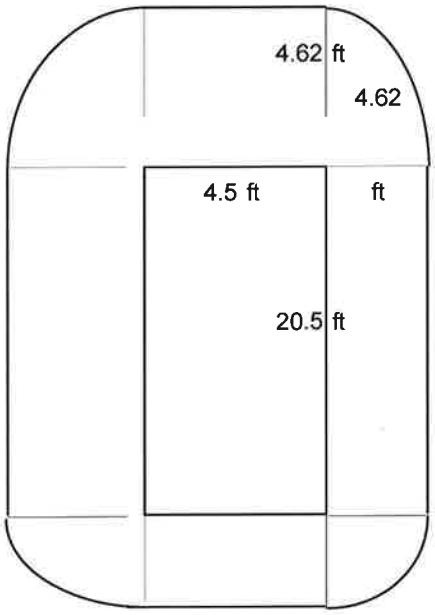
SOIL PARAMETERS:

γ_{soil} =	110	pcf
$\gamma_{soil.sub}$ =	60	pcf
h_{soil} =	8	ft
x =	*4.62*	ft

Soil Weight (Wr):

B1 =	92.25
B2 =	92.25
B3 =	408.52

W.soil =	203.84	kips
W.soil.sub =	0.00	kips
Total =	*203.84*	kips



Foundation Plan View

CHECK UPLIFT (PER EIA/TIA-222-F STANDARD AND 2005 CT BUILDING CODE):

SF AGAINST SLIDING

2.02 > *2* ***OK***

→ ***GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE***

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Job :	Verizon ~ Ledyard: 347-ft Guyed Lattice Tower	**Project No.**	15001.037	**Sheet**	2 of 2
Address:	889 Colonel Ledyard Rd., Ledyard, CT	**Computed by**	TJL	**Date**	5/14/15
Description:	Guy Anchor Evaluation - 2005 CSBC 3108.4.2/TIA Req	**Checked by**	CFC	**Date**	

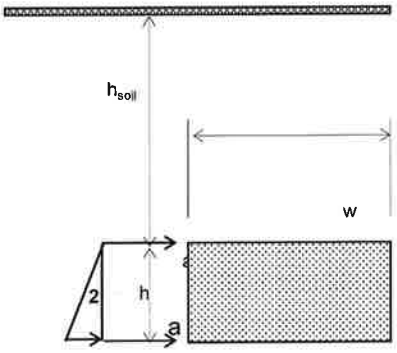
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

γ soil =	110	pcf
γ soil =	60	pcf
h_{soil} =	8	ft
h =	4.5	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	4.5	ft
h =	4.5	ft
d =	20.5	ft



Foundation Elevation View

K_p = 3.00

HORIZONTAL FORCES

	2.64	ksf
	4.13	ksf
RESIST TO SLIDING =	312.04	k

SOIL & CONCRETE WEIGHT =	Wr + Wc = 266.11	k
UPLIFT REACTIONS =	-132	k
SUM =	134.11	k

COEF. OF FRICTION, (0.45) =	60.35	k
RESIST TO SLIDING =	312.04	k
SUM =	372.38	k

SF AGAINST SLIDING

SF = 2.8 > 2 OK

→ ***GUY ANCHORS AGAINST SLIDING ARE ADEQUATE***

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Subject:		Base Foundation Analysis
Location:		347-ft Guyed Lattice Tower Ledyard, CT
Rev. 0: 5/14/15		Prepared by: T.J.L. Checked by: C.F.C. Job No. 15001.037

Guyed Tower Foundation:

Input Data:

Tower Data

Shear Force =	Shear := 7.21·kip	(User Input from tnxTower)	
Axial Force =	Axial := 317.3·kip	(User Input from tnxTower)	
Axial Force =	Moment := 0·kip·ft	(User Input from tnxTower)	
Tower Height =	H_t := 347·ft	(User Input)	

Footing Data:

Overall Depth of Footing =	D_f := 4.0·ft	(User Input)	
Length of Pier =	L_p := 2.0·ft	(User Input)	
Extension of Pier Above Grade =	L_{pag} := 0.5·ft	(User Input)	
Width of Pier =	d_p := 3.5·ft	(User Input)	
Thickness of Footing =	T_f := 2.5·ft	(User Input)	
Width of Footing =	W_f := 9.5·ft	(User Input)	

Material Properties:

Concrete Compressive Strength =	f_c := 3000·psi	(User Input)	
Steel Reinforcement Yield Strength =	f_y := 60000·psi	(User Input)	
Internal Friction Angle of Soil =	Φ_s := 30·deg	(User Input)	
Allowable Soil Bearing Capacity =	q_s := 10000·psf	(User Input)	
Unit Weight of Soil =	γ_{soil} := 120·pcf	(User Input)	
Unit Weight of Concrete =	γ_{conc} := 150·pcf	(User Input)	
Foundation Bouyancy =	Bouyancy := 0	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	n := 0·ft	(User Input)	
Cohesion of Clay Type Soil =	c := 0·ksf	(User Input)	(Use 0 for Sandy Soil)
Coefficient of Friction Between Concrete =	μ := 0.45	(User Input)	
Overturning/Sliding Factor of Safety Required =	FS_{req} := 2	(User Input)	

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 =

$$\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 120\cdot pcf$$

Passive Pressure =

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

$$P_{pt} := K_p\cdot\gamma_s\cdot(D_f - T_f) + c\cdot 2\cdot\sqrt{K_p} = 0.54\cdot ksf$$

$$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 0.54\cdot ksf$$

$$P_{bot} := K_p\cdot\gamma_s\cdot D_f + c\cdot 2\cdot\sqrt{K_p} = 1.44\cdot ksf$$

$$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0.99\cdot ksf$$

$$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 2.5$$

$$A_p := W_f\cdot T_p = 23.75$$

Ultimate Shear =

$$S_u := P_{ave}\cdot A_p = 23.513\cdot kip$$

Weight of Concrete =

$$WT_c := \left[\left(W_f^2\cdot T_f\right) + d_p^2 L_p\right]\cdot\gamma_c = 37.52\cdot kip$$

Total Weight =

$$WT_{tot} := WT_c + Axial = 354.82\cdot kip$$

Resisting Moment =

$$M_r := (WT_{tot})\cdot\frac{W_f}{2} + S_u\cdot\frac{T_f}{3} = 1705\cdot kip\cdot ft$$

Overturning Moment =

$$M_{ot} := Moment + Shear\cdot(L_p + T_f) = 32\cdot kip\cdot ft$$

Factor of Safety Actual =

$$FS := \frac{M_r}{M_{ot}} = 52.55$$

Factor of Safety Required =

$$FS_{req} := 2$$

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

OverTurning_Moment_Check = "Okay"

Soil/Concrete Friction Resistance = $Sl_2 := \mu \cdot WT_{tot} = 159.67 \cdot kips$

Total Sliding Resistance = $Sl_{tot} := S_u + Sl_2 = 183.18 \cdot kips$

Factor of Safety Actual = $FS := \frac{Sl_{tot}}{Shear} = 25.41$

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

Sliding_Resistance_Check = "Okay"

Bearing Pressure Caused by Footing:

Overturning Moment = $M_{ot} := Moment + Shear \cdot (L_p + T_f) = 32 \cdot kip \cdot ft$

Area of the Mat = $A_{mat} := W_f^2 = 90.25$

Section Modulus of Mat = $S := \frac{W_f^3}{6} = 142.9 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{WT_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 4.159 \cdot ksf$

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

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{WT_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = 3.704 \cdot ksf$

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

Min_Pressure_Check = "Okay"

SITE NAME	LEDYARD CT	ECP - CELL #	2	90
LATITUDE	41-27-43.15 N	LONGITUDE	72-01-24.99 W	
Additional Comments: 2015 AWS ADD.		SAVE BUTTON		
		STRUCTURE TYPE	Guy Tower	

AWS - LTE ANTENNA ADD	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	2100 MHz BBU	2100 MHz BBU	2100 MHz BBU
ANTENNA TYPE	HBXX-6517DS-VTM	HBXX-6517DS-VTM	HBXX-6517DS-VTM
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	60	180	300
DOWN TILT (MECH/ELEC)	0M/3E	0M/3E	0M/3E
RAD CTR (FT AGL)	180	180	180
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			
RRH - QTY/MODEL	1 ALU RH_2X60-AWS	1 ALU RH_2X60-AWS	1 ALU RH_2X60-AWS
SECTOR DISTRIBUTION BOX			
MAIN DISTRIBUTION BOX	2		DB-T1-6Z-8AB-0Z

700 Mhz - LTE Current Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	eNodeB	eNodeB	eNodeB
ANTENNA TYPE	BXA-70063-6CF_2	BXA-70063-6CF_2	BXA-70063-6CF_2
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	60	180	300
DOWN TILT (MECH/DEG)	2	0	2
RAD CTR (FT AGL)	180	180	180
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			

700 Mhz - LTE Future Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	eNodeB	eNodeB	eNodeB
ANTENNA TYPE	LNX-6514DS-VTM	LNX-6514DS-VTM	LNX-6514DS-VTM
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	60	180	300
DOWN TILT (MECH/DEG)	0M/6E	0M/6E	0M/7E
RAD CTR (FT AGL)	180	180	180
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			

850 Celluar - Current Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	Cellular Modcell 4.0B	Cellular Modcell 4.0B	Cellular Modcell 4.0B
ANTENNA TYPE	LPA-80080/4CF	LPA-80063/4CF	LPA-80063/4CF
QTY OF ANTENNAS PER FACE	2	2	2
ORIENTATION (DEG)	60	180	300
DOWN TILT (MECH/DEG)	6	2	6
RAD CTR (FT AGL)	180	180	180
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			

850 Celluar - Future Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	Cellular Modcell 4.0B	Cellular Modcell 4.0B	Cellular Modcell 4.0B
ANTENNA TYPE	LNX-6514DS-VTM	LNX-6514DS-VTM	LNX-6514DS-VTM
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	60	180	300
DOWN TILT (MECH/ELEC)	0M/6E	0M/2E	0M/6E
RAD CTR (FT AGL)	180	180	180
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			
DIPLEX WITH LTE CABLE			

1900 PCS - Current Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	PCS Modcell 4.0B	PCS Modcell 4.0B	PCS Modcell 4.0B
ANTENNA TYPE	LPA-171085-12CF EDIN 2	LPA-171085-12CF EDIN 2	LPA-171085-12CF EDIN 2
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	60	180	300
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	180	180	180
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			

1900 PCS - Future Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	PCS Modcell 4.0B	PCS Modcell 4.0B	PCS Modcell 4.0B
ANTENNA TYPE	HBXX-6517DS-VTM	HBXX-6517DS-VTM	HBXX-6517DS-VTM
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	60	180	300
DOWN TILT (MECH/DEG)	0M/3E	0M/3E	0M/3E
RAD CTR (FT AGL)	180	180	180
RRH - QTY/MODEL	1 ALU RRH_2X60-PCS	1 ALU RRH_2X60-PCS	1 ALU RRH_2X60-PCS
TMA - QTY / MODEL			
DIPLEX WITH CELLULAR CABLE			

NUMBER OF CABLE'S NEEDED						ESTIMATED CABLE LENGTH			
MAINLINE SIZE	1 5/8"	TOTAL # OF MAINLINES			18	MAINLINE (FT)			
JUMPER SIZE	1/2 "	TOTAL # OF TOP JUMPERS			18	TOP JUMPER (FT)			12
Equipment Cable Ordering		MAIN CABLE	18	+	0	TOP JUMPER #	18	+	0
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			3	TOP JUMPER MODEL #			HB058-1-08U1-S1J18
Fiber Cable Ordering		FIBER CABLE	0	+	2	TOP JUMPER #	0	+	3

TX / RX FREQUENCIES			TX POWER OUTPUT	
Cellular A-Band	PCS F / AWS-Band	700 Mhz C - E	Cellular (Watts)	20
TX - 869-880,890-891.5 MHz	TX - 1970-1975 / 2145-21	TX - 746-757	PCS (Watts)	16
RX - 824-835,845-846.5 MHz	RX - 1890-1895 / 1745-17	RX - 776-787	LTE (Watts)	60

ALPHA				BETA				GAMMA			
Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code
A1	800	Tx1/Rx0	RED	A7	800	Tx2/Rx0	BLUE	A13	800	Tx3/Rx0	GREEN
A2	1900	Tx1/Rx0	RED/ WHITE	A8	1900	Tx2/Rx0	BLUE/ WHITE	A14	1900	Tx3/Rx0	GREEN/WHITE
A3	700	Tx1/Rx0	RED/ ORANGE	A9	700	Tx2/Rx0	BLUE/ ORANGE	A15	700	Tx3/Rx0	GREEN/ORANGE
A4	700	Tx4/Rx1	RED/RED/ ORANGE	A10	700	Tx5/Rx1	BLUE/BLUE/ ORANGE	A16	700	Tx6/Rx1	GREEN/GREEN/ ORANGE
A5	1900	Tx4/Rx1	RED/RED/ WHITE	A11	1900	Tx5/Rx1	BLUE/BLUE/ WHITE	A17	1900	Tx6/Rx1	GREEN/GREEN/ WHITE
A6	800	Tx4/Rx1	RED/RED	A12	800	Tx5/Rx1	BLUE/BLUE	A18	800	Tx6/Rx1	GREEN/GREEN

RF ENGINEER	RF MANAGER	INITIALS	DATE
Prepared By: Mark Brauer	Rob Hesselbach	MB	3/12/2014

Site Configuration

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBXX-6517DS-VTM

Andrew® Quad Port Teletilt® Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression
- The values presented on this datasheet have been calculated based on N-P-BASTA White Paper version 9.6 by the NGMN Alliance

Electrical Specifications

Frequency Band, MHz	**1710–1880**	**1850–1990**	**1920–2180**
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 18.4 3 ° | 18.7 6 ° | 18.4	0 ° | 18.4 3 ° | 18.7 6 ° | 18.5	0 ° | 18.7 3 ° | 18.9 6 ° | 18.6
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® single band, quad
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz
Number of Ports, all types	4

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom

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Product Specifications

HBXX-6517DS-VTM

RF Connector Quantity, total	4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1903.0 mm | 74.9 in
Width	305.0 mm | 12.0 in
Net Weight	19.5 kg | 43.0 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	HBXX-6517DS-R2M
Model with Factory Installed AISG 2.0 Actuator	HBXX-6517DS-A2M
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

600899A-2 — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

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Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

LNX-6514DS-VTM

Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Excellent solution for site sharing and maximizing capacity
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**
Gain, dBi	15.7	16.3
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Horizontal Tolerance, degrees	±3	±3
Beamwidth, Vertical, degrees	12.5	11.2
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	17	18
Front-to-Back Ratio at 180°, dB	32	30
CPR at Boresight, dB	20	20
CPR at Sector, dB	10	10
Isolation, dB	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°
Impedance	50 ohm	50 ohm

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	698 – 896 MHz

Mechanical Specifications

Color	Light gray
Connector Interface	7-16 DIN Female
Connector Location	Bottom
Connector Quantity, total	2
Lightning Protection	dc Ground
Radiator Material	Aluminum
Radome Material	Fiberglass, UV resistant
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

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Product Specifications

LNX-6514DS-VTM

Dimensions

Depth	181.0 mm | 7.1 in
Length	1847.0 mm | 72.7 in
Width	301.0 mm | 11.9 in
Net Weight	17.6 kg | 38.8 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	LNX-6514DS-R2M
Model with Factory Installed AISG 2.0 Actuator	LNX-6514DS-A1M
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

DB380 — Pipe Mounting Kit for 2.4"-4.5" (60-115mm) OD round members on wide panel antennas. Includes 2 clamp sets and double nuts.

DB5083 — Downtilt Mounting Kit for 2.4"-4.5" (60 - 115 mm) OD round members. Includes a heavy-duty, galvanized steel downtilt mounting bracket assembly and associated hardware. This kit is compatible with the DB380 pipe mount kit for panel antennas that are equipped with two mounting brackets.

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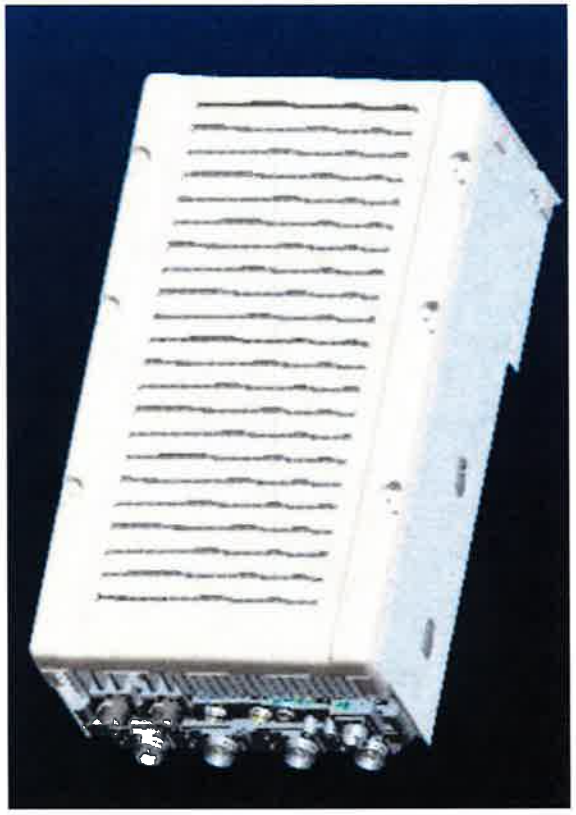
NEW PCS RF MODULES FOR VZW
RRH2X60 - HW CHARACTERISTICS

LR14.3

	RRH2x60
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w)x 9.4" (d)**
Weight	55lb**



**- Includes solar shield but not mounting brackets (8 lbs.)

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ALCATEL-LUCENT WIRELESS PRODUCT DATASHEET

RRH2X60-AWS FOR BAND 4 APPLICATIONS

The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.

A distributed Node B expands the 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 a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-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.

SUPERIOR RF PERFORMANCE

The Alcatel-Lucent RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

The Alcatel-Lucent RRH2x60-AWS is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

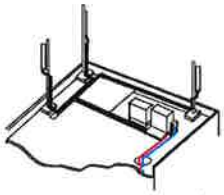
EASY INSTALLATION

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

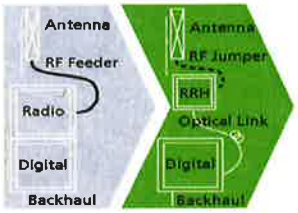
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

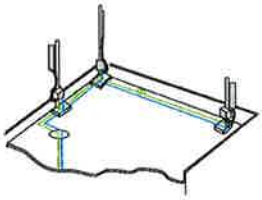
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : ~~510x285x186mm~~ 36.7"x10.6"x5.8" (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics

- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

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Alcatel·Lucent

AT THE SPEED OF IDEAS™

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.