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Also admitted in Massachusetts

April 22, 2014

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

Re: **Notice of Exempt Modification – Facility Modification**
88 Parsonage Hill Road, North Branford, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 145-foot level of the existing 195-foot tower at 88 Parsonage Hill Road in North Branford, Connecticut (the "Property"). The tower and the Property are owned by Ochenkowski Towers, LLC. The Council approved Cellco's use of this tower in 2006. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model LNX-6513DS-VTM, 1900 MHz antennas and three (3) model BXA-171063-12CF, 2100 MHz antennas, all at the same 145-foot level on the tower. Cellco also intends to install three (3) remote radio heads ("RRHs") behind its 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable outside one leg of the lattice tower. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cable.

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 Michael T. Paulhus, Town Manager for the Town of North Branford.

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 located at the 145-foot level on the 195-foot 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 modified facility 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 for 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:
Michael T. Paulhus, North Branford Town Manager
Ochenkowski Towers, LLC
Sandy M. Carter

ATTACHMENT 1

Product Specifications

LNX-6513DS-VTM

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

- Extended tilt range offers better coverage
- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- 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	14.6	15.1
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Horizontal Tolerance, degrees	±3	±3
Beamwidth, Vertical, degrees	16.0	14.5
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	20	20
Front-to-Back Ratio at 180°, dB	30	30
CPR at Boresight, dB	12	12
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	437.9 N @ 150 km/h 98.4 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	181.0 mm | 7.1 in

Product Specifications

LNX-6513DS-VTM

Length	1390.0 mm | 54.7 in
Width	301.0 mm | 11.9 in
Net Weight	14.1 kg | 31.1 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	LNX-6513DS-R2M
Model with Factory Installed AISG 2.0 Actuator	LNX-6513DS-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.

Amphenol ANTENNA SOLUTIONS

BXA-171063-12CF-EDIN-X

X-Pol | FET Panel | 63° | 19.0 dBi

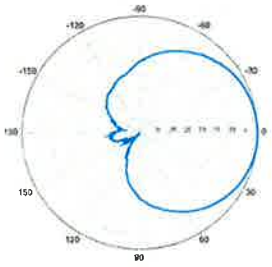
Replace "X" with desired electrical downtilt

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

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	< -25 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1842 x 154 x 105 mm		72.5 x 6.1 x 4.1 in
Depth with z-brackets	133 mm		5.2 in
Weight without mounting brackets	5.8 kg		12.8 lbs
Survival wind speed	> 201 km/hr		> 125 mph
Wind area	Front: 0.28 m² Side: 0.19 m²		Front: 3.1 ft² Side: 2.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N		Front: 103 lbf Side: 68 lbf

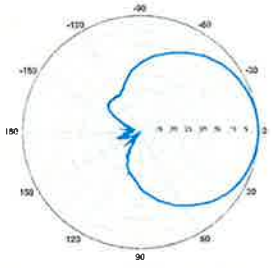
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12CF-EDIN-X-FP		

BXA-171063-12CF-EDIN-X



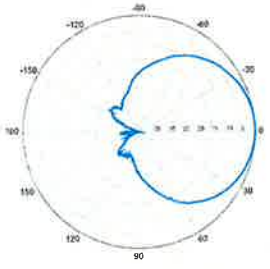
Horizontal | 1710-1880 MHz

BXA-171063-12CF-EDIN-X



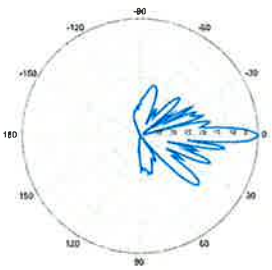
Horizontal | 1850-1990 MHz

BXA-171063-12CF-EDIN-X



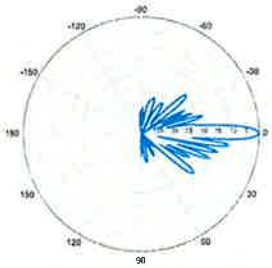
Horizontal | 1920-2170 MHz

BXA-171063-12CF-EDIN-0



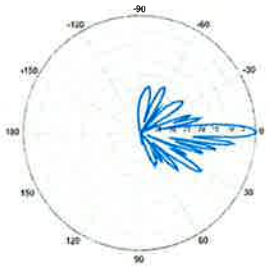
0° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-0



0° | Vertical | 1920-2170 MHz

Alcatel-Lucent RRH2x40-07-U

REMOTE RADIO HEAD

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

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

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

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

Fast, low-cost installation and deployment

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

Excellent RF performance

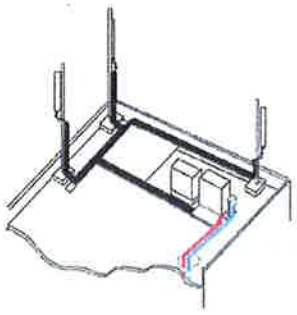
Because of its small size and weight, the Alcatel-Lucent RRH2x40-07-U can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-07-U where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and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

Features

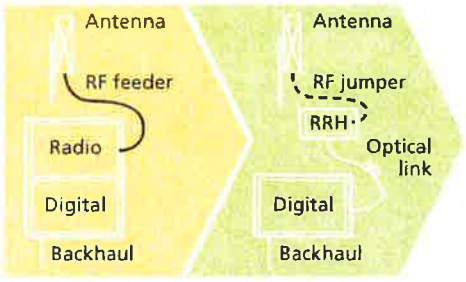
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless), noise-free, and heaterless unit
- Best-in-class power efficiency, with significantly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

Benefits

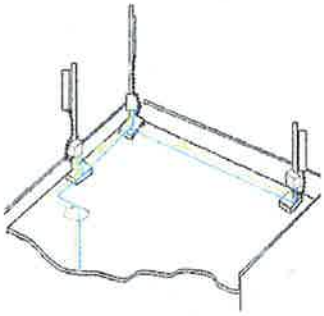
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

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

Power

- Power supply: -48V

Operating environment

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

RF characteristics

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

Optical characteristics

Type/number of fibers

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

Optical fiber length

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

Alarms and ports

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

CPG2809100913 (09)

Alcatel·Lucent

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.

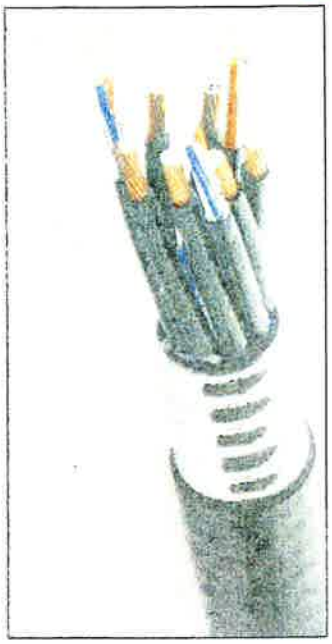


Figure 1: HYBRIFLEX Series

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
Mechanical Properties			
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)
Electrical Properties			
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)
Fiber Optic Properties			
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
Electrical Wire Properties			
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (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
Environment			
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

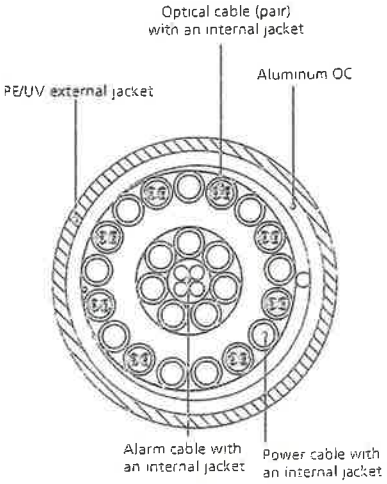


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Northford (North Branford)								
Tower Height: 195Ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Nextel	9	100	160	0.0126	850	0.5667	2.23%	
*Motient	4	381	140	0.0280	855	0.5700	4.90%	
*Sprint CDMA/LTE	4	693	190.5	0.0275	1900	1.0000	2.75%	
*Sprint CDMA/LTE	1	390	190.5	0.0039	850	0.5667	0.68%	
*T-Mobile	8	113	180	0.0100	1945	1.0000	1.00%	
*T-Mobile	2	639	180	0.0142	2100	1.0000	1.42%	
*AT&T UMTS	2	1077	173	0.0259	1900	1.0000	2.59%	
*AT&T UMTS	2	565	173	0.0136	880	0.5867	2.31%	
*AT&T GSM	1	283	173	0.0034	880	0.5867	0.58%	
*AT&T GSM	4	646	173	0.0310	1900	1.0000	3.10%	
*AT&T LTE	1	1313	173	0.0158	734	0.4893	3.22%	
Verizon	**7**	**237**	**145**	**0.0284**	**1970**	**1.0000**	**2.84%**	
Verizon	**9**	**283**	**145**	**0.0436**	**869**	**0.5793**	**7.52%**	
Verizon	**1**	**1828**	**145**	**0.0313**	**2145**	**1.0000**	**3.13%**	
Verizon	**1**	**828**	**145**	**0.0142**	**698**	**0.4653**	**3.04%**	
								41.32%
* Source: Siting Council								

ATTACHMENT 3

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

195' Existing Lattice Tower

Proposed Verizon Wireless
Antenna Upgrade

Verizon Site Ref: Northford

88 Parsonage Hill Road
Northford, CT

CENTEK Project No. 14001.031

Date: February 26, 2014

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

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

Table of Contents

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 lattice tower located in Northford (North Branford), Connecticut.

The host tower is a 195-ft, three legged, lattice tower originally designed and manufactured by Central Tower project no. F-722 dated 4/9/99. The tower geometry, structure member sizes and foundation information were taken from the aforementioned design documents.

Antenna and appurtenance inventory were taken from a previous structural report prepared by Centek Engineering project no. 14048.001 dated February 25, 2014 and a RF data sheet.

The tower consists of ten (10) vertical sections consisting of solid round pipe legs conforming to ASTM A529 Gr. 50 and steel angle lateral bracing conforming to ASTM A36. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 5-ft 0-in at the top and 23-ft 6-in at the bottom.

Verizon proposes the replacement of six (6) of the existing twelve (12) panel antennas and the installation of three (3) Remote Radio Heads (RRH's) and one (1) main distribution box mounted to the existing three (3) T-Frames. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing tower supports several communication antennas. The existing and proposed loads considered in the analysis consist of the following:

- Sprint (Existing):
  Antenna: Three (3) RFS APXVSPP18-C-A20 panel antennas, three (3) 1900MHz 4X45W RRH's and three (3) 800MHz 2X50W RRH's mounted on a 15-ft triangular platform with a RAD center elevation of ±190-ft above grade level.
  Coax Cable: Three (3) 1-1/4"∅ Hybriflex cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- T-MOBILE (Existing/Reserved):
  Antennas: Six (6) Ericsson AIR 21 panel antennas and three (3) TMA's mounted on three (3) 15-ft T-Frames with a RAD center elevation of ±180-ft above grade level.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables and one (1) 1-5/8" ∅ fiber cable running on a face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing):
  Antennas: One (1) Raycap DC6-48-60-18-8F surge arrestor leg mounted with an elevation of 175-ft above grade level.
  Coax Cables: One (1) fiber cable and two (2) dc control cables running inside of the existing tower.

- AT&T (Existing):
  Antenna: Three (3) Kathrein 800-10121 panel antennas, three (3) KMW AM-X-CD-16-65-00T panel antennas, six (6) Powerwave LGP21401TMA's and six (6) Ericsson RRUS-11 remote radio heads mounted on three (3) 12-ft T-Frames with a RAD center elevation of ±173-ft above grade level.
  Coax Cable: Six (6) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Nextel (Existing):
  Antenna: Twelve (12) Andrew DB844H90E-XY panel antennas mounted on three (3) 15-ft T-Frames with a RAD center elevation of ±160-ft above grade level.
  Coax Cable: Twelve (12) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Sprint (Existing):
  Antenna: One (1) GPS antenna on a 2-ft standoff with an elevation of ±80-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Verizon (Existing):
  Antenna: One (1) GPS antenna on a 2-ft standoff with an elevation of ±80-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Verizon (Existing to Remain):
  Antennas: Three (3) Antel BXA-171085/8BF panel antennas, three (3) Antel BXA-70063/6CF panel antennas and six (6) RFS FD9R6004/2C-3L Diplexers mounted on (3) 15-ft T-Frames with a RAD center elevation of ±145-ft above grade level.
  Coax Cable: Twelve (12) 1-5/8" ∅ coax cables coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Verizon (Existing to Remove):
  Antennas: Six (6) Antel LPA-80080/4CF panel antennas mounted on (3) 15-ft T-Frames with a RAD center elevation of ±145-ft above grade level.
- **Verizon (Proposed):**
  Antennas: Three (3) Antel BXA-171063-12CF panel antennas, three (3) Andrew LNX-6513DS panel antennas, three (3) Alcatel-Lucent RRH2x40-AWS Remote Radio Heads and one (1) RFS DB-T1-6Z-8AB-0Z man distribution box mounted on (3) 15-ft T-Frames with a RAD center elevation of ±145-ft above grade level.
  Coax Cables: One (1) 1-5/8" ∅ fiber cable running on a 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 should be 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 Haven; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Northford (North Branford); v = 110 mph (3 second gust) equivalent to v = 90 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	Appendix K wind speed controls.	
Load Cases:	Load Case 1; 90 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; 78 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 78 mph wind speed velocity represents 75% of the wind pressure generated by the 90 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 1, per tnxTower "Section Capacity Table", this tower was found to be at **72.7%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Diagonal (T10)	0'-0"-20'-0"	72.7%	**PASS**
Leg (T9)	20'-0"-40'-0"	58.2%	**PASS**

Foundation and Anchors

The existing foundation consists of a three (3) 3-ft ∅ x 4-ft long reinforced concrete piers concentrically bearing on a 34-ft square x 2-ft 6-in thick reinforced concrete mat. The sub grade conditions used in the foundation analysis were derived from the aforementioned design documents. The base of the tower is connected to the foundation by means of (8) 1.375"∅, ASTM A449 anchor bolts per leg embedded 5-ft 10-in into the concrete foundation structure.

- The tower reactions developed from the governing Load Case 1 were used in the verification of the foundation and anchor bolts:

Load Effect	Proposed Tower Reactions
Leg Shear	35 kips
Leg Compression	332 kips
Leg Tension	276 kips
Base Moment	6287 ft-kips
Base Shear	56 kips

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	49.7%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS)[4]	Proposed Loading (FS)[3]	Result
Reinforced Concrete Pad and Piers	Overturning	2.00	2.60	**PASS**

Note 3: FS denotes Factor of Safety

Conclusion

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

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principal ~ Structural Engineer

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

Prepared by:

Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

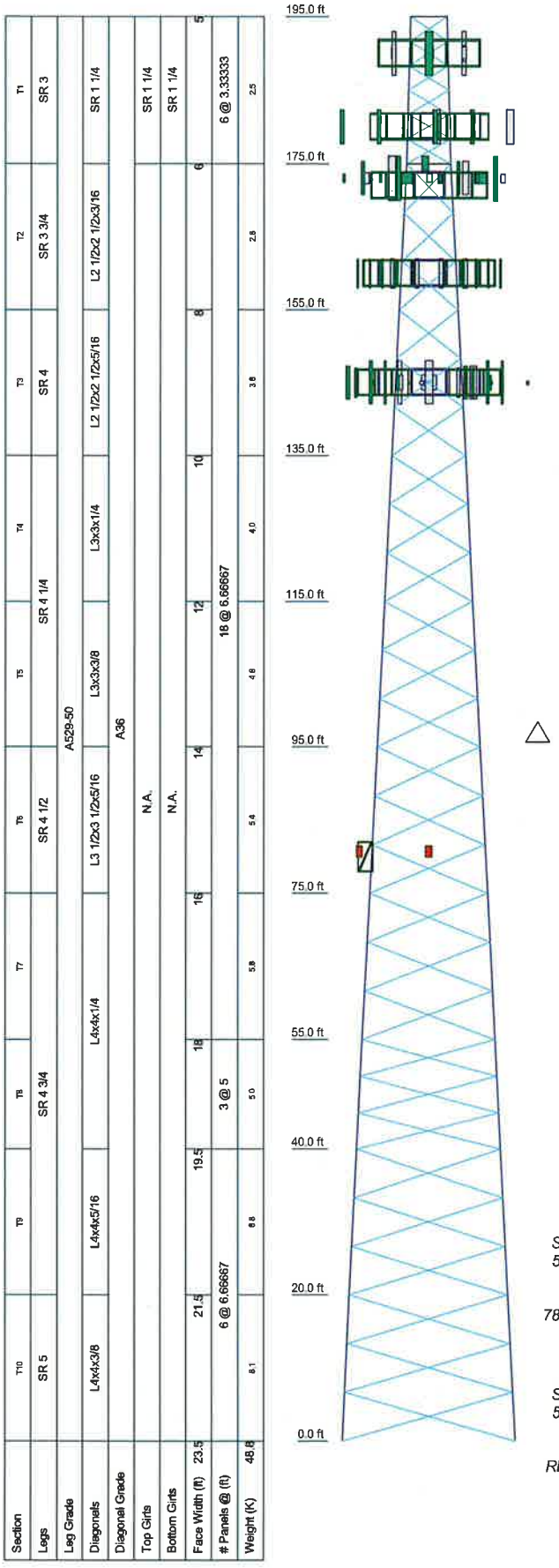
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly RISA Tower, 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
15-ft Triangular Mount (Sprint Existing)	190	Pirod 12' T-Frame Sector Mount (1) (AT⌶ Existing)	172
APXVSPP18-C-A20 (Sprint Existing)	190	Pirod 15' T-Frame Sector Mount (1) (Nextel Existing)	160
APXVSPP18-C-A20 (Sprint Existing)	190	Pirod 15' T-Frame Sector Mount (1) (Nextel Existing)	160
APXVSPP18-C-A20 (Sprint Existing)	190	Pirod 15' T-Frame Sector Mount (1) (Nextel Existing)	160
FD-RRH 2x50 800 (Sprint Existing)	190	(4) DB844H90E-XY (Nextel Existing)	160
FD-RRH 2x50 800 (Sprint Existing)	190	(4) DB844H90E-XY (Nextel Existing)	160
FD-RRH 2x50 800 (Sprint Existing)	190	(4) DB844H90E-XY (Nextel Existing)	160
FD-RRH 4x45 1900 (Sprint Existing)	190	Pirod 15' T-Frame Sector Mount (1) (Verizon Existing)	145
FD-RRH 4x45 1900 (Sprint Existing)	190	Pirod 15' T-Frame Sector Mount (1) (Verizon Existing)	145
FD-RRH 4x45 1900 (Sprint Existing)	190	Pirod 15' T-Frame Sector Mount (1) (Verizon Existing)	145
Pirod 15' T-Frame Sector Mount (1) (T-Mobile Existing)	180	LNX-6513DS-VTM (Verizon Proposed)	145
Pirod 15' T-Frame Sector Mount (1) (T-Mobile Existing)	180	BXA-171063-12CF (Verizon Proposed)	145
Pirod 15' T-Frame Sector Mount (1) (T-Mobile Existing)	180	LNX-6513DS-VTM (Verizon Proposed)	145
(2) AIR21 (T-Mobile Existing)	180	BXA-171063-12CF (Verizon Proposed)	145
(2) AIR21 (T-Mobile Existing)	180	LNX-6513DS-VTM (Verizon Proposed)	145
(2) AIR21 (T-Mobile Existing)	180	BXA-171063-12CF (Verizon Proposed)	145
TMA (T-Mobile Existing)	180	RRH2x40-AWS (Verizon Proposed)	145
TMA (T-Mobile Existing)	180	RRH2x40-AWS (Verizon Proposed)	145
TMA (T-Mobile Existing)	180	RRH2x40-AWS (Verizon Proposed)	145
DC6-48-60-18-8F Surge Arrestor (AT⌶ Existing)	175	DB-T1-6Z-8AB-0Z (Verizon Proposed)	145
800 10121 (AT⌶ Existing)	173	BXA-171085-8BF (Verizon Existing)	145
800 10121 (AT⌶ Existing)	173	BXA-70063/6CF (Verizon Existing)	145
800 10121 (AT⌶ Existing)	173	BXA-171085-8BF (Verizon Existing)	145
(2) LGP21401 TMA (AT⌶ Existing)	173	BXA-70063/6CF (Verizon Existing)	145
(2) LGP21401 TMA (AT⌶ Existing)	173	BXA-171085-8BF (Verizon Existing)	145
(2) LGP21401 TMA (AT⌶ Existing)	173	BXA-70063/6CF (Verizon Existing)	145
(2) RRUS-11 (AT⌶ Existing)	173	(2) FD9R6004/2C-3L Diplexer (Verizon Existing)	145
(2) RRUS-11 (AT⌶ Existing)	173	(2) FD9R6004/2C-3L Diplexer (Verizon Existing)	145
(2) RRUS-11 (AT⌶ Existing)	173	(2) FD9R6004/2C-3L Diplexer (Verizon Existing)	145
AM-X-CD-16-65-00T-RET(72") (AT⌶ Existing)	173	GPS (Sprint Existing)	80
AM-X-CD-16-65-00T-RET(72") (AT⌶ Existing)	173	2-ft Stand Off (Sprint Existing)	80
AM-X-CD-16-65-00T-RET(72") (AT⌶ Existing)	173	GPS (Verizon Existing)	80
Pirod 12' T-Frame Sector Mount (1) (AT⌶ Existing)	172	2-ft Stand Off (Verizon Existing)	80
Pirod 12' T-Frame Sector Mount (1) (AT⌶ Existing)	172		

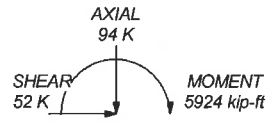
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A529-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

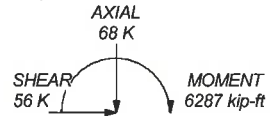
TOWER DESIGN NOTES

1. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 78 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 72.7%

MAX. CORNER REACTIONS AT BASE:
DOWN: 332 K
UPLIFT: -276 K
SHEAR: 35 K



TORQUE 56 kip-ft
78 mph WIND - 0.5000 in ICE



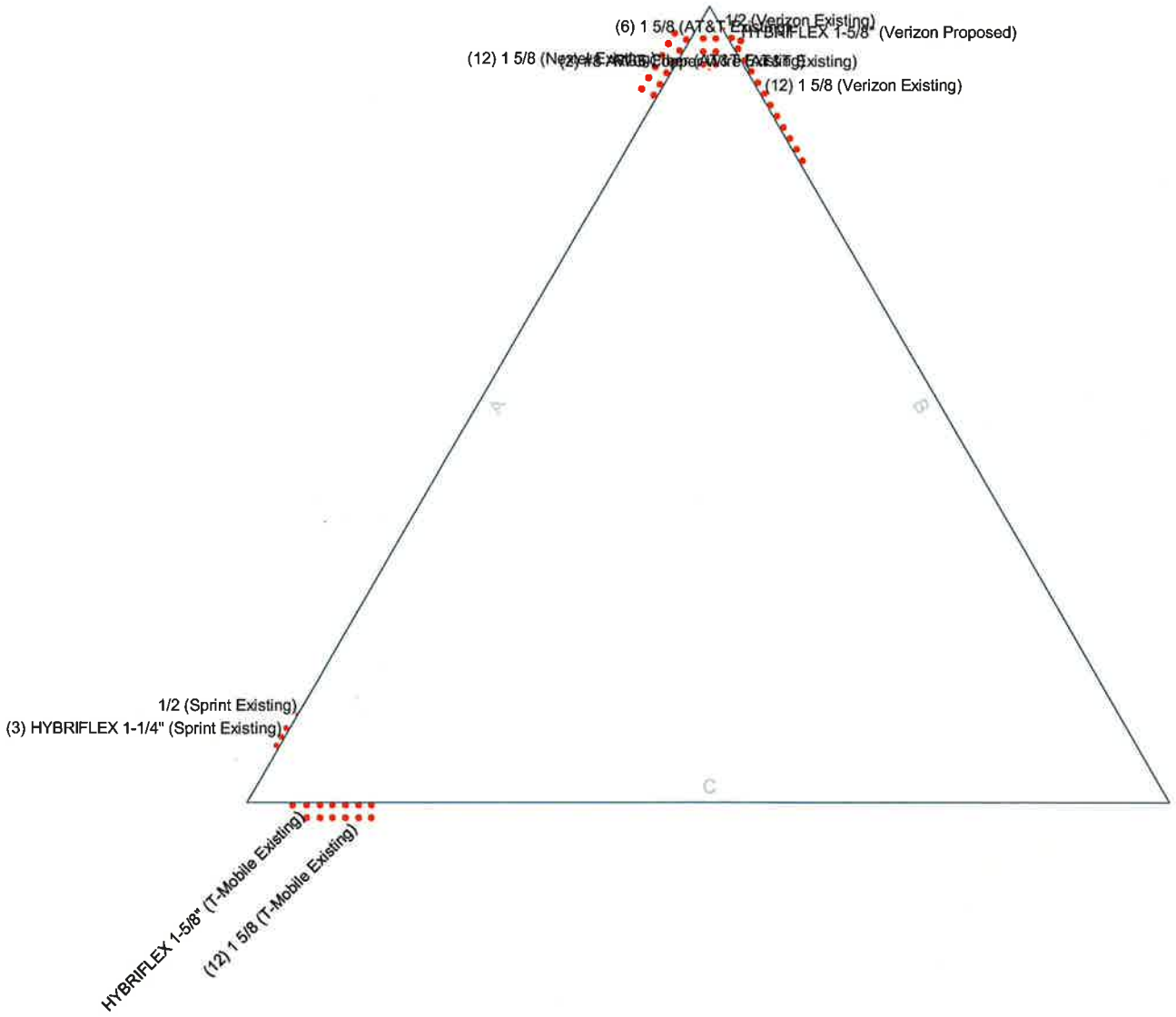
TORQUE 53 kip-ft
REACTIONS - 90 mph WIND

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

Job: *14001.031 - Northford*		
Project: *195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT*		
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 02/26/14	Scale: NTS
Path:		Dwg No. E-1

Feedline Plan

Round Flat App In Face App Out Face



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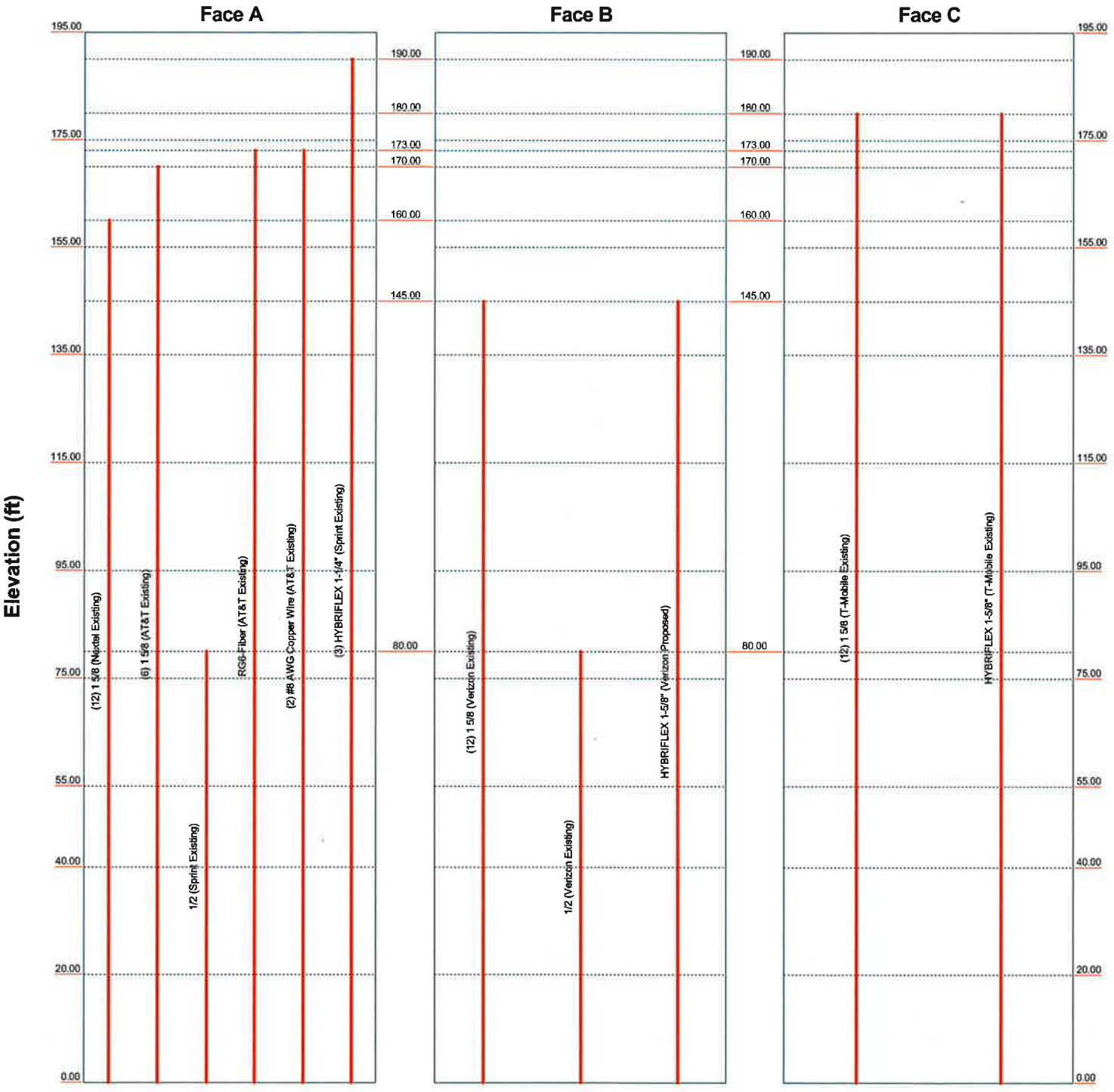
Job: 14001.031 - Northford		
Project: 195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT		
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 02/26/14	Scale: NTS
Path:		Dwg No. E-7

Feedline Distribution Chart
0' - 195'

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



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Phone: (203) 488-0580
FAX: (203) 488-8587

Job: 14001.031 - Northford			
Project: 195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 02/26/14	Scale: NTS	
Path:		Dwg No. E-7	

tnxTower	Job	Page
	14001.031 - Northford	1 of 36
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	**Project** 195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT	**Date** 15:22:00 02/26/14
	Client Verizon Wireless	**Designed by** TJL

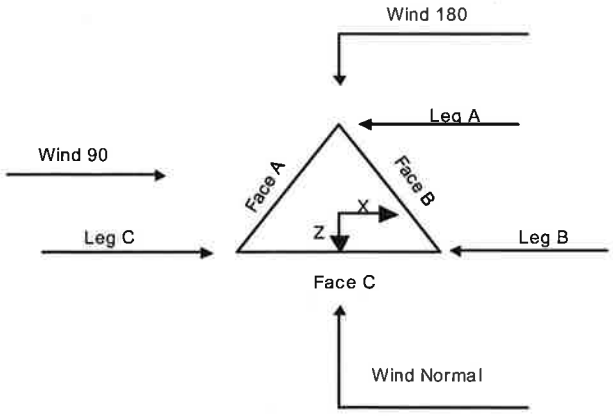
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 195.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 23.50 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 90 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 78 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	195.00-175.00			5.00	1	20.00
T2	175.00-155.00			6.00	1	20.00
T3	155.00-135.00			8.00	1	20.00
T4	135.00-115.00			10.00	1	20.00
T5	115.00-95.00			12.00	1	20.00
T6	95.00-75.00			14.00	1	20.00
T7	75.00-55.00			16.00	1	20.00
T8	55.00-40.00			18.00	1	15.00
T9	40.00-20.00			19.50	1	20.00
T10	20.00-0.00			21.50	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	195.00-175.00	3.33	X Brace	No	Yes	0.0000	0.0000
T2	175.00-155.00	6.67	X Brace	No	No	0.0000	0.0000
T3	155.00-135.00	6.67	X Brace	No	No	0.0000	0.0000
T4	135.00-115.00	6.67	X Brace	No	No	0.0000	0.0000
T5	115.00-95.00	6.67	X Brace	No	No	0.0000	0.0000

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
T6	95.00-75.00	6.67	X Brace	No	No	0.0000	0.0000
T7	75.00-55.00	6.67	X Brace	No	No	0.0000	0.0000
T8	55.00-40.00	5.00	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 195.00-175.00	Solid Round	3	A529-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T2 175.00-155.00	Solid Round	3 3/4	A529-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 155.00-135.00	Solid Round	4	A529-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T4 135.00-115.00	Solid Round	4 1/4	A529-50 (50 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 115.00-95.00	Solid Round	4 1/4	A529-50 (50 ksi)	Single Angle	L3x3x3/8	A36 (36 ksi)
T6 95.00-75.00	Solid Round	4 1/2	A529-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T7 75.00-55.00	Solid Round	4 3/4	A529-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T8 55.00-40.00	Solid Round	4 3/4	A529-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T9 40.00-20.00	Solid Round	4 3/4	A529-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T10 20.00-0.00	Solid Round	5	A529-50 (50 ksi)	Single Angle	L4x4x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 195.00-175.00	Solid Round	1 1/4	A36 (36 ksi)	Solid Round	1 1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in

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 195.00-175.00	0.00	0.0000	A36 (36 ksi)	1	1	1	30.0000	30.0000
T2 175.00-155.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 155.00-135.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 135.00-115.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 115.00-95.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 95.00-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 75.00-55.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 55.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X 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 195.00-175.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 175.00-155.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 155.00-135.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 135.00-115.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 115.00-95.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 95.00-75.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 75.00-55.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 55.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 20.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		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 195.00-175.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 175.00-155.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 155.00-135.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 135.00-115.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 115.00-95.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 95.00-75.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 75.00-55.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 55.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 195.00-175.00	Flange	1.1250 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 175.00-155.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 155.00-135.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 135.00-115.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 115.00-95.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 95.00-75.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 75.00-55.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 55.00-40.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T9 40.00-20.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T10 20.00-0.00	Flange	1.3750 A449	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0

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 5/8 (Verizon Existing)	B	Yes	Ar (CfAe)	145.00 - 0.00	0.0000	-0.38	12	12	1.9800	1.9800		1.04
1 5/8 (Nextel Existing)	A	Yes	Ar (CfAe)	160.00 - 0.00	0.0000	0.42	12	6	1.9800	1.9800		1.04
1 5/8 (AT&T Existing)	A	No	Ar (Leg)	170.00 - 0.00	0.0000	0.05	6	3	1.9800	1.9800		1.04
1 5/8 (T-Mobile Existing)	C	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.4	12	6	1.9800	1.9800		1.04
1/2 (Sprint Existing)	A	Yes	Ar (CfAe)	80.00 - 0.00	0.0000	-0.39	1	1	0.5800	0.5800		0.25
1/2 (Verizon Existing)	B	Yes	Ar (CfAe)	80.00 - 0.00	0.0000	-0.47	1	1	0.5800	0.5800		0.25
RG6-Fiber (AT&T Existing)	A	No	Ar (Leg)	173.00 - 0.00	0.0000	0.07	1	1	0.5000	0.5000		1.00
#8 AWG Copper WIre (AT&T Existing)	A	No	Ar (Leg)	173.00 - 0.00	0.0000	0.07	2	1	0.2500	0.1285		0.05
HYBRIFLEX 1-5/8" (T-Mobile Existing)	C	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.45	1	1	1.9800	1.9800		1.90
HYBRIFLEX 1-1/4" (Sprint Existing)	A	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.42	3	3	1.5400	1.5400		1.30
HYBRIFLEX 1-5/8" (Verizon Proposed)	B	Yes	Ar (CfAe)	145.00 - 0.00	2.0000	-0.45	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 K
T1	195.00-175.00	A	5.775	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.00
		C	5.775	0.000	0.000	0.000	0.07
T2	175.00-155.00	A	21.018	0.000	0.000	0.000	0.25
		B	8.368	0.000	0.000	0.000	0.00
		C	23.100	0.000	0.000	0.000	0.29
T3	155.00-135.00	A	38.447	0.000	0.000	0.000	0.47
		B	32.398	0.000	0.000	0.000	0.14
		C	23.100	0.000	0.000	0.000	0.29
T4	135.00-115.00	A	38.447	0.000	0.000	0.000	0.47
		B	53.847	0.000	0.000	0.000	0.29
		C	23.100	0.000	0.000	0.000	0.29
T5	115.00-95.00	A	38.447	0.000	0.000	0.000	0.47
		B	53.847	0.000	0.000	0.000	0.29

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	23.100	0.000	0.000	0.000	0.29
T6	95.00-75.00	A	38.689	0.000	0.000	0.000	0.48
		B	54.089	0.000	0.000	0.000	0.29
		C	23.100	0.000	0.000	0.000	0.29
T7	75.00-55.00	A	39.414	0.000	0.000	0.000	0.48
		B	54.814	0.000	0.000	0.000	0.29
		C	23.100	0.000	0.000	0.000	0.29
T8	55.00-40.00	A	29.561	0.000	0.000	0.000	0.36
		B	41.111	0.000	0.000	0.000	0.22
		C	17.325	0.000	0.000	0.000	0.22
T9	40.00-20.00	A	39.414	0.000	0.000	0.000	0.48
		B	54.814	0.000	0.000	0.000	0.29
		C	23.100	0.000	0.000	0.000	0.29
T10	20.00-0.00	A	39.414	0.000	0.000	0.000	0.48
		B	54.814	0.000	0.000	0.000	0.29
		C	23.100	0.000	0.000	0.000	0.29

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	195.00-175.00	A	0.500	9.525	0.000	0.000	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.00
		C		8.692	0.000	0.000	0.000	0.17
T2	175.00-155.00	A	0.500	35.268	0.000	0.000	0.000	0.58
		B		15.118	0.000	0.000	0.000	0.00
		C		34.767	0.000	0.000	0.000	0.68
T3	155.00-135.00	A	0.500	61.781	0.000	0.000	0.000	1.12
		B		51.564	0.000	0.000	0.000	0.34
		C		34.767	0.000	0.000	0.000	0.68
T4	135.00-115.00	A	0.500	61.781	0.000	0.000	0.000	1.12
		B		83.847	0.000	0.000	0.000	0.68
		C		34.767	0.000	0.000	0.000	0.68
T5	115.00-95.00	A	0.500	61.781	0.000	0.000	0.000	1.12
		B		83.847	0.000	0.000	0.000	0.68
		C		34.767	0.000	0.000	0.000	0.68
T6	95.00-75.00	A	0.500	62.439	0.000	0.000	0.000	1.13
		B		84.506	0.000	0.000	0.000	0.69
		C		34.767	0.000	0.000	0.000	0.68
T7	75.00-55.00	A	0.500	64.414	0.000	0.000	0.000	1.14
		B		86.481	0.000	0.000	0.000	0.70
		C		34.767	0.000	0.000	0.000	0.68
T8	55.00-40.00	A	0.500	48.311	0.000	0.000	0.000	0.86
		B		64.861	0.000	0.000	0.000	0.52
		C		26.075	0.000	0.000	0.000	0.51
T9	40.00-20.00	A	0.500	64.414	0.000	0.000	0.000	1.14
		B		86.481	0.000	0.000	0.000	0.70
		C		34.767	0.000	0.000	0.000	0.68
T10	20.00-0.00	A	0.500	64.414	0.000	0.000	0.000	1.14
		B		86.481	0.000	0.000	0.000	0.70
		C		34.767	0.000	0.000	0.000	0.68

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	195.00-175.00	A	0.483	1.433	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.483	1.307	0.000	0.000
T2	175.00-155.00	A	0.000	0.698	1.096	1.745
		B	0.000	0.000	0.000	0.000
		C	0.000	1.204	2.001	3.011
T3	155.00-135.00	A	0.000	1.324	2.142	3.311
		B	0.000	1.006	1.671	2.515
		C	0.000	1.083	1.800	2.709
T4	135.00-115.00	A	0.000	1.243	2.414	3.730
		B	0.000	1.889	3.766	5.667
		C	0.000	1.017	2.028	3.052
T5	115.00-95.00	A	0.000	1.195	2.319	3.584
		B	0.000	1.815	3.618	5.445
		C	0.000	0.977	1.948	2.932
T6	95.00-75.00	A	0.000	1.181	2.657	4.134
		B	0.000	1.785	4.132	6.247
		C	0.000	0.951	2.213	3.330
T7	75.00-55.00	A	0.000	1.212	3.058	4.849
		B	0.000	1.805	4.713	7.220
		C	0.000	0.934	2.482	3.735
T8	55.00-40.00	A	0.000	1.168	2.946	4.671
		B	0.000	1.739	4.540	6.955
		C	0.000	0.900	2.391	3.598
T9	40.00-20.00	A	0.000	1.187	2.994	4.746
		B	0.000	1.767	4.613	7.067
		C	0.000	0.914	2.429	3.656
T10	20.00-0.00	A	0.000	1.177	2.969	4.708
		B	0.000	1.752	4.575	7.009
		C	0.000	0.907	2.409	3.626

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	195.00-175.00	-4.7794	2.9634	-4.5564	2.7890
T2	175.00-155.00	-8.4368	0.7683	-8.7287	0.1265
T3	155.00-135.00	-7.5266	-10.9701	-7.8142	-11.7580
T4	135.00-115.00	-6.6599	-16.6617	-7.0658	-17.8345
T5	115.00-95.00	-7.5861	-18.9934	-8.0717	-20.3787
T6	95.00-75.00	-7.9067	-19.7485	-8.6350	-21.6508
T7	75.00-55.00	-8.1841	-20.1625	-9.2549	-22.6078
T8	55.00-40.00	-7.5077	-18.6534	-8.5438	-21.1281
T9	40.00-20.00	-9.1821	-22.6335	-10.4501	-25.5333
T10	20.00-0.00	-9.6074	-23.6882	-10.9940	-26.8662

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
15-ft Triangular Mount	C	From Face	2.00	0.0000	190.00	No Ice	75.30	75.30	2.50
(Sprint Existing)			0.00			1/2" Ice	86.60	86.60	2.88
			0.00						
APXVSPP18-C-A20	A	From Face	4.00	0.0000	190.00	No Ice	8.26	5.28	0.06
(Sprint Existing)			0.00			1/2" Ice	8.81	5.74	0.11
			0.00						
APXVSPP18-C-A20	B	From Face	4.00	0.0000	190.00	No Ice	8.26	5.28	0.06
(Sprint Existing)			0.00			1/2" Ice	8.81	5.74	0.11
			0.00						
APXVSPP18-C-A20	C	From Face	4.00	0.0000	190.00	No Ice	8.26	5.28	0.06
(Sprint Existing)			0.00			1/2" Ice	8.81	5.74	0.11
			0.00						
FD-RRH 2x50 800	A	From Face	4.00	0.0000	190.00	No Ice	2.40	2.25	0.06
(Sprint Existing)			0.00			1/2" Ice	2.61	2.46	0.09
			0.00						
FD-RRH 2x50 800	B	From Face	4.00	0.0000	190.00	No Ice	2.40	2.25	0.06
(Sprint Existing)			0.00			1/2" Ice	2.61	2.46	0.09
			0.00						
FD-RRH 2x50 800	C	From Face	4.00	0.0000	190.00	No Ice	2.40	2.25	0.06
(Sprint Existing)			0.00			1/2" Ice	2.61	2.46	0.09
			0.00						
FD-RRH 4x45 1900	A	From Face	4.00	0.0000	190.00	No Ice	2.71	2.78	0.06
(Sprint Existing)			0.00			1/2" Ice	2.94	3.02	0.08
			0.00						
FD-RRH 4x45 1900	B	From Face	4.00	0.0000	190.00	No Ice	2.71	2.78	0.06
(Sprint Existing)			0.00			1/2" Ice	2.94	3.02	0.08
			0.00						
FD-RRH 4x45 1900	C	From Face	4.00	0.0000	190.00	No Ice	2.71	2.78	0.06
(Sprint Existing)			0.00			1/2" Ice	2.94	3.02	0.08
			0.00						
Pirod 15' T-Frame Sector	A	From Leg	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(T-Mobile Existing)			0.00						
Pirod 15' T-Frame Sector	B	From Leg	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(T-Mobile Existing)			0.00						
Pirod 15' T-Frame Sector	C	From Leg	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(T-Mobile Existing)			0.00						
(2) AIR21	A	From Leg	4.00	0.0000	180.00	No Ice	6.53	4.36	0.08
(T-Mobile Existing)			6.00			1/2" Ice	6.98	4.77	0.12
			0.00						
(2) AIR21	B	From Leg	4.00	0.0000	180.00	No Ice	6.53	4.36	0.08
(T-Mobile Existing)			6.00			1/2" Ice	6.98	4.77	0.12
			0.00						
(2) AIR21	C	From Leg	4.00	0.0000	180.00	No Ice	6.53	4.36	0.08
(T-Mobile Existing)			6.00			1/2" Ice	6.98	4.77	0.12
			0.00						
TMA	A	From Leg	4.00	0.0000	180.00	No Ice	1.17	0.39	0.01
(T-Mobile Existing)			0.00			1/2" Ice	1.31	0.48	0.02
			0.00						
TMA	B	From Leg	4.00	0.0000	180.00	No Ice	1.17	0.39	0.01
(T-Mobile Existing)			0.00			1/2" Ice	1.31	0.48	0.02
			0.00						
TMA	C	From Leg	4.00	0.0000	180.00	No Ice	1.17	0.39	0.01
(T-Mobile Existing)			0.00			1/2" Ice	1.31	0.48	0.02
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pirod 12' T-Frame Sector Mount (1) (AT&T Existing)	A	From Leg	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
Pirod 12' T-Frame Sector Mount (1) (AT&T Existing)	B	From Leg	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
Pirod 12' T-Frame Sector Mount (1) (AT&T Existing)	C	From Leg	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
800 10121 (AT&T Existing)	A	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice	5.46 5.88	3.29 3.64	0.05 0.08
800 10121 (AT&T Existing)	B	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice	5.46 5.88	3.29 3.64	0.05 0.08
800 10121 (AT&T Existing)	C	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice	5.46 5.88	3.29 3.64	0.05 0.08
(2) LGP21401 TMA (AT&T Existing)	A	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	0.02 0.02
(2) LGP21401 TMA (AT&T Existing)	B	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	0.02 0.02
(2) LGP21401 TMA (AT&T Existing)	C	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	0.02 0.02
DC6-48-60-18-8F Surge Arrestor (AT&T Existing)	C	From Face	0.50 0.50 0.00	0.0000	175.00	No Ice 1/2" Ice	2.23 2.45	2.23 2.45	0.02 0.04
(2) RRUS-11 (AT&T Existing)	A	From Face	4.00 -2.00 0.00	0.0000	173.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	0.05 0.07
(2) RRUS-11 (AT&T Existing)	B	From Face	4.00 -2.00 0.00	0.0000	173.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	0.05 0.07
(2) RRUS-11 (AT&T Existing)	C	From Face	4.00 -2.00 0.00	0.0000	173.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	0.05 0.07
AM-X-CD-16-65-00T-RET(72") (AT&T Existing)	A	From Leg	4.00 -5.00 0.00	0.0000	173.00	No Ice 1/2" Ice	8.26 8.81	4.64 5.09	0.05 0.10
AM-X-CD-16-65-00T-RET(72") (AT&T Existing)	B	From Leg	4.00 -5.00 0.00	0.0000	173.00	No Ice 1/2" Ice	8.26 8.81	4.64 5.09	0.05 0.10
AM-X-CD-16-65-00T-RET(72") (AT&T Existing)	C	From Leg	4.00 -5.00 0.00	0.0000	173.00	No Ice 1/2" Ice	8.26 8.81	4.64 5.09	0.05 0.10
Pirod 15' T-Frame Sector Mount (1) (Nextel Existing)	A	From Leg	2.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
Pirod 15' T-Frame Sector Mount (1) (Nextel Existing)	B	From Leg	2.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
Pirod 15' T-Frame Sector Mount (1) (Nextel Existing)	C	From Leg	2.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(4) DB844H90E-XY	A	From Leg	4.00	0.0000	160.00	No Ice	2.87	3.73	0.01
(Nextel Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(4) DB844H90E-XY	B	From Leg	4.00	0.0000	160.00	No Ice	2.87	3.73	0.01
(Nextel Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(4) DB844H90E-XY	C	From Leg	4.00	0.0000	160.00	No Ice	2.87	3.73	0.01
(Nextel Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
Pirod 15' T-Frame Sector	A	From Leg	2.00	0.0000	145.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(Verizon Existing)			0.00						
Pirod 15' T-Frame Sector	B	From Leg	2.00	0.0000	145.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(Verizon Existing)			0.00						
Pirod 15' T-Frame Sector	C	From Leg	2.00	0.0000	145.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(Verizon Existing)			0.00						
LNX-6513DS-VTM	A	From Leg	4.00	0.0000	145.00	No Ice	6.33	3.84	0.03
(Verizon Proposed)			6.00			1/2" Ice	6.76	4.19	0.07
			0.00						
BXA-171063-12CF	A	From Leg	4.00	0.0000	145.00	No Ice	4.79	3.62	0.02
(Verizon Proposed)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
LNX-6513DS-VTM	B	From Leg	4.00	0.0000	145.00	No Ice	6.33	3.84	0.03
(Verizon Proposed)			6.00			1/2" Ice	6.76	4.19	0.07
			0.00						
BXA-171063-12CF	B	From Leg	4.00	0.0000	145.00	No Ice	4.79	3.62	0.02
(Verizon Proposed)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
LNX-6513DS-VTM	C	From Leg	4.00	0.0000	145.00	No Ice	6.33	3.84	0.03
(Verizon Proposed)			6.00			1/2" Ice	6.76	4.19	0.07
			0.00						
BXA-171063-12CF	C	From Leg	4.00	0.0000	145.00	No Ice	4.79	3.62	0.02
(Verizon Proposed)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
RRH2x40-AWS	A	From Leg	2.00	0.0000	145.00	No Ice	2.52	1.59	0.04
(Verizon Proposed)			-4.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RRH2x40-AWS	B	From Leg	2.00	0.0000	145.00	No Ice	2.52	1.59	0.04
(Verizon Proposed)			-4.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RRH2x40-AWS	C	From Leg	2.00	0.0000	145.00	No Ice	2.52	1.59	0.04
(Verizon Proposed)			-4.00			1/2" Ice	2.75	1.80	0.06
			0.00						
DB-T1-6Z-8AB-0Z	A	From Leg	2.00	0.0000	145.00	No Ice	5.60	2.33	0.04
(Verizon Proposed)			0.00			1/2" Ice	5.92	2.56	0.08
			0.00						
BXA-171085-8BF	A	From Leg	4.00	0.0000	145.00	No Ice	2.94	2.16	0.01
(Verizon Existing)			4.00			1/2" Ice	3.26	2.46	0.03
			0.00						
BXA-70063/6CF	A	From Leg	4.00	0.0000	145.00	No Ice	7.73	4.16	0.02
(Verizon Existing)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171085-8BF	B	From Leg	4.00	0.0000	145.00	No Ice	2.94	2.16	0.01
(Verizon Existing)			4.00			1/2" Ice	3.26	2.46	0.03
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-70063/6CF	B	From Leg	4.00	0.0000	145.00	No Ice	7.73	4.16	0.02
(Verizon Existing)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171085-8BF	C	From Leg	4.00	0.0000	145.00	No Ice	2.94	2.16	0.01
(Verizon Existing)			4.00			1/2" Ice	3.26	2.46	0.03
			0.00						
BXA-70063/6CF	C	From Leg	4.00	0.0000	145.00	No Ice	7.73	4.16	0.02
(Verizon Existing)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.0000	145.00	No Ice	0.37	0.08	0.00
Diplexer			-6.00			1/2" Ice	0.45	0.14	0.01
(Verizon Existing)			0.00						
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	145.00	No Ice	0.37	0.08	0.00
Diplexer			-6.00			1/2" Ice	0.45	0.14	0.01
(Verizon Existing)			0.00						
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	145.00	No Ice	0.37	0.08	0.00
Diplexer			-6.00			1/2" Ice	0.45	0.14	0.01
(Verizon Existing)			0.00						
GPS	C	From Leg	2.00	0.0000	80.00	No Ice	1.00	1.00	0.01
(Sprint Existing)			0.00			1/2" Ice	1.50	1.50	0.01
			0.00						
2-ft Stand Off	C	From Leg	1.00	0.0000	80.00	No Ice	1.07	1.07	0.02
(Sprint Existing)			0.00			1/2" Ice	1.62	1.62	0.03
			0.00						
GPS	A	From Leg	2.00	0.0000	80.00	No Ice	1.00	1.00	0.01
(Verizon Existing)			0.00			1/2" Ice	1.50	1.50	0.01
			0.00						
2-ft Stand Off	A	From Leg	1.00	0.0000	80.00	No Ice	1.07	1.07	0.02
(Verizon Existing)			0.00			1/2" Ice	1.62	1.62	0.03
			0.00						

Tower Pressures - No Ice

$G_H = 1.116$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	185.00	1.636	34	115.002	A	0.000	24.066	10.004	41.57	0.000	0.000
195.00-175.00					B	0.000	18.774		53.29	0.000	0.000
					C	0.000	24.066		41.57	0.000	0.000
T2	165.00	1.584	33	146.258	A	10.477	33.539	12.521	28.45	0.000	0.000
175.00-155.00					B	11.572	20.889		38.57	0.000	0.000
					C	9.572	35.621		27.71	0.000	0.000
T3	145.00	1.526	32	186.675	A	11.352	51.803	13.356	21.15	0.000	0.000
155.00-135.00					B	11.823	45.753		23.20	0.000	0.000
					C	11.695	36.456		27.74	0.000	0.000
T4	125.00	1.463	30	227.092	A	16.271	52.638	14.190	20.59	0.000	0.000
135.00-115.00					B	14.920	68.038		17.11	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	16.657	37.290		26.30	0.000	0.000
T5	105.00	1.392	29	267.092	A	19.003	52.638	14.190	19.81	0.000	0.000
115.00-95.00					B	17.705	68.038		16.55	0.000	0.000
					C	19.374	37.290		25.04	0.000	0.000
T6 95.00-75.00	85.00	1.31	27	307.509	A	25.362	53.714	15.025	19.00	0.000	0.000
					B	23.887	69.114		16.16	0.000	0.000
					C	25.806	38.125		23.50	0.000	0.000
T7 75.00-55.00	65.00	1.214	25	347.927	A	32.624	55.274	15.860	18.04	0.000	0.000
					B	30.969	70.674		15.60	0.000	0.000
					C	33.200	38.960		21.98	0.000	0.000
T8 55.00-40.00	47.50	1.11	23	287.195	A	35.046	41.455	11.895	15.55	0.000	0.000
					B	33.453	53.005		13.76	0.000	0.000
					C	35.602	29.220		18.35	0.000	0.000
T9 40.00-20.00	30.00	1	21	417.927	A	39.290	55.274	15.860	16.77	0.000	0.000
					B	37.671	70.674		14.64	0.000	0.000
					C	39.855	38.960		20.12	0.000	0.000
T10 20.00-0.00	10.00	1	21	458.344	A	43.105	56.109	16.694	16.83	0.000	0.000
					B	41.499	71.509		14.77	0.000	0.000
					C	43.665	39.794		20.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.116$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	185.00	1.636	25	0.5000	116.669	A	0.000	37.216	13.339	35.84	0.000	0.000
195.00-175.00						B	0.000	29.124		45.80	0.000	0.000
						C	0.000	36.508		36.54	0.000	0.000
T2	165.00	1.584	25	0.5000	147.927	A	9.827	55.058	15.860	24.44	0.000	0.000
175.00-155.00						B	11.572	35.606		33.62	0.000	0.000
						C	8.561	54.051		25.33	0.000	0.000
T3	145.00	1.526	24	0.5000	188.344	A	10.183	82.549	16.694	18.00	0.000	0.000
155.00-135.00						B	10.979	72.650		19.96	0.000	0.000
						C	10.786	55.775		25.08	0.000	0.000
T4	125.00	1.463	23	0.5000	228.761	A	14.955	84.295	17.529	17.66	0.000	0.000
135.00-115.00						B	13.018	105.716		14.76	0.000	0.000
						C	15.633	57.507		23.97	0.000	0.000
T5 115.00-95.00	105.00	1.392	22	0.5000	268.761	A	17.738	85.223	17.529	17.02	0.000	0.000
						B	15.878	106.669		14.30	0.000	0.000
						C	18.391	58.426		22.82	0.000	0.000
T6 95.00-75.00	85.00	1.31	20	0.5000	309.178	A	23.885	87.627	18.364	16.47	0.000	0.000
						B	21.771	109.090		14.03	0.000	0.000
						C	24.689	60.184		21.64	0.000	0.000
T7 75.00-55.00	65.00	1.214	19	0.5000	349.595	A	30.833	91.321	19.199	15.72	0.000	0.000
						B	28.462	112.795		13.59	0.000	0.000
						C	31.947	61.952		20.45	0.000	0.000
T8 55.00-40.00	47.50	1.11	17	0.5000	288.446	A	33.321	71.040	14.399	13.80	0.000	0.000
						B	31.038	87.019		12.20	0.000	0.000
						C	34.394	49.073		17.25	0.000	0.000
T9 40.00-20.00	30.00	1	16	0.5000	419.595	A	37.538	92.997	19.199	14.71	0.000	0.000
						B	35.217	114.484		12.82	0.000	0.000
						C	38.628	63.622		18.78	0.000	0.000
T10 20.00-0.00	10.00	1	16	0.5000	460.012	A	41.367	94.789	20.033	14.71	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						B	39.065	116.280		12.90	0.000	0.000
						C	42.448	65.412		18.57	0.000	0.000

Tower Pressure - Service

$G_H = 1.116$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	185.00	1.636	10	115.002	A	0.000	24.066	10.004	41.57	0.000	0.000
195.00-175.00					B	0.000	18.774		53.29	0.000	0.000
					C	0.000	24.066		41.57	0.000	0.000
T2	165.00	1.584	10	146.258	A	10.477	33.539	12.521	28.45	0.000	0.000
175.00-155.00					B	11.572	20.889		38.57	0.000	0.000
					C	9.572	35.621		27.71	0.000	0.000
T3	145.00	1.526	10	186.675	A	11.352	51.803	13.356	21.15	0.000	0.000
155.00-135.00					B	11.823	45.753		23.20	0.000	0.000
					C	11.695	36.456		27.74	0.000	0.000
T4	125.00	1.463	9	227.092	A	16.271	52.638	14.190	20.59	0.000	0.000
135.00-115.00					B	14.920	68.038		17.11	0.000	0.000
					C	16.657	37.290		26.30	0.000	0.000
T5	105.00	1.392	9	267.092	A	19.003	52.638	14.190	19.81	0.000	0.000
115.00-95.00					B	17.705	68.038		16.55	0.000	0.000
					C	19.374	37.290		25.04	0.000	0.000
T6 95.00-75.00	85.00	1.31	8	307.509	A	25.362	53.714	15.025	19.00	0.000	0.000
					B	23.887	69.114		16.16	0.000	0.000
					C	25.806	38.125		23.50	0.000	0.000
T7 75.00-55.00	65.00	1.214	8	347.927	A	32.624	55.274	15.860	18.04	0.000	0.000
					B	30.969	70.674		15.60	0.000	0.000
					C	33.200	38.960		21.98	0.000	0.000
T8 55.00-40.00	47.50	1.11	7	287.195	A	35.046	41.455	11.895	15.55	0.000	0.000
					B	33.453	53.005		13.76	0.000	0.000
					C	35.602	29.220		18.35	0.000	0.000
T9 40.00-20.00	30.00	1	6	417.927	A	39.290	55.274	15.860	16.77	0.000	0.000
					B	37.671	70.674		14.64	0.000	0.000
					C	39.855	38.960		20.12	0.000	0.000
T10 20.00-0.00	10.00	1	6	458.344	A	43.105	56.109	16.694	16.83	0.000	0.000
					B	41.499	71.509		14.77	0.000	0.000
					C	43.665	39.794		20.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	1	1	14.255	1.38	69.21	C
195.00-175.00			B	0.163	2.723	0.584	1	1	10.956			
			C	0.209	2.565	0.592	1	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	1	1	31.143	2.63	131.58	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
175.00-155.00			B	0.222	2.524	0.595	1	1	24.004			
			C	0.309	2.272	0.619	1	1	31.610			
T3	0.91	3.57	A	0.338	2.199	0.628	1	1	43.904	3.41	170.44	A
155.00-135.00			B	0.308	2.274	0.619	1	1	40.122			
			C	0.258	2.414	0.604	1	1	33.711			
T4	1.05	4.04	A	0.303	2.287	0.617	1	1	48.747	4.22	210.91	B
135.00-115.00			B	0.365	2.137	0.638	1	1	58.332			
			C	0.238	2.475	0.599	1	1	38.986			
T5	1.05	4.79	A	0.268	2.384	0.607	1	1	50.938	4.33	216.74	B
115.00-95.00			B	0.321	2.242	0.623	1	1	60.062			
			C	0.212	2.556	0.593	1	1	41.486			
T6	1.05	5.35	A	0.257	2.416	0.604	1	1	57.790	4.62	230.77	B
95.00-75.00			B	0.302	2.29	0.617	1	1	66.506			
			C	0.208	2.57	0.592	1	1	48.378			
T7	1.06	5.79	A	0.253	2.43	0.603	1	1	65.929	4.84	241.77	B
75.00-55.00			B	0.292	2.317	0.614	1	1	74.330			
			C	0.207	2.571	0.592	1	1	56.262			
T8	0.79	5.02	A	0.266	2.389	0.606	1	1	60.176	3.89	259.45	B
55.00-40.00			B	0.301	2.293	0.616	1	1	66.116			
			C	0.226	2.512	0.596	1	1	53.016			
T9	1.06	6.79	A	0.226	2.511	0.596	1	1	72.240	4.48	224.04	B
40.00-20.00			B	0.259	2.41	0.604	1	1	80.377			
			C	0.189	2.635	0.588	1	1	62.768			
T10	1.06	8.13	A	0.216	2.542	0.594	1	1	76.428	4.78	239.16	B
20.00-0.00			B	0.247	2.448	0.601	1	1	84.476			
			C	0.182	2.657	0.587	1	1	67.021			
Sum Weight:	8.70	48.83						OTM	3240.73 kip-ft	38.58		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.825	1	14.255	1.38	69.21	C
195.00-175.00			B	0.163	2.723	0.584	0.825	1	10.956			
			C	0.209	2.565	0.592	0.825	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.825	1	29.309	2.49	124.60	C
175.00-155.00			B	0.222	2.524	0.595	0.825	1	21.979			
			C	0.309	2.272	0.619	0.825	1	29.935			
T3	0.91	3.57	A	0.338	2.199	0.628	0.825	1	41.917	3.25	162.73	A
155.00-135.00			B	0.308	2.274	0.619	0.825	1	38.053			
			C	0.258	2.414	0.604	0.825	1	31.665			
T4	1.05	4.04	A	0.303	2.287	0.617	0.825	1	45.899	4.03	201.47	B
135.00-115.00			B	0.365	2.137	0.638	0.825	1	55.721			
			C	0.238	2.475	0.599	0.825	1	36.071			
T5	1.05	4.79	A	0.268	2.384	0.607	0.825	1	47.613	4.11	205.56	B
115.00-95.00			B	0.321	2.242	0.623	0.825	1	56.964			
			C	0.212	2.556	0.593	0.825	1	38.095			
T6	1.05	5.35	A	0.257	2.416	0.604	0.825	1	53.352	4.33	216.27	B
95.00-75.00			B	0.302	2.29	0.617	0.825	1	62.326			
			C	0.208	2.57	0.592	0.825	1	43.862			
T7	1.06	5.79	A	0.253	2.43	0.603	0.825	1	60.220	4.48	224.14	B
75.00-55.00			B	0.292	2.317	0.614	0.825	1	68.910			
			C	0.207	2.571	0.592	0.825	1	50.452			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T8	0.79	5.02	A	0.266	2.389	0.606	0.825	1	54.043	3.55	236.48	B
55.00-40.00			B	0.301	2.293	0.616	0.825	1	60.261			
			C	0.226	2.512	0.596	0.825	1	46.786			
T9	1.06	6.79	A	0.226	2.511	0.596	0.825	1	65.364	4.11	205.67	B
40.00-20.00			B	0.259	2.41	0.604	0.825	1	73.785			
			C	0.189	2.635	0.588	0.825	1	55.794			
T10	1.06	8.13	A	0.216	2.542	0.594	0.825	1	68.884	4.37	218.60	B
20.00-0.00			B	0.247	2.448	0.601	0.825	1	77.213			
			C	0.182	2.657	0.587	0.825	1	59.379			
Sum Weight:	8.70	48.83						OTM	3069.20 kip-ft	36.11		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.8	1	14.255	1.38	69.21	C
195.00-175.00			B	0.163	2.723	0.584	0.8	1	10.956			
			C	0.209	2.565	0.592	0.8	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.8	1	29.048	2.47	123.61	C
175.00-155.00			B	0.222	2.524	0.595	0.8	1	21.689			
			C	0.309	2.272	0.619	0.8	1	29.696			
T3	0.91	3.57	A	0.338	2.199	0.628	0.8	1	41.633	3.23	161.63	A
155.00-135.00			B	0.308	2.274	0.619	0.8	1	37.758			
			C	0.258	2.414	0.604	0.8	1	31.372			
T4	1.05	4.04	A	0.303	2.287	0.617	0.8	1	45.492	4.00	200.12	B
135.00-115.00			B	0.365	2.137	0.638	0.8	1	55.348			
			C	0.238	2.475	0.599	0.8	1	35.655			
T5	1.05	4.79	A	0.268	2.384	0.607	0.8	1	47.138	4.08	203.97	B
115.00-95.00			B	0.321	2.242	0.623	0.8	1	56.521			
			C	0.212	2.556	0.593	0.8	1	37.611			
T6	1.05	5.35	A	0.257	2.416	0.604	0.8	1	52.718	4.28	214.19	B
95.00-75.00			B	0.302	2.29	0.617	0.8	1	61.728			
			C	0.208	2.57	0.592	0.8	1	43.217			
T7	1.06	5.79	A	0.253	2.43	0.603	0.8	1	59.404	4.43	221.62	B
75.00-55.00			B	0.292	2.317	0.614	0.8	1	68.136			
			C	0.207	2.571	0.592	0.8	1	49.622			
T8	0.79	5.02	A	0.266	2.389	0.606	0.8	1	53.167	3.50	233.20	B
55.00-40.00			B	0.301	2.293	0.616	0.8	1	59.425			
			C	0.226	2.512	0.596	0.8	1	45.896			
T9	1.06	6.79	A	0.226	2.511	0.596	0.8	1	64.382	4.06	203.04	B
40.00-20.00			B	0.259	2.41	0.604	0.8	1	72.843			
			C	0.189	2.635	0.588	0.8	1	54.797			
T10	1.06	8.13	A	0.216	2.542	0.594	0.8	1	67.807	4.31	215.66	B
20.00-0.00			B	0.247	2.448	0.601	0.8	1	76.176			
			C	0.182	2.657	0.587	0.8	1	58.288			
Sum Weight:	8.70	48.83						OTM	3044.69 kip-ft	35.76		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.85	1	14.255	1.38	69.21	C
195.00-175.00			B	0.163	2.723	0.584	0.85	1	10.956			
			C	0.209	2.565	0.592	0.85	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.85	1	29.571	2.51	125.60	C
175.00-155.00			B	0.222	2.524	0.595	0.85	1	22.268			
			C	0.309	2.272	0.619	0.85	1	30.174			
T3	0.91	3.57	A	0.338	2.199	0.628	0.85	1	42.201	3.28	163.83	A
155.00-135.00			B	0.308	2.274	0.619	0.85	1	38.349			
			C	0.258	2.414	0.604	0.85	1	31.957			
T4	1.05	4.04	A	0.303	2.287	0.617	0.85	1	46.306	4.06	202.82	B
135.00-115.00			B	0.365	2.137	0.638	0.85	1	56.094			
			C	0.238	2.475	0.599	0.85	1	36.488			
T5	1.05	4.79	A	0.268	2.384	0.607	0.85	1	48.088	4.14	207.16	B
115.00-95.00			B	0.321	2.242	0.623	0.85	1	57.406			
			C	0.212	2.556	0.593	0.85	1	38.580			
T6	1.05	5.35	A	0.257	2.416	0.604	0.85	1	53.986	4.37	218.34	B
95.00-75.00			B	0.302	2.29	0.617	0.85	1	62.923			
			C	0.208	2.57	0.592	0.85	1	44.507			
T7	1.06	5.79	A	0.253	2.43	0.603	0.85	1	61.035	4.53	226.66	B
75.00-55.00			B	0.292	2.317	0.614	0.85	1	69.684			
			C	0.207	2.571	0.592	0.85	1	51.282			
T8	0.79	5.02	A	0.266	2.389	0.606	0.85	1	54.919	3.60	239.76	B
55.00-40.00			B	0.301	2.293	0.616	0.85	1	61.098			
			C	0.226	2.512	0.596	0.85	1	47.676			
T9	1.06	6.79	A	0.226	2.511	0.596	0.85	1	66.346	4.17	208.29	B
40.00-20.00			B	0.259	2.41	0.604	0.85	1	74.727			
			C	0.189	2.635	0.588	0.85	1	56.790			
T10	1.06	8.13	A	0.216	2.542	0.594	0.85	1	69.962	4.43	221.54	B
20.00-0.00			B	0.247	2.448	0.601	0.85	1	78.251			
			C	0.182	2.657	0.587	0.85	1	60.471			
Sum Weight:	8.70	48.83						OTM	3093.70 kip-ft	36.47		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.28	2.96	A	0.319	2.247	0.622	1	1	23.144	1.48	73.81	A
195.00-175.00			B	0.25	2.439	0.602	1	1	17.526			
			C	0.313	2.262	0.62	1	1	22.633			
T2	1.26	3.35	A	0.439	1.993	0.668	1	1	46.613	2.55	127.60	A
175.00-155.00			B	0.319	2.247	0.622	1	1	33.715			
			C	0.423	2.02	0.661	1	1	44.309			
T3	2.14	4.21	A	0.492	1.91	0.694	1	1	67.442	3.41	170.57	A
155.00-135.00			B	0.444	1.983	0.671	1	1	59.695			
			C	0.353	2.164	0.634	1	1	46.130			
T4	2.49	4.84	A	0.434	2.001	0.666	1	1	71.095	4.18	209.09	B
135.00-115.00			B	0.519	1.876	0.707	1	1	87.800			
			C	0.32	2.245	0.622	1	1	51.410			
T5	2.49	5.68	A	0.383	2.098	0.645	1	1	72.694	4.17	208.64	B
115.00-95.00			B	0.456	1.964	0.676	1	1	87.989			
			C	0.286	2.334	0.612	1	1	54.128			
T6	2.49	6.46	A	0.361	2.147	0.636	1	1	79.646	4.31	215.62	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
95.00-75.00			B	0.423	2.02	0.661	1	1	93.920			
			C	0.275	2.366	0.608	1	1	61.307			
T7	2.52	7.13	A	0.349	2.173	0.632	1	1	88.572	4.42	221.11	B
75.00-55.00			B	0.404	2.056	0.653	1	1	102.148			
			C	0.269	2.383	0.607	1	1	69.539			
T8	1.89	6.39	A	0.362	2.145	0.637	1	1	78.557	3.47	231.26	B
55.00-40.00			B	0.409	2.046	0.655	1	1	88.073			
			C	0.289	2.325	0.613	1	1	64.461			
T9	2.52	8.34	A	0.311	2.267	0.619	1	1	95.136	4.04	201.79	B
40.00-20.00			B	0.357	2.156	0.635	1	1	107.905			
			C	0.244	2.457	0.6	1	1	76.819			
T10	2.52	9.80	A	0.296	2.307	0.615	1	1	99.632	4.28	213.99	B
20.00-0.00			B	0.338	2.201	0.628	1	1	112.108			
			C	0.234	2.485	0.598	1	1	81.567			
Sum Weight:	20.61	59.16						OTM	3132.34 kip-ft	36.31		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.28	2.96	A	0.319	2.247	0.622	0.825	1	23.144	1.48	73.81	A
195.00-175.00			B	0.25	2.439	0.602	0.825	1	17.526			
			C	0.313	2.262	0.62	0.825	1	22.633			
T2	1.26	3.35	A	0.439	1.993	0.668	0.825	1	44.893	2.46	122.90	A
175.00-155.00			B	0.319	2.247	0.622	0.825	1	31.690			
			C	0.423	2.02	0.661	0.825	1	42.811			
T3	2.14	4.21	A	0.492	1.91	0.694	0.825	1	65.659	3.32	166.06	A
155.00-135.00			B	0.444	1.983	0.671	0.825	1	57.774			
			C	0.353	2.164	0.634	0.825	1	44.243			
T4	2.49	4.84	A	0.434	2.001	0.666	0.825	1	68.478	4.07	203.66	B
135.00-115.00			B	0.519	1.876	0.707	0.825	1	85.522			
			C	0.32	2.245	0.622	0.825	1	48.675			
T5	2.49	5.68	A	0.383	2.098	0.645	0.825	1	69.590	4.04	202.05	B
115.00-95.00			B	0.456	1.964	0.676	0.825	1	85.211			
			C	0.286	2.334	0.612	0.825	1	50.909			
T6	2.49	6.46	A	0.361	2.147	0.636	0.825	1	75.466	4.14	206.88	B
95.00-75.00			B	0.423	2.02	0.661	0.825	1	90.110			
			C	0.275	2.366	0.608	0.825	1	56.986			
T7	2.52	7.13	A	0.349	2.173	0.632	0.825	1	83.177	4.21	210.32	B
75.00-55.00			B	0.404	2.056	0.653	0.825	1	97.167			
			C	0.269	2.383	0.607	0.825	1	63.948			
T8	1.89	6.39	A	0.362	2.145	0.637	0.825	1	72.726	3.25	216.99	B
55.00-40.00			B	0.409	2.046	0.655	0.825	1	82.641			
			C	0.289	2.325	0.613	0.825	1	58.442			
T9	2.52	8.34	A	0.311	2.267	0.619	0.825	1	88.567	3.81	190.27	B
40.00-20.00			B	0.357	2.156	0.635	0.825	1	101.742			
			C	0.244	2.457	0.6	0.825	1	70.059			
T10	2.52	9.80	A	0.296	2.307	0.615	0.825	1	92.393	4.02	200.94	B
20.00-0.00			B	0.338	2.201	0.628	0.825	1	105.272			
			C	0.234	2.485	0.598	0.825	1	74.139			
Sum Weight:	20.61	59.16						OTM	3027.76 kip-ft	34.79		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
T1	0.28	2.96	A	0.319	2.247	0.622	0.8	1	23.144	1.48	73.81	A
195.00-175.00			B	0.25	2.439	0.602	0.8	1	17.526			
			C	0.313	2.262	0.62	0.8	1	22.633			
T2	1.26	3.35	A	0.439	1.993	0.668	0.8	1	44.648	2.44	122.22	A
175.00-155.00			B	0.319	2.247	0.622	0.8	1	31.401			
			C	0.423	2.02	0.661	0.8	1	42.597			
T3	2.14	4.21	A	0.492	1.91	0.694	0.8	1	65.405	3.31	165.42	A
155.00-135.00			B	0.444	1.983	0.671	0.8	1	57.499			
			C	0.353	2.164	0.634	0.8	1	43.973			
T4	2.49	4.84	A	0.434	2.001	0.666	0.8	1	68.104	4.06	202.89	B
135.00-115.00			B	0.519	1.876	0.707	0.8	1	85.197			
			C	0.32	2.245	0.622	0.8	1	48.284			
T5	2.49	5.68	A	0.383	2.098	0.645	0.8	1	69.147	4.02	201.11	B
115.00-95.00			B	0.456	1.964	0.676	0.8	1	84.814			
			C	0.286	2.334	0.612	0.8	1	50.449			
T6	2.49	6.46	A	0.361	2.147	0.636	0.8	1	74.869	4.11	205.63	B
95.00-75.00			B	0.423	2.02	0.661	0.8	1	89.565			
			C	0.275	2.366	0.608	0.8	1	56.369			
T7	2.52	7.13	A	0.349	2.173	0.632	0.8	1	82.406	4.18	208.78	B
75.00-55.00			B	0.404	2.056	0.653	0.8	1	96.455			
			C	0.269	2.383	0.607	0.8	1	63.150			
T8	1.89	6.39	A	0.362	2.145	0.637	0.8	1	71.893	3.22	214.96	B
55.00-40.00			B	0.409	2.046	0.655	0.8	1	81.865			
			C	0.289	2.325	0.613	0.8	1	57.582			
T9	2.52	8.34	A	0.311	2.267	0.619	0.8	1	87.629	3.77	188.62	B
40.00-20.00			B	0.357	2.156	0.635	0.8	1	100.861			
			C	0.244	2.457	0.6	0.8	1	69.094			
T10	2.52	9.80	A	0.296	2.307	0.615	0.8	1	91.358	3.98	199.08	B
20.00-0.00			B	0.338	2.201	0.628	0.8	1	104.295			
			C	0.234	2.485	0.598	0.8	1	73.077			
Sum Weight:	20.61	59.16						OTM	3012.82 kip-ft	34.58		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
T1	0.28	2.96	A	0.319	2.247	0.622	0.85	1	23.144	1.48	73.81	A
195.00-175.00			B	0.25	2.439	0.602	0.85	1	17.526			
			C	0.313	2.262	0.62	0.85	1	22.633			
T2	1.26	3.35	A	0.439	1.993	0.668	0.85	1	45.139	2.47	123.57	A
175.00-155.00			B	0.319	2.247	0.622	0.85	1	31.979			
			C	0.423	2.02	0.661	0.85	1	43.025			
T3	2.14	4.21	A	0.492	1.91	0.694	0.85	1	65.914	3.33	166.70	A
155.00-135.00			B	0.444	1.983	0.671	0.85	1	58.048			
			C	0.353	2.164	0.634	0.85	1	44.513			
T4	2.49	4.84	A	0.434	2.001	0.666	0.85	1	68.852	4.09	204.44	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
135.00-115.00			B	0.519	1.876	0.707	0.85	1	85.847			
			C	0.32	2.245	0.622	0.85	1	49.065			
T5	2.49	5.68	A	0.383	2.098	0.645	0.85	1	70.033	4.06	202.99	B
115.00-95.00			B	0.456	1.964	0.676	0.85	1	85.608			
			C	0.286	2.334	0.612	0.85	1	51.369			
T6	2.49	6.46	A	0.361	2.147	0.636	0.85	1	76.063	4.16	208.13	B
95.00-75.00			B	0.423	2.02	0.661	0.85	1	90.654			
			C	0.275	2.366	0.608	0.85	1	57.604			
T7	2.52	7.13	A	0.349	2.173	0.632	0.85	1	83.947	4.24	211.86	B
75.00-55.00			B	0.404	2.056	0.653	0.85	1	97.878			
			C	0.269	2.383	0.607	0.85	1	64.747			
T8	1.89	6.39	A	0.362	2.145	0.637	0.85	1	73.559	3.29	219.03	B
55.00-40.00			B	0.409	2.046	0.655	0.85	1	83.417			
			C	0.289	2.325	0.613	0.85	1	59.302			
T9	2.52	8.34	A	0.311	2.267	0.619	0.85	1	89.506	3.84	191.92	B
40.00-20.00			B	0.357	2.156	0.635	0.85	1	102.622			
			C	0.244	2.457	0.6	0.85	1	71.025			
T10	2.52	9.80	A	0.296	2.307	0.615	0.85	1	93.427	4.06	202.81	B
20.00-0.00			B	0.338	2.201	0.628	0.85	1	106.248			
			C	0.234	2.485	0.598	0.85	1	75.200			
Sum Weight:	20.61	59.16						OTM	3042.70 kip-ft	35.01		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	1	1	14.255	0.43	21.36	C
195.00-175.00			B	0.163	2.723	0.584	1	1	10.956			
			C	0.209	2.565	0.592	1	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	1	1	31.143	0.81	40.61	C
175.00-155.00			B	0.222	2.524	0.595	1	1	24.004			
			C	0.309	2.272	0.619	1	1	31.610			
T3	0.91	3.57	A	0.338	2.199	0.628	1	1	43.904	1.05	52.61	A
155.00-135.00			B	0.308	2.274	0.619	1	1	40.122			
			C	0.258	2.414	0.604	1	1	33.711			
T4	1.05	4.04	A	0.303	2.287	0.617	1	1	48.747	1.30	65.10	B
135.00-115.00			B	0.365	2.137	0.638	1	1	58.332			
			C	0.238	2.475	0.599	1	1	38.986			
T5	1.05	4.79	A	0.268	2.384	0.607	1	1	50.938	1.34	66.90	B
115.00-95.00			B	0.321	2.242	0.623	1	1	60.062			
			C	0.212	2.556	0.593	1	1	41.486			
T6	1.05	5.35	A	0.257	2.416	0.604	1	1	57.790	1.42	71.23	B
95.00-75.00			B	0.302	2.29	0.617	1	1	66.506			
			C	0.208	2.57	0.592	1	1	48.378			
T7	1.06	5.79	A	0.253	2.43	0.603	1	1	65.929	1.49	74.62	B
75.00-55.00			B	0.292	2.317	0.614	1	1	74.330			
			C	0.207	2.571	0.592	1	1	56.262			
T8	0.79	5.02	A	0.266	2.389	0.606	1	1	60.176	1.20	80.08	B
55.00-40.00			B	0.301	2.293	0.616	1	1	66.116			
			C	0.226	2.512	0.596	1	1	53.016			
T9	1.06	6.79	A	0.226	2.511	0.596	1	1	72.240	1.38	69.15	B
40.00-20.00			B	0.259	2.41	0.604	1	1	80.377			
			C	0.189	2.635	0.588	1	1	62.768			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T10	1.06	8.13	A	0.216	2.542	0.594	1	1	76.428	1.48	73.82	B
20.00-0.00			B	0.247	2.448	0.601	1	1	84.476			
			C	0.182	2.657	0.587	1	1	67.021			
Sum Weight:	8.70	48.83						OTM	1000.23 kip-ft	11.91		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.825	1	14.255	0.43	21.36	C
195.00-175.00			B	0.163	2.723	0.584	0.825	1	10.956			
			C	0.209	2.565	0.592	0.825	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.825	1	29.309	0.77	38.46	C
175.00-155.00			B	0.222	2.524	0.595	0.825	1	21.979			
			C	0.309	2.272	0.619	0.825	1	29.935			
T3	0.91	3.57	A	0.338	2.199	0.628	0.825	1	41.917	1.00	50.23	A
155.00-135.00			B	0.308	2.274	0.619	0.825	1	38.053			
			C	0.258	2.414	0.604	0.825	1	31.665			
T4	1.05	4.04	A	0.303	2.287	0.617	0.825	1	45.899	1.24	62.18	B
135.00-115.00			B	0.365	2.137	0.638	0.825	1	55.721			
			C	0.238	2.475	0.599	0.825	1	36.071			
T5	1.05	4.79	A	0.268	2.384	0.607	0.825	1	47.613	1.27	63.45	B
115.00-95.00			B	0.321	2.242	0.623	0.825	1	56.964			
			C	0.212	2.556	0.593	0.825	1	38.095			
T6	1.05	5.35	A	0.257	2.416	0.604	0.825	1	53.352	1.33	66.75	B
95.00-75.00			B	0.302	2.29	0.617	0.825	1	62.326			
			C	0.208	2.57	0.592	0.825	1	43.862			
T7	1.06	5.79	A	0.253	2.43	0.603	0.825	1	60.220	1.38	69.18	B
75.00-55.00			B	0.292	2.317	0.614	0.825	1	68.910			
			C	0.207	2.571	0.592	0.825	1	50.452			
T8	0.79	5.02	A	0.266	2.389	0.606	0.825	1	54.043	1.09	72.99	B
55.00-40.00			B	0.301	2.293	0.616	0.825	1	60.261			
			C	0.226	2.512	0.596	0.825	1	46.786			
T9	1.06	6.79	A	0.226	2.511	0.596	0.825	1	65.364	1.27	63.48	B
40.00-20.00			B	0.259	2.41	0.604	0.825	1	73.785			
			C	0.189	2.635	0.588	0.825	1	55.794			
T10	1.06	8.13	A	0.216	2.542	0.594	0.825	1	68.884	1.35	67.47	B
20.00-0.00			B	0.247	2.448	0.601	0.825	1	77.213			
			C	0.182	2.657	0.587	0.825	1	59.379			
Sum Weight:	8.70	48.83						OTM	947.28 kip-ft	11.15		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.8	1	14.255	0.43	21.36	C
195.00-175.00			B	0.163	2.723	0.584	0.8	1	10.956			
			C	0.209	2.565	0.592	0.8	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.8	1	29.048	0.76	38.15	C
175.00-155.00			B	0.222	2.524	0.595	0.8	1	21.689			
			C	0.309	2.272	0.619	0.8	1	29.696			
T3	0.91	3.57	A	0.338	2.199	0.628	0.8	1	41.633	1.00	49.89	A
155.00-135.00			B	0.308	2.274	0.619	0.8	1	37.758			
			C	0.258	2.414	0.604	0.8	1	31.372			
T4	1.05	4.04	A	0.303	2.287	0.617	0.8	1	45.492	1.24	61.77	B
135.00-115.00			B	0.365	2.137	0.638	0.8	1	55.348			
			C	0.238	2.475	0.599	0.8	1	35.655			
T5	1.05	4.79	A	0.268	2.384	0.607	0.8	1	47.138	1.26	62.95	B
115.00-95.00			B	0.321	2.242	0.623	0.8	1	56.521			
			C	0.212	2.556	0.593	0.8	1	37.611			
T6	1.05	5.35	A	0.257	2.416	0.604	0.8	1	52.718	1.32	66.11	B
95.00-75.00			B	0.302	2.29	0.617	0.8	1	61.728			
			C	0.208	2.57	0.592	0.8	1	43.217			
T7	1.06	5.79	A	0.253	2.43	0.603	0.8	1	59.404	1.37	68.40	B
75.00-55.00			B	0.292	2.317	0.614	0.8	1	68.136			
			C	0.207	2.571	0.592	0.8	1	49.622			
T8	0.79	5.02	A	0.266	2.389	0.606	0.8	1	53.167	1.08	71.97	B
55.00-40.00			B	0.301	2.293	0.616	0.8	1	59.425			
			C	0.226	2.512	0.596	0.8	1	45.896			
T9	1.06	6.79	A	0.226	2.511	0.596	0.8	1	64.382	1.25	62.67	B
40.00-20.00			B	0.259	2.41	0.604	0.8	1	72.843			
			C	0.189	2.635	0.588	0.8	1	54.797			
T10	1.06	8.13	A	0.216	2.542	0.594	0.8	1	67.807	1.33	66.56	B
20.00-0.00			B	0.247	2.448	0.601	0.8	1	76.176			
			C	0.182	2.657	0.587	0.8	1	58.288			
Sum Weight:	8.70	48.83						OTM	939.72 kip-ft	11.04		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.85	1	14.255	0.43	21.36	C
195.00-175.00			B	0.163	2.723	0.584	0.85	1	10.956			
			C	0.209	2.565	0.592	0.85	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.85	1	29.571	0.78	38.77	C
175.00-155.00			B	0.222	2.524	0.595	0.85	1	22.268			
			C	0.309	2.272	0.619	0.85	1	30.174			
T3	0.91	3.57	A	0.338	2.199	0.628	0.85	1	42.201	1.01	50.57	A
155.00-135.00			B	0.308	2.274	0.619	0.85	1	38.349			
			C	0.258	2.414	0.604	0.85	1	31.957			
T4	1.05	4.04	A	0.303	2.287	0.617	0.85	1	46.306	1.25	62.60	B
135.00-115.00			B	0.365	2.137	0.638	0.85	1	56.094			
			C	0.238	2.475	0.599	0.85	1	36.488			
T5	1.05	4.79	A	0.268	2.384	0.607	0.85	1	48.088	1.28	63.94	B
115.00-95.00			B	0.321	2.242	0.623	0.85	1	57.406			
			C	0.212	2.556	0.593	0.85	1	38.580			
T6	1.05	5.35	A	0.257	2.416	0.604	0.85	1	53.986	1.35	67.39	B
95.00-75.00			B	0.302	2.29	0.617	0.85	1	62.923			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.208	2.57	0.592	0.85	1	44.507			
T7	1.06	5.79	A	0.253	2.43	0.603	0.85	1	61.035	1.40	69.96	B
75.00-55.00			B	0.292	2.317	0.614	0.85	1	69.684			
			C	0.207	2.571	0.592	0.85	1	51.282			
T8	0.79	5.02	A	0.266	2.389	0.606	0.85	1	54.919	1.11	74.00	B
55.00-40.00			B	0.301	2.293	0.616	0.85	1	61.098			
			C	0.226	2.512	0.596	0.85	1	47.676			
T9	1.06	6.79	A	0.226	2.511	0.596	0.85	1	66.346	1.29	64.29	B
40.00-20.00			B	0.259	2.41	0.604	0.85	1	74.727			
			C	0.189	2.635	0.588	0.85	1	56.790			
T10	1.06	8.13	A	0.216	2.542	0.594	0.85	1	69.962	1.37	68.38	B
20.00-0.00			B	0.247	2.448	0.601	0.85	1	78.251			
			C	0.182	2.657	0.587	0.85	1	60.471			
Sum Weight:	8.70	48.83						OTM	954.85 kip-ft	11.25		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	29.31					
Bracing Weight	19.52					
Total Member Self-Weight	48.83			-20.29	20.13	
Total Weight	68.32			-20.29	20.13	
Wind 0 deg - No Ice		0.00	-56.37	-6267.63	20.13	-26.25
Wind 30 deg - No Ice		27.07	-46.98	-5303.31	-3021.66	-42.63
Wind 45 deg - No Ice		38.03	-38.11	-4316.53	-4264.28	-46.89
Wind 60 deg - No Ice		46.27	-26.77	-3045.94	-5205.96	-47.84
Wind 90 deg - No Ice		54.13	0.00	-20.29	-6063.45	-42.31
Wind 120 deg - No Ice		48.72	28.18	3103.38	-5375.74	-26.38
Wind 135 deg - No Ice		38.03	38.11	4275.95	-4264.28	-12.17
Wind 150 deg - No Ice		27.07	46.98	5262.73	-3021.66	0.32
Wind 180 deg - No Ice		0.00	53.54	6031.01	20.13	24.31
Wind 210 deg - No Ice		-27.07	46.98	5262.73	3061.93	42.63
Wind 225 deg - No Ice		-38.03	38.11	4275.95	4304.55	46.89
Wind 240 deg - No Ice		-48.72	28.18	3103.38	5416.01	52.63
Wind 270 deg - No Ice		-54.13	0.00	-20.29	6103.72	42.31
Wind 300 deg - No Ice		-46.27	-26.77	-3045.94	5246.23	23.53
Wind 315 deg - No Ice		-38.03	-38.11	-4316.53	4304.55	12.17
Wind 330 deg - No Ice		-27.07	-46.98	-5303.31	3061.93	-0.32
Member Ice	10.33					
Total Weight Ice	94.48			-61.42	45.62	
Wind 0 deg - Ice		0.00	-52.37	-5901.21	45.62	-26.99
Wind 30 deg - Ice		25.49	-44.23	-5041.20	-2823.01	-45.70
Wind 45 deg - Ice		35.90	-35.96	-4116.83	-4000.67	-50.79
Wind 60 deg - Ice		43.78	-25.32	-2921.56	-4897.11	-52.34
Wind 90 deg - Ice		50.98	0.00	-61.42	-5691.63	-46.38
Wind 120 deg - Ice		45.28	26.19	2858.47	-5000.62	-28.64
Wind 135 deg - Ice		35.90	35.96	3993.98	-4000.67	-14.27
Wind 150 deg - Ice		25.49	44.23	4918.35	-2823.01	-0.68
Wind 180 deg - Ice		0.00	50.64	5658.84	45.62	25.66
Wind 210 deg - Ice		-25.49	44.23	4918.35	2914.25	45.70
Wind 225 deg - Ice		-35.90	35.96	3993.98	4091.91	50.79
Wind 240 deg - Ice		-45.28	26.19	2858.47	5091.86	55.63

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 270 deg - Ice		-50.98	0.00	-61.42	5782.88	46.38
Wind 300 deg - Ice		-43.78	-25.32	-2921.56	4988.35	26.68
Wind 315 deg - Ice		-35.90	-35.96	-4116.83	4091.91	14.27
Wind 330 deg - Ice		-25.49	-44.23	-5041.20	2914.25	0.68
Total Weight	68.32			-20.29	20.13	
Wind 0 deg - Service		0.00	-17.40	-1919.80	0.28	-8.10
Wind 30 deg - Service		8.35	-14.50	-1622.17	-938.55	-13.16
Wind 45 deg - Service		11.74	-11.76	-1317.61	-1322.07	-14.47
Wind 60 deg - Service		14.28	-8.26	-925.45	-1612.72	-14.77
Wind 90 deg - Service		16.71	0.00	8.39	-1877.37	-13.06
Wind 120 deg - Service		15.04	8.70	972.49	-1665.12	-8.14
Wind 135 deg - Service		11.74	11.76	1334.39	-1322.07	-3.76
Wind 150 deg - Service		8.35	14.50	1638.95	-938.55	0.10
Wind 180 deg - Service		0.00	16.53	1876.08	0.28	7.50
Wind 210 deg - Service		-8.35	14.50	1638.95	939.10	13.16
Wind 225 deg - Service		-11.74	11.76	1334.39	1322.63	14.47
Wind 240 deg - Service		-15.04	8.70	972.49	1665.67	16.24
Wind 270 deg - Service		-16.71	0.00	8.39	1877.93	13.06
Wind 300 deg - Service		-14.28	-8.26	-925.45	1613.27	7.26
Wind 315 deg - Service		-11.74	-11.76	-1317.61	1322.63	3.76
Wind 330 deg - Service		-8.35	-14.50	-1622.17	939.10	-0.10

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp

Comb. No.	Description
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	195 - 175	Leg	Max Tension	10	14.41	-0.11	0.00
			Max. Compression	13	-18.50	0.51	-0.03
			Max. Mx	5	-1.77	0.86	-0.23
			Max. My	15	-0.39	0.15	-1.34
			Max. Vy	5	0.78	-0.43	-0.23
			Max. Vx	15	1.13	0.15	0.53
		Diagonal	Max Tension	6	4.11	0.00	0.00
			Max. Compression	6	-4.14	0.00	0.00
			Max. Mx	29	2.50	-0.01	0.00
			Max. My	14	-3.39	-0.00	-0.00
			Max. Vy	30	-0.01	-0.01	-0.00
			Max. Vx	14	0.00	-0.00	-0.00
		Top Girt	Max Tension	10	0.10	0.00	0.00
			Max. Compression	7	-0.12	0.00	0.00
			Max. Mx	18	-0.02	0.02	0.00
			Max. My	8	0.01	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
		Bottom Girt	Max Tension	2	0.36	0.00	0.00
			Max. Compression	15	-0.39	0.00	0.00
			Max. Mx	18	-0.02	0.02	0.00
			Max. My	34	-0.02	0.00	-0.00
			Max. Vy	18	-0.02	0.00	0.00
			Max. Vx	34	0.00	0.00	0.00
T2	175 - 155	Leg	Max Tension	10	43.66	-0.50	-0.02
			Max. Compression	13	-52.21	0.37	0.01
			Max. Mx	5	19.60	1.15	0.03
			Max. My	17	-4.46	-0.03	-1.14
			Max. Vy	5	-0.85	-0.50	0.01
			Max. Vx	17	0.81	-0.01	0.38
		Diagonal	Max Tension	6	6.57	0.00	0.00
			Max. Compression	6	-6.66	0.00	0.00
			Max. Mx	28	3.06	0.02	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	14	-5.94	0.00	0.02
			Max. Vy	27	0.01	0.02	-0.00
			Max. Vx	14	-0.00	0.00	0.00
T3	155 - 135	Leg	Max Tension	10	78.93	-0.89	-0.02
			Max. Compression	13	-92.84	-0.10	-0.04
			Max. Mx	10	65.65	1.54	-0.02
			Max. My	6	-5.41	-0.03	-1.56
			Max. Vy	10	0.75	-0.89	-0.02
			Max. Vx	14	0.75	-0.03	-0.82
		Diagonal	Max Tension	6	7.61	0.00	0.00
			Max. Compression	6	-7.66	0.00	0.00
			Max. Mx	33	5.26	0.04	-0.00
			Max. My	32	-6.16	0.02	0.01
			Max. Vy	27	0.02	0.04	-0.00
			Max. Vx	32	-0.00	0.00	0.00
T4	135 - 115	Leg	Max Tension	10	114.56	-0.12	-0.02
			Max. Compression	13	-132.59	0.30	-0.06
			Max. Mx	7	-131.81	0.30	0.03
			Max. My	14	-8.22	-0.00	-0.28
			Max. Vy	10	0.10	-0.26	-0.02
			Max. Vx	14	0.10	-0.01	-0.18
		Diagonal	Max Tension	6	7.18	0.00	0.00
			Max. Compression	6	-7.23	0.00	0.00
			Max. Mx	30	5.42	0.05	-0.01
			Max. My	27	-5.85	0.03	-0.01
			Max. Vy	32	0.03	0.05	0.01
			Max. Vx	27	0.00	0.00	0.00
T5	115 - 95	Leg	Max Tension	10	145.59	-0.20	-0.02
			Max. Compression	13	-168.44	0.17	-0.05
			Max. Mx	7	-143.70	0.30	0.03
			Max. My	14	-8.52	-0.00	-0.28
			Max. Vy	10	-0.07	-0.30	-0.03
			Max. Vx	13	-0.10	-0.15	-0.26
		Diagonal	Max Tension	3	7.53	0.00	0.00
			Max. Compression	3	-7.63	0.00	0.00
			Max. Mx	32	5.69	0.09	-0.01
			Max. My	21	-7.12	0.05	0.01
			Max. Vy	32	0.05	0.09	-0.01
			Max. Vx	21	-0.00	0.00	0.00
T6	95 - 75	Leg	Max Tension	15	174.33	-0.23	-0.03
			Max. Compression	2	-202.61	0.17	0.02
			Max. Mx	10	174.16	-0.24	-0.03
			Max. My	14	-12.09	-0.01	-0.29
			Max. Vy	27	-0.09	-0.22	-0.03
			Max. Vx	13	-0.14	-0.13	-0.27
		Diagonal	Max Tension	3	8.22	0.00	0.00
			Max. Compression	3	-8.29	0.00	0.00
			Max. Mx	32	5.85	0.11	-0.01
			Max. My	21	-7.79	0.07	0.02
			Max. Vy	32	0.05	0.11	-0.01
			Max. Vx	21	-0.00	0.00	0.00
T7	75 - 55	Leg	Max Tension	15	201.98	-0.27	-0.03
			Max. Compression	2	-236.17	0.06	-0.01
			Max. Mx	27	182.39	-0.30	-0.02
			Max. My	14	-14.63	-0.04	-0.36
			Max. Vy	27	-0.10	-0.30	-0.02
			Max. Vx	6	0.12	-0.04	0.35
		Diagonal	Max Tension	3	8.96	0.00	0.00
			Max. Compression	3	-9.06	0.00	0.00
			Max. Mx	19	6.15	0.13	0.02
			Max. My	21	-8.22	0.08	0.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	32	0.06	0.13	-0.02
			Max. Vx	21	-0.00	0.00	0.00
T8	55 - 40	Leg	Max Tension	15	223.07	-0.10	-0.00
			Max. Compression	2	-262.57	0.56	0.05
			Max. Mx	27	200.47	-1.01	-0.05
			Max. My	31	-25.83	-0.51	-0.54
			Max. Vy	27	0.28	-1.01	-0.05
			Max. Vx	23	-0.14	-0.51	0.53
		Diagonal	Max Tension	28	9.34	0.00	0.00
			Max. Compression	11	-9.36	0.00	0.00
			Max. Mx	32	5.93	0.14	-0.02
			Max. My	22	-7.71	0.10	0.02
			Max. Vy	32	0.06	0.14	-0.02
			Max. Vx	22	-0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	15	247.93	-0.26	-0.02
			Max. Compression	2	-294.17	0.29	0.03
			Max. Mx	24	-279.35	2.26	0.04
			Max. My	31	-26.00	-0.51	-0.54
			Max. Vy	24	-0.51	2.26	0.04
			Max. Vx	14	0.12	-0.03	-0.50
		Diagonal	Max Tension	28	10.46	0.00	0.00
			Max. Compression	28	-11.27	0.00	0.00
			Max. Mx	32	5.31	0.25	-0.02
			Max. My	22	-9.95	0.21	0.03
			Max. Vy	32	0.09	0.25	-0.02
			Max. Vx	22	-0.00	0.00	0.00
T10	20 - 0	Leg	Max Tension	15	272.68	-0.27	-0.03
			Max. Compression	2	-326.83	-0.00	-0.00
			Max. Mx	24	-299.24	3.54	0.03
			Max. My	14	-22.46	-0.05	-0.60
			Max. Vy	27	-0.98	-3.20	-0.01
			Max. Vx	14	-0.16	-0.05	-0.60
		Diagonal	Max Tension	28	14.15	0.00	0.00
			Max. Compression	28	-13.48	0.00	0.00
			Max. Mx	32	3.69	0.39	-0.03
			Max. My	21	-12.43	0.32	0.04
			Max. Vy	32	0.11	0.39	-0.03
			Max. Vx	21	-0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	13	330.43	29.35	-18.43
	Max. H_x	13	330.43	29.35	-18.43
	Max. H_z	21	-240.95	-27.70	18.58
	Min. Vert	5	-274.51	-25.06	15.83
	Min. H_x	22	-249.76	-28.97	18.17
	Min. H_z	13	330.43	29.35	-18.43
Leg B	Max. Vert	7	328.71	-29.65	-17.86
	Max. H_x	32	-253.65	29.32	17.68
	Max. H_z	33	-244.84	28.19	17.85
	Min. Vert	15	-276.22	25.38	15.33
	Min. H_x	7	328.71	-29.65	-17.86
	Min. H_z	7	328.71	-29.65	-17.86
Leg A	Max. Vert	2	331.68	-0.65	34.69

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_x	14	23.77	5.39	1.81
	Max. H_z	2	331.68	-0.65	34.69
	Min. Vert	10	-274.49	0.60	-29.66
	Min. H_x	6	23.77	-5.42	1.81
	Min. H_z	27	-247.65	0.61	-34.17

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	68.32	0.00	0.00	-20.29	20.13	-0.00
Dead+Wind 0 deg - No Ice	68.32	-0.00	-56.37	-6286.83	20.23	-26.31
Dead+Wind 30 deg - No Ice	68.32	27.07	-46.98	-5319.66	-3030.96	-42.69
Dead+Wind 45 deg - No Ice	68.32	38.03	-38.11	-4329.86	-4277.44	-46.94
Dead+Wind 60 deg - No Ice	68.32	46.27	-26.77	-3055.36	-5222.06	-47.88
Dead+Wind 90 deg - No Ice	68.32	54.13	-0.00	-20.34	-6082.19	-42.32
Dead+Wind 120 deg - No Ice	68.32	48.72	28.18	3112.94	-5392.27	-26.37
Dead+Wind 135 deg - No Ice	68.32	38.03	38.11	4289.21	-4277.48	-12.15
Dead+Wind 150 deg - No Ice	68.32	27.07	46.98	5279.03	-3030.98	0.36
Dead+Wind 180 deg - No Ice	68.32	-0.00	53.54	6049.71	20.23	24.37
Dead+Wind 210 deg - No Ice	68.32	-27.07	46.98	5279.01	3071.42	42.69
Dead+Wind 225 deg - No Ice	68.32	-38.03	38.11	4289.18	4317.88	46.95
Dead+Wind 240 deg - No Ice	68.32	-48.72	28.18	3112.92	5432.67	52.68
Dead+Wind 270 deg - No Ice	68.32	-54.13	-0.00	-20.33	6122.57	42.32
Dead+Wind 300 deg - No Ice	68.32	-46.27	-26.77	-3055.31	5262.45	23.52
Dead+Wind 315 deg - No Ice	68.32	-38.03	-38.11	-4329.81	4317.85	12.14
Dead+Wind 330 deg - No Ice	68.32	-27.07	-46.98	-5319.62	3071.39	-0.36
Dead+Ice+Temp	94.48	0.00	0.00	-61.43	45.61	-0.00
Dead+Wind 0 deg+Ice+Temp	94.48	0.00	-52.37	-5923.94	45.79	-27.10
Dead+Wind 30 deg+Ice+Temp	94.48	25.49	-44.23	-5060.71	-2833.98	-45.84
Dead+Wind 45 deg+Ice+Temp	94.48	35.90	-35.96	-4132.77	-4016.24	-50.94
Dead+Wind 60 deg+Ice+Temp	94.48	43.78	-25.32	-2932.87	-4916.19	-52.48
Dead+Wind 90 deg+Ice+Temp	94.48	50.98	0.00	-61.61	-5713.79	-46.47
Dead+Wind 120 deg+Ice+Temp	94.48	45.28	26.19	2869.61	-5020.01	-28.66
Dead+Wind 135 deg+Ice+Temp	94.48	35.90	35.96	4009.60	-4016.25	-14.26
Dead+Wind 150 deg+Ice+Temp	94.48	25.49	44.23	4937.57	-2833.98	-0.63
Dead+Wind 180 deg+Ice+Temp	94.48	0.00	50.64	5680.94	45.91	25.77
Dead+Wind 210 deg+Ice+Temp	94.48	-25.49	44.23	4937.55	2925.61	45.84
Dead+Wind 225 deg+Ice+Temp	94.48	-35.90	35.96	4009.59	4107.85	50.94
Dead+Wind 240 deg+Ice+Temp	94.48	-45.28	26.19	2869.61	5111.59	55.76
Dead+Wind 270 deg+Ice+Temp	94.48	-50.98	0.00	-61.57	5805.34	46.47
Dead+Wind 300 deg+Ice+Temp	94.48	-43.78	-25.32	-2932.87	5007.66	26.70
Dead+Wind 315 deg+Ice+Temp	94.48	-35.90	-35.96	-4132.71	4107.79	14.25
Dead+Wind 330 deg+Ice+Temp	94.48	-25.49	-44.23	-5060.65	2925.55	0.63
Dead+Wind 0 deg - Service	68.32	0.00	-17.40	-1954.43	20.19	-8.12
Dead+Wind 30 deg - Service	68.32	8.35	-14.50	-1655.91	-921.54	-13.17
Dead+Wind 45 deg - Service	68.32	11.74	-11.76	-1350.41	-1306.26	-14.49
Dead+Wind 60 deg - Service	68.32	14.28	-8.26	-957.04	-1597.80	-14.78
Dead+Wind 90 deg - Service	68.32	16.71	0.00	-20.31	-1863.27	-13.06
Dead+Wind 120 deg - Service	68.32	15.04	8.70	946.75	-1650.33	-8.14
Dead+Wind 135 deg - Service	68.32	11.74	11.76	1309.80	-1306.26	-3.74
Dead+Wind 150 deg - Service	68.32	8.35	14.50	1615.30	-921.54	0.11
Dead+Wind 180 deg - Service	68.32	0.00	16.53	1853.17	20.19	7.52
Dead+Wind 210 deg - Service	68.32	-8.35	14.50	1615.30	961.92	13.17
Dead+Wind 225 deg - Service	68.32	-11.74	11.76	1309.80	1346.64	14.49
Dead+Wind 240 deg - Service	68.32	-15.04	8.70	946.76	1690.71	16.26

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 270 deg - Service	68.32	-16.71	-0.00	-20.31	1903.65	13.06
Dead+Wind 300 deg - Service	68.32	-14.28	-8.26	-957.04	1638.18	7.26
Dead+Wind 315 deg - Service	68.32	-11.74	-11.76	-1350.41	1346.63	3.74
Dead+Wind 330 deg - Service	68.32	-8.35	-14.50	-1655.91	961.92	-0.11

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-68.32	0.00	0.00	68.32	0.00	0.000%
2	0.00	-68.32	-56.37	0.00	68.32	56.37	0.000%
3	27.07	-68.32	-46.98	-27.07	68.32	46.98	0.000%
4	38.03	-68.32	-38.11	-38.03	68.32	38.11	0.000%
5	46.27	-68.32	-26.77	-46.27	68.32	26.77	0.000%
6	54.13	-68.32	0.00	-54.13	68.32	0.00	0.001%
7	48.72	-68.32	28.18	-48.72	68.32	-28.18	0.000%
8	38.03	-68.32	38.11	-38.03	68.32	-38.11	0.000%
9	27.07	-68.32	46.98	-27.07	68.32	-46.98	0.000%
10	0.00	-68.32	53.54	0.00	68.32	-53.54	0.000%
11	-27.07	-68.32	46.98	27.07	68.32	-46.98	0.000%
12	-38.03	-68.32	38.11	38.03	68.32	-38.11	0.001%
13	-48.72	-68.32	28.18	48.72	68.32	-28.18	0.000%
14	-54.13	-68.32	0.00	54.13	68.32	0.00	0.001%
15	-46.27	-68.32	-26.77	46.27	68.32	26.77	0.000%
16	-38.03	-68.32	-38.11	38.03	68.32	38.11	0.000%
17	-27.07	-68.32	-46.98	27.07	68.32	46.98	0.000%
18	0.00	-94.48	0.00	-0.00	94.48	-0.00	0.000%
19	0.00	-94.48	-52.37	-0.00	94.48	52.37	0.000%
20	25.49	-94.48	-44.23	-25.49	94.48	44.23	0.000%
21	35.90	-94.48	-35.96	-35.90	94.48	35.96	0.000%
22	43.78	-94.48	-25.32	-43.78	94.48	25.32	0.000%
23	50.98	-94.48	0.00	-50.98	94.48	-0.00	0.000%
24	45.28	-94.48	26.19	-45.28	94.48	-26.19	0.000%
25	35.90	-94.48	35.96	-35.90	94.48	-35.96	0.000%
26	25.49	-94.48	44.23	-25.49	94.48	-44.23	0.000%
27	0.00	-94.48	50.64	-0.00	94.48	-50.64	0.000%
28	-25.49	-94.48	44.23	25.49	94.48	-44.23	0.000%
29	-35.90	-94.48	35.96	35.90	94.48	-35.96	0.000%
30	-45.28	-94.48	26.19	45.28	94.48	-26.19	0.000%
31	-50.98	-94.48	0.00	50.98	94.48	-0.00	0.000%
32	-43.78	-94.48	-25.32	43.78	94.48	25.32	0.000%
33	-35.90	-94.48	-35.96	35.90	94.48	35.96	0.000%
34	-25.49	-94.48	-44.23	25.49	94.48	44.23	0.000%
35	0.00	-68.32	-17.40	0.00	68.32	17.40	0.000%
36	8.35	-68.32	-14.50	-8.35	68.32	14.50	0.000%
37	11.74	-68.32	-11.76	-11.74	68.32	11.76	0.000%
38	14.28	-68.32	-8.26	-14.28	68.32	8.26	0.000%
39	16.71	-68.32	0.00	-16.71	68.32	0.00	0.000%
40	15.04	-68.32	8.70	-15.04	68.32	-8.70	0.000%
41	11.74	-68.32	11.76	-11.74	68.32	-11.76	0.000%
42	8.35	-68.32	14.50	-8.35	68.32	-14.50	0.000%
43	0.00	-68.32	16.53	0.00	68.32	-16.53	0.000%
44	-8.35	-68.32	14.50	8.35	68.32	-14.50	0.000%
45	-11.74	-68.32	11.76	11.74	68.32	-11.76	0.000%
46	-15.04	-68.32	8.70	15.04	68.32	-8.70	0.000%
47	-16.71	-68.32	0.00	16.71	68.32	0.00	0.000%
48	-14.28	-68.32	-8.26	14.28	68.32	8.26	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
49	-11.74	-68.32	-11.76	11.74	68.32	11.76	0.000%
50	-8.35	-68.32	-14.50	8.35	68.32	14.50	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000075
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000102
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000074
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000068
20	Yes	4	0.00000001	0.00000096
21	Yes	4	0.00000001	0.00000102
22	Yes	4	0.00000001	0.00000105
23	Yes	4	0.00000001	0.00000105
24	Yes	4	0.00000001	0.00000064
25	Yes	4	0.00000001	0.00000067
26	Yes	4	0.00000001	0.00000099
27	Yes	4	0.00000001	0.00000104
28	Yes	4	0.00000001	0.00000094
29	Yes	4	0.00000001	0.00000073
30	Yes	4	0.00000001	0.00000065
31	Yes	4	0.00000001	0.00000107
32	Yes	4	0.00000001	0.00000107
33	Yes	4	0.00000001	0.00000108
34	Yes	4	0.00000001	0.00000104
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001

50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	3.061	46	0.1234	0.0305
T2	175 - 155	2.542	46	0.1193	0.0202
T3	155 - 135	2.030	46	0.1110	0.0147
T4	135 - 115	1.570	35	0.0983	0.0157
T5	115 - 95	1.161	35	0.0841	0.0161
T6	95 - 75	0.822	35	0.0680	0.0149
T7	75 - 55	0.544	35	0.0529	0.0128
T8	55 - 40	0.320	35	0.0389	0.0097
T9	40 - 20	0.181	35	0.0283	0.0064
T10	20 - 0	0.060	35	0.0135	0.0031

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	15-ft Triangular Mount	46	2.932	0.1225	0.0281	676348
180.00	Pirod 15' T-Frame Sector Mount (1)	46	2.672	0.1206	0.0231	225452
175.00	DC6-48-60-18-8F Surge Arrestor	46	2.542	0.1193	0.0202	205088
173.00	800 10121	46	2.490	0.1187	0.0192	263865
172.00	Pirod 12' T-Frame Sector Mount (1)	46	2.464	0.1184	0.0187	333601
160.00	Pirod 15' T-Frame Sector Mount (1)	46	2.154	0.1135	0.0153	97188
145.00	Pirod 15' T-Frame Sector Mount (1)	35	1.793	0.1050	0.0155	87991
80.00	GPS	35	0.608	0.0565	0.0134	80698

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	9.843	13	0.3916	0.0988
T2	175 - 155	8.189	13	0.3813	0.0656
T3	155 - 135	6.553	2	0.3562	0.0551
T4	135 - 115	5.068	2	0.3162	0.0589
T5	115 - 95	3.748	2	0.2712	0.0581
T6	95 - 75	2.651	2	0.2193	0.0532
T7	75 - 55	1.755	2	0.1703	0.0453
T8	55 - 40	1.035	2	0.1251	0.0340
T9	40 - 20	0.586	2	0.0910	0.0221
T10	20 - 0	0.195	2	0.0435	0.0106

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	15-ft Triangular Mount	13	9.431	0.3897	0.0911	312901
180.00	Pirod 15' T-Frame Sector Mount (1)	13	8.605	0.3849	0.0750	104301
175.00	DC6-48-60-18-8F Surge Arrestor	13	8.189	0.3813	0.0656	99099
173.00	800 10121	2	8.023	0.3796	0.0622	142490
172.00	Pirod 12' T-Frame Sector Mount (1)	2	7.940	0.3787	0.0605	206810
160.00	Pirod 15' T-Frame Sector Mount (1)	2	6.953	0.3641	0.0517	32097
145.00	Pirod 15' T-Frame Sector Mount (1)	2	5.790	0.3373	0.0584	27832
80.00	GPS	2	1.961	0.1820	0.0475	25073

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	195	Leg	A325N	1.1250	4	3.60	43.74	0.082 ✓	1.333	Bolt Tension
T2	175	Leg	A325N	1.1250	6	7.28	43.74	0.166 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	6.57	8.16	0.806 ✓	1.333	Member Bearing
T3	155	Leg	A325N	1.1250	6	13.15	43.74	0.301 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	7.66	12.63	0.607 ✓	1.333	Bolt Shear
T4	135	Leg	A325N	1.1250	6	19.09	43.74	0.437 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	7.18	10.88	0.660 ✓	1.333	Member Bearing
T5	115	Leg	A325N	1.1250	8	18.20	43.74	0.416 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	7.63	16.49	0.463 ✓	1.333	Bolt Shear
T6	95	Leg	A325N	1.1250	8	21.79	43.74	0.498 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	8.22	15.86	0.519 ✓	1.333	Member Bearing
T7	75	Leg	A325N	1.2500	8	25.25	54.00	0.468 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	8.96	12.69	0.706 ✓	1.333	Member Bearing
T8	55	Leg	A325N	1.2500	8	27.88	54.00	0.516 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	9.34	12.69	0.736 ✓	1.333	Member Bearing
T9	40	Leg	A325N	1.2500	8	30.99	54.00	0.574 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	11.27	16.49	0.684 ✓	1.333	Bolt Shear
T10	20	Leg	A449	1.3750	8	34.09	51.45	0.662 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	14.15	16.49	0.858 ✓	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 175	3	20.01	3.33	53.4 K=1.00	23.819	7.0686	-18.50	168.37	0.110 ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5 K=1.00	17.895	11.0447	-52.21	197.65	0.264 ✔
T3	155 - 135	4	20.03	6.68	80.1 K=1.00	18.986	12.5664	-92.84	238.58	0.389 ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4 K=1.00	19.913	14.1863	-132.59	282.48	0.469 ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4 K=1.00	19.913	14.1863	-168.44	282.48	0.596 ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2 K=1.00	20.709	15.9043	-202.61	329.36	0.615 ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5 K=1.00	21.400	17.7205	-236.17	379.22	0.623 ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6 K=1.00	24.255	17.7205	-262.57	429.82	0.611 ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5 K=1.00	21.400	17.7205	-294.17	379.22	0.776 ✔
T10	20 - 0	5	20.03	6.68	64.1 K=1.00	22.004	19.6350	-326.83	432.05	0.756 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 175	1 1/4	6.79	3.30	95.0 K=0.75	13.596	1.2272	-4.14	16.68	0.248 ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.93	119.6 K=1.00	10.340	0.9020	-6.66	9.33	0.714 ✔
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.71	140.0 K=1.00	7.618	1.4600	-7.66	11.12	0.689 ✔
T4	135 - 115	L3x3x1/4	13.44	6.54	132.6 K=1.00	8.496	1.4400	-7.13	12.23	0.582 ✔
T5	115 - 95	L3x3x3/8	15.21	7.40	151.4 K=1.00	6.517	2.1100	-7.63	13.75	0.555 ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.30	144.4 K=1.00	7.161	2.0900	-8.29	14.97	0.554 ✔
T7	75 - 55	L4x4x1/4	18.88	9.22	139.2 K=1.00	7.709	1.9400	-9.06	14.95	0.606 ✔
T8	55 - 40	L4x4x1/4	19.89	9.68	146.1 K=1.00	6.992	1.9400	-9.36	13.56	0.690 ✔
T9	40 - 20	L4x4x5/16	22.19	10.88	165.0 K=1.00	5.485	2.4000	-11.27	13.16	0.856 ✔
T10	20 - 0	L4x4x3/8	23.47	11.50	175.2 K=1.00	4.866	2.8600	-13.48	13.92	0.969 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 175	1 1/4	5.00	4.75	127.7 K=0.70	9.160	1.2272	-0.12	11.24	0.011 ✔

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 175	1 1/4	6.00	5.75	154.6 K=0.70	6.251	1.2272	-0.39	7.67	0.051 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 175	3	20.01	3.33	53.4	30.000	7.0686	14.41	212.06	0.068 ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5	30.000	11.0447	43.66	331.34	0.132 ✔
T3	155 - 135	4	20.03	6.68	80.1	30.000	12.5664	78.93	376.99	0.209 ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4	30.000	14.1863	114.56	425.59	0.269 ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4	30.000	14.1863	145.59	425.59	0.342 ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2	30.000	15.9043	174.33	477.13	0.365 ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5	30.000	17.7205	201.98	531.62	0.380 ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6	30.000	17.7205	223.07	531.62	0.420 ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5	30.000	17.7205	247.93	531.62	0.466 ✔
T10	20 - 0	5	20.03	6.68	64.1	30.000	19.6350	272.68	589.05	0.463 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 175	1 1/4	6.79	3.30	126.7	21.600	1.2272	4.11	26.51	0.155 ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.93	78.6	21.600	0.9020	6.57	19.48	0.337 ✔
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.71	92.6	21.600	1.4600	7.61	31.54	0.241 ✔
T4	135 - 115	L3x3x1/4	12.30	5.98	79.3	21.600	1.4400	7.18	31.10	0.231 ✔
T5	115 - 95	L3x3x3/8	15.21	7.40	99.8	21.600	2.1100	7.53	45.58	0.165 ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.30	94.3	21.600	2.0900	8.22	45.14	0.182 ✔
T7	75 - 55	L4x4x1/4	18.88	9.22	90.3	21.600	1.9400	8.96	41.90	0.214 ✔
T8	55 - 40	L4x4x1/4	19.89	9.68	94.7	21.600	1.9400	9.34	41.90	0.223 ✔
T9	40 - 20	L4x4x5/16	21.56	10.56	104.0	21.600	2.4000	10.46	51.84	0.202 ✔
T10	20 - 0	L4x4x3/8	24.11	11.82	117.2	21.600	2.8600	14.15	61.78	0.229 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 175	1 1/4	5.00	4.75	182.4	21.600	1.2272	0.10	26.51	0.004 ✔

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 175	1 1/4	6.00	5.75	220.8	21.600	1.2272	0.36	26.51	0.014 ✔

Section Capacity Table

tnxTower	Job: 14001.031 - Northford	Page: 36 of 36
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project: 195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT	Date: 15:22:00 02/26/14
	Client: Verizon Wireless	Designed by: TJL

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	195 - 175	Leg	3	1	-18.50	224.43	8.2	Pass
T2	175 - 155	Leg	3 3/4	46	-52.21	263.47	19.8	Pass
T3	155 - 135	Leg	4	67	-92.84	318.03	29.2	Pass
T4	135 - 115	Leg	4 1/4	88	-132.59	376.55	35.2	Pass
T5	115 - 95	Leg	4 1/4	109	-168.44	376.55	44.7	Pass
T6	95 - 75	Leg	4 1/2	132	-202.61	439.04	46.1	Pass
T7	75 - 55	Leg	4 3/4	153	-236.17	505.50	46.7	Pass
T8	55 - 40	Leg	4 3/4	174	-262.57	572.94	45.8	Pass
T9	40 - 20	Leg	4 3/4	195	-294.17	505.50	58.2	Pass
T10	20 - 0	Leg	5	216	-326.83	575.93	56.7	Pass
T1	195 - 175	Diagonal	1 1/4	11	-4.14	22.24	18.6	Pass
T2	175 - 155	Diagonal	L2 1/2x2 1/2x3/16	50	-6.66	12.43	53.6 60.5 (b)	Pass
T3	155 - 135	Diagonal	L2 1/2x2 1/2x5/16	71	-7.66	14.83	51.7	Pass
T4	135 - 115	Diagonal	L3x3x1/4	95	-7.13	16.31	43.7 49.5 (b)	Pass
T5	115 - 95	Diagonal	L3x3x3/8	116	-7.63	18.33	41.6	Pass
T6	95 - 75	Diagonal	L3 1/2x3 1/2x5/16	137	-8.29	19.95	41.5	Pass
T7	75 - 55	Diagonal	L4x4x1/4	158	-9.06	19.93	45.5 53.0 (b)	Pass
T8	55 - 40	Diagonal	L4x4x1/4	180	-9.36	18.08	51.8 55.2 (b)	Pass
T9	40 - 20	Diagonal	L4x4x5/16	201	-11.27	17.55	64.2	Pass
T10	20 - 0	Diagonal	L4x4x3/8	228	-13.48	18.55	72.7	Pass
T1	195 - 175	Top Girt	1 1/4	6	-0.12	14.98	0.8	Pass
T1	195 - 175	Bottom Girt	1 1/4	9	-0.39	10.23	3.8	Pass
							Summary	
						Leg (T9)	58.2	Pass
						Diagonal (T10)	72.7	Pass
						Top Girt (T1)	0.8	Pass
						Bottom Girt (T1)	3.8	Pass
						Bolt Checks	64.4	Pass
						RATING =	**72.7**	**Pass**

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Subject:	FOUNDATION ANALYSIS
Location:	Northford, CT
Rev. 0: 2/26/14	Prepared by: T.J.L. Checked by: C.F.C. Job No. 14001.031

Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 6287 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 56 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 68 \cdot kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 332 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 276 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 195 \cdot ft$	(User Input)	
Tower Width =	$W_t := 23.5 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 6.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 2.5 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 34.0 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 4.0 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 3 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 6000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pier Reinforcement:

Bar Size =	$BS_{pier} := 8$	(User Input)	
Bar Diameter =	$d_{bpier} := 1.0 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 20$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 3 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 8$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 1.0 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 34$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 8$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.0 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 34$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area =

$$A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 0.785 \cdot in^2$$

Pad Top Reinforcement Bar Area =

$$A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.785 \cdot in^2$$

Pad Bottom Reinforcement Bar Area =

$$A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 0.785 \cdot in^2$$

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 =

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

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 1.26 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 1.26 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 2.16 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.71 \cdot ksf$

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

$A_p := W_f \cdot T_p = 85$

Ultimate Shear =

$S_u := P_{ave} \cdot A_p = 145.35 \cdot kip$

Weight of Concrete Pad =

$WT_{pad} := \left(W_f^2 \cdot T_f\right) \cdot \gamma_c = 433.5 \cdot kip$

Weight of Concrete Piers =

$WT_{pier} := 3 \cdot \left[\left(L_p \cdot \frac{d_p^2 \cdot \pi}{4}\right) \cdot \gamma_c\right] = 12.723 \cdot kip$

Total Weight of Concrete =

$WT_c := WT_{pad} + WT_{pier} = 446 \cdot kip$

Weight of Soil Above Footing =

$WT_{s1} := \left(W_f^2 - 3 \cdot \frac{d_p^2 \cdot \pi}{4}\right) \cdot (L_p - L_{pag}) \cdot \gamma_s = 477 \cdot kip$

Weight of Soil Back Face =

$WT_{s2} := \left[\frac{\tan(\Phi_s) \cdot (D_f)^2}{2} \cdot W_f\right] \cdot \gamma_s = 42 \cdot kip$

Tower Offset =

$X_{t1} := \left[\frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{2}\right]$ $X_{t2} := \frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{3}$

$X_t := if(Pos_t, X_{t1}, X_{t2}) = 6.824$

$X_{off} := \frac{W_f}{2} - \left[\frac{(W_t \cdot \cos(30 \cdot deg))}{3} + X_t\right] = 3.392$

Resisting Moment =

$M_r := (WT_c + WT_{s1}) \cdot \frac{W_f}{2} + S_u \cdot \frac{T_f}{3} + WT_{s2} \cdot \left[W_f + \frac{\tan(\Phi_s) \cdot (L_p - L_{pag})}{3}\right] = 17280 \cdot ki$

Overturning Moment =

$M_{ot} := OM + S_t \cdot (L_p + T_f) = 6651 \cdot kip \cdot ft$

Factor of Safety Actual =

$FS := \frac{M_r}{M_{ot}} = 2.6$

Factor of Safety Required =

$FS_{req} := 2$

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

$OverTurning\_Moment\_Check = "Okay"$

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_{s1} + WT_t = 991 \cdot kip$

Area of the Mat = $A_{mat} := W_f^2 = 1.156 \times 10^3$

Section Modulus of Mat = $S := \frac{W_f^3}{6} = 6550.67 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 1.872 \cdot ksf$

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

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.158 \cdot ksf$

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

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 10.45$

Distance to Kern = $X_k := \frac{W_f}{6} = 5.667$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 6.713$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \left(\frac{W_f}{2} - e \right)} = 1.889 \cdot ksf$

$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 1.889 \cdot ksf$

$Pressure\_Check := if(q_{adj} < q_s, "Okay", "No Good")$

Pressure_Check = "Okay"

SITE NAME	NORTHFORD CT	ECP - CELL #	2	174
LATITUDE	41-22-04.99 N	LONGITUDE	72-48-37.99 W	
Additional Comments: 2014 AWS ADD.		SAVE BUTTON	Version 0009	
		STRUCTURE TYPE		

AWS - LTE ANTENNA ADD	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	2100 MHz BBU		2100 MHz BBU		2100 MHz BBU	
ANTENNA TYPE	BXA-171063-12CF-EDIN-5		BXA-171063-12CF-EDIN-5		BXA-171063-12CF-EDIN-5	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		260	
DOWN TILT (MECH/DEG)	3		6		3	
RAD CTR (FT AGL)	145		145		145	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL	1	ALU RH_2X40-AWS	1	ALU RH_2X40-AWS	1	ALU RH_2X40-AWS
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX	1			DB-T1-6Z-8AB-0Z		

700 Mhz - LTE ANTENNA ADD	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	700 eNodeB		700 eNodeB		700 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)	30		150		260	
DOWN TILT (MECH/DEG)	0		0		5	
RAD CTR (FT AGL)	145		145		145	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						

700 Mhz - LTE ANTENNA ADD	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	700 eNodeB		700 eNodeB		700 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)	30		150		260	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	145		145		145	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						

850 Cellular - Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	Cellular Mod 4.0B		Cellular Mod 4.0B		Cellular Mod 4.0B	
ANTENNA TYPE	LPA-80080/4CF		LPA-80080/4CF		LPA-80080/4CF-EDIN-6	
QTY OF ANTENNAS PER FACE	2		2		2	
ORIENTATION (DEG)	30		150		260	
DOWN TILT (MECH/DEG)	0		0		5	
RAD CTR (FT AGL)	145		145		145	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	2	FD9R6004/2C-3L	2	FD9R6004/2C-3L	2	FD9R6004/2C-3L

850 Cellular - Future Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	Cellular Mod 4.0B		Cellular Mod 4.0B		Cellular Mod 4.0B	
ANTENNA TYPE	LNX-6513DS-VTM_00DT_0850		LNX-6513DS-VTM_00DT_0850		LNX-6513DS-VTM_06DT_0850	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		260	
DOWN TILT (MECH/DEG)	0		0		5	
RAD CTR (FT AGL)	145		145		145	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	2	FD9R6004/2C-3L	2	FD9R6004/2C-3L	2	FD9R6004/2C-3L
DIPLEX WITH LTE CABLE						

1900 PCS - Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	PCS Mod 4.0B		PCS Mod 4.0B		PCS Mod 4.0B	
ANTENNA TYPE	BXA-171085-8BF-EDIN-2		BXA-171085-8BF-EDIN-2		BXA-171085-8BF-EDIN-2	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		2	
RAD CTR (FT AGL)	145		145		145	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	2	FD9R6004/2C-3L	2	FD9R6004/2C-3L	2	FD9R6004/2C-3L

1900 PCS - Future Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	PCS Mod 4.0B		PCS Mod 4.0B		PCS Mod 4.0B	
ANTENNA TYPE	BXA-171085-8BF-EDIN-2		BXA-171085-8BF-EDIN-2		BXA-171085-8BF-EDIN-2	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		2	
RAD CTR (FT AGL)	145		145		145	
TMA - QTY / MODEL						
DIPLEXER WITH CELLULAR CABLE	YES		YES		YES	

NUMBER OF CABLE'S NEEDED					Fiber Lines Model number			
TOTAL # FIBER LINES		TOTAL # OF MAINLINES		12	FIBER LINE MODEL #			HB158-1-08U8-S8J18
TOTAL # TOP JUMPERS		TOTAL # OF TOP JUMPERS		12	FIBER TOP JUMPER MODEL #			HB114-1-08U4-S4J18
Equipment Cable Ordering		**MAIN CABLE #**	12	+	**TOP JUMPER #**	12	+	
FIBER LINE SIZE	1 5/8"	TOTAL # OF FIBER LINES		1	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	+ 1	**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 / 2145-2155	TX - 746-757	PCS (Watts)	16
RX - 824-835,845-846.5 MHz	RX - 1890-1895 / 1745-1755	RX - 776-787	LTE/ AWS (Watts)	40

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

RF ENGINEER	RF MANAGER	INITIALS	DATE
Prepared By: Maria Montrose Updated By: Jaime Laredo	Robert Hesselbach	MMM JL	3/6/2013 2/26/2014

BXA-171063-12CF-EDIN-X

X-Pol | FET Panel | 63° | 19.0 dBi

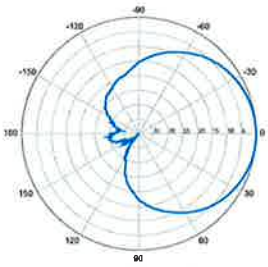
Replace "X" with desired electrical downtilt.

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

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	< -25 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1842 x 154 x 105 mm		72.5 x 6.1 x 4.1 in
Depth with z-brackets	133 mm		5.2 in
Weight without mounting brackets	5.8 kg		12.8 lbs
Survival wind speed	> 201 km/hr		> 125 mph
Wind area	Front: 0.28 m² Side: 0.19 m²		Front: 3.1 ft² Side: 2.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N		Front: 103 lbf Side: 68 lbf

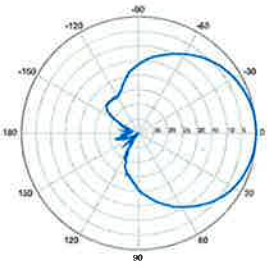
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12CF-EDIN-X-FP		

BXA-171063-12CF-EDIN-X



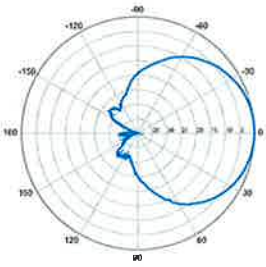
Horizontal | 1710-1880 MHz

BXA-171063-12CF-EDIN-X



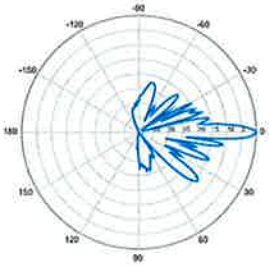
Horizontal | 1850-1990 MHz

BXA-171063-12CF-EDIN-X



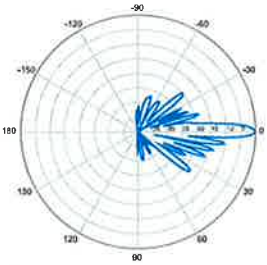
Horizontal | 1920-2170 MHz

BXA-171063-12CF-EDIN-0



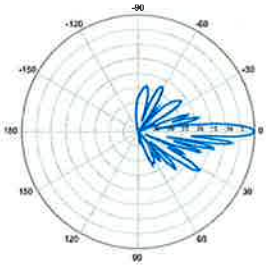
0° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-0



0° | Vertical | 1920-2170 MHz

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

LNX-6513DS-VTM

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

- Extended tilt range offers better coverage
- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- 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	14.6	15.1
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Horizontal Tolerance, degrees	±3	±3
Beamwidth, Vertical, degrees	16.0	14.5
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	20	20
Front-to-Back Ratio at 180°, dB	30	30
CPR at Boresight, dB	12	12
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	437.9 N @ 150 km/h 98.4 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	181.0 mm | 7.1 in

Product Specifications

LNX-6513DS-VTM

Length	1390.0 mm | 54.7 in
Width	301.0 mm | 11.9 in
Net Weight	14.1 kg | 31.1 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	LNX-6513DS-R2M
Model with Factory Installed AISG 2.0 Actuator	LNX-6513DS-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.

Alcatel-Lucent RRH2x40-AWS

REMOTE RADIO HEAD

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

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

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

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

Fast, low-cost installation and deployment

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

Excellent RF performance

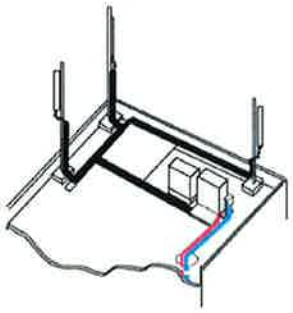
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation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

Features

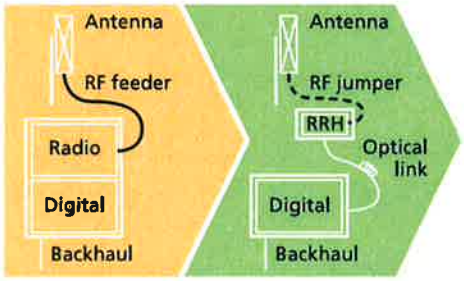
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

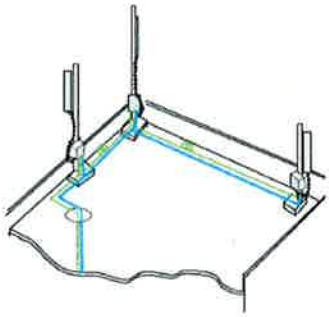
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

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

Power

- Power supply: -48VDC

Operating environment

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

RF characteristics

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

Optical characteristics

Type/number of fibers

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

Optical fiber length

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

Digital Ports and Alarms

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

Alcatel·Lucent

Product Data Sheet DB-B1 and DB-T1 Series

DC and Fiber Management Distribution Boxes for HYBRIFLEX™ Cable

Product Description

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

Features/Benefits

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

Technical Specifications

Mechanical Specifications

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

Electrical Specifications

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

* This data is provisional and subject to change.