Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

July 11, 2014

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

Re: **Notice of Exempt Modification – Facility Modification**
24 Rockdale Road, West Haven, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 146-foot level of the existing 180-foot tower at 234 Rockdale Road in West Haven, Connecticut (the "Property"). The tower is owned by Radio Communications Corporation. The Council approved Cellco's use of this tower in 1986. Cellco now intends to modify its facility by removing nine (9) existing antennas and replacing them with three (3) model BXA-80063-6BF, 850 MHz antennas; two (2) BXA-70040-6CF, 700 MHz antennas; one (1) model BXA-70063-6CF, 700 MHz antenna; and three (3) model BXA-171063-8BF, 2100 MHz antennas, all at the same 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. 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 Edward M. O'Brien, Mayor of the City of West Haven. A copy of this letter is also being sent to Radio Communications Corporation, the owner of the Property.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's new antennas and RRHs will be installed at the 146-foot level on the existing 180-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 replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table 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, with certain modifications, can support Cellco's proposed modifications. (*See* the attached Independent Structural Engineer's Review Letters and Reinforcement Design and Analysis 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:
Edward M. O'Brien, West Haven Mayor
Radio Communications Corporation
Sandy M. Carter

ATTACHMENT 1

BXA-80063-6BF-EDIN-X

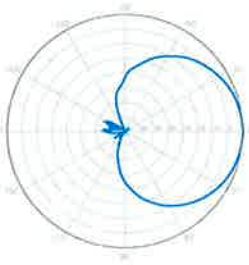
Replace "X" with desired electrical downtilt

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

X-Pol | FET Panel | 63° | 14.5 dBd

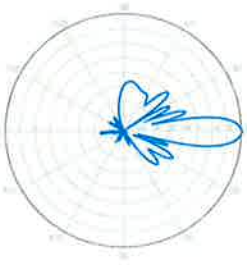
Electrical Characteristics				
Frequency bands	806-900 MHz*			
*Optional frequency band for iDEN	806-941 MHz (specify when ordering)			
Polarization	±45°			
Horizontal beamwidth	63°			
Vertical beamwidth	11°			
Gain	14.5 dBd (16.6 dBi)			
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10, 15			
Impedance	50Ω			
VSWR	≤1.4:1			
Upper sidelobe suppression (0°)	-18.2 dB			
Front-to-back ratio (+/-30°)	-36.3 dB			
Null fill	5% (-26.02 dB)			
Isolation between ports	< -25 dB			
Input power with EDIN connectors	500 W			
Input power with N connectors	300 W			
Lightning protection	Direct Ground			
Connector(s)	2 Ports / EDIN or N / Female / Bottom			
Mechanical Characteristics				
Dimensions Length x Width x Depth	1742 x 285 x 135 mm		68.6 x 11.2 x 5.3 in	
Depth with z-brackets	175 mm		6.9 in	
Weight without mounting brackets	8.7 kg		19.2 lbs	
Survival wind speed	> 201 km/hr		> 125 mph	
Wind area	Front: 0.50 m²	Side: 0.24 m²	Front: 5.3 ft²	Side: 2.5 ft²
Wind load @ 161 km/hr (100 mph)	Front: 733 N	Side: 386 N	Front: 164 lbf	Side: 88 lbf
Mounting Options	Part Number	Fits Pipe Diameter	Weight	
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs	
Concealment Configurations	For concealment configurations, order BXA-80063-6BF-EDIN-X-FP			

BXA-80063-6BF-EDIN-X



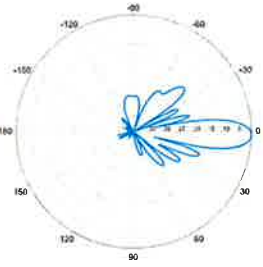
Horizontal

BXA-80063-6BF-EDIN-0



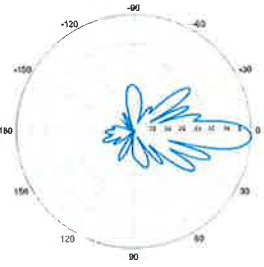
0° | Vertical

BXA-80063-6BF-EDIN-2



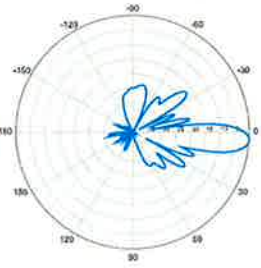
2° | Vertical

BXA-80063-6BF-EDIN-3



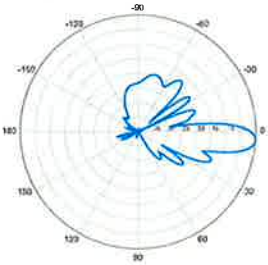
3° | Vertical

BXA-80063-6BF-EDIN-4



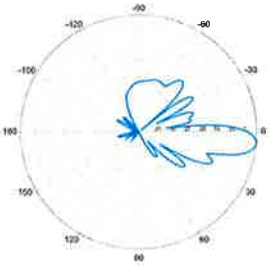
4° | Vertical

BXA-80063-6BF-EDIN-5



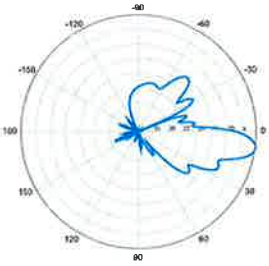
5° | Vertical

BXA-80063-6BF-EDIN-6



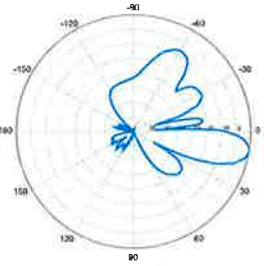
6° | Vertical

BXA-80063-6BF-EDIN-8



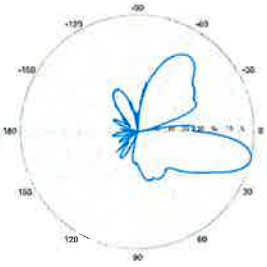
8° | Vertical

BXA-80063-6BF-EDIN-10



10° | Vertical

BXA-80063-6BF-EDIN-15



15° | Vertical

BXA-70040-6CF-EDIN-X

X-Pol | FET Panel | 40° | 16.0 dBd

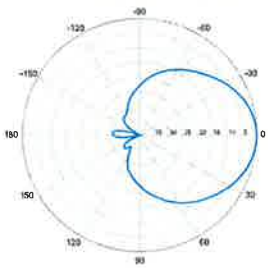
Replace "X" with desired electrical downtilt

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

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	42°	40°
Vertical beamwidth	12°	10°
Gain	15.5 dBd (17.6 dBi)	16.0 dBd (18.1 dBi)
Electrical downtilt (X)	0, 2, 4, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-12.1 dB	-13.4 dB
Front-to-back ratio (+/-30°)	-35.8 dB	-38.0 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1806 x 606 x 200 mm	71.1 x 23.9 x 7.9 in
Depth with z-brackets	240 mm	9.4 in
Weight without mounting brackets	17 kg	38 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 1.09 m^2 Side: 0.36 m^2	Front: 11.8 ft^2 Side: 3.9 ft^2
Wind load @ 161 km/hr (100 mph)	Front:1564 N Side: 547 N	Front: 350 lbf Side: 123 lbf

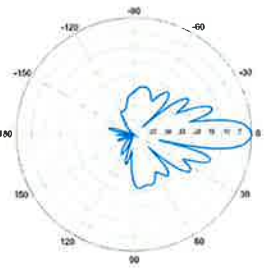
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	This model cannot be used in a standard FP concealment configuration		

BXA-70040-6CF-EDIN-X



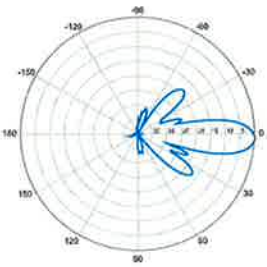
Horizontal | 750 MHz

BXA-70040-6CF-EDIN-0



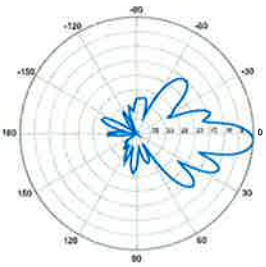
0° | Vertical | 750 MHz

BXA-70040-6CF-EDIN-2



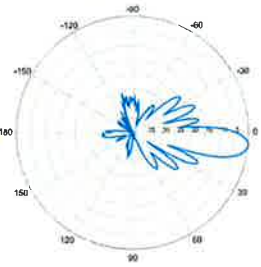
2° | Vertical | 750 MHz

BXA-70040-6CF-EDIN-4

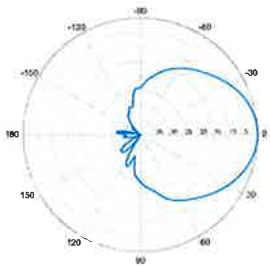


4° | Vertical | 750 MHz

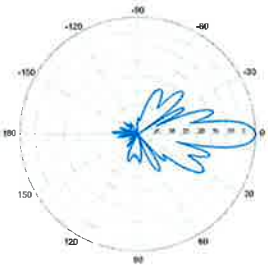
BXA-70040-6CF-EDIN-6



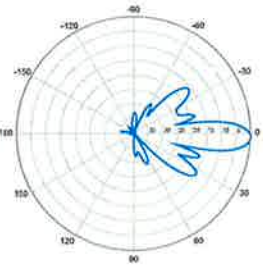
6° | Vertical | 750 MHz



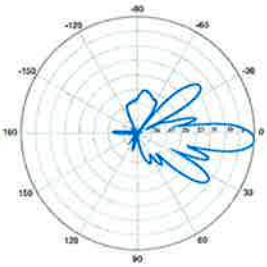
Horizontal | 850 MHz



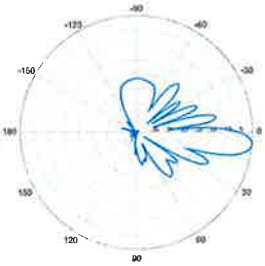
0° | Vertical | 850 MHz



2° | Vertical | 850 MHz



4° | Vertical | 850 MHz



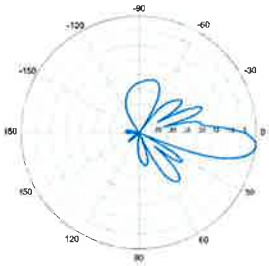
6° | Vertical | 850 MHz

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

BXA-70040-6CF-EDIN-X

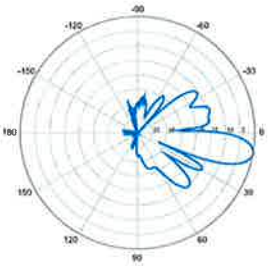
X-Pol | FET Panel | 40° | 16.0 dBd

BXA-70040-6CF-EDIN-8

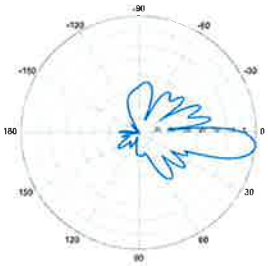


8° | Vertical | 750 MHz

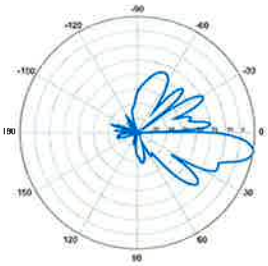
BXA-70040-6CF-EDIN-10



10° | Vertical | 750 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

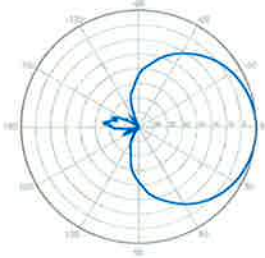
Replace "X" with desired electrical downtilt.

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

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	13°	11°
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
IM3 (2x20W carriers)	< -153 dBc	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm	6.8 in
Weight without mounting brackets	7.9 kg	17 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.51 m² Side: 0.24 m²	Front: 5.5 ft² Side: 2.6 ft²
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

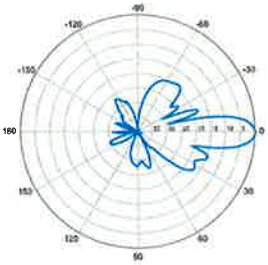
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



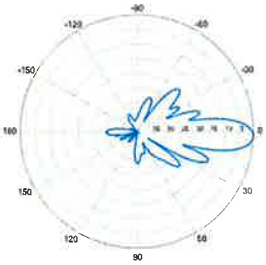
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

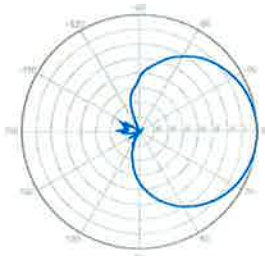


0° | Vertical | 750 MHz

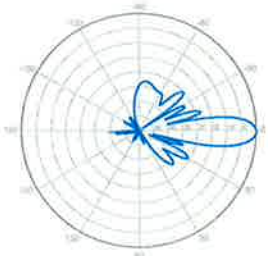
BXA-70063-6CF-EDIN-2



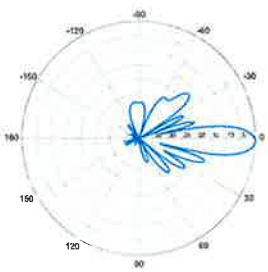
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

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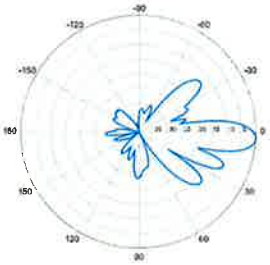
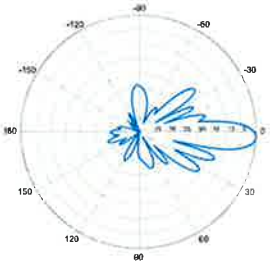
BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3

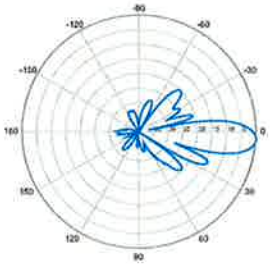


3° | Vertical | 750 MHz

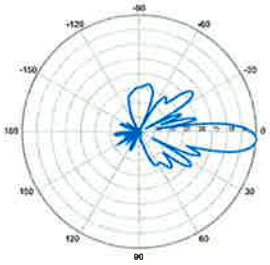


3° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-4

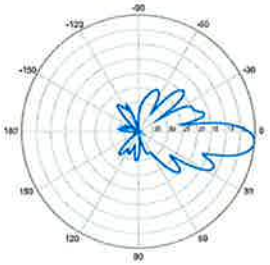


4° | Vertical | 750 MHz

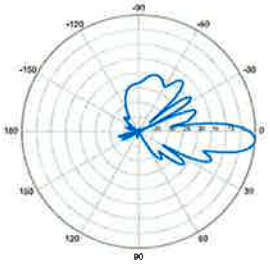


4° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-5

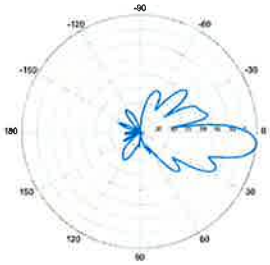


5° | Vertical | 750 MHz

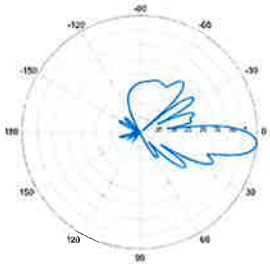


5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6

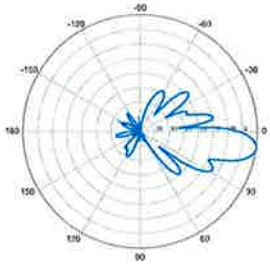


6° | Vertical | 750 MHz

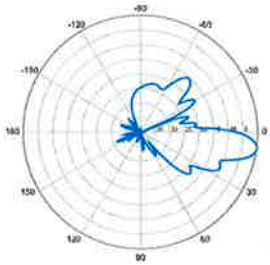


6° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-8

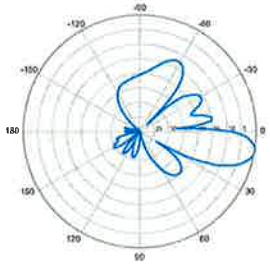


8° | Vertical | 750 MHz

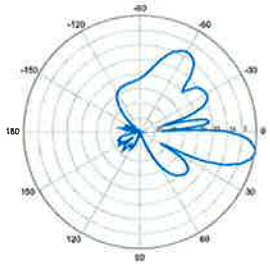


8° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-10



10° | Vertical | 750 MHz



10° | Vertical | 850 MHz

BXA-171063-8BF-EDIN-X

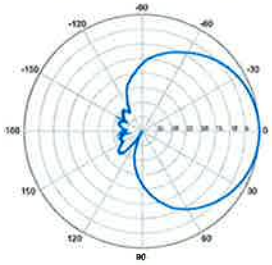
Replace "X" with desired electrical downtilt

X-Pol | FET Panel | 63° | 17.4 dBi

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	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 6, 8		
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 / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1225 x 154 x 105 mm		48.2 x 6.1 x 4.1 in
Depth with t-brackets	133 mm		5.2 in
Weight without mounting brackets	4.2 kg		9.2 lbs
Survival wind speed	296 km/hr		184 mph
Wind area	Front: 0.19 m² Side: 0.14 m²		Front: 2.0 ft² Side: 1.5 ft²
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N		Front: 63 lbf Side: 50 lbf

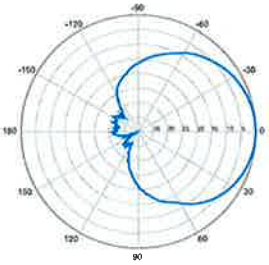
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8BF-EDIN-X-FP		

BXA-171063-8BF-EDIN-X



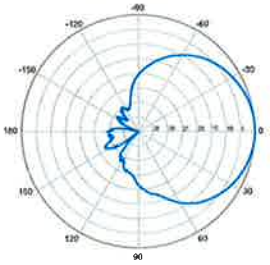
Horizontal | 1710-1880 MHz

BXA-171063-8BF-EDIN-X



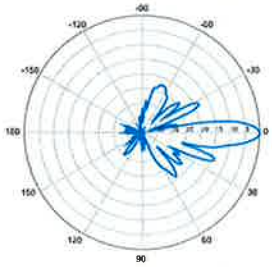
Horizontal | 1850-1990 MHz

BXA-171063-8BF-EDIN-X



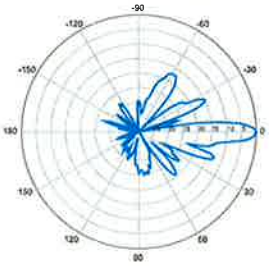
Horizontal | 1920-2170 MHz

BXA-171063-8BF-EDIN-0



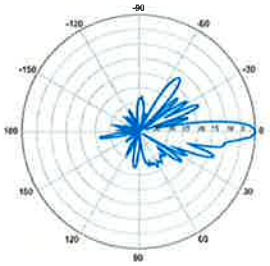
0° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-0

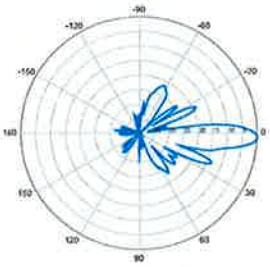


0° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-X

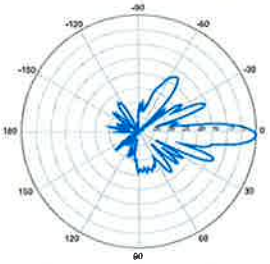
X-Pol | FET Panel | 63° | 17.4 dBi

BXA-171063-8BF-EDIN-2



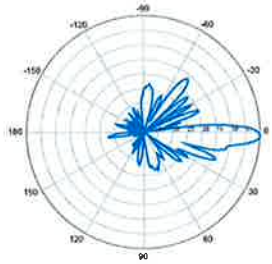
2° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-2



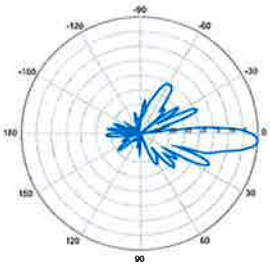
2° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-2



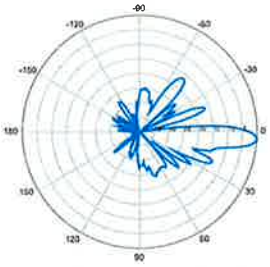
2° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-4



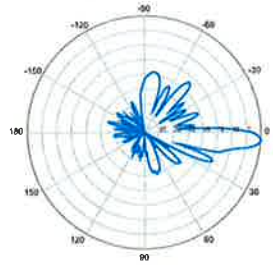
4° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-4



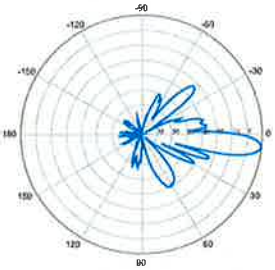
4° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-4



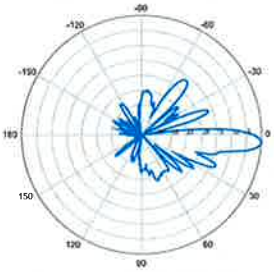
4° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-6



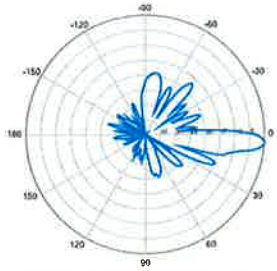
6° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-6



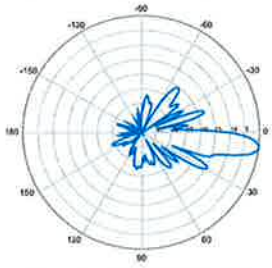
6° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-6



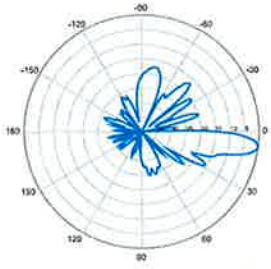
6° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-8



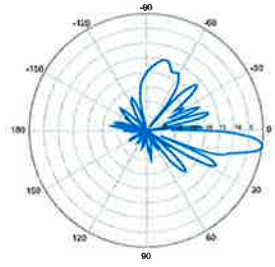
8° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-8



8° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-8

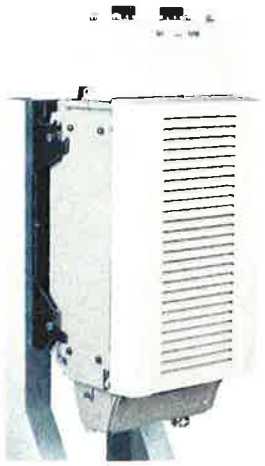


8° | Vertical | 1920-2170 MHz

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

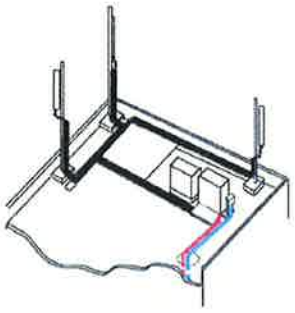
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation 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

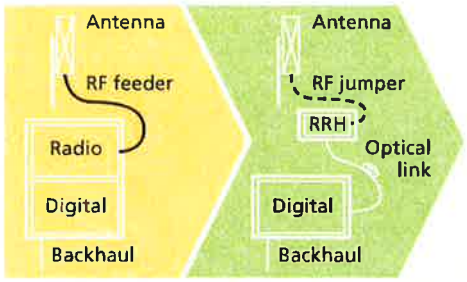
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

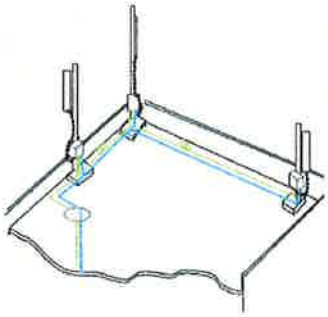
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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

CPG2809100912 (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.

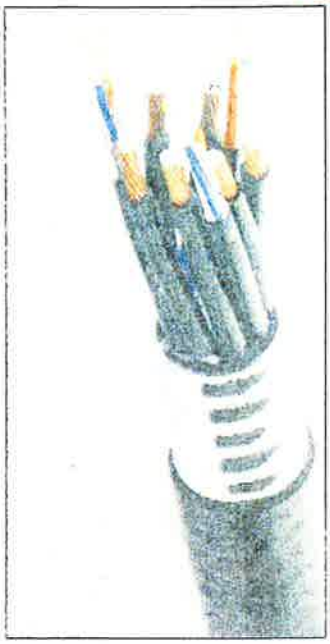


Figure 1: HYBRIFLEX Series

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
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	.068 (0.205)
DC-Resistance Power Cable 8.4mm²/8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[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
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

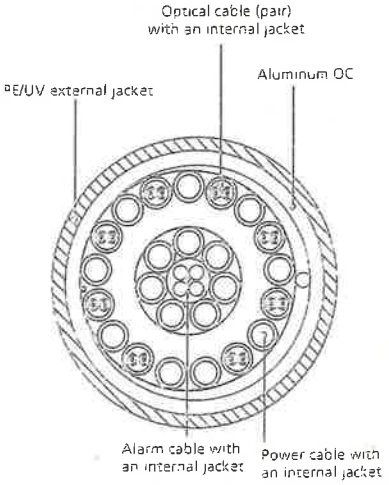


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: West Haven								
Tower Height: Verizon @ 180Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Antenna 1	1	500	199	0.0045	451.175	0.3008	1.51%	
*Antenna 2	1	500	199	0.0045	451.975	0.3013	1.51%	
*Antenna 3	1	500	199	0.0045	452.275	0.3015	1.51%	
*Antenna 4	1	500	199	0.0045	452.8	0.3019	1.50%	
*Antenna 5	1	500	199	0.0045	461.075	0.3074	1.48%	
*Antenna 6	1	500	199	0.0045	462.475	0.3083	1.47%	
*Antenna 7	1	500	199	0.0045	463.5	0.3090	1.47%	
*Antenna 8	1	500	199	0.0045	463.875	0.3093	1.47%	
*Antenna 9	1	500	199	0.0045	464.7	0.3098	1.47%	
*Antenna 10	1	500	199	0.0045	452.975	0.3020	1.50%	
*Antenna 11	1	500	199	0.0045	462.05	0.3080	1.47%	
*Antenna 12	1	500	199	0.0045	459.075	0.3061	1.48%	
*Antenna 13	1	1400	199	0.0127	454.075	0.3027	4.20%	
*Antenna 14	1	3500	199	0.0318	929.6625	0.6198	5.13%	
*Antenna 15	1	3500	199	0.0318	929.7625	0.6198	5.13%	
*Antenna 16	1	3500	199	0.0318	929.7125	0.6198	5.13%	
*Antenna 17	1	3500	199	0.0318	940.225	0.6268	5.07%	
*Antenna 18	1	1500	102	0.0518	940	0.6267	8.27%	
*Antenna 19	1	500	199	0.0045	162	0.2000	2.27%	
*Antenna 20	1	500	175	0.0059	13600	1.0000	0.59%	
*TV Ch. 28	1	3500	178	0.0397	554	0.3693	10.75%	
*T-Mobile LTE	2	24	135	0.0009	2100	1.0000	0.09%	
*T-Mobile GSM/UMTS	2	12	135	0.0005	1950	1.0000	0.05%	
*T-Mobile UMTS	2	12	135	0.0005	2100	1.0000	0.05%	
Verizon PCS	**7**	**412**	**146**	**0.0486**	**1970**	**1.0000**	**4.86%**	
Verizon Cellular	**9**	**388**	**146**	**0.0589**	**869**	**0.5793**	**10.17%**	
Verizon AWS	**1**	**1750**	**146**	**0.0295**	**2145**	**1.0000**	**2.95%**	
Verizon 700	**1**	**1016**	**146**	**0.0171**	**698**	**0.4653**	**3.68%**	
								86.23%
* Source: Siting Council								

ATTACHMENT 3

CENTEK engineering

Centered on Solutions℠

July 7, 2014

Mr. Frank Gladwin
Building Official
City of West Haven
355 Main Street
West Haven, CT 06516

Re: *Independent Structural Engineer's Review*
Verizon Wireless Site Ref: West Haven
24 Rockdale Road,
West Haven, CT 06516

Centek Project No. 14006.095

Dear Mr. Gladwin,

Centek Engineering Inc. has completed the independent structural engineering review of the proposed Verizon Wireless antenna upgrade on the existing 180-ft tall self-support lattice tower at the above referenced wireless communications facility. Specifically, the Structural Analysis Report and reinforcement design prepared by KM Consulting Engineers Inc., Project No. 120514.03, dated 5/14/2014, signed and sealed by Michael L. Bohlinger, P.E (CT License No. 20405) was reviewed for compliance with the requirements of the 2005 Connecticut State Building Code, as amended by the 2009 Connecticut State supplement.

Per Section 3108 of the Connecticut State Building Code, the TIA/EIA-222-F "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures" governs the structural design for this project. Additionally, Section 3108.4.2 of the CSBC requiring foundations and anchorages to resist two times the calculated wind load must also be satisfied. The proposed antenna installation meets the requirements of the TIA/EIA-222-F Standard considering a basic wind speed (fastest mile) of 85 mph for New Haven County.

Based on our review of structural analysis provided, it is our opinion that the proposed upgrade is in conformance with the applicable structural requirements of the State Building Code. It is noted that our review does not constitute a design, nor is it all-inclusive; the responsibility for the structural design remains with the Structural Engineer of Record.

This completes the independent structural engineering review for this project. Should you have any questions, please do not hesitate to contact us.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Cc: Aleksey Tyurin – Verizon Wireless (via email)

KM Consulting Engineers, Inc.
Wireless Engineering and Project Management

May 14, 2014

Mr. Aleksey Tyurin
Verizon Wireless
99 East River Drive
9th Floor
East Hartford, CT 06108

Re: West Haven
Site No. CT11014B
KM Project No. 120514.0

Dear Mr. Tyurin,

Further to your request, KM Consulting Engineers, Inc. (KMCE) has reviewed the structural capability of the West Haven self-support tower to support the existing Verizon Wireless installation with the proposed reinforcement by KMCE dated 5/7/14.

The existing tower structure, existing antenna loading, proposed Verizon Wireless installation, and proposed reinforcement was modeled using TNX Tower version 6.1.3.1. With the proposed modifications installed, KMCE finds the tower to be acceptable as per the TIA/EIA-222-F standards. The tower is rated at 98% with the reinforcement included.

Should you require additional information, please do not hesitate to contact our office.

Sincerely,
KM CONSULTING ENGINEERS, INC.

Michael L. Bohlinger, PE
Principal
CT License # 20405

STATE OF CONNECTICUT
MICHAEL L BOHLINGER
20405
LICENSED
PROFESSIONAL ENGINEER
5/24/14

32 W Upper Ferry Road, Ewing, New Jersey 08628 Tel. (609)538-0400 Fax. (609)538-8853
Email: info@kmengr.com VISIT OUR WEB PAGE @ www.kmengr.com

TOWER REINFORCEMENT DRAWINGS & SPECIFICATIONS

SITE LOCATION: 24 ROCKDALE ROAD, WEST HAVEN, CT 06516

SCOPE:
THE PURPOSE OF THESE REINFORCING DETAILS AND SPECIFICATIONS IS TO REINFORCE THE TOWER MEMBERS. A SECONDARY HORIZONTAL WILL BE ADDED IN THE TOWER SECTION FROM 30' AGL TO 40' AGL. A CONCRETE RING WILL BE POURED AROUND THE EXISTING TOWER LEGS AT THE BASE OF THE TOWER AS REINFORCEMENT FOR THE FOUNDATION.

REINFORCING INCLUDES: INSTALLING A NEW L3½x3½x¼ SECONDARY HORIZONTAL AT THE 35' AGL ELEVATION. THE HORIZONTAL WILL BE SECURED AT THE CROSSING DIAGONALS WITH A NEW 30"x8"x½" STITCH PLATE. THE HORIZONALS WILL BE ATTACHED TO THE TOWER LEGS USING ½"ø STEEL HOT DIPPED GALVANIZED U-BOLTS. ADDING A CONCRETE RING TO THE BASE OF EACH TOWER LEG, 3'-6"ø AND 3'-6' TALL.

THIS REINFORCEMENT IS REQUIRED AFTER ANALYZING THE TOWER. REFER TO STRUCTURAL ANALYSIS DATED AUGUST 19TH, 2013.

OWNER:

STATE OF CONNECTICUT * MICHAEL L BOHLINGER * 20405 * LICENSED PROFESSIONAL ENGINEER
6/24/14

MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405

KM Consulting Engineers, Inc.
Wireless Engineering & Project Management
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT: verizonwireless

4 SYLVAN WAY
PARSIPPANY, NJ 07054
(973) 943-2465 PH.
(973) 490-3217 FAX

APPROVALS & DATE:
OWNER: _____ DATE: _____
S.A.C.: _____ DATE: _____
/ F.: _____ DATE: _____
CONST.: _____ DATE: _____

PROJECT NAME: WEST HAVEN

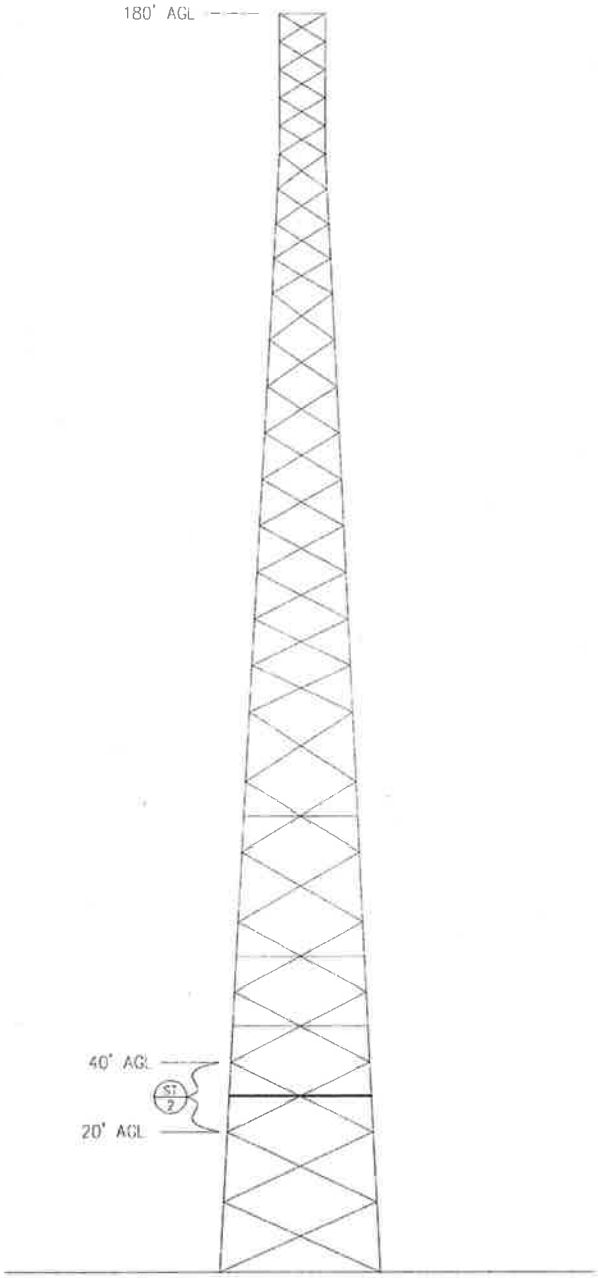
PROJECT ADDRESS: 24 ROCKDALE ROAD
WEST HAVEN, CT 06516

REVISIONS:

NO.	DATE
1	5/7/14

DRAWING NO.: **T-1**

PROJECT #:	SITE ID #:	DRAWING TITLE:	P.C.:	CHKD:	DRN:	DATE:
120514.04		TITLE SHEET		MLB	DJA	9/6/13



1 / ST-1 TOWER ELEVATION

SCALE: NTS

OWNER:

KM Consulting Engineers, Inc.
Wireless Engineering & Project Management
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT: verizon wireless
4 SYLVAN WAY
PARSIPPANY, NJ 07054
(973) 943-2465 PH.
(973) 490-3217 FAX

REVISIONS:

NO.	DATE
1	5/7/14

STATE OF CONNECTICUT · MICHAEL L. BOHLINGER · 20405 · LICENSED PROFESSIONAL ENGINEER

MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405

6/24/14

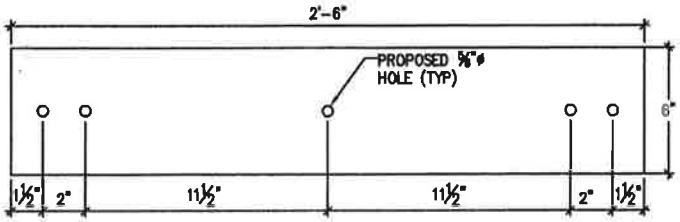
APPROVALS & DATE:
OWNER: _____ DATE: _____
S.A.C.: _____ DATE: _____
P / F.: _____ DATE: _____
CONST.: _____ DATE: _____

PROJECT NAME: WEST HAVEN

PROJECT ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

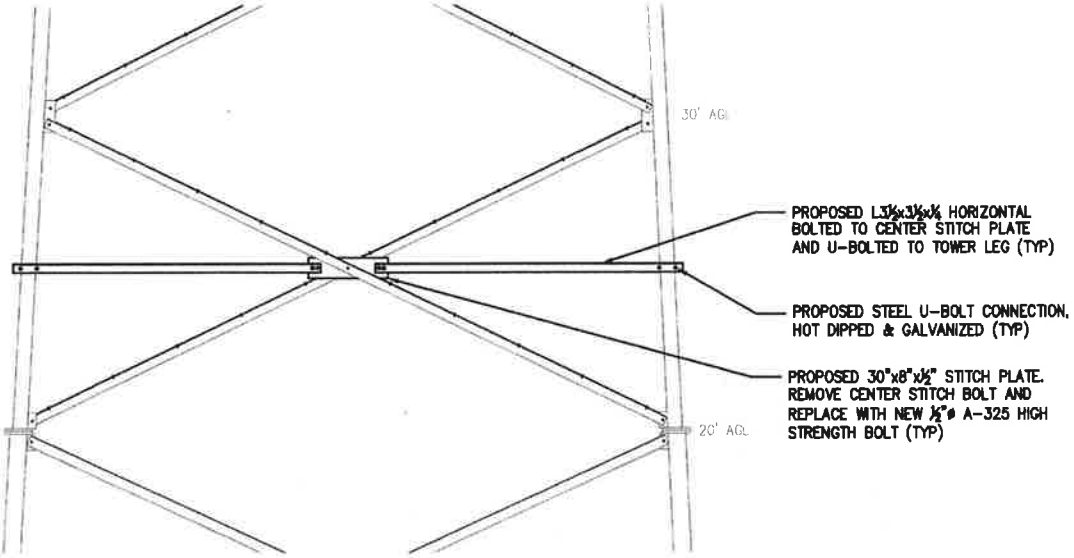
DRAWING NO.: **ST-1**

PROJECT #:	SITE ID #:	DRAWING TITLE:	P.C.:	CHKD:	DRN:	DATE:
120514.04		TOWER ELEVATION		MLB	DJA	9/6/13



2 / ST-2 STITCH PLATE DETAIL

SCALE: NTS



1 / ST-2 LEG REINFORCEMENT: 20'-30'

SCALE: 3/16" = 1'-0"

NOTES:
1. ALL MEMBERS, BOLTS HOLES, AND DIMENSIONS MUST BE FIELD VERIFIED PRIOR TO FABRICATION / PROCUREMENT OF REINFORCEMENT MATERIALS. ANY CHANGES TO THESE DRAWINGS AND SPECIFICATIONS OR CHANGES FOUND IN THE FIELD OF EXISTING TOWER MEMBERS MUST BE COMMUNICATED TO KM CONSULTING ENGINEERS INC. PRIOR TO INSTALLING REINFORCEMENT.

2. STEEL: ALL STEEL PLATE MEMBERS TO BE A-36 HOT-DIP GALVANIZED TO ASTM A-123.

3. IF STEEL PLATE OR ANGLE IS FIELD CUT, ENDS OF STEEL MUST BE SPRAYED WITH COLD GALVANIZE ZRC.

SAFETY NOTICE!
INSTALLATION OF THESE TOWER MODIFICATIONS WILL REQUIRE TOWER CLIMBING AT HEIGHTS WHERE FALLING COULD HARM OR PROVE FATAL TO WORKERS. THESE DRAWINGS INDICATE ONLY THE REINFORCEMENT AND NOT THE MEANS, METHODS, AND REQUIRED CONTRACTOR SAFETY. THESE REINFORCEMENT MEMBERS SHOULD BE INSTALLED BY A QUALIFIED, PROFESSIONAL TOWER CLIMBING COMPANY. KM CONSULTING ENGINEERS INC. TAKES NO RESPONSIBILITY FOR THE CONTRACTORS SAFETY POLICIES, PRACTICES, AND METHODS.

CERTIFICATION OF INSTALLATION:
DURING OR UPON COMPLETION OF THESE MODIFICATIONS TO THE TOWER, A CERTIFICATION LETTER FROM A LICENSED PROFESSIONAL ENGINEER MUST BE SUBMITTED TO THE TOWER OWNER.

NOTES:
ANY INTERFERENCE OF EXISTING TOWER LEG STRUCTURE OR APPURTENANCES TO PROPOSED REINFORCEMENT, CONTRACTOR TO COORDINATE SHIFTING OF REINFORCEMENT ATTACHMENT WITH ENGINEER PRIOR TO INSTALL.

OWNER:

STATE OF CONNECTICUT
MICHAEL L. BOHLINGER
LICENSED
PROFESSIONAL ENGINEER
6/24/14

MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405

KM Consulting Engineers, Inc.
Wireless Engineering & Project Management
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT: verizonwireless
4 SYLVAN WAY
PARSIPPANY, NJ 07054
(973) 943-2465 PH
(973) 490-3217 FAX

APPROVALS & DATE:
OWNER: _____ DATE: _____
S.A.C.: _____ DATE: _____
R / F.: _____ DATE: _____
CONST.: _____ DATE: _____

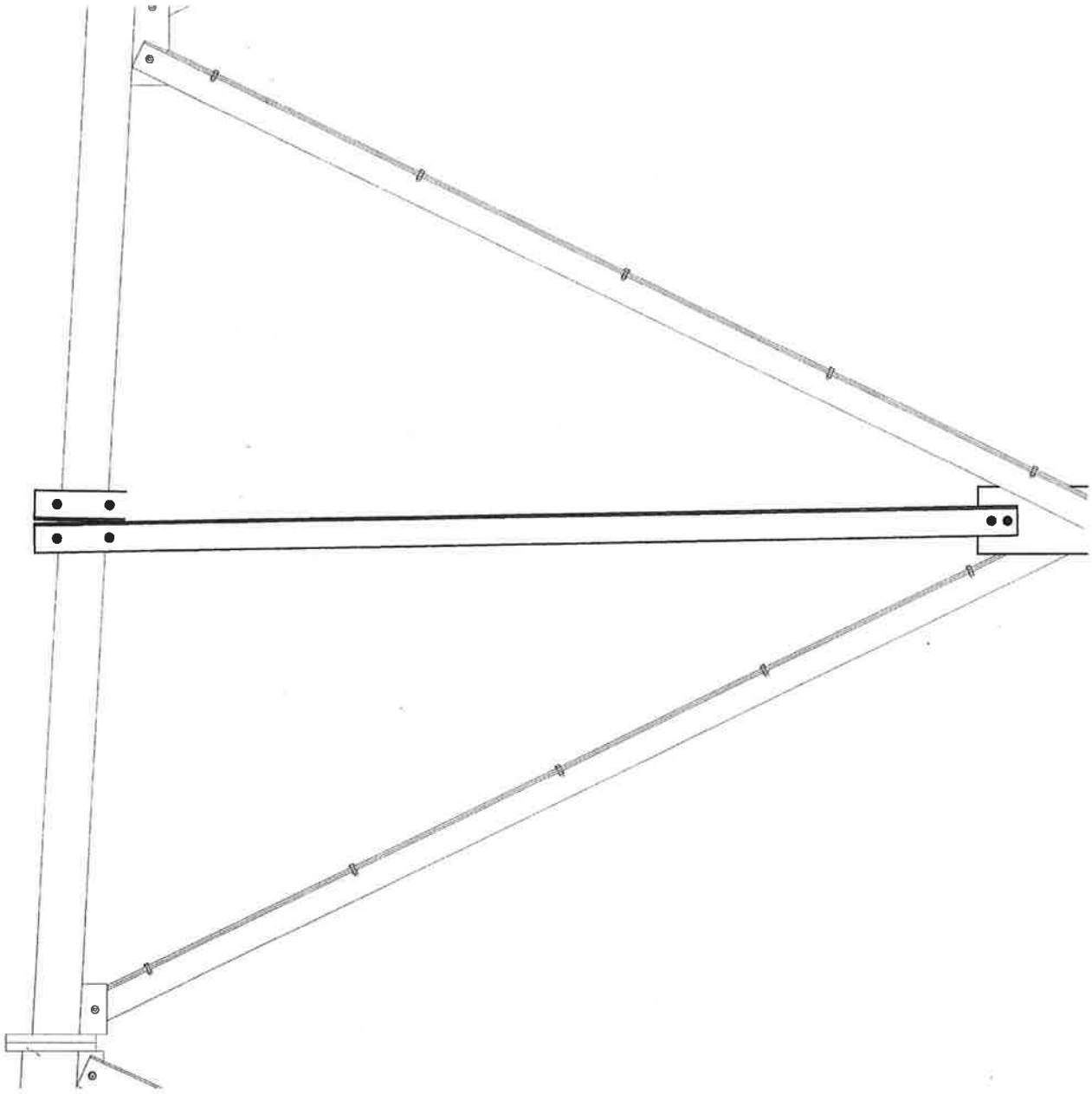
PROJECT NAME: WEST HAVEN

PROJECT ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

REVISIONS:	
NO.	DATE
1	5/7/14

DRAWING NO.: **ST-2**

PROJECT #:	SITE ID #:	DRAWING TITLE:	P.C.:	CHKD:	DRN:	DATE:
120514.04		LEG REINFORCEMENT		MLB	DJA	9/6/13



1 ST-3 OFFSET HORIZONTAL DETAIL

SCALE: NTS

OWNER:

STATE OF CONNECTICUT
MICHAEL L. BOHLINGER
LICENSED PROFESSIONAL ENGINEER

MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405

6/24/14

KM Consulting Engineers, Inc.
Wireless Engineering & Project Management
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT: verizon wireless

4 SYLVAN WAY
PARSIPPANY, NJ 07054
(973) 993-2465 PH
(973) 490-3217 FAX

APPROVALS & DATE:

OWNER: _____ DATE: _____

S.A.C.: _____ DATE: _____

R / F.: _____ DATE: _____

CONST.: _____ DATE: _____

PROJECT NAME: WEST HAVEN

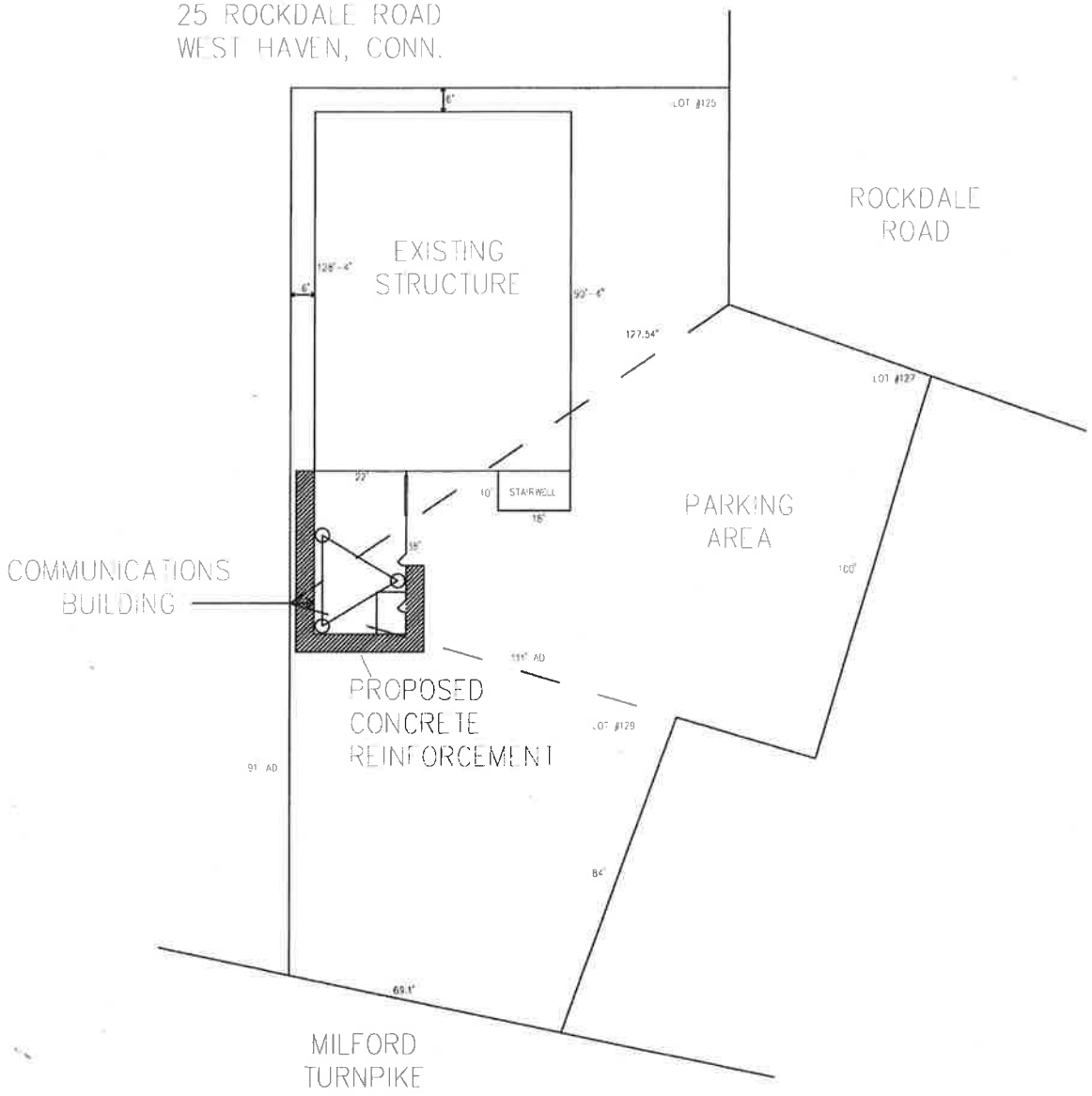
PROJECT ADDRESS: 24 ROCKDALE ROAD
WEST HAVEN, CT 06516

REVISIONS:	
NO.	DATE
1	5/7/14

DRAWING NO.: **ST-3**

PROJECT #:	SITE ID #:	DRAWING TITLE:	P.C.:	CHKD:	DRN:	DATE:
120514.04		OFFSET HORIZONTAL DETAIL		MLB	DJA	9/6/13

SITE PLAN
RADIO COMMUNICATIONS SERVICE CO.
25 ROCKDALE ROAD
WEST HAVEN, CONN.



1 / ST-4 OVERALL SITE PLAN
SCALE: NTS

OWNER:

KM Consulting Engineers, Inc.
Wireless Engineering & Project Management
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT: verizonwireless
4 SYLVAN WAY
PARSIPPANY, NJ 07054
(973) 943-2465 PH
(973) 490-3217 FAX

REVISIONS:

NO.	DATE
1	5/7/14

APPROVALS & DATE:
OWNER: _____ DATE: _____
S.A.C.: _____ DATE: _____
R / F.: _____ DATE: _____
CONST.: _____ DATE: _____

PROJECT NAME: WEST HAVEN

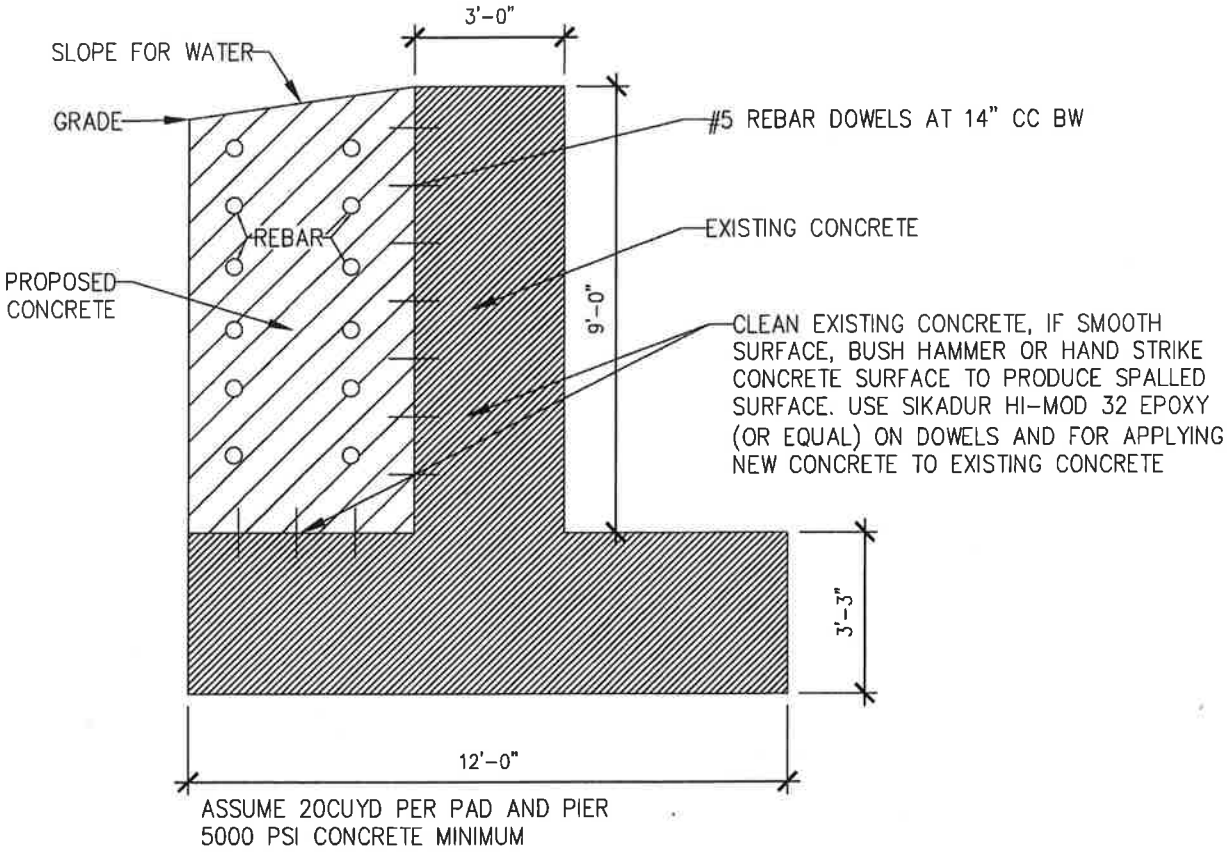
PROJECT ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

DRAWING NO.: **ST-4**

STATE OF CONNECTICUT * MICHAEL L. BOHLINGER * LICENSED PROFESSIONAL ENGINEER
6/24/14

MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405

PROJECT #:	SITE ID #:	DRAWING TITLE:	P.C.:	CHKD:	DRN:	DATE:
120514.04		FOUNDATION REINFORCEMENT		MLB	DJA	9/6/13



1 / ST-4 FOUNDATION REINFORCEMENT

SCALE: NTS

OWNER:

STATE OF CONNECTICUT * MICHAEL L. BOHLINGER * LICENSED PROFESSIONAL ENGINEER

6/24/14

MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405

KM Consulting Engineers, Inc.
Wireless Engineering & Project Management
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT: verizonwireless

4 BYLVAN WAY
PARSIPPANY, NJ 07054
(973) 943-2465 PH
(973) 490-3217 FAX

APPROVALS & DATE:

OWNER: _____ DATE: _____

S.A.C.: _____ DATE: _____

R / F.: _____ DATE: _____

CONST.: _____ DATE: _____

PROJECT NAME:
WEST HAVEN

PROJECT ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

REVISIONS:	
NO.	DATE
1	5/7/14

DRAWING NO.: **ST-5**

PROJECT #:	SITE ID #:	DRAWING TITLE:	P.C.:	CHKD:	DRN:	DATE:
120514.04		FOUNDATION REINFORCEMENT		MLB	DJA	9/6/13

SECTION 1704
SPECIAL INSPECTIONS

1704.1 General. Where application is made for construction as described in this section, the owner or the *registered design professional in responsible charge* acting as the owner's agent shall employ one or more *approved agencies* to perform inspections during construction on the types of work listed under Section 1704. These inspections are in addition to the inspections identified in Section 110.

The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the *building official*, for the inspection of the particular type of construction or operation requiring *special inspection*. The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspector for the work designed by them, provided those personnel meet the qualification requirements of this section to the satisfaction of the *building official*. The special inspector shall provide written documentation to the building official demonstrating his or her competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of *special inspection* activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

Exceptions:

1. *Special inspections* are not required for work of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.
2. *Special inspections* are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the *building official*, *special inspections* are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

1704.1.1 Statement of special inspections. The applicant shall submit a statement of *special inspections* prepared by the *registered design professional in responsible charge* in accordance with Section 107.1 as a condition for issuance. This statement shall be in accordance with Section 1705.

Exceptions:

1. A statement of *special inspections* is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308.
2. The statement of *special inspections* is permitted to be prepared by a qualified person *approved* by the *building official* for construction not designed by a *registered design professional*.

1704.1.2 Report requirement. Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the *building official*, and to the *registered design professional in responsible charge*. Reports shall indicate that work inspected was or was not completed in conformance to *approved construction documents*. Discrepancies shall be brought to the immediate attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the *building official* and to the *registered design professional in responsible charge* prior to the completion of that phase of the work. A final report documenting required *special inspections* and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon prior to the start of work by the applicant and the *building official*.

1704.2 Inspection of fabricators. Where fabrication of structural load-bearing members and assemblies is being performed

1704.2.1 Fabrication and implementation procedures. The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to *approved construction documents* and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

Exception: *Special inspections* as required by Section 1704.2 shall not be required where the fabricator is *approved* in accordance with Section 1704.2.2.

1704.2.2 Fabricator approval. *Special inspections* required by Section 1704 are not required where the work is done on the premises of a fabricator registered and *approved* to perform such work without *special inspection*. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an *approved special inspection* agency. At completion of fabrication, the *approved* fabricator shall submit a *certificate of compliance* to the *building official* stating that the work was performed in accordance with the *approved construction documents*.

1704.3 Steel construction. The *special inspections* for steel elements of buildings and structures shall be as required by Section 1704.3 and Table 1704.3.

Exceptions:

1. *Special inspection* of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress carrying elements are capable of being determined.
2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.
   2.1. Single-pass fillet welds not exceeding 5/16 inch (7.9 mm) in size.
   2.2. Floor and roof deck welding.
   2.3. Welded studs when used for structural diaphragm.
   2.4. Welded sheet steel for cold-formed steel members.
   2.5. Welding of stairs and railing systems.

1704.3.1 Welding. Welding inspection and welding inspector qualification shall be in accordance with this section.

1704.3.1.1 Structural steel. Welding inspection and welding inspector qualification for structural steel shall be in accordance with AWS D1.1.

1704.3.1.2 Cold-formed steel. Welding inspection and welding inspector qualification for cold-formed steel floor and roof decks shall be in accordance with AWS D1.3.

1704.3.1.3 Reinforcing steel. Welding inspection and welding inspector qualification for reinforcing steel shall be in accordance with AWS D1.4 and ACI 318.

1704.3.2 Details. The special inspector shall perform an inspection of the steel frame to verify compliance with the details shown on the *approved construction documents*, such as bracing, stiffening, member locations and proper application of joint details at each connection.

1704.3.3 High-strength bolts. Installation of high-strength bolts shall be inspected in accordance with AISC 360.

1704.3.3.1 General. While the work is in progress, the special inspector shall determine that the requirements for bolts, nuts, washers and paint; bolted parts and installation and tightening in such standards are met. For bolts requiring pretensioning, the special inspector shall observe the preinstallation testing and calibration procedures when such procedures are required by the installation method or by project plans or specifications; determine that all plies of connected materials have been drawn together and properly snugged and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to the snug-tight con-

OWNER:	KM Consulting Engineers, Inc. *Wireless Engineering & Project Management* 32 West Upper Ferry Road Ewing, NJ 08628 Phone: (609) 538-0400 Fax: (609) 538-8858	CLIENT: verizon wireless 4 SYLVAN WAY PARSIPPANY, NJ 07054 (973) 993-2465 PH (973) 490-3217 FAX	REVISIONS: 1 5/7/14 NO. DATE
STATE OF CONNECTICUT · MICHAEL L BOHLINGER · LICENSED PROFESSIONAL ENGINEER · 6/24/14 MICHAEL L. BOHLINGER, PE CONNECTICUT PROFESSIONAL ENGINEER LICENSE # 20405	APPROVALS & DATE: OWNER: _____ DATE: _____ S.A.C.: _____ DATE: _____ R / F.: _____ DATE: _____ CONST.: _____ DATE: _____	PROJECT NAME: WEST HAVEN PROJECT ADDRESS: 24 ROCKDALE ROAD WEST HAVEN, CT 06516	DRAWING NO.: **ST-6**
PROJECT #: 120514.04	SITE ID #:	DRAWING TITLE: SPECIAL INSPECTION NOTES	P.C.: CHKD: MLB DRN: DJA DATE: 9/6/13

TABLE 1704.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
1 Material verification of high-strength bolts, nuts and washers:				
a Identification markings to conform to ASTM standards specified in the approved construction documents		X	AISC 360 Section A3.3 and applicable ASTM material standards	
b Manufacturer's certificate of compliance required		X		
2 Inspection of high-strength bolting:				
a Snug-tight joints		X	AISC 360 Section M2.5	1704.3.3
b Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation		X		
c Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation	X			
3 Material verification of structural steel and cold-formed steel deck:				
a For structural steel, identification markings to conform to AISC 360		X	AISC 360 Section M5.5	
b For other steel, identification markings to conform to ASTM standards specified in the approved construction documents		X	Applicable ASTM material standards	
c Manufacturer's certified test reports		X		
4 Material verification of weld filler materials:				
a Identification markings to conform to AWS specification in the approved construction documents		X	AISC 360 Section A3.5 and applicable AWS A5 documents	
b Manufacturer's certificate of compliance required		X		
5 Inspection of welding:				
a Structural steel and cold-formed steel deck:				
1) Complete and partial joint penetration groove welds	X		AWS D1.1	1704.3.1
2) Multipass fillet welds	X			
3) Single-pass fillet welds [illegible]	X			
4) Plug and slot welds	X			
5) Single-pass fillet welds ≤ [illegible]		X		
6) Floor and roof deck welds		X	AWS D1.3	
b Reinforcing steel:				
1) Verification of weldability of reinforcing steel other than ASTM A 706		X	AWS D1.4/ACI 318: Section 3.5.2	
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement	X			
3) Shear reinforcement	X			
4) Other reinforcing steel		X		
6 Inspection of steel frame joint details for compliance:				
a Details such as bracing and stiffening		X		
b Member locations		X		1704.3.2
c Application of joint details at each connection		X		

For SI: 1 inch = 25.4 mm.

OWNER:

KM Consulting Engineers, Inc.
Wireless Engineering & Project Management
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT: verizon wireless
4 SYLVAN WAY
PARSIPPANY, NJ 07054
(973) 993-2465 PH
(973) 490-3217 FAX

REVISIONS:

NO.	DATE
1	5/7/14

STATE OF CONNECTICUT * MICHAEL L. BOHLINGER * LICENSED PROFESSIONAL ENGINEER
6/24/14

MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405

APPROVALS & DATE:
OWNER: _____ DATE: _____
S.A.C.: _____ DATE: _____
R / F.: _____ DATE: _____
CONST.: _____ DATE: _____

PROJECT NAME: WEST HAVEN

PROJECT ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

DRAWING NO.: **ST-7**

PROJECT #:	SITE ID #:	DRAWING TITLE:	P.C.:	CHKD:	DRN:	DATE:
120514.04		SPECIAL INSPECTION NOTES		MLB	DJA	9/6/13

KM Consulting Engineers, Inc.
32 West Upper Ferry Road
Ewing, NJ 08628

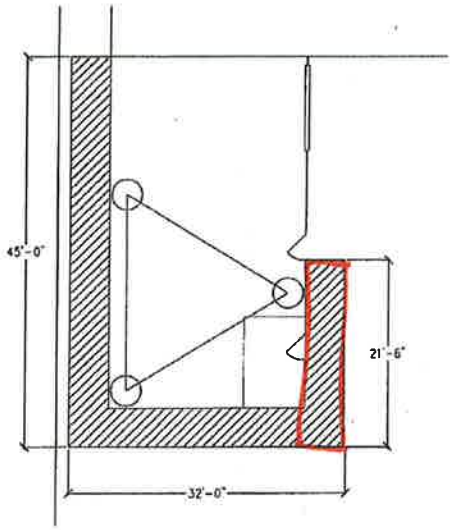
Tel.: (609) 538-0400
Fax.: (609) 538-8858
www.kmengr.com
Email: infor@kmengr.com

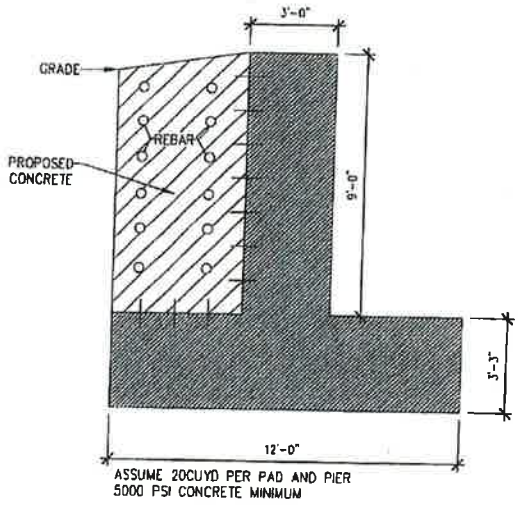
Foundation Calculations

Allowable uplift prior to reinforcement (without 2.0 safety factor): 467.96 k
Actual uplift from analysis: 248.21 k

Overstress (including 2.0 safety factor): $248.21 - \frac{467.96}{2} = 14.23 \quad k$

Proposed Reinforcement:





Assume section marked in red as minimum supporting max corner reaction

$\text{Volume} := 21.5 \cdot 4.5 \cdot 9 = 870.75 \quad ft^3 \quad concrete$

$\text{Weight} := 50 \quad \frac{lb}{ft^3}$ (150 lb/ft^3 concrete - 100 lb/ft^3 soil)

$\text{Resistance} := \frac{\text{Volume} \cdot \text{Weight}}{1000} = 43.54 \quad k$

$\text{Total} := \text{Resistance} + 467.96 = 511.5 \quad k$

$\text{FS} := \frac{\text{Total}}{248.21} = 2.061 \quad > \quad 2.0$ **OK**

STATE OF CONNECTICUT
MICHAEL L BOHLINGER
20405
LICENSED PROFESSIONAL ENGINEER

6/24/14

By: Domenic Aversa, EIT
Approved by: Michael Bohlinger, PE

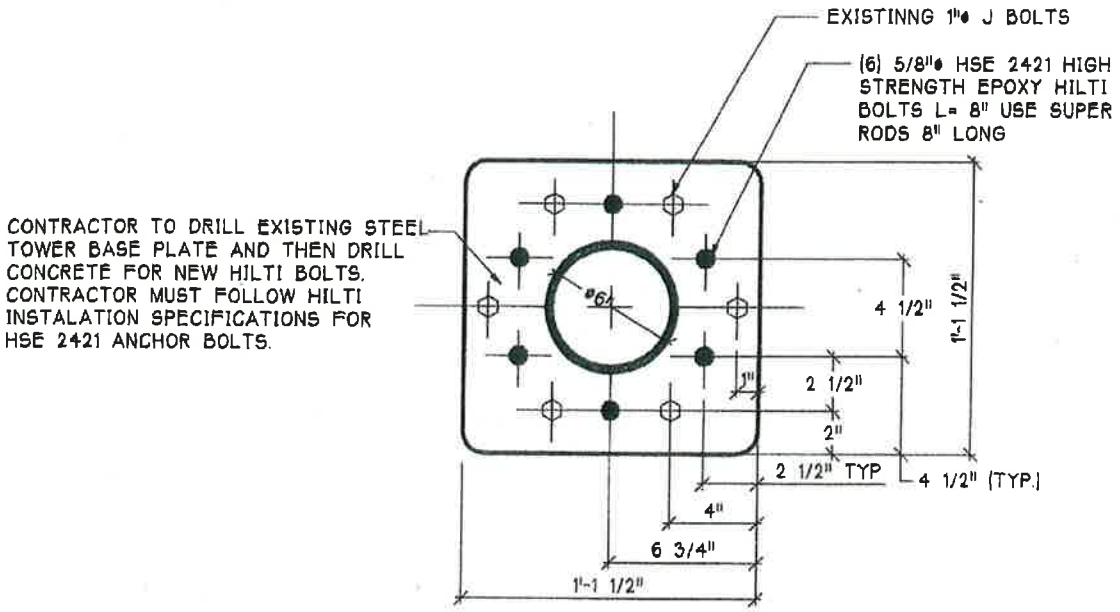
Verizon Wireless
West Haven
Foundation Calculations

KM Consulting Engineers, Inc.
32 West Upper Ferry Road
Ewing, NJ 08628

Tel.: (609) 538-0400
Fax.: (609) 538-8858
www.kmengr.com
Email: infor@kmengr.com

Anchor Bolt Calculations

Existing anchor bolt configuartion:



(6) Original 1" diameter A-490 anchor bolts:

Yield Strength: $130 \quad ksi$

Area of bolts: $A_b := 6 \cdot \pi \cdot (0.5)^2 = 4.712 \quad in^2$

Allowable tenstion (per leg): $130 \cdot 4.712 = 612.6 \quad k$

(6) reinforcement Hilti anchors:

Allowable tension (per bolt): $T_a := 6.25 \quad k$

Total allowable tension: $T := 6 \cdot T_a = 37.5 \quad k$

Total resistance: $T_{total} := 612.6 + 37.5 = 650.1 \quad k$

Actual max tension per leg: $T_{max} := 284.2 \quad k$

$$FS := \frac{T_{total}}{T_{max}} = 2.287 \quad > \quad 2.0 \qquad \textbf{OK}$$

STATE OF CONNECTICUT * MICHAEL L BOHLINGER * 20405 LICENSED PROFESSIONAL ENGINEER

6/24/14

HSE 2421 High Strength Epoxy

Specification Tables

Rebar:

Nominal Rebar Size	Drill Bit Diameter[1]	Standard Embed. Depth	Ultimate Bond Strength[2] in 2000 psi Concrete[6]	Approx. No. of Fastenings per Cartridge[5]		Embedment to Develop GR 60 Rebar Yield Strength[3]		Embedment to Develop GR 60 Rebar Ultimate Tensile Strength[3]	
				Large	Small	2000 psi	4000 psi	2000 psi	4000 psi
#3	1/2"	3 3/8"	9765	161	81	2 3/8"	1 7/8"	3 1/2"	2 3/4"
#4	5/8"	4 1/2"	17,365	91	46	3 1/8"	2 3/4"	4 3/4"	4"
#5	3/4"	5 5/8"	24,865	59	30	4 1/4"	3 3/4"	6 3/8"	5 5/8"
#6	7/8"	6 3/4"	36,900	41	20	5"	4 3/4"	7 1/4"	7"
#7	1"	7 7/8"	37,190	30	15	7 5/8"	6 1/8"	11 1/2"	9 1/8"
#8	1 1/8"	9"	55,985	22	11	7 3/4"	6 1/2"	11 1/2"	9 3/4"
#9	1 3/8"	10 1/8"	61,475	10	5	9 7/8"	8"	14 7/8"	11 1/2"
#10	1 1/2"	11 1/4"	75,895	8	4	11 3/8"	9 1/4"	17"	14"
#11	1 3/4"	12 3/8"	82,935	5	2	14"	10 1/2"	21"	15 3/4"

Threaded Rod:

Anchor Rod Size	Drill Bit Diameter	Standard Embed. Depth	Bond Strength (lb)[6] 2000 psi Concrete[4]		Approx. No of Fastenings/Cartridge[5]		HAS Ultimate[3,4] Tensile Strength		HAS Allowable[3,4] Tensile Strength	
			Ultimate	Allowable	Large	Small	Std Rods	Super Rods	Std Rods	Super Rods
3/8"	7/16"	3-3/8"	8,770	2,195	189	95	4,800	10,350	2,115	4,555
1/2"	9/16"	4-1/2"	16,225	4,055	100	50	8,540	18,405	3,755	8,100
5/8"	3/4"	5-5/8"	25,000	6,250	41	20	13,345	28,760	5,870	12,665
3/4"	7/8"	6-3/4"	39,135	9,785	27	14	19,220	41,420	8,455	18,225
7/8"	1"	7-7/8"	46,905	11,725	19	10	26,155	56,370	11,510	24,805
1"	1-1/8"	9	66,260	16,565	14	7	34,165	73,630	15,030	32,400
1-1/4"	1-3/8"	11-1/4"	75,490	18,870	9	4	53,385	115,050	23,490	50,620

1 Rebar diameter may vary. Use smallest drill bit which will accommodate rebar.

2 Use lower value of test results of average ultimate bond strength compared to nominal strength of the rebar. Steel strength based on nominal cross-sectional area of rebar, grade 60.

3 Steel strength as defined on AISC Manual of Steel Construction (LRFD), except where shear is limited by concrete strength: Yield = Fy x Tensile Stress Area, Tensile = 0.75 x Fu x Nominal Area, Shear = 0.45 x Fu x Nominal Area.

4 Use lower value of either bond strength or steel strength for tensile load. Allowable bond strength = ultimate / 4.

5 Assumes no waste.

6 Because of variations in concrete materials, on-site testing should be performed to determine performance at any specific site.

Gel/Cure Times [1]

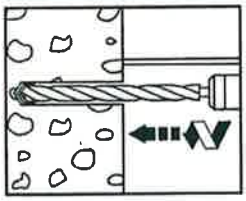
Temperature (°F)	Gel Times (minutes)	Cure Times (hours)
35	45	60
40	30	55
68	15	26
86	11	16
115	2.5	8

1 Cure times listed above are approximate, and a function of base material temperature, not ambient air temperature.

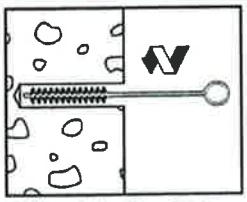
Cartridges should be stored between 70°-90° F prior to use.

Cartridge temperature at time of use should be greater than 70°F, not to exceed 120°F.

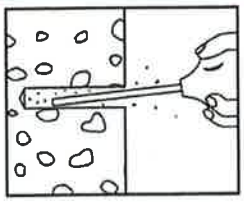
Installation Instructions



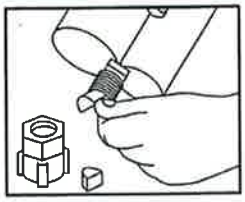
1. Drill anchor hole.



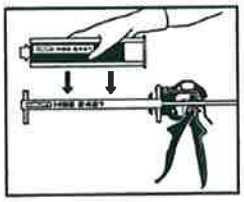
2. Clean hole with a wire or nylon brush. Proper hole cleaning is essential



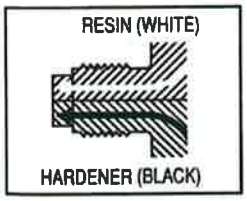
3. Insert air nozzle to bottom of hole and blow out hole using compressed air.



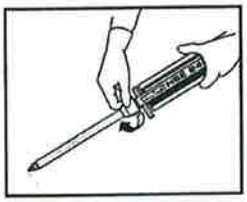
4. Remove plastic wrap on threads and pop out end plugs.



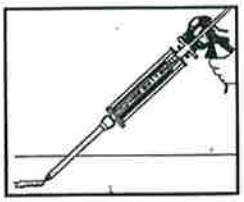
5. Place cartridge in Hilti manual or pneumatic HSE dispenser.



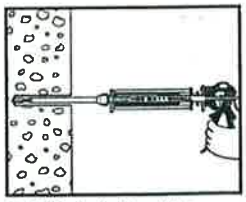
6. Actuate dispenser to fill neck of resin and hardener tubes.



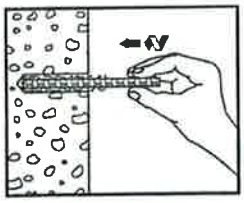
7. Attach HSE 2421 mixer using retaining nut and tighten.



8. Discard adhesive until a uniform gray color is achieved.



9. Fill hole starting at the bottom about 1/2 to 2/3 full. (enough so that adhesive overflows hole when rod/rebar is inserted.



10. Insert dowel, rebar, threaded rod or HIS slowly twisting it into hole.

tnxTower	Job	Page
KM Consulting Engineers, Inc. 9 Forest Lane Ewing, NJ 08628 Phone: (609) 538-0400 FAX:	West Haven LC1	1 of 41
	Project 180 ft. Self Support Tower	Date 14:03:32 05/14/14
	Client Verizon Wireless	Designed by Domenic Aversa

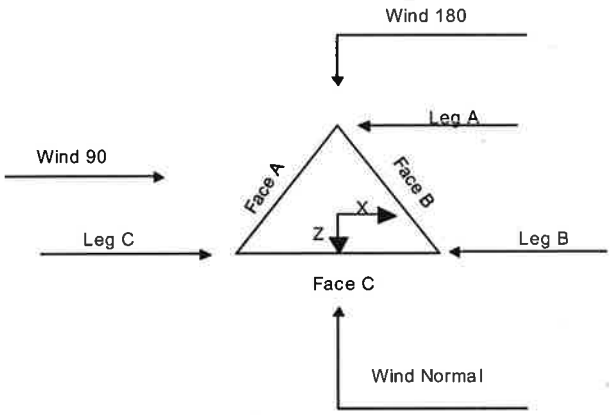
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 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 6.50 ft at the top and 22.80 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Tower legs have 5/8" diameter stainless steel cable(40K tension) in grouted leg..
Grouted pipe f'_c is 8 ksi.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line 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	Use TIA-222-G Tension Splice Capacity Exemption	



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.00-160.00			6.50	1	20.00
T2	160.00-140.00			6.60	1	20.00
T3	140.00-120.00			8.63	1	20.00
T4	120.00-113.33			10.65	1	6.67
T5	113.33-106.67			11.33	1	6.67
T6	106.67-100.00			12.00	1	6.67
T7	100.00-80.00			12.68	1	20.00
T8	80.00-70.00			14.70	1	10.00
T9	70.00-60.00			15.71	1	10.00
T10	60.00-50.00			16.73	1	10.00
T11	50.00-40.00			17.74	1	10.00
T12	40.00-30.00			18.75	1	10.00
T13	30.00-20.00			19.76	1	10.00
T14	20.00-0.00			20.78	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	180.00-160.00	4.00	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
T2	160.00-140.00	5.00	X Brace	No	No	0.0000	0.0000
T3	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T4	120.00-113.33	6.67	X Brace	No	No	0.0000	0.0000
T5	113.33-106.67	6.67	X Brace	No	No	0.0000	0.0000
T6	106.67-100.00	6.67	X Brace	No	No	0.0000	0.0000
T7	100.00-80.00	6.67	X Brace	No	No	0.0000	0.0000
T8	80.00-70.00	10.00	X Brace	No	No	0.0000	0.0000
T9	70.00-60.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	60.00-50.00	10.00	X Brace	No	No	0.0000	0.0000
T11	50.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T12	40.00-30.00	10.00	X Brace	No	Yes	0.0000	0.0000
T13	30.00-20.00	10.00	X Brace	No	Yes	0.0000	0.0000
T14	20.00-0.00	10.00	X Brace	No	Yes	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 180.00-160.00	Grouted Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A572-50 (50 ksi)
T2 160.00-140.00	Arbitrary Shape	ROHN 2.5 STD (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/8	A572-50 (50 ksi)
T3 140.00-120.00	Arbitrary Shape	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L2x2x1/8 w/1.5" sch 40 pipe	A572-50 (50 ksi)
T4 120.00-113.33	Arbitrary Shape	ROHN 3 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A572-50 (50 ksi)
T5 113.33-106.67	Arbitrary Shape	ROHN 3 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A572-50 (50 ksi)
T6 106.67-100.00	Arbitrary Shape	ROHN 3 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T7 100.00-80.00	Arbitrary Shape	ROHN 4 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T8 80.00-70.00	Arbitrary Shape	ROHN 5 STD (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T9 70.00-60.00	Arbitrary Shape	ROHN 5 STD (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 60.00-50.00	Arbitrary Shape	ROHN 5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T11 50.00-40.00	Arbitrary Shape	ROHN 5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T12 40.00-30.00	Arbitrary Shape	ROHN 5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Arbitrary Shape	L3.5x3.5x1/4 w/ 2x1/4 plate	A572-50 (50 ksi)
T13 30.00-20.00	Arbitrary Shape	ROHN 5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Arbitrary Shape	L3.5x3.5x1/4 w/ 2x1/4 plate	A572-50 (50 ksi)
T14 20.00-0.00	Grouted Pipe	ROHN 6 EH (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Double Equal Angle	4x4x1/4 w/ sch 40	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 70.00-60.00	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T11 50.00-40.00	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T12 40.00-30.00	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T13 30.00-20.00	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T4 120.00-113.33	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T5 113.33-106.67	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T6 106.67-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T7 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T8 80.00-70.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T9 70.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T10 60.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T11 50.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T12 40.00-30.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T13 30.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000
T14 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	Mid-Pt	36.0000

Tower Section Geometry *(cont'd)*

K Factors[1]

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	No	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
120.00-113.33				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
113.33-106.67				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
106.67-100.00				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
80.00-70.00				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
70.00-60.00				1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1
60.00-50.00				1	1	1	1	1	1	1
T11	Yes	No	1	1	1	1	1	1	1	1
50.00-40.00				1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1
40.00-30.00				1	1	1	1	1	1	1
T13	Yes	No	1	1	1	1	1	1	1	1
30.00-20.00				1	1	1	1	1	1	1
T14	Yes	No	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
180.00-160.00														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
160.00-140.00														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
140.00-120.00														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
120.00-113.33														
T5	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
113.33-106.67														
T6	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
106.67-100.00														
T7	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
100.00-80.00														
T8 80.00-70.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower 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
T9 70.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 60.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 50.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 40.00-30.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 30.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-160.00	Flange	0.6250 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 160.00-140.00	Flange	0.6250 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	0.7500 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-113.33	Flange	0.8750 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 113.33-106.67	Flange	0.8750 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 106.67-100.00	Flange	0.8750 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 100.00-80.00	Flange	1.0000 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 80.00-70.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 70.00-60.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 60.00-50.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 50.00-40.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 40.00-30.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 30.00-20.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 20.00-0.00	Flange	1.0000 A325N	12	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
ROHN 2 STD (GR)	50	1.0745	3.3556	10.647	5098	41737	71
ROHN 6 EH (GR) w/ 5/8" Cable (GR)	50	8.5495	25.9221	83.097	5098	41366	71

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
LDF1-50A (1/4 FOAM) (GPS)	A	No	Ar (CaAa)	59.00 - 10.00	0.0000	-0.45	1	1	0.3500	0.3500		0.08
LDF4P-50A (1/2 FOAM) (GPS)	B	No	Ar (CaAa)	18.00 - 10.00	0.0000	-0.5	2	2	0.6300	0.6300		0.19
LDF1-50A (1/4 FOAM) (GPS)	B	No	Ar (CaAa)	18.00 - 10.00	0.0000	-0.4	2	2	0.3500	0.3500		0.08
LDF4P-50A (1/2 FOAM) (GPS)	A	No	Ar (CaAa)	59.00 - 10.00	0.0000	-0.47	1	1	0.6300	0.6300		0.19
LDF4P-50A (1/2 FOAM)	A	No	Ar (CaAa)	103.00 - 10.00	0.0000	-0.42	1	1	0.6300	0.6300		0.19
LDF7-50A (1-5/8 FOAM) (T-Mobile)	B	No	Ar (CaAa)	136.00 - 10.00	-2.0000	0.4	24	12	1.9800	1.9800		1.10
LDF7-50A (1-5/8 FOAM)	A	No	Ar (CaAa)	124.00 - 10.00	0.0000	0.3	6	6	1.9800	1.9800		1.10
LDF7-50A (1-5/8 FOAM) (Verizon)	C	No	Ar (CfAe)	146.00 - 10.00	0.0000	-0.4	18	9	1.9800	1.9800		1.10
LDF7-50A (1-5/8 FOAM)	A	No	Ar (CaAa)	176.00 - 10.00	0.0000	0.4	1	1	1.9800	1.9800		1.10
LDF5-50A (7/8 FOAM)	C	No	Ar (CaAa)	180.00 - 10.00	0.0000	0.3	9	9	1.0900	1.0900		0.45
LDF6-50A (1-1/4 FOAM)	C	No	Ar (CaAa)	180.00 - 10.00	0.0000	0.45	2	2	1.5500	1.5500		0.81
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	180.00 - 10.00	0.0000	-0.4	1	1	1.0900	1.0900		0.45

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	180.00-160.00	A	0.000	0.000	5.348	0.000	26.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	25.820	0.000	113.40
T2	160.00-140.00	A	0.000	0.000	6.140	0.000	31.00
		B	0.000	0.000	0.000	0.000	0.00
		C	8.910	0.000	25.820	0.000	232.20
T3	140.00-120.00	A	0.000	0.000	10.892	0.000	57.40

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B	0.000	0.000	73.151	0.000	422.40
		C	29.700	0.000	25.820	0.000	509.40
T4	120.00-113.33	A	0.000	0.000	9.967	0.000	54.33
		B	0.000	0.000	30.480	0.000	176.00
		C	9.900	0.000	8.607	0.000	169.80
T5	113.33-106.67	A	0.000	0.000	9.967	0.000	54.33
		B	0.000	0.000	30.480	0.000	176.00
		C	9.900	0.000	8.607	0.000	169.80
T6	106.67-100.00	A	0.000	0.000	10.156	0.000	54.90
		B	0.000	0.000	30.480	0.000	176.00
		C	9.900	0.000	8.607	0.000	169.80
T7	100.00-80.00	A	0.000	0.000	31.160	0.000	166.80
		B	0.000	0.000	91.439	0.000	528.00
		C	29.700	0.000	25.820	0.000	509.40
T8	80.00-70.00	A	0.000	0.000	15.580	0.000	83.40
		B	0.000	0.000	45.720	0.000	264.00
		C	14.850	0.000	12.910	0.000	254.70
T9	70.00-60.00	A	0.000	0.000	15.580	0.000	83.40
		B	0.000	0.000	45.720	0.000	264.00
		C	14.850	0.000	12.910	0.000	254.70
T10	60.00-50.00	A	0.000	0.000	16.462	0.000	85.83
		B	0.000	0.000	45.720	0.000	264.00
		C	14.850	0.000	12.910	0.000	254.70
T11	50.00-40.00	A	0.000	0.000	16.560	0.000	86.10
		B	0.000	0.000	45.720	0.000	264.00
		C	14.850	0.000	12.910	0.000	254.70
T12	40.00-30.00	A	0.000	0.000	16.560	0.000	86.10
		B	0.000	0.000	45.720	0.000	264.00
		C	14.850	0.000	12.910	0.000	254.70
T13	30.00-20.00	A	0.000	0.000	16.560	0.000	86.10
		B	0.000	0.000	45.720	0.000	264.00
		C	14.850	0.000	12.910	0.000	254.70
T14	20.00-0.00	A	0.000	0.000	16.560	0.000	86.10
		B	0.000	0.000	47.288	0.000	268.32
		C	14.850	0.000	12.910	0.000	254.70

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	180.00-160.00	A	0.500	0.000	0.000	8.948	0.000	70.26
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	47.820	0.000	338.32
T2	160.00-140.00	A	0.500	0.000	0.000	10.140	0.000	80.72
		B		0.000	0.000	0.000	0.000	0.00
		C		13.410	0.000	47.820	0.000	620.73
T3	140.00-120.00	A	0.500	0.000	0.000	17.292	0.000	143.48
		B		0.000	0.000	74.751	0.000	1004.14
		C		44.700	0.000	47.820	0.000	1279.70
T4	120.00-113.33	A	0.500	0.000	0.000	15.300	0.000	131.51
		B		0.000	0.000	31.146	0.000	418.39
		C		14.900	0.000	15.940	0.000	426.57
T5	113.33-106.67	A	0.500	0.000	0.000	15.300	0.000	131.51
		B		0.000	0.000	31.146	0.000	418.39
		C		14.900	0.000	15.940	0.000	426.57
T6	106.67-100.00	A	0.500	0.000	0.000	15.789	0.000	134.15
		B		0.000	0.000	31.146	0.000	418.39

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		14.900	0.000	15.940	0.000	426.57
T7	100.00-80.00	A	0.500	0.000	0.000	49.160	0.000	412.12
		B		0.000	0.000	93.439	0.000	1255.17
		C		44.700	0.000	47.820	0.000	1279.70
T8	80.00-70.00	A	0.500	0.000	0.000	24.580	0.000	206.06
		B		0.000	0.000	46.720	0.000	627.59
		C		22.350	0.000	23.910	0.000	639.85
T9	70.00-60.00	A	0.500	0.000	0.000	24.580	0.000	206.06
		B		0.000	0.000	46.720	0.000	627.59
		C		22.350	0.000	23.910	0.000	639.85
T10	60.00-50.00	A	0.500	0.000	0.000	27.262	0.000	219.38
		B		0.000	0.000	46.720	0.000	627.59
		C		22.350	0.000	23.910	0.000	639.85
T11	50.00-40.00	A	0.500	0.000	0.000	27.560	0.000	220.86
		B		0.000	0.000	46.720	0.000	627.59
		C		22.350	0.000	23.910	0.000	639.85
T12	40.00-30.00	A	0.500	0.000	0.000	27.560	0.000	220.86
		B		0.000	0.000	46.720	0.000	627.59
		C		22.350	0.000	23.910	0.000	639.85
T13	30.00-20.00	A	0.500	0.000	0.000	27.560	0.000	220.86
		B		0.000	0.000	46.720	0.000	627.59
		C		22.350	0.000	23.910	0.000	639.85
T14	20.00-0.00	A	0.500	0.000	0.000	27.560	0.000	220.86
		B		0.000	0.000	51.717	0.000	649.64
		C		22.350	0.000	23.910	0.000	639.85

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.00-160.00	-4.2818	2.8246	-4.5291	3.1633
T2	160.00-140.00	-2.7933	4.2748	-3.4034	4.6209
T3	140.00-120.00	7.4948	6.2380	5.4748	6.4548
T4	120.00-113.33	7.5300	4.5983	5.4721	4.4596
T5	113.33-106.67	7.9780	4.8544	5.7976	4.7056
T6	106.67-100.00	8.2196	5.0446	5.9024	4.9145
T7	100.00-80.00	8.8422	5.4737	6.2545	5.3598
T8	80.00-70.00	9.8791	6.0852	7.0182	5.9801
T9	70.00-60.00	10.0101	6.1486	7.1304	6.0563
T10	60.00-50.00	10.6552	6.7963	7.1128	6.7777
T11	50.00-40.00	10.7634	6.8800	7.1370	6.8719
T12	40.00-30.00	11.2282	7.1631	7.5091	7.2138
T13	30.00-20.00	11.7496	7.4824	7.8621	7.5376
T14	20.00-0.00	10.3141	6.0911	6.8179	5.9217

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Top Platform	C	None			0.0000	180.00	No Ice	20.00	20.00	1200.00
							1/2" Ice	26.50	26.50	1600.00
10' Inverted Whip	B	From Face	2.00	0.00	0.0000	180.00 - 170.00	No Ice	5.10	5.10	65.00
			3.00	0.00			1/2" Ice	7.20	7.20	90.00
2' yagi	A	From Face	1.00	0.00	0.0000	102.00	No Ice	1.50	1.50	25.00
			0.00	0.00			1/2" Ice	3.00	3.00	40.00
(2) GPS	B	From Leg	0.00	0.00	0.0000	17.67	No Ice	0.10	0.10	20.00
			0.00	0.00			1/2" Ice	0.17	0.17	35.00
(2) GPS	B	From Leg	0.00	0.00	0.0000	18.00	No Ice	0.10	0.10	20.00
			0.00	0.00			1/2" Ice	0.17	0.17	35.00
GPS	A	From Leg	0.00	0.00	0.0000	59.00	No Ice	0.10	0.10	20.00
			0.00	0.00			1/2" Ice	0.17	0.17	35.00
GPS	A	From Leg	0.00	0.00	0.0000	59.50	No Ice	0.10	0.10	20.00
			0.00	0.00			1/2" Ice	0.17	0.17	35.00
Empty Mount	C	From Leg	0.00	0.00	0.0000	102.50	No Ice	4.00	3.50	150.00
			0.00	0.00			1/2" Ice	6.20	5.50	250.00
RFS Panel Antennas	A	From Leg	0.00	0.00	0.0000	124.00	No Ice	3.25	1.75	50.00
			0.00	0.00			1/2" Ice	3.80	2.28	75.00
RFS Panel Antennas	B	From Leg	0.00	0.00	0.0000	124.00	No Ice	3.25	1.75	50.00
			0.00	0.00			1/2" Ice	3.80	2.28	75.00
RFS Panel Antennas	C	From Leg	0.00	0.00	0.0000	124.00	No Ice	3.25	1.75	50.00
			0.00	0.00			1/2" Ice	3.80	2.28	75.00
Stand-Off T-Frame (T-Mobile)	A	From Leg	0.00	0.00	0.0000	135.00	No Ice	8.50	4.50	150.00
			0.00	0.00			1/2" Ice	11.50	6.25	250.00
Stand-Off T-Frame (T-Mobile)	B	From Leg	0.00	0.00	0.0000	135.00	No Ice	8.50	4.50	150.00
			0.00	0.00			1/2" Ice	11.50	6.25	250.00
Stand-Off T-Frame (T-Mobile)	C	From Leg	0.00	0.00	0.0000	135.00	No Ice	8.50	4.50	150.00
			0.00	0.00			1/2" Ice	11.50	6.25	250.00
(3) Ericsson AIR21 Antenna (T-Mobile)	A	From Leg	5.00	0.00	0.0000	135.00	No Ice	4.67	3.11	125.00
			0.00	0.00			1/2" Ice	5.15	4.02	205.00
(3) Ericsson AIR21 Antenna (T-Mobile)	B	From Leg	5.00	0.00	0.0000	135.00	No Ice	4.67	3.11	125.00
			0.00	0.00			1/2" Ice	5.15	4.02	205.00
(3) Ericsson AIR21 Antenna (T-Mobile)	C	From Leg	5.00	0.00	0.0000	135.00	No Ice	4.67	3.11	125.00
			0.00	0.00			1/2" Ice	5.15	4.02	205.00
BXA-171063-8BF (Verizon)	A	From Leg	4.50	0.00	0.0000	146.00	No Ice	2.02	2.02	55.00
			0.00	0.00			1/2" Ice	2.41	2.41	85.00
BXA-171063-8BF (Verizon)	B	From Leg	4.50	0.00	0.0000	146.00	No Ice	2.02	2.02	55.00
			0.00	0.00			1/2" Ice	2.41	2.41	85.00
BXA-171063-12BF	C	From Leg	4.50	0.00	0.0000	146.00	No Ice	2.02	2.02	55.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Verizon)			0.00	0.00			1/2" Ice	2.41	2.41	85.00
BXA-80063-6BF	A	From Leg	4.50	0.0000	146.00		No Ice	5.53	2.47	75.00
(Verizon)			0.00	0.00			1/2" Ice	6.10	3.00	105.00
BXA-80063-6BF	B	From Leg	4.50	0.0000	146.00		No Ice	5.53	2.47	75.00
(Verizon)			0.00	0.00			1/2" Ice	6.10	3.00	105.00
BXA-80063-6BF	C	From Leg	4.50	0.0000	146.00		No Ice	5.53	2.47	75.00
(Verizon)			0.00	0.00			1/2" Ice	6.10	3.00	105.00
BXA-70063-6CF	A	From Leg	4.50	0.0000	146.00		No Ice	5.54	3.00	75.00
(Verizon)			0.00	0.00			1/2" Ice	6.13	3.55	105.00
BXA-70040-6CF	B	From Leg	4.50	0.0000	146.00		No Ice	5.54	3.00	75.00
(Verizon)			0.00	0.00			1/2" Ice	6.13	3.55	105.00
BXA-70040-6CF	C	From Leg	4.50	0.0000	146.00		No Ice	5.54	3.00	75.00
(Verizon)			0.00	0.00			1/2" Ice	6.13	3.55	105.00
Stand-Off T-Frame	A	From Leg	0.00	0.0000	146.00		No Ice	8.50	4.50	150.00
(Verizon)			0.00	0.00			1/2" Ice	11.50	6.25	250.00
Stand-Off T-Frame	B	From Leg	0.00	0.0000	146.00		No Ice	8.50	4.50	150.00
(Verizon)			0.00	0.00			1/2" Ice	11.50	6.25	250.00
Stand-Off T-Frame	C	From Leg	0.00	0.0000	146.00		No Ice	8.50	4.50	150.00
(Verizon)			0.00	0.00			1/2" Ice	11.50	6.25	250.00
(2) Scala Panels	B	From Leg	4.50	0.0000	175.60		No Ice	8.21	5.25	65.00
			0.00	0.00			1/2" Ice	10.10	6.87	95.00
Stand Off Mount	B	From Leg	0.00	0.0000	175.60		No Ice	4.50	6.50	105.00
			0.00	0.00			1/2" Ice	8.50	9.21	145.00
14' Inverted Whip	C	From Face	4.00	0.0000	166.00 - 180.00		No Ice	5.20	5.20	65.00
			0.00	0.00			1/2" Ice	7.10	7.10	94.00
21' Whip	A	From Leg	2.00	0.0000	191.50		No Ice	4.38	4.38	50.00
			0.00	0.00			1/2" Ice	6.15	6.15	85.00
20' Dipole	B	From Leg	2.00	0.0000	191.00		No Ice	6.00	6.15	65.00
			0.00	0.00			1/2" Ice	8.50	6.75	105.00
6' Yagi	B	From Face	4.00	0.0000	184.00		No Ice	1.10	0.60	22.00
			0.00	0.00			1/2" Ice	1.60	0.80	28.00
PG1*0F-0090-310	B	From Leg	2.00	0.0000	187.00		No Ice	3.00	3.00	33.00
			0.00	0.00			1/2" Ice	4.00	4.00	44.00
21' Whip	A	From Leg	2.00	0.0000	192.50		No Ice	4.38	4.38	40.00
			0.00	0.00			1/2" Ice	6.15	6.15	70.00
16' Whip	C	From Face	4.00	0.0000	190.00		No Ice	3.50	3.50	30.00
			0.00	0.00			1/2" Ice	5.25	5.25	45.00
6' Yagi	C	From Face	4.00	0.0000	185.00		No Ice	1.10	0.60	22.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	1.60	0.80	28.00
			0.00						
10' Whip	B	From Face	4.00	0.0000	187.00	No Ice	3.10	3.10	30.00
			0.00			1/2" Ice	3.90	3.90	37.00
			0.00						
20' Dipole	A	From Face	4.00	0.0000	188.00	No Ice	3.00	2.19	25.00
			0.00			1/2" Ice	4.25	3.08	42.00
			0.00						
10' Whip	C	From Leg	2.00	0.0000	188.50	No Ice	3.10	3.10	30.00
			0.00			1/2" Ice	3.90	3.90	37.00
			0.00						
BXA-171063-8BF (Verizon)	A	From Leg	4.50	0.0000	146.00	No Ice	2.02	2.02	50.00
			0.00			1/2" Ice	2.41	2.41	75.00
			0.00						
BXA-171063-8BF (Verizon)	B	From Leg	4.50	0.0000	146.00	No Ice	2.02	2.02	50.00
			0.00			1/2" Ice	2.41	2.41	75.00
			0.00						
BXA-171063-8BF (Verizon)	C	From Leg	4.50	0.0000	146.00	No Ice	2.02	2.02	50.00
			0.00			1/2" Ice	2.41	2.41	75.00
			0.00						
ALU RH_2X40-AWS RRH (Verizon)	A	From Leg	4.50	0.0000	146.00	No Ice	1.25	0.75	60.00
			0.00			1/2" Ice	1.64	1.20	85.00
			0.00						
ALU RH_2X40-AWS RRH (Verizon)	B	From Leg	4.50	0.0000	146.00	No Ice	1.25	0.75	60.00
			0.00			1/2" Ice	1.64	1.20	85.00
			0.00						
ALU RH_2X40-AWS RRH (Verizon)	C	From Leg	4.50	0.0000	146.00	No Ice	1.25	0.75	60.00
			0.00			1/2" Ice	1.64	1.20	85.00
			0.00						

Tower Pressures - No Ice

$G_H = 1.121$

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	170.00	1.597	30	134.958	A	10.879	7.917	7.917	42.12	5.348	0.000
180.00-160.00					B	10.879	7.917		42.12	0.000	0.000
					C	10.879	7.917		42.12	25.820	0.000
T2	150.00	1.541	29	157.047	A	19.905	0.000	9.600	48.23	6.140	0.000
160.00-140.00					B	19.905	0.000		48.23	0.000	0.000
					C	19.905	8.910		33.31	25.820	0.000
T3	130.00	1.48	27	198.281	A	21.032	0.000	9.600	45.64	10.892	0.000
140.00-120.00					B	21.032	0.000		45.64	73.151	0.000
					C	21.032	29.700		18.92	25.820	0.000
T4	116.67	1.434	27	75.200	A	9.122	0.000	3.896	42.71	9.967	0.000
120.00-113.33					B	9.122	0.000		42.71	30.480	0.000
					C	9.122	9.900		20.48	8.607	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
T5	110.00	1.411	26	79.700	A	9.353	0.000	3.896	41.65	9.967	0.000
113.33-106.67					B	9.353	0.000		41.65	30.480	0.000
					C	9.353	9.900		20.23	8.607	0.000
T6	103.33	1.386	26	84.200	A	10.742	0.000	3.896	36.26	10.156	0.000
106.67-100.00					B	10.742	0.000		36.26	30.480	0.000
					C	10.742	9.900		18.87	8.607	0.000
T7	90.00	1.332	25	281.260	A	37.265	0.000	15.026	40.32	31.160	0.000
100.00-80.00					B	37.265	0.000		40.32	91.439	0.000
					C	37.265	29.700		22.44	25.820	0.000
T8 80.00-70.00	75.00	1.264	23	156.710	A	18.138	0.000	9.287	51.21	15.580	0.000
					B	18.138	0.000		51.21	45.720	0.000
					C	18.138	14.850		28.15	12.910	0.000
T9 70.00-60.00	65.00	1.214	22	166.835	A	24.676	0.000	9.287	37.64	15.580	0.000
					B	24.676	0.000		37.64	45.720	0.000
					C	24.676	14.850		23.50	12.910	0.000
T10	55.00	1.157	21	176.797	A	20.598	0.000	9.287	45.09	16.462	0.000
60.00-50.00					B	20.598	0.000		45.09	45.720	0.000
					C	20.598	14.850		26.20	12.910	0.000
T11	45.00	1.093	20	186.922	A	26.298	0.000	9.287	35.32	16.560	0.000
50.00-40.00					B	26.298	0.000		35.32	45.720	0.000
					C	26.298	14.850		22.57	12.910	0.000
T12	35.00	1.017	19	197.047	A	27.937	0.000	9.287	33.24	16.560	0.000
40.00-30.00					B	27.937	0.000		33.24	45.720	0.000
					C	27.937	14.850		21.71	12.910	0.000
T13	25.00	1	18	207.172	A	28.798	0.000	9.287	32.25	16.560	0.000
30.00-20.00					B	28.798	0.000		32.25	45.720	0.000
					C	28.798	14.850		21.28	12.910	0.000
T14 20.00-0.00	10.00	1	18	446.806	A	31.190	22.121	22.121	41.49	16.560	0.000
					B	31.190	22.121		41.49	47.288	0.000
					C	31.190	36.971		32.45	12.910	0.000

Tower Pressure - With Ice

$G_H = 1.121$

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	170.00	1.597	22	0.5000	136.625	A	10.879	17.978	11.250	38.99	8.948	0.000
180.00-160.00						B	10.879	17.978		38.99	0.000	0.000
						C	10.879	17.978		38.99	47.820	0.000
T2	150.00	1.541	21	0.5000	158.715	A	22.131	5.889	11.826	42.20	10.140	0.000
160.00-140.00						B	22.131	5.889		42.20	0.000	0.000
						C	22.131	19.299		28.54	47.820	0.000
T3	130.00	1.48	21	0.5000	199.950	A	23.258	5.716	11.826	40.81	17.292	0.000
140.00-120.00						B	23.258	5.716		40.81	74.751	0.000
						C	23.258	50.416		16.05	47.820	0.000
T4	116.67	1.434	20	0.5000	75.757	A	9.864	2.090	4.638	38.79	15.300	0.000
120.00-113.33						B	9.864	2.090		38.79	31.146	0.000
						C	9.864	16.990		17.27	15.940	0.000
T5	110.00	1.411	20	0.5000	80.257	A	10.095	2.183	4.638	37.77	15.300	0.000
113.33-106.67						B	10.095	2.183		37.77	31.146	0.000
						C	10.095	17.083		17.06	15.940	0.000
T6	103.33	1.386	19	0.5000	84.757	A	11.484	2.282	4.638	33.69	15.789	0.000
106.67-100.00						B	11.484	2.282		33.69	31.146	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
						C	11.484	17.182		16.18	15.940	0.000
T7 100.00-80.00	90.00	1.332	18	0.5000	282.928	A	39.491	7.413	17.252	36.78	49.160	0.000
						B	39.491	7.413		36.78	93.439	0.000
						C	39.491	52.113		18.83	47.820	0.000
T8 80.00-70.00	75.00	1.264	18	0.5000	157.545	A	19.251	2.950	10.401	46.85	24.580	0.000
						B	19.251	2.950		46.85	46.720	0.000
						C	19.251	25.300		23.35	23.910	0.000
T9 70.00-60.00	65.00	1.214	17	0.5000	167.670	A	25.790	4.397	10.401	34.45	24.580	0.000
						B	25.790	4.397		34.45	46.720	0.000
						C	25.790	26.747		19.80	23.910	0.000
T10 60.00-50.00	55.00	1.157	16	0.5000	177.631	A	21.711	3.231	10.401	41.70	27.262	0.000
						B	21.711	3.231		41.70	46.720	0.000
						C	21.711	25.581		21.99	23.910	0.000
T11 50.00-40.00	45.00	1.093	15	0.5000	187.756	A	27.411	4.860	10.401	32.23	27.560	0.000
						B	27.411	4.860		32.23	46.720	0.000
						C	27.411	27.210		19.04	23.910	0.000
T12 40.00-30.00	35.00	1.017	14	0.5000	197.881	A	31.403	1.565	10.401	31.55	27.560	0.000
						B	31.403	1.565		31.55	46.720	0.000
						C	31.403	23.915		18.80	23.910	0.000
T13 30.00-20.00	25.00	1	14	0.5000	208.006	A	32.365	1.649	10.401	30.58	27.560	0.000
						B	32.365	1.649		30.58	46.720	0.000
						C	32.365	23.999		18.45	23.910	0.000
T14 20.00-0.00	10.00	1	14	0.5000	448.475	A	31.190	33.258	25.460	39.51	27.560	0.000
						B	31.190	33.258		39.51	51.717	0.000
						C	31.190	55.608		29.33	23.910	0.000

Tower Pressure - Service

$G_H = 1.121$

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	170.00	1.597	15	134.958	A	10.879	7.917	7.917	42.12	5.348	0.000
180.00-160.00					B	10.879	7.917		42.12	0.000	0.000
					C	10.879	7.917		42.12	25.820	0.000
T2	150.00	1.541	14	157.047	A	19.905	0.000	9.600	48.23	6.140	0.000
160.00-140.00					B	19.905	0.000		48.23	0.000	0.000
					C	19.905	8.910		33.31	25.820	0.000
T3	130.00	1.48	14	198.281	A	21.032	0.000	9.600	45.64	10.892	0.000
140.00-120.00					B	21.032	0.000		45.64	73.151	0.000
					C	21.032	29.700		18.92	25.820	0.000
T4	116.67	1.434	13	75.200	A	9.122	0.000	3.896	42.71	9.967	0.000
120.00-113.33					B	9.122	0.000		42.71	30.480	0.000
					C	9.122	9.900		20.48	8.607	0.000
T5	110.00	1.411	13	79.700	A	9.353	0.000	3.896	41.65	9.967	0.000
113.33-106.67					B	9.353	0.000		41.65	30.480	0.000
					C	9.353	9.900		20.23	8.607	0.000
T6	103.33	1.386	13	84.200	A	10.742	0.000	3.896	36.26	10.156	0.000
106.67-100.00					B	10.742	0.000		36.26	30.480	0.000
					C	10.742	9.900		18.87	8.607	0.000
T7	90.00	1.332	12	281.260	A	37.265	0.000	15.026	40.32	31.160	0.000
100.00-80.00					B	37.265	0.000		40.32	91.439	0.000
					C	37.265	29.700		22.44	25.820	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
T8 80.00-70.00	75.00	1.264	12	156.710	A	18.138	0.000	9.287	51.21	15.580	0.000
					B	18.138	0.000		51.21	45.720	0.000
					C	18.138	14.850		28.15	12.910	0.000
T9 70.00-60.00	65.00	1.214	11	166.835	A	24.676	0.000	9.287	37.64	15.580	0.000
					B	24.676	0.000		37.64	45.720	0.000
					C	24.676	14.850		23.50	12.910	0.000
T10 60.00-50.00	55.00	1.157	11	176.797	A	20.598	0.000	9.287	45.09	16.462	0.000
					B	20.598	0.000		45.09	45.720	0.000
					C	20.598	14.850		26.20	12.910	0.000
T11 50.00-40.00	45.00	1.093	10	186.922	A	26.298	0.000	9.287	35.32	16.560	0.000
					B	26.298	0.000		35.32	45.720	0.000
					C	26.298	14.850		22.57	12.910	0.000
T12 40.00-30.00	35.00	1.017	9	197.047	A	27.937	0.000	9.287	33.24	16.560	0.000
					B	27.937	0.000		33.24	45.720	0.000
					C	27.937	14.850		21.71	12.910	0.000
T13 30.00-20.00	25.00	1	9	207.172	A	28.798	0.000	9.287	32.25	16.560	0.000
					B	28.798	0.000		32.25	45.720	0.000
					C	28.798	14.850		21.28	12.910	0.000
T14 20.00-0.00	10.00	1	9	446.806	A	31.190	22.121	22.121	41.49	16.560	0.000
					B	31.190	22.121		41.49	47.288	0.000
					C	31.190	36.971		32.45	12.910	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 180.00-160.00	140.00	806.22	A	0.139	2.811	0.58	1	1	15.470	2472.46	123.62	C
			B	0.139	2.811	0.58	1	1	15.470			
			C	0.139	2.811	0.58	1	1	15.470			
T2 160.00-140.00	263.20	890.14	A	0.127	2.859	0.578	1	1	19.905	3151.39	157.57	C
			B	0.127	2.859	0.578	1	1	19.905			
			C	0.183	2.652	0.587	1	1	25.137			
T3 140.00-120.00	989.20	1635.64	A	0.106	2.94	0.576	1	1	21.032	6261.30	313.06	C
			B	0.106	2.94	0.576	1	1	21.032			
			C	0.256	2.42	0.603	1	1	38.953			
T4 120.00-113.33	400.13	537.07	A	0.121	2.88	0.578	1	1	9.122	2548.53	382.28	C
			B	0.121	2.88	0.578	1	1	9.122			
			C	0.253	2.429	0.603	1	1	15.088			
T5 113.33-106.67	400.13	547.78	A	0.117	2.895	0.577	1	1	9.353	2535.85	380.38	C
			B	0.117	2.895	0.577	1	1	9.353			
			C	0.242	2.463	0.6	1	1	15.291			
T6 106.67-100.00	400.70	712.70	A	0.128	2.856	0.578	1	1	10.742	2590.03	388.50	C
			B	0.128	2.856	0.578	1	1	10.742			
			C	0.245	2.452	0.601	1	1	16.689			
T7 100.00-80.00	1204.20	2695.98	A	0.132	2.837	0.579	1	1	37.265	7858.99	392.95	C
			B	0.132	2.837	0.579	1	1	37.265			
			C	0.238	2.474	0.599	1	1	55.053			
T8 80.00-70.00	602.10	1378.16	A	0.116	2.902	0.577	1	1	18.138	3753.72	375.37	C
			B	0.116	2.902	0.577	1	1	18.138			
			C	0.211	2.561	0.593	1	1	26.938			
T9 70.00-60.00	602.10	1780.07	A	0.148	2.779	0.581	1	1	24.676	3959.60	395.96	C
			B	0.148	2.779	0.581	1	1	24.676			
			C	0.237	2.477	0.599	1	1	33.566			
T10 60.00-50.00	604.53	1561.19	A	0.117	2.899	0.577	1	1	20.598	3629.07	362.91	C
			B	0.117	2.899	0.577	1	1	20.598			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.2	2.594	0.591	1	1	29.367			
T11	604.80	1906.12	A	0.141	2.806	0.58	1	1	26.298	3716.66	371.67	C
50.00-40.00			B	0.141	2.806	0.58	1	1	26.298			
			C	0.22	2.53	0.595	1	1	35.130			
T12	604.80	2159.10	A	0.142	2.802	0.58	1	1	27.937	3553.50	355.35	C
40.00-30.00			B	0.142	2.802	0.58	1	1	27.937			
			C	0.217	2.54	0.594	1	1	36.759			
T13	604.80	2216.27	A	0.139	2.812	0.58	1	1	28.798	3554.82	355.48	C
30.00-20.00			B	0.139	2.812	0.58	1	1	28.798			
			C	0.211	2.561	0.593	1	1	37.599			
T14	609.12	9793.68	A	0.119	2.888	0.577	1	1	43.960	4609.21	230.46	C
20.00-0.00			B	0.119	2.888	0.577	1	1	43.960			
			C	0.153	2.762	0.582	1	1	52.702			
Sum Weight:	8029.82	28620.10						OTM	4423299.5 7 lb-ft	54195.13		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	140.00	806.22	A	0.139	2.811	0.58	0.8	1	13.294	2269.89	113.49	C
180.00-160.00			B	0.139	2.811	0.58	0.8	1	13.294			
			C	0.139	2.811	0.58	0.8	1	13.294			
T2	263.20	890.14	A	0.127	2.859	0.578	0.8	1	15.924	2814.02	140.70	C
160.00-140.00			B	0.127	2.859	0.578	0.8	1	15.924			
			C	0.183	2.652	0.587	0.8	1	21.156			
T3	989.20	1635.64	A	0.106	2.94	0.576	0.8	1	16.826	5949.05	297.45	C
140.00-120.00			B	0.106	2.94	0.576	0.8	1	16.826			
			C	0.256	2.42	0.603	0.8	1	34.747			
T4	400.13	537.07	A	0.121	2.88	0.578	0.8	1	7.297	2416.77	362.52	C
120.00-113.33			B	0.121	2.88	0.578	0.8	1	7.297			
			C	0.253	2.429	0.603	0.8	1	13.263			
T5	400.13	547.78	A	0.117	2.895	0.577	0.8	1	7.483	2401.11	360.17	C
113.33-106.67			B	0.117	2.895	0.577	0.8	1	7.483			
			C	0.242	2.463	0.6	0.8	1	13.420			
T6	400.70	712.70	A	0.128	2.856	0.578	0.8	1	8.594	2438.69	365.80	C
106.67-100.00			B	0.128	2.856	0.578	0.8	1	8.594			
			C	0.245	2.452	0.601	0.8	1	14.540			
T7	1204.20	2695.98	A	0.132	2.837	0.579	0.8	1	29.812	7349.89	367.49	C
100.00-80.00			B	0.132	2.837	0.579	0.8	1	29.812			
			C	0.238	2.474	0.599	0.8	1	47.600			
T8	602.10	1378.16	A	0.116	2.902	0.577	0.8	1	14.510	3510.18	351.02	C
80.00-70.00			B	0.116	2.902	0.577	0.8	1	14.510			
			C	0.211	2.561	0.593	0.8	1	23.310			
T9	602.10	1780.07	A	0.148	2.779	0.581	0.8	1	19.741	3651.96	365.20	C
70.00-60.00			B	0.148	2.779	0.581	0.8	1	19.741			
			C	0.237	2.477	0.599	0.8	1	28.631			
T10	604.53	1561.19	A	0.117	2.899	0.577	0.8	1	16.478	3372.68	337.27	C
60.00-50.00			B	0.117	2.899	0.577	0.8	1	16.478			
			C	0.2	2.594	0.591	0.8	1	25.247			
T11	604.80	1906.12	A	0.141	2.806	0.58	0.8	1	21.039	3415.21	341.52	C
50.00-40.00			B	0.141	2.806	0.58	0.8	1	21.039			
			C	0.22	2.53	0.595	0.8	1	29.870			
T12	604.80	2159.10	A	0.142	2.802	0.58	0.8	1	22.350	3254.32	325.43	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
40.00-30.00			B	0.142	2.802	0.58	0.8	1	22.350			
			C	0.217	2.54	0.594	0.8	1	31.171			
T13	604.80	2216.27	A	0.139	2.812	0.58	0.8	1	23.038	3249.05	324.91	C
30.00-20.00			B	0.139	2.812	0.58	0.8	1	23.038			
			C	0.211	2.561	0.593	0.8	1	31.839			
T14	609.12	9793.68	A	0.119	2.888	0.577	0.8	1	37.722	4252.01	212.60	C
20.00-0.00			B	0.119	2.888	0.577	0.8	1	37.722			
			C	0.153	2.762	0.582	0.8	1	46.464			
Sum Weight:	8029.82	28620.10						OTM	4118397.9 1 lb-ft	50344.83		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	140.00	806.22	A	0.139	2.811	0.58	0.85	1	13.838	2320.53	116.03	C
180.00-160.00			B	0.139	2.811	0.58	0.85	1	13.838			
			C	0.139	2.811	0.58	0.85	1	13.838			
T2	263.20	890.14	A	0.127	2.859	0.578	0.85	1	16.919	2898.36	144.92	C
160.00-140.00			B	0.127	2.859	0.578	0.85	1	16.919			
			C	0.183	2.652	0.587	0.85	1	22.151			
T3	989.20	1635.64	A	0.106	2.94	0.576	0.85	1	17.878	6027.11	301.36	C
140.00-120.00			B	0.106	2.94	0.576	0.85	1	17.878			
			C	0.256	2.42	0.603	0.85	1	35.798			
T4	400.13	537.07	A	0.121	2.88	0.578	0.85	1	7.753	2449.71	367.46	C
120.00-113.33			B	0.121	2.88	0.578	0.85	1	7.753			
			C	0.253	2.429	0.603	0.85	1	13.719			
T5	400.13	547.78	A	0.117	2.895	0.577	0.85	1	7.950	2434.79	365.22	C
113.33-106.67			B	0.117	2.895	0.577	0.85	1	7.950			
			C	0.242	2.463	0.6	0.85	1	13.888			
T6	400.70	712.70	A	0.128	2.856	0.578	0.85	1	9.131	2476.53	371.48	C
106.67-100.00			B	0.128	2.856	0.578	0.85	1	9.131			
			C	0.245	2.452	0.601	0.85	1	15.077			
T7	1204.20	2695.98	A	0.132	2.837	0.579	0.85	1	31.675	7477.16	373.86	C
100.00-80.00			B	0.132	2.837	0.579	0.85	1	31.675			
			C	0.238	2.474	0.599	0.85	1	49.463			
T8	602.10	1378.16	A	0.116	2.902	0.577	0.85	1	15.417	3571.07	357.11	C
80.00-70.00			B	0.116	2.902	0.577	0.85	1	15.417			
			C	0.211	2.561	0.593	0.85	1	24.217			
T9	602.10	1780.07	A	0.148	2.779	0.581	0.85	1	20.975	3728.87	372.89	C
70.00-60.00			B	0.148	2.779	0.581	0.85	1	20.975			
			C	0.237	2.477	0.599	0.85	1	29.865			
T10	604.53	1561.19	A	0.117	2.899	0.577	0.85	1	17.508	3436.78	343.68	C
60.00-50.00			B	0.117	2.899	0.577	0.85	1	17.508			
			C	0.2	2.594	0.591	0.85	1	26.277			
T11	604.80	1906.12	A	0.141	2.806	0.58	0.85	1	22.353	3490.57	349.06	C
50.00-40.00			B	0.141	2.806	0.58	0.85	1	22.353			
			C	0.22	2.53	0.595	0.85	1	31.185			
T12	604.80	2159.10	A	0.142	2.802	0.58	0.85	1	23.747	3329.12	332.91	C
40.00-30.00			B	0.142	2.802	0.58	0.85	1	23.747			
			C	0.217	2.54	0.594	0.85	1	32.568			
T13	604.80	2216.27	A	0.139	2.812	0.58	0.85	1	24.478	3325.49	332.55	C
30.00-20.00			B	0.139	2.812	0.58	0.85	1	24.478			
			C	0.211	2.561	0.593	0.85	1	33.279			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T14	609.12	9793.68	A	0.119	2.888	0.577	0.85	1	39.281	4341.31	217.07	C
20.00-0.00			B	0.119	2.888	0.577	0.85	1	39.281			
			C	0.153	2.762	0.582	0.85	1	48.024			
Sum Weight:	8029.82	28620.10						OTM	4194623.3 3 lb-ft	51307.41		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	408.59	1321.07	A	0.211	2.559	0.593	1	1	21.535	2778.72	138.94	C
180.00-160.00			B	0.211	2.559	0.593	1	1	21.535			
			C	0.211	2.559	0.593	1	1	21.535			
T2	701.46	1376.56	A	0.177	2.676	0.586	1	1	25.582	3337.05	166.85	C
160.00-140.00			B	0.177	2.676	0.586	1	1	25.582			
			C	0.261	2.405	0.605	1	1	33.802			
T3	2427.32	2149.68	A	0.145	2.79	0.581	1	1	26.578	5936.14	296.81	C
140.00-120.00			B	0.145	2.79	0.581	1	1	26.578			
			C	0.368	2.13	0.639	1	1	55.487			
T4	976.46	759.32	A	0.158	2.743	0.583	1	1	11.082	2386.27	357.94	C
120.00-113.33			B	0.158	2.743	0.583	1	1	11.082			
			C	0.354	2.161	0.634	1	1	20.637			
T5	976.46	778.15	A	0.153	2.761	0.582	1	1	11.366	2372.68	355.90	C
113.33-106.67			B	0.153	2.761	0.582	1	1	11.366			
			C	0.339	2.198	0.628	1	1	20.832			
T6	979.10	984.02	A	0.162	2.726	0.583	1	1	12.816	2410.30	361.54	C
106.67-100.00			B	0.162	2.726	0.583	1	1	12.816			
			C	0.338	2.199	0.628	1	1	22.280			
T7	2947.00	3605.41	A	0.166	2.714	0.584	1	1	43.820	7275.05	363.75	C
100.00-80.00			B	0.166	2.714	0.584	1	1	43.820			
			C	0.324	2.235	0.623	1	1	71.981			
T8	1473.50	1776.81	A	0.141	2.805	0.58	1	1	20.962	3470.10	347.01	C
80.00-70.00			B	0.141	2.805	0.58	1	1	20.962			
			C	0.283	2.343	0.611	1	1	34.703			
T9	1473.50	2387.97	A	0.18	2.664	0.587	1	1	28.368	3604.93	360.49	C
70.00-60.00			B	0.18	2.664	0.587	1	1	28.368			
			C	0.313	2.261	0.62	1	1	42.374			
T10	1486.81	2034.39	A	0.14	2.807	0.58	1	1	23.585	3361.42	336.14	C
60.00-50.00			B	0.14	2.807	0.58	1	1	23.585			
			C	0.266	2.39	0.606	1	1	37.217			
T11	1488.29	2565.50	A	0.172	2.693	0.585	1	1	30.255	3406.57	340.66	C
50.00-40.00			B	0.172	2.693	0.585	1	1	30.255			
			C	0.291	2.32	0.613	1	1	44.095			
T12	1488.29	2807.51	A	0.167	2.711	0.584	1	1	32.318	3262.79	326.28	C
40.00-30.00			B	0.167	2.711	0.584	1	1	32.318			
			C	0.28	2.352	0.61	1	1	45.988			
T13	1488.29	2889.39	A	0.164	2.722	0.584	1	1	33.328	3261.04	326.10	C
30.00-20.00			B	0.164	2.722	0.584	1	1	33.328			
			C	0.271	2.376	0.607	1	1	46.943			
T14	1510.35	11529.71	A	0.144	2.795	0.581	1	1	50.497	4207.27	210.36	C
20.00-0.00			B	0.144	2.795	0.581	1	1	50.497			
			C	0.194	2.618	0.589	1	1	63.948			
Sum Weight:	19825.45	36965.49						OTM	4258396.9	51070.32		

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
									8 lb-ft			

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	408.59	1321.07	A	0.211	2.559	0.593	0.8	1	19.360	2640.42	132.02	C
180.00-160.00			B	0.211	2.559	0.593	0.8	1	19.360			
			C	0.211	2.559	0.593	0.8	1	19.360			
T2	701.46	1376.56	A	0.177	2.676	0.586	0.8	1	21.155	3081.97	154.10	C
160.00-140.00			B	0.177	2.676	0.586	0.8	1	21.155			
			C	0.261	2.405	0.605	0.8	1	29.376			
T3	2427.32	2149.68	A	0.145	2.79	0.581	0.8	1	21.926	5708.22	285.41	C
140.00-120.00			B	0.145	2.79	0.581	0.8	1	21.926			
			C	0.368	2.13	0.639	0.8	1	50.835			
T4	976.46	759.32	A	0.158	2.743	0.583	0.8	1	9.109	2291.18	343.68	C
120.00-113.33			B	0.158	2.743	0.583	0.8	1	9.109			
			C	0.354	2.161	0.634	0.8	1	18.664			
T5	976.46	778.15	A	0.153	2.761	0.582	0.8	1	9.347	2275.33	341.30	C
113.33-106.67			B	0.153	2.761	0.582	0.8	1	9.347			
			C	0.339	2.198	0.628	0.8	1	18.813			
T6	979.10	984.02	A	0.162	2.726	0.583	0.8	1	10.519	2301.47	345.22	C
106.67-100.00			B	0.162	2.726	0.583	0.8	1	10.519			
			C	0.338	2.199	0.628	0.8	1	19.984			
T7	2947.00	3605.41	A	0.166	2.714	0.584	0.8	1	35.922	6909.51	345.48	C
100.00-80.00			B	0.166	2.714	0.584	0.8	1	35.922			
			C	0.324	2.235	0.623	0.8	1	64.083			
T8	1473.50	1776.81	A	0.141	2.805	0.58	0.8	1	17.112	3292.77	329.28	C
80.00-70.00			B	0.141	2.805	0.58	0.8	1	17.112			
			C	0.283	2.343	0.611	0.8	1	30.853			
T9	1473.50	2387.97	A	0.18	2.664	0.587	0.8	1	23.210	3384.84	338.48	C
70.00-60.00			B	0.18	2.664	0.587	0.8	1	23.210			
			C	0.313	2.261	0.62	0.8	1	37.217			
T10	1486.81	2034.39	A	0.14	2.807	0.58	0.8	1	19.243	3174.73	317.47	C
60.00-50.00			B	0.14	2.807	0.58	0.8	1	19.243			
			C	0.266	2.39	0.606	0.8	1	32.875			
T11	1488.29	2565.50	A	0.172	2.693	0.585	0.8	1	24.772	3190.44	319.04	C
50.00-40.00			B	0.172	2.693	0.585	0.8	1	24.772			
			C	0.291	2.32	0.613	0.8	1	38.613			
T12	1488.29	2807.51	A	0.167	2.711	0.584	0.8	1	26.037	3029.23	302.92	C
40.00-30.00			B	0.167	2.711	0.584	0.8	1	26.037			
			C	0.28	2.352	0.61	0.8	1	39.707			
T13	1488.29	2889.39	A	0.164	2.722	0.584	0.8	1	26.855	3021.90	302.19	C
30.00-20.00			B	0.164	2.722	0.584	0.8	1	26.855			
			C	0.271	2.376	0.607	0.8	1	40.470			
T14	1510.35	11529.71	A	0.144	2.795	0.581	0.8	1	44.259	3953.37	197.67	C
20.00-0.00			B	0.144	2.795	0.581	0.8	1	44.259			
			C	0.194	2.618	0.589	0.8	1	57.711			
Sum Weight:	19825.45	36965.49						OTM	4036757.0 2 lb-ft	48255.37		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	408.59	1321.07	A	0.211	2.559	0.593	0.85	1	19.904	2675.00	133.75	C
180.00-160.00			B	0.211	2.559	0.593	0.85	1	19.904			
			C	0.211	2.559	0.593	0.85	1	19.904			
T2	701.46	1376.56	A	0.177	2.676	0.586	0.85	1	22.262	3145.74	157.29	C
160.00-140.00			B	0.177	2.676	0.586	0.85	1	22.262			
			C	0.261	2.405	0.605	0.85	1	30.483			
T3	2427.32	2149.68	A	0.145	2.79	0.581	0.85	1	23.089	5765.20	288.26	C
140.00-120.00			B	0.145	2.79	0.581	0.85	1	23.089			
			C	0.368	2.13	0.639	0.85	1	51.998			
T4	976.46	759.32	A	0.158	2.743	0.583	0.85	1	9.602	2314.95	347.24	C
120.00-113.33			B	0.158	2.743	0.583	0.85	1	9.602			
			C	0.354	2.161	0.634	0.85	1	19.157			
T5	976.46	778.15	A	0.153	2.761	0.582	0.85	1	9.852	2299.67	344.95	C
113.33-106.67			B	0.153	2.761	0.582	0.85	1	9.852			
			C	0.339	2.198	0.628	0.85	1	19.318			
T6	979.10	984.02	A	0.162	2.726	0.583	0.85	1	11.093	2328.68	349.30	C
106.67-100.00			B	0.162	2.726	0.583	0.85	1	11.093			
			C	0.338	2.199	0.628	0.85	1	20.558			
T7	2947.00	3605.41	A	0.166	2.714	0.584	0.85	1	37.897	7000.90	350.04	C
100.00-80.00			B	0.166	2.714	0.584	0.85	1	37.897			
			C	0.324	2.235	0.623	0.85	1	66.058			
T8	1473.50	1776.81	A	0.141	2.805	0.58	0.85	1	18.074	3337.11	333.71	C
80.00-70.00			B	0.141	2.805	0.58	0.85	1	18.074			
			C	0.283	2.343	0.611	0.85	1	31.816			
T9	1473.50	2387.97	A	0.18	2.664	0.587	0.85	1	24.500	3439.86	343.99	C
70.00-60.00			B	0.18	2.664	0.587	0.85	1	24.500			
			C	0.313	2.261	0.62	0.85	1	38.506			
T10	1486.81	2034.39	A	0.14	2.807	0.58	0.85	1	20.329	3221.40	322.14	C
60.00-50.00			B	0.14	2.807	0.58	0.85	1	20.329			
			C	0.266	2.39	0.606	0.85	1	33.960			
T11	1488.29	2565.50	A	0.172	2.693	0.585	0.85	1	26.143	3244.47	324.45	C
50.00-40.00			B	0.172	2.693	0.585	0.85	1	26.143			
			C	0.291	2.32	0.613	0.85	1	39.984			
T12	1488.29	2807.51	A	0.167	2.711	0.584	0.85	1	27.607	3087.62	308.76	C
40.00-30.00			B	0.167	2.711	0.584	0.85	1	27.607			
			C	0.28	2.352	0.61	0.85	1	41.278			
T13	1488.29	2889.39	A	0.164	2.722	0.584	0.85	1	28.473	3081.68	308.17	C
30.00-20.00			B	0.164	2.722	0.584	0.85	1	28.473			
			C	0.271	2.376	0.607	0.85	1	42.089			
T14	1510.35	11529.71	A	0.144	2.795	0.581	0.85	1	45.818	4016.84	200.84	C
20.00-0.00			B	0.144	2.795	0.581	0.85	1	45.818			
			C	0.194	2.618	0.589	0.85	1	59.270			
Sum Weight:	19825.45	36965.49						OTM	4092167.0 1 lb-ft	48959.11		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	140.00	806.22	A	0.139	2.811	0.58	1	1	15.470	1231.95	61.60	C
180.00-160.00			B	0.139	2.811	0.58	1	1	15.470			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.139	2.811	0.58	1	1	15.470			
T2	263.20	890.14	A	0.127	2.859	0.578	1	1	19.905	1570.24	78.51	C
160.00-140.00			B	0.127	2.859	0.578	1	1	19.905			
			C	0.183	2.652	0.587	1	1	25.137			
T3	989.20	1635.64	A	0.106	2.94	0.576	1	1	21.032	3119.82	155.99	C
140.00-120.00			B	0.106	2.94	0.576	1	1	21.032			
			C	0.256	2.42	0.603	1	1	38.953			
T4	400.13	537.07	A	0.121	2.88	0.578	1	1	9.122	1269.86	190.48	C
120.00-113.33			B	0.121	2.88	0.578	1	1	9.122			
			C	0.253	2.429	0.603	1	1	15.088			
T5	400.13	547.78	A	0.117	2.895	0.577	1	1	9.353	1263.54	189.53	C
113.33-106.67			B	0.117	2.895	0.577	1	1	9.353			
			C	0.242	2.463	0.6	1	1	15.291			
T6	400.70	712.70	A	0.128	2.856	0.578	1	1	10.742	1290.53	193.58	C
106.67-100.00			B	0.128	2.856	0.578	1	1	10.742			
			C	0.245	2.452	0.601	1	1	16.689			
T7	1204.20	2695.98	A	0.132	2.837	0.579	1	1	37.265	3915.90	195.79	C
100.00-80.00			B	0.132	2.837	0.579	1	1	37.265			
			C	0.238	2.474	0.599	1	1	55.053			
T8	602.10	1378.16	A	0.116	2.902	0.577	1	1	18.138	1870.37	187.04	C
80.00-70.00			B	0.116	2.902	0.577	1	1	18.138			
			C	0.211	2.561	0.593	1	1	26.938			
T9	602.10	1780.07	A	0.148	2.779	0.581	1	1	24.676	1972.95	197.29	C
70.00-60.00			B	0.148	2.779	0.581	1	1	24.676			
			C	0.237	2.477	0.599	1	1	33.566			
T10	604.53	1561.19	A	0.117	2.899	0.577	1	1	20.598	1808.26	180.83	C
60.00-50.00			B	0.117	2.899	0.577	1	1	20.598			
			C	0.2	2.594	0.591	1	1	29.367			
T11	604.80	1906.12	A	0.141	2.806	0.58	1	1	26.298	1851.90	185.19	C
50.00-40.00			B	0.141	2.806	0.58	1	1	26.298			
			C	0.22	2.53	0.595	1	1	35.130			
T12	604.80	2159.10	A	0.142	2.802	0.58	1	1	27.937	1770.60	177.06	C
40.00-30.00			B	0.142	2.802	0.58	1	1	27.937			
			C	0.217	2.54	0.594	1	1	36.759			
T13	604.80	2216.27	A	0.139	2.812	0.58	1	1	28.798	1771.26	177.13	C
30.00-20.00			B	0.139	2.812	0.58	1	1	28.798			
			C	0.211	2.561	0.593	1	1	37.599			
T14	609.12	9793.68	A	0.119	2.888	0.577	1	1	43.960	2296.63	114.83	C
20.00-0.00			B	0.119	2.888	0.577	1	1	43.960			
			C	0.153	2.762	0.582	1	1	52.702			
Sum Weight:	8029.82	28620.10						OTM	2203997.02 lb-ft	27003.80		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	140.00	806.22	A	0.139	2.811	0.58	0.8	1	13.294	1131.02	56.55	C
180.00-160.00			B	0.139	2.811	0.58	0.8	1	13.294			
			C	0.139	2.811	0.58	0.8	1	13.294			
T2	263.20	890.14	A	0.127	2.859	0.578	0.8	1	15.924	1402.14	70.11	C
160.00-140.00			B	0.127	2.859	0.578	0.8	1	15.924			
			C	0.183	2.652	0.587	0.8	1	21.156			
T3	989.20	1635.64	A	0.106	2.94	0.576	0.8	1	16.826	2964.23	148.21	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
140.00-120.00			B	0.106	2.94	0.576	0.8	1	16.826			
			C	0.256	2.42	0.603	0.8	1	34.747			
T4	400.13	537.07	A	0.121	2.88	0.578	0.8	1	7.297	1204.20	180.63	C
120.00-113.33			B	0.121	2.88	0.578	0.8	1	7.297			
			C	0.253	2.429	0.603	0.8	1	13.263			
T5	400.13	547.78	A	0.117	2.895	0.577	0.8	1	7.483	1196.40	179.46	C
113.33-106.67			B	0.117	2.895	0.577	0.8	1	7.483			
			C	0.242	2.463	0.6	0.8	1	13.420			
T6	400.70	712.70	A	0.128	2.856	0.578	0.8	1	8.594	1215.13	182.27	C
106.67-100.00			B	0.128	2.856	0.578	0.8	1	8.594			
			C	0.245	2.452	0.601	0.8	1	14.540			
T7	1204.20	2695.98	A	0.132	2.837	0.579	0.8	1	29.812	3662.23	183.11	C
100.00-80.00			B	0.132	2.837	0.579	0.8	1	29.812			
			C	0.238	2.474	0.599	0.8	1	47.600			
T8	602.10	1378.16	A	0.116	2.902	0.577	0.8	1	14.510	1749.02	174.90	C
80.00-70.00			B	0.116	2.902	0.577	0.8	1	14.510			
			C	0.211	2.561	0.593	0.8	1	23.310			
T9	602.10	1780.07	A	0.148	2.779	0.581	0.8	1	19.741	1819.66	181.97	C
70.00-60.00			B	0.148	2.779	0.581	0.8	1	19.741			
			C	0.237	2.477	0.599	0.8	1	28.631			
T10	604.53	1561.19	A	0.117	2.899	0.577	0.8	1	16.478	1680.51	168.05	C
60.00-50.00			B	0.117	2.899	0.577	0.8	1	16.478			
			C	0.2	2.594	0.591	0.8	1	25.247			
T11	604.80	1906.12	A	0.141	2.806	0.58	0.8	1	21.039	1701.70	170.17	C
50.00-40.00			B	0.141	2.806	0.58	0.8	1	21.039			
			C	0.22	2.53	0.595	0.8	1	29.870			
T12	604.80	2159.10	A	0.142	2.802	0.58	0.8	1	22.350	1621.53	162.15	C
40.00-30.00			B	0.142	2.802	0.58	0.8	1	22.350			
			C	0.217	2.54	0.594	0.8	1	31.171			
T13	604.80	2216.27	A	0.139	2.812	0.58	0.8	1	23.038	1618.91	161.89	C
30.00-20.00			B	0.139	2.812	0.58	0.8	1	23.038			
			C	0.211	2.561	0.593	0.8	1	31.839			
T14	609.12	9793.68	A	0.119	2.888	0.577	0.8	1	37.722	2118.65	105.93	C
20.00-0.00			B	0.119	2.888	0.577	0.8	1	37.722			
			C	0.153	2.762	0.582	0.8	1	46.464			
Sum Weight:	8029.82	28620.10						OTM	2052073.7 0 lb-ft	25085.31		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	140.00	806.22	A	0.139	2.811	0.58	0.85	1	13.838	1156.25	57.81	C
180.00-160.00			B	0.139	2.811	0.58	0.85	1	13.838			
			C	0.139	2.811	0.58	0.85	1	13.838			
T2	263.20	890.14	A	0.127	2.859	0.578	0.85	1	16.919	1444.17	72.21	C
160.00-140.00			B	0.127	2.859	0.578	0.85	1	16.919			
			C	0.183	2.652	0.587	0.85	1	22.151			
T3	989.20	1635.64	A	0.106	2.94	0.576	0.85	1	17.878	3003.13	150.16	C
140.00-120.00			B	0.106	2.94	0.576	0.85	1	17.878			
			C	0.256	2.42	0.603	0.85	1	35.798			
T4	400.13	537.07	A	0.121	2.88	0.578	0.85	1	7.753	1220.62	183.09	C
120.00-113.33			B	0.121	2.88	0.578	0.85	1	7.753			
			C	0.253	2.429	0.603	0.85	1	13.719			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T5	400.13	547.78	A	0.117	2.895	0.577	0.85	1	7.950	1213.18	181.98	C
113.33-106.67			B	0.117	2.895	0.577	0.85	1	7.950			
			C	0.242	2.463	0.6	0.85	1	13.888			
T6	400.70	712.70	A	0.128	2.856	0.578	0.85	1	9.131	1233.98	185.10	C
106.67-100.00			B	0.128	2.856	0.578	0.85	1	9.131			
			C	0.245	2.452	0.601	0.85	1	15.077			
T7	1204.20	2695.98	A	0.132	2.837	0.579	0.85	1	31.675	3725.65	186.28	C
100.00-80.00			B	0.132	2.837	0.579	0.85	1	31.675			
			C	0.238	2.474	0.599	0.85	1	49.463			
T8	602.10	1378.16	A	0.116	2.902	0.577	0.85	1	15.417	1779.36	177.94	C
80.00-70.00			B	0.116	2.902	0.577	0.85	1	15.417			
			C	0.211	2.561	0.593	0.85	1	24.217			
T9	602.10	1780.07	A	0.148	2.779	0.581	0.85	1	20.975	1857.98	185.80	C
70.00-60.00			B	0.148	2.779	0.581	0.85	1	20.975			
			C	0.237	2.477	0.599	0.85	1	29.865			
T10	604.53	1561.19	A	0.117	2.899	0.577	0.85	1	17.508	1712.44	171.24	C
60.00-50.00			B	0.117	2.899	0.577	0.85	1	17.508			
			C	0.2	2.594	0.591	0.85	1	26.277			
T11	604.80	1906.12	A	0.141	2.806	0.58	0.85	1	22.353	1739.25	173.92	C
50.00-40.00			B	0.141	2.806	0.58	0.85	1	22.353			
			C	0.22	2.53	0.595	0.85	1	31.185			
T12	604.80	2159.10	A	0.142	2.802	0.58	0.85	1	23.747	1658.80	165.88	C
40.00-30.00			B	0.142	2.802	0.58	0.85	1	23.747			
			C	0.217	2.54	0.594	0.85	1	32.568			
T13	604.80	2216.27	A	0.139	2.812	0.58	0.85	1	24.478	1656.99	165.70	C
30.00-20.00			B	0.139	2.812	0.58	0.85	1	24.478			
			C	0.211	2.561	0.593	0.85	1	33.279			
T14	609.12	9793.68	A	0.119	2.888	0.577	0.85	1	39.281	2163.14	108.16	C
20.00-0.00			B	0.119	2.888	0.577	0.85	1	39.281			
			C	0.153	2.762	0.582	0.85	1	48.024			
Sum Weight:	8029.82	28620.10						OTM	2090054.53 lb-ft	25564.94		

Discrete Appurtenance Pressures - No Ice $G_H = 1.121$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Top Platform	0.0000	1200.00	0.00	0.00	180.00	1.624	30	20.00	20.00
10' Inverted Whip	60.0000	65.00	4.86	0.66	175.00	1.611	30	5.10	5.10
2' yagi	300.0000	25.00	-3.98	-2.30	102.00	1.380	26	1.50	1.50
GPS	120.0000	40.00	10.51	6.07	17.67	1.000	18	0.20	0.20
GPS	120.0000	40.00	10.49	6.06	18.00	1.000	18	0.20	0.20
GPS	0.0000	20.00	0.00	-9.71	59.00	1.181	22	0.10	0.10
GPS	0.0000	20.00	0.00	-9.69	59.50	1.183	22	0.10	0.10
Empty Mount	240.0000	150.00	-6.21	3.59	102.50	1.382	26	4.00	3.50
RFS Panel Antennas	0.0000	50.00	0.00	-5.91	124.00	1.460	27	3.25	1.75
RFS Panel Antennas	120.0000	50.00	5.12	2.96	124.00	1.460	27	3.25	1.75
RFS Panel Antennas	240.0000	50.00	-5.12	2.96	124.00	1.460	27	3.25	1.75
Stand-Off T-Frame	0.0000	150.00	0.00	-5.27	135.00	1.496	28	8.50	4.50
Stand-Off T-Frame	120.0000	150.00	4.57	2.64	135.00	1.496	28	8.50	4.50
Stand-Off T-Frame	240.0000	150.00	-4.57	2.64	135.00	1.496	28	8.50	4.50
Ericsson AIR21 Antenna	0.0000	375.00	0.00	-10.27	135.00	1.496	28	14.00	9.33
Ericsson AIR21 Antenna	120.0000	375.00	8.90	5.14	135.00	1.496	28	14.00	9.33
Ericsson AIR21 Antenna	240.0000	375.00	-8.90	5.14	135.00	1.496	28	14.00	9.33
BXA-171063-8BF	0.0000	55.00	0.00	-9.13	146.00	1.529	28	2.02	2.02

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
BXA-171063-8BF	120.0000	55.00	7.91	4.56	146.00	1.529	28	2.02	2.02
BXA-171063-12BF	240.0000	55.00	-7.91	4.56	146.00	1.529	28	2.02	2.02
BXA-80063-6BF	0.0000	75.00	0.00	-9.13	146.00	1.529	28	5.53	2.47
BXA-80063-6BF	120.0000	75.00	7.91	4.56	146.00	1.529	28	5.53	2.47
BXA-80063-6BF	240.0000	75.00	-7.91	4.56	146.00	1.529	28	5.53	2.47
BXA-70063-6CF	0.0000	75.00	0.00	-9.13	146.00	1.529	28	5.54	3.00
BXA-70040-6CF	120.0000	75.00	7.91	4.56	146.00	1.529	28	5.54	3.00
BXA-70040-6CF	240.0000	75.00	-7.91	4.56	146.00	1.529	28	5.54	3.00
Stand-Off T-Frame	0.0000	150.00	0.00	-4.63	146.00	1.529	28	8.50	4.50
Stand-Off T-Frame	120.0000	150.00	4.01	2.31	146.00	1.529	28	8.50	4.50
Stand-Off T-Frame	240.0000	150.00	-4.01	2.31	146.00	1.529	28	8.50	4.50
Scala Panels	120.0000	130.00	7.16	4.13	175.60	1.612	30	16.42	10.50
Stand Off Mount	120.0000	105.00	3.26	1.88	175.60	1.612	30	4.50	6.50
14' Inverted Whip	180.0000	65.00	0.00	5.89	173.00	1.605	30	5.20	5.20
21' Whip	0.0000	50.00	0.00	-5.72	191.50	1.653	31	4.38	4.38
20' Dipole	120.0000	65.00	4.95	2.86	191.00	1.651	31	6.00	6.15
6' Yagi	60.0000	22.00	5.08	-2.94	184.00	1.634	30	1.10	0.60
PG1*0F-0090-310	120.0000	33.00	4.96	2.87	187.00	1.641	30	3.00	3.00
21' Whip	0.0000	40.00	0.00	-5.72	192.50	1.655	31	4.38	4.38
16' Whip	180.0000	30.00	0.00	5.86	190.00	1.649	30	3.50	3.50
6' Yagi	180.0000	22.00	0.00	5.87	185.00	1.636	30	1.10	0.60
10' Whip	60.0000	30.00	5.08	-2.93	187.00	1.641	30	3.10	3.10
20' Dipole	300.0000	25.00	-5.08	-2.93	188.00	1.644	30	3.00	2.19
10' Whip	240.0000	30.00	-4.96	2.86	188.50	1.645	30	3.10	3.10
BXA-171063-8BF	0.0000	50.00	0.00	-9.13	146.00	1.529	28	2.02	2.02
BXA-171063-8BF	120.0000	50.00	7.91	4.56	146.00	1.529	28	2.02	2.02
BXA-171063-8BF	240.0000	50.00	-7.91	4.56	146.00	1.529	28	2.02	2.02
ALU RH_2X40-AWS RRH	0.0000	60.00	0.00	-9.13	146.00	1.529	28	1.25	0.75
ALU RH_2X40-AWS RRH	120.0000	60.00	7.91	4.56	146.00	1.529	28	1.25	0.75
ALU RH_2X40-AWS RRH	240.0000	60.00	-7.91	4.56	146.00	1.529	28	1.25	0.75
	Sum Weight:	5327.00							

Discrete Appurtenance Pressures - With Ice $G_H = 1.121$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Top Platform	0.0000	1600.00	0.00	0.00	180.00	1.624	23	26.50	26.50	0.5000
10' Inverted Whip	60.0000	90.00	4.86	0.66	175.00	1.611	22	7.20	7.20	0.5000
2' yagi	300.0000	40.00	-3.98	-2.30	102.00	1.380	19	3.00	3.00	0.5000
GPS	120.0000	70.00	10.51	6.07	17.67	1.000	14	0.34	0.34	0.5000
GPS	120.0000	70.00	10.49	6.06	18.00	1.000	14	0.34	0.34	0.5000
GPS	0.0000	35.00	0.00	-9.71	59.00	1.181	16	0.17	0.17	0.5000
GPS	0.0000	35.00	0.00	-9.69	59.50	1.183	16	0.17	0.17	0.5000
Empty Mount	240.0000	250.00	-6.21	3.59	102.50	1.382	19	6.20	5.50	0.5000
RFS Panel Antennas	0.0000	75.00	0.00	-5.91	124.00	1.460	20	3.80	2.28	0.5000
RFS Panel Antennas	120.0000	75.00	5.12	2.96	124.00	1.460	20	3.80	2.28	0.5000
RFS Panel Antennas	240.0000	75.00	-5.12	2.96	124.00	1.460	20	3.80	2.28	0.5000
Stand-Off T-Frame	0.0000	250.00	0.00	-5.27	135.00	1.496	21	11.50	6.25	0.5000
Stand-Off T-Frame	120.0000	250.00	4.57	2.64	135.00	1.496	21	11.50	6.25	0.5000
Stand-Off T-Frame	240.0000	250.00	-4.57	2.64	135.00	1.496	21	11.50	6.25	0.5000
Ericsson AIR21 Antenna	0.0000	615.00	0.00	-10.27	135.00	1.496	21	15.44	12.06	0.5000
Ericsson AIR21 Antenna	120.0000	615.00	8.90	5.14	135.00	1.496	21	15.44	12.06	0.5000
Ericsson AIR21 Antenna	240.0000	615.00	-8.90	5.14	135.00	1.496	21	15.44	12.06	0.5000

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
BXA-171063-8BF	0.0000	85.00	0.00	-9.13	146.00	1.529	21	2.41	2.41	0.5000
BXA-171063-8BF	120.0000	85.00	7.91	4.56	146.00	1.529	21	2.41	2.41	0.5000
BXA-171063-12BF	240.0000	85.00	-7.91	4.56	146.00	1.529	21	2.41	2.41	0.5000
BXA-80063-6BF	0.0000	105.00	0.00	-9.13	146.00	1.529	21	6.10	3.00	0.5000
BXA-80063-6BF	120.0000	105.00	7.91	4.56	146.00	1.529	21	6.10	3.00	0.5000
BXA-80063-6BF	240.0000	105.00	-7.91	4.56	146.00	1.529	21	6.10	3.00	0.5000
BXA-70063-6CF	0.0000	105.00	0.00	-9.13	146.00	1.529	21	6.13	3.55	0.5000
BXA-70040-6CF	120.0000	105.00	7.91	4.56	146.00	1.529	21	6.13	3.55	0.5000
BXA-70040-6CF	240.0000	105.00	-7.91	4.56	146.00	1.529	21	6.13	3.55	0.5000
Stand-Off T-Frame	0.0000	250.00	0.00	-4.63	146.00	1.529	21	11.50	6.25	0.5000
Stand-Off T-Frame	120.0000	250.00	4.01	2.31	146.00	1.529	21	11.50	6.25	0.5000
Stand-Off T-Frame	240.0000	250.00	-4.01	2.31	146.00	1.529	21	11.50	6.25	0.5000
Scala Panels	120.0000	190.00	7.16	4.13	175.60	1.612	22	20.20	13.74	0.5000
Stand Off Mount	120.0000	145.00	3.26	1.88	175.60	1.612	22	8.50	9.21	0.5000
14' Inverted Whip	180.0000	94.00	0.00	5.89	173.00	1.605	22	7.10	7.10	0.5000
21' Whip	0.0000	85.00	0.00	-5.72	191.50	1.653	23	6.15	6.15	0.5000
20' Dipole	120.0000	105.00	4.95	2.86	191.00	1.651	23	8.50	6.75	0.5000
6' Yagi	60.0000	28.00	5.08	-2.94	184.00	1.634	23	1.60	0.80	0.5000
PG1*0F-0090-310	120.0000	44.00	4.96	2.87	187.00	1.641	23	4.00	4.00	0.5000
21' Whip	0.0000	70.00	0.00	-5.72	192.50	1.655	23	6.15	6.15	0.5000
16' Whip	180.0000	45.00	0.00	5.86	190.00	1.649	23	5.25	5.25	0.5000
6' Yagi	180.0000	28.00	0.00	5.87	185.00	1.636	23	1.60	0.80	0.5000
10' Whip	60.0000	37.00	5.08	-2.93	187.00	1.641	23	3.90	3.90	0.5000
20' Dipole	300.0000	42.00	-5.08	-2.93	188.00	1.644	23	4.25	3.08	0.5000
10' Whip	240.0000	37.00	-4.96	2.86	188.50	1.645	23	3.90	3.90	0.5000
BXA-171063-8BF	0.0000	75.00	0.00	-9.13	146.00	1.529	21	2.41	2.41	0.5000
BXA-171063-8BF	120.0000	75.00	7.91	4.56	146.00	1.529	21	2.41	2.41	0.5000
BXA-171063-8BF	240.0000	75.00	-7.91	4.56	146.00	1.529	21	2.41	2.41	0.5000
ALU RH_2X40-AWS RRH	0.0000	85.00	0.00	-9.13	146.00	1.529	21	1.64	1.20	0.5000
ALU RH_2X40-AWS RRH	120.0000	85.00	7.91	4.56	146.00	1.529	21	1.64	1.20	0.5000
ALU RH_2X40-AWS RRH	240.0000	85.00	-7.91	4.56	146.00	1.529	21	1.64	1.20	0.5000
	Sum Weight:	8075.00								

Discrete Appurtenance Pressures - Service $G_H = 1.121$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Top Platform	0.0000	1200.00	0.00	0.00	180.00	1.624	15	20.00	20.00
10' Inverted Whip	60.0000	65.00	4.86	0.66	175.00	1.611	15	5.10	5.10
2' yagi	300.0000	25.00	-3.98	-2.30	102.00	1.380	13	1.50	1.50
GPS	120.0000	40.00	10.51	6.07	17.67	1.000	9	0.20	0.20
GPS	120.0000	40.00	10.49	6.06	18.00	1.000	9	0.20	0.20
GPS	0.0000	20.00	0.00	-9.71	59.00	1.181	11	0.10	0.10
GPS	0.0000	20.00	0.00	-9.69	59.50	1.183	11	0.10	0.10
Empty Mount	240.0000	150.00	-6.21	3.59	102.50	1.382	13	4.00	3.50
RFS Panel Antennas	0.0000	50.00	0.00	-5.91	124.00	1.460	13	3.25	1.75
RFS Panel Antennas	120.0000	50.00	5.12	2.96	124.00	1.460	13	3.25	1.75
RFS Panel Antennas	240.0000	50.00	-5.12	2.96	124.00	1.460	13	3.25	1.75
Stand-Off T-Frame	0.0000	150.00	0.00	-5.27	135.00	1.496	14	8.50	4.50
Stand-Off T-Frame	120.0000	150.00	4.57	2.64	135.00	1.496	14	8.50	4.50
Stand-Off T-Frame	240.0000	150.00	-4.57	2.64	135.00	1.496	14	8.50	4.50
Ericsson AIR21 Antenna	0.0000	375.00	0.00	-10.27	135.00	1.496	14	14.00	9.33
Ericsson AIR21 Antenna	120.0000	375.00	8.90	5.14	135.00	1.496	14	14.00	9.33

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Ericsson AIR21 Antenna	240.0000	375.00	-8.90	5.14	135.00	1.496	14	14.00	9.33
BXA-171063-8BF	0.0000	55.00	0.00	-9.13	146.00	1.529	14	2.02	2.02
BXA-171063-8BF	120.0000	55.00	7.91	4.56	146.00	1.529	14	2.02	2.02
BXA-171063-12BF	240.0000	55.00	-7.91	4.56	146.00	1.529	14	2.02	2.02
BXA-80063-6BF	0.0000	75.00	0.00	-9.13	146.00	1.529	14	5.53	2.47
BXA-80063-6BF	120.0000	75.00	7.91	4.56	146.00	1.529	14	5.53	2.47
BXA-80063-6BF	240.0000	75.00	-7.91	4.56	146.00	1.529	14	5.53	2.47
BXA-70063-6CF	0.0000	75.00	0.00	-9.13	146.00	1.529	14	5.54	3.00
BXA-70040-6CF	120.0000	75.00	7.91	4.56	146.00	1.529	14	5.54	3.00
BXA-70040-6CF	240.0000	75.00	-7.91	4.56	146.00	1.529	14	5.54	3.00
Stand-Off T-Frame	0.0000	150.00	0.00	-4.63	146.00	1.529	14	8.50	4.50
Stand-Off T-Frame	120.0000	150.00	4.01	2.31	146.00	1.529	14	8.50	4.50
Stand-Off T-Frame	240.0000	150.00	-4.01	2.31	146.00	1.529	14	8.50	4.50
Scala Panels	120.0000	130.00	7.16	4.13	175.60	1.612	15	16.42	10.50
Stand Off Mount	120.0000	105.00	3.26	1.88	175.60	1.612	15	4.50	6.50
14' Inverted Whip	180.0000	65.00	0.00	5.89	173.00	1.605	15	5.20	5.20
21' Whip	0.0000	50.00	0.00	-5.72	191.50	1.653	15	4.38	4.38
20' Dipole	120.0000	65.00	4.95	2.86	191.00	1.651	15	6.00	6.15
6' Yagi	60.0000	22.00	5.08	-2.94	184.00	1.634	15	1.10	0.60
PG1*0F-0090-310	120.0000	33.00	4.96	2.87	187.00	1.641	15	3.00	3.00
21' Whip	0.0000	40.00	0.00	-5.72	192.50	1.655	15	4.38	4.38
16' Whip	180.0000	30.00	0.00	5.86	190.00	1.649	15	3.50	3.50
6' Yagi	180.0000	22.00	0.00	5.87	185.00	1.636	15	1.10	0.60
10' Whip	60.0000	30.00	5.08	-2.93	187.00	1.641	15	3.10	3.10
20' Dipole	300.0000	25.00	-5.08	-2.93	188.00	1.644	15	3.00	2.19
10' Whip	240.0000	30.00	-4.96	2.86	188.50	1.645	15	3.10	3.10
BXA-171063-8BF	0.0000	50.00	0.00	-9.13	146.00	1.529	14	2.02	2.02
BXA-171063-8BF	120.0000	50.00	7.91	4.56	146.00	1.529	14	2.02	2.02
BXA-171063-8BF	240.0000	50.00	-7.91	4.56	146.00	1.529	14	2.02	2.02
ALU RH_2X40-AWS RRH	0.0000	60.00	0.00	-9.13	146.00	1.529	14	1.25	0.75
ALU RH_2X40-AWS RRH	120.0000	60.00	7.91	4.56	146.00	1.529	14	1.25	0.75
ALU RH_2X40-AWS RRH	240.0000	60.00	-7.91	4.56	146.00	1.529	14	1.25	0.75
	Sum Weight:	5327.00							

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	12520.68					
Bracing Weight	16099.43					
Total Member Self-Weight	28620.10			22333.33	-34238.02	
Total Weight	41976.92			22333.33	-34238.02	
Wind 0 deg - No Ice		-52.96	-60859.34	-5440054.50	-24431.22	41495.11
Wind 30 deg - No Ice		28977.67	-50178.41	-4505290.46	-2648986.33	48281.10
Wind 60 deg - No Ice		49410.15	-28458.66	-2547916.82	-4506908.59	43308.49
Wind 90 deg - No Ice		58047.08	52.96	32140.13	-5280720.50	27985.91
Wind 120 deg - No Ice		52797.57	30475.54	2762020.18	-4780767.97	4710.53
Wind 150 deg - No Ice		29069.41	50231.38	4559763.91	-2665972.20	-20295.19
Wind 180 deg - No Ice		52.96	57009.05	5179819.49	-44044.82	-38958.35
Wind 210 deg - No Ice		-28977.67	50178.41	4549957.11	2580510.28	-48281.10
Wind 240 deg - No Ice		-52744.61	30383.80	2745034.30	4702485.13	-46205.65
Wind 270 deg - No Ice		-58047.08	-52.96	12526.53	5212244.46	-27985.91

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 300 deg - No Ice		-49463.11	-28550.39	-2564902.69	4448239.34	-4350.15
Wind 330 deg - No Ice		-29069.41	-50231.38	-4515097.25	2597496.16	20295.19
Member Ice	8345.38					
Total Weight Ice	64865.94			54173.14	-76167.44	
Wind 0 deg - Ice		-79.56	-57534.05	-5214289.18	-61332.83	26984.20
Wind 30 deg - Ice		27695.96	-47957.80	-4357072.40	-2623759.27	35865.51
Wind 60 deg - Ice		47440.92	-27290.65	-2456390.90	-4455574.08	35608.88
Wind 90 deg - Ice		55529.72	79.56	69007.75	-5197045.40	26596.89
Wind 120 deg - Ice		49958.30	28835.93	2701251.45	-4662354.51	10439.90
Wind 150 deg - Ice		27833.77	48037.37	4480253.28	-2649453.56	-9268.61
Wind 180 deg - Ice		79.56	54719.10	5100995.51	-91002.04	-25749.53
Wind 210 deg - Ice		-27695.96	47957.80	4465418.68	2471424.40	-35865.51
Wind 240 deg - Ice		-49878.73	28698.12	2675557.16	4495185.04	-37424.10
Wind 270 deg - Ice		-55529.72	-79.56	39338.54	5044710.52	-26596.89
Wind 300 deg - Ice		-47520.48	-27428.45	-2482085.19	4318073.81	-9859.35
Wind 330 deg - Ice		-27833.77	-48037.37	-4371907.00	2497118.69	9268.61
Total Weight	41976.92			22333.33	-34238.02	
Wind 0 deg - Service		-26.39	-30324.38	-2720076.22	3012.65	20675.77
Wind 30 deg - Service		14438.70	-25002.39	-2254311.43	-1304724.15	24057.02
Wind 60 deg - Service		24619.59	-14180.09	-1279011.07	-2230470.88	21579.32
Wind 90 deg - Service		28923.11	26.39	6553.63	-2616038.07	13944.54
Wind 120 deg - Service		26307.44	15185.04	1366770.68	-2366926.77	2347.12
Wind 150 deg - Service		14484.41	25028.78	2262532.26	-1313187.70	-10112.48
Wind 180 deg - Service		26.39	28405.89	2571487.29	-6760.22	-19411.77
Wind 210 deg - Service		-14438.70	25002.39	2257645.83	1300976.58	-24057.02
Wind 240 deg - Service		-26281.05	15139.34	1358307.13	2358292.77	-23022.88
Wind 270 deg - Service		-28923.11	-26.39	-3219.23	2612290.50	-13944.54
Wind 300 deg - Service		-24645.98	-14225.80	-1287474.62	2231609.75	-2167.55
Wind 330 deg - Service		-14484.41	-25028.78	-2259197.87	1309440.13	10112.48

Load Combinations

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

Comb. No.	Description
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	180 - 160	Leg	Max Tension	21	12231.31	-23.60	-4.19
			Max. Compression	19	-15807.65	86.49	-11.39
			Max. Mx	19	-5624.85	88.01	-12.41
			Max. My	16	-1042.48	0.24	-117.10
			Max. Vy	25	-629.77	0.00	0.00
			Max. Vx	9	712.06	0.00	0.00
		Diagonal	Max Tension	24	2331.01	0.00	0.00
			Max. Compression	23	-2391.34	0.00	0.00
			Max. Mx	20	659.54	8.47	0.91
			Max. My	9	1247.21	4.13	1.98
			Max. Vy	20	-6.76	8.47	0.91
			Max. Vx	22	-0.52	0.00	0.00
		Top Girt	Max Tension	10	230.32	0.00	0.00
			Max. Compression	8	-222.34	0.00	0.00
			Max. Mx	14	3.72	-40.22	0.00
			Max. My	14	3.20	0.00	0.06
			Max. Vy	14	24.75	0.00	0.00
			Max. Vx	14	-0.04	0.00	0.00
T2	160 - 140	Leg	Max Tension	21	26576.80	-222.74	-11.78
			Max. Compression	19	-33725.21	184.84	-19.56
			Max. Mx	12	21208.24	342.08	7.62
			Max. My	3	-1487.60	-3.67	400.97
			Max. Vy	4	576.79	-228.24	4.55
			Max. Vx	7	539.59	-9.16	-140.54
		Diagonal	Max Tension	24	3217.61	0.00	0.00
			Max. Compression	24	-3246.06	0.00	0.00
			Max. Mx	20	1400.56	12.83	0.70
			Max. My	23	-3059.53	4.32	3.18
			Max. Vy	20	9.40	12.83	0.70
			Max. Vx	17	0.95	0.00	0.00
T3	140 - 120	Leg	Max Tension	21	47774.38	-185.09	27.23
			Max. Compression	19	-61009.60	130.21	-9.92
			Max. Mx	12	30476.07	453.30	7.66
			Max. My	3	-2940.72	-23.39	479.32
			Max. Vy	12	547.21	-431.50	7.66
			Max. Vx	9	-539.13	-23.40	374.41
		Diagonal	Max Tension	24	5426.58	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	24	-5391.88	0.00	0.00
			Max. Mx	19	4038.96	46.37	-5.44
			Max. My	18	-4932.22	8.18	-7.76
			Max. Vy	19	-23.58	46.37	-5.44
			Max. Vx	18	1.89	0.00	0.00
T4	120 - 113.333	Leg	Max Tension	21	56532.76	-74.94	32.99
			Max. Compression	19	-71261.79	142.36	-0.85
			Max. Mx	25	55271.70	-201.52	10.71
			Max. My	9	-3999.06	-10.55	184.17
			Max. Vy	12	-99.15	-194.62	5.32
			Max. Vx	9	132.53	-10.55	184.17
		Diagonal	Max Tension	11	5902.55	0.00	0.00
			Max. Compression	24	-5960.71	0.00	0.00
			Max. Mx	19	4237.25	40.62	-3.94
			Max. My	23	-5681.65	11.24	6.11
			Max. Vy	21	21.29	39.86	4.48
			Max. Vx	23	-1.47	0.00	0.00
T5	113.333 - 106.667	Leg	Max Tension	21	65775.62	-244.46	22.27
			Max. Compression	19	-82374.79	135.95	-22.44
			Max. Mx	25	63705.25	-261.14	23.41
			Max. My	9	-4662.72	-10.28	295.87
			Max. Vy	25	103.86	-261.14	23.41
			Max. Vx	9	-147.33	-10.28	295.87
		Diagonal	Max Tension	11	6418.32	0.00	0.00
			Max. Compression	11	-6440.67	0.00	0.00
			Max. Mx	21	4566.75	40.22	4.36
			Max. My	23	-5842.86	16.33	6.88
			Max. Vy	21	22.00	40.22	4.36
			Max. Vx	23	-1.57	0.00	0.00
T6	106.667 - 100	Leg	Max Tension	8	75339.71	-210.91	39.35
			Max. Compression	19	-93425.30	268.97	-33.33
			Max. Mx	15	-88901.94	279.16	11.76
			Max. My	9	-4844.77	-10.28	295.87
			Max. Vy	15	-125.85	279.16	11.76
			Max. Vx	9	148.52	-10.28	295.87
		Diagonal	Max Tension	11	7006.91	0.00	0.00
			Max. Compression	24	-7065.24	0.00	0.00
			Max. Mx	19	5033.45	88.01	-7.67
			Max. My	23	4504.91	66.86	9.88
			Max. Vy	19	-35.74	88.01	-7.67
			Max. Vx	23	-2.21	0.00	0.00
T7	100 - 80	Leg	Max Tension	8	107288.26	-202.10	32.06
			Max. Compression	19	-130280.48	135.08	-9.87
			Max. Mx	25	102082.69	-699.86	11.74
			Max. My	9	-6696.25	-1.30	403.21
			Max. Vy	25	196.12	-699.86	11.74
			Max. Vx	9	-168.83	-1.30	403.21
		Diagonal	Max Tension	24	8615.02	0.00	0.00
			Max. Compression	11	-8590.74	0.00	0.00
			Max. Mx	19	5780.81	84.13	-7.72
			Max. My	23	-7521.03	15.96	12.14
			Max. Vy	21	37.19	81.93	8.63
			Max. Vx	23	-2.43	0.00	0.00
T8	80 - 70	Leg	Max Tension	8	120975.48	-438.75	64.38
			Max. Compression	19	-145344.20	482.48	-16.06
			Max. Mx	25	115845.55	-699.86	11.74
			Max. My	9	-7456.33	-67.57	1102.65
			Max. Vy	25	-221.59	-699.86	11.74
			Max. Vx	3	302.93	-67.44	-1101.65
		Diagonal	Max Tension	11	10048.57	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	24	-10128.94	0.00	0.00
			Max. Mx	21	6897.63	105.25	9.95
			Max. My	23	-9625.93	47.48	14.45
			Max. Vy	21	41.09	105.25	9.95
			Max. Vx	23	-2.62	0.00	0.00
T9	70 - 60	Leg	Max Tension	8	138030.33	-351.78	108.17
			Max. Compression	19	-165382.75	-306.00	-13.03
			Max. Mx	19	-164942.50	1054.57	5.60
			Max. My	9	-7718.72	-67.57	1102.65
			Max. Vy	19	311.99	1054.57	5.60
			Max. Vx	9	419.34	-67.57	1102.65
		Diagonal	Max Tension	11	10744.21	0.00	0.00
			Max. Compression	11	-10859.39	0.00	0.00
			Max. Mx	19	8225.77	116.64	-14.25
			Max. My	23	7535.14	95.17	17.58
			Max. Vy	21	48.47	112.64	-9.40
			Max. Vx	23	-3.10	0.00	0.00
		Secondary Horizontal	Max Tension	19	2926.80	0.00	0.00
			Max. Compression	19	-2868.49	0.00	0.00
			Max. Mx	14	321.08	-290.46	0.00
			Max. My	14	321.08	0.00	8.49
			Max. Vy	14	71.71	0.00	0.00
			Max. Vx	14	2.10	0.00	0.00
T10	60 - 50	Leg	Max Tension	8	155386.31	-382.69	82.15
			Max. Compression	19	-184310.06	726.96	-14.37
			Max. Mx	25	147373.63	-1011.52	14.84
			Max. My	9	-9239.38	-85.67	1056.42
			Max. Vy	25	-284.05	-1011.52	14.84
			Max. Vx	3	258.31	-85.65	-1055.78
		Diagonal	Max Tension	11	11413.31	0.00	0.00
			Max. Compression	24	-11529.60	0.00	0.00
			Max. Mx	21	7441.83	168.24	13.01
			Max. My	23	-10656.63	92.17	20.72
			Max. Vy	21	55.65	168.24	13.01
			Max. Vx	23	-3.39	0.00	0.00
T11	50 - 40	Leg	Max Tension	8	172681.32	-275.92	79.65
			Max. Compression	19	-204991.15	-1321.47	-20.30
			Max. Mx	19	-204991.15	-1321.47	-20.30
			Max. My	9	-10111.90	-45.72	1214.85
			Max. Vy	19	553.61	1308.08	7.52
			Max. Vx	9	-436.88	-45.72	1214.85
		Diagonal	Max Tension	24	12109.71	0.00	0.00
			Max. Compression	11	-12090.81	0.00	0.00
			Max. Mx	19	9345.05	124.00	-18.24
			Max. My	22	10299.46	109.93	21.56
			Max. Vy	21	52.40	116.61	-13.60
			Max. Vx	22	-3.44	0.00	0.00
		Secondary Horizontal	Max Tension	19	3628.95	0.00	0.00
			Max. Compression	19	-3555.62	0.00	0.00
			Max. Mx	14	394.54	-367.67	0.00
			Max. My	14	394.54	0.00	10.75
			Max. Vy	14	-80.68	0.00	0.00
			Max. Vx	14	-2.36	0.00	0.00
T12	40 - 30	Leg	Max Tension	8	190200.94	85.74	99.55
			Max. Compression	19	-223737.48	279.74	-7.70
			Max. Mx	21	183828.59	1750.48	61.55
			Max. My	9	-11179.75	-190.98	1868.73
			Max. Vy	21	-624.82	-1208.57	-32.01
			Max. Vx	9	-604.46	-190.98	1868.73

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Diagonal	Max Tension	11	12575.35	0.00	0.00
			Max. Compression	24	-13037.17	0.00	0.00
			Max. Mx	21	7977.05	-242.94	-14.52
			Max. My	23	-12478.41	-120.24	-27.49
			Max. Vy	21	-71.91	-242.94	-14.52
			Max. Vx	23	4.17	0.00	0.00
		Secondary Horizontal	Max Tension	6	3835.69	0.00	0.00
			Max. Compression	19	-3960.41	0.00	0.00
			Max. Mx	14	275.93	-409.68	0.00
			Max. My	14	275.93	0.00	11.97
			Max. Vy	14	-85.16	0.00	0.00
			Max. Vx	14	-2.49	0.00	0.00
T13	30 - 20	Leg	Max Tension	8	207518.97	502.96	67.81
			Max. Compression	19	-245435.24	-1816.21	-30.98
			Max. Mx	25	191940.54	-3366.61	28.60
			Max. My	9	-11547.31	-190.98	1868.73
			Max. Vy	19	733.77	1752.29	4.17
			Max. Vx	9	556.85	-190.98	1868.73
		Diagonal	Max Tension	24	13574.29	0.00	0.00
			Max. Compression	10	-13218.08	0.00	0.00
			Max. Mx	6	10275.32	-172.33	19.25
			Max. My	22	11440.75	-136.46	-28.17
			Max. Vy	20	-64.48	-136.99	23.48
			Max. Vx	22	4.19	0.00	0.00
		Secondary Horizontal	Max Tension	19	4496.04	0.00	0.00
			Max. Compression	19	-4257.39	0.00	0.00
			Max. Mx	14	626.30	-453.95	0.00
			Max. My	14	626.30	0.00	13.27
			Max. Vy	14	89.64	0.00	0.00
			Max. Vx	14	-2.62	0.00	0.00
T14	20 - 0	Leg	Max Tension	8	240426.82	-899.56	43.57
			Max. Compression	19	-286894.98	0.00	0.04
			Max. Mx	23	-278273.12	3474.80	-6.32
			Max. My	9	-13570.86	-134.14	1957.04
			Max. Vy	25	-664.80	-3366.61	28.60
			Max. Vx	9	341.50	-134.14	1957.04
		Diagonal	Max Tension	24	15869.81	0.00	0.00
			Max. Compression	24	-15289.41	0.00	0.00
			Max. Mx	20	2597.71	-747.67	-40.40
			Max. My	22	13110.21	-378.88	-93.57
			Max. Vy	20	-211.55	-747.67	-40.40
			Max. Vx	18	-12.64	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	10	289752.46	32392.07	-17310.61
	Max. H_x	10	289752.46	32392.07	-17310.61
	Max. H_z	17	-235999.59	-29981.13	16361.14
	Min. Vert	4	-248198.43	-28172.31	15038.42
	Min. H_x	17	-235999.59	-29981.13	16361.14
	Min. H_z	10	289752.46	32392.07	-17310.61
Leg B	Max. Vert	19	294513.31	-27513.57	-15569.52

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Max. H_x	25	-230619.53	29663.50	16847.15
	Max. H_z	26	-198607.87	24854.59	17278.77
	Min. Vert	12	-246055.35	27700.16	15867.47
	Min. H_x	6	293616.03	-31952.29	-18307.00
	Min. H_z	6	293616.03	-31952.29	-18307.00
Leg A	Max. Vert	2	289502.56	1082.79	36697.61
	Max. H_x	11	13357.91	4216.50	1326.40
	Max. H_z	2	289502.56	1082.79	36697.61
	Min. Vert	8	-248338.40	-954.06	-31914.46
	Min. H_x	6	-125889.54	-4323.18	-16443.19
	Min. H_z	21	-236716.71	-579.71	-34152.85

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	41976.92	-0.00	-0.00	22333.28	-34237.93	0.00
Dead+Wind 0 deg - No Ice	41976.92	-52.96	-60859.34	-5440054.49	-24431.14	41495.13
Dead+Wind 30 deg - No Ice	41976.92	28977.67	-50178.41	-4505290.46	-2648986.20	48281.11
Dead+Wind 60 deg - No Ice	41976.92	49410.15	-28458.66	-2547916.84	-4506908.43	43308.49
Dead+Wind 90 deg - No Ice	41976.92	58047.08	52.96	32140.08	-5280720.34	27985.90
Dead+Wind 120 deg - No Ice	41976.92	52797.57	30475.54	2762020.10	-4780767.81	4710.52
Dead+Wind 150 deg - No Ice	41976.92	29069.41	50231.38	4559763.82	-2665972.07	-20295.20
Dead+Wind 180 deg - No Ice	41976.92	52.96	57009.05	5179819.39	-44044.73	-38958.36
Dead+Wind 210 deg - No Ice	41976.92	-28977.67	50178.41	4549957.02	2580510.34	-48281.11
Dead+Wind 240 deg - No Ice	41976.92	-52744.61	30383.80	2745034.23	4702485.15	-46205.64
Dead+Wind 270 deg - No Ice	41976.92	-58047.08	-52.96	12526.48	5212244.47	-27985.90
Dead+Wind 300 deg - No Ice	41976.92	-49463.11	-28550.39	-2564902.71	4448239.36	-4350.13
Dead+Wind 330 deg - No Ice	41976.92	-29069.41	-50231.38	-4515097.26	2597496.21	20295.20
Dead+Ice+Temp	64865.94	-0.00	-0.00	54173.05	-76167.28	0.00
Dead+Wind 0 deg+Ice+Temp	64865.94	-79.56	-57534.05	-5214289.22	-61332.67	26984.21
Dead+Wind 30 deg+Ice+Temp	64865.94	27695.96	-47957.80	-4357072.44	-2623759.07	35865.52
Dead+Wind 60 deg+Ice+Temp	64865.94	47440.92	-27290.65	-2456390.97	-4455573.85	35608.88
Dead+Wind 90 deg+Ice+Temp	64865.94	55529.72	79.56	69007.66	-5197045.16	26596.88
Dead+Wind 120 deg+Ice+Temp	64865.94	49958.30	28835.93	2701251.33	-4662354.29	10439.88
Dead+Wind 150 deg+Ice+Temp	64865.94	27833.77	48037.37	4480253.15	-2649453.36	-9268.63
Dead+Wind 180 deg+Ice+Temp	64865.94	79.56	54719.10	5100995.38	-91001.88	-25749.55
Dead+Wind 210 deg+Ice+Temp	64865.94	-27695.96	47957.80	4465418.55	2471424.52	-35865.52
Dead+Wind 240 deg+Ice+Temp	64865.94	-49878.73	28698.12	2675557.05	4495185.13	-37424.10
Dead+Wind 270 deg+Ice+Temp	64865.94	-55529.72	-79.56	39338.45	5044710.61	-26596.88
Dead+Wind 300 deg+Ice+Temp	64865.94	-47520.48	-27428.45	-2482085.25	4318073.90	-9859.33
Dead+Wind 330 deg+Ice+Temp	64865.94	-27833.77	-48037.37	-4371907.05	2497118.81	9268.63
Dead+Wind 0 deg - Service	41976.92	-26.39	-30324.38	-2699410.11	-29351.50	20675.77
Dead+Wind 30 deg - Service	41976.92	14438.70	-25002.39	-2233645.33	-1337088.28	24057.02
Dead+Wind 60 deg - Service	41976.92	24619.59	-14180.09	-1258344.98	-2262835.00	21579.32
Dead+Wind 90 deg - Service	41976.92	28923.11	26.39	27219.71	-2648402.18	13944.53
Dead+Wind 120 deg - Service	41976.92	26307.44	15185.04	1387436.75	-2399290.88	2347.11
Dead+Wind 150 deg - Service	41976.92	14484.41	25028.78	2283198.32	-1345551.83	-10112.49
Dead+Wind 180 deg - Service	41976.92	26.39	28405.89	2592153.35	-39124.36	-19411.78
Dead+Wind 210 deg - Service	41976.92	-14438.70	25002.39	2278311.89	1268612.42	-24057.02
Dead+Wind 240 deg - Service	41976.92	-26281.05	15139.33	1378973.20	2325928.59	-23022.88
Dead+Wind 270 deg - Service	41976.92	-28923.11	-26.39	17446.85	2579926.31	-13944.53
Dead+Wind 300 deg - Service	41976.92	-24645.98	-14225.80	-1266808.53	2199245.57	-2167.54
Dead+Wind 330 deg - Service	41976.92	-14484.41	-25028.78	-2238531.77	1277075.96	10112.49

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0.00	-41976.92	0.00	0.00	41976.92	0.00	0.000%
2	-52.96	-41976.92	-60859.34	52.96	41976.92	60859.34	0.000%
3	28977.67	-41976.92	-50178.41	-28977.67	41976.92	50178.41	0.000%
4	49410.15	-41976.92	-28458.66	-49410.15	41976.92	28458.66	0.000%
5	58047.08	-41976.92	52.96	-58047.08	41976.92	-52.96	0.000%
6	52797.57	-41976.92	30475.54	-52797.57	41976.92	-30475.54	0.000%
7	29069.41	-41976.92	50231.38	-29069.41	41976.92	-50231.38	0.000%
8	52.96	-41976.92	57009.05	-52.96	41976.92	-57009.05	0.000%
9	-28977.67	-41976.92	50178.41	28977.67	41976.92	-50178.41	0.000%
10	-52744.61	-41976.92	30383.80	52744.61	41976.92	-30383.80	0.000%
11	-58047.08	-41976.92	-52.96	58047.08	41976.92	52.96	0.000%
12	-49463.11	-41976.92	-28550.39	49463.11	41976.92	28550.39	0.000%
13	-29069.41	-41976.92	-50231.38	29069.41	41976.92	50231.38	0.000%
14	0.00	-64865.94	0.00	0.00	64865.94	0.00	0.000%
15	-79.56	-64865.94	-57534.05	79.56	64865.94	57534.05	0.000%
16	27695.96	-64865.94	-47957.80	-27695.96	64865.94	47957.80	0.000%
17	47440.92	-64865.94	-27290.65	-47440.92	64865.94	27290.65	0.000%
18	55529.72	-64865.94	79.56	-55529.72	64865.94	-79.56	0.000%
19	49958.30	-64865.94	28835.93	-49958.30	64865.94	-28835.93	0.000%
20	27833.77	-64865.94	48037.37	-27833.77	64865.94	-48037.37	0.000%
21	79.56	-64865.94	54719.10	-79.56	64865.94	-54719.10	0.000%
22	-27695.96	-64865.94	47957.80	27695.96	64865.94	-47957.80	0.000%
23	-49878.73	-64865.94	28698.12	49878.73	64865.94	-28698.12	0.000%
24	-55529.72	-64865.94	-79.56	55529.72	64865.94	79.56	0.000%
25	-47520.48	-64865.94	-27428.45	47520.48	64865.94	27428.45	0.000%
26	-27833.77	-64865.94	-48037.37	27833.77	64865.94	48037.37	0.000%
27	-26.39	-41976.92	-30324.38	26.39	41976.92	30324.38	0.000%
28	14438.70	-41976.92	-25002.39	-14438.70	41976.92	25002.39	0.000%
29	24619.59	-41976.92	-14180.09	-24619.59	41976.92	14180.09	0.000%
30	28923.11	-41976.92	26.39	-28923.11	41976.92	-26.39	0.000%
31	26307.44	-41976.92	15185.04	-26307.44	41976.92	-15185.04	0.000%
32	14484.41	-41976.92	25028.78	-14484.41	41976.92	-25028.78	0.000%
33	26.39	-41976.92	28405.89	-26.39	41976.92	-28405.89	0.000%
34	-14438.70	-41976.92	25002.39	14438.70	41976.92	-25002.39	0.000%
35	-26281.05	-41976.92	15139.34	26281.05	41976.92	-15139.33	0.000%
36	-28923.11	-41976.92	-26.39	28923.11	41976.92	26.39	0.000%
37	-24645.98	-41976.92	-14225.80	24645.98	41976.92	14225.80	0.000%
38	-14484.41	-41976.92	-25028.78	14484.41	41976.92	25028.78	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	7.327	31	0.3551	0.0982
T2	160 - 140	5.850	31	0.3234	0.0676
T3	140 - 120	4.514	31	0.2893	0.0441
T4	120 - 113.333	3.360	31	0.2455	0.0375
T5	113.333 - 106.667	3.008	31	0.2313	0.0339
T6	106.667 - 100	2.674	31	0.2157	0.0302
T7	100 - 80	2.371	31	0.1985	0.0278
T8	80 - 70	1.563	31	0.1595	0.0202

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T9	70 - 60	1.216	31	0.1418	0.0166
T10	60 - 50	0.912	31	0.1229	0.0134
T11	50 - 40	0.643	31	0.1034	0.0102
T12	40 - 30	0.417	31	0.0831	0.0069
T13	30 - 20	0.234	31	0.0615	0.0043
T14	20 - 0	0.103	31	0.0393	0.0017

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.50	21' Whip	31	7.327	0.3551	0.0982	117565
191.50	21' Whip	31	7.327	0.3551	0.0982	117565
191.00	20' Dipole	31	7.327	0.3551	0.0982	117565
190.00	16' Whip	31	7.327	0.3551	0.0982	117565
188.50	10' Whip	31	7.327	0.3551	0.0982	117565
188.00	20' Dipole	31	7.327	0.3551	0.0982	117565
187.00	PG1*0F-0090-310	31	7.327	0.3551	0.0982	117565
185.00	6' Yagi	31	7.327	0.3551	0.0982	117565
184.00	6' Yagi	31	7.327	0.3551	0.0982	117565
180.00	Top Platform	31	7.327	0.3551	0.0982	117565
175.60	(2) Scala Panels	31	6.996	0.3481	0.0913	117565
175.00	10' Inverted Whip	31	6.951	0.3471	0.0904	117565
173.00	14' Inverted Whip	31	6.802	0.3439	0.0873	83975
170.00	10' Inverted Whip	31	6.578	0.3392	0.0827	58783
166.00	14' Inverted Whip	31	6.283	0.3328	0.0766	41988
146.00	BXA-171063-8BF	31	4.896	0.3006	0.0492	25659
135.00	Stand-Off T-Frame	31	4.210	0.2789	0.0416	26493
124.00	RFS Panel Antennas	31	3.578	0.2543	0.0388	32917
102.50	Empty Mount	31	2.481	0.2048	0.0286	22427
102.00	2' yagi	31	2.459	0.2035	0.0285	23998
59.50	GPS	31	0.898	0.1219	0.0132	37361
59.00	GPS	31	0.884	0.1210	0.0131	37030
18.00	(2) GPS	31	0.084	0.0351	0.0013	18857
17.67	(2) GPS	31	0.081	0.0344	0.0013	19121

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	14.615	19	0.7182	0.1970
T2	160 - 140	11.639	6	0.6534	0.1357
T3	140 - 120	8.986	6	0.5819	0.0885
T4	120 - 113.333	6.691	6	0.4902	0.0752
T5	113.333 - 106.667	5.991	6	0.4609	0.0681
T6	106.667 - 100	5.326	6	0.4288	0.0606
T7	100 - 80	4.723	6	0.3945	0.0558
T8	80 - 70	3.114	6	0.3171	0.0405
T9	70 - 60	2.425	6	0.2821	0.0332
T10	60 - 50	1.819	6	0.2445	0.0269

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T11	50 - 40	1.283	6	0.2058	0.0204
T12	40 - 30	0.833	6	0.1654	0.0139
T13	30 - 20	0.467	6	0.1224	0.0086
T14	20 - 0	0.205	6	0.0782	0.0034

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.50	21' Whip	19	14.615	0.7182	0.1970	57546
191.50	21' Whip	19	14.615	0.7182	0.1970	57546
191.00	20' Dipole	19	14.615	0.7182	0.1970	57546
190.00	16' Whip	19	14.615	0.7182	0.1970	57546
188.50	10' Whip	19	14.615	0.7182	0.1970	57546
188.00	20' Dipole	19	14.615	0.7182	0.1970	57546
187.00	PG1*0F-0090-310	19	14.615	0.7182	0.1970	57546
185.00	6' Yagi	19	14.615	0.7182	0.1970	57546
184.00	6' Yagi	19	14.615	0.7182	0.1970	57546
180.00	Top Platform	19	14.615	0.7182	0.1970	57546
175.60	(2) Scala Panels	19	13.945	0.7039	0.1833	57546
175.00	10' Inverted Whip	19	13.854	0.7020	0.1814	57546
173.00	14' Inverted Whip	19	13.551	0.6955	0.1752	41104
170.00	10' Inverted Whip	19	13.099	0.6858	0.1659	28773
166.00	14' Inverted Whip	19	12.502	0.6729	0.1537	20552
146.00	BXA-171063-8BF	6	9.744	0.6055	0.0988	12162
135.00	Stand-Off T-Frame	6	8.380	0.5599	0.0835	12409
124.00	RFS Panel Antennas	6	7.125	0.5085	0.0779	15385
102.50	Empty Mount	6	4.943	0.4072	0.0574	10970
102.00	2' yagi	6	4.899	0.4046	0.0571	11731
59.50	GPS	6	1.791	0.2425	0.0265	18642
59.00	GPS	6	1.762	0.2406	0.0262	18481
18.00	(2) GPS	6	0.168	0.0698	0.0026	9439
17.67	(2) GPS	6	0.163	0.0684	0.0025	9570

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.6250	8	247.09	13499.00	0.018 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	1195.67	4123.34	0.290 ✔	1.333	Bolt Shear
T2	160	Leg	A325N	0.6250	8	1955.86	13499.00	0.145 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	1623.03	4123.34	0.394 ✔	1.333	Bolt Shear
T3	140	Leg	A325N	0.7500	8	4029.23	19438.10	0.207 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	2713.29	4123.34	0.658 ✔	1.333	Bolt Shear
T4	120	Leg	A325N	0.8750	8	7066.59	26458.10	0.267 ✔	1.333	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.5000	2	2980.35	4123.34	0.723 ✔	1.333	Bolt Shear
T5	113.333	Leg	A325N	0.8750	8	8221.95	26458.10	0.311 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3220.33	4123.34	0.781 ✔	1.333	Bolt Shear
T6	106.667	Leg	A325N	0.8750	8	9417.46	26458.10	0.356 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3532.62	4123.34	0.857 ✔	1.333	Bolt Shear
T7	100	Leg	A325N	1.0000	8	10721.40	34557.50	0.310 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	4307.51	4123.34	1.045 ✔	1.333	Bolt Shear
T8	80	Leg	A325N	1.0000	8	15121.90	34557.50	0.438 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	5064.47	6442.72	0.786 ✔	1.333	Bolt Shear
T9	70	Leg	A325N	1.0000	8	17253.80	34557.50	0.499 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	5429.69	6442.72	0.843 ✔	1.333	Bolt Shear
T10	60	Leg	A325N	1.0000	8	19423.30	34557.50	0.562 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	5764.80	6442.72	0.895 ✔	1.333	Bolt Shear
T11	50	Leg	A325N	1.0000	8	21585.20	34557.50	0.625 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	6054.85	6442.72	0.940 ✔	1.333	Bolt Shear
T12	40	Leg	A325N	1.0000	8	23775.10	34557.40	0.688 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	6518.58	6442.72	1.012 ✔	1.333	Bolt Shear
T13	30	Leg	A325N	1.0000	8	25939.90	34557.40	0.751 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	6787.15	6442.72	1.053 ✔	1.333	Bolt Shear
T14	20	Leg	A325N	1.0000	12	18771.10	34557.50	0.543 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	7934.90	12885.40	0.616 ✔	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 lb	Allow. P_a lb	Ratio P / P_a
T1	180 - 160	ROHN 2 STD (GR)	20.00	4.00	61.0 K=1.00	30.892	1.0745	-15807.60	33194.70	0.476 ✔
T2	160 - 140	ROHN 2.5 STD (GR) w/ 5/8" Cable	20.03	5.01	73.9 K=1.00	20.206	2.8170	-33725.20	56920.70	0.592 ✔
T3	140 - 120	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	20.03	6.68	87.3 K=1.00	17.518	3.4680	-61009.60	60753.10	1.004 ✔
T4	120 - 113.333	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0 K=1.00	19.016	4.4060	-71261.80	83784.10	0.851 ✔
T5	113.333 - 106.667	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0 K=1.00	19.016	4.4060	-82374.80	83784.10	0.983 ✔
T6	106.667 - 100	ROHN 3 X-STR (GR) w/	6.68	6.68	80.0	19.016	4.4060	-93425.30	83784.20	1.115

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
		5/8" Cable			K=1.00					✔
T7	100 - 80	ROHN 4 X-STR (GR) w/ 5/8" Cable	20.03	6.68	61.6 K=1.00	22.435	6.6150	-130280.00	148407.00	0.878 ✔
T8	80 - 70	ROHN 5 STD (GR) w/ 5/8" Cable	10.02	10.02	72.1 K=1.00	20.544	8.2440	-145344.00	169365.00	0.858 ✔
T9	70 - 60	ROHN 5 STD (GR) w/ 5/8" Cable	10.02	5.16	37.2 K=1.00	26.221	8.2440	-165383.00	216169.00	0.765 ✔
T10	60 - 50	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	10.02	72.1 K=1.00	20.544	8.5440	-184310.00	175528.00	1.050 ✔
T11	50 - 40	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.15	37.1 K=1.00	26.238	8.5440	-204991.00	224180.00	0.914 ✔
T12	40 - 30	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.14	37.0 K=1.00	26.245	8.5440	-223737.00	224241.00	0.998 ✔
T13	30 - 20	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.13	37.0 K=1.00	26.252	8.5440	-245435.00	224296.00	1.094 ✔
T14	20 - 0	ROHN 6 EH (GR) w/ 5/8" Cable (GR)	20.03	10.02	54.8 K=1.00	32.287	8.5495	-286895.00	276036.00	1.039 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	L1 1/2x1 1/2x1/8	7.71	3.58	139.1 K=0.96	7.722	0.3594	-2391.34	2775.27	0.862 ✔
T2	160 - 140	L1 3/4x1 3/4x1/8	9.75	4.72	153.0 K=0.94	6.381	0.4219	-3246.06	2691.97	1.206 ✔
T3	140 - 120	L2x2x1/8 w/1.5" sch 40 pipe	12.28	6.03	167.4 K=0.92	5.332	1.2900	-5391.88	6878.34	0.784 ✔
T4	120 - 113.333	L2 1/2x2 1/2x3/16	12.85	6.29	144.7 K=0.95	7.129	0.9020	-5960.71	6430.01	0.927 ✔
T5	113.333 - 106.667	L2 1/2x2 1/2x3/16	13.43	6.58	150.1 K=0.94	6.628	0.9020	-6440.67	5978.65	1.077 ✔
T6	106.667 - 100	L3x3x1/4	14.02	6.87	134.7 K=0.97	8.225	1.4400	-7065.24	11844.30	0.597 ✔
T7	100 - 80	L3x3x1/4	15.84	7.73	148.0 K=0.94	6.817	1.4400	-8590.74	9816.73	0.875 ✔
T8	80 - 70	L3x3x1/4	18.20	8.93	166.5 K=0.92	5.386	1.4400	-10128.90	7755.70	1.306 ✔
T9	70 - 60	L3 1/2x3 1/2x1/4	19.06	9.36	151.9 K=0.94	6.475	1.6900	-10859.40	10943.00	0.992 ✔
T10	60 - 50	L3 1/2x3 1/2x1/4	19.92	9.79	157.6 K=0.93	6.014	1.6900	-11529.60	10163.20	1.134 ✔
T11	50 - 40	L3 1/2x3 1/2x1/4	20.81	10.23	163.4 K=0.92	5.594	1.6900	-12090.80	9453.85	1.279 ✔
T12	40 - 30	L3.5x3.5x1/4 w/ 2x1/4 plate	21.70	10.87	125.1 K=1.00	9.549	2.1520	-13037.20	20548.40	0.634 ✔
T13	30 - 20	L3.5x3.5x1/4 w/ 2x1/4 plate	22.60	11.33	130.2 K=1.00	8.803	2.1520	-13218.10	18943.10	0.698 ✔
T14	20 - 0	4x4x1/4 w/ sch 40	23.52	11.54	138.2	7.821	6.5600	-15289.40	51306.10	0.298

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
					K=0.96					✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	70 - 60	L3 1/2x3 1/2x1/4	16.20	15.74	219.8 K=0.81	3.092	1.6900	-2868.49	5224.90	0.549 ✔
T11	50 - 40	L3 1/2x3 1/2x1/4	18.23	17.77	243.2 K=0.79	2.525	1.6900	-3555.62	4266.85	0.833 ✔
T12	40 - 30	L3 1/2x3 1/2x1/4	19.24	18.78	254.8 K=0.78	2.300	1.6900	-3960.41	3887.20	1.019 ✔
T13	30 - 20	KL/R > 250 (C) - 184 L3 1/2x3 1/2x1/4 KL/R > 250 (C) - 196	20.26	19.79	266.3 K=0.78	2.105	1.6900	-4257.39	3557.75	1.197 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	L3x3x1/4	6.50	6.30	124.8 K=0.98	9.589	1.4400	-222.34	13808.90	0.016 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 2 STD (GR)	20.00	4.00	61.0	30.000	1.0745	12231.30	32235.90	0.379 ✔
T2	160 - 140	ROHN 2.5 STD (GR) w/ 5/8" Cable	20.03	5.01	73.9	30.000	2.8170	26576.80	84510.00	0.314 ✔
T3	140 - 120	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	20.03	6.68	87.3	30.000	3.4680	47774.40	104040.00	0.459 ✔
T4	120 - 113.333	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0	30.000	4.4060	56532.80	132180.00	0.428 ✔
T5	113.333 - 106.667	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0	30.000	4.4060	65775.60	132180.00	0.498 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T6	106.667 - 100	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0	30.000	4.4060	75339.70	132180.00	0.570 ✔
T7	100 - 80	ROHN 4 X-STR (GR) w/ 5/8" Cable	20.03	6.68	61.6	30.000	6.6150	107288.00	198450.00	0.541 ✔
T8	80 - 70	ROHN 5 STD (GR) w/ 5/8" Cable	10.02	10.02	72.1	30.000	8.2440	120975.00	247320.00	0.489 ✔
T9	70 - 60	ROHN 5 STD (GR) w/ 5/8" Cable	10.02	5.16	37.2	30.000	8.2440	138030.00	247320.00	0.558 ✔
T10	60 - 50	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	10.02	72.1	30.000	8.5440	155386.00	256320.00	0.606 ✔
T11	50 - 40	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.15	37.1	30.000	8.5440	172681.00	256320.00	0.674 ✔
T12	40 - 30	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.14	37.0	30.000	8.5440	190201.00	256320.00	0.742 ✔
T13	30 - 20	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.13	37.0	30.000	8.5440	207519.00	256320.00	0.810 ✔
T14	20 - 0	ROHN 6 EH (GR) w/ 5/8" Cable (GR)	20.03	10.02	54.8	30.000	8.5495	240427.00	256486.00	0.937 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	L1 1/2x1 1/2x1/8	7.71	3.58	96.6	32.500	0.2109	2331.01	6855.47	0.340 ✔
T2	160 - 140	L1 3/4x1 3/4x1/8	9.75	4.72	107.4	32.500	0.2578	3217.61	8378.91	0.384 ✔
T3	140 - 120	L2x2x1/8 w/1.5" sch 40 pipe	12.28	6.03	118.8	32.500	0.9089	5426.58	29539.50	0.184 ✔
T4	120 - 113.333	L2 1/2x2 1/2x3/16	12.85	6.29	99.5	32.500	0.5886	5902.55	19129.80	0.309 ✔
T5	113.333 - 106.667	L2 1/2x2 1/2x3/16	13.43	6.58	104.0	32.500	0.5886	6418.32	19129.80	0.336 ✔
T6	106.667 - 100	L3x3x1/4	14.02	6.87	90.8	32.500	0.9628	7006.91	31291.40	0.224 ✔
T7	100 - 80	L3x3x1/4	15.84	7.73	101.9	32.500	0.9628	8615.02	31291.40	0.275 ✔
T8	80 - 70	L3x3x1/4	18.20	8.93	117.8	32.500	0.9394	10048.60	30529.70	0.329 ✔
T9	70 - 60	L3 1/2x3 1/2x1/4	19.06	9.36	105.2	32.500	1.1269	10744.20	36623.40	0.293 ✔
T10	60 - 50	L3 1/2x3 1/2x1/4	19.92	9.79	109.9	32.500	1.1269	11413.30	36623.40	0.312 ✔
T11	50 - 40	L3 1/2x3 1/2x1/4	20.81	10.23	114.8	32.500	1.1269	12109.70	36623.40	0.331 ✔
T12	40 - 30	L3.5x3.5x1/4 w/ 2x1/4 plate	21.70	10.87	125.1	30.000	2.1520	12575.30	64560.00	0.195 ✔
T13	30 - 20	L3.5x3.5x1/4 w/ 2x1/4 plate	22.60	11.33	130.2	30.000	2.1520	13574.30	64560.00	0.210 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T14	20 - 0	4x4x1/4 w/ sch 40	24.44	11.99	152.0	32.500	4.6388	15869.80	150759.00	0.105 ✔

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	70 - 60	L3 1/2x3 1/2x1/4	16.20	15.74	173.3	32.500	1.2675	2926.80	41193.80	0.071 ✔
T11	50 - 40	L3 1/2x3 1/2x1/4	18.23	17.77	195.6	32.500	1.2675	3628.95	41193.80	0.088 ✔
T12	40 - 30	L3 1/2x3 1/2x1/4	19.24	18.78	206.7	32.500	1.2675	3835.69	41193.80	0.093 ✔
T13	30 - 20	L3 1/2x3 1/2x1/4	20.26	19.79	217.9	32.500	1.2675	4496.04	41193.80	0.109 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	L3x3x1/4	6.50	6.30	81.3	21.600	1.4400	230.32	31104.00	0.007 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 2 STD (GR)	2	-15807.60	44248.53	35.7	Pass
		Diagonal	L1 1/2x1 1/2x1/8	7	-2391.34	3699.43	64.6	Pass
		Top Girt	L3x3x1/4	4	-222.34	18407.26	1.2	Pass
T2	160 - 140	Leg	ROHN 2.5 STD (GR) w/ 5/8" Cable	38	-33725.20	75875.29	44.4	Pass
		Diagonal	L1 3/4x1 3/4x1/8	40	-3246.06	3588.40	90.5	Pass
T3	140 - 120	Leg	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	65	-61009.60	80983.88	75.3	Pass
		Diagonal	L2x2x1/8 w/1.5" sch 40 pipe	67	-5391.88	9168.83	58.8	Pass
T4	120 - 113.333	Leg	ROHN 3 X-STR (GR) w/ 5/8" Cable	86	-71261.80	111684.20	63.8	Pass
		Diagonal	L2 1/2x2 1/2x3/16	88	-5960.71	8571.20	69.5	Pass
T5	113.333 - 106.667	Leg	ROHN 3 X-STR (GR) w/ 5/8" Cable	95	-82374.80	111684.20	73.8	Pass
		Diagonal	L2 1/2x2 1/2x3/16	97	-6440.67	7969.54	80.8	Pass
T6	106.667 - 100	Leg	ROHN 3 X-STR (GR) w/ 5/8" Cable	104	-93425.30	111684.34	83.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
		Diagonal	L3x3x1/4	106	-7065.24	15788.45	44.7 64.3 (b)	Pass
T7	100 - 80	Leg	ROHN 4 X-STR (GR) w/ 5/8" Cable	113	-130280.00	197826.52	65.9	Pass
		Diagonal	L3x3x1/4	115	-8590.74	13085.70	65.6 78.4 (b)	Pass
T8	80 - 70	Leg	ROHN 5 STD (GR) w/ 5/8" Cable	134	-145344.00	225763.54	64.4	Pass
		Diagonal	L3x3x1/4	136	-10128.90	10338.35	98.0	Pass
T9	70 - 60	Leg	ROHN 5 STD (GR) w/ 5/8" Cable	143	-165383.00	288153.27	57.4	Pass
		Diagonal	L3 1/2x3 1/2x1/4	145	-10859.40	14587.02	74.4	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	152	-2868.49	6964.79	41.2	Pass
T10	60 - 50	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	155	-184310.00	233978.81	78.8	Pass
		Diagonal	L3 1/2x3 1/2x1/4	157	-11529.60	13547.55	85.1	Pass
T11	50 - 40	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	164	-204991.00	298831.93	68.6	Pass
		Diagonal	L3 1/2x3 1/2x1/4	166	-12090.80	12601.98	95.9	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	172	-3555.62	5687.71	62.5	Pass
T12	40 - 30	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	176	-223737.00	298913.24	74.9	Pass
		Diagonal	L3.5x3.5x1/4 w/ 2x1/4 plate	178	-13037.20	27391.02	47.6 75.9 (b)	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	184	-3960.41	5181.64	76.4	Pass
T13	30 - 20	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	188	-245435.00	298986.56	82.1	Pass
		Diagonal	L3.5x3.5x1/4 w/ 2x1/4 plate	190	-13218.10	25251.15	52.3 79.0 (b)	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	197	-4257.39	4742.48	89.8	Pass
T14	20 - 0	Leg	ROHN 6 EH (GR) w/ 5/8" Cable (GR)	200	-286895.00	367955.97	78.0	Pass
		Diagonal	4x4x1/4 w/ sch 40	208	-15289.40	68391.03	22.4 46.2 (b)	Pass
						Summary		
						Leg (T6)	83.7	Pass
						Diagonal (T8)	98.0	Pass
						Secondary Horizontal (T13)	89.8	Pass
						Top Girt (T1)	1.2	Pass
						Bolt Checks	79.0	Pass
						RATING =	**98.0**	**Pass**