ROBINSON & COLE

EM-VER-032-120622

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June 21, 2012

Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**
1712 Main Street, Coventry, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 150-foot level of the existing 190-foot lattice tower at the above-referenced address. The tower and underlying property are owned by the Town of Coventry. The Council approved Cellco's shared use of this tower in 2004. Cellco now intends to replace all of its existing antennas with four (4) model LPA-80063-4CF cellular antennas; two (2) model LPA-80080-4CF cellular antennas; two (2) model BXA-171063-8CF PCS antennas; one (1) model BXA-171085-8CF PCS antenna; and three (3) model BXA-70063-6CF LTE antennas, all at the same 150-foot level. Cellco also intends to attach six (6) additional coax cables to the leg of the lattice tower. Attached behind Tab 1 are the specifications for Cellco's replacement antennas.

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

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 replacement antennas will be located at the 150-foot level on the 190-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 boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

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) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 2.

Also attached is a Structural Analysis Report confirming that the tower and its foundation, with certain reinforcements, can support Cellco's proposed modifications. (See Tab 3).

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
John Elsesser, Coventry Town Manager
Sandy M. Carter

Amphenol ANTENNA SOLUTIONS

LPA-80063-4CF-EDIN-X

V-Pol | Log Periodic | 63° | 13.0 dBd

Replace "X" with desired electrical downtilt.

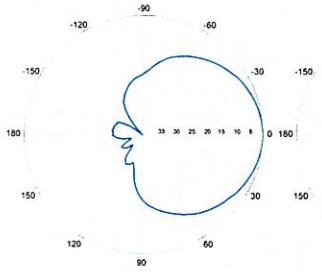
Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	
Frequency bands	806-960 MHz
Polarization	Vertical
Horizontal beamwidth	63°
Vertical beamwidth	15°
Gain	13.0 dBd (15.1 dBi)
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14
Impedance	50Ω
VSWR	≤1.4:1
Upper sidelobe suppression (0°)	-15.7 dB
Front-to-back ratio (+/-30°)	-31.7 dB
Null fill	5% (-26.02 dB)
Input power	500 W
Lightning protection	Direct Ground
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)

Mechanical Characteristics		
Dimensions Length x Width x Depth	1205 x 385 x 332 mm	47.4 x 15.2 x 13.1 in
Depth of antenna with z-bracket	372 mm	14.6 in
Weight without mounting brackets	9.1 kg	20 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.46 m^2 Side: 0.39 m^2	Front: 5.0 ft^2 Side: 4.2 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 660 N Side: 550 N	Front: 149 lbf Side: 124 lbf

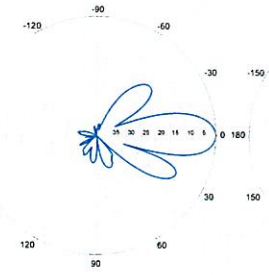
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit (0-20°)	21699999	50-102 mm 2.0-4.0 in	5.4 kg 12 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.		

LPA-80063-4CF-EDIN-X



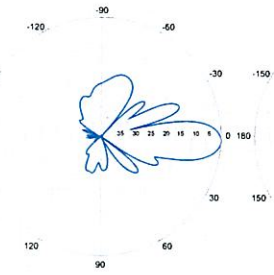
Horizontal

LPA-80063-4CF-EDIN-0



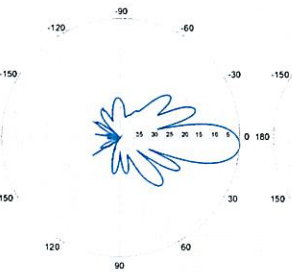
0° | Vertical

LPA-80063-4CF-EDIN-2



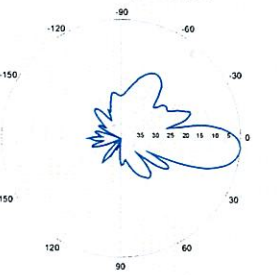
2° | Vertical

LPA-80063-4CF-EDIN-4



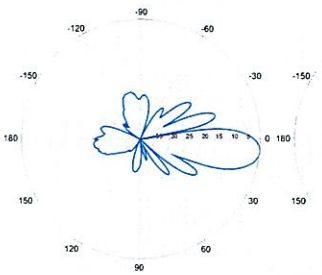
4° | Vertical

LPA-80063-4CF-EDIN-5



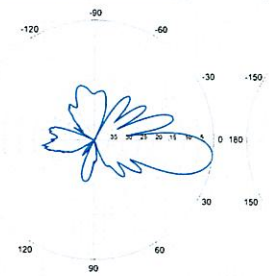
5° | Vertical

LPA-80063-4CF-EDIN-6



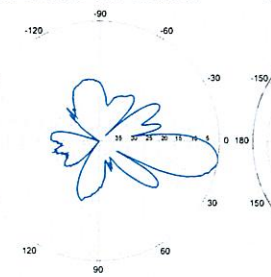
6° | Vertical

LPA-80063-4CF-EDIN-8



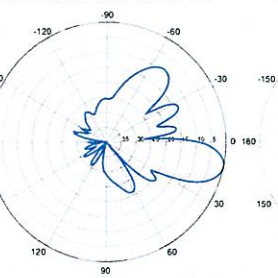
8° | Vertical

LPA-80063-4CF-EDIN-10



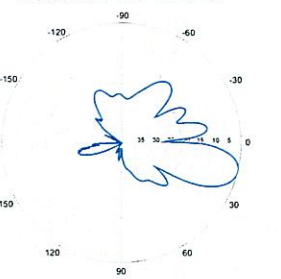
10° | Vertical

LPA-80063-4CF-EDIN-12



12° | Vertical

LPA-80063-4CF-EDIN-14



14° | Vertical

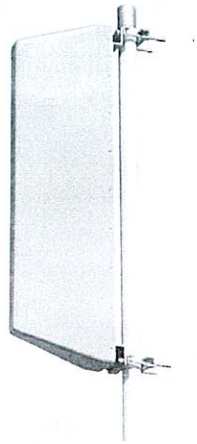
Amphenol ANTENNA SOLUTIONS

LPA-80080-4CF-EDIN-X

V-Pol | Log Periodic | 80° | 12.5 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.

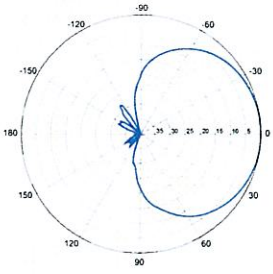


Electrical Characteristics	
Frequency bands	806-960 MHz
Polarization	Vertical
Horizontal beamwidth	80°
Vertical beamwidth	15°
Gain	12.5 dBd (14.6 dBi)
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14
Impedance	50Ω
VSWR	≤1.4:1
Upper sidelobe suppression (0°)	-14.2 dB
Front-to-back ratio (+/-30°)	-34.7 dB
Null fill	15% (-16.48 dB)
Input power	500 W
Lightning protection	Direct Ground
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)

Mechanical Characteristics		
Dimensions Length x Width x Depth	1200 x 140 x 335 mm	47.2 x 5.5 x 13.2 in
Depth of antenna with z-bracket	375 mm	14.8 in
Weight without mounting brackets	5.4 kg	12 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.17 m² Side: 0.40 m²	Front: 1.8 ft² Side: 4.3 ft²
Wind load @ 161 km/hr (100 mph)	Front: 254 N Side: 574 N	Front: 57 lbf Side: 129 lbf

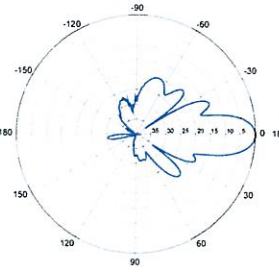
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit (0-20°)	21699999	50-102 mm 2.0-4.0 in	5.4 kg 12 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.		

LPA-80080-4CF-EDIN-X



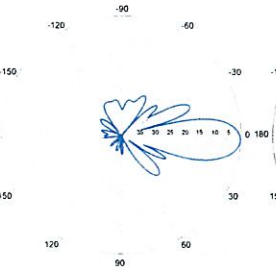
Horizontal

LPA-80080-4CF-EDIN-0



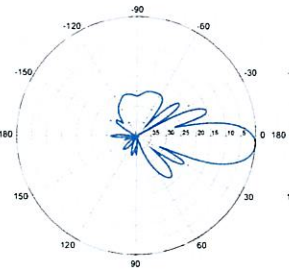
0° | Vertical

LPA-80080-4CF-EDIN-2



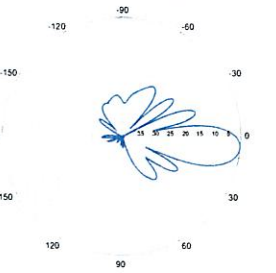
2° | Vertical

LPA-80080-4CF-EDIN-4



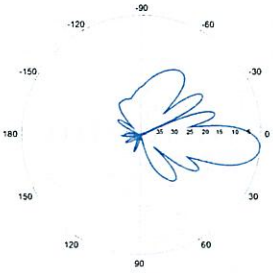
2° | Vertical

LPA-80080-4CF-EDIN-5



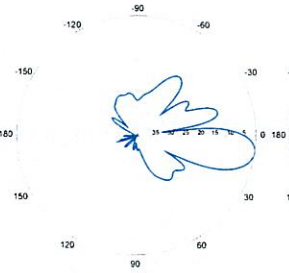
5° | Vertical

LPA-80080-4CF-EDIN-6



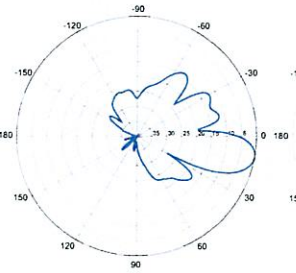
6° | Vertical

LPA-80080-4CF-EDIN-8



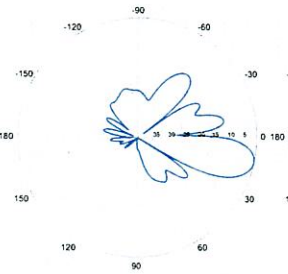
8° | Vertical

LPA-80080-4CF-EDIN-10



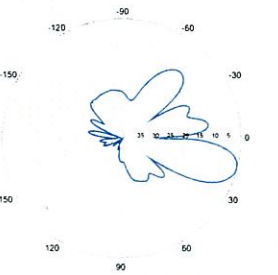
10° | Vertical

LPA-80080-4CF-EDIN-12



12° | Vertical

LPA-80080-4CF-EDIN-14



14° | Vertical

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

BXA-171063-8CF-EDIN-X

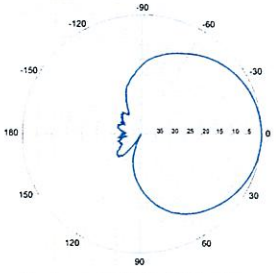
Replace "X" with desired electrical downtilt.

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, 8		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1232 x 154 x 105 mm	48.5 x 6.1 x 4.1 in	
Depth with t-brackets	133 mm	5.2 in	
Weight without mounting brackets	4.8 kg	10.5 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	

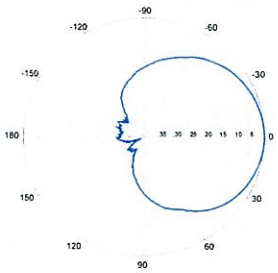
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8CF-EDIN-X-FP		

BXA-171063-8CF-EDIN-X



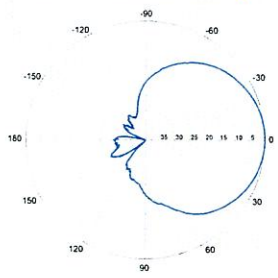
Horizontal | 1710-1880 MHz

BXA-171063-8CF-EDIN-X



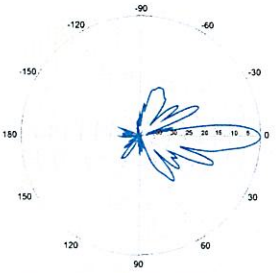
Horizontal | 1850-1990 MHz

BXA-171063-8CF-EDIN-X



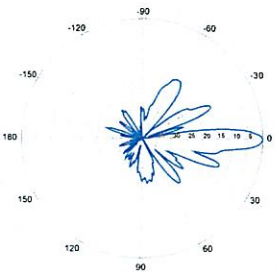
Horizontal | 1920-2170 MHz

BXA-171063-8CF-EDIN-0



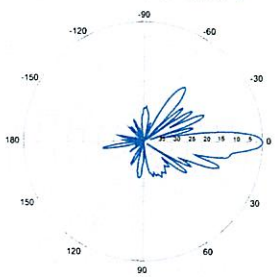
0° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-0

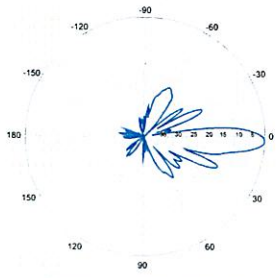


0° | Vertical | 1920-2170 MHz

BXA-171063-8CF-EDIN-X

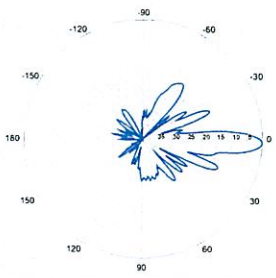
X-Pol | FET Panel | 63° | 17.4 dBi

BXA-171063-8CF-EDIN-2



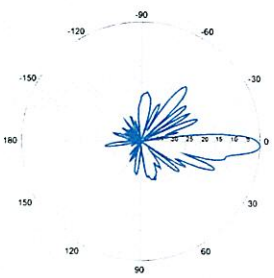
2° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-2



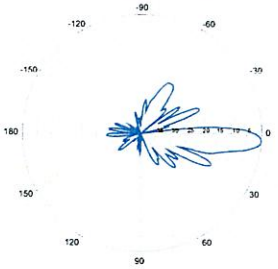
2° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-2



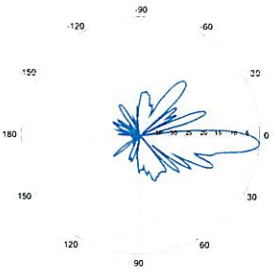
2° | Vertical | 1920-2170 MHz

BXA-171063-8CF-EDIN-4



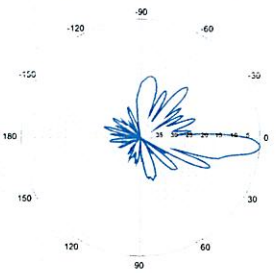
4° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-4



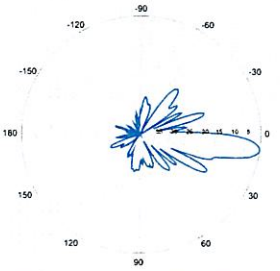
4° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-4



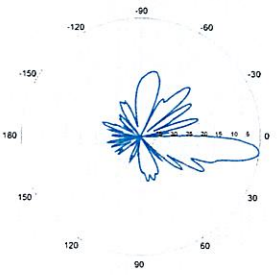
4° | Vertical | 1920-2170 MHz

BXA-171063-8CF-EDIN-8



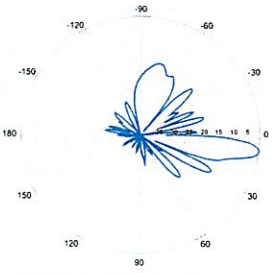
8° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-8



8° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-8



8° | Vertical | 1920-2170 MHz

BXA-171085-8CF-EDIN-X

Replace "X" with desired electrical downtilt.

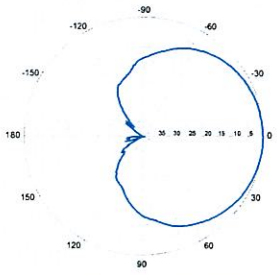
X-Pol | FET Panel | 85° | 16.4 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	88°	85°	80°
Vertical beamwidth	7°	7°	7°
Gain	13.5 dBd / 15.6 dBi	13.9 dBd / 16.0 dBi	14.3 dBd / 16.4 dBi
Electrical downtilt (X)	0, 2, 4		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		

Mechanical Characteristics				
Dimensions Length x Width x Depth	1232 x 154 x 105 mm		48.5 x 6.1 x 4.1 in	
Depth with t-brackets	133 mm		5.2 in	
Weight without mounting brackets	4.8 kg		10.5 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

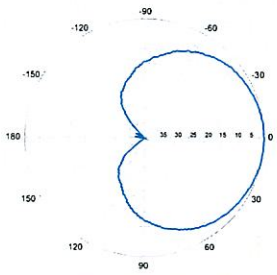
Mounting Options	Part Number	Fits Pipe Diameter		Weight	
2-Point Mounting Bracket Kit	26799997	50-102 mm	2.0-4.0 in	2.3 kg	5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm	2.0-4.0 in	3.6 kg	8 lbs
Concealment Configurations	For concealment configurations, order BXA-171085-8CF-EDIN-X-FP				

BXA-171085-8CF-EDIN-X



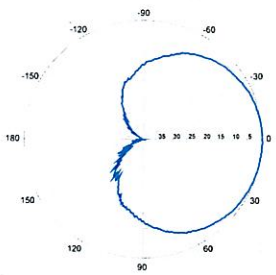
Horizontal | 1710-1880 MHz

BXA-171085-8CF-EDIN-X



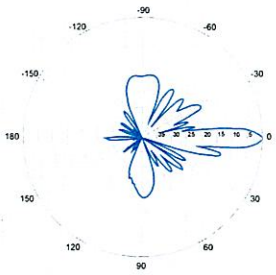
Horizontal | 1850-1990 MHz

BXA-171085-8CF-EDIN-X



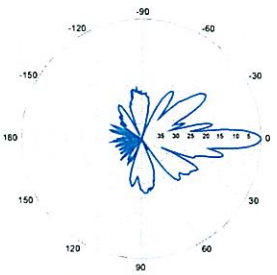
Horizontal | 1920-2170 MHz

BXA-171085-8CF-EDIN-0



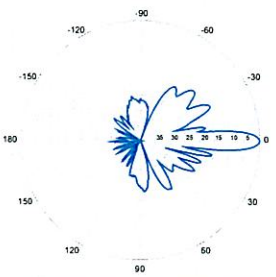
0° | Vertical | 1710-1880 MHz

BXA-171085-8CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171085-8CF-EDIN-0

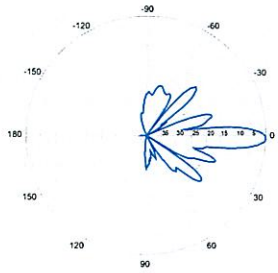


0° | Vertical | 1920-2170 MHz

BXA-171085-8CF-EDIN-X

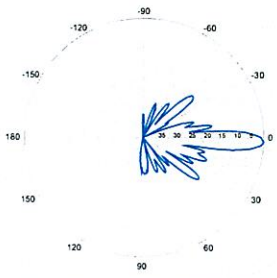
X-Pol | FET Panel | 85° | 16.4 dBi

BXA-171085-8CF-EDIN-2



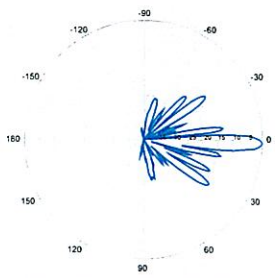
2° | Vertical | 1710-1880 MHz

BXA-171085-8CF-EDIN-2



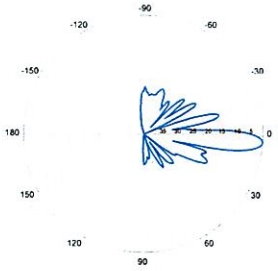
2° | Vertical | 1850-1990 MHz

BXA-171085-8CF-EDIN-2



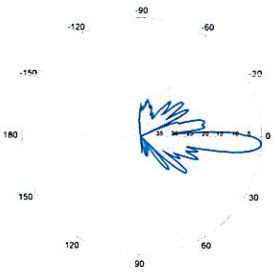
2° | Vertical | 1920-2170 MHz

BXA-171085-8CF-EDIN-4



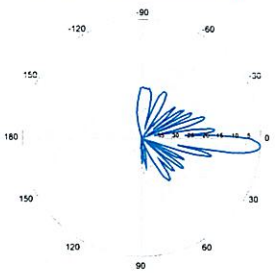
4° | Vertical | 1710-1880 MHz

BXA-171085-8CF-EDIN-4



4° | Vertical | 1850-1990 MHz

BXA-171085-8CF-EDIN-4



4° | Vertical | 1920-2170 MHz

Amphenol ANTENNA SOLUTIONS

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

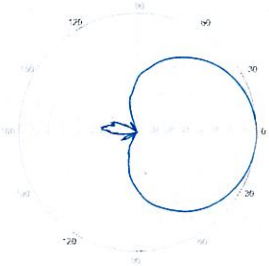
Replace "X" with desired electrical downtilt.

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

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

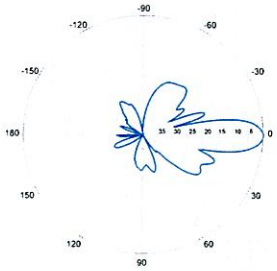
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



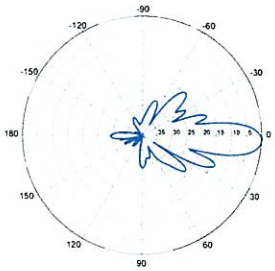
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

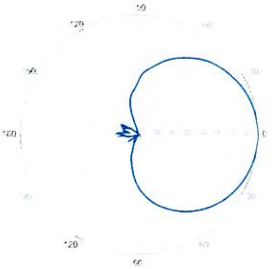


0° | Vertical | 750 MHz

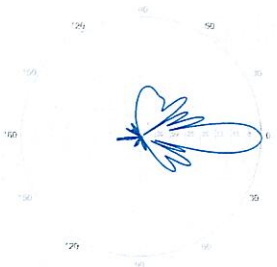
BXA-70063-6CF-EDIN-2



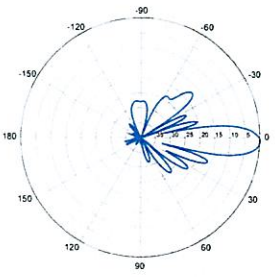
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



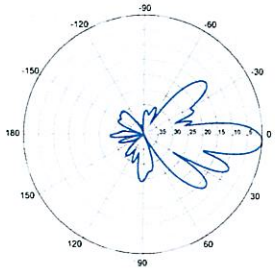
2° | Vertical | 850 MHz

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

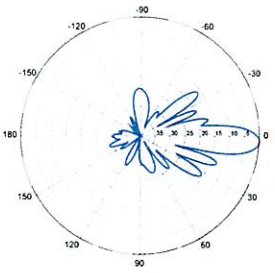
BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3

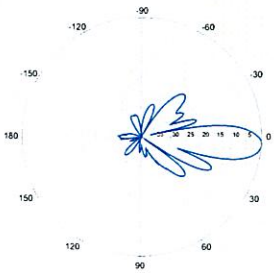


3° | Vertical | 750 MHz

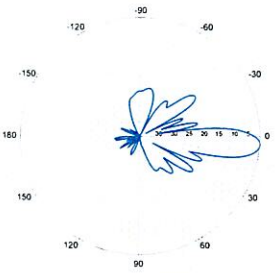


3° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-4

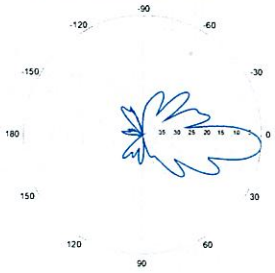


4° | Vertical | 750 MHz

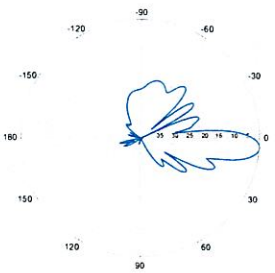


4° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-5

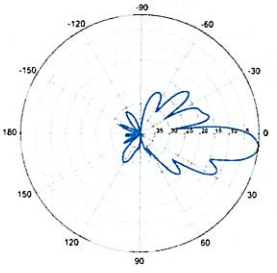


5° | Vertical | 750 MHz

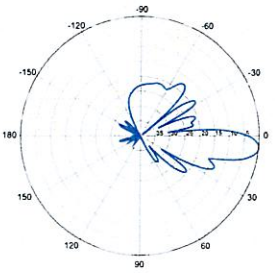


5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6

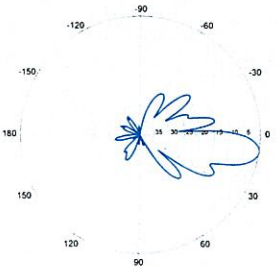


6° | Vertical | 750 MHz

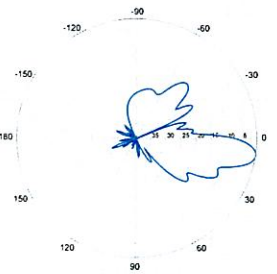


6° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-8

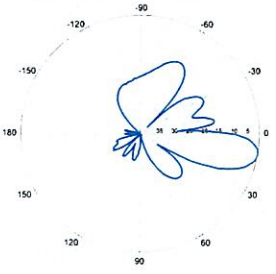


8° | Vertical | 750 MHz

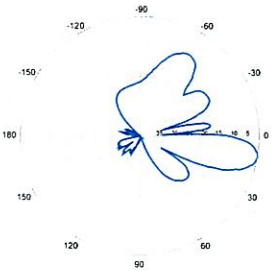


8° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-10



10° | Vertical | 750 MHz



10° | Vertical | 850 MHz

	General	Power	Density					
Site Name: Coventry E								
Tower Height: Verizon @ 150Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint	11	200	180	0.0244	1900	1.0000	2.44%	
*Nextel	12	100	130	0.0255	851	0.5673	4.50%	
*Unknown	1	80	190	0.0008	75.98	0.2000	0.40%	
*Unknown	1	1000	190	0.0100	449.875	0.2999	3.32%	
*Unknown	1	200	190	0.0020	33.8	0.2000	1.00%	
*Unknown	1	750	160	0.0105	450	0.3000	3.51%	
*Unknown	1	600	160	0.0084	450	0.3000	2.81%	
*Unknown	1	100	160	0.0014	450	0.3000	0.47%	
*Unknown	1	30	140	0.0006	145.63	0.2000	0.28%	
*Unknown	1	15	140	0.0003	440.925	0.2940	0.09%	
*Unknown	1	8	140	0.0001	173.20375	0.2000	0.07%	
*Unknown	1	30	190	0.0003	50.4	0.2000	0.15%	
*Unknown	1	2	120	0.0000	420.5	0.2803	0.02%	
*Unknown	1	250	190	0.0025	152.0075	0.2000	1.25%	
*Unknown	1	4	188	0.0000	903	0.6020	0.01%	
*Unknown	1	40	95	0.0016	33.44	0.2000	0.80%	
*Unknown	1	80	75	0.0051	45.4	0.2000	2.56%	
*Unknown	1	80	95	0.0032	45.14	0.2000	1.59%	
*Unknown	1	200	75	0.0128	33.8	0.2000	6.39%	
*Unknown	1	100	120	0.0025	153.955	0.2000	1.25%	
*Unknown	1	4	188	0.0000	903	0.6020	0.01%	
*Unknown	1	80	110	0.0024	45.14	0.2000	1.19%	
*Unknown	1	50	115	0.0014	47.54	0.2000	0.68%	
*Pocket	3	631	95	0.0754	2130	1.0000	7.54%	
Verizon PCS	**11**	**244**	**150**	**0.0429**	**1970**	**1.0000**	**4.29%**	
Verizon Cellular	**9**	**253**	**150**	**0.0364**	**869**	**0.5793**	**6.28%**	
Verizon AWS	**1**	**592**	**150**	**0.0095**	**2145**	**1.0000**	**0.95%**	
Verizon 700	**1**	**831**	**150**	**0.0133**	**698**	**0.4653**	**2.85%**	
								56.68%
* Source: Siting Council								

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

190' Existing Rohn Lattice Tower

Proposed Verizon Wireless
Antenna Upgrade

Verizon Site Ref: Coventry East

1712 Main Street
Coventry, CT

Centek Project No. 12001.CO64

Date: May 21, 2012

Prepared for:

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

Table of Contents

Introduction

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

The host tower is a 190-ft, three legged, lattice tower originally manufactured by ROHN eng. file no. 33814PH dated 7/24/96. The tower geometry, structure member sizes and foundation information were taken from a previous structural report prepared by All Points Technology Corporation dated March 4, 2004. Antenna and appurtenance inventory were taken from the aforementioned APT structural report and a Verizon RF data sheet.

The tower consists of ten (10) vertical sections consisting of steel pipe legs conforming to ASTM A572 Gr. 50 and lateral bracing conforming to ASTM A572 Gr. 50 and ASTM A36. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 4-ft 8-in at the top and 19-ft 0-in at the bottom.

Verizon Wireless proposes the removal of twelve (12) panel antennas and the installation of twelve (12) panel antennas mounted on three (3) existing sector mounts. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

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

- UNKNOWN (Existing):
  Antenna: Two (2) obstruction lights, one (1) PD1142-3 Omni-directional whip antenna, one (1) ASP705 Omni-directional whip antenna, one (1) DB420 dipole antenna and one (1) 3' yagi pipe mounted to the top of the tower.
  Coax Cable: Two (2) 1-1/4" ∅ and two (2) 7/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) PD1142-2A Omni-directional whip antenna, one (1) ASP705 Omni-directional whip antenna, one (1) 4' Omni-directional whip antenna, one (1) 3' yagi, one (1) halo and one (1) paraflector grid mounted on three (3) 4-ft side arms with an elevation of ±188-ft above grade level.
  Coax Cable: Three (3) 7/8" ∅ and three (3) 1/2" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Sprint (Existing):
  Antenna: Six (6) Andrew DB980H90E-M panel antennas mounted on three (3) 14-ft boom gates with a RAD center elevation of ±180-ft above grade level.
  Coax Cable: Six (6) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKNOWN (Existing):
  Antenna: Two (2) ASP705 Omni-directional whip antennas and one (1) 3-ft dish mounted on two (2) 4-ft side arms with an elevation of ±156-ft above grade level.
  Coax Cable: Three (3) 7/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: Two (2) paraflector grid antennas, one (1) DB264 dipole antenna and one (1) DB436 yagi mounted on two (2) 4-ft side arms with an elevation of ±142-ft above grade level.
  Coax Cable: Two (2) 7/8" ∅ and one (1) 1/2" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) DB230 yagi leg mounted with an elevation of ±142-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) single dipole antenna leg mounted with an elevation of ±136-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Nextel (Existing):
  Antenna: Twelve (12) Andrew DB844H90E-XY panel antennas mounted on three (3) 10-ft T-Frames with a RAD center elevation of ±130-ft above grade level.
  Coax Cable: Twelve (12) 1-1/4" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) Dipole antenna mounted on one (1) 4-ft side arm with an elevation of ±113-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) PD320 dipole antenna leg mounted with an elevation of ±110-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 14-ft Omni-directional whip antenna mounted on one (1) 4-ft side arm with an elevation of ±109-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKNOWN (Existing):
  Antenna: One (1) 14-ft Omni-directional whip antenna mounted on one (1) 4-ft side arm with an elevation of ±103-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) GPS antenna mounted on a 1-ft standoff pipe with an elevation of ±102-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) DB212 single dipole antenna leg mounted with an elevation of ±94-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) single dipole antenna leg mounted with an elevation of ±92-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) PD320 dipole antenna leg mounted with an elevation of ±74-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) single dipole antenna leg mounted with an elevation of ±70-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) single dipole antenna leg mounted with an elevation of ±50-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) DB212 single dipole antenna leg mounted with an elevation of ±50-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKNOWN (Existing):
  Antenna: One (1) DB212 single dipole antenna leg mounted with an elevation of ±32-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) single dipole antenna leg mounted with an elevation of ±31-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) PD 400 Omni-directional whip antenna and one (1) 3-ft yagi mounted on one (1) 4-ft side arm with an elevation of ±17-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- VERIZON (Existing to Remain):
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- **VERIZON (Existing to Remove):**
  Antennas: Six (6) Andrew DB948F85T2E-M and six (6) Andrew DB844H90E-XY panel antennas mounted on (3) 12-ft T-Frames with a RAD center elevation of ±150-ft above grade leve
- **VERIZON (Proposed):**
  Antennas: Three (3) Antel BXA-70063-6CF, two (2) Antel LPA-80080-4CF, four (4) Antel LPA-80063-4CF, one (1) Antel BXA-171085-8CF and two (2) Antel BXA-171063-8CF panel antennas mounted on (3) 12-ft T-Frames with a RAD center elevation of ±150-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.

Primary Assumptions Used in the Analysis

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

Analysis

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

The existing tower was analyzed for the controlling basic wind speed (fastest mile) with no ice and a 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

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

Tower Loading

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

Basic Wind Speed:	Tolland; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Coventry; v = 100 mph (3 second gust) equivalent to v = 80 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA-222-F wind speed controls.	
Load Cases:	Load Case 1; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

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

Tower Capacity

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

- Calculated stresses **were NOT found** to be within allowable limits. However, with the implementation of the reinforcements outlined on drawings N-1, N-2, S-1 thru S-4 in Section 4 of this report the tower shall be considered to be within the allowable limits. In Load Case 2, per RISATower "Section Capacity Table", this tower was found to be **120.3%** of its total capacity without reinforcement and **98.1%** with the reinforcement.

Condition	Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Existing Tower	Diagonal (T5)	100'-0"-120'-0"	120.3%	**FAIL**
	Leg (T7)	60'-0"-80'-0"	104.1%	**FAIL**
Reinforced Tower	Diagonal (T9)	20'-0"-40'-0"	98.1%	**PASS**
	Leg (T8)	40'-0"-60'-0"	97.2%	**PASS**

Foundation and Anchors

The existing foundation consists of a 32-ft square x 4.5-ft thick reinforced concrete mat. The base of the tower is connected to the foundation by means of (24) 1.00"∅, ASTM A354 Gr. BC anchor bolts embedded approximately 5.5-ft into the concrete foundation structure.

Review of the foundation and anchor design consisted of verification of applied loads obtained from the tower design calculations and code checks of allowable stresses:

- The tower reactions developed from the governing Load Case 2 were used in the verification of the foundation:

Reactions	Vector	Proposed Base Reactions
Base	Shear	**46 kips**
	Compression	**57 kips**
	Moment	**4765 kip-ft**
Leg	Shear	**30 kips**
	Uplift	**269 kips**
	Compression	**308 kips**

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

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	75.9%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS)[1]	Proposed Loading (FS)[1]	Result
Reinforced Concrete Mat	OM[2]	2.0	2.25	**PASS**

Note 1: FS denotes Factor of Safety
Note 2: OM denotes Overturning Moment.

Conclusion

This analysis shows that the subject tower with the proposed reinforcements outlined on drawings N-1, N-2, S-1 thru S-4 within section 4 of this report **is adequate** to support the proposed modified antenna configuration.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principal ~ Structural Engineer

STATE OF CONNECTICUT
CARLO F. CENTORE
No. 16694
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Timothy J. Lynn, EIT
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

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

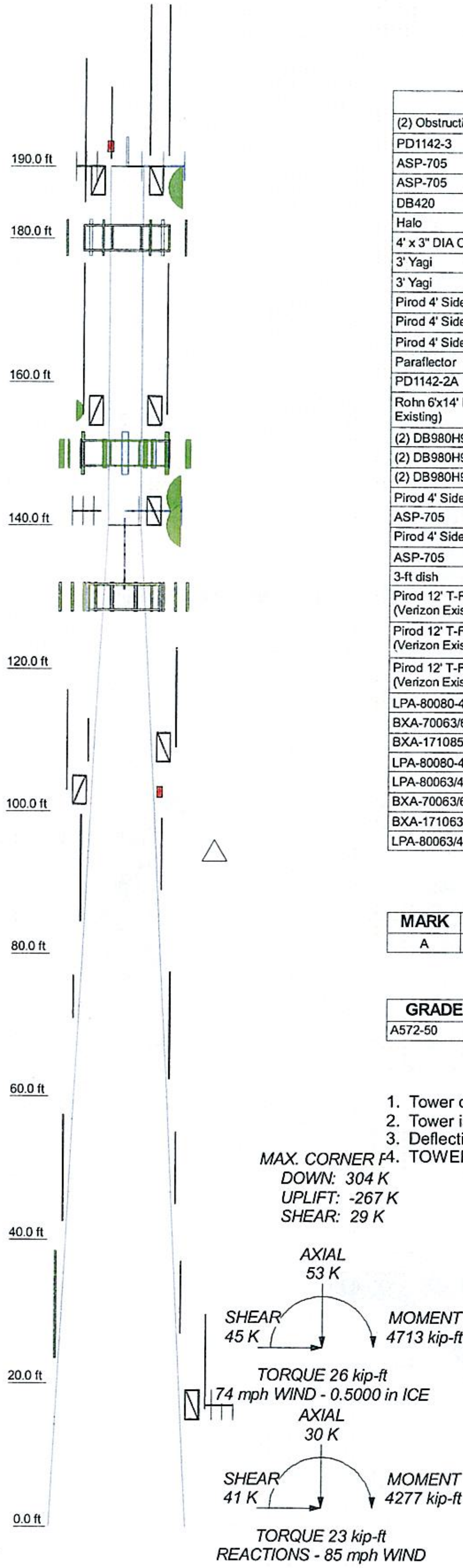
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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

RISATower Features:

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

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	A	A572-50		A36	B	4.65	2 @ 5	0.3
T2	ROHN 2.5 STD				N.A.			0.7
T3	ROHN 3 EH		L1 3/4x1 3/4x3/16			4.69	15 @ 4	1.0
T4	ROHN 3.5 EH				L1 3/4x1 3/4x3/16	4.72		1.2
T5	ROHN 4 EH					6.76	4 @ 5	1.4
T6	ROHN 5 EH		L2 1/2x2 1/2x3/16		N.A.	8.83	9 @ 6.66667	1.9
T7						10.83		2.0
T8	ROHN 6 EHS		L3x3x1/4	A572-50		12.92		2.7
T9	ROHN 6 EH					14.85		2.8
T10	ROHN 8 EHS		L3 1/2x3 1/2x1/4			16.99 / 19	4 @ 10	3.4
								17.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) Obstruction Lights	192	LPA-80063/4CF (Verizon Proposed)	150
PD1142-3	192	BXA-70063/6CF (Verizon Proposed)	150
ASP-705	192	BXA-171063-8CF (Verizon Proposed)	150
ASP-705	192	LPA-80063/4CF (Verizon Proposed)	150
DB420	192	Paraflector	144
Halo	192	Pirod 4' Side Mount Standoff (1)	142
4' x 3" DIA Omni	190	DB264-A	142
3' Yagi	190	DB436-C	142
3' Yagi	190	DB230-2A	142
Pirod 4' Side Mount Standoff (1)	188	Pirod 4' Side Mount Standoff (1)	142
Pirod 4' Side Mount Standoff (1)	188	Paraflector	140
Pirod 4' Side Mount Standoff (1)	188	Single Dipole	136
Paraflector	187	10-ft T-Frame (Nextel Existing)	130
PD1142-2A	187	10-ft T-Frame (Nextel Existing)	130
Rohn 6'x14' Boom Gate (3) (Sprint Existing)	180	10-ft T-Frame (Nextel Existing)	130
		(4) DB844H90E-XY (Nextel Existing)	130
(2) DB980H90E-M (Sprint Existing)	180	(4) DB844H90E-XY (Nextel Existing)	130
(2) DB980H90E-M (Sprint Existing)	180	(4) DB844H90E-XY (Nextel Existing)	130
(2) DB980H90E-M (Sprint Existing)	180	Pirod 4' Side Mount Standoff (1)	113
Pirod 4' Side Mount Standoff (1)	156	Dipole	113
ASP-705	156	PD320	110
Pirod 4' Side Mount Standoff (1)	156	Pirod 4' Side Mount Standoff (1)	109
ASP-705	156	14' x 3" Dia Omni	109
3-ft dish	156	14' x 3" Dia Omni	103
Pirod 12' T-Frame Sector Mount (1) (Verizon Existing)	150	Pirod 4' Side Mount Standoff (1)	103
		GPS	102
Pirod 12' T-Frame Sector Mount (1) (Verizon Existing)	150	1' Standoff Pipe	102
		DB212 Single Dipole	94
Pirod 12' T-Frame Sector Mount (1) (Verizon Existing)	150	15-ft Single Dipole	92
LPA-80080-4CF (Verizon Proposed)	150	PD320	74
BXA-70063/6CF (Verizon Proposed)	150	15-ft Single Dipole	70
BXA-171085-8CF (Verizon Proposed)	150	15-ft Single Dipole	50
LPA-80080-4CF (Verizon Proposed)	150	DB212 Single Dipole	50
LPA-80063/4CF (Verizon Proposed)	150	DB212 Single Dipole	32
BXA-70063/6CF (Verizon Proposed)	150	15-ft Single Dipole	31
BXA-171063-8CF (Verizon Proposed)	150	PD400	17
LPA-80063/4CF (Verizon Proposed)	150	3' Yagi	17
		Pirod 4' Side Mount Standoff (1)	17

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2 STD	B	L1 3/4x1 3/4x3/16

MATERIAL STRENGTH

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

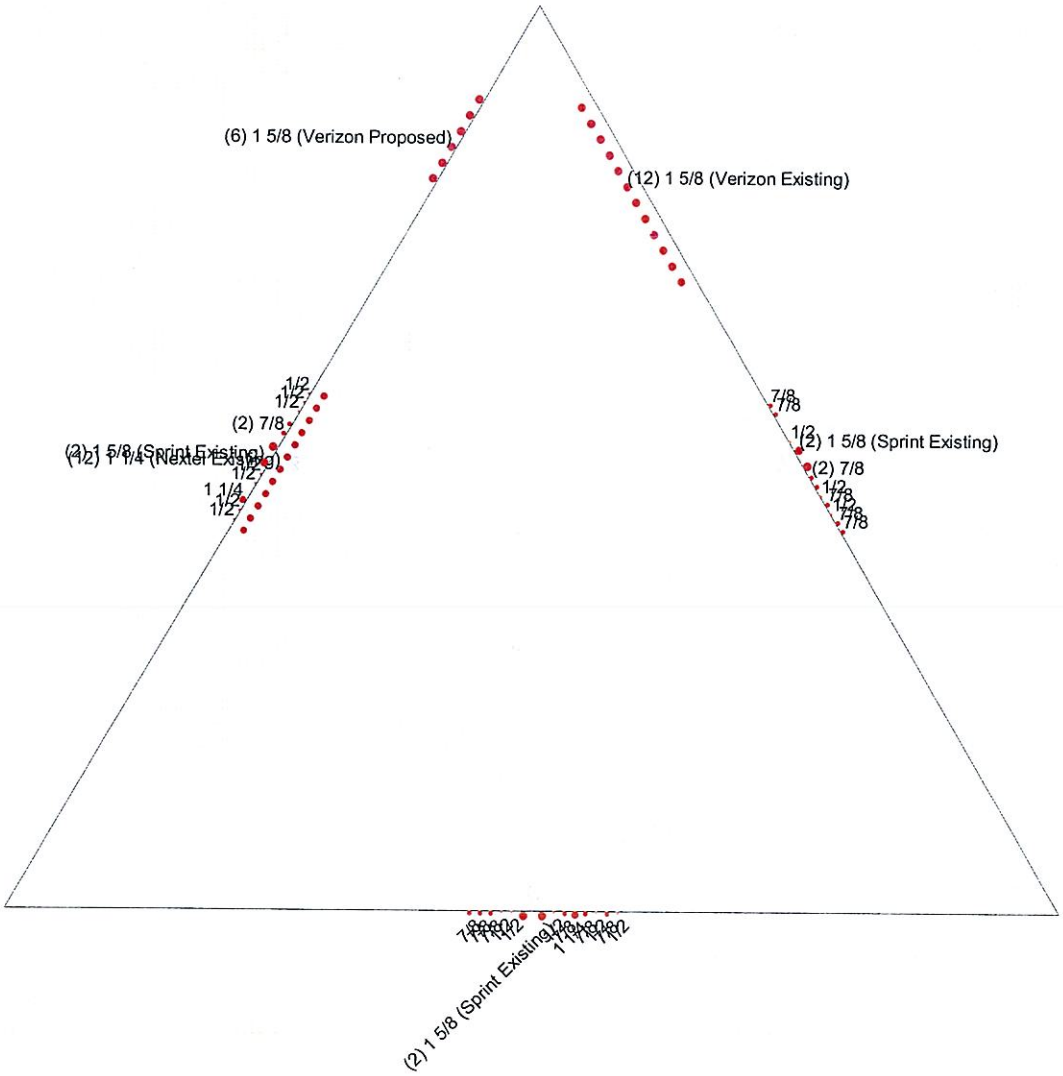
TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 120.3%

Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: **12001.CO64 - Coventry East**		
	Project: **190' Rohn Lattice Tower - 1712 Main St., Coventry, CT**		
	Client: Verizon Wireless	Drawn by: TJL	App'd:
	Code: TIA/EIA-222-F	Date: 05/21/12	Scale: NTS
	Path: [illegible]		Dwg No. E-1

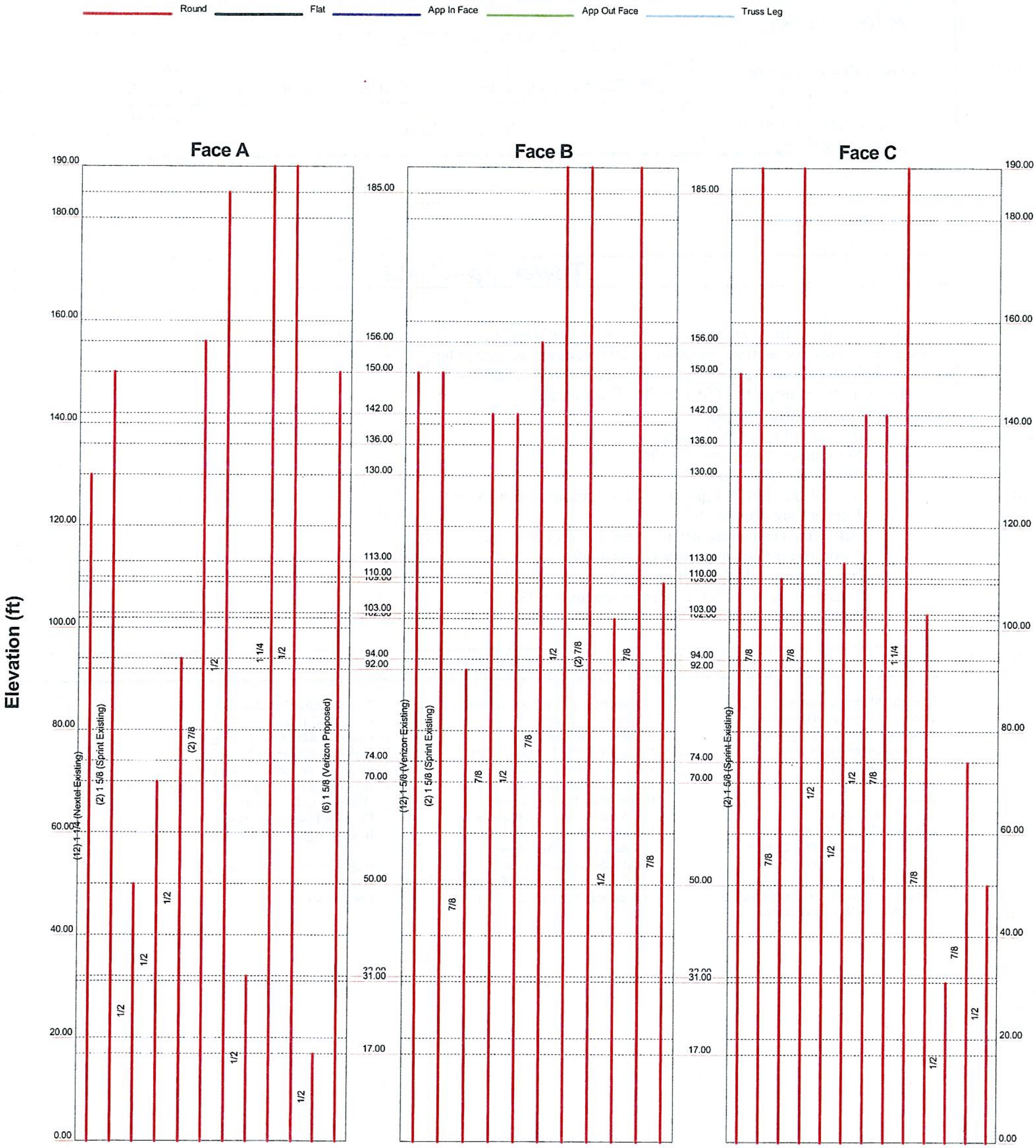
Feedline Plan

Round ____ Flat ____ App In Face ____ App Out Face



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: **12001.CO64 - Coventry East**		
	Project: ***190' Rohn Lattice Tower - 1712 Main St., Coventry, CT***		
	Client: Verizon Wireless	Drawn by: TJL	App'd:
	Code: TIA/EIA-222-F	Date: 05/21/12	Scale: NTS
	Path:		Dwg No. E-7

Feedline Distribution Chart
0' - 190'



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: 12001.CO64 - Coventry East		
	Project: 190' Rohn Lattice Tower - 1712 Main St., Coventry, CT		
	Client: Verizon Wireless	Drawn by: TJL	App'd:
	Code: TIA/EIA-222-F	Date: 05/21/12	Scale: NTS
	Path:		Dwg No. E-7

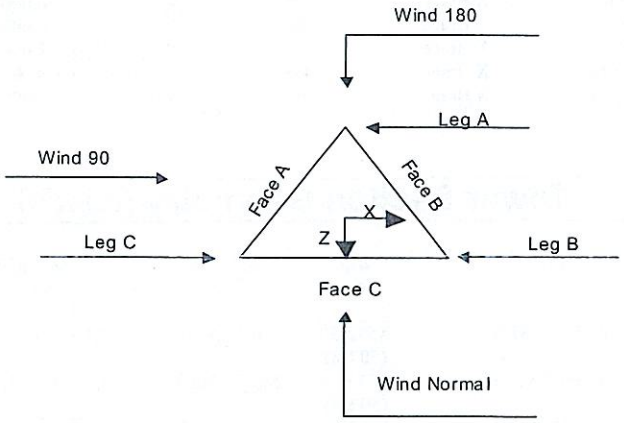
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 190.00 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 4.65 ft at the top and 19.00 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 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	190.00-180.00			4.65	1	10.00
T2	180.00-160.00			4.65	1	20.00
T3	160.00-140.00			4.69	1	20.00
T4	140.00-120.00			4.72	1	20.00
T5	120.00-100.00			6.76	1	20.00
T6	100.00-80.00			8.83	1	20.00
T7	80.00-60.00			10.83	1	20.00
T8	60.00-40.00			12.92	1	20.00
T9	40.00-20.00			14.85	1	20.00
T10	20.00-0.00			16.99	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	190.00-180.00	5.00	X Brace	No	Yes	0.0000	0.0000
T2	180.00-160.00	4.00	X Brace	No	No	0.0000	0.0000
T3	160.00-140.00	4.00	X Brace	No	No	0.0000	0.0000
T4	140.00-120.00	4.00	X Brace	No	Yes	0.0000	0.0000
T5	120.00-100.00	5.00	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
T6	100.00-80.00	6.67	X Brace	No	No	0.0000	0.0000
T7	80.00-60.00	6.67	X Brace	No	No	0.0000	0.0000
T8	60.00-40.00	6.67	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 190.00-180.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 180.00-160.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 160.00-140.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T4 140.00-120.00	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T5 120.00-100.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T6 100.00-80.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.00-60.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 60.00-40.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T9 40.00-20.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T10 20.00-0.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 190.00-180.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T4 140.00-120.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 190.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	30.0000	30.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors[1] X Brace Diags X	K Factors[1] X Brace Diags Y	K Factors[1] Single Diags X	K Factors[1] Single Diags Y	K Factors[1] Girts X	K Factors[1] Girts Y	K Factors[1] Horiz. X	K Factors[1] Horiz. Y	K Factors[1] Sec. Horiz. X	K Factors[1] Sec. Horiz. Y	K Factors[1] Inner Brace X	K Factors[1] Inner Brace Y
T1 190.00-180.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 180.00-160.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 160.00-140.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 190.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 190.00-180.00	Flange	0.6250 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.00-100.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 100.00-80.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.00-40.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T9 40.00-20.00	Flange	1.0000 A325N	8	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T10 20.00-0.00	Flange	1.0000 A354-BC	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon Existing)	B	Yes	Ar (CfAe)	150.00 - 0.00	-2.0000	-0.3	12	12	1.9800	1.9800		1.04
1 1/4 (Nextel Existing)	A	Yes	Ar (CfAe)	130.00 - 0.00	-2.0000	0	12	12	1.5500	1.5500		0.66
1 5/8 (Sprint Existing)	A	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0	2	2	1.9800	1.9800		1.04
1 5/8 (Sprint Existing)	B	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0	2	2	1.9800	1.9800		1.04
1 5/8 (Sprint Existing)	C	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0	2	2	1.9800	1.9800		1.04
1/2	A	Yes	Ar (CfAe)	50.00 - 0.00	0.0000	0.07	1	1	0.5800	0.5800		0.25
1/2	A	Yes	Ar (CfAe)	70.00 - 0.00	0.0000	0.06	1	1	0.5800	0.5800		0.25
1/2	A	Yes	Ar (CfAe)	94.00 - 0.00	0.0000	0.05	1	1	0.5800	0.5800		0.25
7/8	A	Yes	Ar (CfAe)	156.00 - 0.00	0.0000	0.03	2	2	1.1100	1.1100		0.54
1/2	A	Yes	Ar (CfAe)	185.00 - 0.00	0.0000	-0.02	1	1	0.5800	0.5800		0.25
1/2	A	Yes	Ar (CfAe)	32.00 - 0.00	0.0000	-0.03	1	1	0.5800	0.5800		0.25
1 1/4	A	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.05	1	1	1.5500	1.5500		0.66
1/2	A	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.06	1	1	0.5800	0.5800		0.25
1/2	A	Yes	Ar (CfAe)	17.00 - 0.00	0.0000	-0.07	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	92.00 - 0.00	0.0000	0.08	1	1	1.1100	1.1100		0.54
7/8	B	Yes	Ar (CfAe)	142.00 - 0.00	0.0000	0.07	1	1	1.1100	1.1100		0.54
1/2	B	Yes	Ar (CfAe)	142.00 - 0.00	0.0000	0.06	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	156.00 - 0.00	0.0000	0.05	1	1	1.1100	1.1100		0.54
1/2	B	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	0.04	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	0.025	2	2	1.1100	1.1100		0.54
1/2	B	Yes	Ar (CfAe)	102.00 - 0.00	0.0000	-0.02	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.05	1	1	1.1100	1.1100		0.54
7/8	B	Yes	Ar (CfAe)	109.00 - 0.00	0.0000	-0.06	1	1	1.1100	1.1100		0.54
7/8	C	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	0.06	1	1	1.1100	1.1100		0.54
7/8	C	Yes	Ar (CfAe)	110.00 - 0.00	0.0000	0.05	1	1	1.1100	1.1100		0.54
7/8	C	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	0.04	1	1	1.1100	1.1100		0.54
1/2	C	Yes	Ar (CfAe)	136.00 - 0.00	0.0000	0.03	1	1	0.5800	0.5800		0.25
1/2	C	Yes	Ar (CfAe)	113.00 - 0.00	0.0000	0.02	1	1	0.5800	0.5800		0.25
1/2	C	Yes	Ar (CfAe)	142.00 - 0.00	0.0000	-0.02	1	1	0.5800	0.5800		0.25
7/8	C	Yes	Ar (CfAe)	142.00 - 0.00	0.0000	-0.03	1	1	1.1100	1.1100		0.54
1 1/4	C	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.04	1	1	1.5500	1.5500		0.66
7/8	C	Yes	Ar (CfAe)	103.00 - 0.00	0.0000	-0.05	1	1	1.1100	1.1100		0.54
1/2	C	Yes	Ar (CfAe)	31.00 - 0.00	0.0000	-0.06	1	1	0.5800	0.5800		0.25
7/8	C	Yes	Ar (CfAe)	74.00 - 0.00	0.0000	-0.07	1	1	1.1100	1.1100		0.54
1/2	C	Yes	Ar (CfAe)	50.00 - 0.00	0.0000	-0.08	1	1	0.5800	0.5800		0.25
1 5/8 (Verizon Proposed)	A	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0.35	6	6	1.9800	1.9800		1.04

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	190.00-180.00	A	2.017	0.000	0.000	0.000	0.01
		B	3.258	0.000	0.000	0.000	0.02

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	3.142	0.000	0.000	0.000	0.02
T2	180.00-160.00	A	4.517	0.000	0.000	0.000	0.02
		B	6.517	0.000	0.000	0.000	0.04
		C	6.283	0.000	0.000	0.000	0.03
T3	160.00-140.00	A	20.677	0.000	0.000	0.000	0.12
		B	31.378	0.000	0.000	0.000	0.19
		C	9.865	0.000	0.000	0.000	0.06
T4	140.00-120.00	A	50.117	0.000	0.000	0.000	0.29
		B	57.383	0.000	0.000	0.000	0.36
		C	16.473	0.000	0.000	0.000	0.10
T5	120.00-100.00	A	65.617	0.000	0.000	0.000	0.37
		B	58.313	0.000	0.000	0.000	0.36
		C	18.497	0.000	0.000	0.000	0.11
T6	100.00-80.00	A	66.293	0.000	0.000	0.000	0.37
		B	61.310	0.000	0.000	0.000	0.38
		C	21.333	0.000	0.000	0.000	0.12
T7	80.00-60.00	A	67.067	0.000	0.000	0.000	0.38
		B	62.050	0.000	0.000	0.000	0.38
		C	22.628	0.000	0.000	0.000	0.13
T8	60.00-40.00	A	68.033	0.000	0.000	0.000	0.38
		B	62.050	0.000	0.000	0.000	0.38
		C	23.667	0.000	0.000	0.000	0.14
T9	40.00-20.00	A	69.097	0.000	0.000	0.000	0.39
		B	62.050	0.000	0.000	0.000	0.38
		C	24.682	0.000	0.000	0.000	0.14
T10	20.00-0.00	A	70.305	0.000	0.000	0.000	0.39
		B	62.050	0.000	0.000	0.000	0.38
		C	25.117	0.000	0.000	0.000	0.14

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	190.00-180.00	A	0.500	4.100	0.000	0.000	0.000	0.03
		B		6.592	0.000	0.000	0.000	0.05
		C		5.642	0.000	0.000	0.000	0.05
T2	180.00-160.00	A	0.500	9.517	0.000	0.000	0.000	0.07
		B		13.183	0.000	0.000	0.000	0.11
		C		11.283	0.000	0.000	0.000	0.10
T3	160.00-140.00	A	0.500	35.010	0.000	0.000	0.000	0.33
		B		51.378	0.000	0.000	0.000	0.50
		C		16.865	0.000	0.000	0.000	0.16
T4	140.00-120.00	A	0.500	81.783	0.000	0.000	0.000	0.77
		B		92.383	0.000	0.000	0.000	0.90
		C		29.473	0.000	0.000	0.000	0.26
T5	120.00-100.00	A	0.500	107.283	0.000	0.000	0.000	1.00
		B		94.229	0.000	0.000	0.000	0.92
		C		33.998	0.000	0.000	0.000	0.30
T6	100.00-80.00	A	0.500	109.127	0.000	0.000	0.000	1.02
		B		100.643	0.000	0.000	0.000	0.97
		C		39.667	0.000	0.000	0.000	0.35
T7	80.00-60.00	A	0.500	111.233	0.000	0.000	0.000	1.03
		B		102.050	0.000	0.000	0.000	0.98
		C		42.128	0.000	0.000	0.000	0.37
T8	60.00-40.00	A	0.500	113.867	0.000	0.000	0.000	1.05
		B		102.050	0.000	0.000	0.000	0.98
		C		44.500	0.000	0.000	0.000	0.39

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 K
T9	40.00-20.00	A	0.500	116.763	0.000	0.000	0.000	1.07
		B		102.050	0.000	0.000	0.000	0.98
		C		47.265	0.000	0.000	0.000	0.41
T10	20.00-0.00	A	0.500	120.055	0.000	0.000	0.000	1.09
		B		102.050	0.000	0.000	0.000	0.98
		C		48.450	0.000	0.000	0.000	0.41

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	190.00-180.00	A	0.000	0.235	0.202	0.411
		B	0.000	0.378	0.327	0.661
		C	0.000	0.323	0.315	0.566
T2	180.00-160.00	A	0.000	0.522	0.434	0.914
		B	0.000	0.723	0.626	1.266
		C	0.000	0.619	0.603	1.083
T3	160.00-140.00	A	0.000	1.915	1.979	3.351
		B	0.000	2.810	3.003	4.917
		C	0.000	0.922	0.944	1.614
T4	140.00-120.00	A	0.000	4.513	4.839	7.897
		B	0.000	5.098	5.541	8.921
		C	0.000	1.626	1.591	2.846
T5	120.00-100.00	A	0.000	4.258	4.557	7.451
		B	0.000	3.740	4.050	6.544
		C	0.000	1.349	1.285	2.361
T6	100.00-80.00	A	0.000	3.300	5.013	8.251
		B	0.000	3.044	4.636	7.610
		C	0.000	1.200	1.613	2.999
T7	80.00-60.00	A	0.000	3.191	4.811	7.979
		B	0.000	2.928	4.451	7.320
		C	0.000	1.209	1.623	3.022
T8	60.00-40.00	A	0.000	3.159	5.662	9.477
		B	0.000	2.831	5.164	8.493
		C	0.000	1.235	1.970	3.704
T9	40.00-20.00	A	0.000	2.299	4.081	6.897
		B	0.000	2.009	3.665	6.028
		C	0.000	0.931	1.458	2.792
T10	20.00-0.00	A	0.000	2.290	4.693	8.014
		B	0.000	1.946	4.142	6.812
		C	0.000	0.924	1.677	3.234

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	190.00-180.00	0.3629	0.3944	0.4331	0.2891
T2	180.00-160.00	0.2511	0.3282	0.2667	0.2053
T3	160.00-140.00	0.1386	-5.3435	0.1383	-5.2182
T4	140.00-120.00	-0.7154	-8.7944	-0.6857	-8.4166

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T5	120.00-100.00	-1.9824	-11.4813	-2.0077	-11.0274
T6	100.00-80.00	-1.8584	-12.6939	-1.8762	-12.5635
T7	80.00-60.00	-2.0646	-14.7621	-2.1209	-14.5978
T8	60.00-40.00	-2.1890	-15.2840	-2.3780	-15.4847
T9	40.00-20.00	-2.7437	-18.3855	-3.0563	-18.4156
T10	20.00-0.00	-2.9074	-18.2450	-3.4923	-18.8374

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft / ft / ft	°	ft		ft^2	ft^2	K
Pirod 4' Side Mount Standoff (1)	A	From Leg	2.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
(2) Obstruction Lights	C	From Leg	0.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice	0.18 0.25	0.18 0.25	0.01 0.01
PD1142-3	C	From Leg	0.00 0.00 4.00	0.0000	192.00	No Ice 1/2" Ice	0.48 0.55	0.48 0.55	0.01 0.01
3' Yagi	C	From Leg	1.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	2.08 3.79	2.08 3.79	0.03 0.05
PD1142-2A	C	From Leg	4.00 0.00 8.00	0.0000	187.00	No Ice 1/2" Ice	0.79 0.91	0.79 0.91	0.01 0.01
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00 0.00 0.00	0.0000	156.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
ASP-705	C	From Leg	4.00 0.00 10.00	0.0000	156.00	No Ice 1/2" Ice	5.88 8.01	5.88 8.01	0.03 0.07
DB230-2A	C	From Leg	1.00 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice	3.00 5.40	3.00 5.40	0.11 0.15
PD320	C	From Leg	1.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice	2.03 4.58	2.03 4.58	0.01 0.03
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
14' x 3" Dia Omni	C	From Leg	4.00 0.00 7.00	0.0000	103.00	No Ice 1/2" Ice	4.20 5.63	4.20 5.63	0.04 0.07
15-ft Single Dipole	C	From Leg	1.00	0.0000	92.00	No Ice	3.00	3.00	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	6.00	6.00	0.06
			0.00						
PD320	C	From Leg	1.00	0.0000	74.00	No Ice	2.03	2.03	0.01
			0.00			1/2" Ice	4.58	4.58	0.03
			0.00						
15-ft Single Dipole	C	From Leg	1.00	0.0000	50.00	No Ice	3.00	3.00	0.04
			0.00			1/2" Ice	6.00	6.00	0.06
			0.00						
15-ft Single Dipole	C	From Leg	1.00	0.0000	31.00	No Ice	3.00	3.00	0.04
			0.00			1/2" Ice	6.00	6.00	0.06
			0.00						
ASP-705	B	From Leg	1.00	0.0000	192.00	No Ice	5.88	5.88	0.03
			0.00			1/2" Ice	8.01	8.01	0.07
			10.00						
ASP-705	B	From Leg	4.00	0.0000	192.00	No Ice	5.88	5.88	0.03
			0.00			1/2" Ice	8.01	8.01	0.07
			10.00						
Paraflector	B	From Leg	4.00	0.0000	187.00	No Ice	8.90	8.90	0.04
			0.00			1/2" Ice	10.70	10.70	0.60
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	156.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
ASP-705	B	From Leg	4.00	0.0000	156.00	No Ice	5.88	5.88	0.03
			0.00			1/2" Ice	8.01	8.01	0.07
			10.00						
Paraflector	B	From Leg	4.00	0.0000	144.00	No Ice	8.90	8.90	0.04
			0.00			1/2" Ice	10.70	10.70	0.60
			0.00						
Paraflector	B	From Leg	4.00	0.0000	140.00	No Ice	8.90	8.90	0.04
			0.00			1/2" Ice	10.70	10.70	0.60
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	142.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	109.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
14' x 3" Dia Omni	B	From Leg	4.00	0.0000	109.00	No Ice	4.20	4.20	0.04
			0.00			1/2" Ice	5.63	5.63	0.07
			7.00						
GPS	B	From Leg	1.00	0.0000	102.00	No Ice	1.00	1.00	0.01
			0.00			1/2" Ice	1.50	1.50	0.01
			0.00						
1' Standoff Pipe	B	From Leg	0.50	0.0000	102.00	No Ice	0.16	0.16	0.01
			0.00			1/2" Ice	0.23	0.23	0.01
			0.00						
DB212 Single Dipole	B	From Leg	1.00	0.0000	94.00	No Ice	1.60	1.60	0.03
			0.00			1/2" Ice	3.20	3.20	0.04
			0.00						
15-ft Single Dipole	B	From Leg	1.00	0.0000	70.00	No Ice	3.00	3.00	0.04
			0.00			1/2" Ice	6.00	6.00	0.06
			0.00						
DB212 Single Dipole	B	From Leg	1.00	0.0000	50.00	No Ice	1.60	1.60	0.03
			0.00			1/2" Ice	3.20	3.20	0.04
			0.00						
DB212 Single Dipole	B	From Leg	1.00	0.0000	32.00	No Ice	1.60	1.60	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	3.20	3.20	0.04
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	17.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
PD400	B	From Leg	4.00	0.0000	17.00	No Ice	3.13	3.13	0.02
			0.00			1/2" Ice	4.48	4.48	0.04
			6.00						
3' Yagi	B	From Leg	4.00	0.0000	17.00	No Ice	2.08	2.08	0.03
			0.00			1/2" Ice	3.79	3.79	0.05
			0.00						
DB420	A	From Leg	1.00	0.0000	192.00	No Ice	3.33	3.33	0.03
			0.00			1/2" Ice	5.99	5.99	0.04
			10.00						
4' x 3" DIA Omni	A	From Leg	4.00	0.0000	190.00	No Ice	1.00	1.00	0.02
			0.00			1/2" Ice	1.25	1.25	0.02
			2.00						
Halo	A	From Leg	4.00	0.0000	192.00	No Ice	4.00	4.00	0.01
			0.00			1/2" Ice	5.60	5.60	0.03
			0.00						
3' Yagi	A	From Leg	4.00	0.0000	190.00	No Ice	2.08	2.08	0.03
			0.00			1/2" Ice	3.79	3.79	0.05
			0.00						
Pirod 4' Side Mount Standoff (1)	A	From Leg	2.00	0.0000	142.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
DB264-A	A	From Leg	4.00	0.0000	142.00	No Ice	3.16	3.16	0.04
			0.00			1/2" Ice	5.69	5.69	0.05
			0.00						
DB436-C	A	From Leg	4.00	0.0000	142.00	No Ice	0.45	0.45	0.01
			0.00			1/2" Ice	0.81	0.81	0.01
			0.00						
Single Dipole	A	From Leg	1.00	0.0000	136.00	No Ice	1.60	1.60	0.03
			0.00			1/2" Ice	3.20	3.20	0.04
			0.00						
Pirod 4' Side Mount Standoff (1)	A	From Leg	2.00	0.0000	113.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
Dipole	A	From Leg	4.00	0.0000	113.00	No Ice	3.16	3.16	0.04
			0.00			1/2" Ice	5.69	5.69	0.05
			3.00						
Rohn 6'x14' Boom Gate (3) (Sprint Existing)	C	None		0.0000	180.00	No Ice	52.00	52.00	1.75
						1/2" Ice	61.90	61.90	2.19
(2) DB980H90E-M (Sprint Existing)	A	From Leg	4.00	0.0000	180.00	No Ice	3.80	2.19	0.01
			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
(2) DB980H90E-M (Sprint Existing)	B	From Leg	4.00	0.0000	180.00	No Ice	3.80	2.19	0.01
			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
(2) DB980H90E-M (Sprint Existing)	C	From Leg	4.00	0.0000	180.00	No Ice	3.80	2.19	0.01
			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
10-ft T-Frame (Nextel Existing)	A	None		0.0000	130.00	No Ice	13.60	13.60	0.38
						1/2" Ice	17.50	17.50	0.53
10-ft T-Frame (Nextel Existing)	B	None		0.0000	130.00	No Ice	13.60	13.60	0.38
						1/2" Ice	17.50	17.50	0.53
10-ft T-Frame	C	None		0.0000	130.00	No Ice	13.60	13.60	0.38

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Nextel Existing)						1/2" Ice	17.50	17.50	0.53
(4) DB844H90E-XY	A	From Leg	4.00	0.0000	130.00	No Ice	2.87	3.73	0.01
(Nextel Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(4) DB844H90E-XY	B	From Leg	4.00	0.0000	130.00	No Ice	2.87	3.73	0.01
(Nextel Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(4) DB844H90E-XY	C	From Leg	4.00	0.0000	130.00	No Ice	2.87	3.73	0.01
(Nextel Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
Pirod 12' T-Frame Sector Mount (1)	A	None		0.0000	150.00	No Ice	13.60	13.60	0.47
(Verizon Existing)						1/2" Ice	18.40	18.40	0.60
Pirod 12' T-Frame Sector Mount (1)	B	None		0.0000	150.00	No Ice	13.60	13.60	0.47
(Verizon Existing)						1/2" Ice	18.40	18.40	0.60
Pirod 12' T-Frame Sector Mount (1)	C	None		0.0000	150.00	No Ice	13.60	13.60	0.47
(Verizon Existing)						1/2" Ice	18.40	18.40	0.60
LPA-80080-4CF	A	From Leg	4.00	0.0000	150.00	No Ice	2.62	6.06	0.01
(Verizon Proposed)			-6.00			1/2" Ice	2.92	6.45	0.05
			0.00						
BXA-70063/6CF	A	From Leg	4.00	0.0000	150.00	No Ice	7.73	4.16	0.02
(Verizon Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171085-8CF	A	From Leg	4.00	0.0000	150.00	No Ice	2.94	2.16	0.01
(Verizon Proposed)			4.00			1/2" Ice	3.26	2.46	0.03
			0.00						
LPA-80080-4CF	A	From Leg	4.00	0.0000	150.00	No Ice	2.62	6.06	0.01
(Verizon Proposed)			6.00			1/2" Ice	2.92	6.45	0.05
			0.00						
LPA-80063/4CF	B	From Leg	4.00	0.0000	150.00	No Ice	7.00	6.08	0.02
(Verizon Proposed)			-6.00			1/2" Ice	7.41	6.48	0.07
			0.00						
BXA-70063/6CF	B	From Leg	4.00	0.0000	150.00	No Ice	7.73	4.16	0.02
(Verizon Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-8CF	B	From Leg	4.00	0.0000	150.00	No Ice	2.94	2.16	0.01
(Verizon Proposed)			4.00			1/2" Ice	3.26	2.46	0.03
			0.00						
LPA-80063/4CF	B	From Leg	4.00	0.0000	150.00	No Ice	7.00	6.08	0.02
(Verizon Proposed)			6.00			1/2" Ice	7.41	6.48	0.07
			0.00						
LPA-80063/4CF	C	From Leg	4.00	0.0000	150.00	No Ice	7.00	6.08	0.02
(Verizon Proposed)			-6.00			1/2" Ice	7.41	6.48	0.07
			0.00						
BXA-70063/6CF	C	From Leg	4.00	0.0000	150.00	No Ice	7.73	4.16	0.02
(Verizon Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-8CF	C	From Leg	4.00	0.0000	150.00	No Ice	2.94	2.16	0.01
(Verizon Proposed)			4.00			1/2" Ice	3.26	2.46	0.03
			0.00						
LPA-80063/4CF	C	From Leg	4.00	0.0000	150.00	No Ice	7.00	6.08	0.02
(Verizon Proposed)			6.00			1/2" Ice	7.41	6.48	0.07
			0.00						

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
3-ft dish	C	Paraboloid w/o Radome	From Leg	4.00 0.00 0.00	0.0000		156.00	3.00	No Ice 1/2" Ice	3.14 3.41	0.08 0.10

Tower Pressures - No Ice

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg % %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 190.00-180.00	185.00	1.636	30	48.479	A	4.261	5.975	3.958	38.67	0.000	0.000
					B	4.136	7.217		34.87	0.000	0.000
					C	4.148	7.100		35.19	0.000	0.000
T2 180.00-160.00	170.00	1.597	30	98.192	A	8.081	14.100	9.583	43.20	0.000	0.000
					B	7.889	16.100		39.95	0.000	0.000
					C	7.912	15.867		40.30	0.000	0.000
T3 160.00-140.00	150.00	1.541	29	99.933	A	6.479	32.343	11.667	30.05	0.000	0.000
					B	5.455	43.045		24.06	0.000	0.000
					C	7.514	21.532		40.17	0.000	0.000
T4 140.00-120.00	130.00	1.48	27	121.475	A	5.435	63.473	13.356	19.38	0.000	0.000
					B	4.733	70.740		17.70	0.000	0.000
					C	8.684	29.830		34.68	0.000	0.000
T5 120.00-100.00	110.00	1.411	26	163.410	A	5.741	80.643	15.027	17.40	0.000	0.000
					B	6.249	73.339		18.88	0.000	0.000
					C	9.014	33.524		35.33	0.000	0.000
T6 100.00-80.00	90.00	1.332	25	205.883	A	9.163	84.868	18.574	19.75	0.000	0.000
					B	9.540	79.884		20.77	0.000	0.000
					C	12.562	39.908		35.40	0.000	0.000
T7 80.00-60.00	70.00	1.24	23	246.784	A	11.553	85.644	18.577	19.11	0.000	0.000
					B	11.913	80.627		20.07	0.000	0.000
					C	14.740	41.205		33.21	0.000	0.000
T8 60.00-40.00	50.00	1.126	21	288.755	A	16.552	90.151	22.118	20.73	0.000	0.000
					B	17.050	84.168		21.85	0.000	0.000
					C	20.244	45.784		33.50	0.000	0.000
T9 40.00-20.00	30.00	1	18	329.457	A	14.071	91.222	22.125	21.01	0.000	0.000
					B	14.487	84.175		22.43	0.000	0.000
					C	16.695	46.807		34.84	0.000	0.000
T10 20.00-0.00	10.00	1	18	374.293	A	18.426	99.103	28.798	24.50	0.000	0.000
					B	18.977	90.848		26.22	0.000	0.000
					C	21.442	53.915		38.22	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 190.00-180.00	185.00	1.636	23	0.5000	49.313	A	4.052	12.040	5.625	34.96	0.000	0.000
						B	3.802	14.389		30.92	0.000	0.000
						C	3.897	13.494		32.34	0.000	0.000
T2 180.00-160.00	170.00	1.597	22	0.5000	99.858	A	7.601	26.777	12.917	37.57	0.000	0.000
						B	7.249	30.243		34.45	0.000	0.000
						C	7.432	28.447		36.00	0.000	0.000
T3 160.00-140.00	150.00	1.541	21	0.5000	101.600	A	5.107	52.928	15.000	25.85	0.000	0.000
						B	3.540	68.401		20.85	0.000	0.000
						C	6.844	35.776		35.20	0.000	0.000
T4 140.00-120.00	130.00	1.48	21	0.5000	123.144	A	2.377	99.837	16.696	16.33	0.000	0.000
						B	1.354	109.852		15.01	0.000	0.000
						C	7.428	50.414		28.86	0.000	0.000
T5 120.00-100.00	110.00	1.411	20	0.5000	165.079	A	2.847	127.276	18.366	14.11	0.000	0.000
						B	3.754	114.740		15.50	0.000	0.000
						C	7.937	56.899		28.33	0.000	0.000
T6 100.00-80.00	90.00	1.332	18	0.5000	207.552	A	5.924	133.409	21.913	15.73	0.000	0.000
						B	6.566	125.183		16.63	0.000	0.000
						C	11.176	66.050		28.38	0.000	0.000
T7 80.00-60.00	70.00	1.24	17	0.5000	248.453	A	8.385	136.504	21.916	15.13	0.000	0.000
						B	9.044	127.584		16.04	0.000	0.000
						C	13.342	69.381		26.49	0.000	0.000
T8 60.00-40.00	50.00	1.126	16	0.5000	290.423	A	12.737	143.568	25.456	16.29	0.000	0.000
						B	13.720	132.080		17.46	0.000	0.000
						C	18.510	76.126		26.90	0.000	0.000
T9 40.00-20.00	30.00	1	14	0.5000	331.127	A	11.256	145.980	25.465	16.20	0.000	0.000
						B	12.125	131.557		17.72	0.000	0.000
						C	15.361	77.850		27.32	0.000	0.000
T10 20.00-0.00	10.00	1	14	0.5000	375.962	A	15.105	156.508	32.137	18.73	0.000	0.000
						B	16.307	138.846		20.71	0.000	0.000
						C	19.885	86.269		30.27	0.000	0.000

Tower Pressure - Service

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 190.00-180.00	185.00	1.636	10	48.479	A	4.261	5.975	3.958	38.67	0.000	0.000
					B	4.136	7.217		34.87	0.000	0.000
					C	4.148	7.100		35.19	0.000	0.000
T2 180.00-160.00	170.00	1.597	10	98.192	A	8.081	14.100	9.583	43.20	0.000	0.000
					B	7.889	16.100		39.95	0.000	0.000
					C	7.912	15.867		40.30	0.000	0.000
T3 160.00-140.00	150.00	1.541	10	99.933	A	6.479	32.343	11.667	30.05	0.000	0.000
					B	5.455	43.045		24.06	0.000	0.000
					C	7.514	21.532		40.17	0.000	0.000
T4 140.00-120.00	130.00	1.48	9	121.475	A	5.435	63.473	13.356	19.38	0.000	0.000
					B	4.733	70.740		17.70	0.000	0.000
					C	8.684	29.830		34.68	0.000	0.000
T5 120.00-100.00	110.00	1.411	9	163.410	A	5.741	80.643	15.027	17.40	0.000	0.000
					B	6.249	73.339		18.88	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	9.014	33.524		35.33	0.000	0.000
T6 100.00-80.00	90.00	1.332	9	205.883	A	9.163	84.868	18.574	19.75	0.000	0.000
					B	9.540	79.884		20.77	0.000	0.000
					C	12.562	39.908		35.40	0.000	0.000
T7 80.00-60.00	70.00	1.24	8	246.784	A	11.553	85.644	18.577	19.11	0.000	0.000
					B	11.913	80.627		20.07	0.000	0.000
					C	14.740	41.205		33.21	0.000	0.000
T8 60.00-40.00	50.00	1.126	7	288.755	A	16.552	90.151	22.118	20.73	0.000	0.000
					B	17.050	84.168		21.85	0.000	0.000
					C	20.244	45.784		33.50	0.000	0.000
T9 40.00-20.00	30.00	1	6	329.457	A	14.071	91.222	22.125	21.01	0.000	0.000
					B	14.487	84.175		22.43	0.000	0.000
					C	16.695	46.807		34.84	0.000	0.000
T10 20.00-0.00	10.00	1	6	374.293	A	18.426	99.103	28.798	24.50	0.000	0.000
					B	18.977	90.848		26.22	0.000	0.000
					C	21.442	53.915		38.22	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1 190.00-180.00	0.05	0.31	A	0.211	2.559	0.593	1	1	7.802	0.71	71.04	B
			B	0.234	2.486	0.598	1	1	8.451			
			C	0.232	2.493	0.597	1	1	8.390			
T2 180.00-160.00	0.10	0.74	A	0.226	2.512	0.596	1	1	16.485	1.42	71.13	B
			B	0.244	2.455	0.6	1	1	17.557			
			C	0.242	2.461	0.6	1	1	17.430			
T3 160.00-140.00	0.37	1.01	A	0.388	2.087	0.647	1	1	27.404	2.15	107.50	B
			B	0.485	1.92	0.69	1	1	35.161			
			C	0.291	2.321	0.613	1	1	20.714			
T4 140.00-120.00	0.74	1.23	A	0.567	1.828	0.734	1	1	52.031	3.23	161.60	B
			B	0.621	1.792	0.767	1	1	58.981			
			C	0.317	2.252	0.621	1	1	27.216			
T5 120.00-100.00	0.84	1.37	A	0.529	1.866	0.713	1	1	63.202	3.44	171.84	A
			B	0.487	1.917	0.691	1	1	56.924			
			C	0.26	2.407	0.605	1	1	29.281			
T6 100.00-80.00	0.87	1.91	A	0.457	1.963	0.676	1	1	66.566	3.60	179.80	A
			B	0.434	2	0.666	1	1	62.760			
			C	0.255	2.423	0.603	1	1	36.632			
T7 80.00-60.00	0.89	2.00	A	0.394	2.076	0.649	1	1	67.145	3.57	178.57	A
			B	0.375	2.116	0.642	1	1	63.652			
			C	0.227	2.509	0.596	1	1	39.307			
T8 60.00-40.00	0.90	2.73	A	0.37	2.127	0.64	1	1	74.216	3.67	183.70	A
			B	0.351	2.17	0.633	1	1	70.299			
			C	0.229	2.503	0.597	1	1	47.562			
T9 40.00-20.00	0.91	2.83	A	0.32	2.245	0.622	1	1	70.820	3.29	164.29	A
			B	0.299	2.297	0.616	1	1	66.317			
			C	0.193	2.62	0.589	1	1	44.262			
T10 20.00-0.00	0.92	3.41	A	0.314	2.259	0.62	1	1	79.898	3.73	186.52	A
			B	0.293	2.314	0.614	1	1	74.749			
			C	0.201	2.592	0.591	1	1	53.288			
Sum Weight:	6.59	17.53						OTM	2387.19 kip-ft	28.81		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.825	1	7.057	0.65	64.96	B
190.00-180.00			B	0.234	2.486	0.598	0.825	1	7.728			
			C	0.232	2.493	0.597	0.825	1	7.664			
T2	0.10	0.74	A	0.226	2.512	0.596	0.825	1	15.071	1.31	65.53	B
180.00-160.00			B	0.244	2.455	0.6	0.825	1	16.176			
			C	0.242	2.461	0.6	0.825	1	16.046			
T3	0.37	1.01	A	0.388	2.087	0.647	0.825	1	26.270	2.09	104.58	B
160.00-140.00			B	0.485	1.92	0.69	0.825	1	34.206			
			C	0.291	2.321	0.613	0.825	1	19.399			
T4	0.74	1.23	A	0.567	1.828	0.734	0.825	1	51.080	3.19	159.33	B
140.00-120.00			B	0.621	1.792	0.767	0.825	1	58.153			
			C	0.317	2.252	0.621	0.825	1	25.696			
T5	0.84	1.37	A	0.529	1.866	0.713	0.825	1	62.197	3.38	169.11	A
120.00-100.00			B	0.487	1.917	0.691	0.825	1	55.831			
			C	0.26	2.407	0.605	0.825	1	27.704			
T6	0.87	1.91	A	0.457	1.963	0.676	0.825	1	64.962	3.51	175.47	A
100.00-80.00			B	0.434	2	0.666	0.825	1	61.090			
			C	0.255	2.423	0.603	0.825	1	34.433			
T7	0.89	2.00	A	0.394	2.076	0.649	0.825	1	65.123	3.46	173.19	A
80.00-60.00			B	0.375	2.116	0.642	0.825	1	61.567			
			C	0.227	2.509	0.596	0.825	1	36.728			
T8	0.90	2.73	A	0.37	2.127	0.64	0.825	1	71.319	3.53	176.53	A
60.00-40.00			B	0.351	2.17	0.633	0.825	1	67.316			
			C	0.229	2.503	0.597	0.825	1	44.019			
T9	0.91	2.83	A	0.32	2.245	0.622	0.825	1	68.357	3.17	158.57	A
40.00-20.00			B	0.299	2.297	0.616	0.825	1	63.782			
			C	0.193	2.62	0.589	0.825	1	41.340			
T10	0.92	3.41	A	0.314	2.259	0.62	0.825	1	76.674	3.58	178.99	A
20.00-0.00			B	0.293	2.314	0.614	0.825	1	71.428			
			C	0.201	2.592	0.591	0.825	1	49.536			
Sum Weight:	6.59	17.53						OTM	2308.83 kip-ft	27.88		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.8	1	6.950	0.64	64.09	B
190.00-180.00			B	0.234	2.486	0.598	0.8	1	7.624			
			C	0.232	2.493	0.597	0.8	1	7.560			
T2	0.10	0.74	A	0.226	2.512	0.596	0.8	1	14.869	1.29	64.74	B
180.00-160.00			B	0.244	2.455	0.6	0.8	1	15.979			
			C	0.242	2.461	0.6	0.8	1	15.848			
T3	0.37	1.01	A	0.388	2.087	0.647	0.8	1	26.108	2.08	104.16	B
160.00-140.00			B	0.485	1.92	0.69	0.8	1	34.070			
			C	0.291	2.321	0.613	0.8	1	19.211			
T4	0.74	1.23	A	0.567	1.828	0.734	0.8	1	50.944	3.18	159.01	B
140.00-120.00			B	0.621	1.792	0.767	0.8	1	58.035			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.317	2.252	0.621	0.8	1	25.479			
T5	0.84	1.37	A	0.529	1.866	0.713	0.8	1	62.053	3.37	168.72	A
120.00-100.00			B	0.487	1.917	0.691	0.8	1	55.675			
			C	0.26	2.407	0.605	0.8	1	27.478			
T6	0.87	1.91	A	0.457	1.963	0.676	0.8	1	64.733	3.50	174.85	A
100.00-80.00			B	0.434	2	0.666	0.8	1	60.852			
			C	0.255	2.423	0.603	0.8	1	34.119			
T7	0.89	2.00	A	0.394	2.076	0.649	0.8	1	64.835	3.45	172.43	A
80.00-60.00			B	0.375	2.116	0.642	0.8	1	61.269			
			C	0.227	2.509	0.596	0.8	1	36.359			
T8	0.90	2.73	A	0.37	2.127	0.64	0.8	1	70.905	3.51	175.51	A
60.00-40.00			B	0.351	2.17	0.633	0.8	1	66.889			
			C	0.229	2.503	0.597	0.8	1	43.513			
T9	0.91	2.83	A	0.32	2.245	0.622	0.8	1	68.006	3.16	157.76	A
40.00-20.00			B	0.299	2.297	0.616	0.8	1	63.420			
			C	0.193	2.62	0.589	0.8	1	40.923			
T10	0.92	3.41	A	0.314	2.259	0.62	0.8	1	76.213	3.56	177.92	A
20.00-0.00			B	0.293	2.314	0.614	0.8	1	70.954			
			C	0.201	2.592	0.591	0.8	1	49.000			
Sum Weight:	6.59	17.53						OTM	2297.63 kip-ft	27.74		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.85	1	7.163	0.66	65.83	B
190.00-180.00			B	0.234	2.486	0.598	0.85	1	7.831			
			C	0.232	2.493	0.597	0.85	1	7.768			
T2	0.10	0.74	A	0.226	2.512	0.596	0.85	1	15.273	1.33	66.33	B
180.00-160.00			B	0.244	2.455	0.6	0.85	1	16.373			
			C	0.242	2.461	0.6	0.85	1	16.244			
T3	0.37	1.01	A	0.388	2.087	0.647	0.85	1	26.432	2.10	105.00	B
160.00-140.00			B	0.485	1.92	0.69	0.85	1	34.343			
			C	0.291	2.321	0.613	0.85	1	19.587			
T4	0.74	1.23	A	0.567	1.828	0.734	0.85	1	51.216	3.19	159.66	B
140.00-120.00			B	0.621	1.792	0.767	0.85	1	58.271			
			C	0.317	2.252	0.621	0.85	1	25.913			
T5	0.84	1.37	A	0.529	1.866	0.713	0.85	1	62.340	3.39	169.50	A
120.00-100.00			B	0.487	1.917	0.691	0.85	1	55.987			
			C	0.26	2.407	0.605	0.85	1	27.929			
T6	0.87	1.91	A	0.457	1.963	0.676	0.85	1	65.191	3.52	176.08	A
100.00-80.00			B	0.434	2	0.666	0.85	1	61.329			
			C	0.255	2.423	0.603	0.85	1	34.747			
T7	0.89	2.00	A	0.394	2.076	0.649	0.85	1	65.412	3.48	173.96	A
80.00-60.00			B	0.375	2.116	0.642	0.85	1	61.865			
			C	0.227	2.509	0.596	0.85	1	37.096			
T8	0.90	2.73	A	0.37	2.127	0.64	0.85	1	71.733	3.55	177.56	A
60.00-40.00			B	0.351	2.17	0.633	0.85	1	67.742			
			C	0.229	2.503	0.597	0.85	1	44.525			
T9	0.91	2.83	A	0.32	2.245	0.622	0.85	1	68.709	3.19	159.39	A
40.00-20.00			B	0.299	2.297	0.616	0.85	1	64.144			
			C	0.193	2.62	0.589	0.85	1	41.757			
T10	0.92	3.41	A	0.314	2.259	0.62	0.85	1	77.134	3.60	180.07	A

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
20.00-0.00			B	0.293	2.314	0.614	0.85	1	71.903			
			C	0.201	2.592	0.591	0.85	1	50.072			
Sum Weight:	6.59	17.53						OTM	2320.02 kip-ft	28.01		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.14	0.53	A	0.326	2.228	0.624	1	1	11.569	0.70	70.21	B
190.00-180.00			B	0.369	2.129	0.639	1	1	13.003			
			C	0.353	2.165	0.633	1	1	12.445			
T2	0.28	1.18	A	0.344	2.185	0.63	1	1	24.483	1.40	69.79	B
180.00-160.00			B	0.375	2.115	0.642	1	1	26.662			
			C	0.359	2.15	0.636	1	1	25.519			
T3	0.98	1.48	A	0.571	1.825	0.736	1	1	44.084	2.55	127.37	B
160.00-140.00			B	0.708	1.777	0.826	1	1	60.020			
			C	0.419	2.027	0.66	1	1	30.446			
T4	1.94	1.78	A	0.83	1.841	0.921	1	1	94.364	4.85	242.44	B
140.00-120.00			B	0.903	1.928	0.986	1	1	109.658			
			C	0.47	1.942	0.683	1	1	41.837			
T5	2.22	1.94	A	0.788	1.808	0.887	1	1	115.727	4.57	228.68	A
120.00-100.00			B	0.718	1.778	0.833	1	1	99.307			
			C	0.393	2.079	0.649	1	1	44.846			
T6	2.33	2.63	A	0.671	1.777	0.8	1	1	112.631	4.13	206.59	A
100.00-80.00			B	0.635	1.787	0.775	1	1	103.644			
			C	0.372	2.122	0.641	1	1	53.488			
T7	2.38	2.80	A	0.583	1.815	0.743	1	1	109.867	3.83	191.61	A
80.00-60.00			B	0.55	1.844	0.724	1	1	101.443			
			C	0.333	2.212	0.627	1	1	56.812			
T8	2.42	3.75	A	0.538	1.855	0.718	1	1	115.780	3.75	187.44	A
60.00-40.00			B	0.502	1.897	0.699	1	1	105.983			
			C	0.326	2.229	0.624	1	1	66.025			
T9	2.46	3.70	A	0.475	1.935	0.685	1	1	111.252	3.34	166.81	A
40.00-20.00			B	0.434	2.001	0.666	1	1	99.745			
			C	0.281	2.346	0.61	1	1	62.882			
T10	2.49	4.51	A	0.456	1.963	0.676	1	1	120.945	3.68	183.98	A
20.00-0.00			B	0.413	2.039	0.657	1	1	107.509			
			C	0.282	2.344	0.611	1	1	72.565			
Sum Weight:	17.65	24.30						OTM	2847.15 kip-ft	32.80		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.14	0.53	A	0.326	2.228	0.624	0.825	1	10.860	0.67	66.61	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
190.00-180.00			B	0.369	2.129	0.639	0.825	1	12.337			
			C	0.353	2.165	0.633	0.825	1	11.763			
T2	0.28	1.18	A	0.344	2.185	0.63	0.825	1	23.153	1.33	66.47	B
180.00-160.00			B	0.375	2.115	0.642	0.825	1	25.393			
			C	0.359	2.15	0.636	0.825	1	24.219			
T3	0.98	1.48	A	0.571	1.825	0.736	0.825	1	43.190	2.52	126.05	B
160.00-140.00			B	0.708	1.777	0.826	0.825	1	59.401			
			C	0.419	2.027	0.66	0.825	1	29.249			
T4	1.94	1.78	A	0.83	1.841	0.921	0.825	1	93.948	4.84	241.92	B
140.00-120.00			B	0.903	1.928	0.986	0.825	1	109.421			
			C	0.47	1.942	0.683	0.825	1	40.537			
T5	2.22	1.94	A	0.788	1.808	0.887	0.825	1	115.229	4.55	227.70	A
120.00-100.00			B	0.718	1.778	0.833	0.825	1	98.650			
			C	0.393	2.079	0.649	0.825	1	43.457			
T6	2.33	2.63	A	0.671	1.777	0.8	0.825	1	111.594	4.09	204.69	A
100.00-80.00			B	0.635	1.787	0.775	0.825	1	102.496			
			C	0.372	2.122	0.641	0.825	1	51.533			
T7	2.38	2.80	A	0.583	1.815	0.743	0.825	1	108.400	3.78	189.05	A
80.00-60.00			B	0.55	1.844	0.724	0.825	1	99.860			
			C	0.333	2.212	0.627	0.825	1	54.477			
T8	2.42	3.75	A	0.538	1.855	0.718	0.825	1	113.551	3.68	183.83	A
60.00-40.00			B	0.502	1.897	0.699	0.825	1	103.582			
			C	0.326	2.229	0.624	0.825	1	62.785			
T9	2.46	3.70	A	0.475	1.935	0.685	0.825	1	109.282	3.28	163.85	A
40.00-20.00			B	0.434	2.001	0.666	0.825	1	97.623			
			C	0.281	2.346	0.61	0.825	1	60.194			
T10	2.49	4.51	A	0.456	1.963	0.676	0.825	1	118.302	3.60	179.96	A
20.00-0.00			B	0.413	2.039	0.657	0.825	1	104.655			
			C	0.282	2.344	0.611	0.825	1	69.085			
Sum Weight:	17.65	24.30						OTM	2808.55 kip-ft	32.34		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.14	0.53	A	0.326	2.228	0.624	0.8	1	10.758	0.66	66.10	B
190.00-180.00			B	0.369	2.129	0.639	0.8	1	12.242			
			C	0.353	2.165	0.633	0.8	1	11.665			
T2	0.28	1.18	A	0.344	2.185	0.63	0.8	1	22.963	1.32	66.00	B
180.00-160.00			B	0.375	2.115	0.642	0.8	1	25.212			
			C	0.359	2.15	0.636	0.8	1	24.033			
T3	0.98	1.48	A	0.571	1.825	0.736	0.8	1	43.062	2.52	125.86	B
160.00-140.00			B	0.708	1.777	0.826	0.8	1	59.312			
			C	0.419	2.027	0.66	0.8	1	29.078			
T4	1.94	1.78	A	0.83	1.841	0.921	0.8	1	93.889	4.84	241.85	B
140.00-120.00			B	0.903	1.928	0.986	0.8	1	109.387			
			C	0.47	1.942	0.683	0.8	1	40.351			
T5	2.22	1.94	A	0.788	1.808	0.887	0.8	1	115.158	4.55	227.56	A
120.00-100.00			B	0.718	1.778	0.833	0.8	1	98.556			
			C	0.393	2.079	0.649	0.8	1	43.259			
T6	2.33	2.63	A	0.671	1.777	0.8	0.8	1	111.446	4.09	204.42	A
100.00-80.00			B	0.635	1.787	0.775	0.8	1	102.331			
			C	0.372	2.122	0.641	0.8	1	51.253			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T7	2.38	2.80	A	0.583	1.815	0.743	0.8	1	108.190	3.77	188.68	A
80.00-60.00			B	0.55	1.844	0.724	0.8	1	99.634			
			C	0.333	2.212	0.627	0.8	1	54.143			
T8	2.42	3.75	A	0.538	1.855	0.718	0.8	1	113.232	3.67	183.32	A
60.00-40.00			B	0.502	1.897	0.699	0.8	1	103.239			
			C	0.326	2.229	0.624	0.8	1	62.323			
T9	2.46	3.70	A	0.475	1.935	0.685	0.8	1	109.001	3.27	163.43	A
40.00-20.00			B	0.434	2.001	0.666	0.8	1	97.320			
			C	0.281	2.346	0.61	0.8	1	59.809			
T10	2.49	4.51	A	0.456	1.963	0.676	0.8	1	117.924	3.59	179.39	A
20.00-0.00			B	0.413	2.039	0.657	0.8	1	104.248			
			C	0.282	2.344	0.611	0.8	1	68.588			
Sum Weight:	17.65	24.30						OTM	2803.04 kip-ft	32.27		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.14	0.53	A	0.326	2.228	0.624	0.85	1	10.961	0.67	67.13	B
190.00-180.00			B	0.369	2.129	0.639	0.85	1	12.432			
			C	0.353	2.165	0.633	0.85	1	11.860			
T2	0.28	1.18	A	0.344	2.185	0.63	0.85	1	23.343	1.34	66.94	B
180.00-160.00			B	0.375	2.115	0.642	0.85	1	25.574			
			C	0.359	2.15	0.636	0.85	1	24.405			
T3	0.98	1.48	A	0.571	1.825	0.736	0.85	1	43.318	2.52	126.24	B
160.00-140.00			B	0.708	1.777	0.826	0.85	1	59.489			
			C	0.419	2.027	0.66	0.85	1	29.420			
T4	1.94	1.78	A	0.83	1.841	0.921	0.85	1	94.008	4.84	242.00	B
140.00-120.00			B	0.903	1.928	0.986	0.85	1	109.455			
			C	0.47	1.942	0.683	0.85	1	40.722			
T5	2.22	1.94	A	0.788	1.808	0.887	0.85	1	115.300	4.56	227.84	A
120.00-100.00			B	0.718	1.778	0.833	0.85	1	98.744			
			C	0.393	2.079	0.649	0.85	1	43.656			
T6	2.33	2.63	A	0.671	1.777	0.8	0.85	1	111.742	4.10	204.96	A
100.00-80.00			B	0.635	1.787	0.775	0.85	1	102.660			
			C	0.372	2.122	0.641	0.85	1	51.812			
T7	2.38	2.80	A	0.583	1.815	0.743	0.85	1	108.609	3.79	189.41	A
80.00-60.00			B	0.55	1.844	0.724	0.85	1	100.086			
			C	0.333	2.212	0.627	0.85	1	54.810			
T8	2.42	3.75	A	0.538	1.855	0.718	0.85	1	113.869	3.69	184.35	A
60.00-40.00			B	0.502	1.897	0.699	0.85	1	103.925			
			C	0.326	2.229	0.624	0.85	1	63.248			
T9	2.46	3.70	A	0.475	1.935	0.685	0.85	1	109.563	3.29	164.27	A
40.00-20.00			B	0.434	2.001	0.666	0.85	1	97.926			
			C	0.281	2.346	0.61	0.85	1	60.578			
T10	2.49	4.51	A	0.456	1.963	0.676	0.85	1	118.680	3.61	180.54	A
20.00-0.00			B	0.413	2.039	0.657	0.85	1	105.063			
			C	0.282	2.344	0.611	0.85	1	69.582			
Sum Weight:	17.65	24.30						OTM	2814.07 kip-ft	32.40		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	1	1	7.802	0.25	24.58	B
190.00-180.00			B	0.234	2.486	0.598	1	1	8.451			
			C	0.232	2.493	0.597	1	1	8.390			
T2	0.10	0.74	A	0.226	2.512	0.596	1	1	16.485	0.49	24.61	B
180.00-160.00			B	0.244	2.455	0.6	1	1	17.557			
			C	0.242	2.461	0.6	1	1	17.430			
T3	0.37	1.01	A	0.388	2.087	0.647	1	1	27.404	0.74	37.20	B
160.00-140.00			B	0.485	1.92	0.69	1	1	35.161			
			C	0.291	2.321	0.613	1	1	20.714			
T4	0.74	1.23	A	0.567	1.828	0.734	1	1	52.031	1.12	55.92	B
140.00-120.00			B	0.621	1.792	0.767	1	1	58.981			
			C	0.317	2.252	0.621	1	1	27.216			
T5	0.84	1.37	A	0.529	1.866	0.713	1	1	63.202	1.19	59.46	A
120.00-100.00			B	0.487	1.917	0.691	1	1	56.924			
			C	0.26	2.407	0.605	1	1	29.281			
T6	0.87	1.91	A	0.457	1.963	0.676	1	1	66.566	1.24	62.21	A
100.00-80.00			B	0.434	2	0.666	1	1	62.760			
			C	0.255	2.423	0.603	1	1	36.632			
T7	0.89	2.00	A	0.394	2.076	0.649	1	1	67.145	1.24	61.79	A
80.00-60.00			B	0.375	2.116	0.642	1	1	63.652			
			C	0.227	2.509	0.596	1	1	39.307			
T8	0.90	2.73	A	0.37	2.127	0.64	1	1	74.216	1.27	63.57	A
60.00-40.00			B	0.351	2.17	0.633	1	1	70.299			
			C	0.229	2.503	0.597	1	1	47.562			
T9	0.91	2.83	A	0.32	2.245	0.622	1	1	70.820	1.14	56.85	A
40.00-20.00			B	0.299	2.297	0.616	1	1	66.317			
			C	0.193	2.62	0.589	1	1	44.262			
T10	0.92	3.41	A	0.314	2.259	0.62	1	1	79.898	1.29	64.54	A
20.00-0.00			B	0.293	2.314	0.614	1	1	74.749			
			C	0.201	2.592	0.591	1	1	53.288			
Sum Weight:	6.59	17.53						OTM	826.02 kip-ft	9.97		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.825	1	7.057	0.22	22.48	B
190.00-180.00			B	0.234	2.486	0.598	0.825	1	7.728			
			C	0.232	2.493	0.597	0.825	1	7.664			
T2	0.10	0.74	A	0.226	2.512	0.596	0.825	1	15.071	0.45	22.68	B
180.00-160.00			B	0.244	2.455	0.6	0.825	1	16.176			
			C	0.242	2.461	0.6	0.825	1	16.046			
T3	0.37	1.01	A	0.388	2.087	0.647	0.825	1	26.270	0.72	36.19	B
160.00-140.00			B	0.485	1.92	0.69	0.825	1	34.206			
			C	0.291	2.321	0.613	0.825	1	19.399			
T4	0.74	1.23	A	0.567	1.828	0.734	0.825	1	51.080	1.10	55.13	B
140.00-120.00			B	0.621	1.792	0.767	0.825	1	58.153			
			C	0.317	2.252	0.621	0.825	1	25.696			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T5	0.84	1.37	A	0.529	1.866	0.713	0.825	1	62.197	1.17	58.52	A
120.00-100.00			B	0.487	1.917	0.691	0.825	1	55.831			
			C	0.26	2.407	0.605	0.825	1	27.704			
T6	0.87	1.91	A	0.457	1.963	0.676	0.825	1	64.962	1.21	60.71	A
100.00-80.00			B	0.434	2	0.666	0.825	1	61.090			
			C	0.255	2.423	0.603	0.825	1	34.433			
T7	0.89	2.00	A	0.394	2.076	0.649	0.825	1	65.123	1.20	59.93	A
80.00-60.00			B	0.375	2.116	0.642	0.825	1	61.567			
			C	0.227	2.509	0.596	0.825	1	36.728			
T8	0.90	2.73	A	0.37	2.127	0.64	0.825	1	71.319	1.22	61.08	A
60.00-40.00			B	0.351	2.17	0.633	0.825	1	67.316			
			C	0.229	2.503	0.597	0.825	1	44.019			
T9	0.91	2.83	A	0.32	2.245	0.622	0.825	1	68.357	1.10	54.87	A
40.00-20.00			B	0.299	2.297	0.616	0.825	1	63.782			
			C	0.193	2.62	0.589	0.825	1	41.340			
T10	0.92	3.41	A	0.314	2.259	0.62	0.825	1	76.674	1.24	61.94	A
20.00-0.00			B	0.293	2.314	0.614	0.825	1	71.428			
			C	0.201	2.592	0.591	0.825	1	49.536			
Sum Weight:	6.59	17.53						OTM	798.90 kip-ft	9.65		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.8	1	6.950	0.22	22.18	B
190.00-180.00			B	0.234	2.486	0.598	0.8	1	7.624			
			C	0.232	2.493	0.597	0.8	1	7.560			
T2	0.10	0.74	A	0.226	2.512	0.596	0.8	1	14.869	0.45	22.40	B
180.00-160.00			B	0.244	2.455	0.6	0.8	1	15.979			
			C	0.242	2.461	0.6	0.8	1	15.848			
T3	0.37	1.01	A	0.388	2.087	0.647	0.8	1	26.108	0.72	36.04	B
160.00-140.00			B	0.485	1.92	0.69	0.8	1	34.070			
			C	0.291	2.321	0.613	0.8	1	19.211			
T4	0.74	1.23	A	0.567	1.828	0.734	0.8	1	50.944	1.10	55.02	B
140.00-120.00			B	0.621	1.792	0.767	0.8	1	58.035			
			C	0.317	2.252	0.621	0.8	1	25.479			
T5	0.84	1.37	A	0.529	1.866	0.713	0.8	1	62.053	1.17	58.38	A
120.00-100.00			B	0.487	1.917	0.691	0.8	1	55.675			
			C	0.26	2.407	0.605	0.8	1	27.478			
T6	0.87	1.91	A	0.457	1.963	0.676	0.8	1	64.733	1.21	60.50	A
100.00-80.00			B	0.434	2	0.666	0.8	1	60.852			
			C	0.255	2.423	0.603	0.8	1	34.119			
T7	0.89	2.00	A	0.394	2.076	0.649	0.8	1	64.835	1.19	59.66	A
80.00-60.00			B	0.375	2.116	0.642	0.8	1	61.269			
			C	0.227	2.509	0.596	0.8	1	36.359			
T8	0.90	2.73	A	0.37	2.127	0.64	0.8	1	70.905	1.21	60.73	A
60.00-40.00			B	0.351	2.17	0.633	0.8	1	66.889			
			C	0.229	2.503	0.597	0.8	1	43.513			
T9	0.91	2.83	A	0.32	2.245	0.622	0.8	1	68.006	1.09	54.59	A
40.00-20.00			B	0.299	2.297	0.616	0.8	1	63.420			
			C	0.193	2.62	0.589	0.8	1	40.923			
T10	0.92	3.41	A	0.314	2.259	0.62	0.8	1	76.213	1.23	61.56	A
20.00-0.00			B	0.293	2.314	0.614	0.8	1	70.954			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	6.59	17.53	C	0.201	2.592	0.591	0.8	1 OTM	49.000 795.03 kip-ft	9.60		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.85	1	7.163	0.23	22.78	B
190.00-180.00			B	0.234	2.486	0.598	0.85	1	7.831			
			C	0.232	2.493	0.597	0.85	1	7.768			
T2	0.10	0.74	A	0.226	2.512	0.596	0.85	1	15.273	0.46	22.95	B
180.00-160.00			B	0.244	2.455	0.6	0.85	1	16.373			
			C	0.242	2.461	0.6	0.85	1	16.244			
T3	0.37	1.01	A	0.388	2.087	0.647	0.85	1	26.432	0.73	36.33	B
160.00-140.00			B	0.485	1.92	0.69	0.85	1	34.343			
			C	0.291	2.321	0.613	0.85	1	19.587			
T4	0.74	1.23	A	0.567	1.828	0.734	0.85	1	51.216	1.10	55.25	B
140.00-120.00			B	0.621	1.792	0.767	0.85	1	58.271			
			C	0.317	2.252	0.621	0.85	1	25.913			
T5	0.84	1.37	A	0.529	1.866	0.713	0.85	1	62.340	1.17	58.65	A
120.00-100.00			B	0.487	1.917	0.691	0.85	1	55.987			
			C	0.26	2.407	0.605	0.85	1	27.929			
T6	0.87	1.91	A	0.457	1.963	0.676	0.85	1	65.191	1.22	60.93	A
100.00-80.00			B	0.434	2	0.666	0.85	1	61.329			
			C	0.255	2.423	0.603	0.85	1	34.747			
T7	0.89	2.00	A	0.394	2.076	0.649	0.85	1	65.412	1.20	60.19	A
80.00-60.00			B	0.375	2.116	0.642	0.85	1	61.865			
			C	0.227	2.509	0.596	0.85	1	37.096			
T8	0.90	2.73	A	0.37	2.127	0.64	0.85	1	71.733	1.23	61.44	A
60.00-40.00			B	0.351	2.17	0.633	0.85	1	67.742			
			C	0.229	2.503	0.597	0.85	1	44.525			
T9	0.91	2.83	A	0.32	2.245	0.622	0.85	1	68.709	1.10	55.15	A
40.00-20.00			B	0.299	2.297	0.616	0.85	1	64.144			
			C	0.193	2.62	0.589	0.85	1	41.757			
T10	0.92	3.41	A	0.314	2.259	0.62	0.85	1	77.134	1.25	62.31	A
20.00-0.00			B	0.293	2.314	0.614	0.85	1	71.903			
			C	0.201	2.592	0.591	0.85	1	50.072			
Sum Weight:	6.59	17.53						OTM	802.78 kip-ft	9.69		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	10.31					
Bracing Weight	7.22					

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Total Member Self-Weight	17.53			-11.75	0.20	
Total Weight	30.45			-11.75	0.20	
Wind 0 deg - No Ice		0.13	-41.11	-4242.60	-20.42	3.28
Wind 30 deg - No Ice		20.38	-34.90	-3615.32	-2115.81	-8.36
Wind 45 deg - No Ice		28.67	-28.41	-2947.97	-2975.45	-13.55
Wind 60 deg - No Ice		34.97	-20.05	-2086.47	-3629.41	-17.82
Wind 90 deg - No Ice		40.62	-0.08	-24.44	-4209.83	-22.93
Wind 120 deg - No Ice		35.91	20.44	2085.82	-3710.22	-22.08
Wind 135 deg - No Ice		28.65	28.32	2910.28	-2971.82	-18.31
Wind 150 deg - No Ice		20.26	34.85	3584.76	-2096.87	-14.23
Wind 180 deg - No Ice		-0.02	40.00	4123.08	2.84	-3.21
Wind 210 deg - No Ice		-20.29	34.89	3591.41	2102.20	8.69
Wind 225 deg - No Ice		-28.60	28.40	2923.10	2965.03	13.76
Wind 240 deg - No Ice		-35.85	20.56	2103.84	3700.58	18.80
Wind 270 deg - No Ice		-40.57	0.00	-10.99	4202.87	22.60
Wind 300 deg - No Ice		-34.89	-19.99	-2076.88	3618.46	21.03
Wind 315 deg - No Ice		-28.59	-28.35	-2938.51	2963.41	18.30
Wind 330 deg - No Ice		-20.26	-34.85	-3608.08	2097.58	14.23
Member Ice	6.77					
Total Weight Ice	53.17			-25.56	-7.27	
Wind 0 deg - Ice		0.11	-45.01	-4674.32	-24.06	1.98
Wind 30 deg - Ice		22.49	-38.63	-4020.99	-2341.97	-11.23
Wind 45 deg - Ice		31.71	-31.50	-3285.41	-3297.86	-16.94
Wind 60 deg - Ice		38.75	-22.27	-2331.21	-4028.48	-21.52
Wind 90 deg - Ice		44.86	-0.07	-35.90	-4658.76	-26.26
Wind 120 deg - Ice		39.22	22.41	2284.28	-4069.32	-23.98
Wind 135 deg - Ice		31.69	31.43	3222.73	-3294.91	-19.79
Wind 150 deg - Ice		22.39	38.59	3964.13	-2326.54	-14.76
Wind 180 deg - Ice		-0.01	44.45	4573.82	-5.12	-1.88
Wind 210 deg - Ice		-22.41	38.63	3969.54	2316.03	11.50
Wind 225 deg - Ice		-31.65	31.50	3233.18	3274.52	17.11
Wind 240 deg - Ice		-39.17	22.51	2298.95	4046.63	22.00
Wind 270 deg - Ice		-44.82	0.00	-24.94	4638.24	25.99
Wind 300 deg - Ice		-38.69	-22.21	-2323.39	4004.71	23.40
Wind 315 deg - Ice		-31.64	-31.45	-3277.70	3273.21	19.78
Wind 330 deg - Ice		-22.39	-38.59	-4015.10	2312.27	14.76
Total Weight	30.45			-11.75	0.20	
Wind 0 deg - Service		0.05	-14.23	-1461.40	-8.30	1.14
Wind 30 deg - Service		7.05	-12.08	-1244.34	-733.35	-2.89
Wind 45 deg - Service		9.92	-9.83	-1013.43	-1030.80	-4.69
Wind 60 deg - Service		12.10	-6.94	-715.33	-1257.09	-6.17
Wind 90 deg - Service		14.06	-0.03	-1.83	-1457.92	-7.94
Wind 120 deg - Service		12.43	7.07	728.37	-1285.05	-7.64
Wind 135 deg - Service		9.91	9.80	1013.65	-1029.55	-6.34
Wind 150 deg - Service		7.01	12.06	1247.03	-726.80	-4.92
Wind 180 deg - Service		-0.01	13.84	1433.30	-0.26	-1.11
Wind 210 deg - Service		-7.02	12.07	1249.34	726.17	3.01
Wind 225 deg - Service		-9.90	9.83	1018.09	1024.72	4.76
Wind 240 deg - Service		-12.40	7.11	734.60	1279.24	6.51
Wind 270 deg - Service		-14.04	0.00	2.83	1453.05	7.82
Wind 300 deg - Service		-12.07	-6.92	-712.01	1250.83	7.28
Wind 315 deg - Service		-9.89	-9.81	-1010.15	1024.17	6.33
Wind 330 deg - Service		-7.01	-12.06	-1241.84	724.57	4.92

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	190 - 180	Leg	Max Tension	22	4.83	-0.16	-0.02
			Max. Compression	24	-6.43	0.01	0.00
			Max. Mx	23	-3.95	0.27	0.07

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	27	-2.91	0.06	0.34
			Max. Vy	32	0.60	-0.00	0.00
			Max. Vx	27	-0.68	-0.00	0.00
		Diagonal	Max Tension	27	1.75	0.00	0.00
			Max. Compression	19	-1.78	0.00	0.00
			Max. Mx	24	0.21	0.02	0.00
			Max. My	3	-0.44	-0.00	-0.01
			Max. Vy	24	0.01	0.02	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	24	0.31	0.00	0.00
			Max. Compression	22	-0.35	0.00	0.00
			Max. Mx	32	-0.33	-0.01	0.00
			Max. My	26	0.04	0.00	-0.00
			Max. Vy	32	0.01	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T2	180 - 160	Leg	Max Tension	22	27.70	-0.06	-0.00
			Max. Compression	24	-32.10	0.10	-0.00
			Max. Mx	13	-29.96	0.10	0.00
			Max. My	20	-2.92	0.00	-0.10
			Max. Vy	13	-0.03	0.10	0.00
			Max. Vx	3	0.07	-0.00	-0.10
		Diagonal	Max Tension	34	2.91	0.00	0.00
			Max. Compression	26	-2.97	0.00	0.00
			Max. Mx	23	1.12	0.02	-0.00
			Max. My	10	-2.12	0.00	0.01
			Max. Vy	21	0.01	0.02	-0.00
			Max. Vx	10	0.00	0.00	0.00
T3	160 - 140	Leg	Max Tension	22	68.60	-0.68	0.07
			Max. Compression	24	-77.95	0.77	0.10
			Max. Mx	24	-77.95	0.77	0.10
			Max. My	14	-1.27	-0.01	0.72
			Max. Vy	7	-0.62	0.61	-0.00
			Max. Vx	6	0.67	-0.01	0.58
		Diagonal	Max Tension	26	5.67	0.00	0.00
			Max. Compression	34	-5.93	0.00	0.00
			Max. Mx	24	4.05	0.03	0.00
			Max. My	3	-4.49	-0.02	-0.01
			Max. Vy	24	-0.02	0.03	0.00
			Max. Vx	3	0.00	-0.02	-0.01
T4	140 - 120	Leg	Max Tension	22	103.77	-0.28	0.01
			Max. Compression	24	-117.18	0.42	0.01
			Max. Mx	24	-87.22	0.77	0.10
			Max. My	26	-2.42	-0.04	-0.68
			Max. Vy	10	-0.47	-0.64	-0.00
			Max. Vx	6	-0.52	-0.02	0.62
		Diagonal	Max Tension	34	4.67	0.00	0.00
			Max. Compression	34	-4.78	0.00	0.00
			Max. Mx	23	2.01	0.03	0.00
			Max. My	27	-2.88	-0.00	0.01
			Max. Vy	24	-0.01	0.03	0.00
			Max. Vx	27	-0.00	0.00	0.00
		Top Girt	Max Tension	10	0.10	0.00	0.00
			Max. Compression	24	-0.19	0.00	0.00
			Max. Mx	18	-0.02	-0.01	0.00
			Max. My	32	-0.10	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	32	-0.00	0.00	0.00
T5	120 - 100	Leg	Max Tension	22	135.78	-0.43	-0.01
			Max. Compression	24	-151.64	0.69	0.02
			Max. Mx	22	135.65	-0.70	0.03
			Max. My	23	-8.05	-0.01	0.78

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	32	-0.14	-0.48	-0.06
			Max. Vx	23	0.21	-0.01	0.61
		Diagonal	Max Tension	34	5.28	0.00	0.00
			Max. Compression	34	-5.44	0.00	0.00
			Max. Mx	22	3.78	0.02	0.00
			Max. My	33	-5.23	0.00	-0.01
			Max. Vy	22	0.01	0.02	0.00
			Max. Vx	34	0.00	0.00	0.00
T6	100 - 80	Leg	Max Tension	22	165.36	-0.69	0.03
			Max. Compression	24	-184.14	0.71	0.02
			Max. Mx	22	165.26	-0.73	0.03
			Max. My	23	-8.38	-0.01	0.78
			Max. Vy	27	-0.08	-0.71	-0.01
			Max. Vx	30	-0.11	-0.36	-0.67
		Diagonal	Max Tension	34	6.08	0.00	0.00
			Max. Compression	34	-6.31	0.00	0.00
			Max. Mx	24	4.10	0.06	0.00
			Max. My	33	-5.97	-0.01	-0.01
			Max. Vy	22	0.02	0.05	0.00
			Max. Vx	33	0.00	0.00	0.00
T7	80 - 60	Leg	Max Tension	22	192.69	-0.68	0.00
			Max. Compression	24	-214.75	1.06	0.07
			Max. Mx	24	-214.75	1.06	0.07
			Max. My	23	-12.26	0.10	1.11
			Max. Vy	24	-0.11	1.06	0.07
			Max. Vx	23	-0.15	0.10	1.11
		Diagonal	Max Tension	26	6.01	0.00	0.00
			Max. Compression	26	-6.30	0.00	0.00
			Max. Mx	22	4.24	0.06	0.01
			Max. My	32	-5.60	0.02	-0.01
			Max. Vy	22	0.03	0.06	0.01
			Max. Vx	32	0.00	0.00	0.00
T8	60 - 40	Leg	Max Tension	22	218.96	-0.48	0.01
			Max. Compression	24	-245.74	0.59	0.05
			Max. Mx	22	218.85	-1.93	0.05
			Max. My	23	-12.82	0.10	1.11
			Max. Vy	27	0.26	-1.92	-0.00
			Max. Vx	6	0.10	-0.02	0.91
		Diagonal	Max Tension	26	7.31	0.00	0.00
			Max. Compression	26	-7.29	0.00	0.00
			Max. Mx	24	4.54	0.11	0.01
			Max. My	32	-6.06	0.02	-0.01
			Max. Vy	22	0.04	0.11	0.01
			Max. Vx	32	0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	22	239.31	0.36	0.06
			Max. Compression	19	-271.21	-0.32	-0.02
			Max. Mx	22	239.08	-3.26	0.05
			Max. My	23	-17.33	0.96	1.64
			Max. Vy	27	0.42	-3.25	0.02
			Max. Vx	6	0.23	-0.08	1.55
		Diagonal	Max Tension	26	7.83	0.00	0.00
			Max. Compression	25	-7.91	0.00	0.00
			Max. Mx	22	4.36	0.13	0.01
			Max. My	33	-7.53	0.04	-0.03
			Max. Vy	22	0.04	0.13	0.01
			Max. Vx	33	0.00	0.00	0.00
T10	20 - 0	Leg	Max Tension	22	260.16	1.13	0.03
			Max. Compression	19	-298.57	-0.00	0.00
			Max. Mx	24	-282.55	4.42	0.00
			Max. My	23	-20.56	2.74	3.50
			Max. Vy	27	-0.56	-3.25	0.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max. Vx	23	0.45	2.74	3.50
			Max Tension	33	10.07	0.00	0.00
			Max. Compression	26	-9.24	0.00	0.00
			Max. Mx	22	3.75	0.21	0.02
			Max. My	32	-8.66	0.11	-0.03
			Max. Vy	22	0.06	0.21	0.02
			Max. Vx	32	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	30	302.88	22.50	-13.77
	Max. H_x	30	302.88	22.50	-13.77
	Max. H_z	22	-267.47	-25.10	15.24
	Min. Vert	22	-267.47	-25.10	15.24
	Min. H_x	22	-267.47	-25.10	15.24
	Min. H_z	30	302.88	22.50	-13.77
Leg B	Max. Vert	24	303.65	-22.47	-13.84
	Max. H_x	32	-265.95	25.02	15.26
	Max. H_z	32	-265.95	25.02	15.26
	Min. Vert	32	-265.95	25.02	15.26
	Min. H_x	24	303.65	-22.47	-13.84
	Min. H_z	24	303.65	-22.47	-13.84
Leg A	Max. Vert	19	304.12	0.08	26.31
	Max. H_x	31	19.25	2.88	-1.59
	Max. H_z	19	304.12	0.08	26.31
	Min. Vert	27	-262.54	-0.06	-29.15
	Min. H_x	23	19.92	-2.87	-1.55
	Min. H_z	27	-262.54	-0.06	-29.15

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	30.45	0.00	0.00	-11.75	0.20	0.00
Dead+Wind 0 deg - No Ice	30.45	0.13	-41.11	-4262.97	-20.56	3.27
Dead+Wind 30 deg - No Ice	30.45	20.38	-34.90	-3632.69	-2126.02	-8.39
Dead+Wind 45 deg - No Ice	30.45	28.67	-28.41	-2962.16	-2989.80	-13.59
Dead+Wind 60 deg - No Ice	30.45	34.97	-20.05	-2096.54	-3646.91	-17.89
Dead+Wind 90 deg - No Ice	30.45	40.62	-0.08	-24.62	-4230.12	-23.02
Dead+Wind 120 deg - No Ice	30.45	35.91	20.44	2095.78	-3728.10	-22.14
Dead+Wind 135 deg - No Ice	30.45	28.65	28.32	2924.25	-2986.18	-18.35
Dead+Wind 150 deg - No Ice	30.45	20.26	34.85	3602.00	-2107.00	-14.25
Dead+Wind 180 deg - No Ice	30.45	-0.02	40.00	4142.96	2.82	-3.20
Dead+Wind 210 deg - No Ice	30.45	-20.29	34.89	3608.72	2112.32	8.72
Dead+Wind 225 deg - No Ice	30.45	-28.60	28.40	2937.17	2979.32	13.81
Dead+Wind 240 deg - No Ice	30.45	-35.85	20.56	2113.93	3718.40	18.87
Dead+Wind 270 deg - No Ice	30.45	-40.57	0.00	-11.09	4223.13	22.69
Dead+Wind 300 deg - No Ice	30.45	-34.89	-19.99	-2086.91	3635.89	21.09
Dead+Wind 315 deg - No Ice	30.45	-28.59	-28.35	-2952.67	2977.68	18.33

Load Combination	Vertical K	Shear$_x$ K	Shear$_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 330 deg - No Ice	30.45	-20.26	-34.85	-3625.44	2107.66	14.25
Dead+Ice+Temp	53.17	0.00	0.00	-25.57	-7.42	0.00
Dead+Wind 0 deg+Ice+Temp	53.17	0.11	-45.01	-4712.52	-24.46	2.20
Dead+Wind 30 deg+Ice+Temp	53.17	22.49	-38.63	-4053.84	-2361.39	-11.05
Dead+Wind 45 deg+Ice+Temp	53.17	31.71	-31.50	-3312.25	-3325.12	-16.81
Dead+Wind 60 deg+Ice+Temp	53.17	38.75	-22.26	-2350.25	-4061.72	-21.47
Dead+Wind 90 deg+Ice+Temp	53.17	44.86	-0.07	-36.15	-4697.18	-26.34
Dead+Wind 120 deg+Ice+Temp	53.17	39.22	22.41	2303.08	-4102.91	-24.15
Dead+Wind 135 deg+Ice+Temp	53.17	31.69	31.43	3249.27	-3322.14	-19.97
Dead+Wind 150 deg+Ice+Temp	53.17	22.39	38.59	3996.79	-2345.81	-14.95
Dead+Wind 180 deg+Ice+Temp	53.17	-0.01	44.45	4611.54	-5.32	-2.10
Dead+Wind 210 deg+Ice+Temp	53.17	-22.41	38.63	4002.27	2334.90	11.31
Dead+Wind 225 deg+Ice+Temp	53.17	-31.65	31.50	3259.83	3301.28	16.99
Dead+Wind 240 deg+Ice+Temp	53.17	-39.17	22.51	2317.90	4079.72	21.95
Dead+Wind 270 deg+Ice+Temp	53.17	-44.82	0.00	-25.11	4676.20	26.07
Dead+Wind 300 deg+Ice+Temp	53.17	-38.69	-22.21	-2342.40	4037.44	23.57
Dead+Wind 315 deg+Ice+Temp	53.17	-31.64	-31.45	-3304.51	3299.92	19.96
Dead+Wind 330 deg+Ice+Temp	53.17	-22.39	-38.59	-4047.93	2331.08	14.96
Dead+Wind 0 deg - Service	30.45	0.05	-14.23	-1482.88	-6.98	1.13
Dead+Wind 30 deg - Service	30.45	7.05	-12.08	-1264.77	-735.56	-2.91
Dead+Wind 45 deg - Service	30.45	9.92	-9.83	-1032.74	-1034.46	-4.71
Dead+Wind 60 deg - Service	30.45	12.10	-6.94	-733.19	-1261.85	-6.19
Dead+Wind 90 deg - Service	30.45	14.06	-0.03	-16.22	-1463.66	-7.96
Dead+Wind 120 deg - Service	30.45	12.43	7.07	717.53	-1289.94	-7.66
Dead+Wind 135 deg - Service	30.45	9.91	9.80	1004.20	-1033.20	-6.35
Dead+Wind 150 deg - Service	30.45	7.01	12.06	1238.73	-728.97	-4.94
Dead+Wind 180 deg - Service	30.45	-0.01	13.84	1425.91	1.11	-1.11
Dead+Wind 210 deg - Service	30.45	-7.02	12.07	1241.05	731.08	3.03
Dead+Wind 225 deg - Service	30.45	-9.90	9.83	1008.67	1031.09	4.78
Dead+Wind 240 deg - Service	30.45	-12.40	7.11	723.80	1286.85	6.53
Dead+Wind 270 deg - Service	30.45	-14.04	0.00	-11.54	1461.50	7.84
Dead+Wind 300 deg - Service	30.45	-12.07	-6.92	-729.85	1258.29	7.30
Dead+Wind 315 deg - Service	30.45	-9.89	-9.81	-1029.44	1030.53	6.35
Dead+Wind 330 deg - Service	30.45	-7.01	-12.06	-1262.26	729.47	4.94

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-30.45	0.00	0.00	30.45	0.00	0.000%
2	0.13	-30.45	-41.11	-0.13	30.45	41.11	0.000%
3	20.38	-30.45	-34.90	-20.38	30.45	34.90	0.001%
4	28.67	-30.45	-28.41	-28.67	30.45	28.41	0.000%
5	34.97	-30.45	-20.05	-34.97	30.45	20.05	0.000%
6	40.62	-30.45	-0.08	-40.62	30.45	0.08	0.000%
7	35.91	-30.45	20.44	-35.91	30.45	-20.44	0.000%
8	28.65	-30.45	28.32	-28.65	30.45	-28.32	0.000%
9	20.26	-30.45	34.85	-20.26	30.45	-34.85	0.000%
10	-0.02	-30.45	40.00	0.02	30.45	-40.00	0.000%
11	-20.29	-30.45	34.89	20.29	30.45	-34.89	0.000%
12	-28.60	-30.45	28.40	28.60	30.45	-28.40	0.000%
13	-35.85	-30.45	20.56	35.85	30.45	-20.56	0.000%
14	-40.57	-30.45	0.00	40.57	30.45	-0.00	0.000%
15	-34.89	-30.45	-19.99	34.89	30.45	19.99	0.000%
16	-28.59	-30.45	-28.35	28.59	30.45	28.35	0.000%
17	-20.26	-30.45	-34.85	20.26	30.45	34.85	0.000%
18	0.00	-53.17	0.00	0.00	53.17	-0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
19	0.11	-53.17	-45.01	-0.11	53.17	45.01	0.000%
20	22.49	-53.17	-38.63	-22.49	53.17	38.63	0.000%
21	31.71	-53.17	-31.50	-31.71	53.17	31.50	0.000%
22	38.75	-53.17	-22.27	-38.75	53.17	22.26	0.000%
23	44.86	-53.17	-0.07	-44.86	53.17	0.07	0.000%
24	39.22	-53.17	22.41	-39.22	53.17	-22.41	0.000%
25	31.69	-53.17	31.43	-31.69	53.17	-31.43	0.000%
26	22.39	-53.17	38.59	-22.39	53.17	-38.59	0.000%
27	-0.01	-53.17	44.45	0.01	53.17	-44.45	0.000%
28	-22.41	-53.17	38.63	22.41	53.17	-38.63	0.000%
29	-31.65	-53.17	31.50	31.65	53.17	-31.50	0.000%
30	-39.17	-53.17	22.51	39.17	53.17	-22.51	0.000%
31	-44.82	-53.17	0.00	44.82	53.17	-0.00	0.000%
32	-38.69	-53.17	-22.21	38.69	53.17	22.21	0.000%
33	-31.64	-53.17	-31.45	31.64	53.17	31.45	0.000%
34	-22.39	-53.17	-38.59	22.39	53.17	38.59	0.000%
35	0.05	-30.45	-14.23	-0.05	30.45	14.23	0.000%
36	7.05	-30.45	-12.08	-7.05	30.45	12.08	0.000%
37	9.92	-30.45	-9.83	-9.92	30.45	9.83	0.000%
38	12.10	-30.45	-6.94	-12.10	30.45	6.94	0.000%
39	14.06	-30.45	-0.03	-14.06	30.45	0.03	0.000%
40	12.43	-30.45	7.07	-12.43	30.45	-7.07	0.000%
41	9.91	-30.45	9.80	-9.91	30.45	-9.80	0.000%
42	7.01	-30.45	12.06	-7.01	30.45	-12.06	0.000%
43	-0.01	-30.45	13.84	0.01	30.45	-13.84	0.000%
44	-7.02	-30.45	12.07	7.02	30.45	-12.07	0.000%
45	-9.90	-30.45	9.83	9.90	30.45	-9.83	0.000%
46	-12.40	-30.45	7.11	12.40	30.45	-7.11	0.000%
47	-14.04	-30.45	0.00	14.04	30.45	-0.00	0.000%
48	-12.07	-30.45	-6.92	12.07	30.45	6.92	0.000%
49	-9.89	-30.45	-9.81	9.89	30.45	9.81	0.000%
50	-7.01	-30.45	-12.06	7.01	30.45	12.06	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000159
4	Yes	4	0.00000001	0.00000107
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000159
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000083
9	Yes	4	0.00000001	0.00000127
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000139
12	Yes	4	0.00000001	0.00000093
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000158
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000097
17	Yes	4	0.00000001	0.00000128
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000247

20	Yes	4	0.00000001	0.00000341
21	Yes	4	0.00000001	0.00000311
22	Yes	4	0.00000001	0.00000265
23	Yes	4	0.00000001	0.00000289
24	Yes	4	0.00000001	0.00000215
25	Yes	4	0.00000001	0.00000226
26	Yes	4	0.00000001	0.00000255
27	Yes	4	0.00000001	0.00000280
28	Yes	4	0.00000001	0.00000342
29	Yes	4	0.00000001	0.00000289
30	Yes	4	0.00000001	0.00000224
31	Yes	4	0.00000001	0.00000299
32	Yes	4	0.00000001	0.00000272
33	Yes	4	0.00000001	0.00000266
34	Yes	4	0.00000001	0.00000259
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190 - 180	10.696	40	0.5758	0.0864
T2	180 - 160	9.495	46	0.5674	0.0784
T3	160 - 140	7.187	46	0.5125	0.0615
T4	140 - 120	5.161	35	0.4253	0.0454
T5	120 - 100	3.567	35	0.3224	0.0294
T6	100 - 80	2.354	35	0.2390	0.0200
T7	80 - 60	1.445	35	0.1803	0.0147
T8	60 - 40	0.776	35	0.1234	0.0094
T9	40 - 20	0.338	35	0.0725	0.0060
T10	20 - 0	0.093	46	0.0330	0.0028

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	(2) Obstruction Lights	40	10.696	0.5758	0.0864	101461
190.00	3' Yagi	40	10.696	0.5758	0.0864	101461
188.00	Pirod 4' Side Mount Standoff (1)	40	10.455	0.5746	0.0849	101461

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
187.00	PD1142-2A	40	10.334	0.5740	0.0841	101461
180.00	Rohn 6'x14' Boom Gate (3)	46	9.495	0.5674	0.0784	50925
156.00	3-ft dish	46	6.753	0.4971	0.0582	14924
150.00	Pirod 12' T-Frame Sector Mount (1)	46	6.126	0.4720	0.0531	12582
144.00	Paraflector	35	5.534	0.4447	0.0480	10876
142.00	DB230-2A	35	5.345	0.4351	0.0468	10460
140.00	Paraflector	35	5.161	0.4253	0.0454	10232
136.00	Single Dipole	35	4.808	0.4050	0.0423	10415
130.00	10-ft T-Frame	35	4.311	0.3736	0.0371	11169
113.00	Pirod 4' Side Mount Standoff (1)	35	3.103	0.2899	0.0258	13568
110.00	PD320	35	2.918	0.2770	0.0244	13983
109.00	Pirod 4' Side Mount Standoff (1)	35	2.857	0.2729	0.0239	14126
103.00	Pirod 4' Side Mount Standoff (1)	35	2.514	0.2496	0.0212	15058
102.00	GPS	35	2.460	0.2459	0.0208	15230
94.00	DB212 Single Dipole	35	2.053	0.2198	0.0182	17026
92.00	15-ft Single Dipole	35	1.958	0.2138	0.0176	17576
74.00	PD320	35	1.220	0.1633	0.0131	21038
70.00	15-ft Single Dipole	35	1.082	0.1518	0.0120	20565
50.00	15-ft Single Dipole	35	0.530	0.0966	0.0075	22436
32.00	DB212 Single Dipole	46	0.218	0.0555	0.0047	26341
31.00	15-ft Single Dipole	46	0.205	0.0535	0.0045	26325
17.00	Pirod 4' Side Mount Standoff (1)	40	0.072	0.0278	0.0023	30867

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190 - 180	33.315	24	1.7777	0.2498
T2	180 - 160	29.610	24	1.7467	0.2265
T3	160 - 140	22.514	24	1.5768	0.1804
T4	140 - 120	16.270	24	1.3184	0.1470
T5	120 - 100	11.303	24	1.0089	0.1091
T6	100 - 80	7.484	24	0.7539	0.0714
T7	80 - 60	4.603	24	0.5710	0.0525
T8	60 - 40	2.472	24	0.3916	0.0332
T9	40 - 20	1.077	24	0.2305	0.0205
T10	20 - 0	0.295	24	0.1051	0.0093

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	(2) Obstruction Lights	24	33.315	1.7777	0.2498	27136
190.00	3' Yagi	24	33.315	1.7777	0.2498	27136
188.00	Pirod 4' Side Mount Standoff (1)	24	32.571	1.7731	0.2452	27136
187.00	PD1142-2A	24	32.200	1.7707	0.2429	27136
180.00	Rohn 6'x14' Boom Gate (3)	24	29.610	1.7467	0.2265	13945
156.00	3-ft dish	24	21.180	1.5307	0.1738	5051
150.00	Pirod 12' T-Frame Sector Mount (1)	24	19.251	1.4566	0.1645	4255
144.00	Paraflector	24	17.424	1.3760	0.1544	3676

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
142.00	DB230-2A	24	16.840	1.3476	0.1505	3537
140.00	Paraflector	24	16.270	1.3184	0.1470	3460
136.00	Single Dipole	24	15.172	1.2579	0.1399	3518
130.00	10-ft T-Frame	24	13.627	1.1638	0.1282	3764
113.00	Pirod 4' Side Mount Standoff (1)	24	9.847	0.9099	0.0948	4505
110.00	PD320	24	9.264	0.8706	0.0888	4616
109.00	Pirod 4' Side Mount Standoff (1)	24	9.074	0.8579	0.0868	4655
103.00	Pirod 4' Side Mount Standoff (1)	24	7.992	0.7865	0.0761	4900
102.00	GPS	24	7.820	0.7754	0.0744	4947
94.00	DB212 Single Dipole	24	6.532	0.6945	0.0644	5488
92.00	15-ft Single Dipole	24	6.232	0.6760	0.0626	5659
74.00	PD320	24	3.887	0.5176	0.0467	6680
70.00	15-ft Single Dipole	24	3.445	0.4814	0.0427	6503
50.00	15-ft Single Dipole	24	1.690	0.3069	0.0262	7041
32.00	DB212 Single Dipole	24	0.695	0.1765	0.0160	8271
31.00	15-ft Single Dipole	24	0.653	0.1701	0.0154	8264
17.00	Pirod 4' Side Mount Standoff (1)	24	0.228	0.0885	0.0078	9655

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	190	Leg	A325N	0.6250	4	1.21	13.50	0.089 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	1.75	6.12	0.286 ✓	1.333	Member Bearing
		Top Girt	A325N	0.6250	1	0.35	6.44	0.054 ✓	1.333	Bolt Shear
T2	180	Leg	A325N	0.7500	4	6.93	19.44	0.356 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	2.91	6.12	0.475 ✓	1.333	Member Bearing
T3	160	Leg	A325N	0.8750	4	17.18	26.46	0.650 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	5.67	6.12	0.926 ✓	1.333	Member Bearing
T4	140	Leg	A325N	0.8750	4	25.94	26.46	0.981 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	4.67	6.12	0.763 ✓	1.333	Member Bearing
		Top Girt	A325N	0.6250	1	0.19	6.44	0.029 ✓	1.333	Bolt Shear
T5	120	Leg	A325N	1.0000	4	33.95	34.56	0.982 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	5.28	6.12	0.862 ✓	1.333	Member Bearing
T6	100	Leg	A325N	1.0000	4	41.34	34.56	1.196 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	6.08	6.12	0.994 ✓	1.333	Member Bearing
T7	80	Leg	A325N	1.0000	6	32.12	34.56	0.929 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	6.01	6.12	0.983 ✓	1.333	Member Bearing
T8	60	Leg	A325N	1.0000	6	36.49	34.56	1.056 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	7.31	6.44	1.135 ✓	1.333	Bolt Shear
T9	40	Leg	A325N	1.0000	8	29.91	34.56	0.866 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	onent6.44	6.44	1.228 ✓	1.333	Bolt Shear
T10	20	Leg	A354-BC	1.0000	8	32.52	32.40	1.004 ✓	1.333	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.7500	1	10.07	9.28	1.085 ✓	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	190 - 180	ROHN 2 STD	10.00	5.00	76.2 K=1.00	19.756	1.0745	-6.43	21.23	0.303 ✓
T2	180 - 160	ROHN 2.5 STD	20.00	4.00	50.7 K=1.00	24.247	1.7040	-32.10	41.32	0.777 ✓
T3	160 - 140	ROHN 3 EH	20.00	4.00	42.2 K=1.00	25.514	3.0159	-77.95	76.95	1.013 ✓
T4	140 - 120	ROHN 3.5 EH	20.03	4.01	36.8 K=1.00	26.273	3.6784	-117.18	96.64	1.212 ✓
T5	120 - 100	ROHN 4 EH	20.04	5.01	40.7 K=1.00	25.733	4.4074	-151.64	113.42	1.337 ✗
T6	100 - 80	H1-3 (1.34 CR) - 122 ROHN 5 EH	20.03	6.68	43.6 K=1.00	25.320	6.1120	-184.14	154.76	1.190 ✓
T7	80 - 60	ROHN 5 EH	20.04	6.68	43.6 K=1.00	25.320	6.1120	-214.75	154.75	1.388 ✗
T8	60 - 40	H1-3 (1.39 CR) - 170 ROHN 6 EHS	20.03	6.68	36.0 K=1.00	26.380	6.7133	-245.74	177.09	1.388 ✗
T9	40 - 20	H1-3 (1.39 CR) - 191 ROHN 6 EH	20.04	10.02	54.8 K=1.00	23.589	8.4049	-271.21	198.26	1.368 ✗
T10	20 - 0	H1-3 (1.37 CR) - 213 ROHN 8 EHS	20.03	10.02	41.2 K=1.00	25.667	9.7193	-298.57	249.47	1.197 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	190 - 180	L1 3/4x1 3/4x3/16	6.83	3.13	112.1 K=1.02	11.386	0.6211	-1.78	7.07	0.252 ✓
T2	180 - 160	L1 3/4x1 3/4x3/16	6.16	2.79	103.1 K=1.06	12.579	0.6211	-2.97	7.81	0.380 ✓
T3	160 - 140	L1 3/4x1 3/4x3/16	6.18	2.77	102.5 K=1.06	12.656	0.6211	-5.93	7.86	0.754

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	140 - 120	L1 3/4x1 3/4x3/16	7.68	3.63	126.8 K=1.00	9.287	0.6211	-4.70	5.77	0.814 ✓
T5	120 - 100	L1 3/4x1 3/4x3/16	9.92	4.76	166.3 K=1.00	5.400	0.6211	-5.38	3.35	1.604 ✗
T6	100 - 80	H1-3 (1.60 CR) - 127 L2 1/2x2 1/2x3/16	12.44	6.01	145.6 K=1.00	7.045	0.9020	-6.31	6.35	0.992 ✓
T7	80 - 60	L2 1/2x2 1/2x3/16	14.23	6.92	167.6 K=1.00	5.314	0.9020	-6.30	4.79	1.314 ✓
T8	60 - 40	L3x3x1/4	15.99	7.73	156.7 K=1.00	6.081	1.4400	-6.81	8.76	0.778 ✓
T9	40 - 20	L3x3x1/4	18.35	9.04	183.2 K=1.00	4.451	1.4400	-7.91	6.41	1.235 ✓
T10	20 - 0	L3 1/2x3 1/2x1/4	20.15	9.81	169.6 K=1.00	5.189	1.6900	-9.24	8.77	1.053 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190 - 180	L1 3/4x1 3/4x3/16	4.65	4.18	146.1 K=1.00	6.997	0.6211	-0.35	4.35	0.080 ✓
T4	140 - 120	L1 3/4x1 3/4x3/16	4.72	4.16	145.3 K=1.00	7.077	0.6211	-0.19	4.40	0.042 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190 - 180	ROHN 2 STD	10.00	5.00	76.2	30.000	1.0745	4.83	32.24	0.150 ✓
T2	180 - 160	ROHN 2.5 STD	20.00	4.00	50.7	30.000	1.7040	27.70	51.12	0.542 ✓
T3	160 - 140	ROHN 3 EH	20.00	4.00	42.2	30.000	3.0159	68.74	90.48	0.760 ✓
T4	140 - 120	ROHN 3.5 EH	20.03	4.01	36.8	30.000	3.6784	103.77	110.35	0.940 ✓
T5	120 - 100	ROHN 4 EH	20.04	5.01	40.7	30.000	4.4074	135.79	132.22	1.027 ✓
T6	100 - 80	ROHN 5 EH	20.03	6.68	43.6	30.000	6.1120	165.35	183.36	0.902 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T7	80 - 60	ROHN 5 EH	20.04	6.68	43.6	30.000	6.1120	192.69	183.36	1.051 ✓
T8	60 - 40	H1-3 (1.38 CR) - 169 ROHN 6 EHS	20.03	6.68	36.0	30.000	6.7133	218.96	201.40	1.087 ✓
T9	40 - 20	H1-3 (1.38 CR) - 190 ROHN 6 EH	20.04	10.02	54.8	30.000	8.4049	239.31	252.15	0.949 ✓
T10	20 - 0	H1-3 (1.36 CR) - 211 ROHN 8 EHS	20.03	10.02	41.2	30.000	9.7193	260.16	291.58	0.892 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190 - 180	L1 3/4x1 3/4x3/16	6.83	3.13	73.1	21.600	0.6211	1.75	13.42	0.131 ✓
T2	180 - 160	L1 3/4x1 3/4x3/16	6.16	2.79	65.4	21.600	0.6211	2.91	13.42	0.217 ✓
T3	160 - 140	L1 3/4x1 3/4x3/16	6.18	2.77	64.9	21.600	0.6211	5.67	13.42	0.422 ✓
T4	140 - 120	L1 3/4x1 3/4x3/16	7.34	3.46	80.3	21.600	0.6211	4.67	13.42	0.348 ✓
T5	120 - 100	L1 3/4x1 3/4x3/16	9.48	4.54	104.5	21.600	0.6211	5.28	13.42	0.393 ✓
T6	100 - 80	H1-3 (1.46 CR) - 132 L2 1/2x2 1/2x3/16	12.44	6.01	94.7	21.600	0.9020	6.08	19.48	0.312 ✓
T7	80 - 60	L2 1/2x2 1/2x3/16	13.62	6.61	104.1	21.600	0.9020	6.01	19.48	0.309 ✓
T8	60 - 40	L3x3x1/4	15.99	7.73	101.5	32.500	1.2525	7.31	40.71	0.180 ✓
T9	40 - 20	L3x3x1/4	19.26	9.48	124.1	32.500	1.2525	7.83	40.71	0.192 ✓
T10	20 - 0	L3 1/2x3 1/2x1/4	21.03	10.25	114.4	32.500	1.4713	10.07	47.82	0.211 ✓

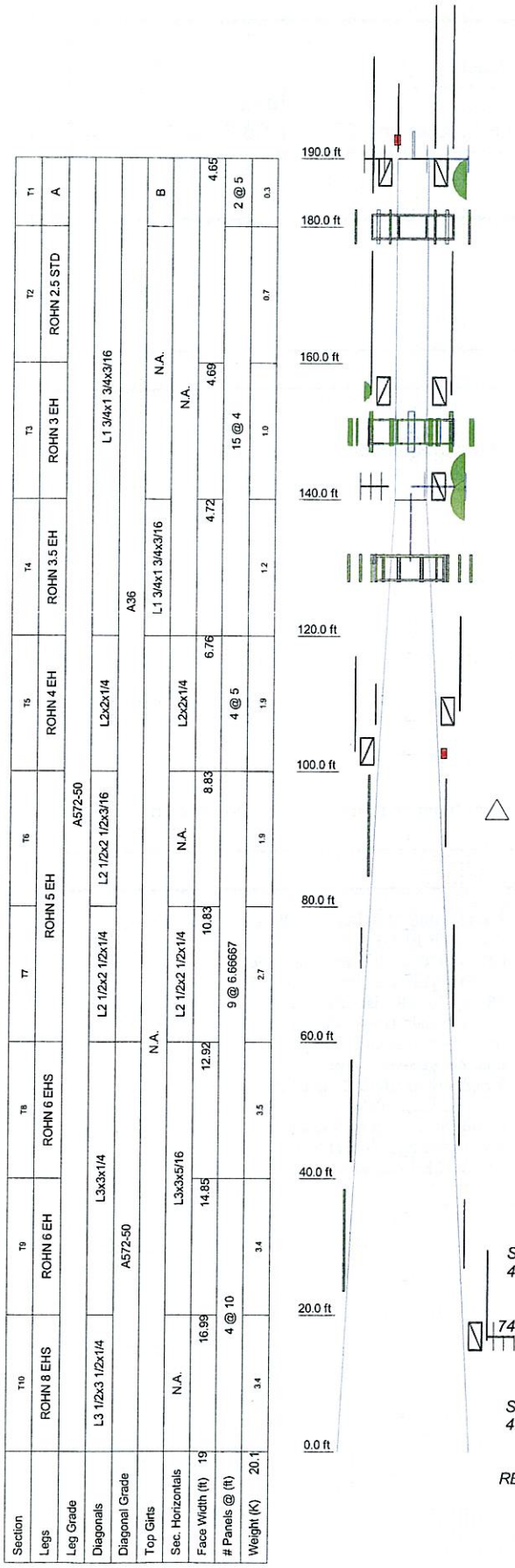
Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190 - 180	L1 3/4x1 3/4x3/16	4.65	4.18	99.5	21.600	0.6211	0.31	13.42	0.023 ✓
T4	140 - 120	L1 3/4x1 3/4x3/16	4.72	4.16	99.0	21.600	0.6211	0.10	13.42	0.007

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

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	190 - 180	Leg	ROHN 2 STD	2	-6.43	28.30	22.7	Pass
T2	180 - 160	Leg	ROHN 2.5 STD	20	-32.10	55.08	58.3	Pass
T3	160 - 140	Leg	ROHN 3 EH	53	-77.95	102.57	76.0	Pass
T4	140 - 120	Leg	ROHN 3.5 EH	86	-117.18	128.82	91.0	Pass
T5	120 - 100	Leg	ROHN 4 EH	122	-151.64	151.18	100.3	Fail ✗
T6	100 - 80	Leg	ROHN 5 EH	149	-184.14	206.29	89.3 89.7 (b)	Pass
T7	80 - 60	Leg	ROHN 5 EH	170	-214.75	206.28	104.1	Fail ✗
T8	60 - 40	Leg	ROHN 6 EHS	191	-245.74	236.06	104.1	Fail ✗
T9	40 - 20	Leg	ROHN 6 EH	213	-271.21	264.29	102.6	Fail ✗
T10	20 - 0	Leg	ROHN 8 EHS	228	-298.57	332.54	89.8	Pass
T1	190 - 180	Diagonal	L1 3/4x1 3/4x3/16	10	-1.78	9.43	18.9 21.5 (b)	Pass
T2	180 - 160	Diagonal	L1 3/4x1 3/4x3/16	24	-2.97	10.41	28.5 35.7 (b)	Pass
T3	160 - 140	Diagonal	L1 3/4x1 3/4x3/16	58	-5.93	10.48	56.6 69.5 (b)	Pass
T4	140 - 120	Diagonal	L1 3/4x1 3/4x3/16	94	-4.70	7.69	61.1	Pass
T5	120 - 100	Diagonal	L1 3/4x1 3/4x3/16	127	-5.38	4.47	120.3	Fail ✗
T6	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	154	-6.31	8.47	74.4 74.6 (b)	Pass
T7	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	174	-6.30	6.39	98.6	Pass
T8	60 - 40	Diagonal	L3x3x1/4	195	-6.81	11.67	58.4 85.2 (b)	Pass
T9	40 - 20	Diagonal	L3x3x1/4	222	-7.91	8.54	92.6	Pass
T10	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	237	-9.24	11.69	79.0 81.4 (b)	Pass
T1	190 - 180	Top Girt	L1 3/4x1 3/4x3/16	5	-0.35	5.79	6.0	Pass
T4	140 - 120	Top Girt	L1 3/4x1 3/4x3/16	90	-0.19	5.86	3.2	Pass
							Summary	
						Leg (T7)	104.1	Fail ✗
						Diagonal (T5)	120.3	Fail ✗
						Top Girt (T1)	6.0	Pass
						Bolt Checks	92.2	Pass
						RATING =	**120.3**	Fail ✗



MAX. CORNER REACTIONS - 85 mph WIND
DOWN: 308 K
UPLIFT: -269 K
SHEAR: 30 K

AXIAL 57 K
SHEAR 46 K
MOMENT 4765 kip-ft
TORQUE 25 kip-ft
74 mph WIND - 0.5000 in ICE
AXIAL 33 K
SHEAR 42 K
MOMENT 4339 kip-ft
TORQUE 22 kip-ft

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) Obstruction Lights	192	LPA-80063/4CF (Verizon Proposed)	150
PD1142-3	192	BXA-70063/6CF (Verizon Proposed)	150
ASP-705	192	BXA-171063-8CF (Verizon Proposed)	150
ASP-705	192	LPA-80063/4CF (Verizon Proposed)	150
DB420	192	Paraflector	144
Halo	192	Pirod 4' Side Mount Standoff (1)	142
4' x 3" DIA Omni	190	DB264-A	142
3' Yagi	190	DB436-C	142
3' Yagi	190	DB230-2A	142
Pirod 4' Side Mount Standoff (1)	188	Pirod 4' Side Mount Standoff (1)	142
Pirod 4' Side Mount Standoff (1)	188	Paraflector	140
Pirod 4' Side Mount Standoff (1)	188	Single Dipole	136
Paraflector	187	10-ft T-Frame (Nextel Existing)	130
PD1142-2A	187	10-ft T-Frame (Nextel Existing)	130
Rohn 6'x14' Boom Gate (3) (Sprint Existing)	180	10-ft T-Frame (Nextel Existing)	130
		(4) DB844H90E-XY (Nextel Existing)	130
(2) DB980H90E-M (Sprint Existing)	180	(4) DB844H90E-XY (Nextel Existing)	130
(2) DB980H90E-M (Sprint Existing)	180	(4) DB844H90E-XY (Nextel Existing)	130
(2) DB980H90E-M (Sprint Existing)	180	Pirod 4' Side Mount Standoff (1)	113
Pirod 4' Side Mount Standoff (1)	156	Dipole	113
ASP-705	156	PD320	110
Pirod 4' Side Mount Standoff (1)	156	Pirod 4' Side Mount Standoff (1)	109
ASP-705	156	14' x 3" Dia Omni	109
3-ft dish	156	14' x 3" Dia Omni	103
Pirod 12' T-Frame Sector Mount (1) (Verizon Existing)	150	Pirod 4' Side Mount Standoff (1)	103
		GPS	102
Pirod 12' T-Frame Sector Mount (1) (Verizon Existing)	150	1' Standoff Pipe	102
		DB212 Single Dipole	94
Pirod 12' T-Frame Sector Mount (1) (Verizon Existing)	150	15-ft Single Dipole	92
		PD320	74
LPA-80080-4CF (Verizon Proposed)	150	15-ft Single Dipole	70
BXA-70063/6CF (Verizon Proposed)	150	15-ft Single Dipole	50
BXA-171085-8CF (Verizon Proposed)	150	DB212 Single Dipole	50
LPA-80080-4CF (Verizon Proposed)	150	DB212 Single Dipole	32
LPA-80063/4CF (Verizon Proposed)	150	15-ft Single Dipole	31
BXA-70063/6CF (Verizon Proposed)	150	PD400	17
BXA-171063-8CF (Verizon Proposed)	150	3' Yagi	17
LPA-80063/4CF (Verizon Proposed)	150	Pirod 4' Side Mount Standoff (1)	17

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2 STD	B	L1 3/4x1 3/4x3/16

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 98.2%

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

Job: 12001.CO64 - Coventry East			
Project: 190' Rohn Lattice Tower - 1712 Main St., Coventry, CT			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 05/23/12	Scale: NTS	
Path: J:\Jobs\12001\00 WI\CO64 - Coventry East\Cad\ER Files\Reinforced Tower\190ft Rohn Lattice Tower.er		Dwg No. E-1	

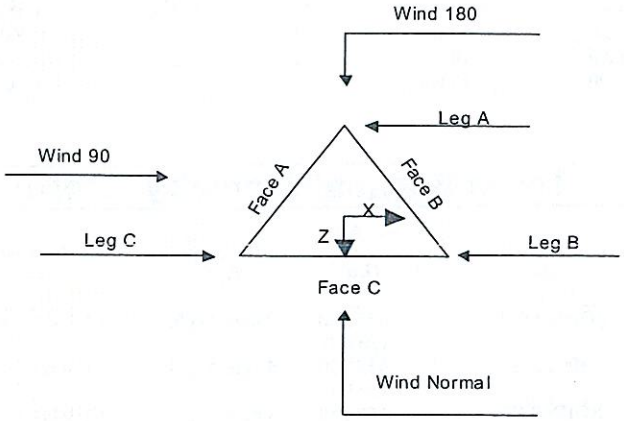
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 190.00 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 4.65 ft at the top and 19.00 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 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	190.00-180.00			4.65	1	10.00
T2	180.00-160.00			4.65	1	20.00
T3	160.00-140.00			4.69	1	20.00
T4	140.00-120.00			4.72	1	20.00
T5	120.00-100.00			6.76	1	20.00
T6	100.00-80.00			8.83	1	20.00
T7	80.00-60.00			10.83	1	20.00
T8	60.00-40.00			12.92	1	20.00
T9	40.00-20.00			14.85	1	20.00
T10	20.00-0.00			16.99	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	190.00-180.00	5.00	X Brace	No	Yes	0.0000	0.0000
T2	180.00-160.00	4.00	X Brace	No	No	0.0000	0.0000
T3	160.00-140.00	4.00	X Brace	No	No	0.0000	0.0000
T4	140.00-120.00	4.00	X Brace	No	Yes	0.0000	0.0000
T5	120.00-100.00	5.00	X Brace	No	Yes	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T6	100.00-80.00	6.67	X Brace	No	No	0.0000	0.0000
T7	80.00-60.00	6.67	X Brace	No	Yes	0.0000	0.0000
T8	60.00-40.00	6.67	X Brace	No	Yes	0.0000	0.0000
T9	40.00-20.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 190.00-180.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 180.00-160.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 160.00-140.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T4 140.00-120.00	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T5 120.00-100.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T6 100.00-80.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.00-60.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T8 60.00-40.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T9 40.00-20.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T10 20.00-0.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 190.00-180.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T4 140.00-120.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Single Angle		A36 (36 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
T5 120.00-100.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 80.00-60.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T8 60.00-40.00	Single Angle	L3x3x5/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 40.00-20.00	Single Angle	L3x3x5/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 190.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	30.0000	30.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors[1] X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
190.00-180.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors[1] X Brace Diags X	K Factors[1] X Brace Diags Y	K Factors[1] Single Diags X	K Factors[1] Single Diags Y	K Factors[1] Girts X	K Factors[1] Girts Y	K Factors[1] Horiz. X	K Factors[1] Horiz. Y	K Factors[1] Sec. Horiz. X	K Factors[1] Sec. Horiz. Y	K Factors[1] Inner Brace X	K Factors[1] Inner Brace Y
140.00-120.00				1	1	1	1	1	1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 190.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 190.00-180.00	Flange	0.6250 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.00-100.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2
T6 100.00-80.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2
T8 60.00-40.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	2
T9 40.00-20.00	Flange	1.0000 A325N	8	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	2
T10 20.00-0.00	Flange	1.0000 A354-BC	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon Existing)	B	Yes	Ar (CfAe)	150.00 - 0.00	-2.0000	-0.3	12	12	1.9800	1.9800		1.04
1 1/4 (Nextel Existing)	A	Yes	Ar (CfAe)	130.00 - 0.00	-2.0000	0	12	12	1.5500	1.5500		0.66
1 5/8 (Sprint Existing)	A	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0	2	2	1.9800	1.9800		1.04
1 5/8 (Sprint Existing)	B	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0	2	2	1.9800	1.9800		1.04
1 5/8 (Sprint Existing)	C	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0	2	2	1.9800	1.9800		1.04
1/2	A	Yes	Ar (CfAe)	50.00 - 0.00	0.0000	0.07	1	1	0.5800	0.5800		0.25
1/2	A	Yes	Ar (CfAe)	70.00 - 0.00	0.0000	0.06	1	1	0.5800	0.5800		0.25
1/2	A	Yes	Ar (CfAe)	94.00 - 0.00	0.0000	0.05	1	1	0.5800	0.5800		0.25
7/8	A	Yes	Ar (CfAe)	156.00 - 0.00	0.0000	0.03	2	2	1.1100	1.1100		0.54
1/2	A	Yes	Ar (CfAe)	185.00 - 0.00	0.0000	-0.02	1	1	0.5800	0.5800		0.25
1/2	A	Yes	Ar (CfAe)	32.00 - 0.00	0.0000	-0.03	1	1	0.5800	0.5800		0.25
1 1/4	A	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.05	1	1	1.5500	1.5500		0.66
1/2	A	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.06	1	1	0.5800	0.5800		0.25
1/2	A	Yes	Ar (CfAe)	17.00 - 0.00	0.0000	-0.07	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	92.00 - 0.00	0.0000	0.08	1	1	1.1100	1.1100		0.54
7/8	B	Yes	Ar (CfAe)	142.00 - 0.00	0.0000	0.07	1	1	1.1100	1.1100		0.54
1/2	B	Yes	Ar (CfAe)	142.00 - 0.00	0.0000	0.06	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	156.00 - 0.00	0.0000	0.05	1	1	1.1100	1.1100		0.54

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/2	B	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	0.04	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	0.025	2	2	1.1100	1.1100		0.54
1/2	B	Yes	Ar (CfAe)	102.00 - 0.00	0.0000	-0.02	1	1	0.5800	0.5800		0.25
7/8	B	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.05	1	1	1.1100	1.1100		0.54
7/8	B	Yes	Ar (CfAe)	109.00 - 0.00	0.0000	-0.06	1	1	1.1100	1.1100		0.54
7/8	C	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	0.06	1	1	1.1100	1.1100		0.54
7/8	C	Yes	Ar (CfAe)	110.00 - 0.00	0.0000	0.05	1	1	1.1100	1.1100		0.54
7/8	C	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	0.04	1	1	1.1100	1.1100		0.54
1/2	C	Yes	Ar (CfAe)	136.00 - 0.00	0.0000	0.03	1	1	0.5800	0.5800		0.25
1/2	C	Yes	Ar (CfAe)	113.00 - 0.00	0.0000	0.02	1	1	0.5800	0.5800		0.25
1/2	C	Yes	Ar (CfAe)	142.00 - 0.00	0.0000	-0.02	1	1	0.5800	0.5800		0.25
7/8	C	Yes	Ar (CfAe)	142.00 - 0.00	0.0000	-0.03	1	1	1.1100	1.1100		0.54
1 1/4	C	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.04	1	1	1.5500	1.5500		0.66
7/8	C	Yes	Ar (CfAe)	103.00 - 0.00	0.0000	-0.05	1	1	1.1100	1.1100		0.54
1/2	C	Yes	Ar (CfAe)	31.00 - 0.00	0.0000	-0.06	1	1	0.5800	0.5800		0.25
7/8	C	Yes	Ar (CfAe)	74.00 - 0.00	0.0000	-0.07	1	1	1.1100	1.1100		0.54
1/2	C	Yes	Ar (CfAe)	50.00 - 0.00	0.0000	-0.08	1	1	0.5800	0.5800		0.25
1 5/8 (Verizon Proposed)	A	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0.35	6	6	1.9800	1.9800		1.04

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	190.00-180.00	A	2.017	0.000	0.000	0.000	0.01
		B	3.258	0.000	0.000	0.000	0.02
		C	3.142	0.000	0.000	0.000	0.02
T2	180.00-160.00	A	4.517	0.000	0.000	0.000	0.02
		B	6.517	0.000	0.000	0.000	0.04
		C	6.283	0.000	0.000	0.000	0.03
T3	160.00-140.00	A	20.677	0.000	0.000	0.000	0.12
		B	31.378	0.000	0.000	0.000	0.19
		C	9.865	0.000	0.000	0.000	0.06
T4	140.00-120.00	A	50.117	0.000	0.000	0.000	0.29
		B	57.383	0.000	0.000	0.000	0.36
		C	16.473	0.000	0.000	0.000	0.10
T5	120.00-100.00	A	65.617	0.000	0.000	0.000	0.37
		B	58.313	0.000	0.000	0.000	0.36
		C	18.497	0.000	0.000	0.000	0.11
T6	100.00-80.00	A	66.293	0.000	0.000	0.000	0.37
		B	61.310	0.000	0.000	0.000	0.38
		C	21.333	0.000	0.000	0.000	0.12
T7	80.00-60.00	A	67.067	0.000	0.000	0.000	0.38
		B	62.050	0.000	0.000	0.000	0.38
		C	22.628	0.000	0.000	0.000	0.13
T8	60.00-40.00	A	68.033	0.000	0.000	0.000	0.38
		B	62.050	0.000	0.000	0.000	0.38
		C	23.667	0.000	0.000	0.000	0.14
T9	40.00-20.00	A	69.097	0.000	0.000	0.000	0.39
		B	62.050	0.000	0.000	0.000	0.38
		C	24.682	0.000	0.000	0.000	0.14
T10	20.00-0.00	A	70.305	0.000	0.000	0.000	0.39
		B	62.050	0.000	0.000	0.000	0.38
		C	25.117	0.000	0.000	0.000	0.14

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	190.00-180.00	A	0.500	4.100	0.000	0.000	0.000	0.03
		B		6.592	0.000	0.000	0.000	0.05
		C		5.642	0.000	0.000	0.000	0.05
T2	180.00-160.00	A	0.500	9.517	0.000	0.000	0.000	0.07
		B		13.183	0.000	0.000	0.000	0.11
		C		11.283	0.000	0.000	0.000	0.10
T3	160.00-140.00	A	0.500	35.010	0.000	0.000	0.000	0.33
		B		51.378	0.000	0.000	0.000	0.50
		C		16.865	0.000	0.000	0.000	0.16
T4	140.00-120.00	A	0.500	81.783	0.000	0.000	0.000	0.77
		B		92.383	0.000	0.000	0.000	0.90
		C		29.473	0.000	0.000	0.000	0.26
T5	120.00-100.00	A	0.500	107.283	0.000	0.000	0.000	1.00
		B		94.229	0.000	0.000	0.000	0.92
		C		33.998	0.000	0.000	0.000	0.30
T6	100.00-80.00	A	0.500	109.127	0.000	0.000	0.000	1.02
		B		100.643	0.000	0.000	0.000	0.97
		C		39.667	0.000	0.000	0.000	0.35
T7	80.00-60.00	A	0.500	111.233	0.000	0.000	0.000	1.03
		B		102.050	0.000	0.000	0.000	0.98
		C		42.128	0.000	0.000	0.000	0.37
T8	60.00-40.00	A	0.500	113.867	0.000	0.000	0.000	1.05
		B		102.050	0.000	0.000	0.000	0.98
		C		44.500	0.000	0.000	0.000	0.39
T9	40.00-20.00	A	0.500	116.763	0.000	0.000	0.000	1.07
		B		102.050	0.000	0.000	0.000	0.98
		C		47.265	0.000	0.000	0.000	0.41
T10	20.00-0.00	A	0.500	120.055	0.000	0.000	0.000	1.09
		B		102.050	0.000	0.000	0.000	0.98
		C		48.450	0.000	0.000	0.000	0.41

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	190.00-180.00	A	0.000	0.235	0.202	0.411
		B	0.000	0.378	0.327	0.661
		C	0.000	0.323	0.315	0.566
T2	180.00-160.00	A	0.000	0.522	0.434	0.914
		B	0.000	0.723	0.626	1.266
		C	0.000	0.619	0.603	1.083
T3	160.00-140.00	A	0.000	1.915	1.979	3.351
		B	0.000	2.810	3.003	4.917
		C	0.000	0.922	0.944	1.614
T4	140.00-120.00	A	0.000	4.513	4.839	7.897
		B	0.000	5.098	5.541	8.921
		C	0.000	1.626	1.591	2.846
T5	120.00-100.00	A	0.000	6.046	7.395	12.091
		B	0.000	5.310	6.572	10.620
		C	0.000	1.916	2.085	3.832

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T6	100.00-80.00	A	0.000	3.300	5.013	8.251
		B	0.000	3.044	4.636	7.610
		C	0.000	1.200	1.613	2.999
T7	80.00-60.00	A	0.000	4.582	6.906	11.455
		B	0.000	4.204	6.390	10.509
		C	0.000	1.735	2.330	4.338
T8	60.00-40.00	A	0.000	4.582	8.213	13.747
		B	0.000	4.107	7.491	12.320
		C	0.000	1.791	2.857	5.372
T9	40.00-20.00	A	0.000	3.272	5.809	9.816
		B	0.000	2.860	5.216	8.579
		C	0.000	1.324	2.075	3.973
T10	20.00-0.00	A	0.000	2.290	4.693	8.014
		B	0.000	1.946	4.142	6.812
		C	0.000	0.924	1.677	3.234

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	190.00-180.00	0.3629	0.3944	0.4331	0.2891
T2	180.00-160.00	0.2511	0.3282	0.2667	0.2053
T3	160.00-140.00	0.1386	-5.3435	0.1383	-5.2182
T4	140.00-120.00	-0.7154	-8.7944	-0.6857	-8.4166
T5	120.00-100.00	-1.7787	-10.3016	-1.8006	-9.8901
T6	100.00-80.00	-1.8584	-12.6939	-1.8762	-12.5635
T7	80.00-60.00	-1.8686	-13.3605	-1.9190	-13.2078
T8	60.00-40.00	-1.9289	-13.4682	-2.1015	-13.6841
T9	40.00-20.00	-2.4925	-16.7024	-2.7911	-16.8177
T10	20.00-0.00	-2.9074	-18.2450	-3.4923	-18.8374

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft / ft / ft	°	ft		ft^2	ft^2	K
Pirod 4' Side Mount Standoff (1)	A	From Leg	2.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
(2) Obstruction Lights	C	From Leg	0.00 0.00	0.0000	192.00	No Ice 1/2" Ice	0.18 0.25	0.18 0.25	0.01 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00						
PD1142-3	C	From Leg	0.00	0.0000	192.00	No Ice	0.48	0.48	0.01
			0.00			1/2" Ice	0.55	0.55	0.01
			4.00						
3' Yagi	C	From Leg	1.00	0.0000	190.00	No Ice	2.08	2.08	0.03
			0.00			1/2" Ice	3.79	3.79	0.05
			0.00						
PD1142-2A	C	From Leg	4.00	0.0000	187.00	No Ice	0.79	0.79	0.01
			0.00			1/2" Ice	0.91	0.91	0.01
			8.00						
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00	0.0000	156.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
ASP-705	C	From Leg	4.00	0.0000	156.00	No Ice	5.88	5.88	0.03
			0.00			1/2" Ice	8.01	8.01	0.07
			10.00						
DB230-2A	C	From Leg	1.00	0.0000	142.00	No Ice	3.00	3.00	0.11
			0.00			1/2" Ice	5.40	5.40	0.15
			0.00						
PD320	C	From Leg	1.00	0.0000	110.00	No Ice	2.03	2.03	0.01
			0.00			1/2" Ice	4.58	4.58	0.03
			0.00						
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00	0.0000	103.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
14' x 3" Dia Omni	C	From Leg	4.00	0.0000	103.00	No Ice	4.20	4.20	0.04
			0.00			1/2" Ice	5.63	5.63	0.07
			7.00						
15-ft Single Dipole	C	From Leg	1.00	0.0000	92.00	No Ice	3.00	3.00	0.04
			0.00			1/2" Ice	6.00	6.00	0.06
			0.00						
PD320	C	From Leg	1.00	0.0000	74.00	No Ice	2.03	2.03	0.01
			0.00			1/2" Ice	4.58	4.58	0.03
			0.00						
15-ft Single Dipole	C	From Leg	1.00	0.0000	50.00	No Ice	3.00	3.00	0.04
			0.00			1/2" Ice	6.00	6.00	0.06
			0.00						
15-ft Single Dipole	C	From Leg	1.00	0.0000	31.00	No Ice	3.00	3.00	0.04
			0.00			1/2" Ice	6.00	6.00	0.06
			0.00						
ASP-705	B	From Leg	1.00	0.0000	192.00	No Ice	5.88	5.88	0.03
			0.00			1/2" Ice	8.01	8.01	0.07
			10.00						
ASP-705	B	From Leg	4.00	0.0000	192.00	No Ice	5.88	5.88	0.03
			0.00			1/2" Ice	8.01	8.01	0.07
			10.00						
Paraflector	B	From Leg	4.00	0.0000	187.00	No Ice	8.90	8.90	0.04
			0.00			1/2" Ice	10.70	10.70	0.60
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	156.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
ASP-705	B	From Leg	4.00	0.0000	156.00	No Ice	5.88	5.88	0.03
			0.00			1/2" Ice	8.01	8.01	0.07
			10.00						
Paraflector	B	From Leg	4.00	0.0000	144.00	No Ice	8.90	8.90	0.04
			0.00			1/2" Ice	10.70	10.70	0.60

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00						
Paraflector	B	From Leg	4.00	0.0000	140.00	No Ice	8.90	8.90	0.04
			0.00			1/2" Ice	10.70	10.70	0.60
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	142.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	109.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
14' x 3" Dia Omni	B	From Leg	4.00	0.0000	109.00	No Ice	4.20	4.20	0.04
			0.00			1/2" Ice	5.63	5.63	0.07
			7.00						
GPS	B	From Leg	1.00	0.0000	102.00	No Ice	1.00	1.00	0.01
			0.00			1/2" Ice	1.50	1.50	0.01
			0.00						
1' Standoff Pipe	B	From Leg	0.50	0.0000	102.00	No Ice	0.16	0.16	0.01
			0.00			1/2" Ice	0.23	0.23	0.01
			0.00						
DB212 Single Dipole	B	From Leg	1.00	0.0000	94.00	No Ice	1.60	1.60	0.03
			0.00			1/2" Ice	3.20	3.20	0.04
			0.00						
15-ft Single Dipole	B	From Leg	1.00	0.0000	70.00	No Ice	3.00	3.00	0.04
			0.00			1/2" Ice	6.00	6.00	0.06
			0.00						
DB212 Single Dipole	B	From Leg	1.00	0.0000	50.00	No Ice	1.60	1.60	0.03
			0.00			1/2" Ice	3.20	3.20	0.04
			0.00						
DB212 Single Dipole	B	From Leg	1.00	0.0000	32.00	No Ice	1.60	1.60	0.03
			0.00			1/2" Ice	3.20	3.20	0.04
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	17.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
PD400	B	From Leg	4.00	0.0000	17.00	No Ice	3.14	3.14	0.02
			0.00			1/2" Ice	4.48	4.48	0.04
			6.00						
3' Yagi	B	From Leg	4.00	0.0000	17.00	No Ice	2.08	2.08	0.03
			0.00			1/2" Ice	3.79	3.79	0.05
			0.00						
DB420	A	From Leg	1.00	0.0000	192.00	No Ice	3.33	3.33	0.03
			0.00			1/2" Ice	5.99	5.99	0.04
			10.00						
4' x 3" DIA Omni	A	From Leg	4.00	0.0000	190.00	No Ice	1.00	1.00	0.02
			0.00			1/2" Ice	1.25	1.25	0.02
			2.00						
Halo	A	From Leg	4.00	0.0000	192.00	No Ice	4.00	4.00	0.01
			0.00			1/2" Ice	5.60	5.60	0.03
			0.00						
3' Yagi	A	From Leg	4.00	0.0000	190.00	No Ice	2.08	2.08	0.03
			0.00			1/2" Ice	3.79	3.79	0.05
			0.00						
Pirod 4' Side Mount Standoff (1)	A	From Leg	2.00	0.0000	142.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
DB264-A	A	From Leg	4.00	0.0000	142.00	No Ice	3.16	3.16	0.04
			0.00			1/2" Ice	5.69	5.69	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00						
DB436-C	A	From Leg	4.00	0.0000	142.00	No Ice	0.45	0.45	0.01
			0.00			1/2" Ice	0.81	0.81	0.01
			0.00						
Single Dipole	A	From Leg	1.00	0.0000	136.00	No Ice	1.60	1.60	0.03
			0.00			1/2" Ice	3.20	3.20	0.04
			0.00						
Pirod 4' Side Mount Standoff (1)	A	From Leg	2.00	0.0000	113.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
Dipole	A	From Leg	4.00	0.0000	113.00	No Ice	3.16	3.16	0.04
			0.00			1/2" Ice	5.69	5.69	0.05
			3.00						
Rohn 6'x14' Boom Gate (3) (Sprint Existing)	C	None		0.0000	180.00	No Ice	52.00	52.00	1.75
						1/2" Ice	61.90	61.90	2.19
(2) DB980H90E-M (Sprint Existing)	A	From Leg	4.00	0.0000	180.00	No Ice	3.80	2.19	0.01
			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
(2) DB980H90E-M (Sprint Existing)	B	From Leg	4.00	0.0000	180.00	No Ice	3.80	2.19	0.01
			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
(2) DB980H90E-M (Sprint Existing)	C	From Leg	4.00	0.0000	180.00	No Ice	3.80	2.19	0.01
			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
10-ft T-Frame (Nextel Existing)	A	None		0.0000	130.00	No Ice	13.60	13.60	0.38
						1/2" Ice	17.50	17.50	0.53
10-ft T-Frame (Nextel Existing)	B	None		0.0000	130.00	No Ice	13.60	13.60	0.38
						1/2" Ice	17.50	17.50	0.53
10-ft T-Frame (Nextel Existing)	C	None		0.0000	130.00	No Ice	13.60	13.60	0.38
						1/2" Ice	17.50	17.50	0.53
(4) DB844H90E-XY (Nextel Existing)	A	From Leg	4.00	0.0000	130.00	No Ice	2.87	3.73	0.01
			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(4) DB844H90E-XY (Nextel Existing)	B	From Leg	4.00	0.0000	130.00	No Ice	2.87	3.73	0.01
			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(4) DB844H90E-XY (Nextel Existing)	C	From Leg	4.00	0.0000	130.00	No Ice	2.87	3.73	0.01
			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
Pirod 12' T-Frame Sector Mount (1) (Verizon Existing)	A	None		0.0000	150.00	No Ice	13.60	13.60	0.47
						1/2" Ice	18.40	18.40	0.60
Pirod 12' T-Frame Sector Mount (1) (Verizon Existing)	B	None		0.0000	150.00	No Ice	13.60	13.60	0.47
						1/2" Ice	18.40	18.40	0.60
Pirod 12' T-Frame Sector Mount (1) (Verizon Existing)	C	None		0.0000	150.00	No Ice	13.60	13.60	0.47
						1/2" Ice	18.40	18.40	0.60
LPA-80080-4CF (Verizon Proposed)	A	From Leg	4.00	0.0000	150.00	No Ice	2.62	6.06	0.01
			-6.00			1/2" Ice	2.92	6.45	0.05
			0.00						
BXA-70063/6CF (Verizon Proposed)	A	From Leg	4.00	0.0000	150.00	No Ice	7.73	4.16	0.02
			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171085-8CF (Verizon Proposed)	A	From Leg	4.00	0.0000	150.00	No Ice	2.94	2.16	0.01
			4.00			1/2" Ice	3.26	2.46	0.03
			0.00						

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 K
LPA-80080-4CF (Verizon Proposed)	A	From Leg	4.00 6.00 0.00	0.0000	150.00	No Ice 1/2" Ice	2.62 2.92	6.06 6.45	0.01 0.05
LPA-80063/4CF (Verizon Proposed)	B	From Leg	4.00 -6.00 0.00	0.0000	150.00	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07
BXA-70063/6CF (Verizon Proposed)	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice	7.73 8.27	4.16 4.60	0.02 0.06
BXA-171063-8CF (Verizon Proposed)	B	From Leg	4.00 4.00 0.00	0.0000	150.00	No Ice 1/2" Ice	2.94 3.26	2.16 2.46	0.01 0.03
LPA-80063/4CF (Verizon Proposed)	B	From Leg	4.00 6.00 0.00	0.0000	150.00	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07
LPA-80063/4CF (Verizon Proposed)	C	From Leg	4.00 -6.00 0.00	0.0000	150.00	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07
BXA-70063/6CF (Verizon Proposed)	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice	7.73 8.27	4.16 4.60	0.02 0.06
BXA-171063-8CF (Verizon Proposed)	C	From Leg	4.00 4.00 0.00	0.0000	150.00	No Ice 1/2" Ice	2.94 3.26	2.16 2.46	0.01 0.03
LPA-80063/4CF (Verizon Proposed)	C	From Leg	4.00 6.00 0.00	0.0000	150.00	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
3-ft dish	C	Paraboloid w/o Radome	From Leg	4.00 0.00 0.00	0.0000		156.00	3.00	No Ice 1/2" Ice	3.14 3.41	0.08 0.10

Tower Pressures - No Ice

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2

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 190.00-180.00	185.00	1.636	30	48.479	A	4.261	5.975	3.958	38.67	0.000	0.000
					B	4.136	7.217		34.87	0.000	0.000
					C	4.148	7.100		35.19	0.000	0.000
T2 180.00-160.00	170.00	1.597	30	98.192	A	8.081	14.100	9.583	43.20	0.000	0.000
					B	7.889	16.100		39.95	0.000	0.000
					C	7.912	15.867		40.30	0.000	0.000
T3 160.00-140.00	150.00	1.541	29	99.933	A	6.479	32.343	11.667	30.05	0.000	0.000
					B	5.455	43.045		24.06	0.000	0.000
					C	7.514	21.532		40.17	0.000	0.000
T4 140.00-120.00	130.00	1.48	27	121.475	A	5.435	63.473	13.356	19.38	0.000	0.000
					B	4.733	70.740		17.70	0.000	0.000
					C	8.684	29.830		34.68	0.000	0.000
T5 120.00-100.00	110.00	1.411	26	163.410	A	9.315	80.643	15.027	16.70	0.000	0.000
					B	10.138	73.339		18.00	0.000	0.000
					C	14.626	33.524		31.21	0.000	0.000
T6 100.00-80.00	90.00	1.332	25	205.883	A	9.163	84.868	18.574	19.75	0.000	0.000
					B	9.540	79.884		20.77	0.000	0.000
					C	12.562	39.908		35.40	0.000	0.000
T7 80.00-60.00	70.00	1.24	23	246.784	A	16.583	85.644	18.577	18.17	0.000	0.000
					B	17.099	80.627		19.01	0.000	0.000
					C	21.159	41.205		29.79	0.000	0.000
T8 60.00-40.00	50.00	1.126	21	288.755	A	23.994	90.151	22.118	19.38	0.000	0.000
					B	24.717	84.168		20.31	0.000	0.000
					C	29.351	45.784		29.44	0.000	0.000
T9 40.00-20.00	30.00	1	18	329.457	A	20.019	91.222	22.125	19.89	0.000	0.000
					B	20.611	84.175		21.11	0.000	0.000
					C	23.753	46.807		31.36	0.000	0.000
T10 20.00-0.00	10.00	1	18	374.293	A	18.426	99.103	28.798	24.50	0.000	0.000
					B	18.977	90.848		26.22	0.000	0.000
					C	21.442	53.915		38.22	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 190.00-180.00	185.00	1.636	23	0.5000	49.313	A	4.052	12.040	5.625	34.96	0.000	0.000
						B	3.802	14.389		30.92	0.000	0.000
						C	3.897	13.494		32.34	0.000	0.000
T2 180.00-160.00	170.00	1.597	22	0.5000	99.858	A	7.601	26.777	12.917	37.57	0.000	0.000
						B	7.249	30.243		34.45	0.000	0.000
						C	7.432	28.447		36.00	0.000	0.000
T3 160.00-140.00	150.00	1.541	21	0.5000	101.600	A	5.107	52.928	15.000	25.85	0.000	0.000
						B	3.540	68.401		20.85	0.000	0.000
						C	6.844	35.776		35.20	0.000	0.000
T4 140.00-120.00	130.00	1.48	21	0.5000	123.144	A	2.377	99.837	16.696	16.33	0.000	0.000
						B	1.354	109.852		15.01	0.000	0.000
						C	7.428	50.414		28.86	0.000	0.000
T5 120.00-100.00	110.00	1.411	20	0.5000	165.079	A	4.619	127.959	18.366	13.85	0.000	0.000
						B	6.090	115.640		15.09	0.000	0.000
						C	12.879	58.803		25.62	0.000	0.000
T6 100.00-80.00	90.00	1.332	18	0.5000	207.552	A	5.924	133.409	21.913	15.73	0.000	0.000
						B	6.566	125.183		16.63	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	11.176	66.050		28.38	0.000	0.000
T7 80.00-60.00	70.00	1.24	17	0.5000	248.453	A	12.035	137.964	21.916	14.61	0.000	0.000
						B	12.980	129.159		15.42	0.000	0.000
						C	19.151	71.705		24.12	0.000	0.000
T8 60.00-40.00	50.00	1.126	16	0.5000	290.423	A	18.461	145.476	25.456	15.53	0.000	0.000
						B	19.888	134.135		16.53	0.000	0.000
						C	26.836	78.901		24.07	0.000	0.000
T9 40.00-20.00	30.00	1	14	0.5000	331.127	A	16.012	147.566	25.465	15.57	0.000	0.000
						B	17.248	133.265		16.92	0.000	0.000
						C	21.854	80.015		25.00	0.000	0.000
T10 20.00-0.00	10.00	1	14	0.5000	375.962	A	15.105	156.508	32.137	18.73	0.000	0.000
						B	16.307	138.846		20.71	0.000	0.000
						C	19.885	86.269		30.27	0.000	0.000

Tower Pressure - Service

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	185.00	1.636	10	48.479	A	4.261	5.975	3.958	38.67	0.000	0.000
190.00-180.00					B	4.136	7.217		34.87	0.000	0.000
					C	4.148	7.100		35.19	0.000	0.000
T2	170.00	1.597	10	98.192	A	8.081	14.100	9.583	43.20	0.000	0.000
180.00-160.00					B	7.889	16.100		39.95	0.000	0.000
					C	7.912	15.867		40.30	0.000	0.000
T3	150.00	1.541	10	99.933	A	6.479	32.343	11.667	30.05	0.000	0.000
160.00-140.00					B	5.455	43.045		24.06	0.000	0.000
					C	7.514	21.532		40.17	0.000	0.000
T4	130.00	1.48	9	121.475	A	5.435	63.473	13.356	19.38	0.000	0.000
140.00-120.00					B	4.733	70.740		17.70	0.000	0.000
					C	8.684	29.830		34.68	0.000	0.000
T5	110.00	1.411	9	163.410	A	9.315	80.643	15.027	16.70	0.000	0.000
120.00-100.00					B	10.138	73.339		18.00	0.000	0.000
					C	14.626	33.524		31.21	0.000	0.000
T6	90.00	1.332	9	205.883	A	9.163	84.868	18.574	19.75	0.000	0.000
100.00-80.00					B	9.540	79.884		20.77	0.000	0.000
					C	12.562	39.908		35.40	0.000	0.000
T7 80.00-60.00	70.00	1.24	8	246.784	A	16.583	85.644	18.577	18.17	0.000	0.000
					B	17.099	80.627		19.01	0.000	0.000
					C	21.159	41.205		29.79	0.000	0.000
T8 60.00-40.00	50.00	1.126	7	288.755	A	23.994	90.151	22.118	19.38	0.000	0.000
					B	24.717	84.168		20.31	0.000	0.000
					C	29.351	45.784		29.44	0.000	0.000
T9 40.00-20.00	30.00	1	6	329.457	A	20.019	91.222	22.125	19.89	0.000	0.000
					B	20.611	84.175		21.11	0.000	0.000
					C	23.753	46.807		31.36	0.000	0.000
T10 20.00-0.00	10.00	1	6	374.293	A	18.426	99.103	28.798	24.50	0.000	0.000
					B	18.977	90.848		26.22	0.000	0.000
					C	21.442	53.915		38.22	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	1	1	7.802	0.71	71.04	B
190.00-180.00			B	0.234	2.486	0.598	1	1	8.451			
			C	0.232	2.493	0.597	1	1	8.390			
T2	0.10	0.74	A	0.226	2.512	0.596	1	1	16.485	1.42	71.13	B
180.00-160.00			B	0.244	2.455	0.6	1	1	17.557			
			C	0.242	2.461	0.6	1	1	17.430			
T3	0.37	1.01	A	0.388	2.087	0.647	1	1	27.404	2.15	107.50	B
160.00-140.00			B	0.485	1.92	0.69	1	1	35.161			
			C	0.291	2.321	0.613	1	1	20.714			
T4	0.74	1.23	A	0.567	1.828	0.734	1	1	52.031	3.23	161.60	B
140.00-120.00			B	0.621	1.792	0.767	1	1	58.981			
			C	0.317	2.252	0.621	1	1	27.216			
T5	0.84	1.91	A	0.551	1.843	0.725	1	1	67.746	3.64	181.97	A
120.00-100.00			B	0.511	1.886	0.703	1	1	61.703			
			C	0.295	2.31	0.614	1	1	35.219			
T6	0.87	1.91	A	0.457	1.963	0.676	1	1	66.566	3.60	179.80	A
100.00-80.00			B	0.434	2	0.666	1	1	62.760			
			C	0.255	2.423	0.603	1	1	36.632			
T7	0.89	2.68	A	0.414	2.037	0.658	1	1	72.894	3.80	190.15	A
80.00-60.00			B	0.396	2.072	0.65	1	1	69.505			
			C	0.253	2.429	0.603	1	1	45.988			
T8	0.90	3.49	A	0.395	2.073	0.65	1	1	82.565	3.98	199.17	A
60.00-40.00			B	0.377	2.111	0.643	1	1	78.796			
			C	0.26	2.407	0.605	1	1	57.029			
T9	0.91	3.40	A	0.338	2.201	0.628	1	1	77.319	3.52	175.81	A
40.00-20.00			B	0.318	2.249	0.622	1	1	72.934			
			C	0.214	2.549	0.593	1	1	51.528			
T10	0.92	3.41	A	0.314	2.259	0.62	1	1	79.898	3.73	186.52	A
20.00-0.00			B	0.293	2.314	0.614	1	1	74.749			
			C	0.201	2.592	0.591	1	1	53.288			
Sum Weight:	6.59	20.07						OTM	2448.07 kip-ft	29.78		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.825	1	7.057	0.65	64.96	B
190.00-180.00			B	0.234	2.486	0.598	0.825	1	7.728			
			C	0.232	2.493	0.597	0.825	1	7.664			
T2	0.10	0.74	A	0.226	2.512	0.596	0.825	1	15.071	1.31	65.53	B
180.00-160.00			B	0.244	2.455	0.6	0.825	1	16.176			
			C	0.242	2.461	0.6	0.825	1	16.046			
T3	0.37	1.01	A	0.388	2.087	0.647	0.825	1	26.270	2.09	104.58	B
160.00-140.00			B	0.485	1.92	0.69	0.825	1	34.206			
			C	0.291	2.321	0.613	0.825	1	19.399			
T4	0.74	1.23	A	0.567	1.828	0.734	0.825	1	51.080	3.19	159.33	B
140.00-120.00			B	0.621	1.792	0.767	0.825	1	58.153			
			C	0.317	2.252	0.621	0.825	1	25.696			
T5	0.84	1.91	A	0.551	1.843	0.725	0.825	1	66.116	3.55	177.59	A
120.00-100.00			B	0.511	1.886	0.703	0.825	1	59.928			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.295	2.31	0.614	0.825	1	32.659			
T6	0.87	1.91	A	0.457	1.963	0.676	0.825	1	64.962	3.51	175.47	A
100.00-80.00			B	0.434	2	0.666	0.825	1	61.090			
			C	0.255	2.423	0.603	0.825	1	34.433			
T7	0.89	2.68	A	0.414	2.037	0.658	0.825	1	69.992	3.65	182.58	A
80.00-60.00			B	0.396	2.072	0.65	0.825	1	66.513			
			C	0.253	2.429	0.603	0.825	1	42.285			
T8	0.90	3.49	A	0.395	2.073	0.65	0.825	1	78.366	3.78	189.04	A
60.00-40.00			B	0.377	2.111	0.643	0.825	1	74.470			
			C	0.26	2.407	0.605	0.825	1	51.892			
T9	0.91	3.40	A	0.338	2.201	0.628	0.825	1	73.816	3.36	167.84	A
40.00-20.00			B	0.318	2.249	0.622	0.825	1	69.327			
			C	0.214	2.549	0.593	0.825	1	47.371			
T10	0.92	3.41	A	0.314	2.259	0.62	0.825	1	76.674	3.58	178.99	A
20.00-0.00			B	0.293	2.314	0.614	0.825	1	71.428			
			C	0.201	2.592	0.591	0.825	1	49.536			
Sum Weight:	6.59	20.07						OTM	2358.69 kip-ft	28.67		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.8	1	6.950	0.64	64.09	B
190.00-180.00			B	0.234	2.486	0.598	0.8	1	7.624			
			C	0.232	2.493	0.597	0.8	1	7.560			
T2	0.10	0.74	A	0.226	2.512	0.596	0.8	1	14.869	1.29	64.74	B
180.00-160.00			B	0.244	2.455	0.6	0.8	1	15.979			
			C	0.242	2.461	0.6	0.8	1	15.848			
T3	0.37	1.01	A	0.388	2.087	0.647	0.8	1	26.108	2.08	104.16	B
160.00-140.00			B	0.485	1.92	0.69	0.8	1	34.070			
			C	0.291	2.321	0.613	0.8	1	19.211			
T4	0.74	1.23	A	0.567	1.828	0.734	0.8	1	50.944	3.18	159.01	B
140.00-120.00			B	0.621	1.792	0.767	0.8	1	58.035			
			C	0.317	2.252	0.621	0.8	1	25.479			
T5	0.84	1.91	A	0.551	1.843	0.725	0.8	1	65.883	3.54	176.97	A
120.00-100.00			B	0.511	1.886	0.703	0.8	1	59.675			
			C	0.295	2.31	0.614	0.8	1	32.294			
T6	0.87	1.91	A	0.457	1.963	0.676	0.8	1	64.733	3.50	174.85	A
100.00-80.00			B	0.434	2	0.666	0.8	1	60.852			
			C	0.255	2.423	0.603	0.8	1	34.119			
T7	0.89	2.68	A	0.414	2.037	0.658	0.8	1	69.578	3.63	181.49	A
80.00-60.00			B	0.396	2.072	0.65	0.8	1	66.085			
			C	0.253	2.429	0.603	0.8	1	41.756			
T8	0.90	3.49	A	0.395	2.073	0.65	0.8	1	77.766	3.75	187.60	A
60.00-40.00			B	0.377	2.111	0.643	0.8	1	73.853			
			C	0.26	2.407	0.605	0.8	1	51.158			
T9	0.91	3.40	A	0.338	2.201	0.628	0.8	1	73.316	3.33	166.70	A
40.00-20.00			B	0.318	2.249	0.622	0.8	1	68.812			
			C	0.214	2.549	0.593	0.8	1	46.777			
T10	0.92	3.41	A	0.314	2.259	0.62	0.8	1	76.213	3.56	177.92	A
20.00-0.00			B	0.293	2.314	0.614	0.8	1	70.954			
			C	0.201	2.592	0.591	0.8	1	49.000			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	6.59	20.07						OTM	2345.93 kip-ft	28.51		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.85	1	7.163	0.66	65.83	B
190.00-180.00			B	0.234	2.486	0.598	0.85	1	7.831			
			C	0.232	2.493	0.597	0.85	1	7.768			
T2	0.10	0.74	A	0.226	2.512	0.596	0.85	1	15.273	1.33	66.33	B
180.00-160.00			B	0.244	2.455	0.6	0.85	1	16.373			
			C	0.242	2.461	0.6	0.85	1	16.244			
T3	0.37	1.01	A	0.388	2.087	0.647	0.85	1	26.432	2.10	105.00	B
160.00-140.00			B	0.485	1.92	0.69	0.85	1	34.343			
			C	0.291	2.321	0.613	0.85	1	19.587			
T4	0.74	1.23	A	0.567	1.828	0.734	0.85	1	51.216	3.19	159.66	B
140.00-120.00			B	0.621	1.792	0.767	0.85	1	58.271			
			C	0.317	2.252	0.621	0.85	1	25.913			
T5	0.84	1.91	A	0.551	1.843	0.725	0.85	1	66.349	3.56	178.22	A
120.00-100.00			B	0.511	1.886	0.703	0.85	1	60.182			
			C	0.295	2.31	0.614	0.85	1	33.025			
T6	0.87	1.91	A	0.457	1.963	0.676	0.85	1	65.191	3.52	176.08	A
100.00-80.00			B	0.434	2	0.666	0.85	1	61.329			
			C	0.255	2.423	0.603	0.85	1	34.747			
T7	0.89	2.68	A	0.414	2.037	0.658	0.85	1	70.407	3.67	183.66	A
80.00-60.00			B	0.396	2.072	0.65	0.85	1	66.940			
			C	0.253	2.429	0.603	0.85	1	42.814			
T8	0.90	3.49	A	0.395	2.073	0.65	0.85	1	78.966	3.81	190.49	A
60.00-40.00			B	0.377	2.111	0.643	0.85	1	75.088			
			C	0.26	2.407	0.605	0.85	1	52.626			
T9	0.91	3.40	A	0.338	2.201	0.628	0.85	1	74.317	3.38	168.98	A
40.00-20.00			B	0.318	2.249	0.622	0.85	1	69.842			
			C	0.214	2.549	0.593	0.85	1	47.965			
T10	0.92	3.41	A	0.314	2.259	0.62	0.85	1	77.134	3.60	180.07	A
20.00-0.00			B	0.293	2.314	0.614	0.85	1	71.903			
			C	0.201	2.592	0.591	0.85	1	50.072			
Sum Weight:	6.59	20.07						OTM	2371.46 kip-ft	28.83		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.14	0.53	A	0.326	2.228	0.624	1	1	11.569	0.70	70.21	B
190.00-180.00			B	0.369	2.129	0.639	1	1	13.003			
			C	0.353	2.165	0.633	1	1	12.445			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T2	0.28	1.18	A	0.344	2.185	0.63	1	1	24.483	1.40	69.79	B
180.00-160.00			B	0.375	2.115	0.642	1	1	26.662			
			C	0.359	2.15	0.636	1	1	25.519			
T3	0.98	1.48	A	0.571	1.825	0.736	1	1	44.084	2.55	127.37	B
160.00-140.00			B	0.708	1.777	0.826	1	1	60.020			
			C	0.419	2.027	0.66	1	1	30.446			
T4	1.94	1.78	A	0.83	1.841	0.921	1	1	94.364	4.85	242.44	B
140.00-120.00			B	0.903	1.928	0.986	1	1	109.658			
			C	0.47	1.942	0.683	1	1	41.837			
T5	2.22	2.71	A	0.803	1.818	0.899	1	1	119.648	4.76	237.81	A
120.00-100.00			B	0.737	1.783	0.847	1	1	104.075			
			C	0.434	2	0.666	1	1	52.051			
T6	2.33	2.63	A	0.671	1.777	0.8	1	1	112.631	4.13	206.59	A
100.00-80.00			B	0.635	1.787	0.775	1	1	103.644			
			C	0.372	2.122	0.641	1	1	53.488			
T7	2.38	3.72	A	0.604	1.802	0.756	1	1	116.320	4.03	201.33	A
80.00-60.00			B	0.572	1.824	0.737	1	1	108.160			
			C	0.366	2.136	0.638	1	1	64.913			
T8	2.42	4.84	A	0.564	1.83	0.733	1	1	125.023	3.99	199.68	A
60.00-40.00			B	0.53	1.864	0.713	1	1	115.586			
			C	0.364	2.14	0.638	1	1	77.143			
T9	2.46	4.54	A	0.494	1.908	0.694	1	1	118.490	3.50	175.19	A
40.00-20.00			B	0.455	1.966	0.675	1	1	107.252			
			C	0.308	2.276	0.618	1	1	71.325			
T10	2.49	4.51	A	0.456	1.963	0.676	1	1	120.945	3.68	183.98	A
20.00-0.00			B	0.413	2.039	0.657	1	1	107.509			
			C	0.282	2.344	0.611	1	1	72.565			
Sum Weight:	17.65	27.91						OTM	2898.12 kip-ft	33.59		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.14	0.53	A	0.326	2.228	0.624	0.825	1	10.860	0.67	66.61	B
190.00-180.00			B	0.369	2.129	0.639	0.825	1	12.337			
			C	0.353	2.165	0.633	0.825	1	11.763			
T2	0.28	1.18	A	0.344	2.185	0.63	0.825	1	23.153	1.33	66.47	B
180.00-160.00			B	0.375	2.115	0.642	0.825	1	25.393			
			C	0.359	2.15	0.636	0.825	1	24.219			
T3	0.98	1.48	A	0.571	1.825	0.736	0.825	1	43.190	2.52	126.05	B
160.00-140.00			B	0.708	1.777	0.826	0.825	1	59.401			
			C	0.419	2.027	0.66	0.825	1	29.249			
T4	1.94	1.78	A	0.83	1.841	0.921	0.825	1	93.948	4.84	241.92	B
140.00-120.00			B	0.903	1.928	0.986	0.825	1	109.421			
			C	0.47	1.942	0.683	0.825	1	40.537			
T5	2.22	2.71	A	0.803	1.818	0.899	0.825	1	118.839	4.72	236.20	A
120.00-100.00			B	0.737	1.783	0.847	0.825	1	103.009			
			C	0.434	2	0.666	0.825	1	49.797			
T6	2.33	2.63	A	0.671	1.777	0.8	0.825	1	111.594	4.09	204.69	A
100.00-80.00			B	0.635	1.787	0.775	0.825	1	102.496			
			C	0.372	2.122	0.641	0.825	1	51.533			
T7	2.38	3.72	A	0.604	1.802	0.756	0.825	1	114.214	3.95	197.69	A
80.00-60.00			B	0.572	1.824	0.737	0.825	1	105.888			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.366	2.136	0.638	0.825	1	61.562			
T8	2.42	4.84	A	0.564	1.83	0.733	0.825	1	121.793	3.89	194.52	A
60.00-40.00			B	0.53	1.864	0.713	0.825	1	112.105			
			C	0.364	2.14	0.638	0.825	1	72.447			
T9	2.46	4.54	A	0.494	1.908	0.694	0.825	1	115.688	3.42	171.04	A
40.00-20.00			B	0.455	1.966	0.675	0.825	1	104.233			
			C	0.308	2.276	0.618	0.825	1	67.500			
T10	2.49	4.51	A	0.456	1.963	0.676	0.825	1	118.302	3.60	179.96	A
20.00-0.00			B	0.413	2.039	0.657	0.825	1	104.655			
			C	0.282	2.344	0.611	0.825	1	69.085			
Sum Weight:	17.65	27.91						OTM	2854.37 kip-ft	33.04		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.14	0.53	A	0.326	2.228	0.624	0.8	1	10.758	0.66	66.10	B
190.00-180.00			B	0.369	2.129	0.639	0.8	1	12.242			
			C	0.353	2.165	0.633	0.8	1	11.665			
T2	0.28	1.18	A	0.344	2.185	0.63	0.8	1	22.963	1.32	66.00	B
180.00-160.00			B	0.375	2.115	0.642	0.8	1	25.212			
			C	0.359	2.15	0.636	0.8	1	24.033			
T3	0.98	1.48	A	0.571	1.825	0.736	0.8	1	43.062	2.52	125.86	B
160.00-140.00			B	0.708	1.777	0.826	0.8	1	59.312			
			C	0.419	2.027	0.66	0.8	1	29.078			
T4	1.94	1.78	A	0.83	1.841	0.921	0.8	1	93.889	4.84	241.85	B
140.00-120.00			B	0.903	1.928	0.986	0.8	1	109.387			
			C	0.47	1.942	0.683	0.8	1	40.351			
T5	2.22	2.71	A	0.803	1.818	0.899	0.8	1	118.724	4.72	235.97	A
120.00-100.00			B	0.737	1.783	0.847	0.8	1	102.857			
			C	0.434	2	0.666	0.8	1	49.475			
T6	2.33	2.63	A	0.671	1.777	0.8	0.8	1	111.446	4.09	204.42	A
100.00-80.00			B	0.635	1.787	0.775	0.8	1	102.331			
			C	0.372	2.122	0.641	0.8	1	51.253			
T7	2.38	3.72	A	0.604	1.802	0.756	0.8	1	113.913	3.94	197.17	A
80.00-60.00			B	0.572	1.824	0.737	0.8	1	105.564			
			C	0.366	2.136	0.638	0.8	1	61.083			
T8	2.42	4.84	A	0.564	1.83	0.733	0.8	1	121.331	3.88	193.78	A
60.00-40.00			B	0.53	1.864	0.713	0.8	1	111.608			
			C	0.364	2.14	0.638	0.8	1	71.776			
T9	2.46	4.54	A	0.494	1.908	0.694	0.8	1	115.288	3.41	170.45	A
40.00-20.00			B	0.455	1.966	0.675	0.8	1	103.802			
			C	0.308	2.276	0.618	0.8	1	66.954			
T10	2.49	4.51	A	0.456	1.963	0.676	0.8	1	117.924	3.59	179.39	A
20.00-0.00			B	0.413	2.039	0.657	0.8	1	104.248			
			C	0.282	2.344	0.611	0.8	1	68.588			
Sum Weight:	17.65	27.91						OTM	2848.12 kip-ft	32.96		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.14	0.53	A	0.326	2.228	0.624	0.85	1	10.961	0.67	67.13	B
190.00-180.00			B	0.369	2.129	0.639	0.85	1	12.432			
			C	0.353	2.165	0.633	0.85	1	11.860			
T2	0.28	1.18	A	0.344	2.185	0.63	0.85	1	23.343	1.34	66.94	B
180.00-160.00			B	0.375	2.115	0.642	0.85	1	25.574			
			C	0.359	2.15	0.636	0.85	1	24.405			
T3	0.98	1.48	A	0.571	1.825	0.736	0.85	1	43.318	2.52	126.24	B
160.00-140.00			B	0.708	1.777	0.826	0.85	1	59.489			
			C	0.419	2.027	0.66	0.85	1	29.420			
T4	1.94	1.78	A	0.83	1.841	0.921	0.85	1	94.008	4.84	242.00	B
140.00-120.00			B	0.903	1.928	0.986	0.85	1	109.455			
			C	0.47	1.942	0.683	0.85	1	40.722			
T5	2.22	2.71	A	0.803	1.818	0.899	0.85	1	118.955	4.73	236.43	A
120.00-100.00			B	0.737	1.783	0.847	0.85	1	103.162			
			C	0.434	2	0.666	0.85	1	50.119			
T6	2.33	2.63	A	0.671	1.777	0.8	0.85	1	111.742	4.10	204.96	A
100.00-80.00			B	0.635	1.787	0.775	0.85	1	102.660			
			C	0.372	2.122	0.641	0.85	1	51.812			
T7	2.38	3.72	A	0.604	1.802	0.756	0.85	1	114.514	3.96	198.21	A
80.00-60.00			B	0.572	1.824	0.737	0.85	1	106.213			
			C	0.366	2.136	0.638	0.85	1	62.040			
T8	2.42	4.84	A	0.564	1.83	0.733	0.85	1	122.254	3.91	195.26	A
60.00-40.00			B	0.53	1.864	0.713	0.85	1	112.602			
			C	0.364	2.14	0.638	0.85	1	73.118			
T9	2.46	4.54	A	0.494	1.908	0.694	0.85	1	116.088	3.43	171.64	A
40.00-20.00			B	0.455	1.966	0.675	0.85	1	104.665			
			C	0.308	2.276	0.618	0.85	1	68.047			
T10	2.49	4.51	A	0.456	1.963	0.676	0.85	1	118.680	3.61	180.54	A
20.00-0.00			B	0.413	2.039	0.657	0.85	1	105.063			
			C	0.282	2.344	0.611	0.85	1	69.582			
Sum Weight:	17.65	27.91						OTM	2860.62 kip-ft	33.12		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	1	1	7.802	0.25	24.58	B
190.00-180.00			B	0.234	2.486	0.598	1	1	8.451			
			C	0.232	2.493	0.597	1	1	8.390			
T2	0.10	0.74	A	0.226	2.512	0.596	1	1	16.485	0.49	24.61	B
180.00-160.00			B	0.244	2.455	0.6	1	1	17.557			
			C	0.242	2.461	0.6	1	1	17.430			
T3	0.37	1.01	A	0.388	2.087	0.647	1	1	27.404	0.74	37.20	B
160.00-140.00			B	0.485	1.92	0.69	1	1	35.161			
			C	0.291	2.321	0.613	1	1	20.714			
T4	0.74	1.23	A	0.567	1.828	0.734	1	1	52.031	1.12	55.92	B
140.00-120.00			B	0.621	1.792	0.767	1	1	58.981			
			C	0.317	2.252	0.621	1	1	27.216			
T5	0.84	1.91	A	0.551	1.843	0.725	1	1	67.746	1.26	62.97	A
120.00-100.00			B	0.511	1.886	0.703	1	1	61.703			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.295	2.31	0.614	1	1	35.219			
T6	0.87	1.91	A	0.457	1.963	0.676	1	1	66.566	1.24	62.21	A
100.00-80.00			B	0.434	2	0.666	1	1	62.760			
			C	0.255	2.423	0.603	1	1	36.632			
T7	0.89	2.68	A	0.414	2.037	0.658	1	1	72.894	1.32	65.79	A
80.00-60.00			B	0.396	2.072	0.65	1	1	69.505			
			C	0.253	2.429	0.603	1	1	45.988			
T8	0.90	3.49	A	0.395	2.073	0.65	1	1	82.565	1.38	68.92	A
60.00-40.00			B	0.377	2.111	0.643	1	1	78.796			
			C	0.26	2.407	0.605	1	1	57.029			
T9	0.91	3.40	A	0.338	2.201	0.628	1	1	77.319	1.22	60.83	A
40.00-20.00			B	0.318	2.249	0.622	1	1	72.934			
			C	0.214	2.549	0.593	1	1	51.528			
T10	0.92	3.41	A	0.314	2.259	0.62	1	1	79.898	1.29	64.54	A
20.00-0.00			B	0.293	2.314	0.614	1	1	74.749			
			C	0.201	2.592	0.591	1	1	53.288			
Sum Weight:	6.59	20.07						OTM	847.08 kip-ft	10.31		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.825	1	7.057	0.22	22.48	B
190.00-180.00			B	0.234	2.486	0.598	0.825	1	7.728			
			C	0.232	2.493	0.597	0.825	1	7.664			
T2	0.10	0.74	A	0.226	2.512	0.596	0.825	1	15.071	0.45	22.68	B
180.00-160.00			B	0.244	2.455	0.6	0.825	1	16.176			
			C	0.242	2.461	0.6	0.825	1	16.046			
T3	0.37	1.01	A	0.388	2.087	0.647	0.825	1	26.270	0.72	36.19	B
160.00-140.00			B	0.485	1.92	0.69	0.825	1	34.206			
			C	0.291	2.321	0.613	0.825	1	19.399			
T4	0.74	1.23	A	0.567	1.828	0.734	0.825	1	51.080	1.10	55.13	B
140.00-120.00			B	0.621	1.792	0.767	0.825	1	58.153			
			C	0.317	2.252	0.621	0.825	1	25.696			
T5	0.84	1.91	A	0.551	1.843	0.725	0.825	1	66.116	1.23	61.45	A
120.00-100.00			B	0.511	1.886	0.703	0.825	1	59.928			
			C	0.295	2.31	0.614	0.825	1	32.659			
T6	0.87	1.91	A	0.457	1.963	0.676	0.825	1	64.962	1.21	60.71	A
100.00-80.00			B	0.434	2	0.666	0.825	1	61.090			
			C	0.255	2.423	0.603	0.825	1	34.433			
T7	0.89	2.68	A	0.414	2.037	0.658	0.825	1	69.992	1.26	63.17	A
80.00-60.00			B	0.396	2.072	0.65	0.825	1	66.513			
			C	0.253	2.429	0.603	0.825	1	42.285			
T8	0.90	3.49	A	0.395	2.073	0.65	0.825	1	78.366	1.31	65.41	A
60.00-40.00			B	0.377	2.111	0.643	0.825	1	74.470			
			C	0.26	2.407	0.605	0.825	1	51.892			
T9	0.91	3.40	A	0.338	2.201	0.628	0.825	1	73.816	1.16	58.08	A
40.00-20.00			B	0.318	2.249	0.622	0.825	1	69.327			
			C	0.214	2.549	0.593	0.825	1	47.371			
T10	0.92	3.41	A	0.314	2.259	0.62	0.825	1	76.674	1.24	61.94	A
20.00-0.00			B	0.293	2.314	0.614	0.825	1	71.428			
			C	0.201	2.592	0.591	0.825	1	49.536			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	6.59	20.07						OTM	816.16 kip-ft	9.92		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.8	1	6.950	0.22	22.18	B
190.00-180.00			B	0.234	2.486	0.598	0.8	1	7.624			
			C	0.232	2.493	0.597	0.8	1	7.560			
T2	0.10	0.74	A	0.226	2.512	0.596	0.8	1	14.869	0.45	22.40	B
180.00-160.00			B	0.244	2.455	0.6	0.8	1	15.979			
			C	0.242	2.461	0.6	0.8	1	15.848			
T3	0.37	1.01	A	0.388	2.087	0.647	0.8	1	26.108	0.72	36.04	B
160.00-140.00			B	0.485	1.92	0.69	0.8	1	34.070			
			C	0.291	2.321	0.613	0.8	1	19.211			
T4	0.74	1.23	A	0.567	1.828	0.734	0.8	1	50.944	1.10	55.02	B
140.00-120.00			B	0.621	1.792	0.767	0.8	1	58.035			
			C	0.317	2.252	0.621	0.8	1	25.479			
T5	0.84	1.91	A	0.551	1.843	0.725	0.8	1	65.883	1.22	61.23	A
120.00-100.00			B	0.511	1.886	0.703	0.8	1	59.675			
			C	0.295	2.31	0.614	0.8	1	32.294			
T6	0.87	1.91	A	0.457	1.963	0.676	0.8	1	64.733	1.21	60.50	A
100.00-80.00			B	0.434	2	0.666	0.8	1	60.852			
			C	0.255	2.423	0.603	0.8	1	34.119			
T7	0.89	2.68	A	0.414	2.037	0.658	0.8	1	69.578	1.26	62.80	A
80.00-60.00			B	0.396	2.072	0.65	0.8	1	66.085			
			C	0.253	2.429	0.603	0.8	1	41.756			
T8	0.90	3.49	A	0.395	2.073	0.65	0.8	1	77.766	1.30	64.91	A
60.00-40.00			B	0.377	2.111	0.643	0.8	1	73.853			
			C	0.26	2.407	0.605	0.8	1	51.158			
T9	0.91	3.40	A	0.338	2.201	0.628	0.8	1	73.316	1.15	57.68	A
40.00-20.00			B	0.318	2.249	0.622	0.8	1	68.812			
			C	0.214	2.549	0.593	0.8	1	46.777			
T10	0.92	3.41	A	0.314	2.259	0.62	0.8	1	76.213	1.23	61.56	A
20.00-0.00			B	0.293	2.314	0.614	0.8	1	70.954			
			C	0.201	2.592	0.591	0.8	1	49.000			
Sum Weight:	6.59	20.07						OTM	811.74 kip-ft	9.86		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.05	0.31	A	0.211	2.559	0.593	0.85	1	7.163	0.23	22.78	B
190.00-180.00			B	0.234	2.486	0.598	0.85	1	7.831			
			C	0.232	2.493	0.597	0.85	1	7.768			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T2	0.10	0.74	A	0.226	2.512	0.596	0.85	1	15.273	0.46	22.95	B
180.00-160.00			B	0.244	2.455	0.6	0.85	1	16.373			
			C	0.242	2.461	0.6	0.85	1	16.244			
T3	0.37	1.01	A	0.388	2.087	0.647	0.85	1	26.432	0.73	36.33	B
160.00-140.00			B	0.485	1.92	0.69	0.85	1	34.343			
			C	0.291	2.321	0.613	0.85	1	19.587			
T4	0.74	1.23	A	0.567	1.828	0.734	0.85	1	51.216	1.10	55.25	B
140.00-120.00			B	0.621	1.792	0.767	0.85	1	58.271			
			C	0.317	2.252	0.621	0.85	1	25.913			
T5	0.84	1.91	A	0.551	1.843	0.725	0.85	1	66.349	1.23	61.67	A
120.00-100.00			B	0.511	1.886	0.703	0.85	1	60.182			
			C	0.295	2.31	0.614	0.85	1	33.025			
T6	0.87	1.91	A	0.457	1.963	0.676	0.85	1	65.191	1.22	60.93	A
100.00-80.00			B	0.434	2	0.666	0.85	1	61.329			
			C	0.255	2.423	0.603	0.85	1	34.747			
T7	0.89	2.68	A	0.414	2.037	0.658	0.85	1	70.407	1.27	63.55	A
80.00-60.00			B	0.396	2.072	0.65	0.85	1	66.940			
			C	0.253	2.429	0.603	0.85	1	42.814			
T8	0.90	3.49	A	0.395	2.073	0.65	0.85	1	78.966	1.32	65.91	A
60.00-40.00			B	0.377	2.111	0.643	0.85	1	75.088			
			C	0.26	2.407	0.605	0.85	1	52.626			
T9	0.91	3.40	A	0.338	2.201	0.628	0.85	1	74.317	1.17	58.47	A
40.00-20.00			B	0.318	2.249	0.622	0.85	1	69.842			
			C	0.214	2.549	0.593	0.85	1	47.965			
T10	0.92	3.41	A	0.314	2.259	0.62	0.85	1	77.134	1.25	62.31	A
20.00-0.00			B	0.293	2.314	0.614	0.85	1	71.903			
			C	0.201	2.592	0.591	0.85	1	50.072			
Sum Weight:	6.59	20.07						OTM	820.58 kip-ft	9.98		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	10.31					
Bracing Weight	9.77					
Total Member Self-Weight	20.07			-11.75	0.20	
Total Weight	32.99			-11.75	0.20	
Wind 0 deg - No Ice		0.13	-42.09	-4303.48	-20.42	3.38
Wind 30 deg - No Ice		20.79	-35.61	-3659.86	-2141.53	-7.85
Wind 45 deg - No Ice		29.23	-28.97	-2983.23	-3010.71	-12.88
Wind 60 deg - No Ice		35.63	-20.43	-2110.62	-3671.23	-17.03
Wind 90 deg - No Ice		41.44	-0.08	-24.44	-4261.27	-22.13
Wind 120 deg - No Ice		36.75	20.93	2116.26	-3762.93	-21.55
Wind 135 deg - No Ice		29.21	28.88	2945.54	-3007.08	-17.81
Wind 150 deg - No Ice		20.67	35.56	3629.31	-2122.59	-13.94
Wind 180 deg - No Ice		-0.02	40.77	4171.37	2.84	-3.34
Wind 210 deg - No Ice		-20.70	35.60	3635.96	2127.92	8.19
Wind 225 deg - No Ice		-29.16	28.96	2958.36	3000.29	13.09
Wind 240 deg - No Ice		-36.69	21.04	2134.27	3753.30	18.17
Wind 270 deg - No Ice		-41.39	0.00	-10.99	4254.31	21.80
Wind 300 deg - No Ice		-35.56	-20.37	-2101.03	3660.28	20.36
Wind 315 deg - No Ice		-29.15	-28.91	-2973.77	2998.67	17.80
Wind 330 deg - No Ice		-20.67	-35.56	-3652.63	2123.30	13.94

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Member Ice	7.84					
Total Weight Ice	56.79			-25.56	-7.27	
Wind 0 deg - Ice		0.11	-45.80	-4725.29	-24.06	2.14
Wind 30 deg - Ice		22.84	-39.25	-4061.30	-2365.24	-10.54
Wind 45 deg - Ice		32.20	-32.00	-3317.81	-3330.26	-16.05
Wind 60 deg - Ice		39.34	-22.61	-2353.74	-4067.51	-20.49
Wind 90 deg - Ice		45.57	-0.07	-35.90	-4705.31	-25.19
Wind 120 deg - Ice		39.90	22.81	2309.76	-4113.46	-23.19
Wind 135 deg - Ice		32.18	31.92	3255.13	-3327.30	-19.15
Wind 150 deg - Ice		22.74	39.21	4004.44	-2349.82	-14.37
Wind 180 deg - Ice		-0.01	45.14	4618.90	-5.12	-2.06
Wind 210 deg - Ice		-22.77	39.24	4009.86	2339.30	10.81
Wind 225 deg - Ice		-32.15	31.99	3265.57	3306.92	16.23
Wind 240 deg - Ice		-39.85	22.90	2324.44	4090.76	21.05
Wind 270 deg - Ice		-45.53	0.00	-24.94	4684.79	24.92
Wind 300 deg - Ice		-39.29	-22.56	-2345.93	4043.74	22.55
Wind 315 deg - Ice		-32.14	-31.95	-3310.10	3305.60	19.14
Wind 330 deg - Ice		-22.75	-39.21	-4055.41	2335.54	14.37
Total Weight	32.99			-11.75	0.20	
Wind 0 deg - Service		0.05	-14.56	-1482.46	-8.30	1.17
Wind 30 deg - Service		7.19	-12.32	-1259.76	-742.25	-2.72
Wind 45 deg - Service		10.11	-10.02	-1025.63	-1043.00	-4.46
Wind 60 deg - Service		12.33	-7.07	-723.69	-1271.56	-5.89
Wind 90 deg - Service		14.34	-0.03	-1.83	-1475.72	-7.66
Wind 120 deg - Service		12.72	7.24	738.90	-1303.29	-7.46
Wind 135 deg - Service		10.11	9.99	1025.85	-1041.75	-6.16
Wind 150 deg - Service		7.15	12.30	1262.45	-735.70	-4.82
Wind 180 deg - Service		-0.01	14.11	1450.01	-0.26	-1.16
Wind 210 deg - Service		-7.16	12.32	1264.75	735.07	2.83
Wind 225 deg - Service		-10.09	10.02	1030.29	1036.93	4.53
Wind 240 deg - Service		-12.70	7.28	745.13	1297.48	6.29
Wind 270 deg - Service		-14.32	0.00	2.83	1470.84	7.54
Wind 300 deg - Service		-12.30	-7.05	-720.37	1265.30	7.05
Wind 315 deg - Service		-10.09	-10.00	-1022.35	1036.37	6.16
Wind 330 deg - Service		-7.15	-12.30	-1257.25	733.47	4.82

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice

Comb. No.	Description
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	190 - 180	Leg	Max Tension	22	4.83	-0.16	-0.02
			Max. Compression	24	-6.43	0.01	0.00
			Max. Mx	23	-3.95	0.27	0.07
			Max. My	27	-2.91	0.06	0.34
			Max. Vy	32	0.60	-0.00	0.00
			Max. Vx	27	-0.68	-0.00	0.00
		Diagonal	Max Tension	27	1.75	0.00	0.00
			Max. Compression	19	-1.78	0.00	0.00
			Max. Mx	24	0.21	0.02	0.00
			Max. My	3	-0.44	-0.00	-0.01
			Max. Vy	24	0.01	0.02	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	24	0.31	0.00	0.00
			Max. Compression	22	-0.35	0.00	0.00
			Max. Mx	32	-0.33	-0.01	0.00
			Max. My	26	0.04	0.00	-0.00
			Max. Vy	32	0.01	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T2	180 - 160	Leg	Max Tension	22	27.71	-0.06	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	24	-32.10	0.10	-0.00
			Max. Mx	13	-29.96	0.10	0.00
			Max. My	20	-2.91	0.00	-0.10
			Max. Vy	13	-0.03	0.10	0.00
			Max. Vx	3	0.07	-0.00	-0.10
		Diagonal	Max Tension	34	2.91	0.00	0.00
			Max. Compression	26	-2.97	0.00	0.00
			Max. Mx	23	1.12	0.02	-0.00
			Max. My	10	-2.12	0.00	0.01
			Max. Vy	21	0.01	0.02	-0.00
			Max. Vx	10	0.00	0.00	0.00
T3	160 - 140	Leg	Max Tension	22	68.61	-0.68	0.06
			Max. Compression	24	-77.96	0.77	0.09
			Max. Mx	24	-77.96	0.77	0.09
			Max. My	14	-1.27	-0.01	0.72
			Max. Vy	7	-0.62	0.61	-0.00
			Max. Vx	6	0.67	-0.01	0.58
		Diagonal	Max Tension	26	5.67	0.00	0.00
			Max. Compression	34	-5.93	0.00	0.00
			Max. Mx	24	4.05	0.03	0.00
			Max. My	3	-4.49	-0.02	-0.01
			Max. Vy	24	-0.02	0.03	0.00
			Max. Vx	3	0.00	-0.02	-0.01
T4	140 - 120	Leg	Max Tension	22	103.79	-0.30	0.01
			Max. Compression	24	-117.21	0.18	0.02
			Max. Mx	24	-87.22	0.77	0.09
			Max. My	23	-5.87	-0.04	0.79
			Max. Vy	10	-0.47	-0.64	-0.00
			Max. Vx	6	-0.50	-0.02	0.59
		Diagonal	Max Tension	34	4.67	0.00	0.00
			Max. Compression	34	-4.78	0.00	0.00
			Max. Mx	23	2.02	0.03	0.00
			Max. My	27	-2.88	-0.00	0.01
			Max. Vy	24	-0.01	0.03	0.00
			Max. Vx	27	-0.00	0.00	0.00
		Top Girt	Max Tension	10	0.10	0.00	0.00
			Max. Compression	24	-0.19	0.00	0.00
			Max. Mx	18	-0.02	-0.01	0.00
			Max. My	32	-0.10	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	32	-0.00	0.00	0.00
T5	120 - 100	Leg	Max Tension	22	135.48	0.15	-0.02
			Max. Compression	24	-151.72	0.02	-0.03
			Max. Mx	24	-133.46	1.37	-0.10
			Max. My	23	-7.12	-0.13	1.45
			Max. Vy	24	-0.86	1.37	-0.10
			Max. Vx	23	0.88	-0.11	1.35
		Diagonal	Max Tension	33	5.44	0.00	0.00
			Max. Compression	25	-5.64	0.00	0.00
			Max. Mx	24	2.68	0.04	0.00
			Max. My	33	-5.15	-0.01	-0.01
			Max. Vy	22	0.02	0.04	0.00
			Max. Vx	33	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	24	2.63	0.00	0.00
			Max. Compression	24	-2.63	0.00	0.00
			Max. Mx	18	0.16	-0.05	0.00
			Max. My	23	2.29	0.00	0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T6	100 - 80	Leg	Max Tension	22	165.59	-0.72	0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	24	-184.96	0.25	0.04
			Max. Mx	24	-162.08	0.85	0.02
			Max. My	23	-10.40	-0.08	1.36
			Max. Vy	30	-0.18	0.84	-0.03
			Max. Vx	23	-0.19	-0.08	1.36
		Diagonal	Max Tension	34	6.11	0.00	0.00
			Max. Compression	34	-6.32	0.00	0.00
			Max. Mx	24	4.16	0.06	0.00
			Max. My	33	-5.94	-0.01	-0.01
			Max. Vy	24	-0.02	0.06	0.00
			Max. Vx	33	0.00	0.00	0.00
T7	80 - 60	Leg	Max Tension	22	192.75	0.28	0.00
			Max. Compression	24	-215.74	-0.75	0.01
			Max. Mx	24	-215.72	2.16	-0.01
			Max. My	23	-12.71	-0.08	2.32
			Max. Vy	24	-0.95	2.16	-0.01
			Max. Vx	23	-0.88	-0.08	2.32
		Diagonal	Max Tension	33	6.27	0.00	0.00
			Max. Compression	25	-6.64	0.00	0.00
			Max. Mx	24	3.70	0.07	0.01
			Max. My	32	-5.29	0.02	-0.01
			Max. Vy	22	0.03	0.07	0.01
			Max. Vx	32	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	24	3.74	0.00	0.00
			Max. Compression	24	-3.74	0.00	0.00
			Max. Mx	22	1.97	-0.13	0.00
			Max. My	23	3.25	0.00	0.00
			Max. Vy	22	0.04	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T8	60 - 40	Leg	Max Tension	22	219.21	0.71	0.01
			Max. Compression	24	-247.69	-1.48	0.02
			Max. Mx	24	-247.64	2.99	-0.01
			Max. My	23	-15.81	-0.83	2.66
			Max. Vy	24	1.33	2.99	-0.01
			Max. Vx	23	-1.00	-0.83	2.66
		Diagonal	Max Tension	33	7.57	0.00	0.00
			Max. Compression	25	-7.75	0.00	0.00
			Max. Mx	24	4.06	0.11	0.01
			Max. My	32	-5.66	0.02	-0.01
			Max. Vy	22	0.04	0.11	0.01
			Max. Vx	32	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	24	4.30	0.00	0.00
			Max. Compression	24	-4.30	0.00	0.00
			Max. Mx	18	0.26	-0.23	0.00
			Max. My	23	3.73	0.00	0.01
			Max. Vy	18	0.06	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	22	240.01	1.73	0.05
			Max. Compression	19	-273.98	-2.18	-0.01
			Max. Mx	19	-273.68	3.86	-0.03
			Max. My	23	-18.14	0.42	3.61
			Max. Vy	24	1.19	3.85	-0.02
			Max. Vx	23	1.01	0.42	3.61
		Diagonal	Max Tension	33	7.97	0.00	0.00
			Max. Compression	25	-8.39	0.00	0.00
			Max. Mx	22	5.18	0.13	0.01
			Max. My	24	-8.31	0.02	0.03
			Max. Vy	22	0.04	0.13	0.01
			Max. Vx	24	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Secondary Horizontal	Max Tension	19	4.75	0.00	0.00
			Max. Compression	19	-4.75	0.00	0.00
			Max. Mx	18	0.43	-0.30	0.00
			Max. My	23	4.13	0.00	0.01
			Max. Vy	18	-0.07	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T10	20 - 0	Leg	Max Tension	22	261.61	1.02	0.03
			Max. Compression	19	-302.96	-0.00	0.00
			Max. Mx	24	-286.35	4.79	0.00
			Max. My	23	-21.88	2.84	3.40
			Max. Vy	30	-0.76	4.79	0.00
			Max. Vx	23	0.44	2.84	3.40
		Diagonal	Max Tension	33	10.27	0.00	0.00
			Max. Compression	26	-9.46	0.00	0.00
			Max. Mx	22	3.91	0.21	0.01
			Max. My	33	-9.38	0.09	-0.03
			Max. Vy	22	0.06	0.21	0.01
			Max. Vx	33	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	30	307.25	22.67	-13.83
	Max. H_x	13	274.68	22.81	-13.81
	Max. H_z	22	-269.07	-25.40	15.37
	Min. Vert	22	-269.07	-25.40	15.37
	Min. H_x	22	-269.07	-25.40	15.37
	Min. H_z	30	307.25	22.67	-13.83
Leg B	Max. Vert	24	308.02	-22.65	-13.91
	Max. H_x	32	-267.55	25.31	15.39
	Max. H_z	32	-267.55	25.31	15.39
	Min. Vert	32	-267.55	25.31	15.39
	Min. H_x	7	274.64	-22.76	-13.90
	Min. H_z	24	308.02	-22.65	-13.91
Leg A	Max. Vert	19	308.49	0.08	26.50
	Max. H_x	31	20.45	3.08	-1.70
	Max. H_z	2	273.82	0.10	26.54
	Min. Vert	27	-264.14	-0.06	-29.47
	Min. H_x	23	21.13	-3.08	-1.66
	Min. H_z	27	-264.14	-0.06	-29.47

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	32.99	0.00	0.00	-11.75	0.20	-0.00
Dead+Wind 0 deg - No Ice	32.99	0.13	-42.09	-4324.60	-20.56	3.37
Dead+Wind 30 deg - No Ice	32.99	20.79	-35.61	-3677.87	-2152.11	-7.89
Dead+Wind 45 deg - No Ice	32.99	29.23	-28.97	-2997.93	-3025.58	-12.93

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 60 deg - No Ice	32.99	35.63	-20.43	-2121.05	-3689.36	-17.09
Dead+Wind 90 deg - No Ice	32.99	41.44	-0.08	-24.62	-4282.29	-22.21
Dead+Wind 120 deg - No Ice	32.99	36.75	20.93	2126.59	-3781.48	-21.61
Dead+Wind 135 deg - No Ice	32.99	29.21	28.88	2960.01	-3021.96	-17.85
Dead+Wind 150 deg - No Ice	32.99	20.67	35.56	3647.17	-2133.09	-13.96
Dead+Wind 180 deg - No Ice	32.99	-0.02	40.77	4191.96	2.82	-3.34
Dead+Wind 210 deg - No Ice	32.99	-20.70	35.60	3653.89	2138.40	8.22
Dead+Wind 225 deg - No Ice	32.99	-29.16	28.96	2972.94	3015.09	13.14
Dead+Wind 240 deg - No Ice	32.99	-36.69	21.04	2144.74	3771.78	18.23
Dead+Wind 270 deg - No Ice	32.99	-41.39	0.00	-11.09	4275.30	21.88
Dead+Wind 300 deg - No Ice	32.99	-35.56	-20.37	-2111.42	3678.34	20.43
Dead+Wind 315 deg - No Ice	32.99	-29.15	-28.91	-2988.44	3013.45	17.84
Dead+Wind 330 deg - No Ice	32.99	-20.67	-35.56	-3670.62	2133.74	13.96
Dead+Ice+Temp	56.79	0.00	0.00	-25.56	-7.43	0.00
Dead+Wind 0 deg+Ice+Temp	56.79	0.11	-45.80	-4764.62	-24.47	2.36
Dead+Wind 30 deg+Ice+Temp	56.79	22.84	-39.25	-4095.11	-2385.22	-10.37
Dead+Wind 45 deg+Ice+Temp	56.79	32.20	-32.00	-3345.43	-3358.30	-15.93
Dead+Wind 60 deg+Ice+Temp	56.79	39.34	-22.61	-2373.34	-4101.72	-20.43
Dead+Wind 90 deg+Ice+Temp	56.79	45.57	-0.07	-36.16	-4744.84	-25.27
Dead+Wind 120 deg+Ice+Temp	56.79	39.90	22.81	2329.12	-4148.05	-23.36
Dead+Wind 135 deg+Ice+Temp	56.79	32.18	31.92	3282.43	-3355.33	-19.33
Dead+Wind 150 deg+Ice+Temp	56.79	22.74	39.21	4038.05	-2369.65	-14.58
Dead+Wind 180 deg+Ice+Temp	56.79	-0.01	45.14	4657.70	-5.32	-2.29
Dead+Wind 210 deg+Ice+Temp	56.79	-22.77	39.24	4043.54	2358.74	10.63
Dead+Wind 225 deg+Ice+Temp	56.79	-32.15	31.99	3293.00	3334.46	16.10
Dead+Wind 240 deg+Ice+Temp	56.79	-39.85	22.90	2343.95	4124.85	20.99
Dead+Wind 270 deg+Ice+Temp	56.79	-45.53	0.00	-25.10	4723.85	25.00
Dead+Wind 300 deg+Ice+Temp	56.79	-39.29	-22.56	-2365.49	4077.42	22.71
Dead+Wind 315 deg+Ice+Temp	56.79	-32.14	-31.95	-3337.69	3333.09	19.32
Dead+Wind 330 deg+Ice+Temp	56.79	-22.75	-39.21	-4089.20	2354.90	14.58
Dead+Wind 0 deg - Service	32.99	0.05	-14.56	-1504.20	-6.98	1.17
Dead+Wind 30 deg - Service	32.99	7.19	-12.32	-1280.40	-744.58	-2.74
Dead+Wind 45 deg - Service	32.99	10.11	-10.02	-1045.11	-1046.84	-4.48
Dead+Wind 60 deg - Service	32.99	12.33	-7.07	-741.67	-1276.53	-5.92
Dead+Wind 90 deg - Service	32.99	14.34	-0.03	-16.22	-1481.71	-7.68
Dead+Wind 120 deg - Service	32.99	12.72	7.24	728.19	-1308.41	-7.48
Dead+Wind 135 deg - Service	32.99	10.11	9.99	1016.58	-1045.58	-6.18
Dead+Wind 150 deg - Service	32.99	7.15	12.30	1254.36	-738.00	-4.84
Dead+Wind 180 deg - Service	32.99	-0.01	14.11	1442.86	1.11	-1.16
Dead+Wind 210 deg - Service	32.99	-7.16	12.32	1256.68	740.10	2.85
Dead+Wind 225 deg - Service	32.99	-10.09	10.02	1021.04	1043.47	4.55
Dead+Wind 240 deg - Service	32.99	-12.70	7.28	734.46	1305.32	6.31
Dead+Wind 270 deg - Service	32.99	-14.32	0.00	-11.54	1479.55	7.56
Dead+Wind 300 deg - Service	32.99	-12.30	-7.05	-738.33	1272.98	7.07
Dead+Wind 315 deg - Service	32.99	-10.09	-10.00	-1041.82	1042.91	6.18
Dead+Wind 330 deg - Service	32.99	-7.15	-12.30	-1277.89	738.50	4.84

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-32.99	0.00	0.00	32.99	0.00	0.000%
2	0.13	-32.99	-42.09	-0.13	32.99	42.09	0.000%
3	20.79	-32.99	-35.61	-20.79	32.99	35.61	0.001%
4	29.23	-32.99	-28.97	-29.23	32.99	28.97	0.000%
5	35.63	-32.99	-20.43	-35.63	32.99	20.43	0.000%
6	41.44	-32.99	-0.08	-41.44	32.99	0.08	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
7	36.75	-32.99	20.93	-36.75	32.99	-20.93	0.000%
8	29.21	-32.99	28.88	-29.21	32.99	-28.88	0.000%
9	20.67	-32.99	35.56	-20.67	32.99	-35.56	0.000%
10	-0.02	-32.99	40.77	0.02	32.99	-40.77	0.000%
11	-20.70	-32.99	35.60	20.70	32.99	-35.60	0.000%
12	-29.16	-32.99	28.96	29.16	32.99	-28.96	0.000%
13	-36.69	-32.99	21.04	36.69	32.99	-21.04	0.000%
14	-41.39	-32.99	0.00	41.39	32.99	-0.00	0.000%
15	-35.56	-32.99	-20.37	35.56	32.99	20.37	0.000%
16	-29.15	-32.99	-28.91	29.15	32.99	28.91	0.000%
17	-20.67	-32.99	-35.56	20.67	32.99	35.56	0.000%
18	0.00	-56.79	0.00	0.00	56.79	-0.00	0.000%
19	0.11	-56.79	-45.80	-0.11	56.79	45.80	0.000%
20	22.84	-56.79	-39.25	-22.84	56.79	39.25	0.000%
21	32.20	-56.79	-32.00	-32.20	56.79	32.00	0.000%
22	39.34	-56.79	-22.61	-39.34	56.79	22.61	0.000%
23	45.57	-56.79	-0.07	-45.57	56.79	0.07	0.000%
24	39.90	-56.79	22.81	-39.90	56.79	-22.81	0.000%
25	32.18	-56.79	31.92	-32.18	56.79	-31.92	0.000%
26	22.74	-56.79	39.21	-22.74	56.79	-39.21	0.000%
27	-0.01	-56.79	45.14	0.01	56.79	-45.14	0.000%
28	-22.77	-56.79	39.24	22.77	56.79	-39.24	0.000%
29	-32.15	-56.79	31.99	32.15	56.79	-31.99	0.000%
30	-39.85	-56.79	22.90	39.85	56.79	-22.90	0.000%
31	-45.53	-56.79	0.00	45.53	56.79	-0.00	0.000%
32	-39.29	-56.79	-22.56	39.29	56.79	22.56	0.000%
33	-32.14	-56.79	-31.95	32.14	56.79	31.95	0.000%
34	-22.75	-56.79	-39.21	22.75	56.79	39.21	0.000%
35	0.05	-32.99	-14.56	-0.05	32.99	14.56	0.000%
36	7.19	-32.99	-12.32	-7.19	32.99	12.32	0.000%
37	10.11	-32.99	-10.02	-10.11	32.99	10.02	0.000%
38	12.33	-32.99	-7.07	-12.33	32.99	7.07	0.000%
39	14.34	-32.99	-0.03	-14.34	32.99	0.03	0.000%
40	12.72	-32.99	7.24	-12.72	32.99	-7.24	0.000%
41	10.11	-32.99	9.99	-10.11	32.99	-9.99	0.000%
42	7.15	-32.99	12.30	-7.15	32.99	-12.30	0.000%
43	-0.01	-32.99	14.11	0.01	32.99	-14.11	0.000%
44	-7.16	-32.99	12.32	7.16	32.99	-12.32	0.000%
45	-10.09	-32.99	10.02	10.09	32.99	-10.02	0.000%
46	-12.70	-32.99	7.28	12.70	32.99	-7.28	0.000%
47	-14.32	-32.99	0.00	14.32	32.99	-0.00	0.000%
48	-12.30	-32.99	-7.05	12.30	32.99	7.05	0.000%
49	-10.09	-32.99	-10.00	10.09	32.99	10.00	0.000%
50	-7.15	-32.99	-12.30	7.15	32.99	12.30	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000121
4	Yes	4	0.00000001	0.00000079
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000117
7	Yes	4	0.00000001	0.00000001

8	Yes	4	0.00000001	0.00000066
9	Yes	4	0.00000001	0.00000098
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000102
12	Yes	4	0.00000001	0.00000070
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000116
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000076
17	Yes	4	0.00000001	0.00000098
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000228
20	Yes	4	0.00000001	0.00000289
21	Yes	4	0.00000001	0.00000272
22	Yes	4	0.00000001	0.00000244
23	Yes	4	0.00000001	0.00000253
24	Yes	4	0.00000001	0.00000207
25	Yes	4	0.00000001	0.00000217
26	Yes	4	0.00000001	0.00000236
27	Yes	4	0.00000001	0.00000255
28	Yes	4	0.00000001	0.00000290
29	Yes	4	0.00000001	0.00000256
30	Yes	4	0.00000001	0.00000215
31	Yes	4	0.00000001	0.00000262
32	Yes	4	0.00000001	0.00000251
33	Yes	4	0.00000001	0.00000248
34	Yes	4	0.00000001	0.00000242
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190 - 180	10.738	40	0.5780	0.0819
T2	180 - 160	9.532	46	0.5696	0.0738
T3	160 - 140	7.215	46	0.5147	0.0569
T4	140 - 120	5.180	35	0.4275	0.0400
T5	120 - 100	3.576	35	0.3246	0.0244
T6	100 - 80	2.368	35	0.2406	0.0183
T7	80 - 60	1.453	35	0.1817	0.0131
T8	60 - 40	0.787	35	0.1243	0.0091
T9	40 - 20	0.344	35	0.0733	0.0057
T10	20 - 0	0.095	46	0.0335	0.0027

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	(2) Obstruction Lights	40	10.738	0.5780	0.0819	102243
190.00	3' Yagi	40	10.738	0.5780	0.0819	102243
188.00	Pirod 4' Side Mount Standoff (1)	40	10.496	0.5769	0.0803	102243
187.00	PD1142-2A	40	10.375	0.5763	0.0795	102243
180.00	Rohn 6'x14' Boom Gate (3)	46	9.532	0.5696	0.0738	51220
156.00	3-ft dish	46	6.779	0.4993	0.0536	14917
150.00	Pirod 12' T-Frame Sector Mount (1)	46	6.149	0.4743	0.0486	12679
144.00	Paraflector	35	5.555	0.4469	0.0431	11025
142.00	DB230-2A	35	5.365	0.4373	0.0414	10612
140.00	Paraflector	35	5.180	0.4275	0.0400	10365
136.00	Single Dipole	35	4.824	0.4072	0.0367	10420
130.00	10-ft T-Frame	35	4.324	0.3759	0.0313	10879
113.00	Pirod 4' Side Mount Standoff (1)	35	3.114	0.2919	0.0219	13235
110.00	PD320	35	2.930	0.2789	0.0210	14006
109.00	Pirod 4' Side Mount Standoff (1)	35	2.870	0.2748	0.0207	14283
103.00	Pirod 4' Side Mount Standoff (1)	35	2.528	0.2513	0.0191	16192
102.00	GPS	35	2.474	0.2476	0.0188	16526
94.00	DB212 Single Dipole	35	2.066	0.2213	0.0167	17923
92.00	15-ft Single Dipole	35	1.970	0.2154	0.0161	18113
74.00	PD320	35	1.228	0.1646	0.0118	19853
70.00	15-ft Single Dipole	35	1.090	0.1530	0.0110	20208
50.00	15-ft Single Dipole	35	0.540	0.0975	0.0073	23203
32.00	DB212 Single Dipole	46	0.222	0.0562	0.0045	25828
31.00	15-ft Single Dipole	46	0.209	0.0542	0.0043	25839
17.00	Pirod 4' Side Mount Standoff (1)	40	0.074	0.0282	0.0022	30636

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190 - 180	33.418	24	1.7843	0.2366
T2	180 - 160	29.699	24	1.7533	0.2133
T3	160 - 140	22.576	24	1.5833	0.1644
T4	140 - 120	16.305	24	1.3249	0.1281
T5	120 - 100	11.311	24	1.0154	0.0893
T6	100 - 80	7.512	24	0.7582	0.0645
T7	80 - 60	4.614	24	0.5749	0.0458
T8	60 - 40	2.498	24	0.3941	0.0317
T9	40 - 20	1.092	24	0.2323	0.0196
T10	20 - 0	0.300	24	0.1062	0.0089

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	(2) Obstruction Lights	24	33.418	1.7843	0.2366	27327
190.00	3' Yagi	24	33.418	1.7843	0.2366	27327
188.00	Pirod 4' Side Mount Standoff (1)	24	32.672	1.7796	0.2320	27327
187.00	PD1142-2A	24	32.299	1.7772	0.2297	27327
180.00	Rohn 6'x14' Boom Gate (3)	24	29.699	1.7533	0.2133	14021
156.00	3-ft dish	24	21.237	1.5372	0.1558	5048
150.00	Pirod 12' T-Frame Sector Mount (1)	24	19.301	1.4630	0.1467	4292
144.00	Paraflector	24	17.465	1.3824	0.1365	3734
142.00	DB230-2A	24	16.878	1.3541	0.1325	3596
140.00	Paraflector	24	16.305	1.3249	0.1281	3511
136.00	Single Dipole	24	15.200	1.2644	0.1197	3520
130.00	10-ft T-Frame	24	13.644	1.1705	0.1070	3654
113.00	Pirod 4' Side Mount Standoff (1)	24	9.861	0.9157	0.0792	4380
110.00	PD320	24	9.282	0.8760	0.0755	4623
109.00	Pirod 4' Side Mount Standoff (1)	24	9.094	0.8632	0.0743	4709
103.00	Pirod 4' Side Mount Standoff (1)	24	8.019	0.7911	0.0677	5303
102.00	GPS	24	7.848	0.7799	0.0667	5405
94.00	DB212 Single Dipole	24	6.557	0.6986	0.0582	5800
92.00	15-ft Single Dipole	24	6.255	0.6801	0.0561	5846
74.00	PD320	24	3.900	0.5212	0.0412	6283
70.00	15-ft Single Dipole	24	3.462	0.4847	0.0384	6386
50.00	15-ft Single Dipole	24	1.713	0.3090	0.0254	7304
32.00	DB212 Single Dipole	24	0.705	0.1781	0.0151	8114
31.00	15-ft Single Dipole	24	0.663	0.1717	0.0145	8117
17.00	Pirod 4' Side Mount Standoff (1)	24	0.232	0.0895	0.0074	9611

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	190	Leg	A325N	0.6250	4	1.21	13.50	0.089 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	1.75	6.12	0.286 ✓	1.333	Member Bearing
		Top Girt	A325N	0.6250	1	0.35	6.44	0.054 ✓	1.333	Bolt Shear
T2	180	Leg	A325N	0.7500	4	6.93	19.44	0.356 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	2.91	6.12	0.475 ✓	1.333	Member Bearing
T3	160	Leg	A325N	0.8750	4	17.19	26.46	0.650 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	5.67	6.12	0.927 ✓	1.333	Member Bearing
T4	140	Leg	A325N	0.8750	4	25.95	26.46	0.981 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	4.67	6.12	0.764 ✓	1.333	Member Bearing
		Top Girt	A325N	0.6250	1	0.19	6.44	0.029 ✓	1.333	Bolt Shear
T5	120	Leg	A325N	1.0000	4	33.81	34.56	0.979 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	5.64	6.44	0.876 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	2	1.32	6.44	0.204 ✓	1.333	Bolt Shear
T6	100	Leg	A325N	1.0000	4	41.40	34.56	1.198 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	6.11	6.12	0.999 ✓	1.333	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T7	80	Leg	A325N	1.0000	6	32.09	34.56	0.929 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	6.64	6.44	1.031 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	2	1.87	6.44	0.290 ✓	1.333	Bolt Shear
T8	60	Leg	A325N	1.0000	6	36.49	34.56	1.056 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	7.75	6.44	1.203 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	2	2.15	6.44	0.333 ✓	1.333	Bolt Shear
T9	40	Leg	A325N	1.0000	8	29.96	34.56	0.867 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	8.39	6.44	1.302 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	2	2.38	6.44	0.369 ✓	1.333	Bolt Shear
T10	20	Leg	A354-BC	1.0000	8	32.70	32.40	1.009 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	10.27	9.28	1.107 ✓	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	190 - 180	ROHN 2 STD	10.00	5.00	76.2 K=1.00	19.756	1.0745	-6.43	21.23	0.303 ✓
T2	180 - 160	ROHN 2.5 STD	20.00	4.00	50.7 K=1.00	24.247	1.7040	-32.10	41.32	0.777 ✓
T3	160 - 140	ROHN 3 EH	20.00	4.00	42.2 K=1.00	25.514	3.0159	-77.96	76.95	1.013 ✓
T4	140 - 120	ROHN 3.5 EH	20.03	4.01	36.8 K=1.00	26.273	3.6784	-117.21	96.64	1.213 ✓
T5	120 - 100	ROHN 4 EH	20.04	2.60	21.1 K=1.00	28.182	4.4074	-151.72	124.21	1.222 ✓
T6	100 - 80	ROHN 5 EH	20.03	6.68	43.6 K=1.00	25.320	6.1120	-184.96	154.76	1.195 ✓
T7	80 - 60	ROHN 5 EH	20.04	3.44	22.5 K=1.00	28.033	6.1120	-215.74	171.34	1.259 ✓
T8	60 - 40	ROHN 6 EHS	20.03	3.42	18.4 K=1.00	28.462	6.7133	-247.69	191.07	1.296 ✓
T9	40 - 20	ROHN 6 EH	20.04	5.18	28.3 K=1.00	27.355	8.4049	-273.98	229.92	1.192 ✓
T10	20 - 0	ROHN 8 EHS	20.03	10.02	41.2 K=1.00	25.667	9.7193	-302.96	249.47	1.214 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190 - 180	L1 3/4x1 3/4x3/16	6.83	3.13	112.1 K=1.02	11.386	0.6211	-1.78	7.07	0.252 ✓
T2	180 - 160	L1 3/4x1 3/4x3/16	6.16	2.79	103.1 K=1.06	12.579	0.6211	-2.97	7.81	0.380 ✓
T3	160 - 140	L1 3/4x1 3/4x3/16	6.18	2.77	102.5 K=1.06	12.656	0.6211	-5.93	7.86	0.754 ✓
T4	140 - 120	L1 3/4x1 3/4x3/16	7.68	3.63	126.8 K=1.00	9.287	0.6211	-4.65	5.77	0.807 ✓
T5	120 - 100	L2x2x1/4	9.92	4.76	146.1 K=1.00	6.999	0.9380	-5.48	6.57	0.835 ✓
T6	100 - 80	L2 1/2x2 1/2x3/16	12.44	6.01	145.6 K=1.00	7.045	0.9020	-6.31	6.35	0.992 ✓
T7	80 - 60	L2 1/2x2 1/2x1/4	14.23	6.92	169.0 K=1.00	5.228	1.1900	-6.64	6.22	1.068 ✓
T8	60 - 40	L3x3x1/4	15.99	7.73	156.7 K=1.00	6.081	1.4400	-7.18	8.76	0.820 ✓
T9	40 - 20	L3x3x1/4	18.35	9.04	183.2 K=1.00	4.451	1.4400	-8.39	6.41	1.308 ✓
T10	20 - 0	L3 1/2x3 1/2x1/4	20.15	9.81	169.6 K=1.00	5.189	1.6900	-9.46	8.77	1.079 ✓

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T5	120 - 100	L2x2x1/4	8.56	7.76	196.9 K=0.83	3.853	0.9380	-2.63	3.61	0.728 ✓
T7	80 - 60	L2 1/2x2 1/2x1/4	12.56	11.67	228.6 K=0.80	2.857	1.1900	-3.74	3.40	1.100 ✓
T8	60 - 40	L3x3x5/16	14.52	13.54	222.4 K=0.81	3.020	1.7800	-4.30	5.38	0.799 ✓
T9	40 - 20	L3x3x5/16	16.44	15.46	248.4 K=0.79	2.420	1.7800	-4.75	4.31	1.103 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190 - 180	L1 3/4x1 3/4x3/16	4.65	4.18	146.1 K=1.00	6.997	0.6211	-0.35	4.35	0.080 ✓
T4	140 - 120	L1 3/4x1 3/4x3/16	4.72	4.16	145.3 K=1.00	7.077	0.6211	-0.19	4.40	0.042

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

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190 - 180	ROHN 2 STD	10.00	5.00	76.2	30.000	1.0745	4.83	32.24	0.150 ✓
T2	180 - 160	ROHN 2.5 STD	20.00	4.00	50.7	30.000	1.7040	27.71	51.12	0.542 ✓
T3	160 - 140	ROHN 3 EH	20.00	4.00	42.2	30.000	3.0159	68.75	90.48	0.760 ✓
T4	140 - 120	ROHN 3.5 EH	20.03	4.01	36.8	30.000	3.6784	103.79	110.35	0.941 ✓
T5	120 - 100	ROHN 4 EH	20.04	2.60	21.1	30.000	4.4074	135.48	132.22	1.025 ✓
T6	100 - 80	ROHN 5 EH	20.03	6.68	43.6	30.000	6.1120	165.59	183.36	0.903 ✓
T7	80 - 60	ROHN 5 EH	20.04	3.44	22.5	30.000	6.1120	192.75	183.36	1.051 ✓
T8	60 - 40	ROHN 6 EHS	20.03	3.42	18.4	30.000	6.7133	219.21	201.40	1.088 ✓
T9	40 - 20	ROHN 6 EH	20.04	5.18	28.3	30.000	8.4049	240.01	252.15	0.952 ✓
T10	20 - 0	ROHN 8 EHS	20.03	10.02	41.2	30.000	9.7193	261.61	291.58	0.897 ✓
										✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190 - 180	L1 3/4x1 3/4x3/16	6.83	3.13	73.1	21.600	0.6211	1.75	13.42	0.131 ✓
T2	180 - 160	L1 3/4x1 3/4x3/16	6.16	2.79	65.4	21.600	0.6211	2.91	13.42	0.217 ✓
T3	160 - 140	L1 3/4x1 3/4x3/16	6.18	2.77	64.9	21.600	0.6211	5.67	13.42	0.423 ✓
T4	140 - 120	L1 3/4x1 3/4x3/16	7.34	3.46	80.3	21.600	0.6211	4.67	13.42	0.348 ✓
T5	120 - 100	L2x2x1/4	9.48	4.54	92.1	21.600	0.9380	5.44	20.26	0.269 ✓
										✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T6	100 - 80	L2 1/2x2 1/2x3/16	12.44	6.01	94.7	21.600	0.9020	6.11	19.48	0.314 ✓
T7	80 - 60	L2 1/2x2 1/2x1/4	13.62	6.61	105.3	21.600	1.1900	6.27	25.70	0.244 ✓
T8	60 - 40	L3x3x1/4	15.99	7.73	101.5	32.500	1.2525	7.57	40.71	0.186 ✓
T9	40 - 20	L3x3x1/4	19.26	9.48	124.1	32.500	1.2525	7.97	40.71	0.196 ✓
T10	20 - 0	L3 1/2x3 1/2x1/4	21.03	10.25	114.4	32.500	1.4713	10.27	47.82	0.215 ✓

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T5	120 - 100	L2x2x1/4	8.56	7.76	161.3	21.600	0.9380	2.63	20.26	0.130 ✓
T7	80 - 60	L2 1/2x2 1/2x1/4	12.56	11.67	188.8	21.600	1.1900	3.74	25.70	0.146 ✓
T8	60 - 40	L3x3x5/16	14.52	13.54	181.8	21.600	1.7800	4.30	38.45	0.112 ✓
T9	40 - 20	L3x3x5/16	16.44	15.46	206.8	21.600	1.7800	4.75	38.45	0.124 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	190 - 180	L1 3/4x1 3/4x3/16	4.65	4.18	99.5	21.600	0.6211	0.31	13.42	0.023 ✓
T4	140 - 120	L1 3/4x1 3/4x3/16	4.72	4.16	99.0	21.600	0.6211	0.10	13.42	0.008 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	190 - 180	Leg	ROHN 2 STD	2	-6.43	28.30	22.7	Pass
T2	180 - 160	Leg	ROHN 2.5 STD	20	-32.10	55.08	58.3	Pass
T3	160 - 140	Leg	ROHN 3 EH	53	-77.96	102.57	76.0	Pass
T4	140 - 120	Leg	ROHN 3.5 EH	86	-117.21	128.82	91.0	Pass
T5	120 - 100	Leg	ROHN 4 EH	122	-151.72	165.57	91.6	Pass
T6	100 - 80	Leg	ROHN 5 EH	161	-184.96	206.29	89.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
							89.9 (b)	
T7	80 - 60	Leg	ROHN 5 EH	182	-215.74	228.40	94.5	Pass
T8	60 - 40	Leg	ROHN 6 EHS	212	-247.69	254.70	97.2	Pass
T9	40 - 20	Leg	ROHN 6 EH	243	-273.98	306.48	89.4	Pass
T10	20 - 0	Leg	ROHN 8 EHS	264	-302.96	332.54	91.1	Pass
T1	190 - 180	Diagonal	L1 3/4x1 3/4x3/16	10	-1.78	9.43	18.9	Pass
							21.5 (b)	
T2	180 - 160	Diagonal	L1 3/4x1 3/4x3/16	24	-2.97	10.41	28.5	Pass
							35.7 (b)	
T3	160 - 140	Diagonal	L1 3/4x1 3/4x3/16	58	-5.93	10.48	56.6	Pass
							69.5 (b)	
T4	140 - 120	Diagonal	L1 3/4x1 3/4x3/16	94	-4.65	7.69	60.5	Pass
T5	120 - 100	Diagonal	L2x2x1/4	127	-5.48	8.75	62.6	Pass
							65.7 (b)	
T6	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	166	-6.31	8.47	74.4	Pass
							75.0 (b)	
T7	80 - 60	Diagonal	L2 1/2x2 1/2x1/4	186	-6.64	8.29	80.1	Pass
T8	60 - 40	Diagonal	L3x3x1/4	216	-7.18	11.67	61.5	Pass
							90.2 (b)	
T9	40 - 20	Diagonal	L3x3x1/4	255	-8.39	8.54	98.2	Pass
T10	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	273	-9.46	11.69	81.0	Pass
							83.1 (b)	
T5	120 - 100	Secondary Horizontal	L2x2x1/4	130	-2.63	4.82	54.6	Pass
T7	80 - 60	Secondary Horizontal	L2 1/2x2 1/2x1/4	190	-3.74	4.53	82.6	Pass
T8	60 - 40	Secondary Horizontal	L3x3x5/16	220	-4.30	7.17	59.9	Pass
T9	40 - 20	Secondary Horizontal	L3x3x5/16	251	-4.75	5.74	82.7	Pass
T1	190 - 180	Top Girt	L1 3/4x1 3/4x3/16	5	-0.35	5.79	6.0	Pass
T4	140 - 120	Top Girt	L1 3/4x1 3/4x3/16	90	-0.19	5.86	3.2	Pass
							Summary	
						Leg (T8)	97.2	Pass
						Diagonal (T9)	98.2	Pass
						Secondary Horizontal (T9)	82.7	Pass
						Top Girt (T1)	6.0	Pass
						Bolt Checks	97.6	Pass
						RATING =	**98.2**	**Pass**

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Subject:	FOUNDATION ANALYSIS
Location:	Coventry, CT
Rev. 0: 5/21/12	Prepared by: T.J.L. Checked by: C.F.C. Job No. 12001.CO64

Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 4765 \cdot ft \cdot kips$	(User Input from RISATower)	
Shear Force =	$S_t := 46 \cdot kip$	(User Input from RISATower)	
Axial Force =	$WT_t := 57 \cdot kip$	(User Input from RISATower)	
Max Compression Force =	$C_t := 308 \cdot kip$	(User Input from RISATower)	
Max Uplift Force =	$U_t := 269 \cdot kip$	(User Input from RISATower)	
Tower Height =	$H_t := 190 \cdot ft$	(User Input)	
Tower Width =	$W_t := 19 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 4 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 4.5 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 32.0 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 4000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 7$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 0.875 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 33$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 7$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 0.875 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 33$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pad Top Reinforcement Bar Area =

$$A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.601 \cdot in^2$$

Pad Bottom Reinforcement Bar Area =

$$A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 0.601 \cdot in^2$$

Coefficient of Lateral Soil Pressure =

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

Load Factor =

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

Stability of Footing:

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

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

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

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = -0.18 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 0 \cdot ksf$

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

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0.72 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 4$

$A_p := W_f \cdot T_p = 128$

Ultimate Shear =
$S_u := P_{ave} \cdot A_p = 92.16 \cdot kip$

Weight of Concrete =
$WT_c := (W_f^2 \cdot T_f) \cdot \gamma_c = 691.2 \cdot kip$

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

$X_t := if(Pos_t, X_{t1}, X_{t2}) = 7.773$

$X_{off} := \frac{W_f}{2} - \left[\frac{(W_t \cdot \cos(30 \cdot deg))}{3} + X_t\right] = 2.742$

Total Weight =
$WT_{tot} := WT_c = 691.2 \cdot kip$

Resisting Moment =
$M_r := (WT_{tot}) \cdot \frac{W_f}{2} + S_u \cdot \frac{T_f}{3} = 11197 \cdot kip \cdot ft$

Overturning Moment =
$M_{ot} := OM + S_t \cdot T_f = 4972 \cdot kip \cdot ft$

Factor of Safety Actual =
$FS := \frac{M_r}{M_{ot}} = 2.25$

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

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

$OverTurning\_Moment\_Check = "Okay"$

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_t = 748 \cdot kip$

Area of the Mat = $A_{mat} := W_f^{\,2} = 1.024 \times 10^3$

Section Modulus of Mat = $S := \frac{W_f^{\,3}}{6} = 5461.33 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 1.641 \cdot ksf$

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

$Max\_Pressure\_Check = "Okay"$

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.18 \cdot ksf$

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

$Min\_Pressure\_Check = "No Good"$

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 9.614$

Distance to Kern = $X_k := \frac{W_f}{6} = 5.333$

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

Eccentricity = $e := \frac{M_{ot}}{WT_{tot}} = 7.193$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot WT_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 1.635 \cdot ksf$

$q_{adj} := if\left(P_{min} < 0, P_a, P_{max}\right) = 1.635 \cdot ksf$

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

$Pressure\_Check = "Okay"$

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

$$M_{nT} := LF\cdot\left[U_t\cdot\left(W_t\cdot\sin(60\cdot deg) - \frac{d_p}{2}\right) + S_t\cdot\left(D_f + L_{pag}\right)\right] - WT_t\cdot X_{off} = 5989\cdot ft\cdot k$$

$$M_{nS} := -1\cdot\left[\frac{1}{2}\cdot\left(\frac{W_f}{2} + \frac{W_t}{3}\cdot\cos(30\cdot deg) - \frac{d_p}{2}\right)^2\cdot W_t\cdot\left[\gamma_s\cdot\left(T_f - T_f\right)\right]\right]$$

$$M_{nC} := -1\cdot\left[\frac{1}{2}\cdot\left(\frac{W_f}{2} + \frac{W_t}{3}\cdot\cos(30\cdot deg) - \frac{d_p}{2}\right)^2\cdot W_t\cdot\left(\gamma_c\cdot T_f\right)\right]$$

Design Moment = $M_n := \frac{M_{nT} + M_{nS} + M_{nC}}{\phi_m} = 3.366\times 10^3\cdot kips\cdot ft$

$$\beta := \begin{cases} 0.85 & \text{if } 2500\cdot psi \le f_c \le 4000\cdot psi \\ 0.65 & \text{if } f_c > 8000\cdot psi \\ \left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000\right)}{1000}\right]\cdot 0.5\right] & \text{otherwise} \end{cases} = 0.85$$

(ACI-200810.2.7.3)

$b_{eff} := W_t\cdot\cos(30\cdot deg) + d_p = 197.454\cdot in$

$d := T_f - Cvr_{pad} - d_{bbot} = 50.125\cdot in$

$$A_s := \frac{M_n}{\left(f_y\cdot d\right)} = 13.429\cdot in^2$$

$$a := \frac{A_s\cdot f_y}{\beta\cdot f_c\cdot b_{eff}} = 1.6\cdot in$$

$$A_s := \frac{M_n}{f_y\cdot\left(d - \frac{a}{2}\right)} = 13.647\cdot in^2$$

$$\rho := \frac{A_s}{b_{eff}\,d} = 0.00138$$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \geq 60000 \cdot psi \\ .0020 & \text{otherwise} \end{cases} = 0.0018 \qquad \text{(ACI -2008 7.12.2.1)}$$

Check Bottom Bars:

$$As := \begin{cases} \left(\rho \cdot b_{eff} \cdot d\right) & \text{if } \left(\rho \cdot b_{eff} \cdot d\right) > \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d \\ \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d & \text{otherwise} \end{cases} = 13.647 \cdot in^2$$

$$As_{prov} := A_{bbot} \cdot NB_{bot} = 19.8 \cdot in^2$$

$$Pad\_Reinforcement\_Bot := if\left(As_{prov} > As, \text{"Okay"}, \text{"No Good"}\right)$$

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 8.9 \cdot in^2$$

$$As_{prov} := A_{btop} \cdot NB_{top} = 19.8 \cdot in^2$$

$$Pad\_Reinforcement\_Top := if\left(As_{prov} > As, \text{"Okay"}, \text{"No Good"}\right)$$

Pad_Reinforcement_Top = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 10.91 \cdot in$$

Spacing or Cover Dimension =

$$c := if\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 3 \cdot in$$

Transverse Reinforcement Index =

$$k_{tr} := 0 \qquad \text{(ACI-2008 12.2.3)}$$

$$L_{dbt} := \frac{3 \cdot f_y \cdot \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot} = 21 \cdot in$$

Minimum Development Length =

$$L_{dbmin} := 12 \cdot in \qquad \text{(ACI-2008 12.2.1)}$$

$$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, \text{"Use L.dbt"}, \text{"Use L.dbmin"}\right) = \text{"Use L.dbt"}$$

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr_{pad} = 75 \cdot in$$

$$Lpad\_Check := if\left(L_{Pad} > L_{dbt}, \text{"Okay"}, \text{"No Good"}\right)$$

Lpad_Check = "Okay"

DESIGN BASIS:

1. GOVERNING CODE: 2005 CONNECTICUT STATE BUILDING CODE (CSBC) AS MODIFIED BY THE 2009 CT STATE SUPPLEMENT. SPECIFIC REFERENCE IS MADE TO SECTION 3108: RADIO AND TELEVISION TOWERS OF THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE CSBC.

2. DESIGN CRITERIA

   WIND LOAD: (ANTENNA MOUNT)

   2005 CONNECTICUT STATE BUILDING CODE:

   - BASIC WIND SPEED (V) = 80 MPH (FASTEST MILE) EQUIVALENT TO 100 MPH (3-SECOND GUST) AS PER APPENDIX K OF THE CONNECTICUT SUPPLEMENT.

   TIA/EIA-222-F96 STANDARD: **CONTROLS**

   - BASIC WIND SPEED (V) = 85 MPH (FASTEST MILE).
   - BASIC WIND SPEED (V) = 74 MPH (FASTEST MILE) CONCURRENT W/ 0.5" RADIAL ICE.

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES".
2. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH TOWER OWNER.
3. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WOPSRK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
4. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
5. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
7. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK.
8. TOWER REINFORCING SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS AND SUPPORT STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.
9. EXISTING COAXIAL CABLES AND ALL ACCESSORIES SHALL BE RELOCATED AS NECESSARY AND REINSTALLED BY THE CONTRACTOR WITHOUT INTERRUPTION IN SERVICE WHERE THEY ARE IN CONFLICT WITH TOWER REINFORCEMENT.
10. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

REV.	DATE	DRAWN BY/CHK'D BY	DESCRIPTION
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COVENTRY EAST

1712 MAIN STREET
COVENTRY, CT 06238

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SCALE:	AS SHOWN
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SHEET NO.
N-1

STRUCTURAL STEEL

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

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992, (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36, (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND/HALF ROUND SHAPES)---ASTM A500 GRADE C, (FY = 46 KSI)
   E. PIPE---ASTM A53 GRADE B, (FY = 35 KSI MIN)
   F. CONNECTION BOLTS---ASTM A490-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

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

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

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

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

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

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

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

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

10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED

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

12. CONNECTION ANGLES WHERE APPLICABLE SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

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

14. CONNECTIONS SHALL CONFORM TO ALL REQUIREMENTS OF THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR SHELTERS", LATEST EDITION, AND THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", LATEST EDITION.

15. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.

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

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

18. FABRICATE BEAMS WITH MILL CAMBER UP.

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

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

21. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.

22. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

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CHK'D BY:	CFC

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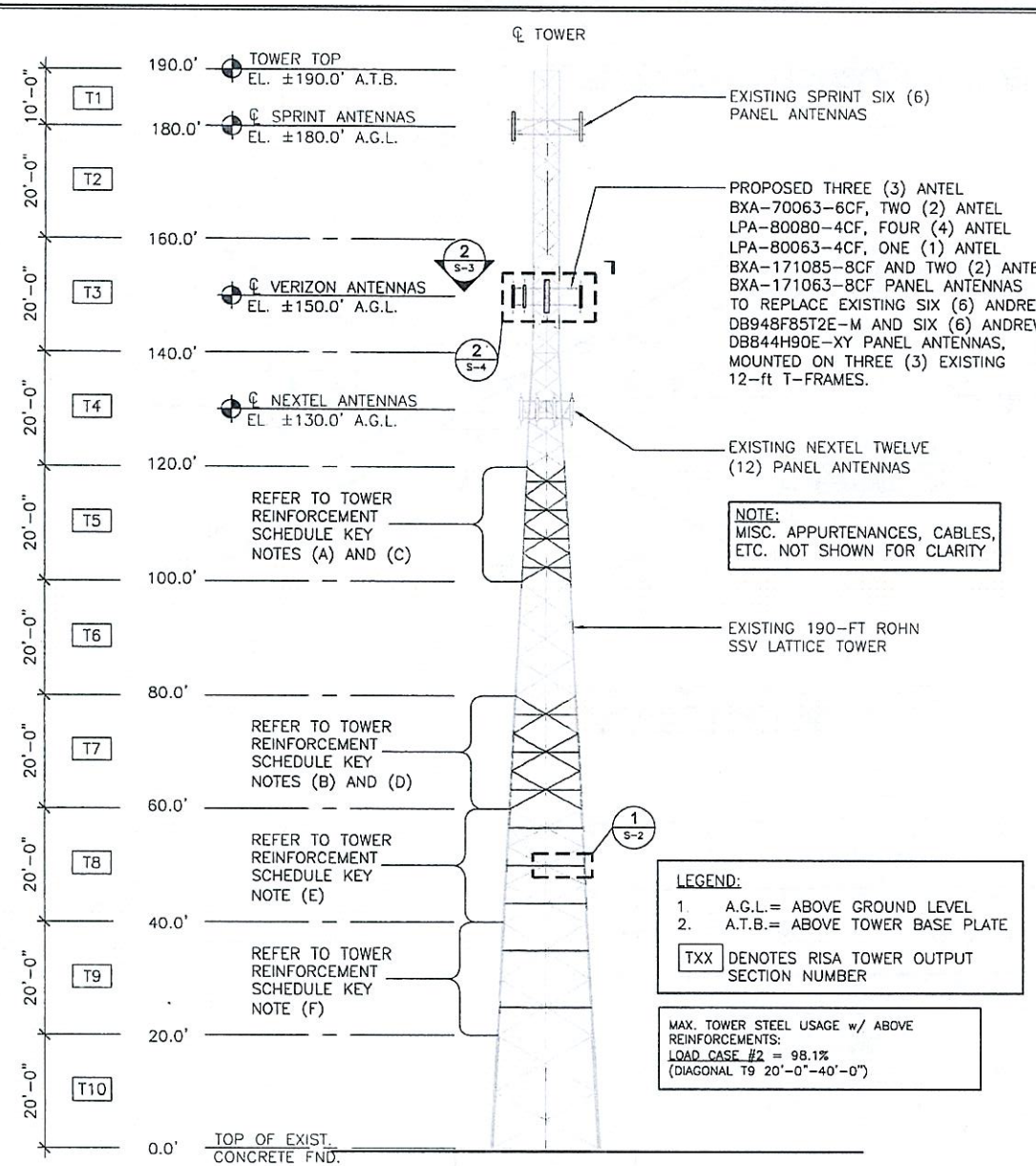
SHEET NO.
N-2



TOWER REINFORCEMENT NOTES:

1. REFER TO STRUCTURAL ANALYSIS AND REINFORCEMENT DESIGN PREPARED BY CENTEK ENGINEERING, INC., FOR VERIZON WIRELESS, DATED 5/21/12.
2. TOWER GEOMETRY, STRUCTURE MEMBER SIZES AND FOUNDATION INFORMATION WERE OBTAINED FROM A PREVIOUS STRUCTURAL ANALYSIS REPORT PREPARED BY ALL POINTS TECHNOLOGY CORP. DATED MARCH 4, 2004.
3. THE TEMPORARY DETACHMENT AND/OR REPLACEMENT OF TOWER MEMBERS SHALL BE DONE ONE AT A TIME AND SHALL BE CONDUCTED ON DAYS WITH LESS THAN 15 MPH WIND PRESENT. NO MEMBER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY.
4. ALL STEEL REINFORCEMENT SHOWN HEREIN APPLIES TO ALL SIDES OF THE TOWER.
5. ALL REPLACEMENT STEEL MEMBERS SHALL BE INSTALLED WITH A325-N BOLTS (SIZE TO MATCH EXISTING). UNLESS OTHERWISE NOTED BELOW.
6. COORDINATE INSTALLATION OF REINFORCEMENT WITH EXISTING ANTENNAS/APPURTENANCES. REFER TO RISA TOWER OUTPUT GRAPHIC SUMMARY FOR INFORMATION.

REINFORCEMENT SCHEDULE KEY:

A. REPLACE EXISTING DIAGONALS w/ L2x2x1/4

B. REPLACE EXISTING DIAGONALS w/ L2-1/2x2-1/2x1/4.

C. (12) L2X2X1/4 SEC. HORIZONTAL MEMBERS W/ (12) RSH0568-68 LEG BUTTERFLY BRACKETS.

D. (9) L2-1/2X2-1/2X1/4 SEC. HORIZONTAL MEMBERS W/ (9) RSH0568-68 LEG BUTTERFLY BRACKETS.

E. (9) L3X3X5/16 SEC. HORIZONTAL MEMBERS W/ (9) RSH0568-68 LEG BUTTERFLY BRACKETS.

F. (6) L3X3X5/16 SEC. HORIZONTAL MEMBERS W/ (6) RSH0568-68 LEG BUTTERFLY BRACKETS.

1 / S-1 TOWER ELEVATION
SCALE: 1/20" = 1'-0"

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CHK'D BY:	CFC

NO	DATE	DRAWN BY/CK'D BY	DESCRIPTION
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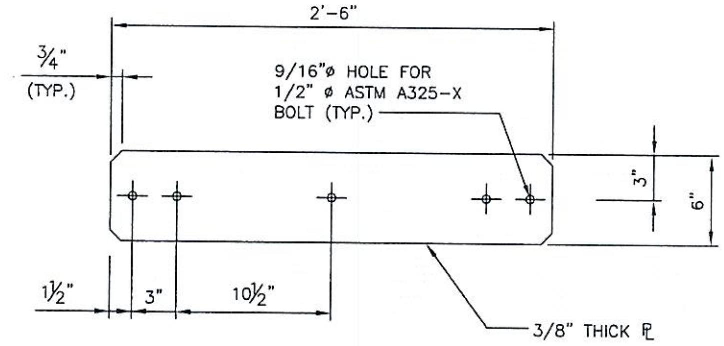
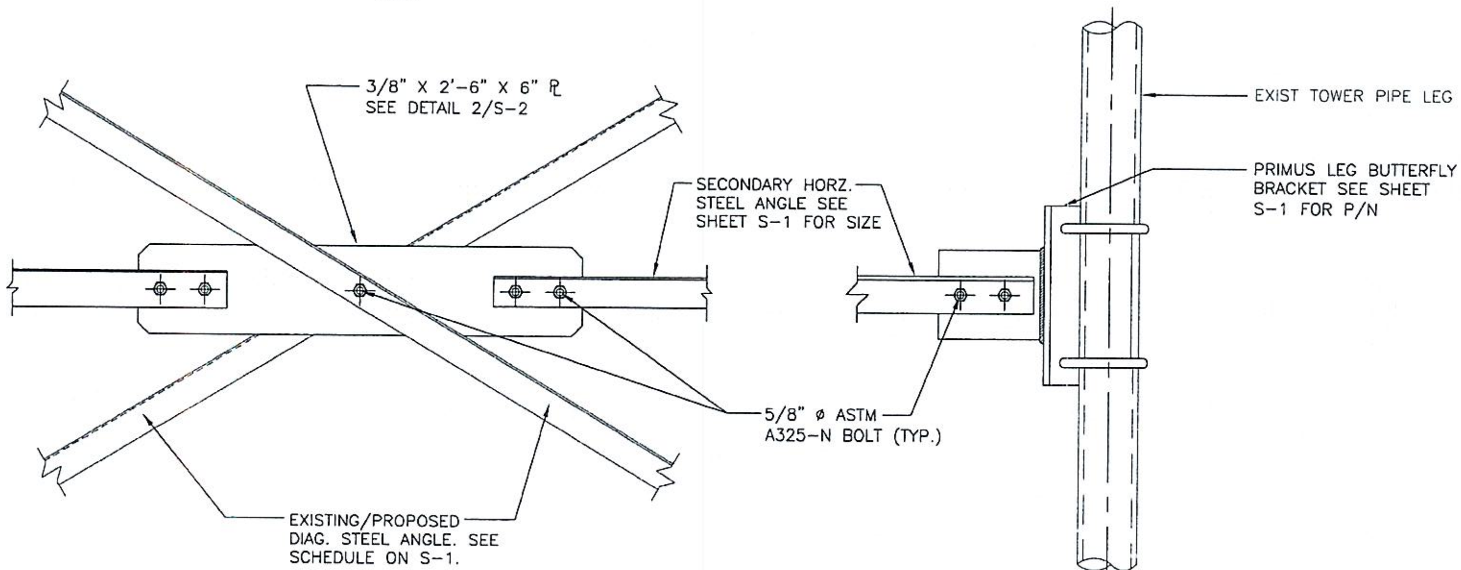
SHEET NO.
S-1



2 / S-2 PLATE P1 DETAIL

SCALE: 1-1/2" = 1'-0"



1 / S-2 SECONDARY HORIZONTAL ELEVATION

SCALE: 1-1/2" = 1'-0"

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PROPOSED ANTENNA UPGRADES
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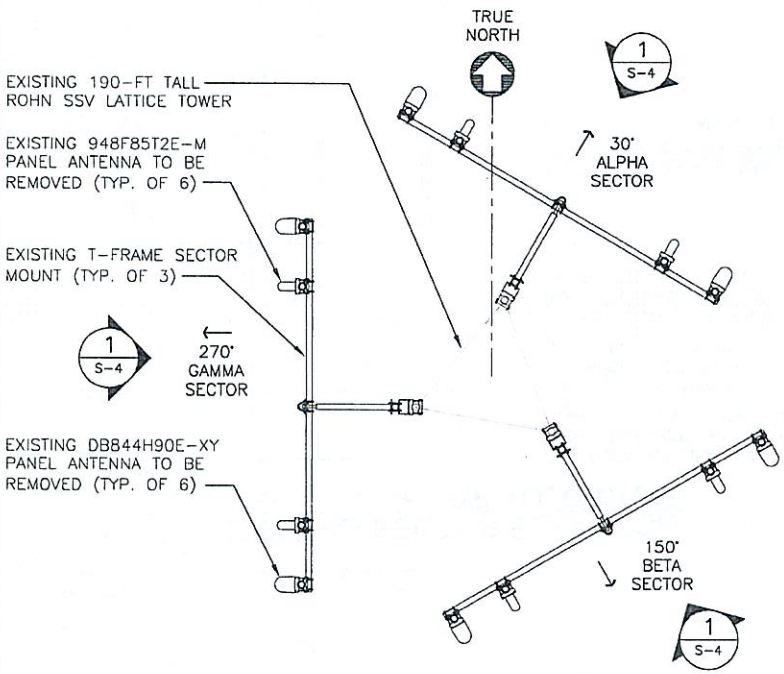
1712 MAIN STREET
COVENTRY, CT 06238

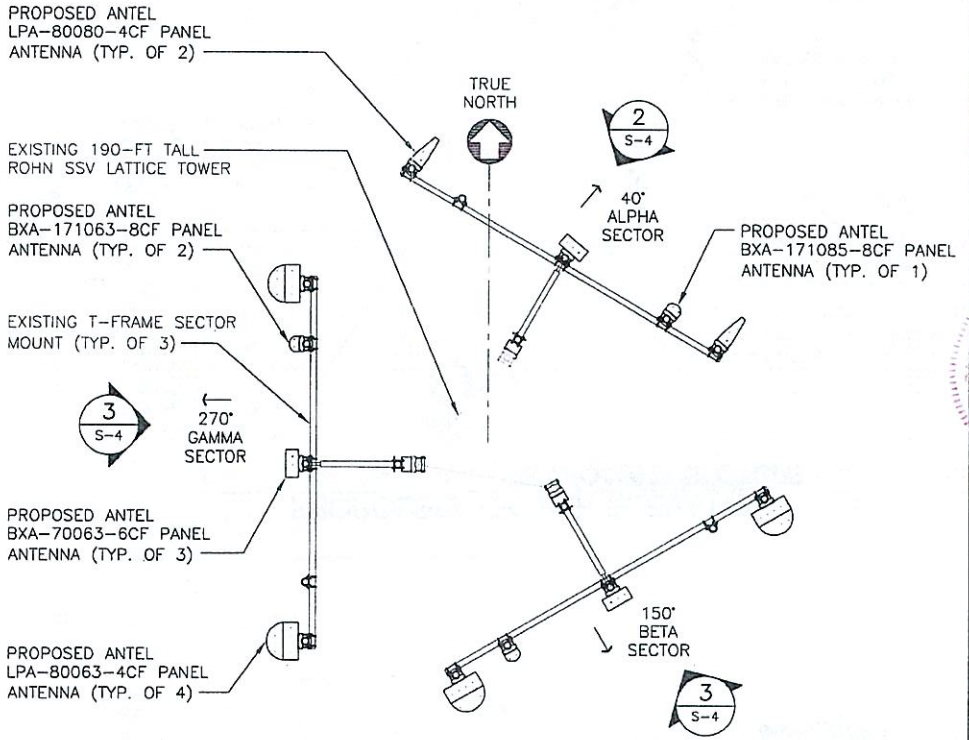
DATE: 5/21/12
SCALE: AS SHOWN
JOB NO. 12001.C004

SHEET NO. S-2



1 S-3 **EXISTING ANTENNA PLAN**

SCALE: 1/4" = 1'-0"



2 S-3 **PROPOSED ANTENNA PLAN**

SCALE: 1/4" = 1'-0"

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

NO.	DATE	BY	DESCRIPTION
4	5/21/12	TJL	ISSUED FOR CONSTRUCTION
3			
2			
1			

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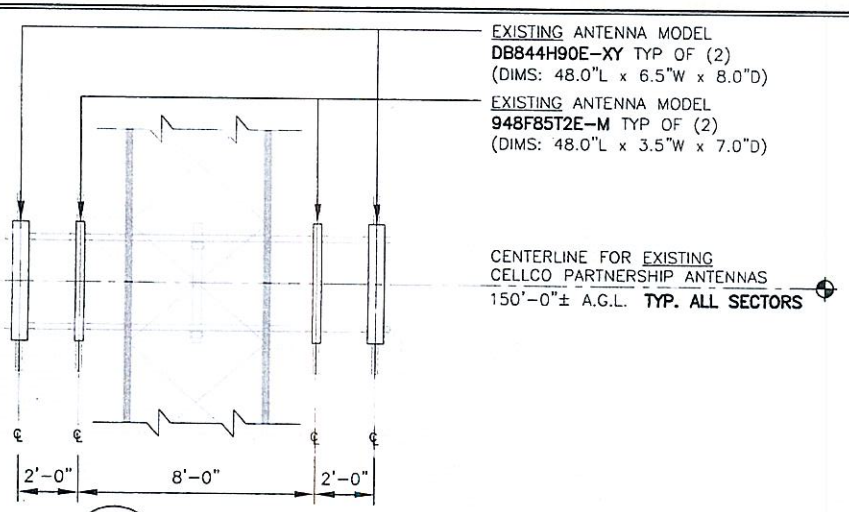
Cellco Partnership d/b/a Verizon Wireless
PROPOSED UNMANNED TELECOMMUNICATIONS FACILITY

COVENTRY EAST

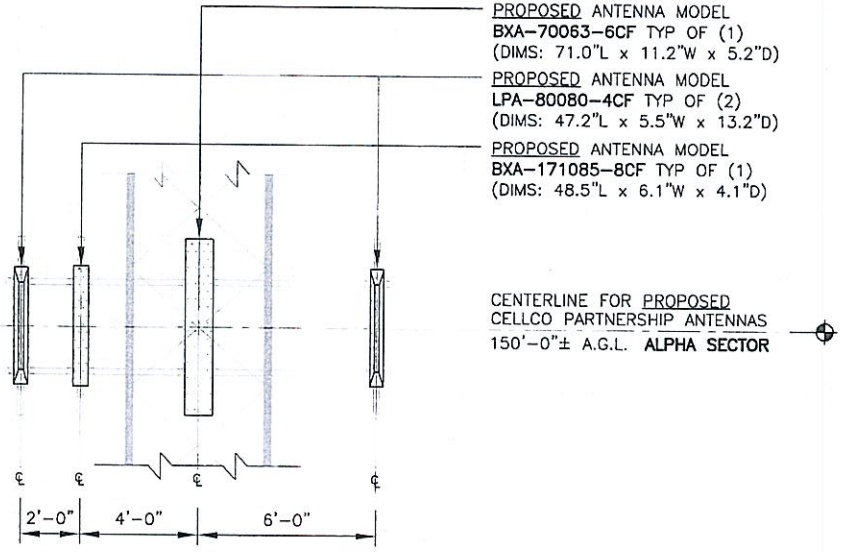
1712 MAIN STREET
COVENTRY, CT 06238

DATE:	5/21/12
SCALE:	AS SHOWN
JOB NO.	12001.C064

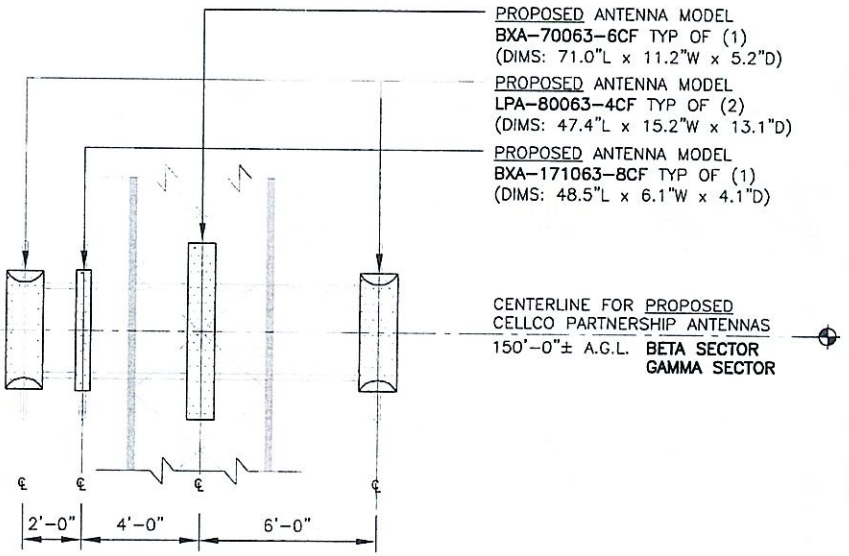
SHEET NO.
S-3



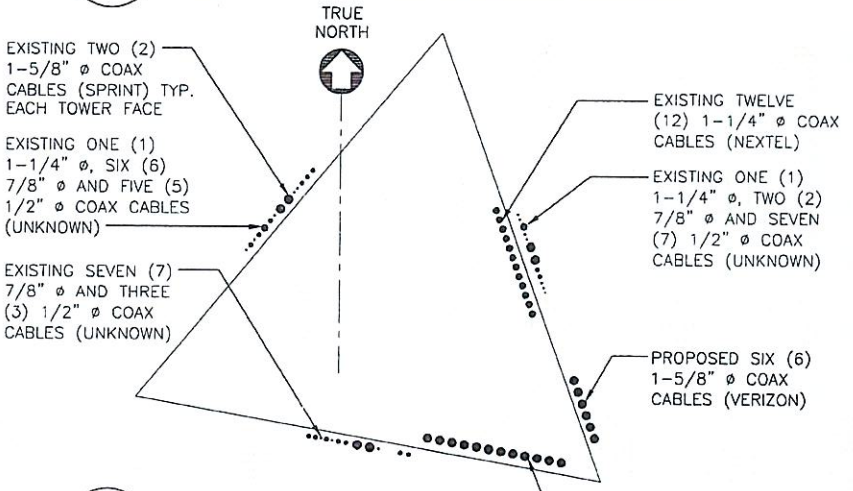
1 S-4 **EXISTING SECTOR ELEVATION**
SCALE: 1/4" = 1'-0" **TYP. ALL SECTORS**



2 S-4 **PROPOSED SECTOR ELEVATION**
SCALE: 1/4" = 1'-0" **ALPHA SECTOR**



3 S-4 **PROPOSED SECTOR ELEVATION**
SCALE: 1/4" = 1'-0" **BETA/GAMMA SECTORS**



4 S-4 **COAX CABLE PLAN**
SCALE: N.T.S.

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	5/21/12	TJL	CFC	ISSUED FOR CONSTRUCTION

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Cellco Partnership d/b/a Verizon Wireless
COVENTRY EAST
1712 MAIN STREET
COVENTRY, CT 06238

DATE:	5/21/12
SCALE:	AS SHOWN
JOB NO.	12001.C064

SHEET NO. S-4

SITE NAME	COVENTRY EAST CT	ECP - CELL #	2	119
LATITUDE	41-46-47.75 N	LONGITUDE	72-18-34.50 W	
Additional Comments: LTE antenna add, keeping with 12 antennas and adding 6 main lines		SAVE BUTTON		
		STRUCTURE TYPE	LATTICE	

700 Mhz - LTE ANTENNA ADD	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	eNodeB	eNodeB	eNodeB
ANTENNA TYPE	BXA-70063-6CF_2	BXA-70063-6CF_2	BXA-70063-6CF_2
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	40	150	270
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	150	150	150
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			

850 Celluar - Current Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	Cellular Modcell 4.0	Cellular Modcell 4.0	Cellular Modcell 4.0
ANTENNA TYPE	DB844H90-XY	DB844H90-XY	DB844H90-XY
QTY OF ANTENNAS PER FACE	2	2	2
ORIENTATION (DEG)	30	150	270
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	150	150	150
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			

850 Celluar - Future Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	Cellular Modcell 4.0	Cellular Modcell 4.0	Cellular Modcell 4.0
ANTENNA TYPE	LPA-80080-4CF	LPA-80063-4CF	LPA-80063-4CF
QTY OF ANTENNAS PER FACE	2	2	2
ORIENTATION (DEG)	40	150	270
DOWN TILT (MECH/DEG)	4	0	0
RAD CTR (FT AGL)	150	150	150
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			
DIPLEX WITH LTE CABLE			

1900 PCS - Current Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	PCS Modcell 4.0B	PCS Modcell 4.0B	PCS Modcell 4.0B
ANTENNA TYPE	948F85T2E-M_2	948F85T2E-M_2	948F85T2E-M_2
QTY OF ANTENNAS PER FACE	2	2	2
ORIENTATION (DEG)	30	150	270
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	150	150	150
TMA - QTY / MODEL	2	2	
DIPLEXER - QTY / MODEL			

1900 PCS - Future Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	PCS Modcell 4.0B	PCS Modcell 4.0B	PCS Modcell 4.0B
ANTENNA TYPE	BXA-171085-8CF_2	BXA-171063-8CF_2	BXA-171063-8CF_2
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	40	150	270
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	150	150	150
TMA - QTY / MODEL	0	0	
DIPLEX WITH CELLULAR CABLE			

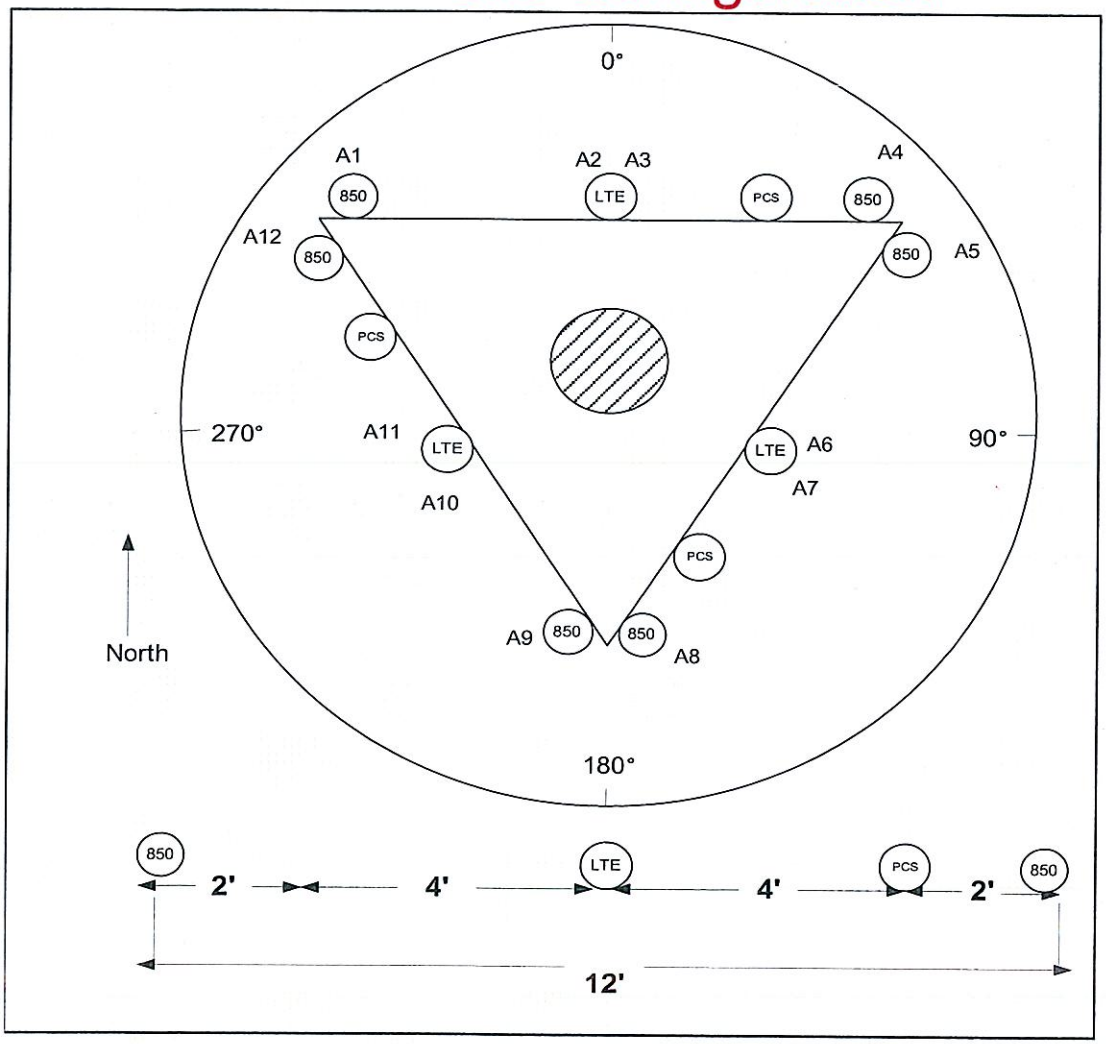
NUMBER OF CABLE'S NEEDED					ESTIMATED CABLE LENGTH			
MAINLINE SIZE	1 5/8"	TOTAL # OF MAINLINES		18	MAINLINE (FT)			
JUMPER SIZE	1/2 "	TOTAL # OF TOP JUMPERS		18	TOP JUMPER (FT)			12
Equipment Cable Ordering		MAIN CABLE	12 +	6	TOP JUMPER #	12	+	6

TX / RX FREQUENCIES			TX POWER OUTPUT	
Cellular A-Band	PCS F / AWS-Band	700 Mhz C - E	Cellular (Watts)	20
TX - 869-880,890-891.5 MHz	TX - 1970-1975 / 2145-21	TX - 746-757	PCS (Watts)	16
RX - 824-835,845-846.5 MHz	RX - 1890-1895 / 1745-17	RX - 776-787	LTE (Watts)	40

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

RF ENGINEER	RF MANAGER	INITIALS	DATE
Prepared By: Mark Brauer	Steve Weatherbee	MB	4/26/2012

Site Configuration



BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

Replace "X" with desired electrical downtilt.

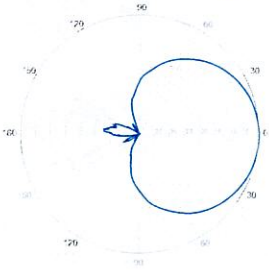
Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	13°	11°
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	

Mechanical Characteristics		
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm	6.8 in
Weight without mounting brackets	7.9 kg	17 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.51 m² Side: 0.24 m²	Front: 5.5 ft² Side: 2.6 ft²
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

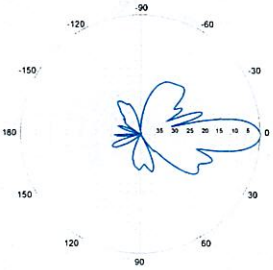
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



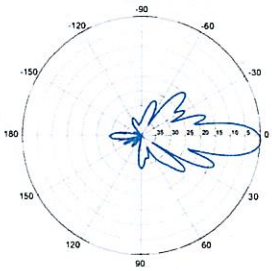
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

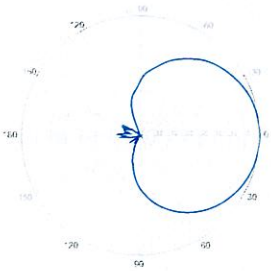


0° | Vertical | 750 MHz

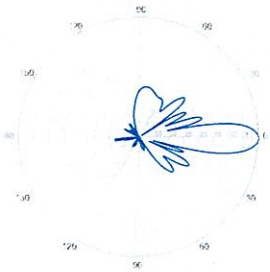
BXA-70063-6CF-EDIN-2



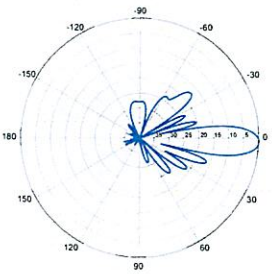
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

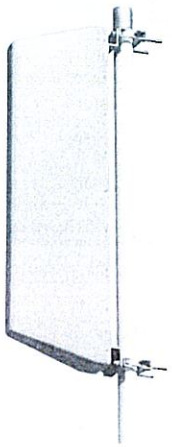
Amphenol ANTENNA SOLUTIONS

LPA-80080-4CF-EDIN-X

V-Pol | Log Periodic | 80° | 12.5 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.

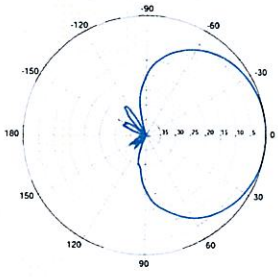


Electrical Characteristics	
Frequency bands	806-960 MHz
Polarization	Vertical
Horizontal beamwidth	80°
Vertical beamwidth	15°
Gain	12.5 dBd (14.6 dBi)
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14
Impedance	50Ω
VSWR	≤1.4:1
Upper sidelobe suppression (0°)	-14.2 dB
Front-to-back ratio (+/-30°)	-34.7 dB
Null fill	15% (-16.48 dB)
Input power	500 W
Lightning protection	Direct Ground
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)

Mechanical Characteristics		
Dimensions Length x Width x Depth	1200 x 140 x 335 mm	47.2 x 5.5 x 13.2 in
Depth of antenna with z-bracket	375 mm	14.8 in
Weight without mounting brackets	5.4 kg	12 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.17 m² Side: 0.40 m²	Front: 1.8 ft² Side: 4.3 ft²
Wind load @ 161 km/hr (100 mph)	Front: 254 N Side: 574 N	Front: 57 lbf Side: 129 lbf

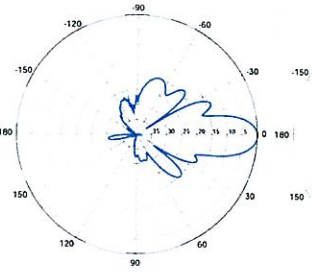
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit (0-20°)	21699999	50-102 mm 2.0-4.0 in	5.4 kg 12 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.		

LPA-80080-4CF-EDIN-X



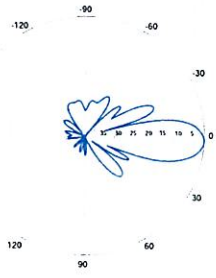
Horizontal

LPA-80080-4CF-EDIN-0



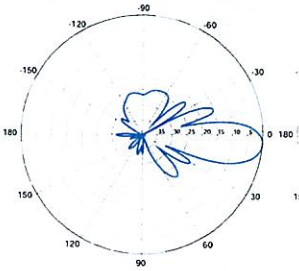
0° | Vertical

LPA-80080-4CF-EDIN-2



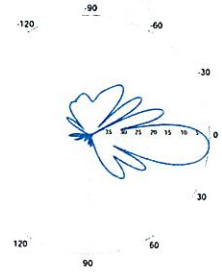
2° | Vertical

LPA-80080-4CF-EDIN-4



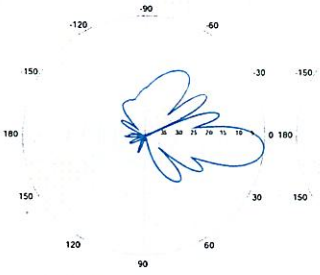
2° | Vertical

LPA-80080-4CF-EDIN-5



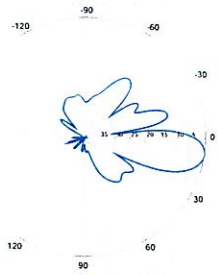
5° | Vertical

LPA-80080-4CF-EDIN-6



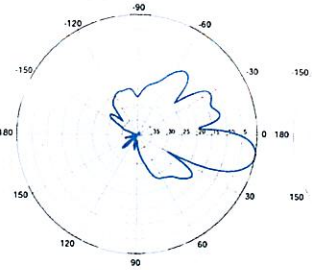
6° | Vertical

LPA-80080-4CF-EDIN-8



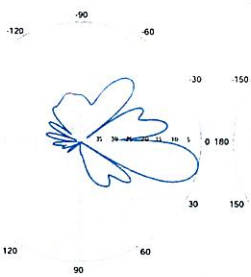
8° | Vertical

LPA-80080-4CF-EDIN-10



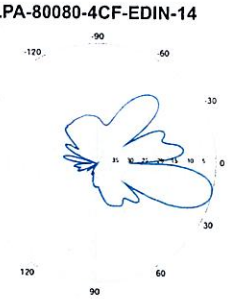
10° | Vertical

LPA-80080-4CF-EDIN-12



12° | Vertical

LPA-80080-4CF-EDIN-14



14° | Vertical

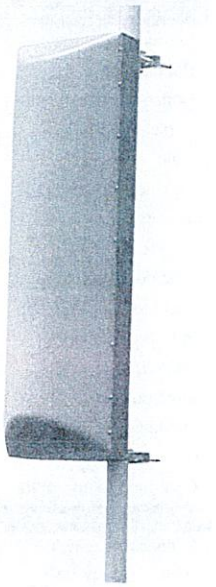
Amphenol ANTENNA SOLUTIONS

LPA-80063-4CF-EDIN-X

V-Pol | Log Periodic | 63° | 13.0 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.

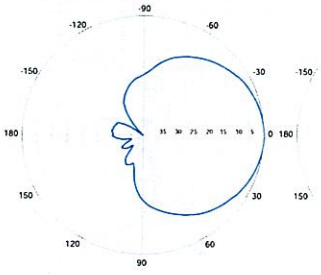


Electrical Characteristics	
Frequency bands	806-960 MHz
Polarization	Vertical
Horizontal beamwidth	63°
Vertical beamwidth	15°
Gain	13.0 dBd (15.1 dBi)
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14
Impedance	50Ω
VSWR	≤1.4:1
Upper sidelobe suppression (0°)	-15.7 dB
Front-to-back ratio (+/-30°)	-31.7 dB
Null fill	5% (-26.02 dB)
Input power	500 W
Lightning protection	Direct Ground
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)

Mechanical Characteristics		
Dimensions Length x Width x Depth	1205 x 385 x 332 mm	47.4 x 15.2 x 13.1 in
Depth of antenna with z-bracket	372 mm	14.6 in
Weight without mounting brackets	9.1 kg	20 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.46 m^2 Side: 0.39 m^2	Front: 5.0 ft^2 Side: 4.2 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 660 N Side: 550 N	Front: 149 lbf Side: 124 lbf

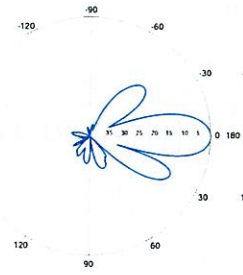
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit (0-20°)	21699999	50-102 mm 2.0-4.0 in	5.4 kg 12 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.		

LPA-80063-4CF-EDIN-X



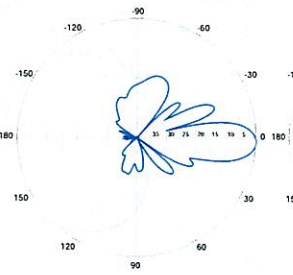
Horizontal

LPA-80063-4CF-EDIN-0



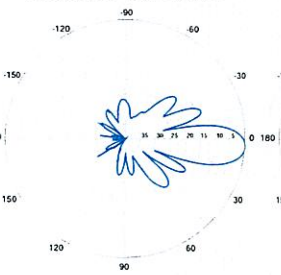
0° | Vertical

LPA-80063-4CF-EDIN-2



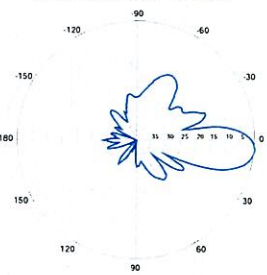
2° | Vertical

LPA-80063-4CF-EDIN-4



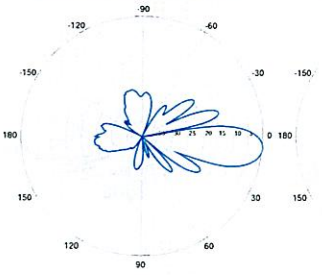
4° | Vertical

LPA-80063-4CF-EDIN-5



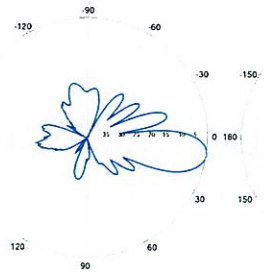
5° | Vertical

LPA-80063-4CF-EDIN-6



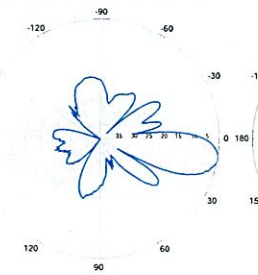
6° | Vertical

LPA-80063-4CF-EDIN-8



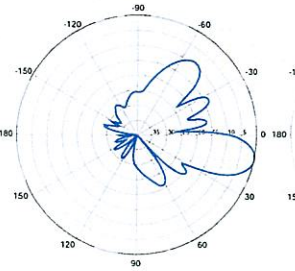
8° | Vertical

LPA-80063-4CF-EDIN-10



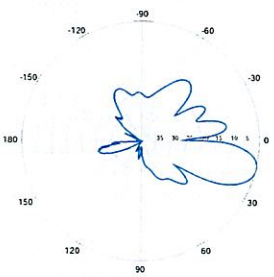
10° | Vertical

LPA-80063-4CF-EDIN-12



12° | Vertical

LPA-80063-4CF-EDIN-14



14° | Vertical

Amphenol ANTENNA SOLUTIONS

BXA-171085-8CF-EDIN-X

Replace "X" with desired electrical downtilt.

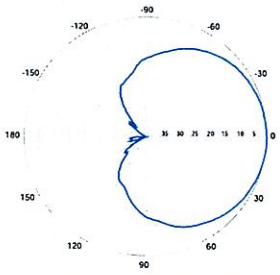
X-Pol | FET Panel | 85° | 16.4 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	88°	85°	80°
Vertical beamwidth	7°	7°	7°
Gain	13.5 dBd / 15.6 dBi	13.9 dBd / 16.0 dBi	14.3 dBd / 16.4 dBi
Electrical downtilt (X)	0, 2, 4		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		

Mechanical Characteristics		
Dimensions Length x Width x Depth	1232 x 154 x 105 mm	48.5 x 6.1 x 4.1 in
Depth with t-brackets	133 mm	5.2 in
Weight without mounting brackets	4.8 kg	10.5 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

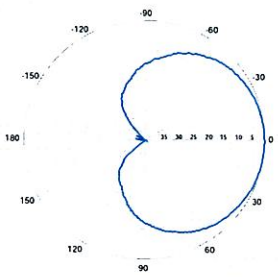
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171085-8CF-EDIN-X-FP		

BXA-171085-8CF-EDIN-X



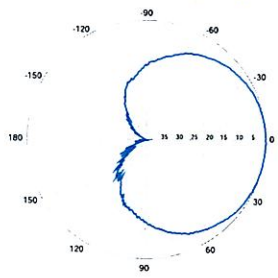
Horizontal | 1710-1880 MHz

BXA-171085-8CF-EDIN-X



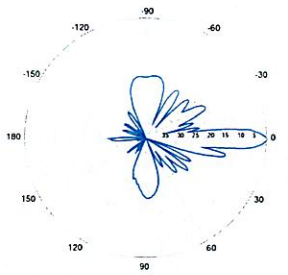
Horizontal | 1850-1990 MHz

BXA-171085-8CF-EDIN-X



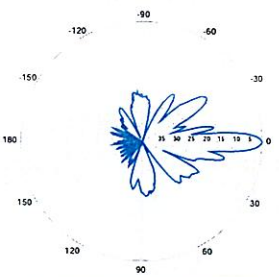
Horizontal | 1920-2170 MHz

BXA-171085-8CF-EDIN-0



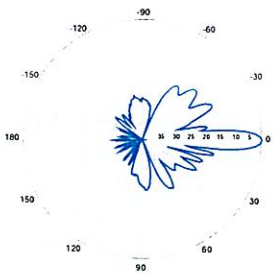
0° | Vertical | 1710-1880 MHz

BXA-171085-8CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171085-8CF-EDIN-0



0° | Vertical | 1920-2170 MHz

BXA-171063-8CF-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, 8		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		

Mechanical Characteristics		
Dimensions Length x Width x Depth	1232 x 154 x 105 mm	48.5 x 6.1 x 4.1 in
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Mounting Options	Part Number	Fits Pipe Diameter	Weight
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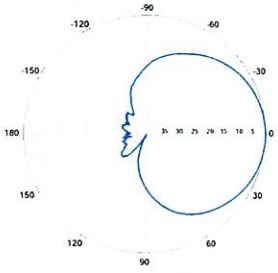
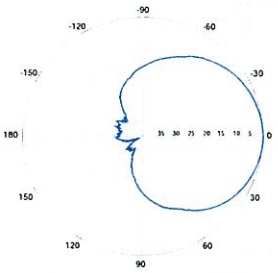
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8CF-EDIN-X-FP		

BXA-171063-8CF-EDIN-X



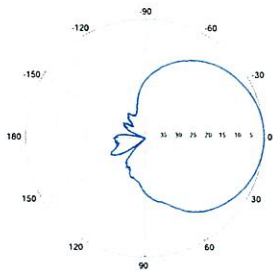
Horizontal | 1710-1880 MHz

BXA-171063-8CF-EDIN-X



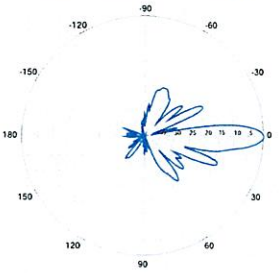
Horizontal | 1850-1990 MHz

BXA-171063-8CF-EDIN-X



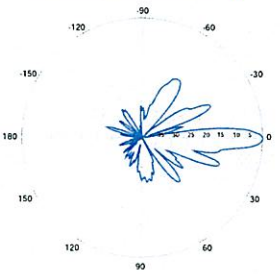
Horizontal | 1920-2170 MHz

BXA-171063-8CF-EDIN-0



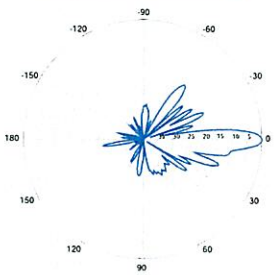
0° | Vertical | 1710-1880 MHz

BXA-171063-8CF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-8CF-EDIN-0



0° | Vertical | 1920-2170 MHz

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