ROBINSON & COLE LLP

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
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Direct (860) 275-8345

June 27, 2012

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

Re: **EM-VER-060-120319 – 131 Manor Road, Guilford, Connecticut**
EM-VER-076-120302 – 864 Opening Hill Road, Madison, Connecticut
EM-VER-083-111202 – 1969 Saybrook Road, Middletown, Connecticut
EM-VER-092-120112 – 1440 Litchfield Turnpike, New Hartford, Connecticut
EM-VER-099-120120 – 88 Parsonage Road, North Branford, Connecticut
EM-VER-106-111212 – 77 Springbrook Road, Old Saybrook, Connecticut

Completion of Construction Activity

Dear Ms. Roberts:

The purpose of this letter is to notify the Siting Council that construction activity associated with the above-referenced Cellco Partnership d/b/a Verizon Wireless telecommunications facilities has been completed.

If you have any questions or need any additional information regarding this facility please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

Copy to:
Sandy M. Carter

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

March 19, 2012

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103

RE: **EM-VER-076-120302** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 864 Opening Hill Road, Madison, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated March 1, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts MAB

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Fillmore McPherson, First Selectman, Town of Madison
Marilyn M. Ozols, Planning & Zoning Administrator, Town of Madison
Unison Site Management

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

March 5, 2012

The Honorable Fillmore McPherson
First Selectman
Town of Madison
Madison Town Campus
8 Campus Drive
Madison, CT 06443-2563

RE: **EM-VER-076-120302** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 864 Opening Hill Road, Madison, Connecticut.

Dear First Selectman McPherson:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by March 19, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Marilyn M. Ozols, Planning & Zoning Administrator, Town of Madison

CSC
CONNECTICUT SITING COUNCIL

ROBINSON & COLE

EM-VER-076-120302

KENNETH C. BALDWIN

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March 1, 2012

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

Re: **Notice of Exempt Modification – Antenna Swap**
864 Opening Hill Road, Madison, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 170-foot level on the existing 180-foot tower at the above-referenced address. The tower is owned by Unison Site Management. The Council approved Cellco's use of the existing tower in 1997. Cellco now intends to modify its installation by replacing ten (10) of its existing antennas with two (2) model APL 868013-42T0 cellular antennas; two (2) model APL 866513-42T0 cellular antennas; two (2) model BXA-171063-8BF PCS antennas; one (1) model BXA-171085-8BF PCS antenna; two (2) model BXA-70063-4CF LTE antennas; and one (1) model BXA-70063-6CF LTE antenna, all at the same 170-foot level on the tower. Cellco also intends to install six (6) coax cable diplexers on its antenna mounting structure. Attached behind Tab 1 are the specifications for the proposed replacement antennas and cable diplexers.

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 Fillmore McPherson, First Selectman of the Town of Madison. A copy of this letter is also being sent to North Madison Volunteer Fire Department, the owner of the property on which the tower is located.

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 overall height of the existing tower. Cellco's antennas and diplexers will be located at the same 170-foot level on the existing 180-foot tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site 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) power density levels 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 foundation 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

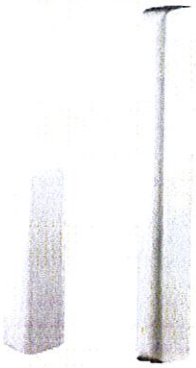
Enclosures
Copy to:
Fillmore McPherson, Madison First Selectman
North Madison Volunteer Fire Department
Sandy M. Carter

Product Data Sheet APL868013-42T0

Maximizer® Log Periodic Antenna, 806-894, 80deg, 14.1dBi, 1.2m, FET, 0deg

Product Description

The Celwave® Maximizer series is a log periodic dipole array which uses a patented design to achieve a front-to-back ratio of 45 dB, the highest front-to-back ratio in the industry. Maximizers are available to cover ESMR, AMPS, PCS and DCS frequency ranges. They use RFS's patented monolithic CELlite® technology, which eliminates cable and soldered joints to reduce the possibility of inter-modulation products. The CELlite technology assures high reliability and excellent repeatability of electrical characteristics. The cellular Maximizers are available in 65°, 80° and 90° horizontal beamwidths and the PCS/DCS Maximizers are available in 65° and 90° horizontal beamwidths. Patent number 6,133,889.



Features/Benefits

• 45 dB front-to-back ratio reduces co-channel interference.• Monolithic construction reduces IM.• No solder joints, high reliability.• Surface treated components prevent galvanic corrosion.• UV stabilized radome assures long life without radome deterioration due to UV exposure.

Technical Specifications

Electrical Specifications

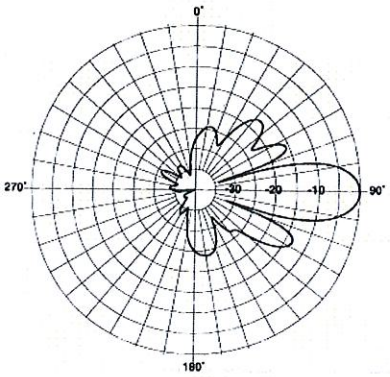
Frequency Range, MHz	806-894
Horizontal Beamwidth, deg	80
Vertical Beamwidth, deg	15
Electrical Downtilt, deg	0
Gain, dBi (dBd)	14.1 (12)
Front-To-Back Ratio, dB	45
Polarization	Vertical
VSWR	< 1.5:1
Impedance, Ohms	50
Maximum Power Input, W	500
Lightning Protection	Direct Ground
Connector Type	7-16 DIN Female

Mechanical Specifications

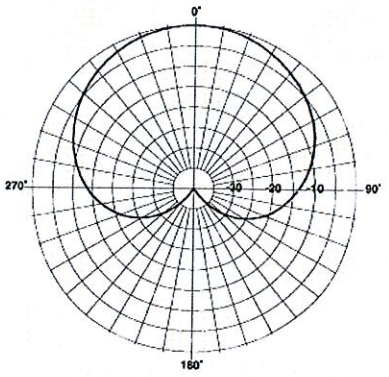
Dimensions - HxWxD, mm (in)	1219 x 152 x 203 (48 x 6 x 8)
Weight w/o Mtg Hardware, kg (lb)	2.8 (6.32)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	200 (125)
Max Wind Loading Area, m² (ft²)	0.307 (3.3)
Maximum Thrust @ Rated Wind, N (lbf)	916 (206)
Wind Load - Side @ Rated Wind, N (lbf)	743 (167)
Radome Material	UV Stabilized High Impact ABS
Shipping Weight, kg (lb)	7.9 (17.5)
Packing Dimensions, HxWxD, mm (in)	1270 x 305 x 203 (50 x 12 x 8)

Ordering Information

Mounting Hardware	APM21-3



Vertical Pattern



Horizontal Pattern

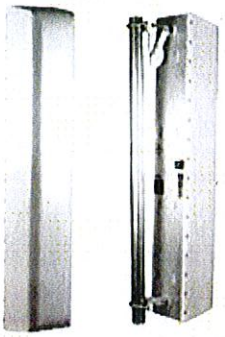
Other Documentation

Product Data Sheet **APL866513-42T0**

Maximizer® Log Periodic Antenna, 806-894, 65deg, 15.1dBi, 1.2m, FET, 0deg

Product Description

The Celwave® Maximizer series is a log periodic dipole array which uses a patented design to achieve a front-to-back ratio of 45 dB, the highest front-to-back ratio in the industry. Maximizers are available to cover ESMR, AMPS, PCS and DCS frequency ranges. They use RFS's patented monolithic CELlite® technology, which eliminates cable and soldered joints to reduce the possibility of inter-modulation products. The CELlite technology assures high reliability and excellent repeatability of electrical characteristics. The cellular Maximizers are available in 65°, 80° and 90° horizontal beamwidths and the PCS/DCS Maximizers are available in 65° and 90° horizontal beamwidths. Patent number 6,133,889.



FRONT BACK

Features/Benefits

- **45 dB front-to-back ratio reduces co-channel interference.• Monolithic construction reduces IM.• No solder joints, high reliability.• Surface treated components prevent galvanic corrosion.• UV stabilized radome assures long life without radome deterioration due to UV exposure.**

Technical Specifications

Electrical Specifications

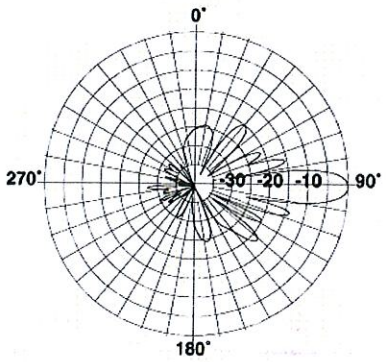
Frequency Range, MHz	806-894
Horizontal Beamwidth, deg	65
Vertical Beamwidth, deg	15
Electrical Downtilt, deg	0
Gain, dBi (dBd)	15.1 (13)
1st Upper Sidelobe Suppression, dB	>20
Upper Sidelobe Suppression, dB	>20
Front-To-Back Ratio, dB	45
Polarization	Vertical
VSWR	< 1.5:1
Impedance, Ohms	50
Maximum Power Input, W	500
Lightning Protection	Direct Ground
Connector Type	7-16 DIN Female

Mechanical Specifications

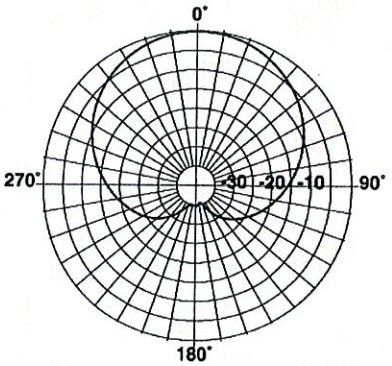
Dimensions - HxWxD, mm (in)	1219 x 234 x 203 (48 x 9.2 x 8)
Weight w/o Mtg Hardware, kg (lb)	7 (15.7)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	180 (112)
Max Wind Loading Area, m² (ft²)	0.376 (4.05)
Maximum Thrust @ Rated Wind, N (lbf)	903 (203)
Wind Load - Side @ Rated Wind, N (lbf)	594 (133.5)
Radome Material	UV Stabilized High Impact ABS
Shipping Weight, kg (lb)	9.1 (20)
Packing Dimensions, HxWxD, mm (in)	1594 x 343 x 349 (62.75 x 13.5 x 13.75)

Ordering Information

Mounting Hardware	APM21-3



Vertical Pattern



Horizontal Pattern

Other Documentation

Amphenol ANTENNA SOLUTIONS

BXA-171063-8BF-EDIN-X

Replace "X" with desired electrical downtilt.

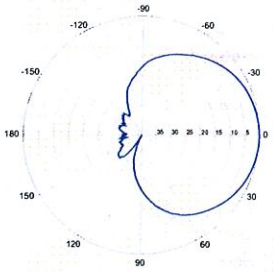
X-Pol | FET Panel | 63° | 17.4 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 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 / Bottom		
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

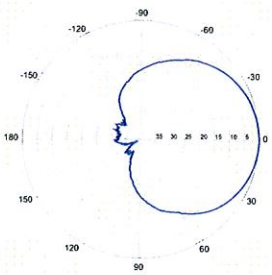
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8BF-EDIN-X-FP		

BXA-171063-8BF-EDIN-X



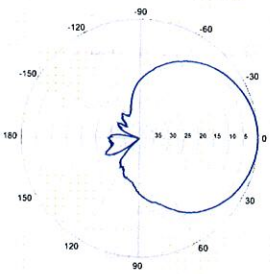
Horizontal | 1710-1880 MHz

BXA-171063-8BF-EDIN-X



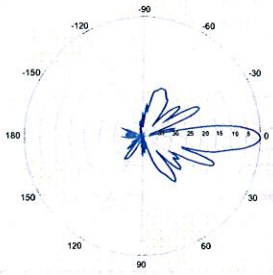
Horizontal | 1850-1990 MHz

BXA-171063-8BF-EDIN-X



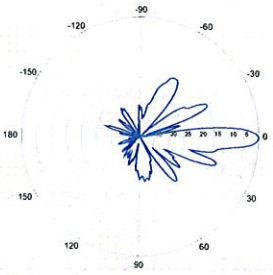
Horizontal | 1920-2170 MHz

BXA-171063-8BF-EDIN-0



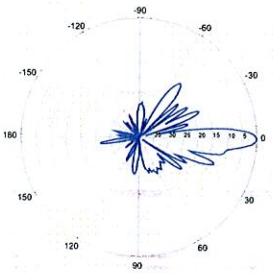
0° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-0

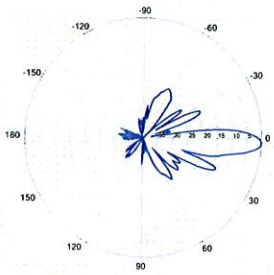


0° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-X

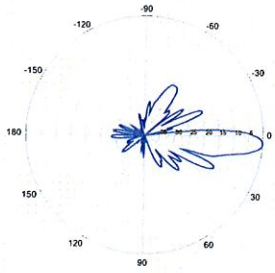
X-Pol | FET Panel | 63° | 17.4 dBi

BXA-171063-8BF-EDIN-2



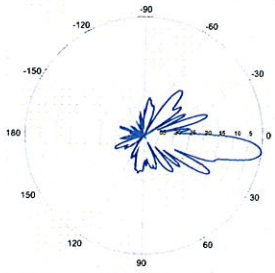
2° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-4



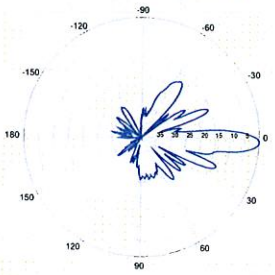
4° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-8



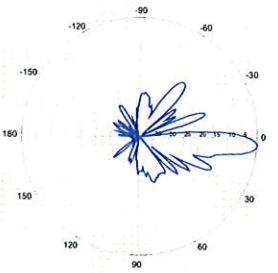
8° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-2



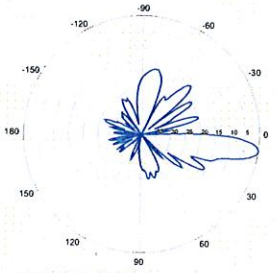
2° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-4



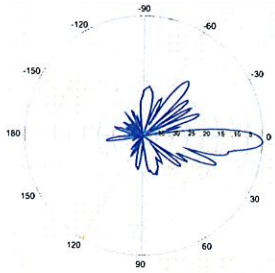
4° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-8



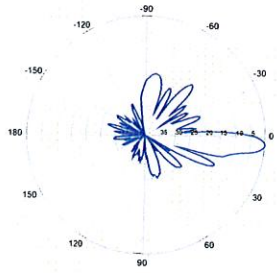
8° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-2



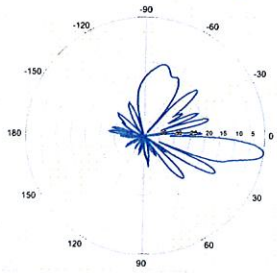
2° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-4



4° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-8



8° | Vertical | 1920-2170 MHz

Amphenol ANTENNA SOLUTIONS

BXA-171085-8BF-EDIN-X

Replace "X" with desired electrical downtilt.

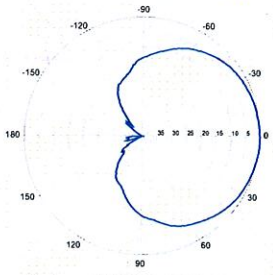
X-Pol | FET Panel | 85° | 16.4 dBi

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 / Bottom		
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

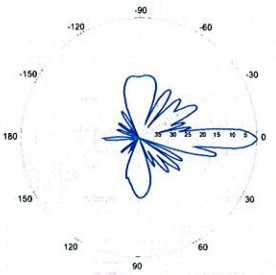
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171085-8BF-EDIN-X-FP		

BXA-171085-8BF-EDIN-X



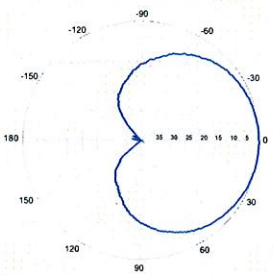
Horizontal | 1710-1880 MHz

BXA-171085-8BF-EDIN-0



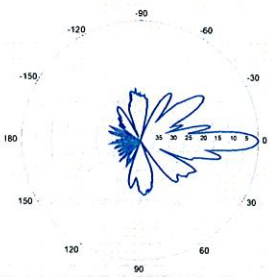
0° | Vertical | 1710-1880 MHz

BXA-171085-8BF-EDIN-X



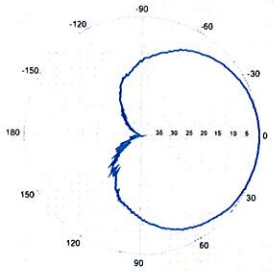
Horizontal | 1850-1990 MHz

BXA-171085-8BF-EDIN-0



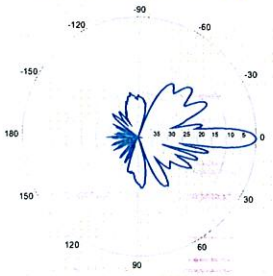
0° | Vertical | 1850-1990 MHz

BXA-171085-8BF-EDIN-X



Horizontal | 1920-2170 MHz

BXA-171085-8BF-EDIN-0

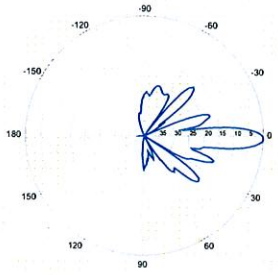


0° | Vertical | 1920-2170 MHz

BXA-171085-8BF-EDIN-X

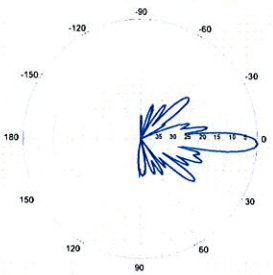
X-Pol | FET Panel | 85° | 16.4 dBi

BXA-171085-8BF-EDIN-2



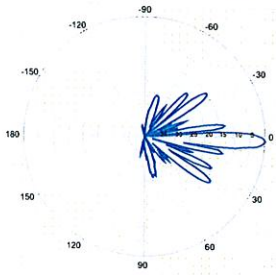
2° | Vertical | 1710-1880 MHz

BXA-171085-8BF-EDIN-2



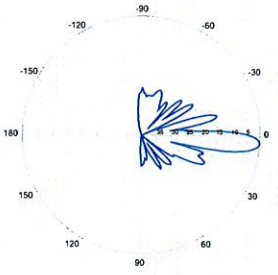
2° | Vertical | 1850-1990 MHz

BXA-171085-8BF-EDIN-2



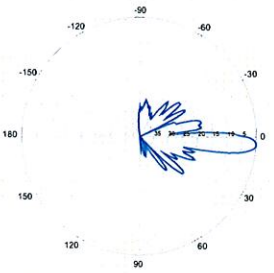
2° | Vertical | 1920-2170 MHz

BXA-171085-8BF-EDIN-4



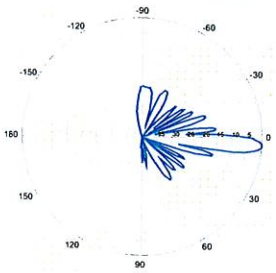
4° | Vertical | 1710-1880 MHz

BXA-171085-8BF-EDIN-4



4° | Vertical | 1850-1990 MHz

BXA-171085-8BF-EDIN-4



4° | Vertical | 1920-2170 MHz

Amphenol ANTENNA SOLUTIONS

BXA-70063-4CF-EDIN-X

X-Pol | FET Panel | 63° | 13.0 dBd

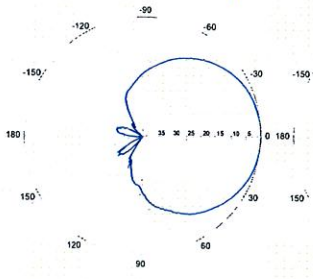
Replace "X" with desired electrical downtilt.

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

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	17°	15°
Gain	12.5 dBd (14.6 dBi)	13.0 dBd (15.1 dBi)
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 9, 10, 12, 14	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-16.3 dB	-22.1 dB
Front-to-back ratio (+/-30°)	-36.1 dB	-34.9 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -30 dB	
Input power	500 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1205 x 285 x 133 mm	47.4 x 11.2 x 5.2 in
Depth with z-brackets	173 mm	6.8 in
Weight without mounting brackets	4.5 kg	9.9 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.34 m² Side: 0.16 m²	Front: 3.7 ft² Side: 1.7 ft²
Wind load @ 161 km/hr (100 mph)	Front: 498 N Side: 260 N	Front: 111 lbf Side: 55 lbf

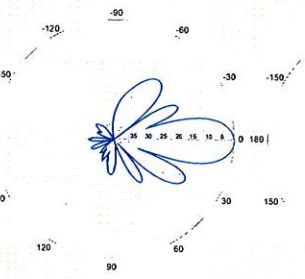
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	36210002	50-160 mm 2.0-6.3 in	4.5 kg 10 lbs
2-Point Downtilt Bracket Kit (0-20°)	36114003	50-160 mm 2.0-6.3 in	4.9 kg 11 lbs
Downtilt Mounting Applications	A mounting bracket and downtilt bracket kit must be ordered for downtilt applications		
Concealment Configurations	For concealment configurations, order BXA-70063-4CF-EDIN-X-FP		

BXA-70063-4CF-EDIN-X



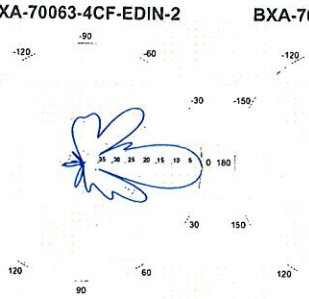
Horizontal | 750 MHz

BXA-70063-4CF-EDIN-0



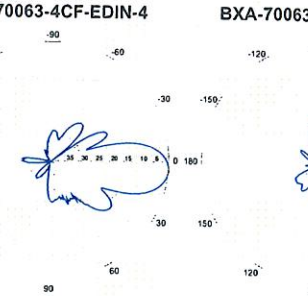
0° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-2



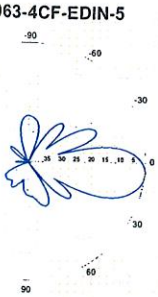
2° | Vertical | 750 MHz

BXA-70063-4CF-EDIN-4

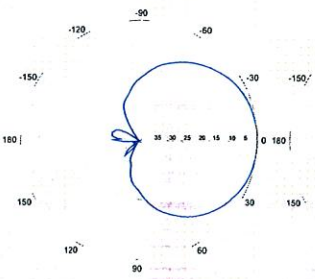


4° | Vertical | 750 MHz

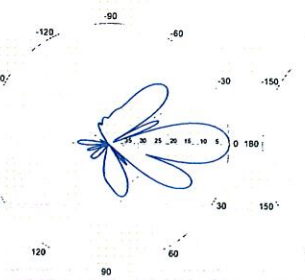
BXA-70063-4CF-EDIN-5



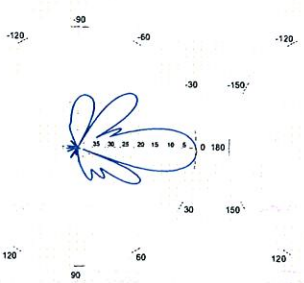
5° | Vertical | 750 MHz



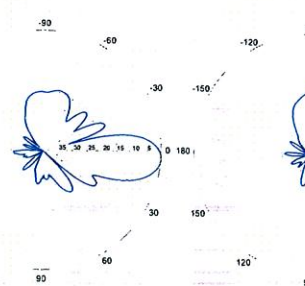
Horizontal | 850 MHz



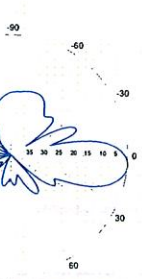
0° | Vertical | 850 MHz



2° | Vertical | 850 MHz



4° | Vertical | 850 MHz

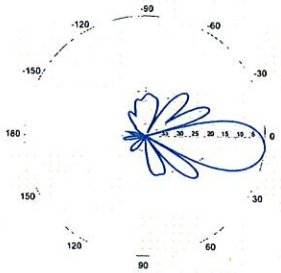


5° | Vertical | 850 MHz

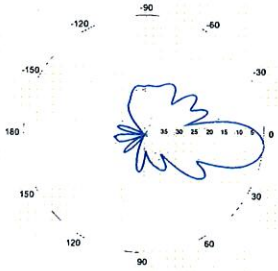
BXA-70063-4CF-EDIN-X

X-Pol | FET Panel | 63° | 13.0 dBd

BXA-70063-4CF-EDIN-6

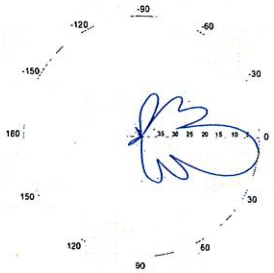


6° | Vertical | 750 MHz

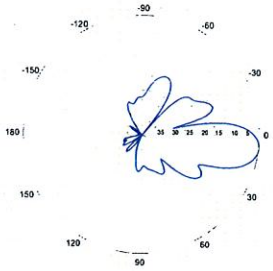


6° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-8

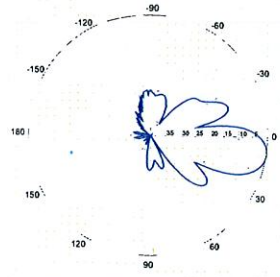


8° | Vertical | 750 MHz

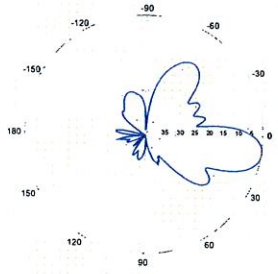


8° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-9

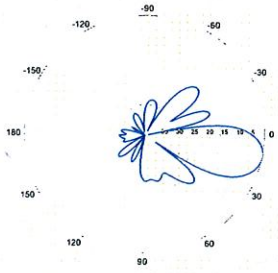


9° | Vertical | 750 MHz

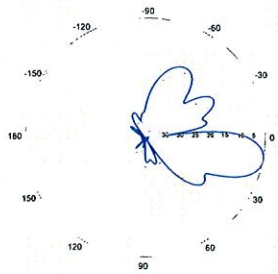


9° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-10

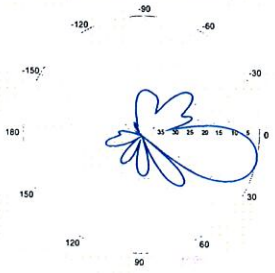


10° | Vertical | 750 MHz

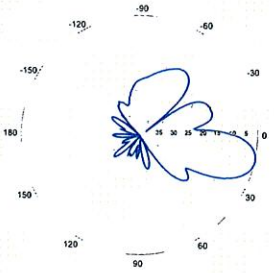


10° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-12

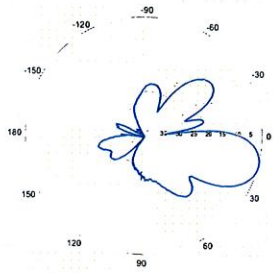


12° | Vertical | 750 MHz

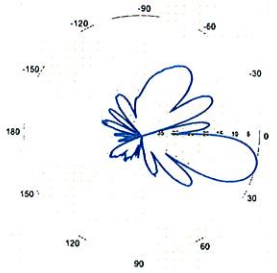


12° | Vertical | 850 MHz

BXA-70063-4CF-EDIN-14



14° | Vertical | 750 MHz



14° | Vertical | 850 MHz

Amphenol ANTENNA SOLUTIONS

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

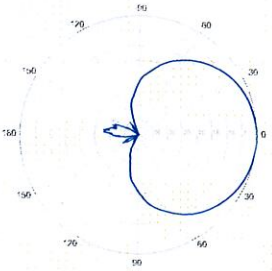
Replace "X" with desired electrical downtilt.

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	500 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

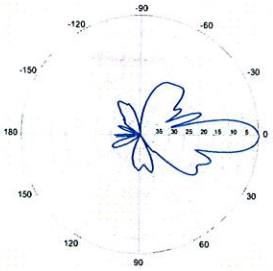
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting Bracket Kit	36210003	50-160 mm 2.0-6.3 in	6.3 kg 14 lbs
3-Point Downtilt Bracket Kit (0-14°)	36210004	50-160 mm 2.0-6.3 in	7.3 kg 16 lbs
Downtilt Mounting Applications	A mounting bracket and downtilt bracket kit must be ordered for downtilt applications		
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



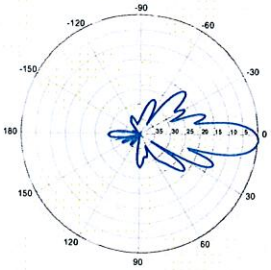
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

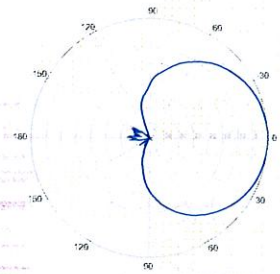


0° | Vertical | 750 MHz

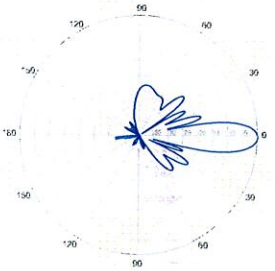
BXA-70063-6CF-EDIN-2



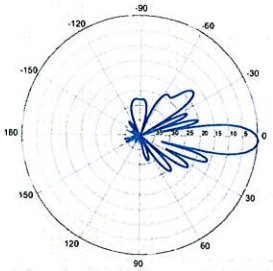
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz

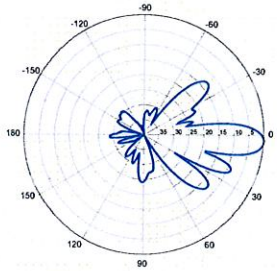


2° | Vertical | 850 MHz

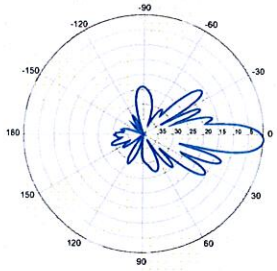
BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3

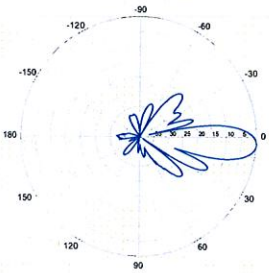


3° | Vertical | 750 MHz

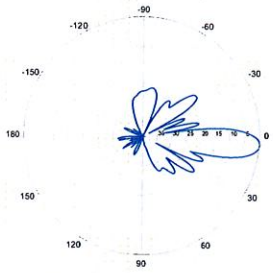


3° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-4

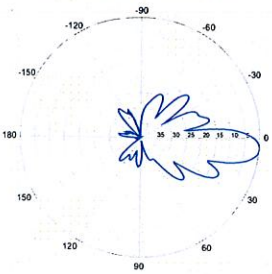


4° | Vertical | 750 MHz

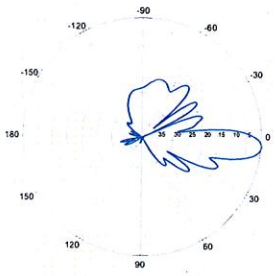


4° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-5



5° | Vertical | 750 MHz



5° | Vertical | 850 MHz

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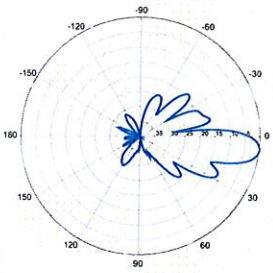
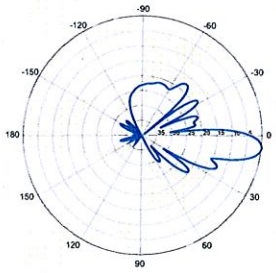


6° | Vertical | 750 MHz



6° | Vertical | 850 MHz

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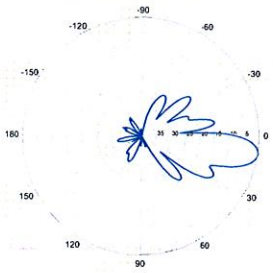
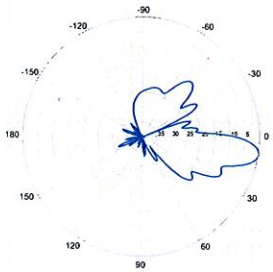
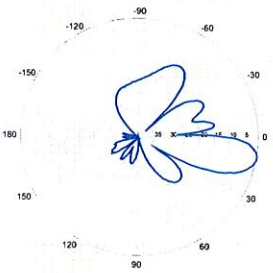


8° | Vertical | 750 MHz

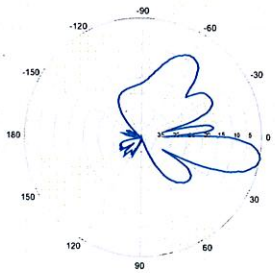


8° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-10



10° | Vertical | 750 MHz



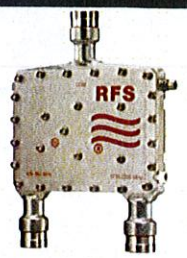
10° | Vertical | 850 MHz

Product Data Sheet **FD9R6004/2C-3L**

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Product Description

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.



Features/Benefits

- **LTE ready design**
- **Extremely Low Insertion Loss**
- **High level of Rejection between bands – Protection against interferences**
- **Extremely High Power Handling Capability**
- **Integrated DC block/bypass versions available**
- **Very compact & small size design – Easy installation and reduced tower load**
- **In-line long-neck connectors for easy connection & waterproofing**
- **Exceptional reliability & environmental protection (IP 67)**
- **Equipped with 1 * Breathable Vent – Prevent any humidity inside the product**
- **Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)**
- **Grounding already provided through the mounting bracket**
- **Kit available for easy dual mount**

Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Frequency Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710-2170MHz path, with mounting hardware SEM2-1A
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Return Loss All Ports Min/Typ, dB	19/23
Power Handling Continuous, Max, W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max, W	15000 in low frequency path & 8000 in high frequency path
Impedance, Ohms	50
Insertion Loss, Path 1, dB	0.07 typ.
Insertion Loss, Path 2, dB	0.13 typ.
Rejection Between Bands Min/Typ, dB	58/64@698-960MHz; 60/70@1710-2200MHz
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
Temperature Range, °C (°F)	-40 to +60 (-40 to +140)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	EN/IEC61000-4-5 Level 4
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

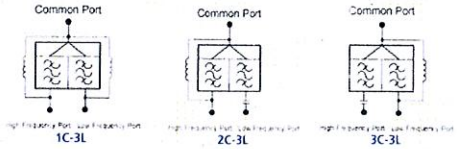
Notes

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Other Documentation

FD9R6004/2C-3L Installation Instructions: Wideband_Diplexer_Installation_Rev5.pdf

Selection Guide Diplexer 698-960 / 1710-2200MHz					
	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single	FD9R6004/1C-3L				X
	FD9R6004/2C-3L				X
	FD9R6004/3C-3L				X
Dual	KIT-FD9R6004/1C-DL				X
	KIT-FD9R6004/2C-DL				X
	KIT-FD9R6004/3C-DL				X



The FD9R6004 Series is upgradeable to a Dual Diplexer kit by means of 2 diplexers and mounting hardware kits SEM2-1A and SEM2-3

Mounting Hardware and Ground Cable Ordering Information		
Model Number	Description	
SEM2-1A	Mounting Hardware, Pole mount ø40-110mm (Included with the Single and Dual Diplexer) Wall Screws M6 (Not included with the product)	
SEM2-3	Assembly kit for 2 pcs of FD9R6004/xC-3L (Can be ordered separately but included with the Dual Diplexer Kit)	
CA020-2	Ground Cable, 2m, includes lugs (Optional)	
CA030-2	Ground Cable, 2m, includes lugs (Optional)	
SEM6	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	

	General	Power	Density					
Site Name:Madison								
Tower Height: Verizon @ 170ft								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*VoiceStream	8	246	130	0.0419	1930	1.0000	4.19%	
*Fire Company	1	100	180	0.0011	46.06	0.2000	0.55%	
*Police Dept	1	100	180	0.0011	453.5	0.3023	0.37%	
*Cingular UMTS	1	500	139	0.0093	880	0.5867	1.59%	
*Cingular GSM	4	296	139	0.0220	880	0.5867	3.76%	
*Cingular GSM	2	427	139	0.0159	1930	1.0000	1.59%	
*Sprint	11	122	150	0.0214	1962.5	1.0000	2.14%	
*Nextel	9	100	160	0.0126	851	0.5673	2.23%	
Verizon PCS	**7**	**256**	**170**	**0.0223**	**1970**	**1.0000**	**2.23%**	
Verizon Cellular	**9**	**288**	**170**	**0.0322**	**869**	**0.5793**	**5.57%**	
Verizon AWS	**1**	**639**	**170**	**0.0080**	**2145**	**1.0000**	**0.80%**	
Verizon 700	**1**	**760**	**170**	**0.0095**	**698**	**0.4653**	**2.03%**	
								27.04%
* Source: Siting Council								

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

180' Existing Rohn Lattice Tower

Proposed Verizon Wireless
Antenna Upgrade

Verizon Site Ref: Madison

864 Opening Hill Road
Madison, CT

Centek Project No. 11001.CO51

~~Date: September 26, 2011~~
Rev 1: February 27, 2012

Prepared for:

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

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

Table of Contents

Introduction

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

The host tower is a 180-ft, three legged, lattice tower originally manufactured by ROHN eng. file no. 35130AE dated 11/30/98. The tower geometry, structure member sizes and foundation information were taken from a previous structural report prepared by Malouf Engineering Intl., Inc. dated November 13, 2008. Antenna and appurtenance inventory were taken from the aforementioned MEI structural report, a Verizon RF data sheet and visual verification from grade by Centek personnel on September 13, 2011.

The tower consists of nine (9) vertical sections consisting of steel pipe legs conforming to ASTM A572 Gr. 50 and lateral bracing conforming to ASTM A572 Gr. 50. 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 8-ft 6-in at the top and 25-ft 4-in at the bottom.

Verizon Wireless proposes the removal of ten (10) panel antennas and the installation of ten (10) panel antennas mounted on three (3) existing boom gates. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

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

- Town (Existing):
  Antenna: One (1) PD455 Omni-directional whip antenna, one (1) 4-bay dual dipole antenna and one (1) 2-bay dual dipole antenna mounted to the top of the tower on two (2) 6-ft side arms.
  Coax Cable: Two (2) 7/8" ∅ coax cables, one (1) 1/2" ∅ coax cable, one (1) 2" rigid conduit and one (1) 1" rigid conduit running on a leg/face of the existing tower as specified in Section 3 of this report.
- Town (Reserved):
  Antenna: One (1) PD455 Omni-directional whip antenna mounted to the top of the tower on one (1) 6-ft side arm.
  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.
- Nextel (Existing):
  Antenna: Twelve (12) Andrew DB844H90E-XY panel antennas mounted on three (3) 15-ft boom gates with a RAD center elevation of ±160-ft above grade level.
  Coax Cable: Twelve (12) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Sprint (Existing):
  Antenna: Six (6) Andrew DB980H90E-M panel antennas mounted on three (3) 15-ft boom gates with a RAD center elevation of ±150-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.

- Sprint (Reserved):
  Antenna: Three (3) Andrew DB980H90E-M panel antennas mounted on three (3) 15-ft boom gates with a RAD center elevation of ±150-ft above grade level.
  Coax Cable: Three (3) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing):
  Antenna: Six (6) Powerwave 7770 panel antennas, six (6) Powerwave LGP21401 TMA's and six (6) Powerwave LGP21901 Diplexers mounted on three (3) 15-ft boom gates with a RAD center elevation of ±140-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.
- T-Mobile (Existing):
  Antenna: Three (3) EMS 72"x12"x4" panel antennas and six (6) 10"x8"x3" TMA's mounted on three (3) 15-ft T-Frames with a RAD center elevation of ±130-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.
- T-Mobile (Reserved):
  Antenna: Three (3) EMS 72"x12"x4" panel antennas mounted on three (3) 15-ft T-Frames with a RAD center elevation of ±130-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.
- Sprint (Existing):
  Antenna: One (1) GPS antenna on a 2-ft standoff with an elevation of ±75-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- VERIZON (Existing to Remain):
  Antennas: Two (2) Antel LPA-80080/6CF panel antennas mounted on (3) 15-ft boom gates with a RAD center elevation of ±170-ft above grade level.
  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 four (4) Andrew DB844H90 panel antennas mounted on (3) 15-ft boom gates with a RAD center elevation of ±170-ft above grade level.
- **VERIZON (Proposed):**
  Antennas: Two (2) RFS APL868013-42T0 panel antennas, two (2) RFS APL866513-42T0 panel antennas, one (1) Antel BXA-171085/8BF panel antenna, two (2) Antel BXA-171063/8BF panel antennas, two (2) Antel BXA-70063/4CF panel antennas, one (1) Antel BXA-70063/6CF panel antennas and six (6) RFS FD9R6004/2C-3L Diplexers mounted on (3) 15-ft boom gates with a RAD center elevation of ±170-ft above grade level.

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 legs, and the model assumes that the leg members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for 95 mph basic wind speed (fastest mile) with no ice and 82 mph 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).

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 tower structure and its components.

Basic Wind Speed:	New Haven v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Madison; v = 115 mph (3 second gust) equivalent to v = 95 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	Appendix K wind speed controls.	
Load Cases:	Load Case 1; 95 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation. This load case typically controls the design of monopole towers.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 82 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 82 mph wind speed velocity represents 75% of the wind pressure generated by the 95 mph wind speed. This load case typically controls the design of lattice towers.	*[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*

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 found to be within allowable limits. In Load Case 2, per RISATower "Section Capacity Table", this tower was found to be at **77.4%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Diagonal (T3)	120'-0"-140'-0"	77.4%	**PASS**
Horizontal (T9)	0'-0"-20'-0"	72.1%	**PASS**
Leg (T6)	60'-0"-80'-0"	70.3%	**PASS**

Foundation and Anchors

The existing foundation consists of a three (3) 6-ft ∅ x 25-ft long reinforced concrete caissons concentrically bearing on existing sub grade. The sub grade conditions used in the foundation analysis were derived from the aforementioned MEI structural analysis report. The base of the tower is connected to the foundation by means of (16) 1.00"∅, ASTM A354 Gr. BC anchor bolts per leg embedded 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	**66 kips**
	Compression	**71 kips**
	Moment	**6933 kip-ft**
Leg	Shear	**40 kips**
	Uplift	**292 kips**
	Compression	**337 kips**

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

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	40.6%	**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 Caisson (3)	Uplift	2.0	2.91	**PASS**

Note 1: FS denotes Factor of Safety

Conclusion

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

The analysis is based, in part, on the information provided to this office by Verizon 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:

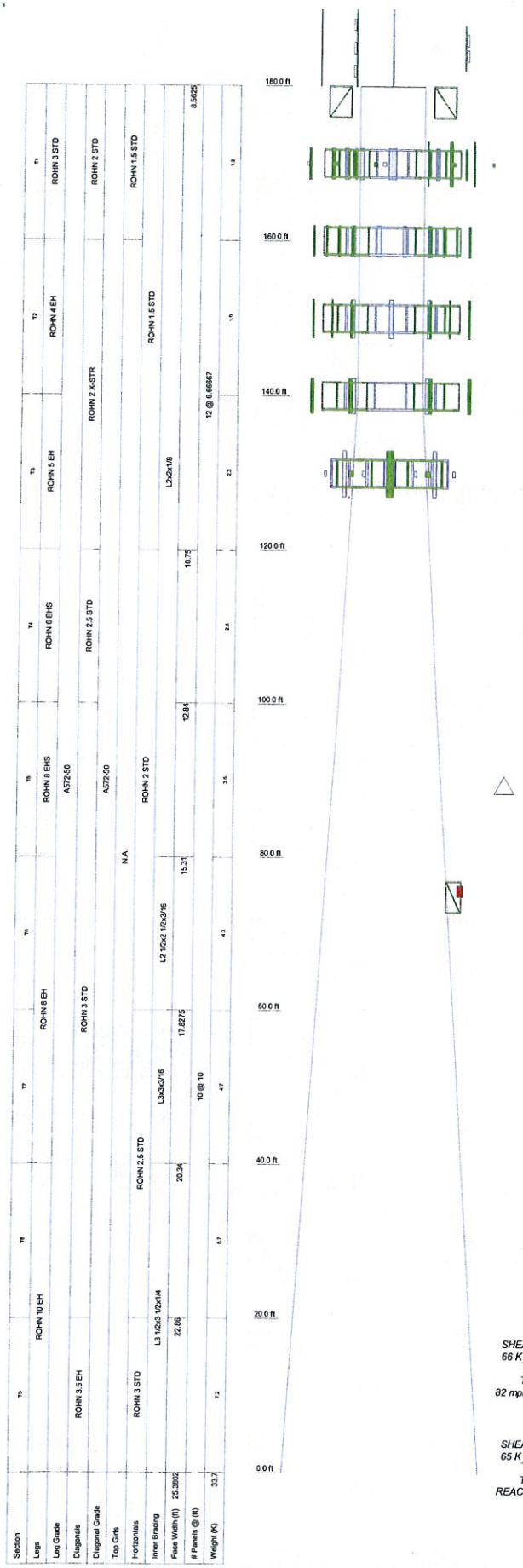
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or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



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PD455 (Town Existing)	180	(2) DB980H90E-M (Sprint Existing)	150
DB408 (Town Existing)	180	(2) DB980H90E-M (Sprint Existing)	150
PD455 (Town Reserved)	180	DB980H90E-M (Sprint Reserved)	150
DB404 (Town Existing)	180	DB980H90E-M (Sprint Reserved)	150
ROHN 6-ft Side Arm (Town Existing)	178	DB980H90E-M (Sprint Reserved)	150
ROHN 6-ft Side Arm (Town Existing)	178	ROHN 6'x15' Boom Gate (1) (ATI Existing)	140
ROHN 6-ft Side Arm (Town Reserved)	178	ROHN 6'x15' Boom Gate (1) (ATI Existing)	140
ROHN 6'x15' Boom Gate (1) (Verizon Existing)	170	ROHN 6'x15' Boom Gate (1) (ATI Existing)	140
ROHN 6'x15' Boom Gate (1) (Verizon Existing)	170	(2) 7770.00 (ATI Existing)	140
ROHN 6'x15' Boom Gate (1) (Verizon Existing)	170	(2) 7770.00 (ATI Existing)	140
APL868013-42T0 (Verizon Proposed)	170	(2) 7770.00 (ATI Existing)	140
BXA-171085-8BF (Verizon Proposed)	170	(2) LGP21401 TMA (ATI Existing)	140
BXA-70063/4CF (Verizon Proposed)	170	(2) LGP21401 TMA (ATI Existing)	140
APL868013-42T0 (Verizon Proposed)	170	(2) LGP21401 TMA (ATI Existing)	140
LPA-80080-6CF (Verizon Existing)	170	(2) LGP21901 Diplexer (ATI Existing)	140
BXA-171063/8BF (Verizon Proposed)	170	(2) LGP21901 Diplexer (ATI Existing)	140
BXA-70063/6CF (Verizon Proposed)	170	(2) LGP21901 Diplexer (ATI Existing)	140
LPA-80080-6CF (Verizon Existing)	170	Pirod 15' T-Frame Sector Mount (1) (T-Mobile Existing)	130
APL866513-42T0 (Verizon Proposed)	170	Pirod 15' T-Frame Sector Mount (1) (T-Mobile Existing)	130
BXA-171063/8BF (Verizon Proposed)	170	Pirod 15' T-Frame Sector Mount (1) (T-Mobile Existing)	130
BXA-70063/4CF (Verizon Proposed)	170	72"x12"x4" Panel Antenna (T-Mobile Existing)	130
APL866513-42T0 (Verizon Proposed)	170	72"x12"x4" Panel Antenna (T-Mobile Existing)	130
(2) FD9R6004/2C-3L Diplexer (Verizon Proposed)	170	72"x12"x4" Panel Antenna (T-Mobile Existing)	130
(2) FD9R6004/2C-3L Diplexer (Verizon Proposed)	170	72"x12"x4" Panel Antenna (T-Mobile Reserved)	130
(2) FD9R6004/2C-3L Diplexer (Verizon Proposed)	170	72"x12"x4" Panel Antenna (T-Mobile Reserved)	130
ROHN 6'x15' Boom Gate (1) (Nextel Existing)	160	72"x12"x4" Panel Antenna (T-Mobile Reserved)	130
ROHN 6'x15' Boom Gate (1) (Nextel Existing)	160	(2) TMA 10"x8"x3" (T-Mobile Existing)	130
ROHN 6'x15' Boom Gate (1) (Nextel Existing)	160	(2) TMA 10"x8"x3" (T-Mobile Existing)	130
(4) DB844H90E-XY (Nextel Existing)	160	(2) TMA 10"x8"x3" (T-Mobile Existing)	130
(4) DB844H90E-XY (Nextel Existing)	160	GPS (Sprint Existing)	75
(4) DB844H90E-XY (Nextel Existing)	160	2-ft Stand Off (Sprint Existing)	75
ROHN 6'x15' Boom Gate (1) (Sprint Existing)	150		
ROHN 6'x15' Boom Gate (1) (Sprint Existing)	150		
ROHN 6'x15' Boom Gate (1) (Sprint Existing)	150		
(2) DB980H90E-M (Sprint Existing)	150		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for a 95 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 82 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 77.4%

MAX. CORNER REACTIONS AT BASE:
DOWN: 337 K
UPLIFT: -292 K
SHEAR: 40 K

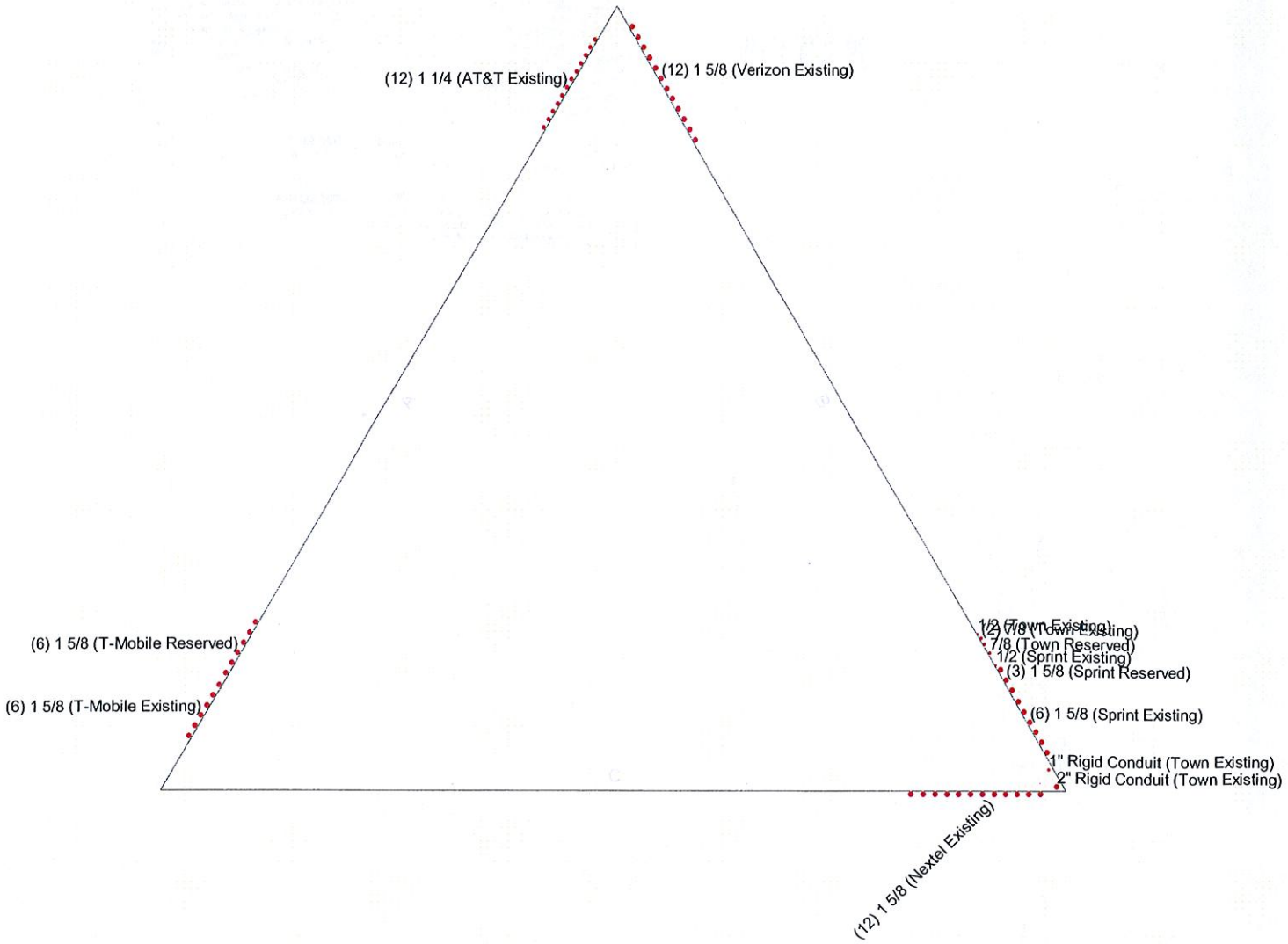
AXIAL 71 K
SHEAR 66 K / *MOMENT 6933 kip-ft*
TORQUE 54 kip-ft
82 mph WIND - 0.5000 in ICE
AXIAL 53 K
SHEAR 65 K / *MOMENT 6758 kip-ft*
TORQUE 46 kip-ft
REACTIONS - 95 mph WIND

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

Job: *11001.CO51 - Madison*
Project: *180' Rohn Lattice Tower - 864 Opening Hill Rd., Madison, CT*
Client: Verizon Wireless | Drawn by: TJL | App'd:
Code: TIA/EIA-222-F | Date: 02/27/12 | Scale: NTS
Path: | Dwg No. E-1

Feedline Plan

Round Flat App In Face App Out Face



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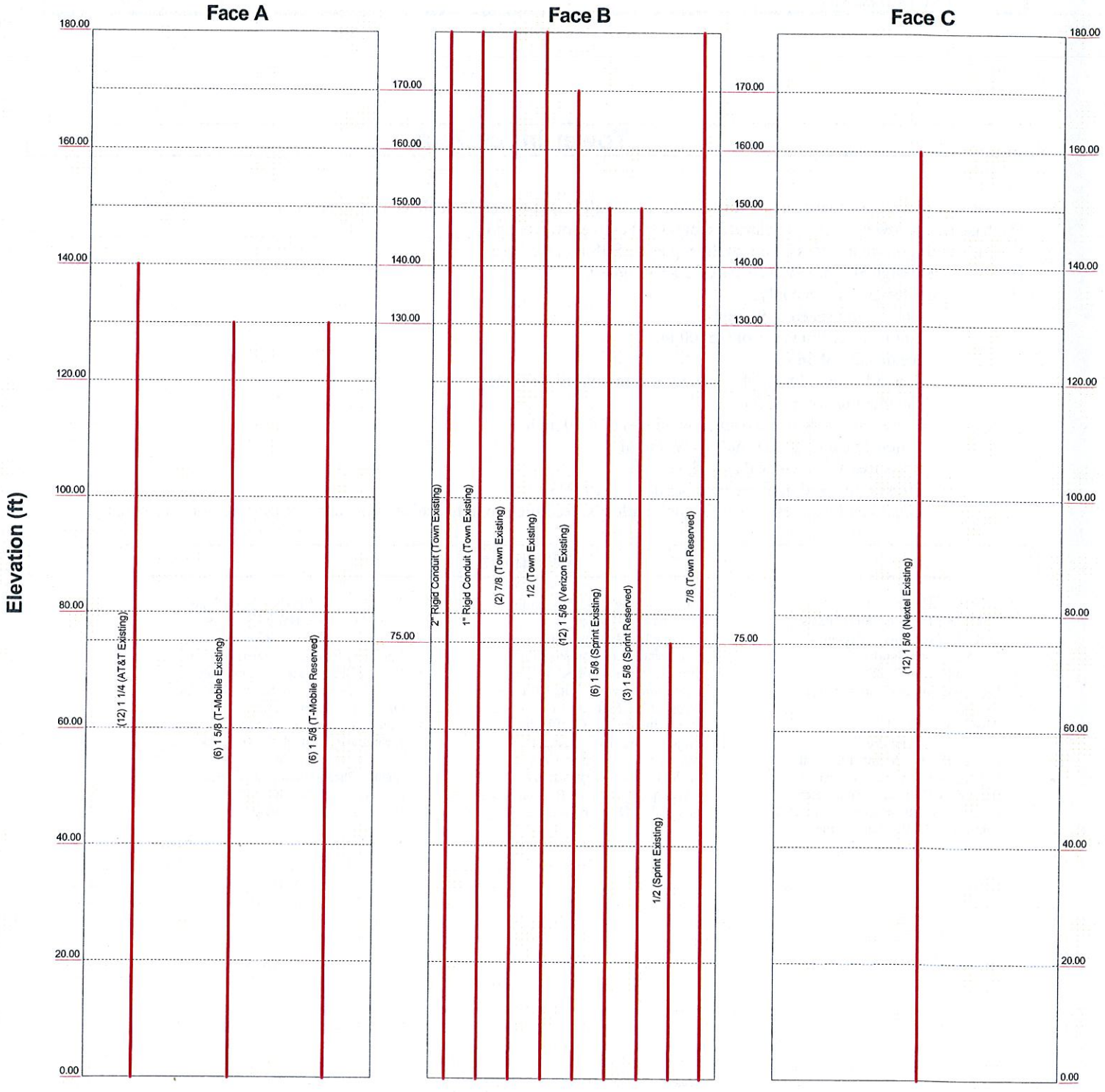
Code: TIA/EIA-222-F	Date: 02/27/12	Scale: NTS
Path: J:\Jobs\1100100.WNCO51- Madison\Rev (1)\Calcs\ERI Files\180-ft Rohn Lattice Tower.er		Dwg No. E-7

Feedline Distribution Chart
0' - 180'

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



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Project: *180' Rohn Lattice Tower - 864 Opening Hill Rd., Madison, CT*		
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 02/27/12	Scale: NTS
Path: J:\Jobs\1100100.W\CO51- Madison\Rev (1)\Calcs\ER\ Files\180-ft Rohn Lattice Tower.er		Dwg No. E-7

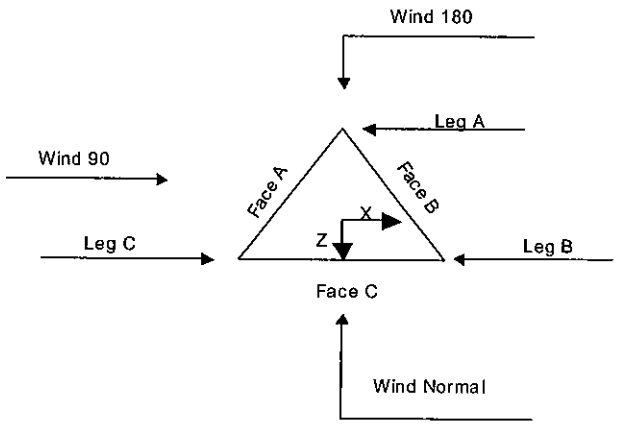
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 8.56 ft at the top and 25.38 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 95 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 82 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
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	180.00-160.00			8.56	1	20.00
T2	160.00-140.00			8.56	1	20.00
T3	140.00-120.00			8.56	1	20.00
T4	120.00-100.00			10.75	1	20.00
T5	100.00-80.00			12.84	1	20.00
T6	80.00-60.00			15.31	1	20.00
T7	60.00-40.00			17.83	1	20.00
T8	40.00-20.00			20.34	1	20.00
T9	20.00-0.00			22.86	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	180.00-160.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T2	160.00-140.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T3	140.00-120.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T4	120.00-100.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T5	100.00-80.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T6	80.00-60.00	10.00	K Brace Down	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
T7	60.00-40.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T8	40.00-20.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T9	20.00-0.00	10.00	K Brace Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T2 160.00-140.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Pipe	ROHN 2 X-STR	A572-50 (50 ksi)
T3 140.00-120.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	ROHN 2 X-STR	A572-50 (50 ksi)
T4 120.00-100.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T5 100.00-80.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T6 80.00-60.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T7 60.00-40.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T8 40.00-20.00	Pipe	ROHN 10 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T9 20.00-0.00	Pipe	ROHN 10 EH	A572-50 (50 ksi)	Pipe	ROHN 3.5 EH	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 180.00-160.00	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-160.00	None	Single Angle		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T2 160.00-140.00	None	Solid Round		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T3 140.00-120.00	None	Single Angle		A36	Pipe	ROHN 1.5 STD	A572-50

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T4 120.00-100.00	None	Single Angle		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 100.00-80.00	None	Single Angle		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T6 80.00-60.00	None	Single Angle		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T7 60.00-40.00	None	Single Angle		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T8 40.00-20.00	None	Single Angle		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T9 20.00-0.00	None	Single Angle		A36 (36 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 180.00-160.00	Single Angle		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T2 160.00-140.00	Single Angle		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T3 140.00-120.00	Single Angle		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T4 120.00-100.00	Single Angle		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 100.00-80.00	Single Angle		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 80.00-60.00	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 60.00-40.00	Single Angle		A36 (36 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 40.00-20.00	Single Angle		A36 (36 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T9 20.00-0.00	Single Angle		A36 (36 ksi)	Single Angle	L3 1/2x3 1/2x1/4	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 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	30.0000	30.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3	0.00	0.0000	A36	1	1	1	36.0000	36.0000

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

Tower Section Geometry *(cont'd)*

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

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg			Diagonal			Top Girt			Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in		U	Net Width Deduct in		U	Net Width Deduct in		U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.00-160.00	0.0000		1	0.0000		1	0.0000		1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 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
T3 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
T4 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
T5 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
T6 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
T7 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
T8 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
T9 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 180.00-160.00	Flange	0.8750 A325N	4	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T2 160.00-140.00	Flange	1.0000 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T3 140.00-120.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T4 120.00-100.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T5 100.00-80.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T6 80.00-60.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T7 60.00-40.00	Flange	1.0000 A325N	12	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T8 40.00-20.00	Flange	1.0000 A325N	12	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	2	0.6250 A325X	0
T9 20.00-0.00	Flange	1.0000 A354-BC	16	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	2	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
2" Rigid Conduit	B	Yes	Ar (CfAe)	180.00 - 0.00	-1.0000	0.49	1	1	2.0000	2.0000		2.80

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
(Town Existing) 1" Rigid Conduit	B	Yes	Ar (CfAe)	180.00 - 0.00	-1.0000	0.47	1	1	1.0000	1.0000		0.70
(Town Existing) 7/8	B	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.31	2	2	1.1100	1.1100		0.54
(Town Existing) 1/2	B	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.3	1	1	0.5800	0.5800		0.25
(Town Existing) 1 5/8	B	Yes	Ar (CfAe)	170.00 - 0.00	0.0000	-0.4	12	12	1.9800	1.9800		1.04
(Verizon Existing) 1 5/8	C	Yes	Ar (CfAe)	160.00 - 0.00	0.0000	-0.4	12	12	1.9800	1.9800		1.04
(Nextel Existing) 1 5/8	B	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0.42	6	6	1.9800	1.9800		1.04
(Sprint Existing) 1 5/8	B	Yes	Ar (CfAe)	150.00 - 0.00	0.0000	0.36	3	3	1.9800	1.9800		1.04
(Sprint Reserved) 1 1/4	A	Yes	Ar (CfAe)	140.00 - 0.00	0.0000	0.4	12	12	1.5500	1.5500		0.66
(AT&T Existing) 1 5/8	A	Yes	Ar (CfAe)	130.00 - 0.00	0.0000	-0.4	6	6	1.9800	1.9800		1.04
(T-Mobile Existing) 1 5/8	A	Yes	Ar (CfAe)	130.00 - 0.00	0.0000	-0.32	6	6	1.9800	1.9800		1.04
(T-Mobile Reserved) 1/2	B	Yes	Ar (CfAe)	75.00 - 0.00	0.0000	0.34	1	1	0.5800	0.5800		0.25
(Sprint Existing) 7/8	B	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.325	1	1	1.1100	1.1100		0.54
(Town Reserved)												

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	180.00-160.00	A	0.000	0.000	0.000	0.000	0.00
		B	31.317	0.000	0.000	0.000	0.23
		C	0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	65.967	0.000	0.000	0.000	0.45
		C	39.600	0.000	0.000	0.000	0.25
T3	140.00-120.00	A	50.800	0.000	0.000	0.000	0.28
		B	80.817	0.000	0.000	0.000	0.54
		C	39.600	0.000	0.000	0.000	0.25
T4	120.00-100.00	A	70.600	0.000	0.000	0.000	0.41
		B	80.817	0.000	0.000	0.000	0.54
		C	39.600	0.000	0.000	0.000	0.25

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
T5	100.00-80.00	A	70.600	0.000	0.000	0.000	0.41
		B	80.817	0.000	0.000	0.000	0.54
		C	39.600	0.000	0.000	0.000	0.25
T6	80.00-60.00	A	70.600	0.000	0.000	0.000	0.41
		B	81.542	0.000	0.000	0.000	0.55
		C	39.600	0.000	0.000	0.000	0.25
T7	60.00-40.00	A	70.600	0.000	0.000	0.000	0.41
		B	81.783	0.000	0.000	0.000	0.55
		C	39.600	0.000	0.000	0.000	0.25
T8	40.00-20.00	A	70.600	0.000	0.000	0.000	0.41
		B	81.783	0.000	0.000	0.000	0.55
		C	39.600	0.000	0.000	0.000	0.25
T9	20.00-0.00	A	70.600	0.000	0.000	0.000	0.41
		B	81.783	0.000	0.000	0.000	0.55
		C	39.600	0.000	0.000	0.000	0.25

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
T1	180.00-160.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		51.317	0.000	0.000	0.000	0.54
		C		0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		103.467	0.000	0.000	0.000	1.07
		C		59.600	0.000	0.000	0.000	0.61
T3	140.00-120.00	A	0.500	80.800	0.000	0.000	0.000	0.77
		B		125.817	0.000	0.000	0.000	1.30
		C		59.600	0.000	0.000	0.000	0.61
T4	120.00-100.00	A	0.500	110.600	0.000	0.000	0.000	1.07
		B		125.817	0.000	0.000	0.000	1.30
		C		59.600	0.000	0.000	0.000	0.61
T5	100.00-80.00	A	0.500	110.600	0.000	0.000	0.000	1.07
		B		125.817	0.000	0.000	0.000	1.30
		C		59.600	0.000	0.000	0.000	0.61
T6	80.00-60.00	A	0.500	110.600	0.000	0.000	0.000	1.07
		B		127.792	0.000	0.000	0.000	1.32
		C		59.600	0.000	0.000	0.000	0.61
T7	60.00-40.00	A	0.500	110.600	0.000	0.000	0.000	1.07
		B		128.450	0.000	0.000	0.000	1.32
		C		59.600	0.000	0.000	0.000	0.61
T8	40.00-20.00	A	0.500	110.600	0.000	0.000	0.000	1.07
		B		128.450	0.000	0.000	0.000	1.32
		C		59.600	0.000	0.000	0.000	0.61
T9	20.00-0.00	A	0.500	110.600	0.000	0.000	0.000	1.07
		B		128.450	0.000	0.000	0.000	1.32
		C		59.600	0.000	0.000	0.000	0.61

Feed Line Shielding

Section	Elevation ft	Face	A_R ft²	A_R Ice ft²	A_F ft²	A_F Ice ft²

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	180.00-160.00	A	0.000	0.000	0.000	0.000
		B	2.464	5.867	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	160.00-140.00	A	0.000	0.000	0.000	0.000
		B	5.191	11.829	0.000	0.000
		C	3.116	6.814	0.000	0.000
T3	140.00-120.00	A	3.722	8.615	0.000	0.000
		B	5.921	13.414	0.000	0.000
		C	2.901	6.354	0.000	0.000
T4	120.00-100.00	A	5.868	12.631	0.000	0.000
		B	6.718	14.369	0.000	0.000
		C	3.292	6.807	0.000	0.000
T5	100.00-80.00	A	4.877	10.120	0.000	0.000
		B	5.583	11.512	0.000	0.000
		C	2.736	5.454	0.000	0.000
T6	80.00-60.00	A	4.557	9.474	0.000	0.000
		B	5.263	10.947	0.000	0.000
		C	2.556	5.106	0.000	0.000
T7	60.00-40.00	A	4.626	9.482	0.000	0.000
		B	5.359	11.012	0.000	0.000
		C	2.595	5.109	0.000	0.000
T8	40.00-20.00	A	4.462	9.152	0.000	0.000
		B	5.169	10.629	0.000	0.000
		C	2.503	4.932	0.000	0.000
T9	20.00-0.00	A	5.085	10.073	0.000	0.000
		B	5.891	11.699	0.000	0.000
		C	2.852	5.428	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.00-160.00	5.7155	-6.9807	6.8706	-6.6727
T2	160.00-140.00	15.7017	-1.3905	16.7076	-1.2003
T3	140.00-120.00	10.8856	-4.8926	11.5400	-5.4247
T4	120.00-100.00	7.7102	-3.7246	8.4864	-4.3341
T5	100.00-80.00	8.6796	-4.1795	9.8238	-5.0015
T6	80.00-60.00	10.2145	-4.7590	11.6885	-5.6420
T7	60.00-40.00	11.4464	-5.2732	13.1960	-6.2593
T8	40.00-20.00	11.9928	-5.5168	14.0602	-6.6596
T9	20.00-0.00	12.5807	-5.7805	14.9146	-7.0562

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

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
ROHN 6-ft Side Arm	A	From Leg	3.00	0.0000	178.00	No Ice	6.68	6.68	0.08
(Town Reserved)			0.00			1/2" Ice	10.00	10.00	0.10
			0.00						
ROHN 6-ft Side Arm	B	From Leg	3.00	0.0000	178.00	No Ice	6.68	6.68	0.08
(Town Existing)			0.00			1/2" Ice	10.00	10.00	0.10
			0.00						
ROHN 6-ft Side Arm	C	From Leg	3.00	0.0000	178.00	No Ice	6.68	6.68	0.08
(Town Existing)			0.00			1/2" Ice	10.00	10.00	0.10
			0.00						
PD455	C	From Leg	6.00	0.0000	180.00	No Ice	3.56	3.56	0.02
(Town Existing)			0.00			1/2" Ice	7.13	7.13	0.05
			5.00						
DB408	C	From Leg	0.50	0.0000	180.00	No Ice	1.65	1.65	0.02
(Town Existing)			0.00			1/2" Ice	2.61	2.61	0.03
			5.00						
PD455	A	From Leg	6.00	0.0000	180.00	No Ice	3.56	3.56	0.02
(Town Reserved)			0.00			1/2" Ice	7.13	7.13	0.05
			5.00						
DB404	B	From Leg	6.00	0.0000	180.00	No Ice	1.14	1.14	0.01
(Town Existing)			0.00			1/2" Ice	2.05	2.05	0.02
			5.00						
ROHN 6'x15' Boom Gate (1)	A	From Leg	2.00	0.0000	170.00	No Ice	17.75	17.75	0.60
(Verizon Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
ROHN 6'x15' Boom Gate (1)	B	From Leg	2.00	0.0000	170.00	No Ice	17.75	17.75	0.60
(Verizon Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
ROHN 6'x15' Boom Gate (1)	C	From Leg	2.00	0.0000	170.00	No Ice	17.75	17.75	0.60
(Verizon Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
APL868013-42T0	A	From Leg	4.00	0.0000	170.00	No Ice	2.87	3.73	0.02
(Verizon Proposed)			-6.00			1/2" Ice	3.18	4.10	0.04
			0.00						
BXA-171085-8BF	A	From Leg	4.00	0.0000	170.00	No Ice	2.94	2.16	0.01
(Verizon Proposed)			-4.00			1/2" Ice	3.26	2.46	0.03
			0.00						
BXA-70063/4CF	A	From Leg	4.00	0.0000	170.00	No Ice	5.16	2.44	0.01
(Verizon Proposed)			0.00			1/2" Ice	5.55	2.74	0.04
			0.00						
APL868013-42T0	A	From Leg	4.00	0.0000	170.00	No Ice	2.87	3.73	0.02
(Verizon Proposed)			6.00			1/2" Ice	3.18	4.10	0.04
			0.00						
LPA-80080-6CF	B	From Leg	4.00	0.0000	170.00	No Ice	4.33	9.09	0.02
(Verizon Existing)			-6.00			1/2" Ice	4.76	9.64	0.07
			0.00						
BXA-171063/8BF	B	From Leg	4.00	0.0000	170.00	No Ice	2.94	2.16	0.01
(Verizon Proposed)			-4.00			1/2" Ice	3.26	2.46	0.03
			0.00						
BXA-70063/6CF	B	From Leg	4.00	0.0000	170.00	No Ice	7.73	4.16	0.02
(Verizon Proposed)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
LPA-80080-6CF	B	From Leg	4.00	0.0000	170.00	No Ice	4.33	9.09	0.02
(Verizon Existing)			6.00			1/2" Ice	4.76	9.64	0.07
			0.00						
APL866513-42T0	C	From Leg	4.00	0.0000	170.00	No Ice	4.29	3.73	0.02
(Verizon Proposed)			-6.00			1/2" Ice	4.67	4.10	0.05
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-171063/8BF	C	From Leg	4.00	0.0000	170.00	No Ice	2.94	2.16	0.01
(Verizon Proposed)			-4.00			1/2" Ice	3.26	2.46	0.03
			0.00						
BXA-70063/4CF	C	From Leg	4.00	0.0000	170.00	No Ice	5.16	2.44	0.01
(Verizon Proposed)			0.00			1/2" Ice	5.55	2.74	0.04
			0.00						
APL866513-42T0	C	From Leg	4.00	0.0000	170.00	No Ice	4.29	3.73	0.02
(Verizon Proposed)			6.00			1/2" Ice	4.67	4.10	0.05
			0.00						
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.0000	170.00	No Ice	0.37	0.08	0.00
Diplexer			-6.00			1/2" Ice	0.45	0.14	0.01
(Verizon Proposed)			0.00						
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	170.00	No Ice	0.37	0.08	0.00
Diplexer			-6.00			1/2" Ice	0.45	0.14	0.01
(Verizon Proposed)			0.00						
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	170.00	No Ice	0.37	0.08	0.00
Diplexer			-6.00			1/2" Ice	0.45	0.14	0.01
(Verizon Proposed)			0.00						
ROHN 6'x15' Boom Gate (1)	A	From Leg	2.00	0.0000	160.00	No Ice	17.75	17.75	0.60
(Nextel Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
ROHN 6'x15' Boom Gate (1)	B	From Leg	2.00	0.0000	160.00	No Ice	17.75	17.75	0.60
(Nextel Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
ROHN 6'x15' Boom Gate (1)	C	From Leg	2.00	0.0000	160.00	No Ice	17.75	17.75	0.60
(Nextel Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
(4) DB844H90E-XY	A	From Leg	4.00	0.0000	160.00	No Ice	2.87	3.73	0.01
(Nextel Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(4) DB844H90E-XY	B	From Leg	4.00	0.0000	160.00	No Ice	2.87	3.73	0.01
(Nextel Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(4) DB844H90E-XY	C	From Leg	4.00	0.0000	160.00	No Ice	2.87	3.73	0.01
(Nextel Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
ROHN 6'x15' Boom Gate (1)	A	From Leg	2.00	0.0000	150.00	No Ice	17.75	17.75	0.60
(Sprint Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
ROHN 6'x15' Boom Gate (1)	B	From Leg	2.00	0.0000	150.00	No Ice	17.75	17.75	0.60
(Sprint Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
ROHN 6'x15' Boom Gate (1)	C	From Leg	2.00	0.0000	150.00	No Ice	17.75	17.75	0.60
(Sprint Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
(2) DB980H90E-M	A	From Leg	4.00	0.0000	150.00	No Ice	3.80	2.19	0.01
(Sprint Existing)			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
(2) DB980H90E-M	B	From Leg	4.00	0.0000	150.00	No Ice	3.80	2.19	0.01
(Sprint Existing)			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
(2) DB980H90E-M	C	From Leg	4.00	0.0000	150.00	No Ice	3.80	2.19	0.01
(Sprint Existing)			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
DB980H90E-M	A	From Leg	4.00	0.0000	150.00	No Ice	3.80	2.19	0.01
(Sprint Reserved)			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB980H90E-M	B	From Leg	4.00	0.0000	150.00	No Ice	3.80	2.19	0.01
(Sprint Reserved)			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
DB980H90E-M	C	From Leg	4.00	0.0000	150.00	No Ice	3.80	2.19	0.01
(Sprint Reserved)			0.00			1/2" Ice	4.18	2.56	0.03
			0.00						
ROHN 6'x15' Boom Gate (1)	A	From Leg	2.00	0.0000	140.00	No Ice	17.75	17.75	0.60
(AT&T Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
ROHN 6'x15' Boom Gate (1)	B	From Leg	2.00	0.0000	140.00	No Ice	17.75	17.75	0.60
(AT&T Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
ROHN 6'x15' Boom Gate (1)	C	From Leg	2.00	0.0000	140.00	No Ice	17.75	17.75	0.60
(AT&T Existing)			0.00			1/2" Ice	21.10	21.10	0.07
			0.00						
(2) 7770.00	A	From Leg	4.00	0.0000	140.00	No Ice	5.88	2.93	0.04
(AT&T Existing)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00						
(2) 7770.00	B	From Leg	4.00	0.0000	140.00	No Ice	5.88	2.93	0.04
(AT&T Existing)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00						
(2) 7770.00	C	From Leg	4.00	0.0000	140.00	No Ice	5.88	2.93	0.04
(AT&T Existing)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00						
(2) LGP21401 TMA	A	From Leg	4.00	0.0000	140.00	No Ice	0.95	0.37	0.02
(AT&T Existing)			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LGP21401 TMA	B	From Leg	4.00	0.0000	140.00	No Ice	0.95	0.37	0.02
(AT&T Existing)			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LGP21401 TMA	C	From Leg	4.00	0.0000	140.00	No Ice	0.95	0.37	0.02
(AT&T Existing)			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LGP21901 Diplexer	A	From Leg	4.00	0.0000	140.00	No Ice	0.23	0.12	0.01
(AT&T Existing)			0.00			1/2" Ice	0.30	0.17	0.01
			0.00						
(2) LGP21901 Diplexer	B	From Leg	4.00	0.0000	140.00	No Ice	0.23	0.12	0.01
(AT&T Existing)			0.00			1/2" Ice	0.30	0.17	0.01
			0.00						
(2) LGP21901 Diplexer	C	From Leg	4.00	0.0000	140.00	No Ice	0.23	0.12	0.01
(AT&T Existing)			0.00			1/2" Ice	0.30	0.17	0.01
			0.00						
Pirod 15' T-Frame Sector	A	From Face	2.00	0.0000	130.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(T-Mobile Existing)			0.00						
Pirod 15' T-Frame Sector	B	From Face	2.00	0.0000	130.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(T-Mobile Existing)			0.00						
Pirod 15' T-Frame Sector	C	From Face	2.00	0.0000	130.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(T-Mobile Existing)			0.00						
72"x12"x4" Panel Antenna	A	From Face	4.00	0.0000	130.00	No Ice	8.40	3.53	0.02
(T-Mobile Existing)			0.00			1/2" Ice	8.95	3.97	0.06
			0.00						
72"x12"x4" Panel Antenna	B	From Face	4.00	0.0000	130.00	No Ice	8.40	3.53	0.02
(T-Mobile Existing)			0.00			1/2" Ice	8.95	3.97	0.06
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
72"x12"x4" Panel Antenna (T-Mobile Existing)	C	From Face	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice	8.40 8.95	3.53 3.97	0.02 0.06
72"x12"x4" Panel Antenna (T-Mobile Reserved)	A	From Face	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice	8.40 8.95	3.53 3.97	0.02 0.06
72"x12"x4" Panel Antenna (T-Mobile Reserved)	B	From Face	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice	8.40 8.95	3.53 3.97	0.02 0.06
72"x12"x4" Panel Antenna (T-Mobile Reserved)	C	From Face	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice	8.40 8.95	3.53 3.97	0.02 0.06
(2) TMA 10"x8"x3" (T-Mobile Existing)	A	From Face	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice	0.78 0.90	0.29 0.38	0.02 0.02
(2) TMA 10"x8"x3" (T-Mobile Existing)	B	From Face	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice	0.78 0.90	0.29 0.38	0.02 0.02
(2) TMA 10"x8"x3" (T-Mobile Existing)	C	From Face	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice	0.78 0.90	0.29 0.38	0.02 0.02
GPS (Sprint Existing)	B	From Leg	2.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	0.01 0.01
2-ft Stand Off (Sprint Existing)	B	From Leg	1.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	1.07 1.62	1.07 1.62	0.02 0.03

Tower Pressures - No Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	170.00	1.597	37	177.083	A	0.000	24.683	11.667	47.27	0.000	0.000
180.00-160.00					B	0.000	53.536		21.79	0.000	0.000
					C	0.000	24.683		47.27	0.000	0.000
T2	150.00	1.541	36	178.750	A	0.000	27.899	15.000	53.77	0.000	0.000
160.00-140.00					B	0.000	88.674		16.92	0.000	0.000
					C	0.000	64.383		23.30	0.000	0.000
T3	130.00	1.48	34	202.411	A	0.000	79.317	18.580	23.43	0.000	0.000
140.00-120.00					B	0.000	107.134		17.34	0.000	0.000
					C	0.000	68.938		26.95	0.000	0.000
T4	110.00	1.411	33	246.957	A	0.000	105.720	22.123	20.93	0.000	0.000
120.00-100.00					B	0.000	115.088		19.22	0.000	0.000
					C	0.000	77.297		28.62	0.000	0.000
T5	90.00	1.332	31	295.902	A	0.000	113.398	28.823	25.42	0.000	0.000
100.00-80.00					B	0.000	122.909		23.45	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	0.000	84.539		34.09	0.000	0.000
T6 80.00-60.00	70.00	1.24	29	345.778	A	0.000	115.646	28.826	24.93	0.000	0.000
					B	0.000	125.881		22.90	0.000	0.000
					C	0.000	86.647		33.27	0.000	0.000
T7 60.00-40.00	50.00	1.126	26	396.078	A	0.000	119.089	28.826	24.20	0.000	0.000
					B	0.000	129.540		22.25	0.000	0.000
					C	0.000	90.121		31.99	0.000	0.000
T8 40.00-20.00	30.00	1	23	449.952	A	0.000	128.474	35.928	27.97	0.000	0.000
					B	0.000	138.951		25.86	0.000	0.000
					C	0.000	99.434		36.13	0.000	0.000
T9 20.00-0.00	10.00	1	23	500.354	A	0.000	135.076	35.928	26.60	0.000	0.000
					B	0.000	145.454		24.70	0.000	0.000
					C	0.000	106.309		33.80	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.597	28	0.5000	178.750	A	0.000	33.911	15.000	44.23	0.000	0.000
180.00-160.00						B	0.000	79.361		18.90	0.000	0.000
						C	0.000	33.911		44.23	0.000	0.000
T2	150.00	1.541	27	0.5000	180.417	A	0.000	37.074	18.333	49.45	0.000	0.000
160.00-140.00						B	0.000	128.712		14.24	0.000	0.000
						C	0.000	89.860		20.40	0.000	0.000
T3	130.00	1.48	26	0.5000	204.080	A	0.000	113.958	21.920	19.24	0.000	0.000
140.00-120.00						B	0.000	154.175		14.22	0.000	0.000
						C	0.000	95.019		23.07	0.000	0.000
T4	110.00	1.411	24	0.5000	248.626	A	0.000	149.333	25.463	17.05	0.000	0.000
120.00-100.00						B	0.000	162.812		15.64	0.000	0.000
						C	0.000	104.158		24.45	0.000	0.000
T5 100.00-80.00	90.00	1.332	23	0.5000	297.572	A	0.000	157.570	32.165	20.41	0.000	0.000
						B	0.000	171.394		18.77	0.000	0.000
						C	0.000	111.237		28.92	0.000	0.000
T6 80.00-60.00	70.00	1.24	21	0.5000	347.448	A	0.000	160.822	32.168	20.00	0.000	0.000
						B	0.000	176.541		18.22	0.000	0.000
						C	0.000	114.191		28.17	0.000	0.000
T7 60.00-40.00	50.00	1.126	20	0.5000	397.748	A	0.000	165.043	32.168	19.49	0.000	0.000
						B	0.000	181.363		17.74	0.000	0.000
						C	0.000	118.416		27.16	0.000	0.000
T8 40.00-20.00	30.00	1	17	0.5000	451.622	A	0.000	175.272	39.270	22.41	0.000	0.000
						B	0.000	191.645		20.49	0.000	0.000
						C	0.000	128.492		30.56	0.000	0.000
T9 20.00-0.00	10.00	1	17	0.5000	502.024	A	0.000	182.309	39.270	21.54	0.000	0.000
						B	0.000	198.533		19.78	0.000	0.000
						C	0.000	135.954		28.88	0.000	0.000

Tower Pressure - Service

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.597	10	177.083	A	0.000	24.683	11.667	47.27	0.000	0.000
180.00-160.00					B	0.000	53.536		21.79	0.000	0.000
					C	0.000	24.683		47.27	0.000	0.000
T2	150.00	1.541	10	178.750	A	0.000	27.899	15.000	53.77	0.000	0.000
160.00-140.00					B	0.000	88.674		16.92	0.000	0.000
					C	0.000	64.383		23.30	0.000	0.000
T3	130.00	1.48	9	202.411	A	0.000	79.317	18.580	23.43	0.000	0.000
140.00-120.00					B	0.000	107.134		17.34	0.000	0.000
					C	0.000	68.938		26.95	0.000	0.000
T4	110.00	1.411	9	246.957	A	0.000	105.720	22.123	20.93	0.000	0.000
120.00-100.00					B	0.000	115.088		19.22	0.000	0.000
					C	0.000	77.297		28.62	0.000	0.000
T5	90.00	1.332	9	295.902	A	0.000	113.398	28.823	25.42	0.000	0.000
100.00-80.00					B	0.000	122.909		23.45	0.000	0.000
					C	0.000	84.539		34.09	0.000	0.000
T6 80.00-60.00	70.00	1.24	8	345.778	A	0.000	115.646	28.826	24.93	0.000	0.000
					B	0.000	125.881		22.90	0.000	0.000
					C	0.000	86.647		33.27	0.000	0.000
T7 60.00-40.00	50.00	1.126	7	396.078	A	0.000	119.089	28.826	24.20	0.000	0.000
					B	0.000	129.540		22.25	0.000	0.000
					C	0.000	90.121		31.99	0.000	0.000
T8 40.00-20.00	30.00	1	6	449.952	A	0.000	128.474	35.928	27.97	0.000	0.000
					B	0.000	138.951		25.86	0.000	0.000
					C	0.000	99.434		36.13	0.000	0.000
T9 20.00-0.00	10.00	1	6	500.354	A	0.000	135.076	35.928	26.60	0.000	0.000
					B	0.000	145.454		24.70	0.000	0.000
					C	0.000	106.309		33.80	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	0.23	1.25	A	0.139	2.811	0.58	1	1	14.314	3.13	156.35	B
180.00-160.00			B	0.302	2.29	0.617	1	1	33.011			
			C	0.139	2.811	0.58	1	1	14.314			
T2	0.70	1.89	A	0.156	2.749	0.582	1	1	16.249	4.69	234.49	B
160.00-140.00			B	0.496	1.905	0.696	1	1	61.674			
			C	0.36	2.148	0.636	1	1	40.958			
T3	1.08	2.30	A	0.392	2.08	0.648	1	1	51.422	5.46	272.85	B
140.00-120.00			B	0.529	1.865	0.713	1	1	76.374			
			C	0.341	2.194	0.629	1	1	43.373			
T4	1.20	2.78	A	0.428	2.011	0.663	1	1	70.142	5.58	278.77	B
120.00-100.00			B	0.466	1.948	0.681	1	1	78.347			
			C	0.313	2.262	0.62	1	1	47.921			
T5	1.20	3.48	A	0.383	2.098	0.645	1	1	73.130	5.68	283.75	B
100.00-80.00			B	0.415	2.034	0.658	1	1	80.873			
			C	0.286	2.335	0.612	1	1	51.707			
T6	1.21	4.31	A	0.334	2.208	0.627	1	1	72.515	5.51	275.65	B
80.00-60.00			B	0.364	2.14	0.638	1	1	80.261			
			C	0.251	2.436	0.602	1	1	52.163			
T7	1.21	4.74	A	0.301	2.294	0.616	1	1	73.372	5.25	262.65	B
60.00-40.00			B	0.327	2.227	0.625	1	1	80.905			

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	0.228	2.507	0.596	1	1	53.748			
T8	1.21	5.75	A	0.286	2.335	0.612	1	1	78.572	5.06	252.97	B
40.00-20.00			B	0.309	2.273	0.619	1	1	85.960			
			C	0.221	2.527	0.595	1	1	59.154			
T9 20.00-0.00	1.21	7.16	A	0.27	2.379	0.607	1	1	82.014	5.36	268.01	B
			B	0.291	2.321	0.613	1	1	89.177			
			C	0.212	2.555	0.593	1	1	63.044			
Sum Weight:	9.24	33.66						OTM	3922.41 kip-ft	45.71		

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	0.23	1.25	A	0.139	2.811	0.58	0.825	1	14.314	3.13	156.35	B
180.00-160.00			B	0.302	2.29	0.617	0.825	1	33.011			
			C	0.139	2.811	0.58	0.825	1	14.314			
T2	0.70	1.89	A	0.156	2.749	0.582	0.825	1	16.249	4.69	234.49	B
160.00-140.00			B	0.496	1.905	0.696	0.825	1	61.674			
			C	0.36	2.148	0.636	0.825	1	40.958			
T3	1.08	2.30	A	0.392	2.08	0.648	0.825	1	51.422	5.46	272.85	B
140.00-120.00			B	0.529	1.865	0.713	0.825	1	76.374			
			C	0.341	2.194	0.629	0.825	1	43.373			
T4	1.20	2.78	A	0.428	2.011	0.663	0.825	1	70.142	5.58	278.77	B
120.00-100.00			B	0.466	1.948	0.681	0.825	1	78.347			
			C	0.313	2.262	0.62	0.825	1	47.921			
T5	1.20	3.48	A	0.383	2.098	0.645	0.825	1	73.130	5.68	283.75	B
100.00-80.00			B	0.415	2.034	0.658	0.825	1	80.873			
			C	0.286	2.335	0.612	0.825	1	51.707			
T6	1.21	4.31	A	0.334	2.208	0.627	0.825	1	72.515	5.51	275.65	B
80.00-60.00			B	0.364	2.14	0.638	0.825	1	80.261			
			C	0.251	2.436	0.602	0.825	1	52.163			
T7	1.21	4.74	A	0.301	2.294	0.616	0.825	1	73.372	5.25	262.65	B
60.00-40.00			B	0.327	2.227	0.625	0.825	1	80.905			
			C	0.228	2.507	0.596	0.825	1	53.748			
T8	1.21	5.75	A	0.286	2.335	0.612	0.825	1	78.572	5.06	252.97	B
40.00-20.00			B	0.309	2.273	0.619	0.825	1	85.960			
			C	0.221	2.527	0.595	0.825	1	59.154			
T9 20.00-0.00	1.21	7.16	A	0.27	2.379	0.607	0.825	1	82.014	5.36	268.01	B
			B	0.291	2.321	0.613	0.825	1	89.177			
			C	0.212	2.555	0.593	0.825	1	63.044			
Sum Weight:	9.24	33.66						OTM	3922.41 kip-ft	45.71		

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	0.23	1.25	A	0.139	2.811	0.58	0.8	1	14.314	3.13	156.35	B
180.00-160.00			B	0.302	2.29	0.617	0.8	1	33.011			
			C	0.139	2.811	0.58	0.8	1	14.314			
T2	0.70	1.89	A	0.156	2.749	0.582	0.8	1	16.249	4.69	234.49	B
160.00-140.00			B	0.496	1.905	0.696	0.8	1	61.674			
			C	0.36	2.148	0.636	0.8	1	40.958			
T3	1.08	2.30	A	0.392	2.08	0.648	0.8	1	51.422	5.46	272.85	B
140.00-120.00			B	0.529	1.865	0.713	0.8	1	76.374			
			C	0.341	2.194	0.629	0.8	1	43.373			
T4	1.20	2.78	A	0.428	2.011	0.663	0.8	1	70.142	5.58	278.77	B
120.00-100.00			B	0.466	1.948	0.681	0.8	1	78.347			
			C	0.313	2.262	0.62	0.8	1	47.921			
T5	1.20	3.48	A	0.383	2.098	0.645	0.8	1	73.130	5.68	283.75	B
100.00-80.00			B	0.415	2.034	0.658	0.8	1	80.873			
			C	0.286	2.335	0.612	0.8	1	51.707			
T6	1.21	4.31	A	0.334	2.208	0.627	0.8	1	72.515	5.51	275.65	B
80.00-60.00			B	0.364	2.14	0.638	0.8	1	80.261			
			C	0.251	2.436	0.602	0.8	1	52.163			
T7	1.21	4.74	A	0.301	2.294	0.616	0.8	1	73.372	5.25	262.65	B
60.00-40.00			B	0.327	2.227	0.625	0.8	1	80.905			
			C	0.228	2.507	0.596	0.8	1	53.748			
T8	1.21	5.75	A	0.286	2.335	0.612	0.8	1	78.572	5.06	252.97	B
40.00-20.00			B	0.309	2.273	0.619	0.8	1	85.960			
			C	0.221	2.527	0.595	0.8	1	59.154			
T9 20.00-0.00	1.21	7.16	A	0.27	2.379	0.607	0.8	1	82.014	5.36	268.01	B
			B	0.291	2.321	0.613	0.8	1	89.177			
			C	0.212	2.555	0.593	0.8	1	63.044			
Sum Weight:	9.24	33.66						OTM	3922.41 kip-ft	45.71		

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	0.23	1.25	A	0.139	2.811	0.58	0.85	1	14.314	3.13	156.35	B
180.00-160.00			B	0.302	2.29	0.617	0.85	1	33.011			
			C	0.139	2.811	0.58	0.85	1	14.314			
T2	0.70	1.89	A	0.156	2.749	0.582	0.85	1	16.249	4.69	234.49	B
160.00-140.00			B	0.496	1.905	0.696	0.85	1	61.674			
			C	0.36	2.148	0.636	0.85	1	40.958			
T3	1.08	2.30	A	0.392	2.08	0.648	0.85	1	51.422	5.46	272.85	B
140.00-120.00			B	0.529	1.865	0.713	0.85	1	76.374			
			C	0.341	2.194	0.629	0.85	1	43.373			
T4	1.20	2.78	A	0.428	2.011	0.663	0.85	1	70.142	5.58	278.77	B
120.00-100.00			B	0.466	1.948	0.681	0.85	1	78.347			
			C	0.313	2.262	0.62	0.85	1	47.921			
T5	1.20	3.48	A	0.383	2.098	0.645	0.85	1	73.130	5.68	283.75	B
100.00-80.00			B	0.415	2.034	0.658	0.85	1	80.873			
			C	0.286	2.335	0.612	0.85	1	51.707			
T6	1.21	4.31	A	0.334	2.208	0.627	0.85	1	72.515	5.51	275.65	B
80.00-60.00			B	0.364	2.14	0.638	0.85	1	80.261			
			C	0.251	2.436	0.602	0.85	1	52.163			
T7	1.21	4.74	A	0.301	2.294	0.616	0.85	1	73.372	5.25	262.65	B
60.00-40.00			B	0.327	2.227	0.625	0.85	1	80.905			

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	0.228	2.507	0.596	0.85	1	53.748			
T8	1.21	5.75	A	0.286	2.335	0.612	0.85	1	78.572	5.06	252.97	B
40.00-20.00			B	0.309	2.273	0.619	0.85	1	85.960			
			C	0.221	2.527	0.595	0.85	1	59.154			
T9 20.00-0.00	1.21	7.16	A	0.27	2.379	0.607	0.85	1	82.014	5.36	268.01	B
			B	0.291	2.321	0.613	0.85	1	89.177			
			C	0.212	2.555	0.593	0.85	1	63.044			
Sum Weight:	9.24	33.66						OTM	3922.41 kip-ft	45.71		

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	0.54	1.83	A	0.19	2.631	0.588	1	1	19.952	3.27	163.73	B
180.00-160.00			B	0.444	1.984	0.671	1	1	53.214			
			C	0.19	2.631	0.588	1	1	19.952			
T2	1.68	2.51	A	0.205	2.578	0.592	1	1	21.931	5.68	284.06	B
160.00-140.00			B	0.713	1.777	0.83	1	1	106.776			
			C	0.498	1.903	0.697	1	1	62.589			
T3	2.68	2.99	A	0.558	1.836	0.729	1	1	83.078	6.83	341.39	B
140.00-120.00			B	0.755	1.79	0.861	1	1	132.756			
			C	0.466	1.949	0.681	1	1	64.666			
T4	2.99	3.65	A	0.601	1.804	0.754	1	1	112.596	6.26	313.14	B
120.00-100.00			B	0.655	1.78	0.789	1	1	128.410			
			C	0.419	2.028	0.66	1	1	68.693			
T5	2.99	4.40	A	0.53	1.865	0.713	1	1	112.347	5.97	298.40	B
100.00-80.00			B	0.576	1.821	0.739	1	1	126.693			
			C	0.374	2.118	0.641	1	1	71.332			
T6	3.00	5.31	A	0.463	1.953	0.679	1	1	109.241	5.64	281.81	B
80.00-60.00			B	0.508	1.89	0.702	1	1	123.873			
			C	0.329	2.223	0.625	1	1	71.379			
T7	3.01	5.86	A	0.415	2.035	0.658	1	1	108.567	5.27	263.30	B
60.00-40.00			B	0.456	1.964	0.676	1	1	122.608			
			C	0.298	2.302	0.615	1	1	72.850			
T8	3.01	7.05	A	0.388	2.088	0.647	1	1	113.369	4.97	248.54	B
40.00-20.00			B	0.424	2.018	0.662	1	1	126.838			
			C	0.285	2.338	0.611	1	1	78.545			
T9 20.00-0.00	3.01	8.66	A	0.363	2.142	0.637	1	1	116.178	5.19	259.70	B
			B	0.395	2.073	0.65	1	1	128.999			
			C	0.271	2.377	0.607	1	1	82.579			
Sum Weight:	22.89	42.28						OTM	4381.42 kip-ft	49.08		

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	0.54	1.83	A	0.19	2.631	0.588	0.825	1	19.952	3.27	163.73	B
180.00-160.00			B	0.444	1.984	0.671	0.825	1	53.214			
			C	0.19	2.631	0.588	0.825	1	19.952			
T2	1.68	2.51	A	0.205	2.578	0.592	0.825	1	21.931	5.68	284.06	B
160.00-140.00			B	0.713	1.777	0.83	0.825	1	106.776			
			C	0.498	1.903	0.697	0.825	1	62.589			
T3	2.68	2.99	A	0.558	1.836	0.729	0.825	1	83.078	6.83	341.39	B
140.00-120.00			B	0.755	1.79	0.861	0.825	1	132.756			
			C	0.466	1.949	0.681	0.825	1	64.666			
T4	2.99	3.65	A	0.601	1.804	0.754	0.825	1	112.596	6.26	313.14	B
120.00-100.00			B	0.655	1.78	0.789	0.825	1	128.410			
			C	0.419	2.028	0.66	0.825	1	68.693			
T5	2.99	4.40	A	0.53	1.865	0.713	0.825	1	112.347	5.97	298.40	B
100.00-80.00			B	0.576	1.821	0.739	0.825	1	126.693			
			C	0.374	2.118	0.641	0.825	1	71.332			
T6	3.00	5.31	A	0.463	1.953	0.679	0.825	1	109.241	5.64	281.81	B
80.00-60.00			B	0.508	1.89	0.702	0.825	1	123.873			
			C	0.329	2.223	0.625	0.825	1	71.379			
T7	3.01	5.86	A	0.415	2.035	0.658	0.825	1	108.567	5.27	263.30	B
60.00-40.00			B	0.456	1.964	0.676	0.825	1	122.608			
			C	0.298	2.302	0.615	0.825	1	72.850			
T8	3.01	7.05	A	0.388	2.088	0.647	0.825	1	113.369	4.97	248.54	B
40.00-20.00			B	0.424	2.018	0.662	0.825	1	126.838			
			C	0.285	2.338	0.611	0.825	1	78.545			
T9 20.00-0.00	3.01	8.66	A	0.363	2.142	0.637	0.825	1	116.178	5.19	259.70	B
			B	0.395	2.073	0.65	0.825	1	128.999			
			C	0.271	2.377	0.607	0.825	1	82.579			
Sum Weight:	22.89	42.28						OTM	4381.42 kip-ft	49.08		

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	0.54	1.83	A	0.19	2.631	0.588	0.8	1	19.952	3.27	163.73	B
180.00-160.00			B	0.444	1.984	0.671	0.8	1	53.214			
			C	0.19	2.631	0.588	0.8	1	19.952			
T2	1.68	2.51	A	0.205	2.578	0.592	0.8	1	21.931	5.68	284.06	B
160.00-140.00			B	0.713	1.777	0.83	0.8	1	106.776			
			C	0.498	1.903	0.697	0.8	1	62.589			
T3	2.68	2.99	A	0.558	1.836	0.729	0.8	1	83.078	6.83	341.39	B
140.00-120.00			B	0.755	1.79	0.861	0.8	1	132.756			
			C	0.466	1.949	0.681	0.8	1	64.666			
T4	2.99	3.65	A	0.601	1.804	0.754	0.8	1	112.596	6.26	313.14	B
120.00-100.00			B	0.655	1.78	0.789	0.8	1	128.410			
			C	0.419	2.028	0.66	0.8	1	68.693			
T5	2.99	4.40	A	0.53	1.865	0.713	0.8	1	112.347	5.97	298.40	B
100.00-80.00			B	0.576	1.821	0.739	0.8	1	126.693			
			C	0.374	2.118	0.641	0.8	1	71.332			
T6	3.00	5.31	A	0.463	1.953	0.679	0.8	1	109.241	5.64	281.81	B
80.00-60.00			B	0.508	1.89	0.702	0.8	1	123.873			
			C	0.329	2.223	0.625	0.8	1	71.379			
T7	3.01	5.86	A	0.415	2.035	0.658	0.8	1	108.567	5.27	263.30	B
60.00-40.00			B	0.456	1.964	0.676	0.8	1	122.608			

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	0.298	2.302	0.615	0.8	1	72.850			
T8	3.01	7.05	A	0.388	2.088	0.647	0.8	1	113.369	4.97	248.54	B
40.00-20.00			B	0.424	2.018	0.662	0.8	1	126.838			
			C	0.285	2.338	0.611	0.8	1	78.545			
T9 20.00-0.00	3.01	8.66	A	0.363	2.142	0.637	0.8	1	116.178	5.19	259.70	B
			B	0.395	2.073	0.65	0.8	1	128.999			
			C	0.271	2.377	0.607	0.8	1	82.579			
Sum Weight:	22.89	42.28						OTM	4381.42 kip-ft	49.08		

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	0.54	1.83	A	0.19	2.631	0.588	0.85	1	19.952	3.27	163.73	B
180.00-160.00			B	0.444	1.984	0.671	0.85	1	53.214			
			C	0.19	2.631	0.588	0.85	1	19.952			
T2	1.68	2.51	A	0.205	2.578	0.592	0.85	1	21.931	5.68	284.06	B
160.00-140.00			B	0.713	1.777	0.83	0.85	1	106.776			
			C	0.498	1.903	0.697	0.85	1	62.589			
T3	2.68	2.99	A	0.558	1.836	0.729	0.85	1	83.078	6.83	341.39	B
140.00-120.00			B	0.755	1.79	0.861	0.85	1	132.756			
			C	0.466	1.949	0.681	0.85	1	64.666			
T4	2.99	3.65	A	0.601	1.804	0.754	0.85	1	112.596	6.26	313.14	B
120.00-100.00			B	0.655	1.78	0.789	0.85	1	128.410			
			C	0.419	2.028	0.66	0.85	1	68.693			
T5	2.99	4.40	A	0.53	1.865	0.713	0.85	1	112.347	5.97	298.40	B
100.00-80.00			B	0.576	1.821	0.739	0.85	1	126.693			
			C	0.374	2.118	0.641	0.85	1	71.332			
T6	3.00	5.31	A	0.463	1.953	0.679	0.85	1	109.241	5.64	281.81	B
80.00-60.00			B	0.508	1.89	0.702	0.85	1	123.873			
			C	0.329	2.223	0.625	0.85	1	71.379			
T7	3.01	5.86	A	0.415	2.035	0.658	0.85	1	108.567	5.27	263.30	B
60.00-40.00			B	0.456	1.964	0.676	0.85	1	122.608			
			C	0.298	2.302	0.615	0.85	1	72.850			
T8	3.01	7.05	A	0.388	2.088	0.647	0.85	1	113.369	4.97	248.54	B
40.00-20.00			B	0.424	2.018	0.662	0.85	1	126.838			
			C	0.285	2.338	0.611	0.85	1	78.545			
T9 20.00-0.00	3.01	8.66	A	0.363	2.142	0.637	0.85	1	116.178	5.19	259.70	B
			B	0.395	2.073	0.65	0.85	1	128.999			
			C	0.271	2.377	0.607	0.85	1	82.579			
Sum Weight:	22.89	42.28						OTM	4381.42 kip-ft	49.08		

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	0.23	1.25	A	0.139	2.811	0.58	1	1	14.314	0.87	43.31	B
180.00-160.00			B	0.302	2.29	0.617	1	1	33.011			
			C	0.139	2.811	0.58	1	1	14.314			
T2	0.70	1.89	A	0.156	2.749	0.582	1	1	16.249	1.30	64.96	B
160.00-140.00			B	0.496	1.905	0.696	1	1	61.674			
			C	0.36	2.148	0.636	1	1	40.958			
T3	1.08	2.30	A	0.392	2.08	0.648	1	1	51.422	1.51	75.58	B
140.00-120.00			B	0.529	1.865	0.713	1	1	76.374			
			C	0.341	2.194	0.629	1	1	43.373			
T4	1.20	2.78	A	0.428	2.011	0.663	1	1	70.142	1.54	77.22	B
120.00-100.00			B	0.466	1.948	0.681	1	1	78.347			
			C	0.313	2.262	0.62	1	1	47.921			
T5	1.20	3.48	A	0.383	2.098	0.645	1	1	73.130	1.57	78.60	B
100.00-80.00			B	0.415	2.034	0.658	1	1	80.873			
			C	0.286	2.335	0.612	1	1	51.707			
T6	1.21	4.31	A	0.334	2.208	0.627	1	1	72.515	1.53	76.36	B
80.00-60.00			B	0.364	2.14	0.638	1	1	80.261			
			C	0.251	2.436	0.602	1	1	52.163			
T7	1.21	4.74	A	0.301	2.294	0.616	1	1	73.372	1.46	72.76	B
60.00-40.00			B	0.327	2.227	0.625	1	1	80.905			
			C	0.228	2.507	0.596	1	1	53.748			
T8	1.21	5.75	A	0.286	2.335	0.612	1	1	78.572	1.40	70.08	B
40.00-20.00			B	0.309	2.273	0.619	1	1	85.960			
			C	0.221	2.527	0.595	1	1	59.154			
T9 20.00-0.00	1.21	7.16	A	0.27	2.379	0.607	1	1	82.014	1.48	74.24	B
			B	0.291	2.321	0.613	1	1	89.177			
			C	0.212	2.555	0.593	1	1	63.044			
Sum Weight:	9.24	33.66						OTM	1086.54 kip-ft	12.66		

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	0.23	1.25	A	0.139	2.811	0.58	0.825	1	14.314	0.87	43.31	B
180.00-160.00			B	0.302	2.29	0.617	0.825	1	33.011			
			C	0.139	2.811	0.58	0.825	1	14.314			
T2	0.70	1.89	A	0.156	2.749	0.582	0.825	1	16.249	1.30	64.96	B
160.00-140.00			B	0.496	1.905	0.696	0.825	1	61.674			
			C	0.36	2.148	0.636	0.825	1	40.958			
T3	1.08	2.30	A	0.392	2.08	0.648	0.825	1	51.422	1.51	75.58	B
140.00-120.00			B	0.529	1.865	0.713	0.825	1	76.374			
			C	0.341	2.194	0.629	0.825	1	43.373			
T4	1.20	2.78	A	0.428	2.011	0.663	0.825	1	70.142	1.54	77.22	B
120.00-100.00			B	0.466	1.948	0.681	0.825	1	78.347			
			C	0.313	2.262	0.62	0.825	1	47.921			
T5	1.20	3.48	A	0.383	2.098	0.645	0.825	1	73.130	1.57	78.60	B
100.00-80.00			B	0.415	2.034	0.658	0.825	1	80.873			
			C	0.286	2.335	0.612	0.825	1	51.707			
T6	1.21	4.31	A	0.334	2.208	0.627	0.825	1	72.515	1.53	76.36	B
80.00-60.00			B	0.364	2.14	0.638	0.825	1	80.261			
			C	0.251	2.436	0.602	0.825	1	52.163			
T7	1.21	4.74	A	0.301	2.294	0.616	0.825	1	73.372	1.46	72.76	B
60.00-40.00			B	0.327	2.227	0.625	0.825	1	80.905			

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	0.228	2.507	0.596	0.825	1	53.748			
T8	1.21	5.75	A	0.286	2.335	0.612	0.825	1	78.572	1.40	70.08	B
40.00-20.00			B	0.309	2.273	0.619	0.825	1	85.960			
			C	0.221	2.527	0.595	0.825	1	59.154			
T9 20.00-0.00	1.21	7.16	A	0.27	2.379	0.607	0.825	1	82.014	1.48	74.24	B
			B	0.291	2.321	0.613	0.825	1	89.177			
			C	0.212	2.555	0.593	0.825	1	63.044			
Sum Weight:	9.24	33.66						OTM	1086.54 kip-ft	12.66		

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	0.23	1.25	A	0.139	2.811	0.58	0.8	1	14.314	0.87	43.31	B
180.00-160.00			B	0.302	2.29	0.617	0.8	1	33.011			
			C	0.139	2.811	0.58	0.8	1	14.314			
T2	0.70	1.89	A	0.156	2.749	0.582	0.8	1	16.249	1.30	64.96	B
160.00-140.00			B	0.496	1.905	0.696	0.8	1	61.674			
			C	0.36	2.148	0.636	0.8	1	40.958			
T3	1.08	2.30	A	0.392	2.08	0.648	0.8	1	51.422	1.51	75.58	B
140.00-120.00			B	0.529	1.865	0.713	0.8	1	76.374			
			C	0.341	2.194	0.629	0.8	1	43.373			
T4	1.20	2.78	A	0.428	2.011	0.663	0.8	1	70.142	1.54	77.22	B
120.00-100.00			B	0.466	1.948	0.681	0.8	1	78.347			
			C	0.313	2.262	0.62	0.8	1	47.921			
T5	1.20	3.48	A	0.383	2.098	0.645	0.8	1	73.130	1.57	78.60	B
100.00-80.00			B	0.415	2.034	0.658	0.8	1	80.873			
			C	0.286	2.335	0.612	0.8	1	51.707			
T6	1.21	4.31	A	0.334	2.208	0.627	0.8	1	72.515	1.53	76.36	B
80.00-60.00			B	0.364	2.14	0.638	0.8	1	80.261			
			C	0.251	2.436	0.602	0.8	1	52.163			
T7	1.21	4.74	A	0.301	2.294	0.616	0.8	1	73.372	1.46	72.76	B
60.00-40.00			B	0.327	2.227	0.625	0.8	1	80.905			
			C	0.228	2.507	0.596	0.8	1	53.748			
T8	1.21	5.75	A	0.286	2.335	0.612	0.8	1	78.572	1.40	70.08	B
40.00-20.00			B	0.309	2.273	0.619	0.8	1	85.960			
			C	0.221	2.527	0.595	0.8	1	59.154			
T9 20.00-0.00	1.21	7.16	A	0.27	2.379	0.607	0.8	1	82.014	1.48	74.24	B
			B	0.291	2.321	0.613	0.8	1	89.177			
			C	0.212	2.555	0.593	0.8	1	63.044			
Sum Weight:	9.24	33.66						OTM	1086.54 kip-ft	12.66		

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	0.23	1.25	A	0.139	2.811	0.58	0.85	1	14.314	0.87	43.31	B
180.00-160.00			B	0.302	2.29	0.617	0.85	1	33.011			
			C	0.139	2.811	0.58	0.85	1	14.314			
T2	0.70	1.89	A	0.156	2.749	0.582	0.85	1	16.249	1.30	64.96	B
160.00-140.00			B	0.496	1.905	0.696	0.85	1	61.674			
			C	0.36	2.148	0.636	0.85	1	40.958			
T3	1.08	2.30	A	0.392	2.08	0.648	0.85	1	51.422	1.51	75.58	B
140.00-120.00			B	0.529	1.865	0.713	0.85	1	76.374			
			C	0.341	2.194	0.629	0.85	1	43.373			
T4	1.20	2.78	A	0.428	2.011	0.663	0.85	1	70.142	1.54	77.22	B
120.00-100.00			B	0.466	1.948	0.681	0.85	1	78.347			
			C	0.313	2.262	0.62	0.85	1	47.921			
T5	1.20	3.48	A	0.383	2.098	0.645	0.85	1	73.130	1.57	78.60	B
100.00-80.00			B	0.415	2.034	0.658	0.85	1	80.873			
			C	0.286	2.335	0.612	0.85	1	51.707			
T6	1.21	4.31	A	0.334	2.208	0.627	0.85	1	72.515	1.53	76.36	B
80.00-60.00			B	0.364	2.14	0.638	0.85	1	80.261			
			C	0.251	2.436	0.602	0.85	1	52.163			
T7	1.21	4.74	A	0.301	2.294	0.616	0.85	1	73.372	1.46	72.76	B
60.00-40.00			B	0.327	2.227	0.625	0.85	1	80.905			
			C	0.228	2.507	0.596	0.85	1	53.748			
T8	1.21	5.75	A	0.286	2.335	0.612	0.85	1	78.572	1.40	70.08	B
40.00-20.00			B	0.309	2.273	0.619	0.85	1	85.960			
			C	0.221	2.527	0.595	0.85	1	59.154			
T9 20.00-0.00	1.21	7.16	A	0.27	2.379	0.607	0.85	1	82.014	1.48	74.24	B
			B	0.291	2.321	0.613	0.85	1	89.177			
			C	0.212	2.555	0.593	0.85	1	63.044			
Sum Weight:	9.24	33.66						OTM	1086.54 kip-ft	12.66		

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	17.78					
Bracing Weight	15.87					
Total Member Self-Weight	33.66			-3.21	-18.37	
Total Weight	52.99			-3.21	-18.37	
Wind 0 deg - No Ice		0.18	-64.88	-6862.01	-48.18	43.95
Wind 30 deg - No Ice		32.55	-56.28	-5958.01	-3466.41	30.36
Wind 45 deg - No Ice		45.94	-46.00	-4874.19	-4879.20	20.18
Wind 60 deg - No Ice		56.21	-32.59	-3458.43	-5960.73	8.63
Wind 90 deg - No Ice		64.80	-0.18	-33.02	-6862.80	-15.41
Wind 120 deg - No Ice		56.03	32.29	3400.37	-5930.91	-35.32
Wind 135 deg - No Ice		45.70	45.76	4825.61	-4837.03	-41.97
Wind 150 deg - No Ice		32.25	56.10	5921.78	-3414.76	-45.77
Wind 180 deg - No Ice		-0.18	64.88	6855.59	11.45	-43.95
Wind 210 deg - No Ice		-32.55	56.28	5951.60	3429.67	-30.36
Wind 225 deg - No Ice		-45.94	46.00	4867.78	4842.46	-20.18
Wind 240 deg - No Ice		-56.21	32.59	3452.02	5924.00	-8.63
Wind 270 deg - No Ice		-64.80	0.18	26.61	6826.07	15.41
Wind 300 deg - No Ice		-56.03	-32.29	-3406.78	5894.18	35.32
Wind 315 deg - No Ice		-45.70	-45.76	-4832.03	4800.30	41.97
Wind 330 deg - No Ice		-32.25	-56.10	-5928.19	3378.03	45.77

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	8.63					
Total Weight Ice	70.86			-13.56	-42.46	
Wind 0 deg - Ice		0.13	-66.37	-7047.37	-65.33	51.12
Wind 30 deg - Ice		33.27	-57.54	-6116.45	-3573.84	34.33
Wind 45 deg - Ice		46.98	-47.02	-5003.39	-5024.75	22.08
Wind 60 deg - Ice		57.49	-33.30	-3550.27	-6136.12	8.34
Wind 90 deg - Ice		66.30	-0.13	-36.42	-7065.61	-19.89
Wind 120 deg - Ice		57.35	33.07	3483.55	-6113.25	-42.78
Wind 135 deg - Ice		46.79	46.83	4943.93	-4992.41	-50.21
Wind 150 deg - Ice		33.03	57.41	6066.47	-3534.23	-54.22
Wind 180 deg - Ice		-0.13	66.37	7020.26	-19.60	-51.12
Wind 210 deg - Ice		-33.27	57.54	6089.34	3488.91	-34.33
Wind 225 deg - Ice		-46.98	47.02	4976.27	4939.82	-22.08
Wind 240 deg - Ice		-57.49	33.30	3523.15	6051.19	-8.34
Wind 270 deg - Ice		-66.30	0.13	9.31	6980.68	19.89
Wind 300 deg - Ice		-57.35	-33.07	-3510.66	6028.33	42.78
Wind 315 deg - Ice		-46.79	-46.83	-4971.05	4907.48	50.21
Wind 330 deg - Ice		-33.03	-57.41	-6093.59	3449.31	54.22
Total Weight	52.99			-3.21	-18.37	
Wind 0 deg - Service		0.05	-17.97	-1899.74	-8.43	12.17
Wind 30 deg - Service		9.02	-15.59	-1649.32	-955.31	8.41
Wind 45 deg - Service		12.73	-12.74	-1349.10	-1346.66	5.59
Wind 60 deg - Service		15.57	-9.03	-956.92	-1646.26	2.39
Wind 90 deg - Service		17.95	-0.05	-8.05	-1896.14	-4.27
Wind 120 deg - Service		15.52	8.94	943.03	-1638.00	-9.78
Wind 135 deg - Service		12.66	12.67	1337.83	-1334.98	-11.63
Wind 150 deg - Service		8.93	15.54	1641.48	-941.00	-12.68
Wind 180 deg - Service		-0.05	17.97	1900.15	8.09	-12.17
Wind 210 deg - Service		-9.02	15.59	1649.74	954.96	-8.41
Wind 225 deg - Service		-12.73	12.74	1349.51	1346.32	-5.59
Wind 240 deg - Service		-15.57	9.03	957.33	1645.91	-2.39
Wind 270 deg - Service		-17.95	0.05	8.47	1895.79	4.27
Wind 300 deg - Service		-15.52	-8.94	-942.61	1637.65	9.78
Wind 315 deg - Service		-12.66	-12.67	-1337.42	1334.64	11.63
Wind 330 deg - Service		-8.93	-15.54	-1641.06	940.66	12.68

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	180 - 160	Leg	Max Tension	22	4.71	-0.65	0.28
			Max. Compression	19	-6.59	0.01	-0.26
			Max. Mx	14	0.57	-1.70	-0.06
			Max. My	2	0.22	-0.10	-1.92
			Max. Vy	14	0.79	0.87	-0.06
			Max. Vx	2	0.90	-0.10	0.99
		Diagonal	Max Tension	9	5.43	0.00	0.00
			Max. Compression	9	-5.49	0.00	0.00
			Max. Mx	20	2.85	0.02	0.00
			Max. My	19	0.09	0.00	-0.00
			Max. Vy	20	-0.01	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	10	3.06	-0.01	0.00
			Max. Compression	2	-3.02	0.00	0.00
			Max. Mx	22	0.07	-0.01	-0.01
			Max. My	5	-0.48	-0.01	-0.01
			Max. Vy	22	-0.01	-0.01	-0.01
			Max. Vx	5	0.00	-0.01	-0.01
		Top Girt	Max Tension	27	0.52	-0.01	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	19	-0.52	-0.01	-0.00
			Max. Mx	22	-0.07	-0.01	-0.00
			Max. My	32	-0.21	-0.01	-0.00
			Max. Vy	22	-0.01	-0.01	-0.00
			Max. Vx	32	0.00	-0.01	-0.00
		Inner Bracing	Max Tension	19	0.01	0.00	0.00
			Max. Compression	19	-0.01	0.00	0.00
			Max. Mx	18	0.00	-0.01	0.00
			Max. My	22	-0.00	0.00	0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T2	160 - 140	Leg	Max Tension	5	35.28	-0.59	0.32
			Max. Compression	2	-41.07	0.14	0.02
			Max. Mx	14	-22.50	-1.17	-0.01
			Max. My	10	-13.77	0.04	1.21
			Max. Vy	14	1.17	-0.26	0.01
			Max. Vx	2	1.20	0.02	-0.33
		Diagonal	Max Tension	9	12.83	0.00	0.00
			Max. Compression	17	-12.90	0.00	0.00
			Max. Mx	20	6.78	0.03	0.00
			Max. My	19	0.59	0.00	-0.00
			Max. Vy	20	-0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	9	6.95	-0.01	0.00
			Max. Compression	17	-6.93	-0.01	-0.00
			Max. Mx	22	0.37	-0.02	-0.01
			Max. My	5	-0.39	-0.02	-0.01
			Max. Vy	22	-0.01	-0.02	-0.01
			Max. Vx	5	0.00	-0.02	-0.01
		Inner Bracing	Max Tension	29	0.01	0.00	0.00
			Max. Compression	26	-0.01	0.00	0.00
			Max. Mx	18	0.00	-0.01	0.00
			Max. My	22	-0.01	0.00	0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T3	140 - 120	Leg	Max Tension	5	81.98	-0.88	-0.00
			Max. Compression	2	-92.20	0.44	-0.06
			Max. Mx	15	64.85	1.06	-0.03
			Max. My	11	-4.59	-0.03	-1.04
			Max. Vy	15	-1.08	0.00	-0.10
			Max. Vx	11	1.05	0.01	0.03
		Diagonal	Max Tension	34	13.69	0.00	0.00
			Max. Compression	34	-13.82	0.00	0.00
			Max. Mx	20	11.11	0.04	0.00
			Max. My	19	1.44	0.00	-0.00
			Max. Vy	20	-0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	34	8.59	0.00	0.00
			Max. Compression	34	-8.64	-0.01	-0.00
			Max. Mx	22	0.84	-0.03	-0.01
			Max. My	13	2.01	0.00	0.02
			Max. Vy	22	-0.02	-0.03	-0.01
			Max. Vx	13	-0.00	0.00	0.02
		Inner Bracing	Max Tension	12	0.01	0.00	0.00
			Max. Compression	26	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.01	0.00
			Max. My	22	-0.01	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T4	120 - 100	Leg	Max Tension	5	128.10	-0.54	0.00
			Max. Compression	19	-141.23	1.19	-0.08

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	5	128.01	-1.22	-0.01
			Max. My	3	-7.66	-0.00	-1.15
			Max. Vy	15	0.17	-1.21	-0.06
			Max. Vx	19	0.16	-0.60	-1.03
		Diagonal	Max Tension	34	13.74	0.00	0.00
			Max. Compression	34	-13.91	0.00	0.00
			Max. Mx	20	10.97	0.06	0.00
			Max. My	19	1.47	0.00	-0.00
			Max. Vy	20	-0.03	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	34	9.36	0.00	0.00
			Max. Compression	34	-9.42	-0.03	-0.00
			Max. Mx	22	1.30	-0.05	-0.02
			Max. My	27	-1.32	-0.05	-0.02
			Max. Vy	22	-0.03	-0.05	-0.02
			Max. Vx	27	0.00	-0.05	-0.02
		Inner Bracing	Max Tension	29	0.01	0.00	0.00
			Max. Compression	34	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.02	0.00
			Max. My	22	-0.01	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T5	100 - 80	Leg	Max Tension	22	160.36	-1.39	0.00
			Max. Compression	19	-178.26	1.02	-0.06
			Max. Mx	5	141.99	-1.42	0.00
			Max. My	3	-8.35	-0.02	-1.48
			Max. Vy	15	-0.16	-1.40	-0.05
			Max. Vx	3	-0.17	-0.02	-1.48
		Diagonal	Max Tension	34	15.54	0.00	0.00
			Max. Compression	34	-15.78	0.00	0.00
			Max. Mx	26	15.28	0.12	0.00
			Max. My	19	1.70	0.00	-0.00
			Max. Vy	26	-0.04	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	34	9.28	0.00	0.00
			Max. Compression	34	-9.43	-0.04	-0.00
			Max. Mx	22	1.64	-0.06	-0.02
			Max. My	30	0.66	-0.00	0.02
			Max. Vy	22	-0.03	-0.06	-0.02
			Max. Vx	30	-0.00	-0.00	0.02
		Inner Bracing	Max Tension	11	0.00	0.00	0.00
			Max. Compression	34	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.02	0.00
			Max. My	22	-0.01	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T6	80 - 60	Leg	Max Tension	22	194.36	-1.28	-0.02
			Max. Compression	19	-217.51	1.51	-0.11
			Max. Mx	27	191.52	-1.57	0.12
			Max. My	20	-14.05	-0.03	-1.65
			Max. Vy	15	0.16	-1.29	-0.03
			Max. Vx	3	0.17	-0.03	-1.27
		Diagonal	Max Tension	34	14.87	0.00	0.00
			Max. Compression	34	-15.17	0.00	0.00
			Max. Mx	26	14.68	0.15	0.00
			Max. My	19	1.53	0.00	-0.00
			Max. Vy	26	0.04	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	34	9.81	0.00	0.00
			Max. Compression	34	-9.91	-0.05	-0.00
			Max. Mx	22	2.01	-0.06	-0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	30	0.43	-0.02	0.02
			Max. Vy	22	-0.03	-0.06	-0.01
			Max. Vx	30	-0.00	-0.02	0.02
		Inner Bracing	Max Tension	11	0.00	0.00	0.00
			Max. Compression	34	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.05	0.00
			Max. My	22	-0.01	0.00	0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T7	60 - 40	Leg	Max Tension	22	225.22	-1.24	-0.00
			Max. Compression	19	-254.06	1.19	-0.03
			Max. Mx	27	207.59	-1.57	0.12
			Max. My	20	-14.90	-0.03	-1.65
			Max. Vy	15	-0.15	-1.55	-0.09
			Max. Vx	11	0.16	-0.03	1.63
		Diagonal	Max Tension	34	14.77	0.00	0.00
			Max. Compression	34	-15.17	0.00	0.00
			Max. Mx	26	14.58	0.18	0.00
			Max. My	19	1.41	0.00	-0.00
			Max. Vy	26	-0.05	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	34	10.52	0.00	0.00
			Max. Compression	34	-10.57	-0.09	-0.00
			Max. Mx	22	2.35	-0.13	-0.02
			Max. My	30	0.43	-0.05	0.02
			Max. Vy	22	-0.05	-0.13	-0.02
			Max. Vx	30	-0.00	-0.05	0.02
		Inner Bracing	Max Tension	11	0.00	0.00	0.00
			Max. Compression	34	-0.01	0.00	0.00
			Max. Mx	18	-0.01	-0.07	0.00
			Max. My	24	-0.00	0.00	-0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
T8	40 - 20	Leg	Max Tension	22	253.62	-1.69	0.01
			Max. Compression	19	-288.82	2.56	-0.32
			Max. Mx	27	250.17	-3.91	0.32
			Max. My	20	-20.42	-0.68	-3.44
			Max. Vy	32	0.34	-3.90	-0.27
			Max. Vx	11	-0.29	-0.02	3.35
		Diagonal	Max Tension	34	14.52	0.00	0.00
			Max. Compression	34	-15.03	0.00	0.00
			Max. Mx	26	14.28	0.22	0.00
			Max. My	19	1.28	0.00	-0.00
			Max. Vy	26	0.06	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	34	11.01	0.00	0.00
			Max. Compression	34	-10.87	-0.12	-0.00
			Max. Mx	22	2.68	-0.14	-0.02
			Max. My	30	0.40	-0.08	0.02
			Max. Vy	22	-0.06	-0.14	-0.02
			Max. Vx	27	0.00	-0.13	-0.02
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-0.01	0.00	0.00
			Max. Mx	18	-0.01	-0.13	0.00
			Max. My	24	-0.00	0.00	-0.00
			Max. Vy	18	0.05	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
T9	20 - 0	Leg	Max Tension	22	279.76	0.86	0.01
			Max. Compression	19	-322.18	-0.00	0.00
			Max. Mx	19	-305.41	5.10	0.05
			Max. My	20	-21.48	-0.68	-3.44

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	-0.59	-3.90	-0.27
			Max. Vx	3	-0.33	-0.07	-1.94
		Diagonal	Max Tension	34	14.82	0.00	0.00
			Max. Compression	34	-15.63	0.00	0.00
			Max. Mx	34	14.82	0.39	0.00
			Max. My	19	1.17	0.00	-0.00
			Max. Vy	34	-0.10	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	34	12.39	0.00	0.00
			Max. Compression	34	-11.85	-0.17	0.00
			Max. Mx	22	3.00	-0.21	-0.03
			Max. My	30	0.36	-0.12	0.03
			Max. Vy	22	-0.08	-0.21	-0.03
			Max. Vx	30	-0.00	-0.12	0.03
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	33	-0.02	0.00	0.00
			Max. Mx	18	-0.01	-0.16	0.00
			Max. My	24	-0.01	0.00	-0.00
			Max. Vy	18	0.05	0.00	0.00
			Max. Vx	24	-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	335.02	35.06	-20.01
	Max. H_x	30	335.02	35.06	-20.01
	Max. H_z	21	-281.25	-30.38	18.68
	Min. Vert	22	-291.74	-32.10	18.32
	Min. H_x	22	-291.74	-32.10	18.32
	Min. H_z	29	324.52	33.39	-20.34
Leg B	Max. Vert	24	336.56	-34.40	-20.99
	Max. H_x	32	-286.58	31.34	19.21
	Max. H_z	33	-275.88	29.37	19.99
	Min. Vert	32	-286.58	31.34	19.21
	Min. H_x	24	336.56	-34.40	-20.99
	Min. H_z	25	325.86	-32.46	-21.71
Leg A	Max. Vert	19	337.08	1.17	40.38
	Max. H_x	31	23.20	6.11	1.80
	Max. H_z	19	337.08	1.17	40.38
	Min. Vert	27	-288.60	-1.15	-36.87
	Min. H_x	23	25.28	-6.04	1.97
	Min. H_z	27	-288.60	-1.15	-36.87

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	52.99	0.00	0.00	-3.21	-18.37	0.00
Dead+Wind 0 deg - No Ice	52.99	0.18	-64.88	-6722.98	-48.40	44.01
Dead+Wind 30 deg - No Ice	52.99	32.55	-56.28	-5837.61	-3397.03	30.41

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 45 deg - No Ice	52.99	45.94	-46.00	-4775.90	-4780.96	20.22
Dead+Wind 60 deg - No Ice	52.99	56.21	-32.59	-3388.96	-5840.37	8.67
Dead+Wind 90 deg - No Ice	52.99	64.80	-0.18	-33.13	-6723.75	-15.42
Dead+Wind 120 deg - No Ice	52.99	56.03	32.29	3330.72	-5810.49	-35.37
Dead+Wind 135 deg - No Ice	52.99	45.70	45.76	4727.18	-4738.72	-42.03
Dead+Wind 150 deg - No Ice	52.99	32.25	56.10	5801.28	-3345.27	-45.83
Dead+Wind 180 deg - No Ice	52.99	-0.18	64.88	6716.56	11.39	-44.01
Dead+Wind 210 deg - No Ice	52.99	-32.55	56.28	5831.26	3360.10	-30.41
Dead+Wind 225 deg - No Ice	52.99	-45.94	46.00	4769.54	4744.08	-20.24
Dead+Wind 240 deg - No Ice	52.99	-56.21	32.59	3382.58	5803.53	-8.67
Dead+Wind 270 deg - No Ice	52.99	-64.80	0.18	26.66	6686.94	15.42
Dead+Wind 300 deg - No Ice	52.99	-56.03	-32.29	-3337.27	5773.61	35.37
Dead+Wind 315 deg - No Ice	52.99	-45.70	-45.76	-4733.73	4701.79	42.03
Dead+Wind 330 deg - No Ice	52.99	-32.25	-56.10	-5807.80	3308.29	45.82
Dead+Ice+Temp	70.86	0.00	0.00	-13.55	-42.45	0.00
Dead+Wind 0 deg+Ice+Temp	70.86	0.13	-66.37	-6889.77	-65.56	51.25
Dead+Wind 30 deg+Ice+Temp	70.86	33.27	-57.54	-5979.96	-3495.18	34.44
Dead+Wind 45 deg+Ice+Temp	70.86	46.98	-47.02	-4891.94	-4913.38	22.16
Dead+Wind 60 deg+Ice+Temp	70.86	57.49	-33.30	-3471.50	-5999.66	8.38
Dead+Wind 90 deg+Ice+Temp	70.86	66.30	-0.13	-36.53	-6907.99	-19.93
Dead+Wind 120 deg+Ice+Temp	70.86	57.35	33.07	3404.59	-5976.78	-42.90
Dead+Wind 135 deg+Ice+Temp	70.86	46.79	46.83	4832.34	-4881.01	-50.35
Dead+Wind 150 deg+Ice+Temp	70.86	33.03	57.41	5929.87	-3455.52	-54.37
Dead+Wind 180 deg+Ice+Temp	70.86	-0.13	66.37	6862.61	-19.74	-51.25
Dead+Wind 210 deg+Ice+Temp	70.86	-33.27	57.54	5952.86	3409.95	-34.43
Dead+Wind 225 deg+Ice+Temp	70.86	-46.98	47.02	4864.85	4828.22	-22.16
Dead+Wind 240 deg+Ice+Temp	70.86	-57.49	33.30	3444.51	5914.68	-8.39
Dead+Wind 270 deg+Ice+Temp	70.86	-66.30	0.13	9.29	6822.91	19.93
Dead+Wind 300 deg+Ice+Temp	70.86	-57.35	-33.07	-3431.91	5891.61	42.90
Dead+Wind 315 deg+Ice+Temp	70.86	-46.79	-46.83	-4859.65	4795.78	50.35
Dead+Wind 330 deg+Ice+Temp	70.86	-33.03	-57.41	-5957.13	3370.24	54.36
Dead+Wind 0 deg - Service	52.99	0.05	-17.97	-1864.66	-26.70	12.19
Dead+Wind 30 deg - Service	52.99	9.02	-15.59	-1619.41	-954.31	8.42
Dead+Wind 45 deg - Service	52.99	12.73	-12.74	-1325.31	-1337.68	5.60
Dead+Wind 60 deg - Service	52.99	15.57	-9.03	-941.11	-1631.15	2.40
Dead+Wind 90 deg - Service	52.99	17.95	-0.05	-11.50	-1875.86	-4.27
Dead+Wind 120 deg - Service	52.99	15.52	8.94	920.34	-1622.87	-9.80
Dead+Wind 135 deg - Service	52.99	12.66	12.67	1307.17	-1325.97	-11.64
Dead+Wind 150 deg - Service	52.99	8.93	15.54	1604.70	-939.97	-12.70
Dead+Wind 180 deg - Service	52.99	-0.05	17.97	1858.24	-10.13	-12.19
Dead+Wind 210 deg - Service	52.99	-9.02	15.59	1612.99	917.49	-8.43
Dead+Wind 225 deg - Service	52.99	-12.73	12.74	1318.89	1300.86	-5.60
Dead+Wind 240 deg - Service	52.99	-15.57	9.03	934.68	1594.34	-2.40
Dead+Wind 270 deg - Service	52.99	-17.95	0.05	5.07	1839.05	4.27
Dead+Wind 300 deg - Service	52.99	-15.52	-8.94	-926.77	1586.06	9.80
Dead+Wind 315 deg - Service	52.99	-12.66	-12.67	-1313.60	1289.15	11.64
Dead+Wind 330 deg - Service	52.99	-8.93	-15.54	-1611.13	903.14	12.69

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	-52.99	0.00	0.00	52.99	0.00	0.000%
2	0.18	-52.99	-64.88	-0.18	52.99	64.88	0.000%
3	32.55	-52.99	-56.28	-32.55	52.99	56.28	0.000%
4	45.94	-52.99	-46.00	-45.94	52.99	46.00	0.000%
5	56.21	-52.99	-32.59	-56.21	52.99	32.59	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
6	64.80	-52.99	-0.18	-64.80	52.99	0.18	0.000%
7	56.03	-52.99	32.29	-56.03	52.99	-32.29	0.000%
8	45.70	-52.99	45.76	-45.70	52.99	-45.76	0.000%
9	32.25	-52.99	56.10	-32.25	52.99	-56.10	0.000%
10	-0.18	-52.99	64.88	0.18	52.99	-64.88	0.000%
11	-32.55	-52.99	56.28	32.55	52.99	-56.28	0.000%
12	-45.94	-52.99	46.00	45.94	52.99	-46.00	0.000%
13	-56.21	-52.99	32.59	56.21	52.99	-32.59	0.000%
14	-64.80	-52.99	0.18	64.80	52.99	-0.18	0.000%
15	-56.03	-52.99	-32.29	56.03	52.99	32.29	0.000%
16	-45.70	-52.99	-45.76	45.70	52.99	45.76	0.000%
17	-32.25	-52.99	-56.10	32.25	52.99	56.10	0.000%
18	0.00	-70.86	0.00	0.00	70.86	0.00	0.000%
19	0.13	-70.86	-66.37	-0.13	70.86	66.37	0.000%
20	33.27	-70.86	-57.54	-33.27	70.86	57.54	0.000%
21	46.98	-70.86	-47.02	-46.98	70.86	47.02	0.000%
22	57.49	-70.86	-33.30	-57.49	70.86	33.30	0.000%
23	66.30	-70.86	-0.13	-66.30	70.86	0.13	0.000%
24	57.35	-70.86	33.07	-57.35	70.86	-33.07	0.000%
25	46.79	-70.86	46.83	-46.79	70.86	-46.83	0.000%
26	33.03	-70.86	57.41	-33.03	70.86	-57.41	0.000%
27	-0.13	-70.86	66.37	0.13	70.86	-66.37	0.000%
28	-33.27	-70.86	57.54	33.27	70.86	-57.54	0.000%
29	-46.98	-70.86	47.02	46.98	70.86	-47.02	0.000%
30	-57.49	-70.86	33.30	57.49	70.86	-33.30	0.000%
31	-66.30	-70.86	0.13	66.30	70.86	-0.13	0.000%
32	-57.35	-70.86	-33.07	57.35	70.86	33.07	0.000%
33	-46.79	-70.86	-46.83	46.79	70.86	46.83	0.000%
34	-33.03	-70.86	-57.41	33.03	70.86	57.41	0.000%
35	0.05	-52.99	-17.97	-0.05	52.99	17.97	0.000%
36	9.02	-52.99	-15.59	-9.02	52.99	15.59	0.000%
37	12.73	-52.99	-12.74	-12.73	52.99	12.74	0.000%
38	15.57	-52.99	-9.03	-15.57	52.99	9.03	0.000%
39	17.95	-52.99	-0.05	-17.95	52.99	0.05	0.000%
40	15.52	-52.99	8.94	-15.52	52.99	-8.94	0.000%
41	12.66	-52.99	12.67	-12.66	52.99	-12.67	0.000%
42	8.93	-52.99	15.54	-8.93	52.99	-15.54	0.000%
43	-0.05	-52.99	17.97	0.05	52.99	-17.97	0.000%
44	-9.02	-52.99	15.59	9.02	52.99	-15.59	0.000%
45	-12.73	-52.99	12.74	12.73	52.99	-12.74	0.000%
46	-15.57	-52.99	9.03	15.57	52.99	-9.03	0.000%
47	-17.95	-52.99	0.05	17.95	52.99	-0.05	0.000%
48	-15.52	-52.99	-8.94	15.52	52.99	8.94	0.000%
49	-12.66	-52.99	-12.67	12.66	52.99	12.67	0.000%
50	-8.93	-52.99	-15.54	8.93	52.99	15.54	0.000%

Non-Linear Convergence Results

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

7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
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	180 - 160	3.120	37	0.1472	0.0466
T2	160 - 140	2.491	37	0.1450	0.0446
T3	140 - 120	1.871	37	0.1322	0.0370
T4	120 - 100	1.322	37	0.1109	0.0266
T5	100 - 80	0.887	37	0.0831	0.0195
T6	80 - 60	0.568	37	0.0615	0.0139
T7	60 - 40	0.324	37	0.0446	0.0091
T8	40 - 20	0.154	37	0.0273	0.0055
T9	20 - 0	0.044	45	0.0138	0.0021

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
180.00	PD455	37	3.120	0.1472	0.0466	Inf
178.00	ROHN 6-ft Side Arm	37	3.057	0.1472	0.0465	Inf
170.00	ROHN 6'x15' Boom Gate (1)	37	2.806	0.1470	0.0461	Inf
160.00	ROHN 6'x15' Boom Gate (1)	37	2.491	0.1450	0.0446	847899
150.00	ROHN 6'x15' Boom Gate (1)	37	2.176	0.1399	0.0415	132191
140.00	ROHN 6'x15' Boom Gate (1)	37	1.871	0.1322	0.0370	61249
130.00	Pirod 15' T-Frame Sector Mount (1)	37	1.584	0.1226	0.0317	48266
75.00	GPS	37	0.500	0.0571	0.0126	73076

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	11.320	21	0.5295	0.1846
T2	160 - 140	9.061	21	0.5206	0.1806
T3	140 - 120	6.836	21	0.4755	0.1556
T4	120 - 100	4.857	21	0.4011	0.1153
T5	100 - 80	3.272	21	0.3026	0.0847
T6	80 - 60	2.099	21	0.2250	0.0603
T7	60 - 40	1.197	21	0.1638	0.0395
T8	40 - 20	0.571	21	0.1005	0.0235
T9	20 - 0	0.162	30	0.0508	0.0092

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	PD455	21	11.320	0.5295	0.1846	585628
178.00	ROHN 6-ft Side Arm	21	11.094	0.5294	0.1846	585628
170.00	ROHN 6'x15' Boom Gate (1)	21	10.191	0.5281	0.1842	292815
160.00	ROHN 6'x15' Boom Gate (1)	21	9.061	0.5206	0.1806	254884
150.00	ROHN 6'x15' Boom Gate (1)	21	7.933	0.5025	0.1710	37713
140.00	ROHN 6'x15' Boom Gate (1)	21	6.836	0.4755	0.1556	17297
130.00	Pirod 15' T-Frame Sector Mount (1)	21	5.804	0.4422	0.1356	13551
75.00	GPS	21	1.849	0.2092	0.0547	20098

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	180	Leg	A325N	0.8750	4	1.18	26.46	0.045 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	1.83	6.44	0.284 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	1.53	6.44	0.237 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	0.26	6.44	0.041 ✓	1.333	Bolt Shear
T2	160	Leg	A325N	1.0000	4	8.82	34.56	0.255 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.30	6.44	0.667 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.47	6.44	0.539 ✓	1.333	Bolt Shear
T3	140	Leg	A325N	1.0000	6	13.66	34.56	0.395 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.61	6.44	0.715 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	4.32	6.44	0.671 ✓	1.333	Bolt Shear
T4	120	Leg	A325N	1.0000	6	21.35	34.56	0.618 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.64	6.44	0.720 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	4.71	6.44	0.731 ✓	1.333	Bolt Shear
T5	100	Leg	A325N	1.0000	6	26.73	34.56	0.773 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.26	6.44	0.817 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	4.72	6.44	0.732 ✓	1.333	Bolt Shear
T6	80	Leg	A325N	1.0000	6	32.39	34.56	0.937 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.06	6.44	0.785 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	4.95	6.44	0.769 ✓	1.333	Bolt Shear
T7	60	Leg	A325N	1.0000	12	18.77	34.56	0.543 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.06	6.44	0.785 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	5.28	6.44	0.820 ✓	1.333	Bolt Shear
T8	40	Leg	A325N	1.0000	12	21.13	34.56	0.612 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.01	6.44	0.777 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	5.51	6.44	0.855 ✓	1.333	Bolt Shear
T9	20	Leg	A354-BC	1.0000	16	17.48	32.40	0.540 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	3	5.21	9.28	0.562 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	6.19	6.44	0.961 ✓	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 3 STD	20.00	6.67	68.8 K=1.00	21.168	2.2285	-6.59	47.17	0.140 ✓
T2	160 - 140	ROHN 4 EH	20.00	6.67	54.2 K=1.00	23.687	4.4074	-41.07	104.40	0.393 ✓
T3	140 - 120	ROHN 5 EH	20.04	6.68	43.6 K=1.00	25.319	6.1120	-92.20	154.75	0.596 ✓
T4	120 - 100	ROHN 6 EHS	20.04	6.68	36.0 K=1.00	26.378	6.7133	-141.23	177.09	0.798 ✓
T5	100 - 80	ROHN 8 EHS	20.05	10.03	41.2 K=1.00	25.662	9.7193	-178.26	249.42	0.715 ✓
T6	80 - 60	ROHN 8 EH	20.05	10.03	41.8 K=1.00	25.576	12.7627	-217.51	326.42	0.666 ✓
T7	60 - 40	ROHN 8 EH	20.05	10.03	41.8 K=1.00	25.576	12.7627	-254.06	326.42	0.778 ✓
T8	40 - 20	ROHN 10 EH	20.05	10.03	33.2 K=1.00	26.753	16.1007	-288.82	430.75	0.671 ✓
T9	20 - 0	ROHN 10 EH	20.05	10.03	33.2 K=1.00	26.753	16.1007	-322.18	430.75	0.748 ✓

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	180 - 160	ROHN 2 STD	7.92	7.65	116.7 K=1.00	10.970	1.0745	-5.49	11.79	0.466 ✓
T2	160 - 140	ROHN 2 X-STR	7.92	7.58	118.6 K=1.00	10.615	1.4773	-12.90	15.68	0.823 ✓
T3	140 - 120	ROHN 2 X-STR	8.57	8.20	128.3 K=1.00	9.068	1.4773	-13.82	13.40	1.032 ✓
T4	120 - 100	ROHN 2.5 STD	9.26	8.86	112.2 K=1.00	11.859	1.7040	-13.67	20.21	0.676 ✓
T5	100 - 80	ROHN 3 STD	12.60	12.01	123.8 K=1.00	9.738	2.2285	-15.58	21.70	0.718 ✓
T6	80 - 60	ROHN 3 STD	13.40	12.86	132.6 K=1.00	8.488	2.2285	-15.04	18.92	0.795 ✓
T7	60 - 40	ROHN 3 STD	14.27	13.76	141.9 K=1.00	7.412	2.2285	-15.06	16.52	0.912 ✓
T8	40 - 20	ROHN 3 STD	15.19	14.60	150.5 K=1.00	6.590	2.2285	-14.87	14.69	1.012 ✓
T9	20 - 0	ROHN 3.5 EH	16.16	15.59	143.2 K=1.00	7.284	3.6784	-15.63	26.79	0.583 ✓

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 $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.56	4.14	79.7 K=1.00	19.071	0.7995	-3.02	15.25	0.198 ✓
T2	160 - 140	ROHN 1.5 STD	8.56	4.09	78.9 K=1.00	19.231	0.7995	-6.93	15.37	0.450 ✓
T3	140 - 120	ROHN 1.5 STD	10.02	4.78	92.1 K=1.00	16.482	0.7995	-8.64	13.18	0.656 ✓
T4	120 - 100	ROHN 2 STD	12.14	5.80	88.4 K=1.00	17.289	1.0745	-9.42	18.58	0.507 ✓
T5	100 - 80	ROHN 2 STD	14.07	6.68	101.8 K=1.00	14.284	1.0745	-9.43	15.35	0.614 ✓
T6	80 - 60	ROHN 2 STD	16.57	7.92	120.8 K=1.00	10.230	1.0745	-9.91	10.99	0.901 ✓
T7	60 - 40	ROHN 2.5 STD	19.08	9.18	116.3 K=1.00	11.040	1.7040	-10.57	18.81	0.562 ✓
T8	40 - 20	ROHN 2.5 STD	21.60	10.35	131.1 K=1.00	8.686	1.7040	-10.87	14.80	0.734 ✓
T9	20 - 0	ROHN 3 STD	24.12	11.61	119.8 K=1.00	10.413	2.2285	-11.44	23.20	0.493 ✓

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	180 - 160	ROHN 1.5 STD	8.56	4.14	79.7 K=1.00	19.071	0.7995	-0.52	15.25	0.034 ✓

Inner Bracing 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	180 - 160	L2x2x1/8	4.28	4.28	129.2 K=1.00	8.942	0.4844	-0.01	4.33	0.002 ✓
T2	160 - 140	L2x2x1/8	4.28	4.28	129.2 K=1.00	8.942	0.4844	-0.01	4.33	0.002 ✓
T3	140 - 120	L2x2x1/8	5.01	5.01	151.2 K=1.00	6.528	0.4844	-0.01	3.16	0.003 ✓
T4	120 - 100	L2x2x1/8	6.07	6.07	183.3 K=1.00	4.446	0.4844	-0.01	2.15	0.005 ✓
T5	100 - 80	L2x2x1/8	7.04	7.04	212.4 K=1.00	3.309	0.4844	-0.01	1.60	0.007 ✓
T6	80 - 60	L2 1/2x2 1/2x3/16	8.28	8.28	200.8 K=1.00	3.702	0.9020	-0.01	3.34	0.003 ✓
T7	60 - 40	L3x3x3/16	9.54	9.54	192.1 K=1.00	4.046	1.0900	-0.01	4.41	0.003 ✓
T8	40 - 20	L3 1/2x3 1/2x1/4	10.80	10.80	186.7	4.282	1.6900	-0.01	7.24	0.002

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 $\frac{P}{P_a}$
T9	20 - 0	L3 1/2x3 1/2x1/4	12.06	12.06	K=1.00 208.5 K=1.00	3.434	1.6900	-0.02	5.80	0.003

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	180 - 160	ROHN 3 STD	20.00	6.67	68.8	30.000	2.2285	4.71	66.85	0.070
T2	160 - 140	ROHN 4 EH	20.00	6.67	54.2	30.000	4.4074	35.28	132.22	0.267
T3	140 - 120	ROHN 5 EH	20.04	6.68	43.6	30.000	6.1120	81.98	183.36	0.447
T4	120 - 100	ROHN 6 EHS	20.04	6.68	36.0	30.000	6.7133	128.10	201.40	0.636
T5	100 - 80	ROHN 8 EHS	20.05	10.03	41.2	30.000	9.7193	160.36	291.58	0.550
T6	80 - 60	ROHN 8 EH	20.05	10.03	41.8	30.000	12.7627	194.36	382.88	0.508
T7	60 - 40	ROHN 8 EH	20.05	10.03	41.8	30.000	12.7627	225.22	382.88	0.588
T8	40 - 20	ROHN 10 EH	20.05	10.03	33.2	30.000	16.1007	253.62	483.02	0.525
T9	20 - 0	ROHN 10 EH	20.05	10.03	33.2	30.000	16.1007	279.76	483.02	0.579

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	180 - 160	ROHN 2 STD	7.92	7.65	116.7	30.000	1.0745	5.43	32.24	0.169
T2	160 - 140	ROHN 2 X-STR	7.92	7.58	118.6	30.000	1.4773	12.83	44.32	0.289
T3	140 - 120	ROHN 2 X-STR	8.57	8.20	128.3	30.000	1.4773	13.69	44.32	0.309
T4	120 - 100	ROHN 2.5 STD	8.79	8.39	106.3	30.000	1.7040	13.74	51.12	0.269
T5	100 - 80	ROHN 3 STD	12.23	11.64	120.1	30.000	2.2285	15.54	66.85	0.232

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	80 - 60	ROHN 3 STD	12.99	12.45	128.4	30.000	2.2285	14.87	66.85	0.222 ✓
T7	60 - 40	ROHN 3 STD	13.83	13.32	137.4	30.000	2.2285	14.77	66.85	0.221 ✓
T8	40 - 20	ROHN 3 STD	14.72	14.13	145.7	30.000	2.2285	14.52	66.85	0.217 ✓
T9	20 - 0	ROHN 3.5 EH	16.16	15.59	143.2	30.000	3.6784	14.82	110.35	0.134 ✓

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 $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.56	4.14	79.7	30.000	0.7995	3.06	23.98	0.127 ✓
T2	160 - 140	ROHN 1.5 STD	8.56	4.09	78.9	30.000	0.7995	6.95	23.98	0.290 ✓
T3	140 - 120	ROHN 1.5 STD	10.02	4.78	92.1	30.000	0.7995	8.59	23.98	0.358 ✓
T4	120 - 100	ROHN 2 STD	12.14	5.80	88.4	30.000	1.0745	9.36	32.24	0.290 ✓
T5	100 - 80	ROHN 2 STD	14.07	6.68	101.8	30.000	1.0745	9.28	32.24	0.288 ✓
T6	80 - 60	ROHN 2 STD	16.57	7.92	120.8	30.000	1.0745	9.81	32.24	0.304 ✓
T7	60 - 40	ROHN 2.5 STD	19.08	9.18	116.3	30.000	1.7040	10.52	51.12	0.206 ✓
T8	40 - 20	ROHN 2.5 STD	21.60	10.35	131.1	30.000	1.7040	11.01	51.12	0.215 ✓
T9	20 - 0	ROHN 3 STD	24.12	11.61	119.8	30.000	2.2285	12.39	66.85	0.185 ✓

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	180 - 160	ROHN 1.5 STD	8.56	4.14	79.7	30.000	0.7995	0.52	23.98	0.022 ✓

Inner Bracing 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 P / P_a
T1	180 - 160	L2x2x1/8	4.28	4.28	82.0	21.600	0.4844	0.01	10.46	0.001 ✔
T2	160 - 140	L2x2x1/8	4.28	4.28	82.0	21.600	0.4844	0.01	10.46	0.001 ✔
T3	140 - 120	L2x2x1/8	4.28	4.28	82.0	21.600	0.4844	0.01	10.46	0.001 ✔
T4	120 - 100	L2x2x1/8	5.38	5.38	103.0	21.600	0.4844	0.01	10.46	0.001 ✔
T5	100 - 80	L2x2x1/8	6.42	6.42	123.0	21.600	0.4844	0.00	10.46	0.000 ✔
T6	80 - 60	L2 1/2x2 1/2x3/16	7.66	7.66	118.1	21.600	0.9020	0.00	19.48	0.000 ✔
T7	60 - 40	L3x3x3/16	8.91	8.91	113.9	21.600	1.0900	0.00	23.54	0.000 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 3 STD	3	-6.59	62.88	10.5	Pass
T2	160 - 140	Leg	ROHN 4 EH	42	-41.07	139.16	29.5	Pass
T3	140 - 120	Leg	ROHN 5 EH	81	-92.20	206.28	44.7	Pass
T4	120 - 100	Leg	ROHN 6 EHS	120	-141.23	236.05	59.8	Pass
T5	100 - 80	Leg	ROHN 8 EHS	159	-178.26	332.48	53.6 58.0 (b)	Pass
T6	80 - 60	Leg	ROHN 8 EH	186	-217.51	435.12	50.0 70.3 (b)	Pass
T7	60 - 40	Leg	ROHN 8 EH	213	-254.06	435.12	58.4	Pass
T8	40 - 20	Leg	ROHN 10 EH	240	-288.82	574.19	50.3	Pass
T9	20 - 0	Leg	ROHN 10 EH	267	-322.18	574.19	56.1	Pass
T1	180 - 160	Diagonal	ROHN 2 STD	11	-5.49	15.71	35.0	Pass
T2	160 - 140	Diagonal	ROHN 2 X-STR	48	-12.90	20.90	61.7	Pass
T3	140 - 120	Diagonal	ROHN 2 X-STR	87	-13.82	17.86	77.4	Pass
T4	120 - 100	Diagonal	ROHN 2.5 STD	126	-13.67	26.94	50.7 54.0 (b)	Pass
T5	100 - 80	Diagonal	ROHN 3 STD	165	-15.58	28.93	53.9 61.3 (b)	Pass
T6	80 - 60	Diagonal	ROHN 3 STD	192	-15.04	25.21	59.6	Pass
T7	60 - 40	Diagonal	ROHN 3 STD	219	-15.06	22.02	68.4	Pass
T8	40 - 20	Diagonal	ROHN 3 STD	246	-14.87	19.58	75.9	Pass
T9	20 - 0	Diagonal	ROHN 3.5 EH	273	-15.63	35.72	43.8	Pass
T1	180 - 160	Horizontal	ROHN 1.5 STD	10	-3.02	20.32	14.9 17.8 (b)	Pass
T2	160 - 140	Horizontal	ROHN 1.5 STD	46	-6.93	20.49	33.8 40.5 (b)	Pass
T3	140 - 120	Horizontal	ROHN 1.5 STD	85	-8.64	17.56	49.2 50.3 (b)	Pass
T4	120 - 100	Horizontal	ROHN 2 STD	124	-9.42	24.76	38.0 54.8 (b)	Pass
T5	100 - 80	Horizontal	ROHN 2 STD	163	-9.43	20.46	46.1 54.9 (b)	Pass
T6	80 - 60	Horizontal	ROHN 2 STD	190	-9.91	14.65	67.6	Pass
T7	60 - 40	Horizontal	ROHN 2.5 STD	217	-10.57	25.08	42.1 61.5 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T8	40 - 20	Horizontal	ROHN 2.5 STD	244	-10.87	19.73	55.1	Pass
T9	20 - 0	Horizontal	ROHN 3 STD	271	-11.44	30.93	64.1 (b) 37.0	Pass
T1	180 - 160	Top Girt	ROHN 1.5 STD	6	-0.52	20.32	72.1 (b) 2.5	Pass
T1	180 - 160	Inner Bracing	L2x2x1/8	16	-0.00	5.77	3.0 (b) 0.2	Pass
T2	160 - 140	Inner Bracing	L2x2x1/8	52	-0.01	5.77	0.2	Pass
T3	140 - 120	Inner Bracing	L2x2x1/8	91	-0.01	4.22	0.3	Pass
T4	120 - 100	Inner Bracing	L2x2x1/8	130	-0.01	2.87	0.4	Pass
T5	100 - 80	Inner Bracing	L2x2x1/8	169	-0.01	2.14	0.6	Pass
T6	80 - 60	Inner Bracing	L2 1/2x2 1/2x3/16	196	-0.01	4.45	0.3	Pass
T7	60 - 40	Inner Bracing	L3x3x3/16	223	-0.01	5.88	0.3	Pass
T8	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	250	-0.01	9.65	0.3	Pass
T9	20 - 0	Inner Bracing	L3 1/2x3 1/2x1/4	277	-0.02	7.74	0.3	Pass
							Summary	
						Leg (T6)	70.3	Pass
						Diagonal (T3)	77.4	Pass
						Horizontal (T9)	72.1	Pass
						Top Girt (T1)	3.0	Pass
						Inner Bracing (T5)	0.6	Pass
						Bolt Checks	72.1	Pass
						RATING =	**77.4**	**Pass**

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Subject:	FOUNDATION ANALYSIS
Location:	Madison, CT
Rev. 1: 2/27/12	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11001.CO51

Foundation Analysis:

Input Data:

Tower Data

Max Compression Force =	$C_t := 337 \cdot kip$	(User Input from RISATower)
Max Uplift Force =	$U_t := 292 \cdot kip$	(User Input from RISATower)

Footing Data:

Caisson Length =	$L_c := 25 \cdot ft$	(User Input)
Diameter of Caisson =	$d_c := 6 \cdot ft$	(User Input)
Height of Pier Above Grade =	$h_c := 0.5 \cdot ft$	(User Input)
Depth Neglected =	$n := 8 \cdot ft$	(User Input)
Water Table Below Grade =	$w_d := 1 \cdot ft$	(User Input)

Material Properties:

Allowable Soil Bearing Capacity =	$q_s := 30000 \cdot psf$	(User Input)
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)
Unit Weight of Concrete =	$\gamma_{water} := 62.5 \cdot pcf$	(User Input)
Ave Allowable Shear @ 8-ft to 14-ft	$f_1 := 600 \cdot psf$	(User Input per MEI Report)
Ave Allowable Shear @ 14-ft to 20-ft	$f_2 := 3000 \cdot psf$	(User Input per MEI Report)
Ave Allowable Shear @ 20-ft to 25-ft	$f_3 := 4000 \cdot psf$	(User Input per MEI Report)
	$h_1 := 6 \cdot ft$	(User Input per MEI Report)
	$h_2 := 6 \cdot ft$	(User Input per MEI Report)
	$h_3 := 5 \cdot ft$	(User Input per MEI Report)

Loading:

Total Compressive Force =

$$Tot_{comp} := C_t + \frac{\pi}{4}\cdot d_c^{\,2}\cdot\left[h_c\cdot\gamma_{conc} + \left(L_c - h_c\right)\cdot\left(\gamma_{conc} - \gamma_{soil}\right)\right] = 359.9\cdot kips$$

Weight of the Caisson =

$$W_{caisson} := \frac{\pi}{4}\cdot d_c^{\,2}\cdot\left[\left(w_d + h_c\right)\cdot\gamma_{conc} + \left(L_c - w_d - h_c\right)\cdot\left(\gamma_{conc} - \gamma_{water}\right)\right] = 64.5\cdot kips$$

Soil Shear =

$$Soil_{shear} := \pi\cdot d_c\cdot\left(f_1\cdot h_1 + f_2\cdot h_2 + f_3\cdot h_3\right) = 784.1\cdot kips$$

Compression Check:

Compression Capacity =

$$Comp_{cap} := 0.5\cdot\left[Soil_{shear} + q_s\cdot\left(\frac{\pi}{4}\cdot d_c^{\,2}\right)\right] = 816.2\cdot kips$$

$$Compression\_Check := if\left(Comp_{cap} > Tot_{comp}, "Ok", "NG"\right)$$

Compression_Check = "Ok"

Uplift Check:

Uplift Capacity =

$$Uplift_{cap} := 0.5\cdot\left(Soil_{shear} + W_{caisson}\right) = 424.3\cdot kips$$

$$Uplift\_Check := if\left(Uplift_{cap} > U_t, "Ok", "NG"\right)$$

Uplift_Check = "Ok"

Cone Failure Check:

Cone Failure Capacity =

$$CF_{cap} := \frac{\left[\left(L_c - h_c\right)\cdot\tan(30\cdot deg)\cdot 2 + d_c\right]^2\cdot\pi}{4}\cdot\frac{\left(L_c - h_c\right)}{3}\cdot\gamma_{soil} = 905\cdot kips$$

$$Cone\_Failure\_Check := if\left(CF_{cap} > U_t, "Ok", "NG"\right)$$

Cone_Failure_Check = "Ok"

SITE NAME	MADISON CT	ECP - CELL #	2	111
LATITUDE	41-21-22.05 N	LONGITUDE	72-38-20.69 W	
		SAVE BUTTON		
Additional Comments:		STRUCTURE TYPE	LATTICE	

700 Mhz - LTE ANTENNA ADD	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	eNodeB	eNodeB	eNodeB
ANTENNA TYPE	BXA-70063/4CF	BXA-70063/6CF-2°	BXA-70063/4CF-4°
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	30	150	270
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	170	170	170
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			

850 Celluar - Current Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	#N/A	#N/A	#N/A
ANTENNA TYPE	DB844H90	LPA-80080/6CF	DB844H90
QTY OF ANTENNAS PER FACE	2	2	2
ORIENTATION (DEG)	30	150	270
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	170	170	170
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			

850 Celluar - Future Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	#N/A	#N/A	#N/A
ANTENNA TYPE	APL868013-42T0	LPA-80080/6CF	APL866513-42T0
QTY OF ANTENNAS PER FACE	2	2	2
ORIENTATION (DEG)	30	150	270
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	170	170	170
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL	2 FD9R6004/2C-3L	2 FD9R6004/2C-3L	2 FD9R6004/2C-3L
DIPLEX WITH LTE CABLE			

1900 PCS - Current Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	PCS Modcell 4.0	PCS Modcell 4.0	PCS Modcell 4.0
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)	170	170	170
TMA - QTY / MODEL			
DIPLEXER - QTY / MODEL			

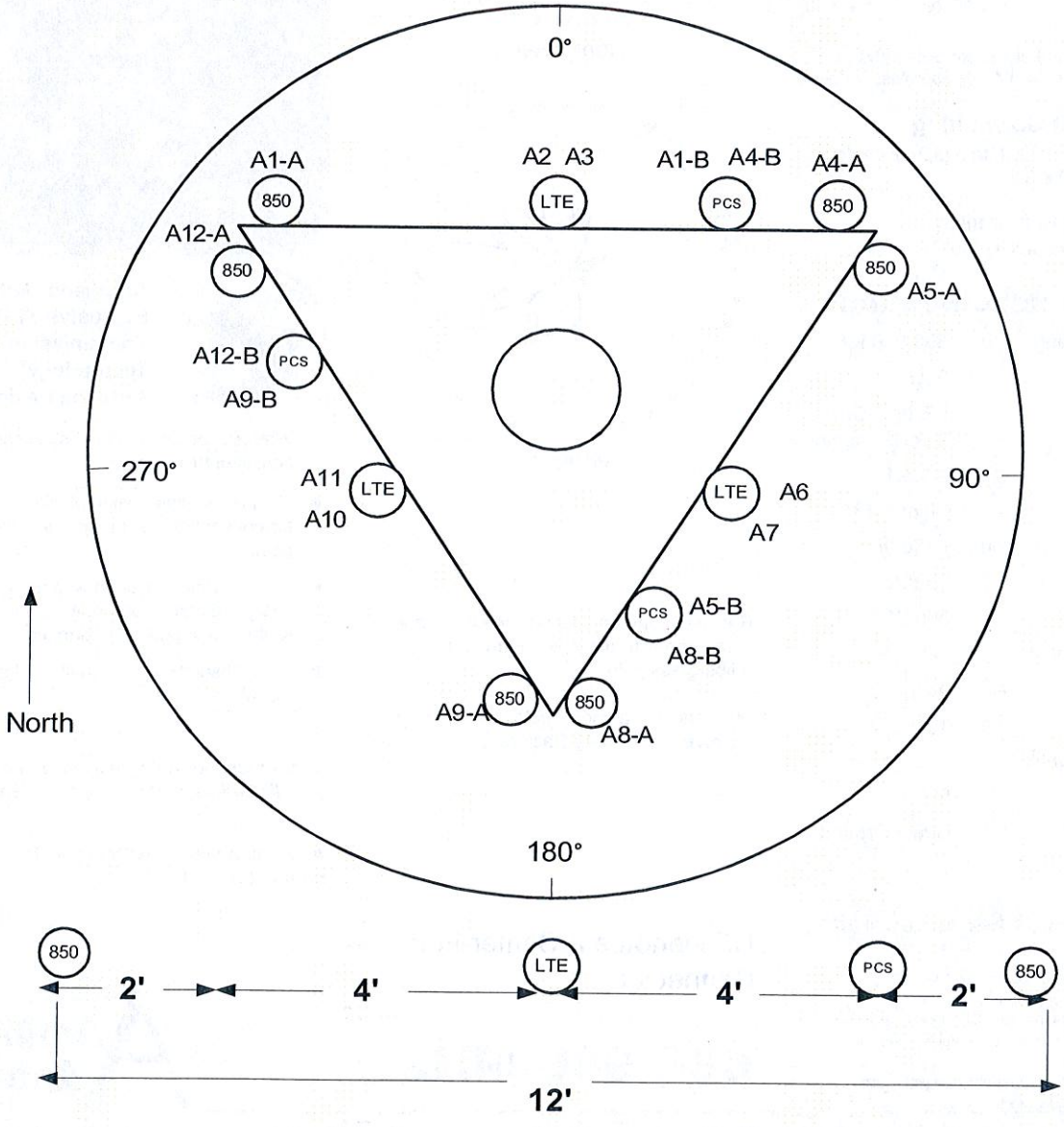
1900 PCS - Future Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	PCS Modcell 4.0	PCS Modcell 4.0	PCS Modcell 4.0
ANTENNA TYPE	BXA-171085/8BF-2°	BXA-171063/8BF-2°	BXA-171063/8BF-2°
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	30	150	270
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	170	170	170
TMA - QTY / MODEL			
DIPLEX WITH CELLULAR CABLE	DIPLEX with Cellular Cable	DIPLEX with Cellular Cable	DIPLEX with Cellular Cable

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

TX / RX FREQUENCIES			TX POWER OUTPUT	
Cellular A-Band	PCS F / AWS-Band	700 Mhz C - B	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-A	800	Tx1/Rx0	RED	A5-A	800	Tx2/Rx0	BLUE	A9-A	800	Tx3/Rx0	GREEN	
A1-B	1900	Tx1/Rx0	RED/ WHITE	A5-B	1900	Tx2/Rx0	BLUE/ WHITE	A9-B	1900	Tx3/Rx0	GREEN/WHITE	
A2	700	Tx1/Rx0	RED/ ORANGE	A6	700	Tx2/Rx0	BLUE/ ORANGE	A10	700	Tx3/Rx0	GREEN/ORANGE	
A3	700	Tx4/Rx1	RED/RED/ ORANGE	A7	700	Tx5/Rx1	BLUE/BLUE/ ORANGE	A11	700	Tx6/Rx1	GREEN/GREEN/ ORANGE	
A4-B	1900	Tx4/Rx1	RED/RED/ WHITE	A8-B	1900	Tx5/Rx1	BLUE/BLUE/ WHITE	A12-B	1900	Tx6/Rx1	GREEN/GREEN/ WHITE	
A4-A	800	Tx4/Rx1	RED/RED	A8-A	800	Tx5/Rx1	BLUE/BLUE	A12-A	800	Tx6/Rx1	GREEN/GREEN	
RF ENGINEER				**RF MANAGER**				**INITIALS**			**DATE**	
Prepared By: Dany Bustamante				Steve Weatherbee				DB			9/1/2011	

Site Configuration



Slant +/- 45° Dual Polarized, Panel 63° / 13 dBd

BXA-70063/4CF ___

When ordering replace "___" with connector type.

Mechanical specifications

Length	1205 mm	47.4 in
Width	285 mm	11.2 in
Depth	126 mm	5.0 in
Depth with z-bracket	166 mm	6.5 in
4) Weight	4.5 kg	9.9 lbs
Wind Area		
Fore/Aft	0.36 m^2	3.9 ft^2
Side	0.15 m^2	1.7 ft^2
Rated Wind Velocity (Safety factor 2.0)	>653 km/hr	>406 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	522 N	117 lbs
Side	244 N	54.5 lbs

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

Mounting and Downtilting

Mounting brackets attach to a pipe diameter of Ø50-160 mm (2.0-6.3 in).

Mounting bracket kit #36210002
Downtilt bracket kit #36114003

Electrical specifications

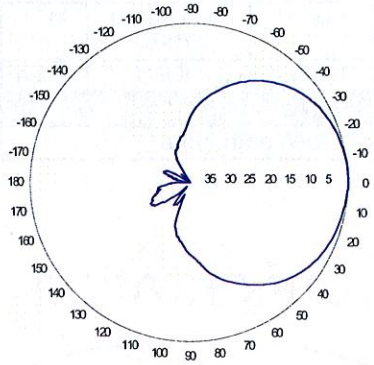
	Frequency Range	696-900 MHz
	Impedance	50Ω
3)	Connector(s)	NE or E-DIN 2 ports / center
1)	VSWR	≤ 1.4:1
	Polarization	Slant ± 45°
1)	Isolation Between Ports	< -30 dB
1)	Gain	13 dBd
2)	Power Rating	500 W
1)	Half Power Angle	
	H-Plane	63°
	E-Plane	15°
1)	Electrical Downtilt	0°
1)	Null Fill	5%
	Lightning Protection	Direct Ground

Patented Dipole Design: U.S. Patent No. 6,608,600 B2

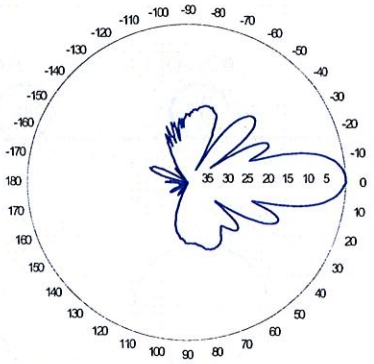
1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
4) The antenna weight listed above does not include the bracket weight.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

Radiation pattern[1)]



Horizontal



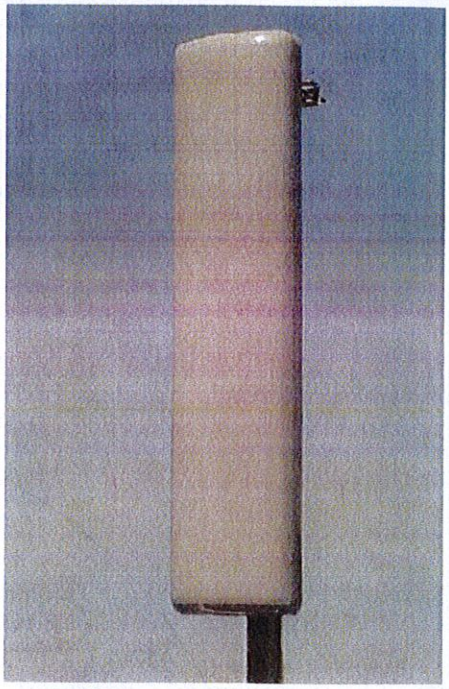
Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.

CF Denotes a Center-Fed Connector.

696-900 MHz



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- Watercut brass feedline assembly for consistent performance.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad band-width and superior performance.
- Air as insulation for virtually no internal signal loss.

This Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

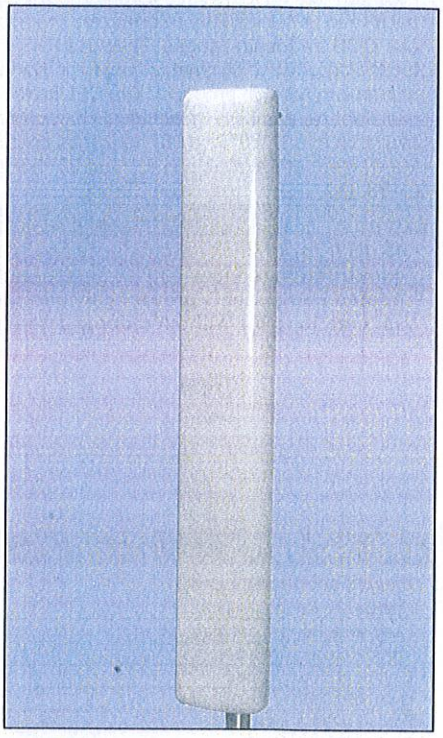
Antenna available with center-fed connectors only.

Amphenol Antel, Inc. 1300 Capital Drive Rockford, Illinois 61109 USA Tel. (815) 399-0001
Toll-Free (888) 417-9562 Fax. (815) 399-0156 antel@antelinc.com www.antelinc.com

Revision Date: 2/12/08

Slant ±45° Dual Polarized FET Panel 63° / 14.5 dBd
696-900 MHz

BXA-70063/6CF ___
When ordering replace "__" with connector type.



Mechanical specifications

Length	1804	mm	71.0	in
Width	285	mm	11.2	in
Depth	114	mm	4.5	in
Depth with z-bracket	154	mm	6.1	in
Weight [4]	7.9	kg	17.0	lbs
Wind Area Fore/Aft	0.51	m^2	5.5	ft^2
Wind Area Side	0.21	m^2	2.2	ft^2
Max Wind Survivability	>201	km/hr	>125	mph
Wind Load @ 100 mph (161 km/hr)				
Fore/Aft	753	N	169	lbf
Side	351	N	79	lbf

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiber-glass radome.

Mounting & Downtilting

Mounting hardware attaches to pipe diameter Ø50-160 mm; Ø2.0-6.3 in

Mounting Bracket Kit	36210002
Downtilt Bracket Kit	36114003

Electrical specifications

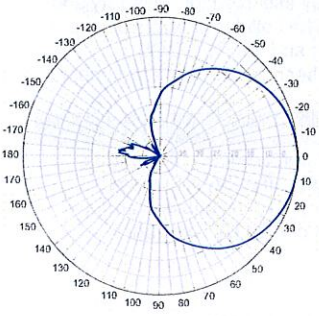
Frequency Range	696-900 MHz
Impedance	50Ω
Connector [3]	NE or E-DIN Female 2 ports / Center
VSWR [1]	≤ 1.35:1
Polarization	Slant ±45°
Isolation Between Ports [1]	< -25 dB
Gain [1]	14.5 dBd 16.5 dBi
Power Rating [2]	500 W
Half Power Angle [1]	
Horizontal Beamwidth	63°
Vertical Beamwidth	11°
Electrical downtilt [5]	0°
Null fill [1]	5%
Lightning protection	Direct ground

Patented Dipole Design: U.S. Patent No. 6,608,600 B2

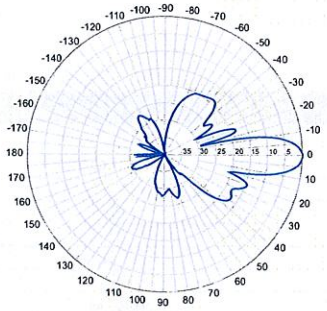
1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
4) Antenna weight does not include brackets.
5) Add'l downtilts may be available. Check website for details.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

Radiation-pattern[1]
750 MHz

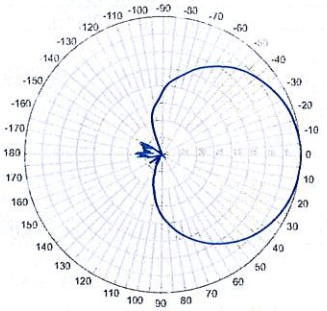


Horizontal

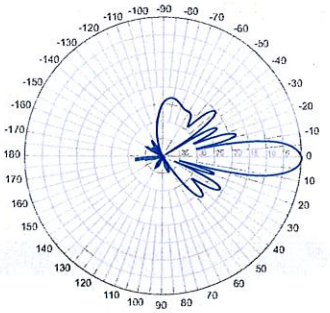


Vertical

850 MHz



Horizontal



Vertical

696-900 MHz

Featuring our Exclusive 3T Technology™ Antenna Design:

- Watercut brass feedline assembly for consistent performance.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad band-width and superior performance.
- Air as insulation for virtually no internal signal loss.

Warranty:
This antenna is under a five-year limited warranty for repair or replacement.

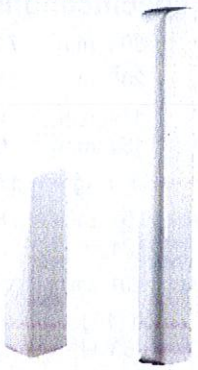
Revision Date: 01/08/09

Product Data Sheet **APL868013-42T0**

Maximizer® Log Periodic Antenna, 806-894, 80deg, 14.1dBi, 1.2m, FET, 0deg

Product Description

The Celwave® Maximizer series is a log periodic dipole array which uses a patented design to achieve a front-to-back ratio of 45 dB, the highest front-to-back ratio in the industry. Maximizers are available to cover ESMR, AMPS, PCS and DCS frequency ranges. They use RFS's patented monolithic CELlite® technology, which eliminates cable and soldered joints to reduce the possibility of inter-modulation products. The CELlite technology assures high reliability and excellent repeatability of electrical characteristics. The cellular Maximizers are available in 65°, 80° and 90° horizontal beamwidths and the PCS/DCS Maximizers are available in 65° and 90° horizontal beamwidths. Patent number 6,133,889.



Features/Benefits

• 45 dB front-to-back ratio reduces co-channel interference.• Monolithic construction reduces IM.• No solder joints, high reliability.• Surface treated components prevent galvanic corrosion.• UV stabilized radome assures long life without radome deterioration due to UV exposure.

Technical Specifications

Electrical Specifications

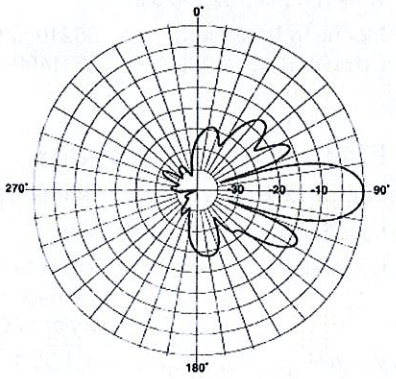
Frequency Range, MHz	806-894
Horizontal Beamwidth, deg	80
Vertical Beamwidth, deg	15
Electrical Downtilt, deg	0
Gain, dBi (dBd)	14.1 (12)
Front-To-Back Ratio, dB	45
Polarization	Vertical
VSWR	< 1.5:1
Impedance, Ohms	50
Maximum Power Input, W	500
Lightning Protection	Direct Ground
Connector Type	7-16 DIN Female

Mechanical Specifications

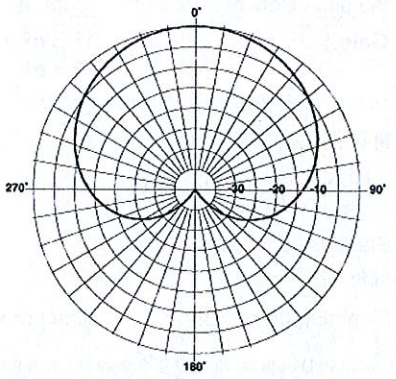
Dimensions - HxWxD, mm (in)	1219 x 152 x 203 (48 x 6 x 8)
Weight w/o Mtg Hardware, kg (lb)	2.8 (6.32)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	200 (125)
Max Wind Loading Area, m² (ft²)	0.307 (3.3)
Maximum Thrust @ Rated Wind, N (lbf)	916 (206)
Wind Load - Side @ Rated Wind, N (lbf)	743 (167)
Radome Material	UV Stabilized High Impact ABS
Shipping Weight, kg (lb)	7.9 (17.5)
Packing Dimensions, HxWxD, mm (in)	1270 x 305 x 203 (50 x 12 x 8)

Ordering Information

Mounting Hardware	APM21-3



Vertical Pattern



Horizontal Pattern

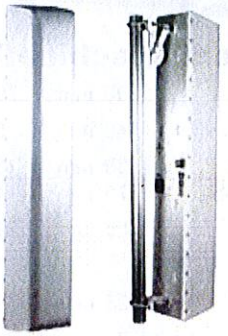
Other Documentation

Product Data Sheet APL866513-42T0

Maximizer® Log Periodic Antenna, 806-894, 65deg, 15.1dBi, 1.2m, FET, 0deg

Product Description

The Celwave® Maximizer series is a log periodic dipole array which uses a patented design to achieve a front-to-back ratio of 45 dB, the highest front-to-back ratio in the industry. Maximizers are available to cover ESMR, AMPS, PCS and DCS frequency ranges. They use RFS's patented monolithic CELlite® technology, which eliminates cable and soldered joints to reduce the possibility of inter-modulation products. The CELlite technology assures high reliability and excellent repeatability of electrical characteristics. The cellular Maximizers are available in 65°, 80° and 90° horizontal beamwidths and the PCS/DCS Maximizers are available in 65° and 90° horizontal beamwidths. Patent number 6,133,889.



FRONT BACK

Features/Benefits

• 45 dB front-to-back ratio reduces co-channel interference.• Monolithic construction reduces IM.• No solder joints, high reliability.• Surface treated components prevent galvanic corrosion.• UV stabilized radome assures long life without radome deterioration due to UV exposure.

Technical Specifications

Electrical Specifications

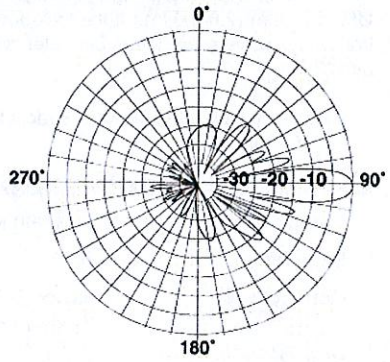
Frequency Range, MHz	806-894
Horizontal Beamwidth, deg	65
Vertical Beamwidth, deg	15
Electrical Downtilt, deg	0
Gain, dBi (dBd)	15.1 (13)
1st Upper Sidelobe Suppression, dB	>20
Upper Sidelobe Suppression, dB	>20
Front-To-Back Ratio, dB	45
Polarization	Vertical
VSWR	< 1.5:1
Impedance, Ohms	50
Maximum Power Input, W	500
Lightning Protection	Direct Ground
Connector Type	7-16 DIN Female

Mechanical Specifications

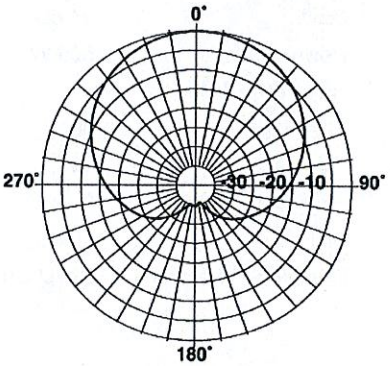
Dimensions - HxWxD, mm (in)	1219 x 234 x 203 (48 x 9.2 x 8)
Weight w/o Mtg Hardware, kg (lb)	7 (15.7)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	180 (112)
Max Wind Loading Area, m² (ft²)	0.376 (4.05)
Maximum Thrust @ Rated Wind, N (lbf)	903 (203)
Wind Load - Side @ Rated Wind, N (lbf)	594 (133.5)
Radome Material	UV Stabilized High Impact ABS
Shipping Weight, kg (lb)	9.1 (20)
Packing Dimensions, HxWxD, mm (in)	1594 x 343 x 349 (62.75 x 13.5 x 13.75)

Ordering Information

Mounting Hardware	APM21-3



Vertical Pattern



Horizontal Pattern

Vertically Polarized, Log Periodic 80° / 14 dBd

LPA-80080/6CF ___

When ordering replace "___" with connector type.

Mechanical specifications

Length	1800 mm	70.9 in
Width	140 mm	5.5 in
Depth	335 mm	13.2 in
Depth with z-bracket	375 mm	14.8 in
[4] Weight	9.5 kg	21.0 lbs
Wind Area		
Fore/Aft	0.25 m^2	2.7 ft^2
Side	0.60 m^2	6.5 ft^2
Rated Wind Velocity (Safety factor 2.0)	>295 km/hr	>183 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	415 N	93.3 lbs
Side	870 N	195.6 lbs

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

Mounting and Downtilting

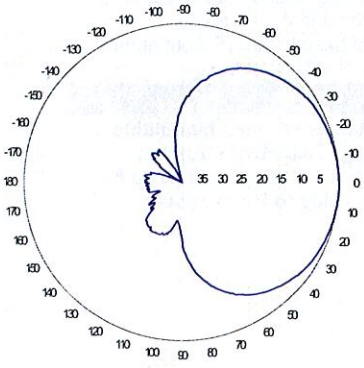
Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in). If the lock-down brace is used, the maximum diameter is Ø88.9 mm (3.5 in)

Mounting Bracket & Downtilt Bracket Kit #21699999

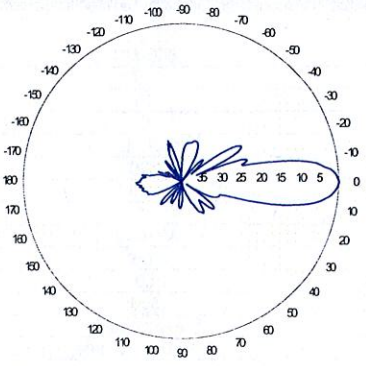
Electrical specifications

Frequency Range	806-960 MHz
Impedance	50Ω
[3] Connector(s)	NE or E-DIN 1 port / center
[1] VSWR	≤ 1.4:1
Polarization	Vertical
[1] Gain	14 dBd
[2] Power Rating	500 W
[1] Half Power Angle	
H-Plane	80°
E-Plane	10°
[1] Electrical Downtilt	0°
[1] Null Fill	10%
Lightning Protection	Direct Ground

Radiation pattern[1]



Horizontal

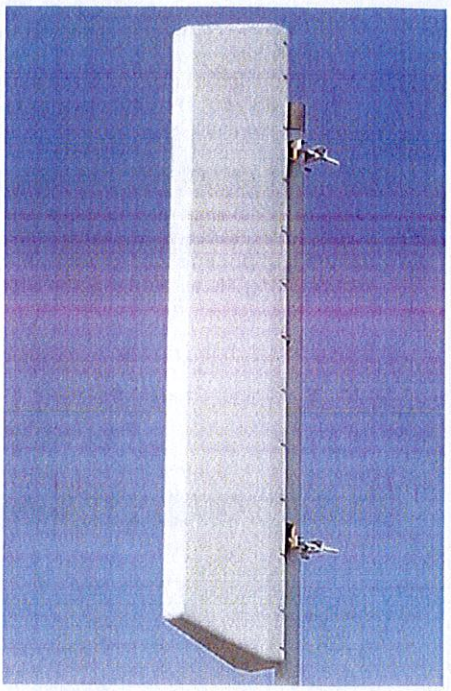


Vertical

Featuring upper side lobe suppression.

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad band-width and superior performance.
- Air as insulation for virtually no internal signal loss.

This Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna available with center-fed connector only.

1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector. E-DIN indicates an elongated DIN connector.
4) The antenna weight listed above does not include the bracket weight.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

CF Denotes a Center-Fed Connector.

806-960 MHz

Amphenol Antel, Inc. 1300 Capital Drive Rockford, Illinois 61109 USA Tel. (815) 399-0001
Toll-Free (888) 417-9562 Fax. (815) 399-0156 antel@antelinc.com www.antelinc.com

Amphenol Antel, Inc. The Antenna Technology Company

Revision Date: 7/5/07

Amphenol ANTENNA SOLUTIONS

BXA-171085-8BF-EDIN-X

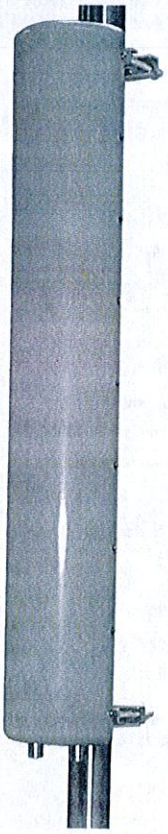
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 85° | 16.4 dBi

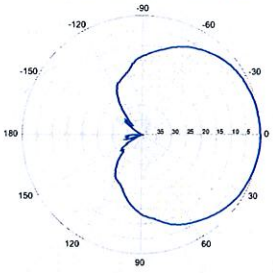
Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	88°	85°	80°
Vertical beamwidth	7°	7°	7°
Gain	13.5 dBd / 15.6 dBi	13.9 dBd / 16.0 dBi	14.3 dBd / 16.4 dBi
Electrical downtilt (X)	0, 2, 4		
Impedance	50Ω		
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 / Bottom		
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-171085-8BF-EDIN-X-FP		

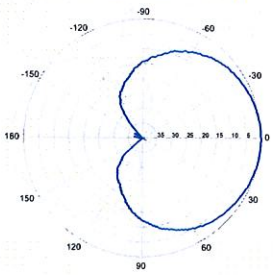


BXA-171085-8BF-EDIN-X



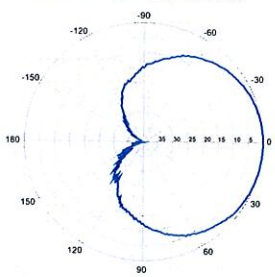
Horizontal | 1710-1880 MHz

BXA-171085-8BF-EDIN-X



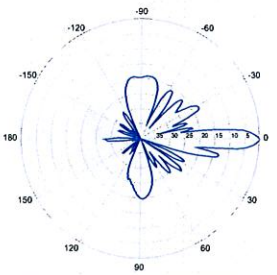
Horizontal | 1850-1990 MHz

BXA-171085-8BF-EDIN-X



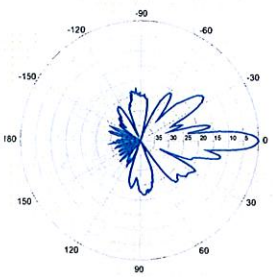
Horizontal | 1920-2170 MHz

BXA-171085-8BF-EDIN-0



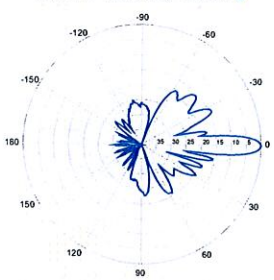
0° | Vertical | 1710-1880 MHz

BXA-171085-8BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171085-8BF-EDIN-0



0° | Vertical | 1920-2170 MHz

Amphenol ANTENNA SOLUTIONS

BXA-171063-8BF-EDIN-X

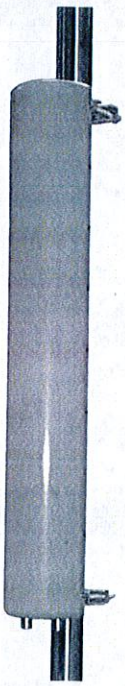
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 63° | 17.4 dBi

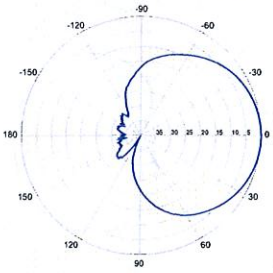
Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 8		
Impedance	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 / Bottom		
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 m^2 Side: 0.14 m^2	Front: 2.0 ft^2 Side: 1.5 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 lbf

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

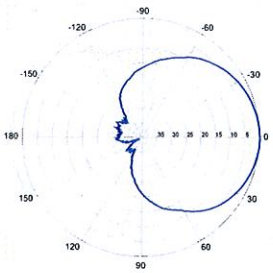


BXA-171063-8BF-EDIN-X



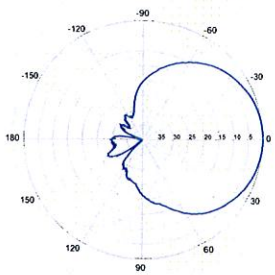
Horizontal | 1710-1880 MHz

BXA-171063-8BF-EDIN-X



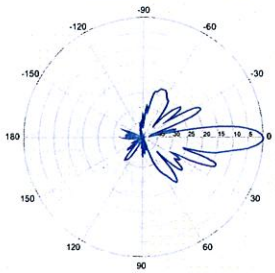
Horizontal | 1850-1990 MHz

BXA-171063-8BF-EDIN-X



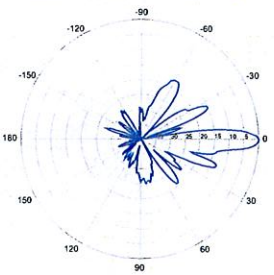
Horizontal | 1920-2170 MHz

BXA-171063-8BF-EDIN-0



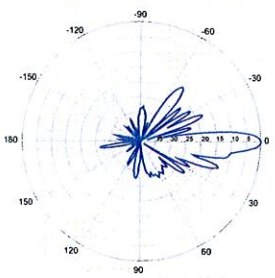
0° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-0



0° | Vertical | 1920-2170 MHz

Product Data Sheet **FD9R6004/2C-3L**

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Product Description

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.

Features/Benefits

- **LTE ready design**
- **Extremely Low Insertion Loss**
- **High level of Rejection between bands – Protection against interferences**
- **Extremely High Power Handling Capability**
- **Integrated DC block/bypass versions available**
- **Very compact & small size design – Easy installation and reduced tower load**
- **In-line long-neck connectors for easy connection & waterproofing**
- **Exceptional reliability & environmental protection (IP 67)**
- **Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)**
- **Grounding already provided through the mounting bracket**
- **Kit available for easy dual mount**

Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Frequency Band, MHz	698-2200
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710 - 2170 MHz path, with mounting hardware SEM2-1A
Mounting	Wall, pole
Frequency Range Low Frequency Path, MHz	698-960
Frequency Range High Frequency Path, MHz	1710-2200
Return Loss All Ports, Min, dB	19
Power Handling Continuous, Max, W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max, W	15000 in low frequency path & 8000 in high frequency path
Impedance, Ohms	50
Insertion Loss 698-960 MHz Path, Typ, dB	0.07
Insertion Loss 1710-2200MHz path, Typ, dB	0.13
Rejection Between Bands Min/Typ, dB	58/64@698-960MHz; 60/70@1710-2200MHz
Rejection between Bands, Min, dB	60
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
Temperature Range, °C (°F)	-40 to +60 (-40 to +140)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	EN/IEC61000-4-5 Level 4
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Application	LTE 700MHz, GSM900/3G/UMTS, GSM900/GSM1800, Cellular 800/PCS
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

Notes