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

September 6, 2011

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

RE: **EM-VER-118-110819** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 76 East Ridge Road, Ridgefield, 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 August 18, 2011. 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
Executive Director

LR/CDM/laf

c: The Honorable Rudolph P. Marconi, First Selectman, Town of Ridgefield
Betty Brosius, Town Planner, Town of Ridgefield

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
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August 22, 2011

The Honorable Rudolph P. Marconi
First Selectman
Town of Ridgefield
Town Hall
400 Main Street
Ridgefield, CT 06877

RE: **EM-VER-118-110819** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 76 East Ridge Road, Ridgefield, Connecticut.

Dear First Selectman Marconi:

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 September 5, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts NHB

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Betty Brosius, Town Planner, Town of Ridgefield

CSC
CONNECTICUT SITING COUNCIL

ROBINSON & COLE LLP

EM-VER-118-110819

KENNETH C. BALDWIN

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

August 18, 2011

ORIGINAL

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

Re: **Notice of Exempt Modification – Antenna Swap**
76 East Ridge Road, Ridgefield, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains wireless telecommunications antennas at the top of the existing 130-foot tower at the above-referenced address. The tower is owned by the Town of Ridgefield. The Siting Council ("Council") approved Cellco's shared use of this tower in 1989. More recently, on November 8, 2010, the Council approved Cellco's request to replace all of its existing antennas with newer model antennas. The work associated with the 2010 antenna replacement proposal was not completed and the scope of work for these facility modifications has now changed.

Cellco now intends to modify its East Ridge Road facility by replacing all twelve of its antennas with three (3) model BXA-80080/4CF cellular antennas; three (3) model MG D3-800T0 PCS antennas; and six (6) model APX75-866512T0 LTE antennas. All replacement antennas will be located at the same 130-foot level on the tower. Cellco will also install six (6) additional coax cables on the outside of the monopole and six (6) antenna cable diplexers on Cellco's antenna platform. 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 Rudy Marconi, First Selectman of the Town of Ridgefield. The Town of Ridgefield is 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 any increase in the overall height of the existing tower. Cellco's antennas and cable diplexers will be located on the existing antenna platform at the 130-foot level on the tower.

2. The proposed modifications will not involve any changes to Cellco's 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 Power Density table for the 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:
Rudy Marconi, Ridgefield First Selectman
Sandy M. Carter

Slant +/- 45° Dual Polarized, Panel 80° / 12 dBd

BXA-80080/4CF ___

When ordering replace "___" with connector type.

Mechanical specifications

Length	1225 mm	48.2 in
Width	285 mm	11.2 in
Depth	150 mm	5.9 in
Depth with z-bracket	190 mm	7.5 in
[4] Weight	6.5 kg	14.3 lbs
Wind Area		
Fore/Aft	0.35 m^2	3.76 ft^2
Side	0.18 m^2	1.98 ft^2
Rated Wind Velocity (Safety factor 2.0)	>380 km/hr	>236 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	500 N	112.3 lbs
Side	277 N	62.2 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	806-900 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	12 dBd
[2]	Power Rating	500 W
[1]	Half Power Angle	
	H-Plane	80°
	E-Plane	15°
[1]	Electrical Downtilt	0°
[1]	Null Fill	5%
	Lightning Protection	Direct Ground

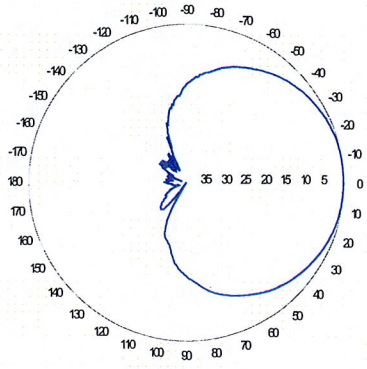
*Also available for 870-960 MHz. Consult your sales director for more information.

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

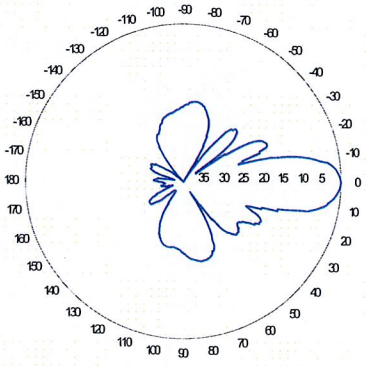
1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector. E-DIN indicates an elongated DIN connector.
4) The antenna weight listed above does not include the bracket weight.

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

Radiation pattern[1]



Horizontal



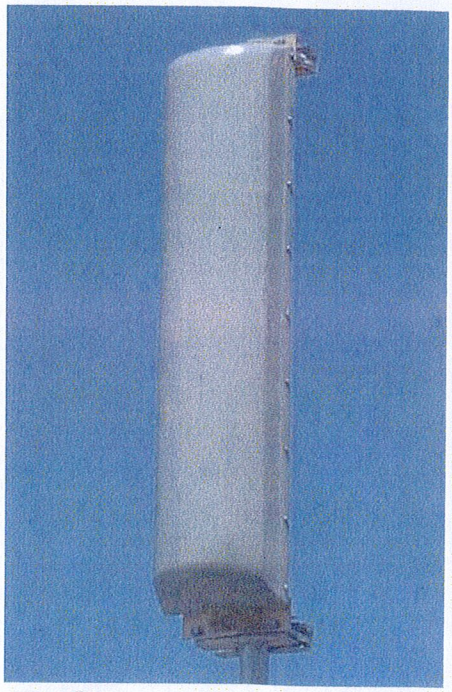
Vertical

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.

806-900 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

Amphenol Antel, Inc. The Antenna Technology Company

Revision Date: 7/3/07

SINGLE-BAND PANEL ANTENNA

BROADBAND 1710-2170 MHz

MGD3-800TX

***BROADBAND** 1710-2170 MHz*

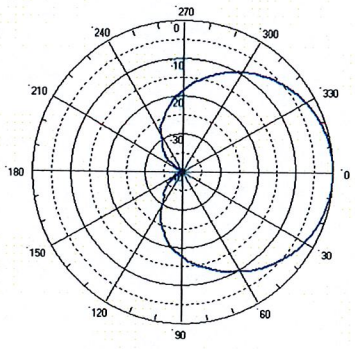
1710 - 2170		
1710-1880	1850-1990	1920-2170
H66º V7.2º	H64º V6.6º	H63º V6.3º
Fixed Tilt 0º,2º,4º,6º	Fixed Tilt 0º,2º,4º,6º	Fixed Tilt 0º,2º,4º,6º

ELECTRICAL SPECIFICATIONS

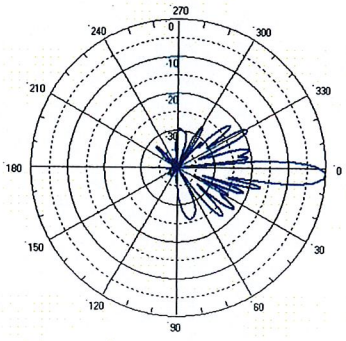
Antenna Model	MGD3-800TX		
Polarization	± 45º		
Frequency	***1710-2170***		
	1710 - 1880	1850 - 1990	1920 - 2170
Horizontal Beamwidth	66º	64º	63º
Vertical Beamwidth	7.2º	6.6º	6.3º
Gain (dBi)	18	18	18.5
Vertical Electrical Tilt	FIXED 0º,2º,4º,6º	FIXED 0º,2º,4º,6º	FIXED 0º,2º,4º,6º
Upper Sidelobe Suppression for the 1st lobe above main beam (dB)	20	20	20
Front-to-Back Ratio @ 180º ± 20º (dB)	> 30	> 30	> 30
VSWR	< 1.4 : 1	< 1.4 : 1	< 1.4 : 1
Cross Polar Ratio @ ± 60º (dB)	> 10	> 10	> 10
Isolation between Ports (dB)	> 30	> 30	> 30
Maximum Power Per Input (W)	250		
Intermodulation (dBc)	< - 150		
Impedance (Ω)	50		

MECHANICAL SPECIFICATIONS

Connectors		2 X 7/16 Female
Connector Position		Bottom
Survival Wind Speed	km/h (mph)	200 (125)
Front Windload N @ 160 km/h	(lbs @ 100 mph)	370 (85)
Lateral Windload N @ 160 km/h	(lbs @ 100 mph)	170 (40)
Radome Color		Grey, paintable
Humidity		100%
Antenna Weight	kg (lbs)	7 (15)
Antenna Dimension mm (in) H X W X D		1340 X 170 X 100 (53 X 7 X 4)



H&V Pattern



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Product Data Sheet **APX75-866512-CT0**

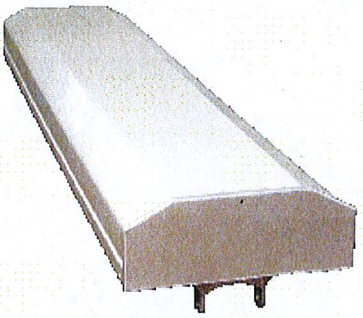
Optimizer® Dual Polarized Antenna, 698-896, 65deg, 14.1dBi, 1.3m, FET, 0deg

Product Description

Wideband antenna for dense networks where site aspect is essential.

Features/Benefits

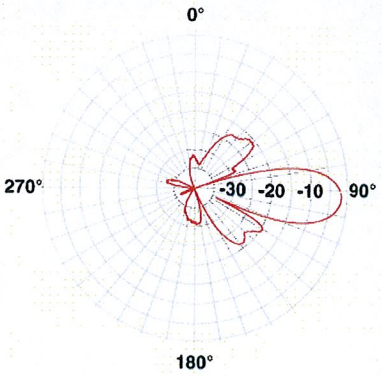
- **Wideband performance 698-896 MHz**
- **High sidelobe suppression**
- **Null fill**
- **Dual polarization**
- **High front-to-back ratio**



Technical Specifications

Electrical Specifications

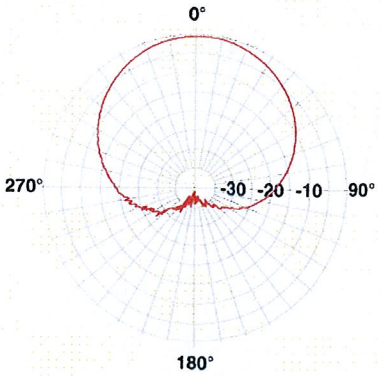
Frequency Range, MHz	698-896
Horizontal Beamwidth, deg	66 +/-5
Vertical Beamwidth, deg	15-19
Electrical Downtilt, deg	0
Gain, dBi (dBd)	14.1 (12)
1st Upper Sidelobe Suppression, dB	>18
Upper Sidelobe Suppression, dB	>18
Front-To-Back Ratio, dB	>30
Polarization	Slant +/-45 degrees
VSWR	1.40:1
Isolation between Ports, dB	>30
3rd Order IMP @ 2 x 43 dBm, dBc	>150
Impedance, Ohms	50
Maximum Power Input, W	500
Lightning Protection	Chassis Ground
Connector Type	(2) 7-16 Long Neck DIN Female



Vertical Pattern

Mechanical Specifications

Dimensions - HxWxD, mm (in)	1320.8 x 311.2 x 120.7 (52 x 12.25 x 4.75)
Weight w/o Mtg Hardware, kg (lb)	9.0 (19.8)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	160 (100)
Max Wind Loading Area, m² (ft²)	0.41 (4.39)
Radome Material	ASA Plastic
Radome Color	Light Grey RAL7035
Mounting Hardware Material	Diecasted Aluminum



Horizontal Pattern

Ordering Information

Mounting Hardware	APM40-2
Mounting Pipe Diameter, mm (in)	60-120 (2.36-4.72)
Mounting Hardware Weight, kg (lb)	3.4 (7.5)

Other Documentation

APM40 Series Datasheet
APM40 Series Installation Instructions

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**

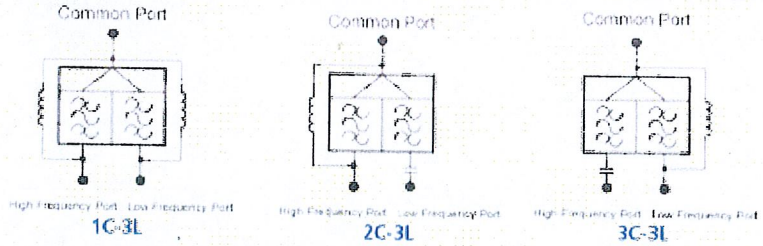
Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Frequency Band, MHz	698-2200
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)
Frequency Range Low Frequency Path, MHz	698-960
Frequency Range High Frequency Path, MHz	1710-2200
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 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
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

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

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



1C-3L 2C-3L 3C-3L

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 FT9DW/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)	

Site Name: Ridgefield, CT
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW PCS	1970	15	370	5550	128	0.1218	1.0	12.18%
VZW Cellular	869	9	276	2484	128	0.0545	0.579333	9.41%
VZW 700	757	2	574	1148	128	0.0252	0.497333	5.07%

Total Percentage of Maximum Permissible Exposure 26.66%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used.

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

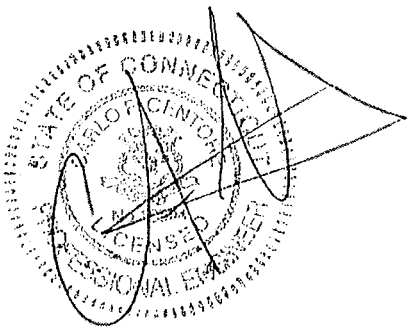
130-ft Existing Valmont Monopole

Proposed Verizon Wireless
LTE Antenna Upgrade

Verizon Wireless Site Ref:
Ridgefield

76 East Ridge Road
Ridgefield, CT

Centek Project No. 11001.CO39



Date: July 22, 2011

Prepared for:

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

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

Table of Contents

Introduction

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

The host tower is a 130-ft tall, three-section, twelve sided, tapered monopole, originally designed and manufactured by Valmont Industries Inc.; order no. 10533-89 dated October 24, 1989. The tower geometry, structure member sizes and foundation system information were obtained from the original manufacturers design documents.

The tower is made up of three (3) tapered vertical sections consisting of A572-65 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 16.26-in at the top and 43.80-in at the base.

Antenna and appurtenance information were obtained from a previous structural report by L & W Engineering; job no. 2217-01 dated November 5, 1999 and field verification from grade by Centek personnel on September 20, 2010.

Verizon Wireless proposes the replacement of twelve (12) existing panel antennas with twelve (12) panel antennas and six (6) diplexers on the existing 13' platform with handrails. 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 was designed to support several communication antennas. The existing, proposed and future loads considered in this analysis consist of the following:

- UNKNOWN (EXSITING):
  Antennas: One (1) RFS PD 440 dipole antenna mounted on the Verizon 13-ft platform with handrails with an elevation of 130-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the inside of the existing tower.
- SPRINT (EXSITING):
  Antennas: Six (6) 5-ft panel antennas mounted on a 13-ft platform with handrails with a RAD center elevation of 118-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the inside of the existing tower.
- T-MOBILE (EXSITING):
  Antennas: Six (6) 5-ft panel antennas and six (6) TMAs mounted on a 13-ft platform with handrails with a RAD center elevation of 100-ft above grade level.
  Coax Cables: Twenty-four (24) 7/8" ∅ coax cables running on the inside of the existing tower.

- UNKNOWN (EXSITING):
  Antennas: One (1) RFS PD 440 dipole antenna and two (2) RFS PD 1142 Omni-directional whip antennas mounted on the T-Mobile 13-ft platform with handrails with an elevation of 100-ft above grade level.
  Coax Cables: Three (3) 1/2" ∅ coax cables running on the inside of the existing tower.
- UNKNOWN (EXSITING):
  Antennas: One (1) RFS PD 1121-6 dipole antenna and one (1) RFS PD 1142 Omni-directional whip antenna mounted on one (1) 3-ft standoff with an elevation of 86-ft above grade level.
  Coax Cables: Two (2) 1/2" ∅ coax cables running on the inside of the existing tower.
- UNKNOWN (EXSITING):
  Antennas: One (1) RFS PD 1142 and one (1) RFS PD 1167 Omni-directional whip antennas mounted on two (2) 3-ft standoffs with an elevation of 58-ft above grade level.
  Coax Cables: Two (2) 1/2" ∅ coax cables running on the inside of the existing tower.
- VERIZON (EXISTING TO REMAIN):
  Coax Cables: Twelve (12) 7/8" ∅ coax cables running on the inside of the existing tower.
- VERIZON (EXSITING TO REMAIN):
  Antennas: One (1) GPS antenna mounted on a 3-ft standoff with an elevation of 50-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the inside of the existing tower.
- **VERIZON (EXISTING TO REMOVE):**
  Antennas: Six (6) Allgon 7130 and six (6) Andrew Decibel 948F85T2E-M panel antennas mounted on the existing 13-ft platform with handrails with a RAD center elevation of 130-ft above grade level.
- **VERIZON (PROPOSED):**
  Antennas: Six (6) RFS APX75-866512T0 panel antennas, three (3) Antel BXA-80080/4CF panel antennas, three (3) RYMSA MG D3-800T0 panel antennas and six (6) RFS FD9R6004/2C-3L Diplexers mounted on the existing 13-ft platform with handrails with a RAD center elevation of 130-ft above grade level.
  Coax Cables: Six (6) 7/8" ∅ coax cables running on the exterior of the existing tower.

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 or reinforcement drawings.
- 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 existing coax cables to be installed as indicated in this report.

Analysis

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

The existing tower was analyzed for 85 mph basic wind speed (fastest mile) with no ice and 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

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:	Fairfield; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Ridgefield; v = 95 mph (3 second gust) equivalent to v = 77.5 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA wind speed criteria controls.	
Load Cases:	Load Case 1; 85 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; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 mph wind speed. 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 1, per RISATower "Section Capacity Table", this tower was found to be at **92.9%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L2)	44.84' - 89.92'	92.9%	**PASS**

Foundation and Anchors

The existing foundation consists of a 6-ft ∅ x 21.0-ft long reinforced concrete caisson. The base of the tower is connected to the foundation by means of (12) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 8.5-ft into the concrete foundation structure.

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

- The tower base reactions developed from the governing Load Case 1 were used in the verification of the foundation and its anchors:

Base Reactions	Vector	Proposed Load
Base	Shear	**24,261 kips**
	Axial	**24,160 kips**
	Moment	**26,007 in-kips**

- The foundation was found to be within allowable limits based on the original design reactions.

Foundation	Design Limit	Original Design Reaction [1]	Proposed Loading	Result
Reinf. Conc. Cassion	Moment	27,091 in-kips	26,007 in-kips	**PASS**
	Shear	24,310 lbs	24,261 lbs	**PASS**
	Axial	22,000 lbs	24,160 lbs	**PASS** [2]

Note: 1. Original design reactions taken from SAC Eng. Inc., drawing no. 1989-15A drawing 1 of 1 dated 9.23.89.
2. Axial force deemed acceptable.

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

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	84.2%	**PASS**
Base Plate	Bending	83.7%	**PASS**

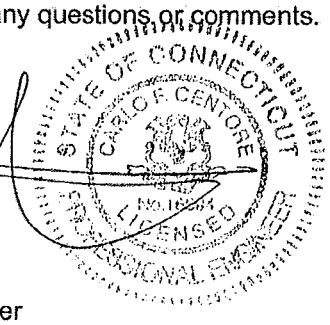
Conclusion

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

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

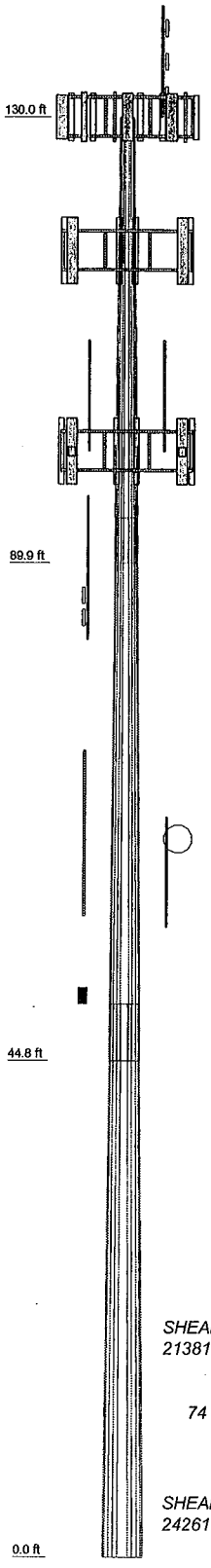
General Description of Structural Analysis Program

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

RISATower Features:

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

Section	1	2	3
Length (ft)	40.08	49.17	50.00
Number of Sides	12	12	12
Thickness (in)	0.2190	0.3130	0.3750
Socket Length (ft)	4.08	5.17	
Top Dia (in)	16.2600	23.7435	32.7973
Bot Dia (in)	25.0800	34.5600	43.8000
Grade		A572-65	
Weight (lb) 14621.3	1966.9	4862.8	7791.6



AXIAL
30789 lb

SHEAR
21381 lb

MOMENT
23754 kip-in

TORQUE 20 kip-in
74 mph WIND - 0.5000 in ICE

AXIAL
24160 lb

SHEAR
24261 lb

MOMENT
26007 kip-in

TORQUE 13 kip-in
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
13-ft Platform w/ Handrails (Verizon - Existing)	130	(2) 5' Panel Antenna (T-Mobile - Existing)	100
BXA-80080/4CF (Verizon - Proposed)	130	(2) 5' Panel Antenna (T-Mobile - Existing)	100
MG D3-800TX (Verizon - Proposed)	130	(2) 5' Panel Antenna (T-Mobile - Existing)	100
APX75-866512T0 (Verizon - Proposed)	130	(2) TMA 10"x8"x3" (T-Mobile - Existing)	100
APX75-866512T0 (Verizon - Proposed)	130	(2) TMA 10"x8"x3" (T-Mobile - Existing)	100
BXA-80080/4CF (Verizon - Proposed)	130	(2) TMA 10"x8"x3" (T-Mobile - Existing)	100
MG D3-800TX (Verizon - Proposed)	130	PD1142-1	100
APX75-866512T0 (Verizon - Proposed)	130	PD1142-1	100
APX75-866512T0 (Verizon - Proposed)	130	440-3	100
BXA-80080/4CF (Verizon - Proposed)	130	Valmont 13' Platform w/Rails (Verizon - Existing)	100
MG D3-800TX (Verizon - Proposed)	130	3' Stand-off Mount	86
APX75-866512T0 (Verizon - Proposed)	130	PD1142-1	86
APX75-866512T0 (Verizon - Proposed)	130	PD1121-6	86
(2) FD9R6004/2C-3L Diplexer (Verizon - Proposed)	130	PD1142-1	58
(2) FD9R6004/2C-3L Diplexer (Verizon - Proposed)	130	3' Stand-off Mount	58
(2) FD9R6004/2C-3L Diplexer (Verizon - Proposed)	130	3' Stand-off Mount	58
440-3	130	PD1167	58
(2) 5' Panel Antenna (Sprint - Existing)	118	3' GPS Stand-off Mount (Verizon - Existing)	50
(2) 5' Panel Antenna (Sprint - Existing)	118	GPS (Verizon - Existing)	50
(2) 5' Panel Antenna (Sprint - Existing)	118		
13-ft Platform w/ Handrails (Verizon - Existing)	118		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 92.9%

Centek Engineering Inc.
63-2 North Branford Road
Branford, CT 06405
Phone: 203.488.0580
FAX: 203.488.8587

Job: *11001.CO33 - Ridgefield*		
Project: *130' Valmont Monopole - 76 East Ridge Rd., Ridgefield, CT*		
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 07/22/11	Scale: NTS
Path: J:\Jobs\11100\100.W\CO39 - Ridgefield\Calcs\ERI\130' Valmont Monopole.er		Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole 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		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	130.00-89.92	40.08	4.08	12	16.2600	25.0800	0.2190	0.8760	A572-65 (65 ksi)
L2	89.92-44.84	49.17	5.17	12	23.7435	34.5600	0.3130	1.2520	A572-65 (65 ksi)
L3	44.84-0.00	50.00		12	32.7973	43.8000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.8336	11.3118	371.5183	5.7427	8.4227	44.1093	752.7969	5.5673	3.7708	17.218
	25.9647	17.5315	1383.0622	8.9002	12.9914	106.4595	2802.4590	8.6285	6.1345	28.012
L2	25.5110	23.6147	1654.7431	8.3881	12.2991	134.5415	3352.9581	11.6224	5.5244	17.65
	35.7791	34.5162	5167.1820	12.2604	17.9021	288.6358	10470.1117	16.9878	8.4232	26.911
L3	35.1313	39.1499	5252.9581	11.6072	16.9890	309.1977	10643.9173	19.2684	7.7847	20.759
	45.3451	52.4357	12620.9652	15.5461	22.6884	556.2739	25573.4973	25.8073	10.7334	28.622

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 130.00-89.92				1	1	1		
L2 89.92-44.84				1	1	1		
L3 44.84-0.00				1	1	1		

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	√
Anchor bolt grade	A615
Anchor bolt size	2.2500 in
Number of bolts	12
Embedment length	102.0000 in
f'_c	4 ksi
Grout space	4.5000 in
Base plate grade	A607-60
Base plate thickness	2.5000 in
Bolt circle diameter	49.7500 in
Outer diameter	56.0800 in
Inner diameter	24.0000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7/8 (Verizon - Existing)	A	No	Inside Pole	130.00 - 10.00	12	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
1/2 (Verizon - Existing)	A	No	Inside Pole	50.00 - 10.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
LCF158-50J (1 5/8 FOAM) (Sprint - Existing)	C	No	Inside Pole	118.00 - 10.00	6	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
LCF78-50J (7/8 FOAM) (T-Mobile - Existing)	C	No	Inside Pole	100.00 - 10.00	24	No Ice	0.00	0.53
						1/2" Ice	0.00	0.53
1/2 (Town)	A	No	Inside Pole	58.00 - 28.00	2	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1/2 (Town)	A	No	Inside Pole	86.00 - 28.00	2	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
1/2 (Town)	A	No	Inside Pole	130.00 - 28.00	3	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
1/2 (Town)	A	No	Inside Pole	130.00 - 28.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
7/8 (Verizon - Proposed)	A	No	CaAa (Out Of Face)	130.00 - 10.00	2	No Ice	0.11	0.54
						1/2" Ice	0.21	1.52
7/8 (Verizon - Proposed)	A	No	CaAa (Out Of Face)	130.00 - 10.00	4	No Ice	0.00	0.54
						1/2" Ice	0.00	1.52

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	130.00-89.92	A	0.000	0.000	0.000	8.898	429.66
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	283.22
L2	89.92-44.84	A	0.000	0.000	0.000	10.009	511.76
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	822.33
L3	44.84-0.00	A	0.000	0.000	0.000	7.734	380.99
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	635.41

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	130.00-89.92	A	0.500	0.000	0.000	0.000	16.913	665.33
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	283.22
L2	89.92-44.84	A	0.500	0.000	0.000	0.000	19.025	776.85
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	822.33
L3	44.84-0.00	A	0.500	0.000	0.000	0.000	14.701	585.82
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	635.41

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	130.00-89.92	0.0000	-0.2950	0.0000	-0.4894
L2	89.92-44.84	0.0000	-0.3055	0.0000	-0.5254
L3	44.84-0.00	0.0000	-0.2387	0.0000	-0.4241

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
13-ft Platform w/ Handrails (Verizon - Existing)	C	None			0.0000	130.00	No Ice	53.00	53.00	2000.00
							1/2" Ice	68.00	68.00	3000.00
BXA-80080/4CF (Verizon - Proposed)	A	From Face	3.00		0.0000	130.00	No Ice	5.25	2.84	0.01
			6.00				1/2" Ice	5.64	3.15	31.01
			0.00							
MG D3-800TX (Verizon - Proposed)	A	From Face	3.00		0.0000	130.00	No Ice	3.45	2.22	0.02
			4.00				1/2" Ice	3.80	2.55	20.09
			0.00							
APX75-866512T0 (Verizon - Proposed)	A	From Face	3.00		0.0000	130.00	No Ice	6.19	2.63	0.02
			0.00				1/2" Ice	6.61	2.95	32.82
			0.00							
APX75-866512T0 (Verizon - Proposed)	A	From Face	3.00		0.0000	130.00	No Ice	6.19	2.63	0.02
			-4.00				1/2" Ice	6.61	2.95	32.82
			0.00							
BXA-80080/4CF (Verizon - Proposed)	B	From Face	3.00		0.0000	130.00	No Ice	5.25	2.84	0.01
			6.00				1/2" Ice	5.64	3.15	31.01
			0.00							
MG D3-800TX (Verizon - Proposed)	B	From Face	3.00		0.0000	130.00	No Ice	3.45	2.22	0.02
			4.00				1/2" Ice	3.80	2.55	20.09
			0.00							
APX75-866512T0 (Verizon - Proposed)	B	From Face	3.00		0.0000	130.00	No Ice	6.19	2.63	0.02
			0.00				1/2" Ice	6.61	2.95	32.82
			0.00							
APX75-866512T0 (Verizon - Proposed)	B	From Face	3.00		0.0000	130.00	No Ice	6.19	2.63	0.02
			-4.00				1/2" Ice	6.61	2.95	32.82
			0.00							
BXA-80080/4CF (Verizon - Proposed)	C	From Face	3.00		0.0000	130.00	No Ice	5.25	2.84	0.01
			6.00				1/2" Ice	5.64	3.15	31.01
			0.00							
MG D3-800TX (Verizon - Proposed)	C	From Face	3.00		0.0000	130.00	No Ice	3.45	2.22	0.02
			4.00				1/2" Ice	3.80	2.55	20.09
			0.00							
APX75-866512T0 (Verizon - Proposed)	C	From Face	3.00		0.0000	130.00	No Ice	6.19	2.63	0.02
			0.00				1/2" Ice	6.61	2.95	32.82
			0.00							
APX75-866512T0 (Verizon - Proposed)	C	From Face	3.00		0.0000	130.00	No Ice	6.19	2.63	0.02
			-4.00				1/2" Ice	6.61	2.95	32.82
			0.00							
(2) FD9R6004/2C-3L Diplexer (Verizon - Proposed)	A	From Face	3.00		0.0000	130.00	No Ice	0.37	0.08	3.00
			0.00				1/2" Ice	0.45	0.14	5.30
			0.00							
(2) FD9R6004/2C-3L Diplexer (Verizon - Proposed)	B	From Face	3.00		0.0000	130.00	No Ice	0.37	0.08	3.00
			0.00				1/2" Ice	0.45	0.14	5.30
			0.00							
(2) FD9R6004/2C-3L Diplexer (Verizon - Proposed)	C	From Face	3.00		0.0000	130.00	No Ice	0.37	0.08	3.00
			0.00				1/2" Ice	0.45	0.14	5.30
			0.00							
13-ft Platform w/ Handrails (Verizon - Existing)	C	None			0.0000	118.00	No Ice	53.00	53.00	2000.00
							1/2" Ice	68.00	68.00	3000.00
(2) 5' Panel Antenna (Sprint - Existing)	A	From Face	3.00		0.0000	118.00	No Ice	3.99	2.78	20.00
			0.00				1/2" Ice	4.37	3.15	38.58

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00						
(2) 5' Panel Antenna	B	From Face	3.00	0.0000	118.00	No Ice	3.99	2.78	20.00
(Sprint - Existing)			0.00			1/2" Ice	4.37	3.15	38.58
			0.00						
(2) 5' Panel Antenna	C	From Face	3.00	0.0000	118.00	No Ice	3.99	2.78	20.00
(Sprint - Existing)			0.00			1/2" Ice	4.37	3.15	38.58
			0.00						
Valmont 13' Platform w/Rails	C	None		0.0000	100.00	No Ice	31.30	31.30	1822.00
(Verizon - Existing)						1/2" Ice	40.20	40.20	2452.00
(2) 5' Panel Antenna	A	From Face	3.00	0.0000	100.00	No Ice	4.36	1.97	20.00
(T-Mobile - Existing)			0.00			1/2" Ice	4.77	2.31	40.42
			0.00						
(2) 5' Panel Antenna	B	From Face	3.00	0.0000	100.00	No Ice	4.36	1.97	20.00
(T-Mobile - Existing)			0.00			1/2" Ice	4.77	2.31	40.42
			0.00						
(2) 5' Panel Antenna	C	From Face	3.00	0.0000	100.00	No Ice	4.36	1.97	20.00
(T-Mobile - Existing)			0.00			1/2" Ice	4.77	2.31	40.42
			0.00						
(2) TMA 10"x8"x3"	A	From Face	3.00	0.0000	100.00	No Ice	0.78	0.29	15.00
(T-Mobile - Existing)			0.00			1/2" Ice	0.90	0.38	20.06
			0.00						
(2) TMA 10"x8"x3"	B	From Face	3.00	0.0000	100.00	No Ice	0.78	0.29	15.00
(T-Mobile - Existing)			0.00			1/2" Ice	0.90	0.38	20.06
			0.00						
(2) TMA 10"x8"x3"	C	From Face	3.00	0.0000	100.00	No Ice	0.78	0.29	15.00
(T-Mobile - Existing)			0.00			1/2" Ice	0.90	0.38	20.06
			0.00						
3' GPS Stand-off Mount	A	From Face	0.00	0.0000	50.00	No Ice	2.45	2.45	51.00
(Verizon - Existing)			0.00			1/2" Ice	3.98	3.98	75.00
			0.00						
GPS	A	From Face	3.00	0.0000	50.00	No Ice	1.00	1.00	10.00
(Verizon - Existing)			0.00			1/2" Ice	1.50	1.50	15.00
			0.00						
3' Stand-off Mount	B	From Face	0.00	0.0000	58.00	No Ice	2.45	2.45	51.00
			0.00			1/2" Ice	3.98	3.98	75.00
			0.00						
PD1167	B	From Face	3.00	0.0000	58.00	No Ice	1.06	1.06	8.00
			0.00			1/2" Ice	2.26	2.26	18.18
			4.00						
3' Stand-off Mount	A	From Face	0.00	0.0000	58.00	No Ice	2.45	2.45	51.00
			0.00			1/2" Ice	3.98	3.98	75.00
			0.00						
PD1142-1	A	From Face	3.00	0.0000	58.00	No Ice	1.32	1.32	10.00
			0.00			1/2" Ice	3.21	3.21	23.85
			7.50						
3' Stand-off Mount	A	From Face	0.00	0.0000	86.00	No Ice	2.45	2.45	51.00
			0.00			1/2" Ice	3.98	3.98	75.00
			0.00						
PD1142-1	A	From Face	3.00	0.0000	86.00	No Ice	1.32	1.32	10.00
			0.00			1/2" Ice	3.21	3.21	23.85
			5.00						
PD1121-6	A	From Face	3.00	0.0000	86.00	No Ice	0.23	0.23	3.00
			0.00			1/2" Ice	0.41	0.41	3.90
			0.00						
PD1142-1	A	From Face	3.00	0.0000	100.00	No Ice	1.32	1.32	10.00
			0.00			1/2" Ice	3.21	3.21	23.85
			5.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
PD1142-1	B	From Face	3.00 0.00 5.00	0.0000	100.00	No Ice 1/2" Ice	1.32 3.21	1.32 3.21	10.00 23.85
440-3	C	From Face	3.00 0.00 5.00	0.0000	100.00	No Ice 1/2" Ice	1.48 2.66	1.48 2.66	20.00 26.00
440-3	B	From Face	3.00 0.00 5.00	0.0000	130.00	No Ice 1/2" Ice	1.48 2.66	1.48 2.66	20.00 26.00

Tower Pressures - No Ice

$G_H = 1.690$

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
L1 130.00-89.92	108.79	1.406	26	69.038	A	0.000	69.038	69.038	100.00	0.000	8.898
					B	0.000	69.038		100.00	0.000	0.000
					C	0.000	69.038		100.00	0.000	0.000
L2 89.92-44.84	66.66	1.222	22	111.210	A	0.000	111.210	111.210	100.00	0.000	10.009
					B	0.000	111.210		100.00	0.000	0.000
					C	0.000	111.210		100.00	0.000	0.000
L3 44.84-0.00	21.49	1	19	145.221	A	0.000	145.221	145.221	100.00	0.000	7.734
					B	0.000	145.221		100.00	0.000	0.000
					C	0.000	145.221		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	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
L1 130.00-89.92	108.79	1.406	19	0.5000	72.378	A	0.000	72.378	72.378	100.00	0.000	16.913
						B	0.000	72.378		100.00	0.000	0.000
						C	0.000	72.378		100.00	0.000	0.000
L2 89.92-44.84	66.66	1.222	17	0.5000	114.967	A	0.000	114.967	114.967	100.00	0.000	19.025
						B	0.000	114.967		100.00	0.000	0.000
						C	0.000	114.967		100.00	0.000	0.000
L3 44.84-0.00	21.49	1	14	0.5000	148.957	A	0.000	148.957	148.957	100.00	0.000	14.701
						B	0.000	148.957		100.00	0.000	0.000
						C	0.000	148.957		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 130.00-89.92	108.79	1.406	9	69.038	A	0.000	69.038	69.038	100.00	0.000	8.898
					B	0.000	69.038		100.00	0.000	0.000
					C	0.000	69.038		100.00	0.000	0.000
L2 89.92-44.84	66.66	1.222	8	111.210	A	0.000	111.210	111.210	100.00	0.000	10.009
					B	0.000	111.210		100.00	0.000	0.000
					C	0.000	111.210		100.00	0.000	0.000
L3 44.84-0.00	21.49	1	6	145.221	A	0.000	145.221	145.221	100.00	0.000	7.734
					B	0.000	145.221		100.00	0.000	0.000
					C	0.000	145.221		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 130.00-89.92	712.88	1966.88	A	1	1.03	1	1	1	69.038	3511.18	87.60	C
			B	1	1.03	1	1	1	69.038			
			C	1	1.03	1	1	1	69.038			
L2 89.92-44.84	1334.09	4862.79	A	1	1.03	1	1	1	111.210	4734.69	105.02	C
			B	1	1.03	1	1	1	111.210			
			C	1	1.03	1	1	1	111.210			
L3 44.84-0.00	1016.40	7791.64	A	1	1.03	1	1	1	145.221	4924.68	109.84	C
			B	1	1.03	1	1	1	145.221			
			C	1	1.03	1	1	1	145.221			
Sum Weight:	3063.36	14621.31						OTM	9641.16 kip-in	13170.55		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 130.00-89.92	712.88	1966.88	A	1	1.03	1	1	1	69.038	3511.18	87.60	C
			B	1	1.03	1	1	1	69.038			
			C	1	1.03	1	1	1	69.038			
L2 89.92-44.84	1334.09	4862.79	A	1	1.03	1	1	1	111.210	4734.69	105.02	C
			B	1	1.03	1	1	1	111.210			
			C	1	1.03	1	1	1	111.210			
L3 44.84-0.00	1016.40	7791.64	A	1	1.03	1	1	1	145.221	4924.68	109.84	C
			B	1	1.03	1	1	1	145.221			
			C	1	1.03	1	1	1	145.221			
Sum Weight:	3063.36	14621.31						OTM	9641.16 kip-in	13170.55		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 130.00-89.92	712.88	1966.88	A	1	1.03	1	1	1	69.038	3511.18	87.60	C
			B	1	1.03	1	1	1	69.038			
			C	1	1.03	1	1	1	69.038			
L2 89.92-44.84	1334.09	4862.79	A	1	1.03	1	1	1	111.210	4734.69	105.02	C
			B	1	1.03	1	1	1	111.210			
			C	1	1.03	1	1	1	111.210			
L3 44.84-0.00	1016.40	7791.64	A	1	1.03	1	1	1	145.221	4924.68	109.84	C
			B	1	1.03	1	1	1	145.221			
			C	1	1.03	1	1	1	145.221			
Sum Weight:	3063.36	14621.31						OTM	9641.16 kip-in	13170.55		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 130.00-89.92	712.88	1966.88	A	1	1.03	1	1	1	69.038	3511.18	87.60	C
			B	1	1.03	1	1	1	69.038			
			C	1	1.03	1	1	1	69.038			
L2 89.92-44.84	1334.09	4862.79	A	1	1.03	1	1	1	111.210	4734.69	105.02	C
			B	1	1.03	1	1	1	111.210			
			C	1	1.03	1	1	1	111.210			
L3 44.84-0.00	1016.40	7791.64	A	1	1.03	1	1	1	145.221	4924.68	109.84	C
			B	1	1.03	1	1	1	145.221			
			C	1	1.03	1	1	1	145.221			
Sum Weight:	3063.36	14621.31						OTM	9641.16 kip-in	13170.55		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 130.00-89.92	948.55	2498.13	A	1	1.03	1	1	1	72.378	3010.45	75.11	C
			B	1	1.03	1	1	1	72.378			
			C	1	1.03	1	1	1	72.378			
L2 89.92-44.84	1599.18	5712.47	A	1	1.03	1	1	1	114.967	3918.40	86.91	C
			B	1	1.03	1	1	1	114.967			
			C	1	1.03	1	1	1	114.967			
L3 44.84-0.00	1221.23	8896.76	A	1	1.03	1	1	1	148.957	3947.45	88.04	C
			B	1	1.03	1	1	1	148.957			
			C	1	1.03	1	1	1	148.957			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	3768.96	17107.36						OTM	8082.49 kip-in	10876.30		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 130.00-89.92	948.55	2498.13	A	1	1.03	1	1	1	72.378	3010.45	75.11	C
			B	1	1.03	1	1	1	72.378			
			C	1	1.03	1	1	1	72.378			
L2 89.92-44.84	1599.18	5712.47	A	1	1.03	1	1	1	114.967	3918.40	86.91	C
			B	1	1.03	1	1	1	114.967			
			C	1	1.03	1	1	1	114.967			
L3 44.84-0.00	1221.23	8896.76	A	1	1.03	1	1	1	148.957	3947.45	88.04	C
			B	1	1.03	1	1	1	148.957			
			C	1	1.03	1	1	1	148.957			
Sum Weight:	3768.96	17107.36						OTM	8082.49 kip-in	10876.30		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 130.00-89.92	948.55	2498.13	A	1	1.03	1	1	1	72.378	3010.45	75.11	C
			B	1	1.03	1	1	1	72.378			
			C	1	1.03	1	1	1	72.378			
L2 89.92-44.84	1599.18	5712.47	A	1	1.03	1	1	1	114.967	3918.40	86.91	C
			B	1	1.03	1	1	1	114.967			
			C	1	1.03	1	1	1	114.967			
L3 44.84-0.00	1221.23	8896.76	A	1	1.03	1	1	1	148.957	3947.45	88.04	C
			B	1	1.03	1	1	1	148.957			
			C	1	1.03	1	1	1	148.957			
Sum Weight:	3768.96	17107.36						OTM	8082.49 kip-in	10876.30		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 130.00-89.92	948.55	2498.13	A	1	1.03	1	1	1	72.378	3010.45	75.11	C
			B	1	1.03	1	1	1	72.378			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L2 89.92-44.84	1599.18	5712.47	C	1	1.03	1	1	1	72.378	3918.40	86.91	C
			A	1	1.03	1	1	1	114.967			
			B	1	1.03	1	1	1	114.967			
L3 44.84-0.00	1221.23	8896.76	C	1	1.03	1	1	1	114.967	3947.45	88.04	C
			A	1	1.03	1	1	1	148.957			
			B	1	1.03	1	1	1	148.957			
Sum Weight:	3768.96	17107.36	C	1	1.03	1	1	1	148.957			
								OTM	8082.49 kip-in	10876.30		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 130.00-89.92	712.88	1966.88	A	1	1.03	1	1	1	69.038	1214.94	30.31	C
			B	1	1.03	1	1	1	69.038			
			C	1	1.03	1	1	1	69.038			
L2 89.92-44.84	1334.09	4862.79	A	1	1.03	1	1	1	111.210	1638.30	36.34	C
			B	1	1.03	1	1	1	111.210			
			C	1	1.03	1	1	1	111.210			
L3 44.84-0.00	1016.40	7791.64	A	1	1.03	1	1	1	145.221	1704.04	38.01	C
			B	1	1.03	1	1	1	145.221			
			C	1	1.03	1	1	1	145.221			
Sum Weight:	3063.36	14621.31						OTM	3336.04 kip-in	4557.28		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 130.00-89.92	712.88	1966.88	A	1	1.03	1	1	1	69.038	1214.94	30.31	C
			B	1	1.03	1	1	1	69.038			
			C	1	1.03	1	1	1	69.038			
L2 89.92-44.84	1334.09	4862.79	A	1	1.03	1	1	1	111.210	1638.30	36.34	C
			B	1	1.03	1	1	1	111.210			
			C	1	1.03	1	1	1	111.210			
L3 44.84-0.00	1016.40	7791.64	A	1	1.03	1	1	1	145.221	1704.04	38.01	C
			B	1	1.03	1	1	1	145.221			
			C	1	1.03	1	1	1	145.221			
Sum Weight:	3063.36	14621.31						OTM	3336.04 kip-in	4557.28		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 130.00-89.92	712.88	1966.88	A	1	1.03	1	1	1	69.038	1214.94	30.31	C
			B	1	1.03	1	1	1	69.038			
			C	1	1.03	1	1	1	69.038			
L2 89.92-44.84	1334.09	4862.79	A	1	1.03	1	1	1	111.210	1638.30	36.34	C
			B	1	1.03	1	1	1	111.210			
			C	1	1.03	1	1	1	111.210			
L3 44.84-0.00	1016.40	7791.64	A	1	1.03	1	1	1	145.221	1704.04	38.01	C
			B	1	1.03	1	1	1	145.221			
			C	1	1.03	1	1	1	145.221			
Sum Weight:	3063.36	14621.31						OTM	3336.04 kip-in	4557.28		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 130.00-89.92	712.88	1966.88	A	1	1.03	1	1	1	69.038	1214.94	30.31	C
			B	1	1.03	1	1	1	69.038			
			C	1	1.03	1	1	1	69.038			
L2 89.92-44.84	1334.09	4862.79	A	1	1.03	1	1	1	111.210	1638.30	36.34	C
			B	1	1.03	1	1	1	111.210			
			C	1	1.03	1	1	1	111.210			
L3 44.84-0.00	1016.40	7791.64	A	1	1.03	1	1	1	145.221	1704.04	38.01	C
			B	1	1.03	1	1	1	145.221			
			C	1	1.03	1	1	1	145.221			
Sum Weight:	3063.36	14621.31						OTM	3336.04 kip-in	4557.28		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-in	Sum of Overturning Moments, M_z kip-in	Sum of Torques kip-in
Leg Weight	14621.31					
Bracing Weight	0.00					
Total Member Self-Weight	14621.31			-8.21	1.63	
Total Weight	24159.88			-8.21	1.63	
Wind 0 deg - No Ice		0.00	-24260.69	-25172.13	1.63	-4.50
Wind 30 deg - No Ice		12130.35	-21010.38	-21800.81	-12580.33	-10.13
Wind 45 deg - No Ice		17154.90	-17154.90	-17801.79	-17791.95	-11.99
Wind 60 deg - No Ice		21010.38	-12130.35	-12590.17	-21790.97	-13.04
Wind 90 deg - No Ice		24260.69	0.00	-8.21	-25162.29	-12.46
Wind 120 deg - No Ice		21010.38	12130.35	12573.76	-21790.97	-8.54
Wind 135 deg - No Ice		17154.90	17154.90	17785.38	-17791.95	-5.62
Wind 150 deg - No Ice		12130.35	21010.38	21784.39	-12580.33	-2.33
Wind 180 deg - No Ice		0.00	24260.69	25155.72	1.63	4.50
Wind 210 deg - No Ice		-12130.35	21010.38	21784.39	12583.60	10.13
Wind 225 deg - No Ice		-17154.90	17154.90	17785.38	17795.22	11.99

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-in	Sum of Overturning Moments, M_z kip-in	Sum of Torques kip-in
Wind 240 deg - No Ice		-21010.38	12130.35	12573.76	21794.23	13.04
Wind 270 deg - No Ice		-24260.69	0.00	-8.21	25165.56	12.46
Wind 300 deg - No Ice		-21010.38	-12130.35	-12590.17	21794.23	8.54
Wind 315 deg - No Ice		-17154.90	-17154.90	-17801.79	17795.22	5.62
Wind 330 deg - No Ice		-12130.35	-21010.38	-21800.81	12583.60	2.33
Member Ice	2486.05					
Total Weight Ice	30789.15			-20.79	3.03	
Wind 0 deg - Ice		0.00	-21380.96	-22641.34	3.03	-7.16
Wind 30 deg - Ice		10690.48	-18516.46	-19610.76	-11307.24	-15.87
Wind 45 deg - Ice		15118.62	-15118.62	-16015.93	-15992.11	-18.73
Wind 60 deg - Ice		18516.46	-10690.48	-11331.06	-19586.94	-20.32
Wind 90 deg - Ice		21380.96	0.00	-20.79	-22617.52	-19.33
Wind 120 deg - Ice		18516.46	10690.48	11289.49	-19586.94	-13.16
Wind 135 deg - Ice		15118.62	15118.62	15974.35	-15992.11	-8.60
Wind 150 deg - Ice		10690.48	18516.46	19569.18	-11307.24	-3.46
Wind 180 deg - Ice		0.00	21380.96	22599.76	3.03	7.16
Wind 210 deg - Ice		-10690.48	18516.46	19569.18	11313.31	15.87
Wind 225 deg - Ice		-15118.62	15118.62	15974.35	15998.17	18.73
Wind 240 deg - Ice		-18516.46	10690.48	11289.49	19593.00	20.32
Wind 270 deg - Ice		-21380.96	0.00	-20.79	22623.58	19.33
Wind 300 deg - Ice		-18516.46	-10690.48	-11331.06	19593.00	13.16
Wind 315 deg - Ice		-15118.62	-15118.62	-16015.93	15998.17	8.60
Wind 330 deg - Ice		-10690.48	-18516.46	-19610.76	11313.31	3.46
Total Weight	24159.88			-8.21	1.63	
Wind 0 deg - Service		0.00	-8394.70	-8709.81	1.63	-1.56
Wind 30 deg - Service		4197.35	-7270.03	-7543.26	-4351.99	-3.51
Wind 45 deg - Service		5935.95	-5935.95	-6159.52	-6155.32	-4.15
Wind 60 deg - Service		7270.03	-4197.35	-4356.19	-7539.06	-4.51
Wind 90 deg - Service		8394.70	0.00	-2.57	-8705.61	-4.31
Wind 120 deg - Service		7270.03	4197.35	4351.05	-7539.06	-2.95
Wind 135 deg - Service		5935.95	5935.95	6154.38	-6155.32	-1.95
Wind 150 deg - Service		4197.35	7270.03	7538.12	-4351.99	-0.81
Wind 180 deg - Service		0.00	8394.70	8704.67	1.63	1.56
Wind 210 deg - Service		-4197.35	7270.03	7538.12	4355.25	3.51
Wind 225 deg - Service		-5935.95	5935.95	6154.38	6158.58	4.15
Wind 240 deg - Service		-7270.03	4197.35	4351.05	7542.32	4.51
Wind 270 deg - Service		-8394.70	0.00	-2.57	8708.87	4.31
Wind 300 deg - Service		-7270.03	-4197.35	-4356.19	7542.32	2.95
Wind 315 deg - Service		-5935.95	-5935.95	-6159.52	6158.58	1.95
Wind 330 deg - Service		-4197.35	-7270.03	-7543.26	4355.25	0.81

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-in	Minor Axis Moment kip-in
L1	130 - 89.92	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-12574.67	-0.99	4.12
			Max. Mx	6	-7283.52	-4038.84	1.34
			Max. My	2	-7282.95	-0.45	4039.32
			Max. Vy	14	-14376.84	4037.32	1.34
			Max. Vx	2	-14377.07	-0.45	4039.32
			Max. Torque	33			-5.57
L2	89.92 - 44.836	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-19689.49	1.26	13.32
			Max. Mx	14	-13674.33	12905.99	5.36
			Max. My	2	-13674.06	0.56	12910.87
			Max. Vy	14	-19271.55	12905.99	5.36
			Max. Vx	2	-19271.74	0.56	12910.87
			Max. Torque	31			-15.36

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-in	Minor Axis Moment kip-in
L3	44.836 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-30789.15	3.04	21.04
			Max. Mx	14	-24135.24	26000.39	8.46
			Max. My	2	-24135.24	1.67	26007.21
			Max. Vy	14	-24285.20	26000.39	8.46
			Max. Vx	2	-24285.21	1.67	26007.21
			Max. Torque	30			-20.18

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	19	30789.15	0.00	21380.98
	Max. H_x	14	24159.88	24260.70	0.00
	Max. H_z	2	24159.88	0.00	24260.70
	Max. M_x	2	26007.21	0.00	24260.70
	Max. M_z	6	25997.05	-24260.70	0.00
	Max. Torsion	22	20.18	-18516.46	10690.48
	Min. Vert	1	24159.88	0.00	0.00
	Min. H_x	6	24159.88	-24260.70	0.00
	Min. H_z	10	24159.88	0.00	-24260.70
	Min. M_x	10	-25990.23	0.00	-24260.70
	Min. M_z	14	-26000.39	24260.70	0.00
	Min. Torsion	30	-20.18	18516.46	-10690.48

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-in	Overturning Moment, M_z kip-in	Torque kip-in
Dead Only	24159.88	0.00	0.00	-8.21	1.63	0.00
Dead+Wind 0 deg - No Ice	24159.88	-0.00	-24260.70	-26007.21	1.66	-4.44
Dead+Wind 30 deg - No Ice	24159.88	12130.35	-21010.38	-22524.07	-12997.73	-10.04
Dead+Wind 45 deg - No Ice	24159.88	17154.90	-17154.90	-18392.38	-18382.26	-11.90
Dead+Wind 60 deg - No Ice	24159.88	21010.38	-12130.35	-13007.85	-22513.94	-12.95
Dead+Wind 90 deg - No Ice	24159.88	24260.70	-0.00	-8.46	-25997.05	-12.39
Dead+Wind 120 deg - No Ice	24159.88	21010.38	12130.35	12990.92	-22513.91	-8.51
Dead+Wind 135 deg - No Ice	24159.88	17154.90	17154.90	18375.43	-18382.22	-5.62
Dead+Wind 150 deg - No Ice	24159.88	12130.35	21010.38	22507.11	-12997.71	-2.35
Dead+Wind 180 deg - No Ice	24159.88	-0.00	24260.70	25990.23	1.66	4.44
Dead+Wind 210 deg - No Ice	24159.88	-12130.35	21010.38	22507.12	13001.04	10.04
Dead+Wind 225 deg - No Ice	24159.88	-17154.90	17154.90	18375.44	18385.56	11.90
Dead+Wind 240 deg - No Ice	24159.88	-21010.38	12130.35	12990.93	22517.25	12.95
Dead+Wind 270 deg - No Ice	24159.88	-24260.70	-0.00	-8.46	26000.39	12.39
Dead+Wind 300 deg - No Ice	24159.88	-21010.38	-12130.35	-13007.85	22517.28	8.51
Dead+Wind 315 deg - No Ice	24159.88	-17154.90	-17154.90	-18392.38	18385.59	5.62
Dead+Wind 330 deg - No Ice	24159.88	-12130.35	-21010.38	-22524.08	13001.07	2.35
Dead+Ice+Temp	30789.15	-0.00	-0.00	-21.04	3.04	-0.00
Dead+Wind 0 deg+Ice+Temp	30789.15	-0.00	-21380.98	-23753.89	3.14	-7.08
Dead+Wind 30 deg+Ice+Temp	30789.15	10690.48	-18516.46	-20574.39	-11862.88	-15.74
Dead+Wind 45 deg+Ice+Temp	30789.15	15118.62	-15118.62	-16802.91	-16777.94	-18.59
Dead+Wind 60 deg+Ice+Temp	30789.15	18516.46	-10690.48	-11887.84	-20549.39	-20.18

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-in	kip-in	kip-in
Dead+Wind 90 deg+Ice+Temp	30789.15	21380.98	0.00	-21.83	-23728.82	-19.22
Dead+Wind 120 deg+Ice+Temp	30789.15	18516.46	10690.48	11844.14	-20549.32	-13.11
Dead+Wind 135 deg+Ice+Temp	30789.15	15118.62	15118.62	16759.18	-16777.87	-8.59
Dead+Wind 150 deg+Ice+Temp	30789.15	10690.48	18516.46	20530.62	-11862.82	-3.48
Dead+Wind 180 deg+Ice+Temp	30789.15	-0.00	21380.98	23710.08	3.14	7.08
Dead+Wind 210 deg+Ice+Temp	30789.15	-10690.48	18516.46	20530.64	11869.12	15.74
Dead+Wind 225 deg+Ice+Temp	30789.15	-15118.62	15118.62	16759.21	16784.18	18.59
Dead+Wind 240 deg+Ice+Temp	30789.15	-18516.46	10690.48	11844.16	20555.65	20.18
Dead+Wind 270 deg+Ice+Temp	30789.15	-21380.98	0.00	-21.83	23735.15	19.22
Dead+Wind 300 deg+Ice+Temp	30789.15	-18516.46	-10690.48	-11887.86	20555.71	13.11
Dead+Wind 315 deg+Ice+Temp	30789.15	-15118.62	-15118.62	-16802.93	16784.25	8.59
Dead+Wind 330 deg+Ice+Temp	30789.15	-10690.48	-18516.46	-20574.41	11869.18	3.48
Dead+Wind 0 deg - Service	24159.88	-0.00	-8394.70	-9020.16	1.68	-1.54
Dead+Wind 30 deg - Service	24159.88	4197.35	-7270.03	-7812.85	-4504.15	-3.49
Dead+Wind 45 deg - Service	24159.88	5935.95	-5935.95	-6380.73	-6370.52	-4.14
Dead+Wind 60 deg - Service	24159.88	7270.03	-4197.35	-4514.36	-7802.64	-4.51
Dead+Wind 90 deg - Service	24159.88	8394.70	-0.00	-8.54	-9009.94	-4.32
Dead+Wind 120 deg - Service	24159.88	7270.03	4197.35	4497.29	-7802.63	-2.97
Dead+Wind 135 deg - Service	24159.88	5935.95	5935.95	6363.66	-6370.52	-1.97
Dead+Wind 150 deg - Service	24159.88	4197.35	7270.03	7795.78	-4504.14	-0.83
Dead+Wind 180 deg - Service	24159.88	-0.00	8394.70	9003.08	1.68	1.54
Dead+Wind 210 deg - Service	24159.88	-4197.35	7270.03	7795.78	4507.50	3.49
Dead+Wind 225 deg - Service	24159.88	-5935.95	5935.95	6363.66	6373.87	4.14
Dead+Wind 240 deg - Service	24159.88	-7270.03	4197.35	4497.29	7805.99	4.51
Dead+Wind 270 deg - Service	24159.88	-8394.70	-0.00	-8.54	9013.30	4.32
Dead+Wind 300 deg - Service	24159.88	-7270.03	-4197.35	-4514.36	7806.00	2.97
Dead+Wind 315 deg - Service	24159.88	-5935.95	-5935.95	-6380.73	6373.88	1.97
Dead+Wind 330 deg - Service	24159.88	-4197.35	-7270.03	-7812.85	4507.50	0.83

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-24159.88	0.00	0.00	24159.88	0.00	0.000%
2	0.00	-24159.88	-24260.69	0.00	24159.88	24260.70	0.000%
3	12130.35	-24159.88	-21010.38	-12130.35	24159.88	21010.38	0.000%
4	17154.90	-24159.88	-17154.90	-17154.90	24159.88	17154.90	0.000%
5	21010.38	-24159.88	-12130.35	-21010.38	24159.88	12130.35	0.000%
6	24260.69	-24159.88	0.00	-24260.70	24159.88	0.00	0.000%
7	21010.38	-24159.88	12130.35	-21010.38	24159.88	-12130.35	0.000%
8	17154.90	-24159.88	17154.90	-17154.90	24159.88	-17154.90	0.000%
9	12130.35	-24159.88	21010.38	-12130.35	24159.88	-21010.38	0.000%
10	0.00	-24159.88	24260.69	0.00	24159.88	-24260.70	0.000%
11	-12130.35	-24159.88	21010.38	12130.35	24159.88	-21010.38	0.000%
12	-17154.90	-24159.88	17154.90	17154.90	24159.88	-17154.90	0.000%
13	-21010.38	-24159.88	12130.35	21010.38	24159.88	-12130.35	0.000%
14	-24260.69	-24159.88	0.00	24260.70	24159.88	0.00	0.000%
15	-21010.38	-24159.88	-12130.35	21010.38	24159.88	12130.35	0.000%
16	-17154.90	-24159.88	-17154.90	17154.90	24159.88	17154.90	0.000%
17	-12130.35	-24159.88	-21010.38	12130.35	24159.88	21010.38	0.000%
18	0.00	-30789.15	0.00	0.00	30789.15	0.00	0.000%
19	0.00	-30789.15	-21380.96	0.00	30789.15	21380.98	0.000%
20	10690.48	-30789.15	-18516.46	-10690.48	30789.15	18516.46	0.000%
21	15118.62	-30789.15	-15118.62	-15118.62	30789.15	15118.62	0.000%
22	18516.46	-30789.15	-10690.48	-18516.46	30789.15	10690.48	0.000%
23	21380.96	-30789.15	0.00	-21380.98	30789.15	-0.00	0.000%
24	18516.46	-30789.15	10690.48	-18516.46	30789.15	-10690.48	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
25	15118.62	-30789.15	15118.62	-15118.62	30789.15	-15118.62	0.000%
26	10690.48	-30789.15	18516.46	-10690.48	30789.15	-18516.46	0.000%
27	0.00	-30789.15	21380.96	0.00	30789.15	-21380.98	0.000%
28	-10690.48	-30789.15	18516.46	10690.48	30789.15	-18516.46	0.000%
29	-15118.62	-30789.15	15118.62	15118.62	30789.15	-15118.62	0.000%
30	-18516.46	-30789.15	10690.48	18516.46	30789.15	-10690.48	0.000%
31	-21380.96	-30789.15	0.00	21380.98	30789.15	-0.00	0.000%
32	-18516.46	-30789.15	-10690.48	18516.46	30789.15	10690.48	0.000%
33	-15118.62	-30789.15	-15118.62	15118.62	30789.15	15118.62	0.000%
34	-10690.48	-30789.15	-18516.46	10690.48	30789.15	18516.46	0.000%
35	0.00	-24159.88	-8394.70	0.00	24159.88	8394.70	0.000%
36	4197.35	-24159.88	-7270.03	-4197.35	24159.88	7270.03	0.000%
37	5935.95	-24159.88	-5935.95	-5935.95	24159.88	5935.95	0.000%
38	7270.03	-24159.88	-4197.35	-7270.03	24159.88	4197.35	0.000%
39	8394.70	-24159.88	0.00	-8394.70	24159.88	0.00	0.000%
40	7270.03	-24159.88	4197.35	-7270.03	24159.88	-4197.35	0.000%
41	5935.95	-24159.88	5935.95	-5935.95	24159.88	-5935.95	0.000%
42	4197.35	-24159.88	7270.03	-4197.35	24159.88	-7270.03	0.000%
43	0.00	-24159.88	8394.70	0.00	24159.88	-8394.70	0.000%
44	-4197.35	-24159.88	7270.03	4197.35	24159.88	-7270.03	0.000%
45	-5935.95	-24159.88	5935.95	5935.95	24159.88	-5935.95	0.000%
46	-7270.03	-24159.88	4197.35	7270.03	24159.88	-4197.35	0.000%
47	-8394.70	-24159.88	0.00	8394.70	24159.88	0.00	0.000%
48	-7270.03	-24159.88	-4197.35	7270.03	24159.88	4197.35	0.000%
49	-5935.95	-24159.88	-5935.95	5935.95	24159.88	5935.95	0.000%
50	-4197.35	-24159.88	-7270.03	4197.35	24159.88	7270.03	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	0.00024342
3	Yes	5	0.00000001	0.00054663
4	Yes	5	0.00000001	0.00059211
5	Yes	5	0.00000001	0.00055873
6	Yes	4	0.00000001	0.00042082
7	Yes	5	0.00000001	0.00054390
8	Yes	5	0.00000001	0.00059149
9	Yes	5	0.00000001	0.00055417
10	Yes	4	0.00000001	0.00024321
11	Yes	5	0.00000001	0.00055529
12	Yes	5	0.00000001	0.00059156
13	Yes	5	0.00000001	0.00054334
14	Yes	4	0.00000001	0.00042083
15	Yes	5	0.00000001	0.00055811
16	Yes	5	0.00000001	0.00059209
17	Yes	5	0.00000001	0.00054768
18	Yes	4	0.00000001	0.00000001
19	Yes	5	0.00000001	0.00021441
20	Yes	6	0.00000001	0.00009482
21	Yes	6	0.00000001	0.00010587
22	Yes	6	0.00000001	0.00009795
23	Yes	5	0.00000001	0.00022386
24	Yes	6	0.00000001	0.00009414
25	Yes	6	0.00000001	0.00010554

26	Yes	6	0.00000001	0.00009652
27	Yes	5	0.00000001	0.00021411
28	Yes	6	0.00000001	0.00009699
29	Yes	6	0.00000001	0.00010559
30	Yes	6	0.00000001	0.00009393
31	Yes	5	0.00000001	0.00022388
32	Yes	6	0.00000001	0.00009771
33	Yes	6	0.00000001	0.00010587
34	Yes	6	0.00000001	0.00009525
35	Yes	4	0.00000001	0.00006239
36	Yes	5	0.00000001	0.00005166
37	Yes	5	0.00000001	0.00006030
38	Yes	5	0.00000001	0.00005402
39	Yes	4	0.00000001	0.00009358
40	Yes	5	0.00000001	0.00005099
41	Yes	5	0.00000001	0.00006001
42	Yes	5	0.00000001	0.00005299
43	Yes	4	0.00000001	0.00006214
44	Yes	5	0.00000001	0.00005321
45	Yes	5	0.00000001	0.00006005
46	Yes	5	0.00000001	0.00005091
47	Yes	4	0.00000001	0.00009360
48	Yes	5	0.00000001	0.00005391
49	Yes	5	0.00000001	0.00006030
50	Yes	5	0.00000001	0.00005184

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 89.92	34.127	35	2.4091	0.0028
L2	94.003 - 44.836	17.502	35	1.8427	0.0015
L3	50.003 - 0	4.715	35	0.8844	0.0007

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	13-ft Platform w/ Handrails	35	34.127	2.4091	0.0028	17249
118.00	13-ft Platform w/ Handrails	35	28.264	2.2382	0.0022	7187
100.00	Valmont 13' Platform w/Rails	35	19.996	1.9524	0.0016	2873
86.00	3' Stand-off Mount	35	14.449	1.6817	0.0014	2387
58.00	3' Stand-off Mount	35	6.310	1.0574	0.0009	2364
50.00	3' GPS Stand-off Mount	35	4.715	0.8844	0.0007	2399

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 89.92	98.127	2	6.9297	0.0118
L2	94.003 - 44.836	50.380	2	5.3043	0.0070
L3	50.003 - 0	13.586	2	2.5482	0.0034

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	13-ft Platform w/ Handrails	2	98.127	6.9297	0.0118	6144
118.00	13-ft Platform w/ Handrails	2	81.291	6.4397	0.0098	2558
100.00	Valmont 13' Platform w/Rails	2	57.545	5.6196	0.0077	1019
86.00	3' Stand-off Mount	2	41.603	4.8418	0.0065	842
58.00	3' Stand-off Mount	2	18.181	3.0460	0.0041	825
50.00	3' GPS Stand-off Mount	2	13.585	2.5480	0.0034	835

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual / Allowable Ratio Bolt Tension lb	Actual / Allowable Ratio Concrete Stress ksi	Actual / Allowable Ratio Plate Stress ksi	Actual / Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
2.5000	12	2.2500	131751.00 118089.52 1.12	2.268 2.800 0.81	41.041 45.000 0.91		Bolt T	1.12 ✓

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	130 - 89.92 (1)	TP25.08x16.26x0.219	40.08	0.00	0.0	39.000	16.8979	-7282.98	659017.00	0.011
L2	89.92 - 44.836 (2)	TP34.56x23.7435x0.313	49.17	0.00	0.0	39.000	33.3705	-13674.10	1301450.00	0.011
L3	44.836 - 0 (3)	TP43.8x32.7973x0.375	50.00	0.00	0.0	39.000	52.4357	-24135.20	2044990.00	0.012

Pole Bending Design Data

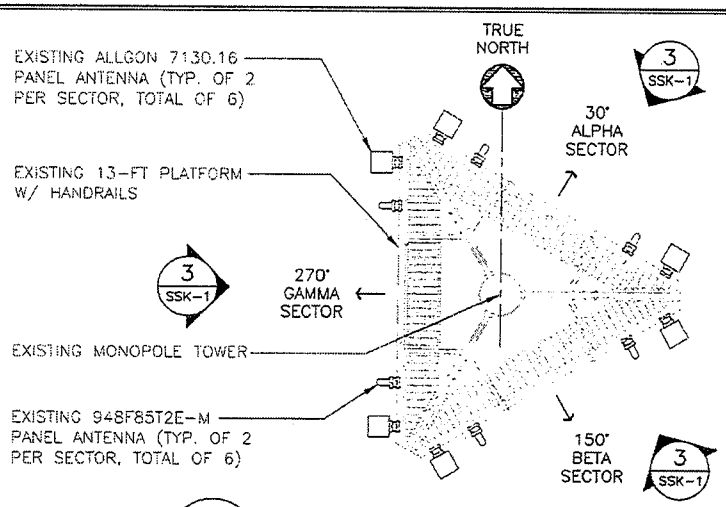
Section No.	Elevation ft	Size	Actual M_x kip-in	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-in	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	130 - 89.92 (1)	TP25.08x16.26x0.219	4039.55	-40.857	39.000	1.048	0.00	0.000	39.000	0.000
L2	89.92 - 44.836 (2)	TP34.56x23.7435x0.313	12910.90	-47.870	39.000	1.227	0.00	0.000	39.000	0.000
L3	44.836 - 0 (3)	TP43.8x32.7973x0.375	26007.20	-46.752	39.000	1.199	0.00	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	130 - 89.92 (1)	TP25.08x16.26x0.219	0.011	1.048	0.000	1.059 ✓	1.333	H1-3 ✓
L2	89.92 - 44.836 (2)	TP34.56x23.7435x0.313	0.011	1.227	0.000	1.238 ✓	1.333	H1-3 ✓
L3	44.836 - 0 (3)	TP43.8x32.7973x0.375	0.012	1.199	0.000	1.211 ✓	1.333	H1-3 ✓

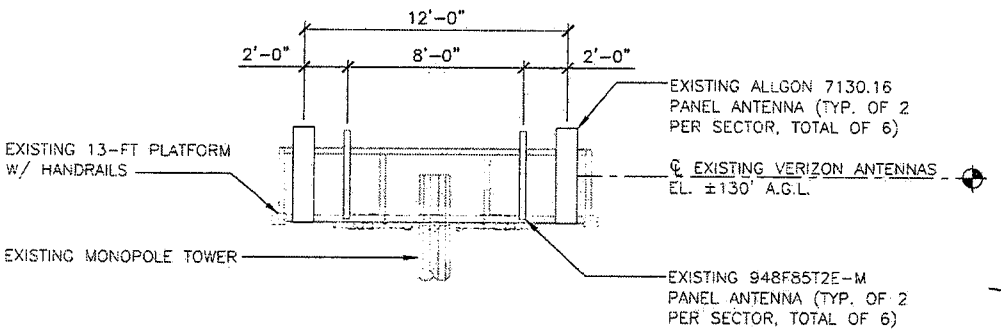
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	130 - 89.92	Pole	TP25.08x16.26x0.219	1	-7282.98	878469.62	79.4	Pass
L2	89.92 - 44.836	Pole	TP34.56x23.7435x0.313	2	-13674.10	1734832.78	92.9	Pass
L3	44.836 - 0	Pole	TP43.8x32.7973x0.375	3	-24135.20	2725971.56	90.8	Pass
						Summary		
						Pole (L2)	92.9	Pass
						Base Plate	83.7	Pass
						RATING =	**92.9**	**Pass**



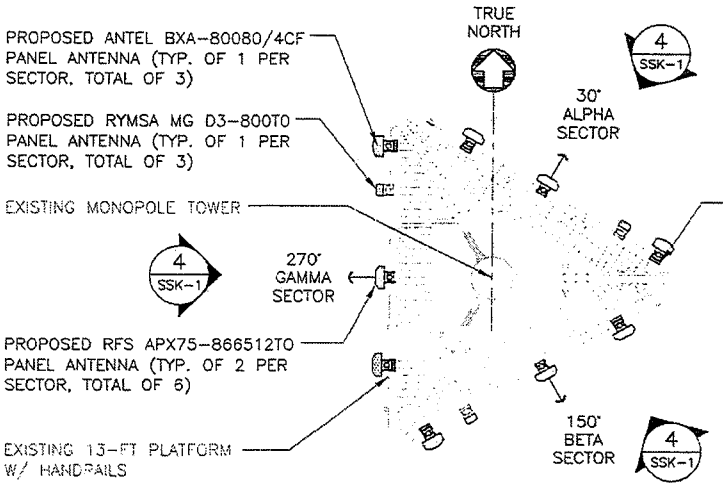
1 SSK-1 EXISTING PLATFORM PLAN

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



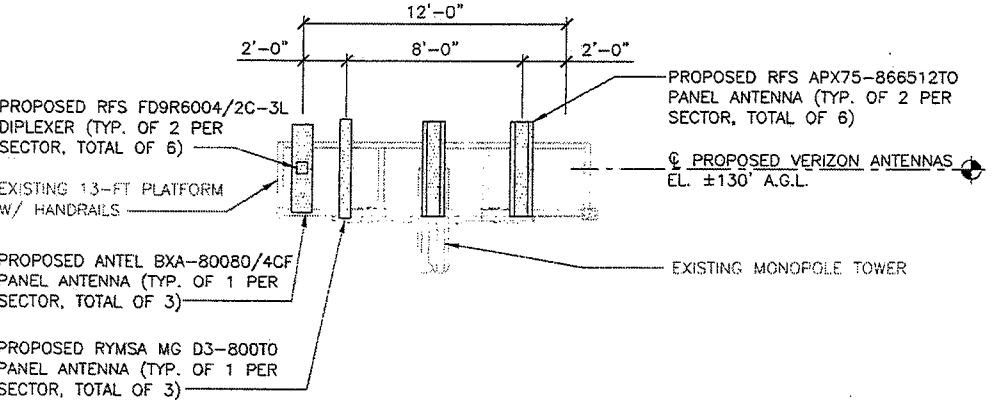
3 SSK-1 EXISTING SECTOR ELEVATION

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



2 SSK-1 PROPOSED PLATFORM PLAN

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



4 SSK-1 PROPOSED SECTOR ELEVATION

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

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

REV	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	7/22/11	TJL	DFC	ISSUED FOR CONSTRUCTION

CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless

RIDGEFIELD
76 EAST RIDGE ROAD
RIDGEFIELD, CT 06877

DATE	7/22/11
SCALE	AS SHOWN
JOB NO.	11001.0033

SHEET NO.
SSK-1

SITE NAME	RIDGEFIELD CT	ECP - CELL #	5	111
LATITUDE	41-16-51.30 N	LONGITUDE	73-29-34.40 W	
		SAVE BUTTON		
Additional Comments: PHASE 3 LTE		STRUCTURE TYPE	MONOPOLE	

700 Mhz C - LTE ANTENNA ADD	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	eNodeB		eNodeB		eNodeB	
ANTENNA TYPE	APX75-866512T0		APX75-866512T0		APX75-866512T0	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	128		128		128	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
MCPA BRICKS (QTY)						
700 Mhz A - LTE ANTENNA ADD	**ALPHA**		**BETA**		**GAMMA**	
EQUIPMENT TYPE	eNodeB		eNodeB		eNodeB	
ANTENNA TYPE	APX75-866512T0		APX75-866512T0		APX75-866512T0	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	128		128		128	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	2	RFS FD9R6004/2C-3L	2	RFS FD9R6004/2C-3L	2	RFS FD9R6004/2C-3L
MCPA BRICKS (QTY)						
850 Celluar - Current Config	**ALPHA**		**BETA**		**GAMMA**	
EQUIPMENT TYPE	Modcell 4.0 HD		Modcell 4.0 HD		Modcell 4.0 HD	
ANTENNA TYPE	7130.16		7130.16		7130.16	
QTY OF ANTENNAS PER FACE	2		2		2	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	128		128		128	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
DIPLEXER KIT - QTY / MODEL						
MCPA BRICKS (QTY)						
850 Celluar - Future Config	**ALPHA**		**BETA**		**GAMMA**	
EQUIPMENT TYPE	Modcell 4.0 HD		Modcell 4.0 HD		Modcell 4.0 HD	
ANTENNA TYPE	BXA-80080/4CF		BXA-80080/4CF		BXA-80080/4CF	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	30		150		270	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	128		128		128	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
DIPLEXER KIT - QTY / MODEL						
MCPA BRICKS (QTY)						
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)	128		128		128	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
DIPLEXER KIT - QTY / MODEL						
MCPA BRICKS (QTY)						

1900 PCS - Future Config	ALPHA	BETA	GAMMA
EQUIPMENT TYPE	PCS Modcell 4.0	PCS Modcell 4.0	PCS Modcell 4.0
ANTENNA TYPE	MG D3-800T0	MG D3-800T0	MG D3-800T0
QTY OF ANTENNAS PER FACE	1	1	1
ORIENTATION (DEG)	30	150	270
DOWN TILT (MECH/DEG)	0	0	0
RAD CTR (FT AGL)	128	128	128
TMA - QTY / MODEL			
DIPLEX WITH CELLULAR CABLE	DIPLEX with LTE A	DIPLEX with LTE A	DIPLEX with LTE A
MCPA BRICKS (QTY)			

NUMBER OF CABLE'S NEEDED					ESTIMATED CABLE LENGTH			
MAINLINE SIZE	7/8"	TOTAL # OF MAINLINES		18	MAINLINE (FT)			
JUMPER SIZE	1/2 "	TOTAL # OF TOP JUMPERS		24	TOP JUMPER (FT)			
Equipment Cable Ordering	MAIN CABLE	12	+	6	TOP JUMPER #	12	+	12

TX / RX FREQUENCIES				TX POWER OUTPUT	
Cellular A-Band	PCS F-Band			Cellular (Watts)	20
TX - 869-880,890-891.5 MHz	TX - 1970-1975			PCS (Watts)	16
RX - 824-835,845-846.5 MHz	RX - 1890-1895			LTE (Watts)	40
700 MHz A - Block	700 MHz C - Block			AWS F - Block	
TX - 698 - 704 MHz	TX - 746-757			TX - 2145-2155	
RX - 728 - 734 MHz	RX - 776-787			RX - 1745-1755	

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

RF ENGINEER	RF MANAGER	INITIALS	DATE
Prepared By : Dany Bustamante	Steve Weatherbee	DB	6/27/2011

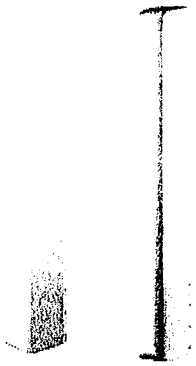
Site Configuration

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

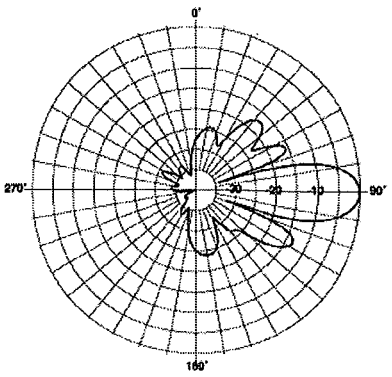
Frequency Range, MHz	806-894
Horizontal Beamwidth, deg	80
Vertical Beamwidth, deg	15
Electrical Downtilt, deg	0
Gain, dBi (dBd)	14.1 (12)
Front-To-Back Ratio, dB	45
Polarization	Vertical
VSWR	< 1.5:1
Impedance, Ohms	50
Maximum Power Input, W	500
Lightning Protection	Direct Ground
Connector Type	7-16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

Mechanical Specifications

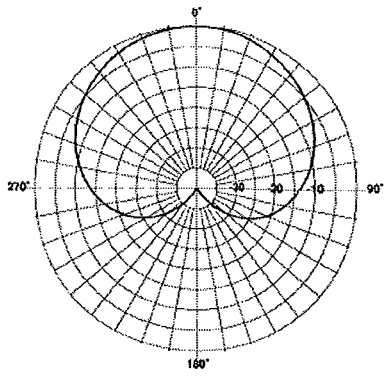
Dimensions - HxWxD, mm (in)	1219 x 152 x 203 (48 x 6 x 8)
Weight w/o Mtg Hardware, kg (lb)	2.8 (6.32)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	200 (125)
Max Wind Loading Area, m² (ft²)	0.307 (3.3)
Maximum Thrust @ Rated Wind, N (lbf)	916 (206)
Wind Load - Side @ Rated Wind, 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 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 Band, MHz	698-2200
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)
Frequency Range Low Frequency Path, MHz	698-960
Frequency Range High Frequency Path, MHz	1710-2200
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 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
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

Slant +/- 45° Dual Polarized, Panel 80° / 12 dBd

BXA-80080/4CF ___

When ordering replace "___" with connector type.

Mechanical specifications

Length	1225 mm	48.2 in
Width	285 mm	11.2 in
Depth	150 mm	5.9 in
Depth with z-bracket	190 mm	7.5 in
4) Weight	6.5 kg	14.3 lbs
Wind Area		
Fore/Aft	0.35 m^2	3.76 ft^2
Side	0.18 m^2	1.98 ft^2
Rated Wind Velocity (Safety factor 2.0)	>380 km/hr	>236 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	500 N	112.3 lbs
Side	277 N	62.2 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	806-900 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	12 dBd
2)	Power Rating	500 W
1)	Half Power Angle	
	H-Plane	80°
	E-Plane	15°
1)	Electrical Downtilt	0°
1)	Null Fill	5%
	Lightning Protection	Direct Ground

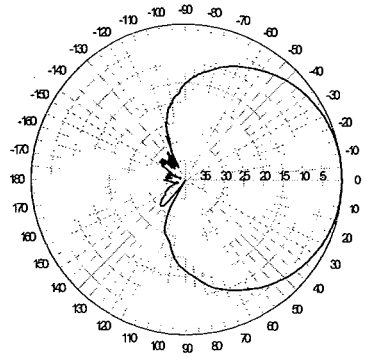
*Also available for 870-960 MHz. Consult your sales director for more information.

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

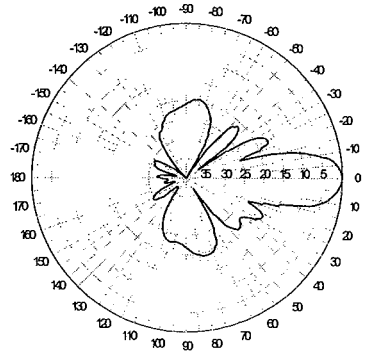
1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector. E-DIN indicates an elongated DIN connector.
4) The antenna weight listed above does not include the bracket weight.

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

Radiation pattern[1)]



Horizontal



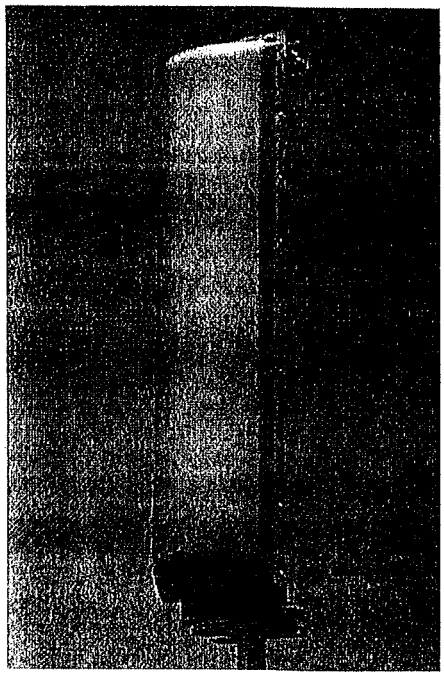
Vertical

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.

806-900 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.
The Antenna Technology Company

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

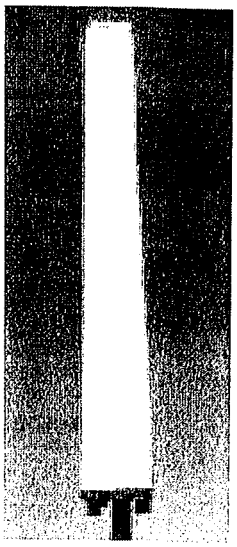
Revision Date: 7/3/07

MG D3-800Tx

Xpol GSM1800+PCS & UMTS Panel Antenna
15.9 dBd/18 dBi
WIDE BAND 1710-2170 MHz
H 65° V 6.5°

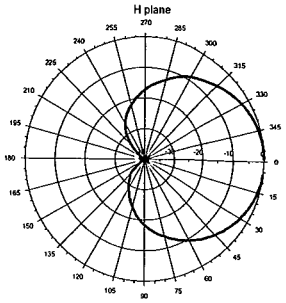
Electrical Specifications

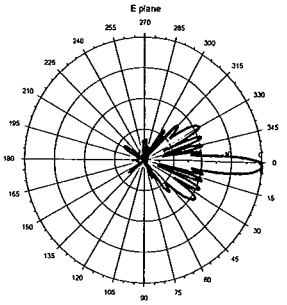
Antenna Model	MG D3-800Tx		
Frequency Range (MHz)	1710-1880	1850-1990	1920-2170
Impedance	50 Ohms		
VSWR	1.40:1		
Polarization	±45°		
Isolation between Ports (dB)	30		
Average Gain (dBd/dBi)	15.7/17.8	15.9/18	16.15/18.25
Horizontal Beamwidth (deg)	65°±5°		
Vertical Beamwidth (deg)	6.5°±0.5°	6.3°±0.5°	6.3°±0.5°
Electrical Tilt (deg)	Fixed 0°-14°		
Sidelobe Suppression (dB)	18	18	18
Front to Back Ratio (dB) @180°±20°	30		
Polarization Isolation (dB) @3 dB Beamwidth	20		
Maximum Power per Input (w)	250		
Intermodulation Products (dBc)	-150		
Connectors	2 x 7/16 Female		
Connector Position	Antenna Bottom		



Mechanical & Environmental Specifications

Dimensions (mm)	1380 x 160 x 90
Survival Wind Speed	200 km/h
Front Windload (N) @ 160 km/h	335
Lateral Windload (N) @ 160 km/h	188
Antenna Weight (kg)	7
Clamps Weight (kg)	2
Mast Mounting	50 to 135 mm
Radome Color	Grey
Grounding	All metallic parts are DC grounded
Temperature Range	-55 to +60°C
Humidity	100 %





Shipping Specifications

Dimensions (mm)	1580 x 340 x 210
Weight (kg)	12
Material	Cardboard and Foam

Ctra. Campo Real, Km 2,100
28500 Arganda del Rey
Madrid-Spain

RYMSA

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