



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

May 31, 2011

Douglas L. Culp, Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-126-110511** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 30 Oliver Terrace (70 Platt Road), Shelton, Connecticut.

Dear Mr. Culp:

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 May 9, 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.

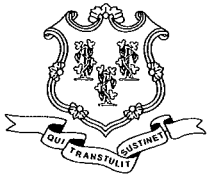
Very truly yours,

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Mark A. Lauretti, Mayor, City of Shelton
Richard Schultz, Planning Administrator, City of Shelton
Brennan Realty, LLC





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May 13, 2011

The Honorable Mark A. Lauretti
Mayor
City of Shelton
54 Hill Street
P. O. Box 364
Shelton, CT 06484

RE: **EM-CING-126-110511** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 30 Oliver Terrace (70 Platt Road), Shelton, Connecticut.

Dear Mayor Lauretti:

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 May 27, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Richard Schultz, Planning Administrator, City of Shelton

EM-CING-126-110511



New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

ORIGINAL

Douglas L. Culp
Real Estate Consultant

HAND DELIVERED

May 9, 2011

RECEIVED
MAY 11 2011

CONNECTICUT
SITING COUNCIL

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

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 30 Oliver Terrace (70 Platt Road) Shelton, CT (owner Brennan Realty, LLC.)

Dear Ms. Roberts:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a new high-performance air interface for cellular mobile communications. It is the last step toward the 4th generation (4G) of radio technologies, designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the

structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.
4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly-licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 463-5511 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Douglas L. Culp
Real Estate Consultant

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

30 Oliver Terrace (70 Platt Road) Shelton, CT
Site Number 5431
Exempt Mod 08/07

Tower Owner/Manager: Brennan Realty, LLC

Equipment configuration: Monopole

Current and/or approved: Three PowerWave antennas @ 95 ft
Six PowerWave TMA's @ 95 ft
Twelve runs 7/8 inch coax to 95 ft
Equipment on Concrete Pad

Planned Modifications: Retain existing PowerWave Antenna's and TMA's at 95 ft
Retain all Coax Cabling
Install six PowerWave P65-16 antennas or equivalent @ 95 ft
Install six remote radio heads and surge arrestor @ 99 ft
Install one fiber and two DC power cables to 95 ft
Install one new cabinet and surge suppressor equipment

Power Density:

Worst-case calculations for existing wireless operations at the site, using standard parameters for other carriers, indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the Tower, of approximately 100% of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 104 % of the standard.

Existing

Other Users							2.65
AT&T UMTS	95	800 Band	1	500	0.0199	0.5867	3.40
AT&T GSM	95	1900 Band	6	427	0.1021	1.0000	10.21
Total							16.3%

* Data for other users are from actual readings performed at the site by SAI Communications on 5-09-11 (see attachment).

Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	Percent of Limit
Other Users							2.65
AT&T UMTS	95	800 Band	1	500	0.0199	0.5867	3.40
AT&T UMTS	95	1900 Band	2	500	0.0398	1.0000	3.98
AT&T GSM	95	1900 Band	6	427	0.1021	1.0000	10.21
AT&T GSM	95	880 - 894	7	296	0.0826	0.5867	14.07
AT&T LTE	95	740 - 746	1	500	0.0199	0.4933	4.04
Total							38.3%

* Data for other users are from actual readings performed at the site by SAI Communications on 5-09-11 (see attachment).

Structural information:

The attached structural analysis demonstrates that the monopole and foundation have adequate structural capacity to accommodate the proposed modifications. (CENTEK, dated 4-13-11).



DESIGN BASIS

GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2006

- ## GENERAL NOTES

- SITE NOTES

- EARTHWORK NOTES

- SIEVE DESIGNATION Z PASSING

No. 200 4-3

- | STATION NUMBER | STATION DESIGNATION | W. B. C. NO. |
|----------------|---------------------|--------------|
| 1 | 1 | 1 |
| 2 | 2 | 2 |
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| 99 | 99 | 99 |
| 100 | 100 | 100 |

513

- [illegible]

1 EXISTING ANTENNA PLAN

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

2 EXISTING ANTENNA SECTOR ELEVATION

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

3 PROPOSED ANTENNA PLAN

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

4 PROPOSED ANTENNA SECTOR ELEVATION

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

5 RRU AND SURGE ARRESTOR PLAN

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

6 RRU MOUNTING DETAIL

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

7 RRU AND SURGE ARRESTOR MOUNTING DETAIL

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

8 RRU DETAIL

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

9 SURGE ARRESTOR DETAIL

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

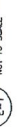
10 RRU DETAIL

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

SITE TYPE	ARRISOR MAKE/MODEL	QTY REQUIRED	ARRISOR LOCATION	WEIGHT
TOWER	ARRISOR MAKE/MODEL	QTY REQUIRED	ARRISOR LOCATION	WEIGHT

EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
ARRISOR MAKE/MODEL	17.5" x 17.5" x 7.5"	17.5 LBS	17.5" MIN. ABOVE 17.5" MIN. ABOVE 17.5" MIN.

NOTE
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTIONS WITH MANUFACTURERS.
2. CONTRACTOR TO INSTALL SURGE ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.



2. **② LTE SCHEMATIC DIAGRAM**

4

SWITCH

3

1

AT&T MOBILITY		SITE NUMBER: CT5431		SITE NAME: SHELTON NORTH EAST	
REPUBLIC COMMUNICATIONS INCORPORATED		30 OLIVER TERRACE		SHELTON, CT 06484	
www.CentelUSA.com		DATE: 02/07/11		DRAWN BY: CMC	
SCALE: AS NOTED		JOB NO.: 1102112245		DATE: 02/07/11	
ELECTRICAL		DRAWING		NOTES	
E-1					



MAXIMUM PERMISSIBLE EXPOSURE STUDY



Site ID: CT5431

Site Name: Shelton North East

Address: 30 Oliver Terrace, Shelton, CT 06484



Conclusion: *The site measurement was 2.65% of FCC Standard for Uncontrolled/General Public Maximum Permissible Exposure (MPE).*

Prepared by:

SAI Communications
260 Cedar Hill Street
Marlboro, MA 01752
508-573-5077

Date of Report:

May 09, 2011

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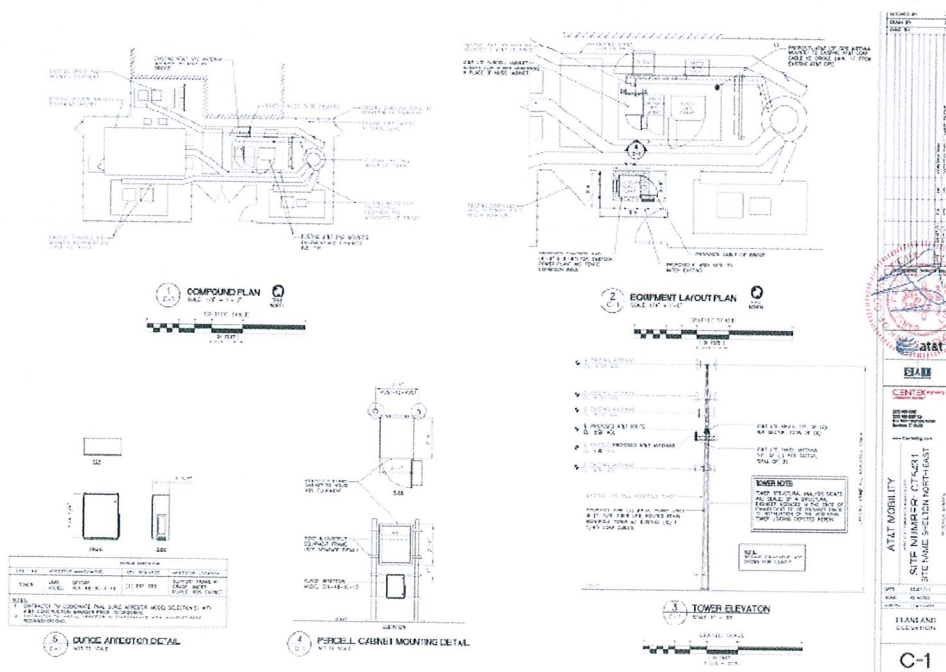
1. INTRODUCTION

SAI Communications conducted Radio Frequency measurements at 30 Oliver Terrace, Shelton, CT around the outer perimeter ground level to determine the current RF exposure levels at the surrounding area prior to construction/modifications of the site. The measurements collected represent the cumulative power density levels of all the RF transmitters in the area, within the frequency range of the equipment used. The FCC has established Maximum Permissible Exposure (MPE) limits for general population exposures and occupational exposures. This report summarizes the Radio Frequency Emission findings in relevance to the FCC compliance standards for limiting human exposure to RF Electromagnetic fields.

2. SITE DESCRIPTION & CONFIGURATION

Below is the current AT&T antenna's configuration for the three sectors containing one antenna per sector for a total of three antennas with construction complete. AT&T's installation is on the tower at 30 Oliver Terrace, Shelton, CT 06484, which is a cell tower approximately 140 feet in height. The center of AT&T's antennas are at approximately 95 feet on the said tower. Other carriers at this location include Verizon Wireless, T-Mobile Wireless, and Sprint Wireless with antenna at 75 feet, 110 feet, and 120 feet respectively.

Sector	1 (alpha)	2 (beta)	3 (gamma)
Number of existing antennas	1	1	1
Current antenna model	800-10121	800-10121	800-10121
Current antenna azimuth	40	170	280
Current center line (ft)	95	95	95
Current number of feeders	2	2	2
Current feeder manufacturer	KATHREIN	KATHREIN	KATHREIN
Current feeder diameter	7/8"	7/8"	7/8"
Current feeder length (ft)	135	135	135



3. FCC GUIDELINES

The FCC, in responding to the Telecommunications Act of 1996, issued ET Docket 93-62 which prescribed rules regarding the environmental effects of RF emission and to modify Title 47 parts 1, 2, 15, 24 and 97. The FCC established two levels for Maximum Permissible Exposure (MPE), the General Public/Uncontrolled limits and the Occupational/Controlled limits. The MPEs are presented in the Table 1 and Table 2, respectively below.

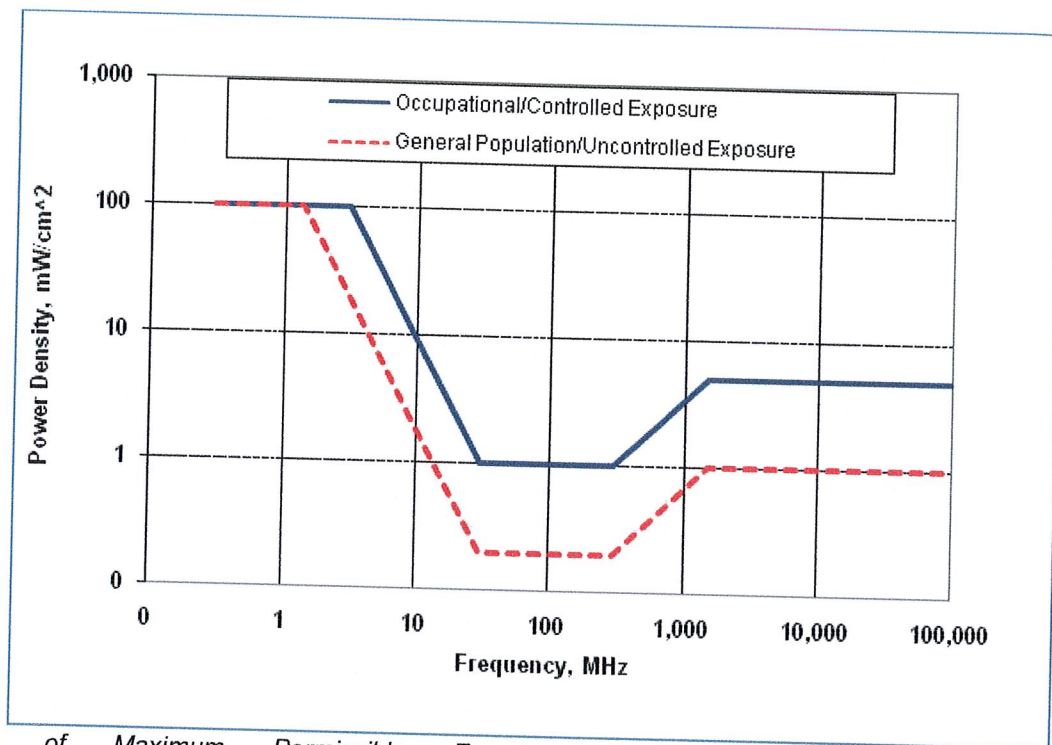
Table 1. MPE Limits for General Population/ Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time for E ² , H ² , or S (Minutes)
0.3 – 1.34	614	1.63	(100)*	30
1.34 – 30	824/f	2.19/f	(180/f ²)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	--	--	f/1500	30
1500– 100,000	--	--	1.0	30
f = frequency in MHz		* = Plane wave equivalent power density		

TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can't exercise control over their exposure.

Table 2. MPE Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time for E ² , H ² , or S (Minutes)
0.3 – 3.0	614	1.63	(100)*	6
3.0 – 30	1842/f	4.89/f	(900/f ²)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	--	--	f/300	6
1500– 100,000	--	--	5.0	6
f = frequency in MHz		* = Plane wave equivalent power density		

TABLE 2: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where such occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

4. FCC RF EXPOSURE LIMITS



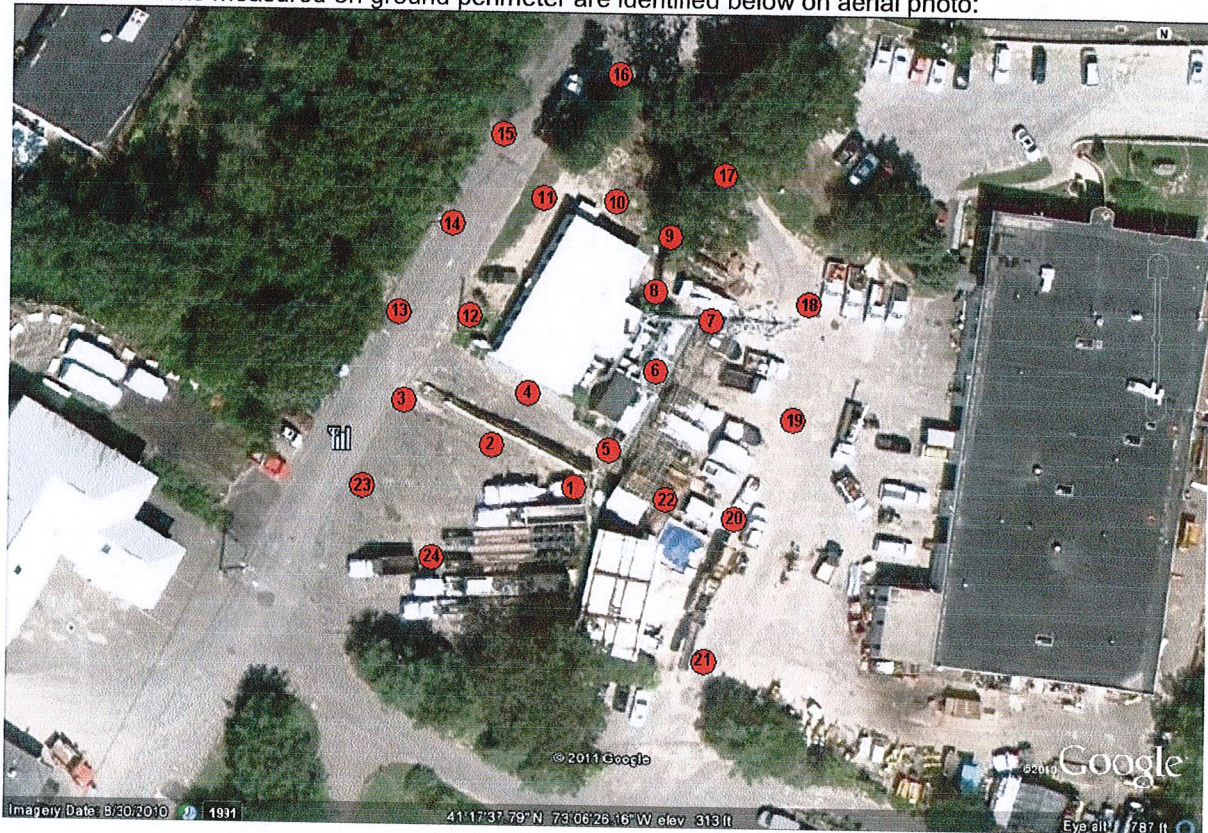
Graph of Maximum Permissible Exposures. Occupational/Controlled and General Population/Uncontrolled MPE's are functions of frequency.

5. FIELD SURVEY RESULTS

The measurement positions conducted at 30 Oliver Terrace, Shelton, CT are shown on the aerial photo of the surrounding area. Contained on the next page is a table summarizing the pre-construction power density measurements recorded at the points indicated. The measurements presented were taken on the site property and nearby public access points.

5.1 GROUND LEVEL MEASUREMENTS

- Positions measured on ground perimeter are identified below on aerial photo:



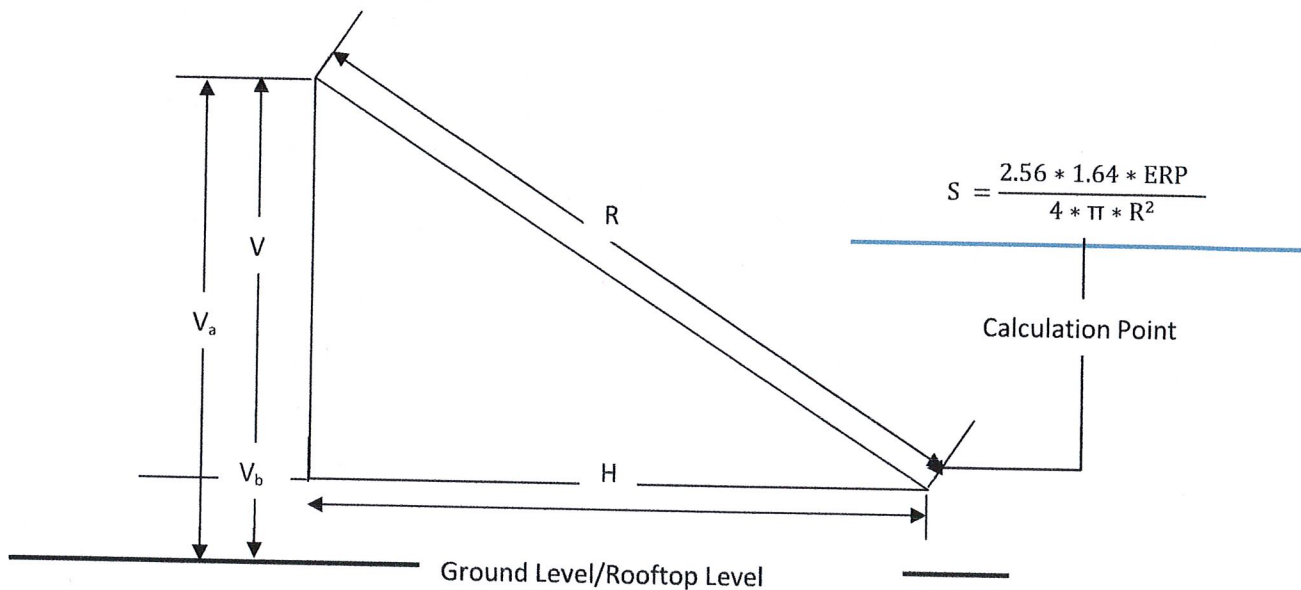
Measurement Position	Spatial Averaged %MPE Measurements - Cumulative of all Carriers	
	Controlled Population	Uncontrolle d Population
1	0.0009	0.0045
2	0.0028	0.0140
3	0.0227	0.1135
4	0.1316	0.6580
5	0.1819	0.9095
6	0.1169	0.5845
7	0.1665	0.8325
8	0.2611	1.3055
9	0.3058	1.5290
10	0.3089	1.5445
11	0.3309	1.6545
12	0.3518	1.7590
13	0.4006	2.0030
14	0.3636	1.8180
15	0.4815	2.4075
16	0.5300	2.6500
17	0.4285	2.1425
18	0.2549	1.2745
19	0.1886	0.9430
20	0.2347	1.1735
21	0.2523	1.2615
22	0.2728	1.3640
23	0.2521	1.2605
24	0.2421	1.2105

6. THEORETICAL CALCULATIONS FOR THE PROPOSED LTE TECHNOLOGY

AT&T Mobility is planning to install 3 antennas (Powerwave P65-16-XLH-RR), 1 per sector, for LTE Technology at 700MHz band, with azimuths of 30°-150°-270° for alpha-beta-gamma sectors, in addition to the existing the GSM/UMTS antennas. This section of the report will evaluate the increase in power density with the addition of LTE Technology with one radio per sector at 45dBm transmit power, through the use of FCC suggested prediction methods.

6.1 RF EXPOSURE PREDICTION METHOD

Power Density is calculated in accordance with FCC OET Bulletin 65 formula (7):



Where:

S = Power Density

ERPrel = Effective Radiated Power relative to antenna pattern

R = Radial distance $= \sqrt{H^2 + V^2}$

H = Horizontal distance from antenna

V = Vertical distance from antenna $= V_a - V_b$

V_a = Antenna height above ground

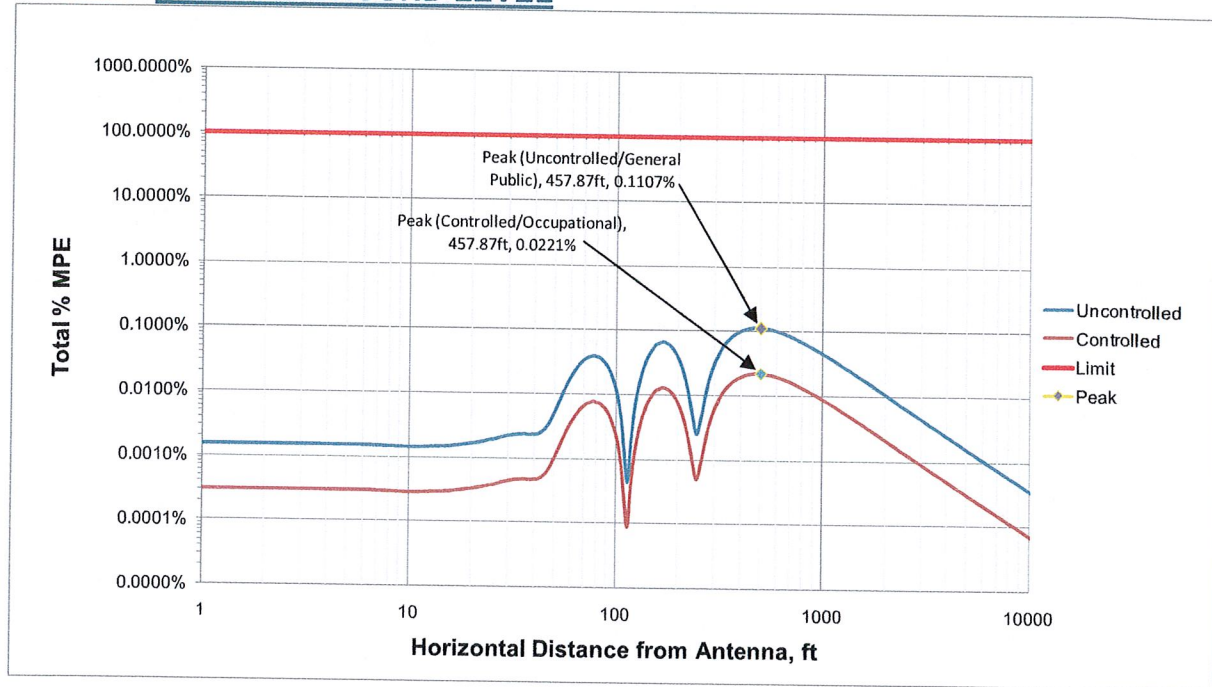
V_b = Calculation height

**Calculations made with assumption of horizontal plane (flat surface) from base of tower throughout the distances to calculation points.*

6.2 CALCULATION RESULTS

The following charts show the graphical representation of the calculated % MPE at ground level for the proposed LTE Technology, as horizontal distance from antenna increases. The calculations take into account the vertical pattern of the antennas and represent the immediate direction of each sector azimuth within the antenna horizontal beamwidth. The calculations also assume line of site to the antennas and the result will be lower if measured indoor due to in-building penetration loss.

6.2.1 %MPE AT GROUND LEVEL



6.3 ADDING THEORETICAL CALCULATIONS OF PROPOSED LTE TO ACTUAL MEASUREMENTS

6.3.1 %MPE AT GROUND LEVEL

Measurement Position	Spatial Averaged %MPE Measurements - Cumulative of all Carriers		Calculated %MPE - LTE Technology		Current Cumulative Measurements plus proposed LTE Technology	
	Controlled Population	Uncontrolled Population	Controlled Population	Uncontrolled Population	Controlled Population	Uncontrolled Population
1 (83 ft radius)	0.0009	0.0045	0.0073	0.0364	0.0082	0.0409
2 (89 ft radius)	0.0028	0.0140	0.0066	0.0329	0.0094	0.0469
3 (117 ft radius)	0.0227	0.1135	0.0001	0.0004	0.0228	0.1139
4 (64 ft radius)	0.1316	0.6580	0.0043	0.0214	0.1359	0.6794
5 (61 ft radius)	0.1819	0.9095	0.0035	0.0174	0.1854	0.9269
6 (24 ft radius)	0.1169	0.5845	0.0004	0.0018	0.1173	0.5863
7 (29 ft radius)	0.1665	0.8325	0.0004	0.0021	0.1669	0.8346
8 (14 ft radius)	0.2611	1.3055	0.0003	0.0014	0.2614	1.3069
9 (33 ft radius)	0.3058	1.5290	0.0005	0.0023	0.3063	1.5313
10 (54 ft radius)	0.3089	1.5445	0.0016	0.0081	0.3105	1.5526
11 (74 ft radius)	0.3309	1.6545	0.0072	0.0358	0.3381	1.6903
12 (82 ft radius)	0.3518	1.7590	0.0075	0.0376	0.3593	1.7966
13 (122 ft radius)	0.4006	2.0030	0.0004	0.0019	0.4010	2.0049
14 (111 ft radius)	0.3636	1.8180	0.0002	0.0011	0.3638	1.8191
15 (115 ft radius)	0.4815	2.4075	0.0001	0.0004	0.4816	2.4079
16 (115 ft radius)	0.5300	2.6500	0.0001	0.0004	0.5301	2.6504
17 (75 ft radius)	0.4285	2.1425	0.0075	0.0373	0.4360	2.1798
18 (76 ft radius)	0.2549	1.2745	0.0075	0.0373	0.2624	1.3118
19 (81 ft radius)	0.1886	0.9430	0.0075	0.0376	0.1961	0.9806
20 (95 ft radius)	0.2347	1.1735	0.0048	0.0238	0.2395	1.1973
21 (158 ft radius)	0.2523	1.2615	0.0115	0.0577	0.2638	1.3192
22 (79 ft radius)	0.2728	1.3640	0.0078	0.0388	0.2806	1.4028
23 (155 ft radius)	0.2521	1.2605	0.0115	0.0577	0.2636	1.3182
24 (148 ft radius)	0.2421	1.2105	0.0078	0.0390	0.2499	1.2495

7. EQUIPMENT USED FOR MEASUREMENTS

The following calibrated NARDA equipment was used for the measurements contained in this report. Calibration certification documents for probe and meter are located on pages 14 and 15 respectively.

Meter Manufacturer: <i>NARDA Microwave</i>	Probe Manufacturer: <i>NARDA Microwave</i>
Model: <i>NBM-550</i>	Model: <i>EA5091</i>
S/N: <i>B-0552</i>	S/N: <i>01046</i>
Calibration Due Date: <i>1/25/2013</i>	Calibration Due Date: <i>1/25/2013</i>

The probe used was a shaped probe which will give an aggregate reading of all transmitted RF Energy detected by the instrument by internally correcting for the different frequency/threshold limits and accurately measures the percent of MPE. The shaped probe has a frequency range of 300 KHz-50 GHz.

8. CONCLUSION

The measurements, recorded on May 05, 2011, revealed the worst-case spatially averaged measured value to be within 2.65% of the FCC MPE limits for uncontrolled/general public as outlined in the FCC OET Bulletin 65. Access door is locked and RF safety signs are displayed at entrance to cell site.

The areas in the vicinity of the surrounding area at 30 Oliver Terrace, Shelton, CT were surveyed and found to be within the mandated uncontrolled/General Population limits for Maximum Permissible Exposure (MPE), as delineated in the FCC's Radio Frequency exposure rules.

In addition, MPE theoretical calculations show that the site will still be within the FCC Standard for Uncontrolled/General Population Maximum Permissible Exposure (MPE) with the addition of the LTE700 Technology.

9. STATEMENT OF CERTIFICATION

I certify to the best of my knowledge that the statements contained in this report are true and accurate. The measurements were obtained with properly calibrated equipment using techniques in compliance with Federal Communications Commission OET Bulletin 65 and FCC ET Docket No. 93-62.

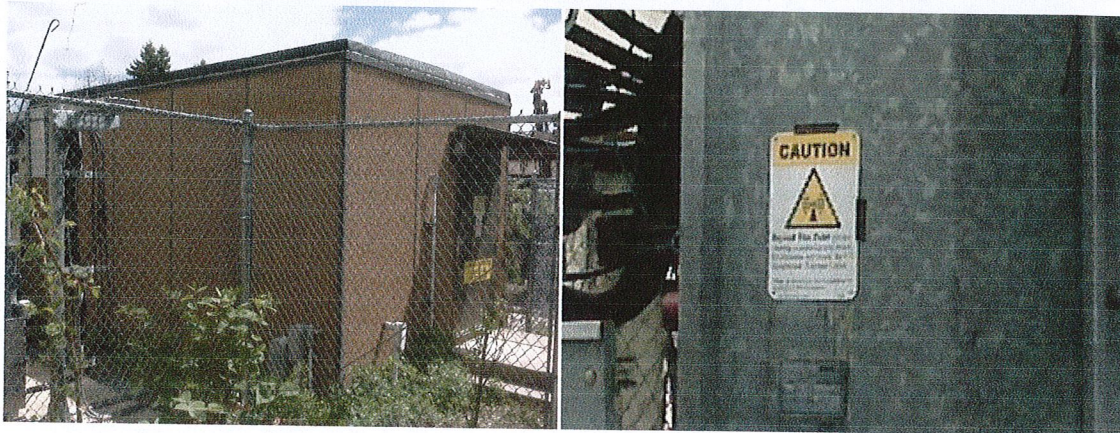
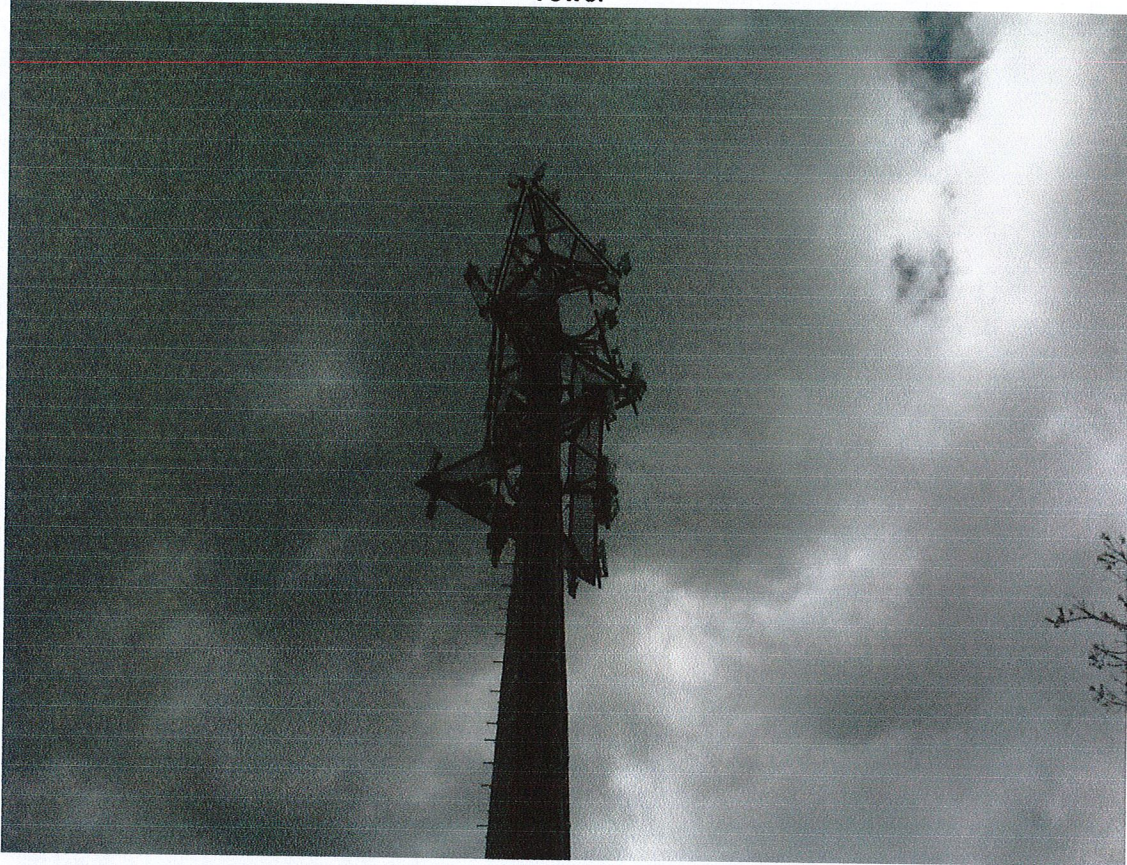


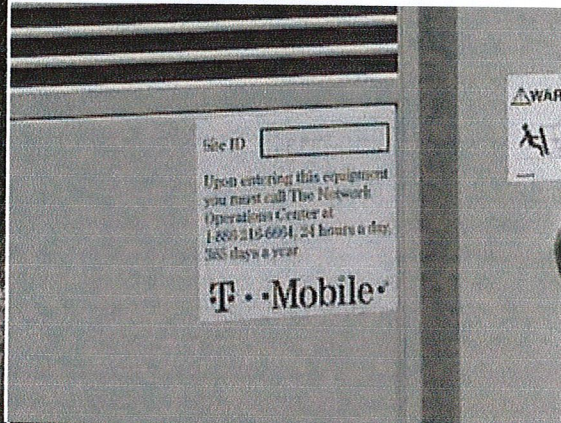
Daniel J Hamman
SAI Communications, Inc

May 09, 2011

Date

Tower





Narda Safety Test Solutions
435 Moreland Road, Hauppauge, NY 11788
Phone: 631-231-1700 · Fax: 631-231-1711
E-mail: nardaeast@L-3com.com
www.nardamicrowave.com



Calibration Certificate

Narda Safety Test Solutions hereby certifies that the referenced equipment has been calibrated by qualified personnel to Narda's approved procedures. The calibration was carried out within a certified quality management system conforming to ISO 9001:2000.

The metrological confirmation system for test equipment complies with ISO 10012-1.

Object	Electric Field Probe EA5091
Part Number (P/N)	2402/07
Serial Number (S/N)	01046
Manufacturer	Narda Safety Test Solutions
Date of Calibration	Wed 18/Feb/2009 10:54:03
Results of Calibration	Test Results within Specification
Confirmation interval (recommended)	24 Months
Ambient Conditions	(23 +/- 3)°C (40...60)% rel. humidity
Calibration Procedure	ATE Software 990199 Ver. 1.47
Probe Definition File Set	P/N 990199-04 Ver. 1.06
Results Filed Under	EA5091_01046_18Feb2009.txt

Hauppauge, NY

Calibrated by



Quality Assurance

This certificate may only be published in full, unless permission for the publication of an approved extract has been obtained in writing from the Director of Quality Assurance.

Certificate No. 01046_18Feb2009.txt

Calibration Certificate

Narda Safety Test Solutions GmbH hereby certifies that the referenced equipment has been calibrated by qualified personnel to Narda's approved procedures. The calibration was carried out within a certified quality management system conforming to DIN EN ISO 9001:2000.

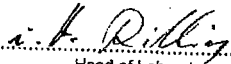
The metrological confirmation system for test equipment complies with ISO 10012-1.

Object	Broadband Field Meter NBM-550
Part Number (P/N)	2401/01
Serial Number (S/N)	B-0552
Manufacturer	Narda Safety Test Solutions GmbH
Customer	
Date of Calibration	2008-12-11
Results of Calibration	Test results within specifications
Confirmation interval (recommended)	24 months
Ambient conditions	(23 ± 3)°C (20 ... 60) % rel. humidity
Calibration procedure	2401-8700-00A

Pfullingen, 2008-12-11



Person In charge
R. Martin



Head of Laboratory
N. Moll

This certificate may only be published in full, unless permission for the publication of an approved extract has been obtained in writing from the Managing Director.

MANAGEMENT
SYSTEM



Certified by DQS against
DIN EN ISO 9001:2000
(Reg.-No. 99379-QM)

Structural Analysis Report

140-ft Existing FWT Monopole

Proposed AT&T Antenna Upgrade

AT&T Site Ref: CT5431:Shelton North East

*Oliver Terrace
Shelton, CT*

CEN TEK Project No. 11021.CO45

Date: April 13, 2011



Prepared for:

*AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067*

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- ANTENNA CUT SHEETS.

Introduction

The purpose of this report is to summarize the results of the non-linear, P- Δ structural analysis of the antenna installation proposed by AT&T Mobility on the existing monopole (tower), owned and operated by the Brennan Realty LLC, located in Shelton, CT.

The host tower is a 101.5-ft tall, two-section, eighteen sided, tapered monopole, originally designed and manufactured by Fort Worth Tower. A 38.5-ft tall, eighteen sided, tapered monopole extension designed by Paul J. Ford job no. 34803-0047 dated October 25, 2004 was added to the tower. The manufacturer's drawings and calculations were unavailable for use in this report. The tower geometry, structure member sizes, foundation information and reinforcement design drawings were obtained from a previous structural report prepared by GPD Associates job no; 2010266.16 dated April 15, 2010.

The tower is made up of three (3) tapered vertical sections consisting of A572-65 pole sections. The bottom two (2) vertical tower sections are slip joint connected and the tower extension is flange connected. The diameter of the pole (flat-flat) is 13.161-in at the top and 44.317-in at the base.

Antenna and appurtenance information were obtained from the aforementioned GPD structural report, an AT&T RFDS sheet and visual verification conducted from grade by Centek personal on March 2, 2011.

AT&T Mobility proposes the installation of three (3) panel antennas on an existing 13-ft 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 (Existing):
Antennas: One (1) 9-ft tall Omni-directional whip antenna mounted on the Verizon platform with a RAD center elevation of 144.5-ft above the existing tower base plate.
Coax Cables: One (1) 7/8" $\varnothing$ coax cable running on the inside of the existing tower.
- VERIZON (Existing):
Antennas: Four (4) Decibel DB846F65ZAXY, two (2) Swedcom SCE-6016 rev2, three (3) RYMSA MG D3-800T0, two (2) Powerwave P65-16-XL-2 and one (1) Andrew LNX-6514DS-T4M panel antennas mounted on a 13-ft low profile platform with a RAD center elevation of 140-ft above the existing tower base plate.
Coax Cables: Twelve (12) 1-5/8" $\varnothing$ coax cables running on the inside of the existing tower and six (6) 1-5/8" $\varnothing$ coax cables running on the exterior of the existing tower.
- T-MOBILE (Existing):
Antennas: Six (6) RFS APX1616PV-16PVL-E panel antennas and six (6) DTMA-1819-DD-12 TMA's mounted on three (3) T-Arms with a RAD center elevation of 120-ft above the existing tower base plate.
Coax Cables: Eighteen (18) 1-5/8" $\varnothing$ coax cables running on the exterior of the existing tower.

- METROPCS (Existing/Reserved):
Antennas: Three (3) Kathrein 800-10504 panel antennas, three (3) Kathrein 742-351 panel antennas and six (6) Kathrein 860-10025 RET's mounted on three (3) 5-ft T-Arms with a RAD center elevation of 110-ft above the existing tower base plate.
Coax Cables: Twelve (12) 1-5/8" Ø coax cables running on the exterior of the existing tower.
- AT&T (EXISTING TO REMAIN):
Antennas: Three (3) Powerwave 7770 panel antennas and six (6) Powerwave LGP TMA's mounted on a 13-ft platform with handrails with a RAD center elevation of 95-ft above the existing tower base plate.
Coax Cables: Six (6) 7/8" Ø coax cables running on the inside of the existing tower.
- SPRINT (Existing):
Antennas: Six (6) EMS RR65-18-04DPL2 panel antennas mounted on a 13-ft low profile platform with a RAD center elevation of 75-ft above the existing tower base plate.
Coax Cables: Six (6) 1-1/4" Ø coax cables running on the inside of the existing tower.
- CLEARWIRE (Existing):
Antennas: Three (3) Argus LLPX310R panel antennas, three (3) Samsung FDD-R6-RRH, two (2) Dragonwave Horizon ODU's and two (2) Dragonwave A-ANT-23-G-2-C dishes mounted on the sprint 13-ft low profile platform with a RAD center elevation of 75-ft above the existing tower base plate.
Coax Cables: Six (6) 5/16" Ø and two (2) 1/2" Ø coax cables running on the inside of the existing tower.
- AT&T (PROPOSED):
Antennas: Three (3) Powerwave P65-16-XLH-RR panel antennas mounted on a 13-ft platform with handrails with a RAD center elevation of 95-ft above the existing tower base plate.
- AT&T (PROPOSED):
Antennas: Six (6) Ericsson RRUS-11 and one (1) Raycap DC6-48-60-18-8F surge arrester mounted to one (1) universal ring mount with a RAD center elevation of 99-ft above grade level.
Coax Cables: One (1) fiber cable and two (2) dc control 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 coax cables to be installed as indicated in this report.
- Refer to construction drawings prepared by Centek Engineering dated 4.7.11 for RRU and Surge Arrestor mounting details.

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]
	Shelton; v = 105 mph (3 second gust) equivalent to v = 85 mph (fastest mile)	[Appendix K of the 2005 CT Building Code Supplement]
	<i>Appendix K and TIA/EIA wind speed criteria are equal.</i>	
Load Cases:	<u>Load Case 1</u> ; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	[Section 2.3.16 of TIA/EIA-222-F-96]
	<u>Load Case 2</u> ; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 mph wind speed.	[Section 2.3.16 of TIA/EIA-222-F-96]
	<u>Load Case 3</u> ; 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 **99.4%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L2)	58.58'-101.58'	99.4%	PASS

Note: The wall thickness of the bottom 58.5-ft of the monopole was increased in the RisaTower analysis to reflect the reinforcements designed in the aforementioned structural analysis report prepared by GPD Associates job no. 2010266.16 dated April 15, 2010.

Foundation and Anchors

The existing foundation consists of a 6-ft Ø x 14.5-ft long reinforced concrete caisson. The sub-grade conditions used in the analysis of the existing foundation were obtained from the aforementioned GPD Associates design report dated April 15, 2010. The base of the tower is connected to the foundation by means of (12) 2.25"Ø, ASTM A615-75 anchor bolts embedded into the concrete foundation structure.

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

- The tower 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 (kips/ft-kips)
Base	Shear	25
	Axial	35
	Moment	2370

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	54.2%	PASS
	Lateral Deflection	0.21 in. ⁽¹⁾	PASS

(1) Lateral deflection typically limited to 1.0 in. for monopole tower structures.

CEN TEK Engineering, Inc.
Structural Analysis – 140-ft FWT Monopole
AT&T Antenna Upgrade – CT5431: Shelton North East
Shelton, CT
April 13, 2011

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

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Flange Bolts	Tension	80.3%	PASS
Flange Plate	Bending	45.1%	PASS
Anchor Bolts	Tension	45.2%	PASS
Base Plate	Bending	81.1%	PASS

Conclusion

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

The analysis is based, in part, on the information provided to this office by AT&T Mobility. 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.

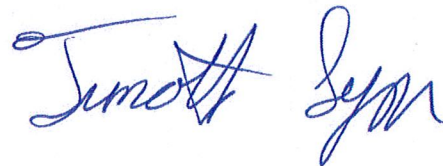
Respectfully Submitted by:



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.

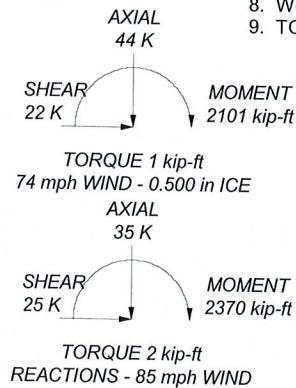
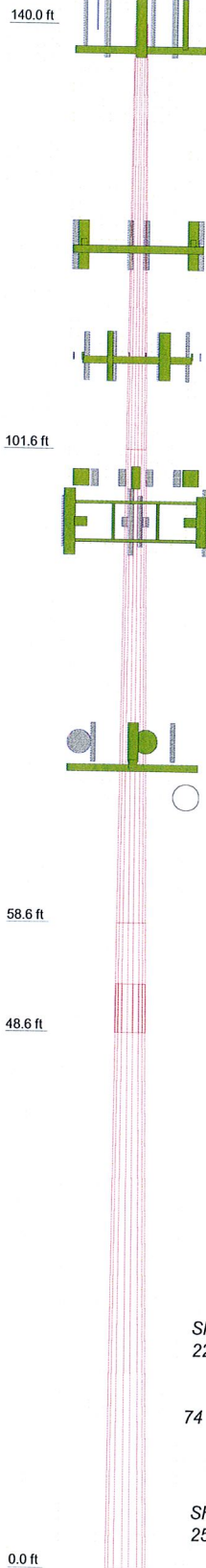
General Description of Structural Analysis Program

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	4
Length (ft)	38.420	43.000	10.000	53.000
Number of Sides	18	18	18	18
Thickness (in)	0.188	0.313	0.583	0.663
Socket Length (ft)			4.420	
Top Dia (in)	13.161	21.882	31.643	31.743
Bot Dia (in)	21.882	31.643	33.913	44.317
Grade		A572-65		
Weight (K)	1.3	3.8	2.0	14.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
9-ft Omni (Unknown)	138	3-ft Standoff T-Arm (5-ft face width) (MetroPCS Existing)	110
DB846F65ZAXY (Verizon Existing)	138	3-ft Standoff T-Arm (5-ft face width) (MetroPCS Existing)	110
MG D3-800T0 (Verizon Existing)	138	3-ft Standoff T-Arm (5-ft face width) (MetroPCS Existing)	110
P65-16-XL-2 (Verizon Existing)	138	(2) RRUS-11 (ATI - Proposed)	99
DB846F65ZAXY (Verizon Existing)	138	(2) RRUS-11 (ATI - Proposed)	99
MG D3-800T0 (Verizon Existing)	138	(2) RRUS-11 (ATI - Proposed)	99
P65-16-XL-2 (Verizon Existing)	138	DC6-48-60-18-8F Surge Arrestor (ATI - Proposed)	99
DB846F65ZAXY (Verizon Existing)	138	Valmont Uni-Tri Bracket (ATI - Proposed)	99
SC 6016-DIN (Verizon Existing)	138	7770.00 (ATI Existing)	95
MG D3-800T0 (Verizon Existing)	138	P65-16-XLH-RR (ATI - Proposed)	95
LNK-6514DS-T4M (Verizon Existing)	138	7770.00 (ATI Existing)	95
SC 6016-DIN (Verizon Existing)	138	P65-16-XLH-RR (ATI - Proposed)	95
Valmont 13' Low Profile Platform (Verizon Existing)	138	7770.00 (ATI Existing)	95
(2) APX16PV-16PVL-E (T-Mobile Existing)	120	P65-16-XLH-RR (ATI - Proposed)	95
(2) APX16PV-16PVL-E (T-Mobile Existing)	120	7770.00 (ATI Existing)	95
(2) APX16PV-16PVL-E (T-Mobile Existing)	120	P65-16-XLH-RR (ATI - Proposed)	95
(2) APX16PV-16PVL-E (T-Mobile Existing)	120	7770.00 (ATI Existing)	95
(2) DTMA-1819-DD-12 (T-Mobile Existing)	120	(2) LGP214nn TMA (ATI Existing)	95
(2) DTMA-1819-DD-12 (T-Mobile Existing)	120	(2) LGP214nn TMA (ATI Existing)	95
(2) DTMA-1819-DD-12 (T-Mobile Existing)	120	(2) LGP214nn TMA (ATI Existing)	95
(2) DTMA-1819-DD-12 (T-Mobile Existing)	120	(2) LGP214nn TMA (ATI Existing)	95
Valmont T-Arm (1) (T-Mobile Existing)	120	(2) RR65-18-04DPL2 (Sprint Existing)	73
Valmont T-Arm (1) (T-Mobile Existing)	120	(2) RR65-18-04DPL2 (Sprint Existing)	73
Valmont T-Arm (1) (T-Mobile Existing)	120	(2) RR65-18-04DPL2 (Sprint Existing)	73
800-10504 (MetroPCS Existing)	110	LLPX310R (Clearwire Existing)	73
800-10504 (MetroPCS Existing)	110	LLPX310R (Clearwire Existing)	73
800-10504 (MetroPCS Existing)	110	LLPX310R (Clearwire Existing)	73
742-351 (MetroPCS Existing)	110	Remote Radio Head FD R6 RRH (Clearwire Existing)	73
742-351 (MetroPCS Existing)	110	Remote Radio Head FD R6 RRH (Clearwire Existing)	73
(2) 860-10025 RET (MetroPCS Existing)	110	Remote Radio Head FD R6 RRH (Clearwire Existing)	73
(2) 860-10025 RET (MetroPCS Existing)	110	Horizon ODU (Clearwire Existing)	73
(2) 860-10025 RET (MetroPCS Existing)	110	Horizon ODU (Clearwire Existing)	73
(2) 860-10025 RET (MetroPCS Existing)	110	Valmont 13' Low Profile Platform (Sprint Existing)	73
(2) 860-10025 RET (MetroPCS Existing)	110	A-Ant-23G-2-C (Nextel Existing)	73
(2) 860-10025 RET (MetroPCS Existing)	110	A-Ant-23G-2-C (Nextel Existing)	73

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. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.
9. TOWER RATING: 99.4%

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

Job: **11021.CO45 - CT5431 ~ Shelton North Ea**
Project: **140-ft FWT Monopole - Shelton, CT**
Client: AT&T Mobility
Code: TIA/EIA-222-F
Path: A:\Jobs\1102100\W\CO45-CT5431 - Clear Tower Shelton, CT\Shelton\Calcs\B\Plan\140 Monopole Shelton CT.dwg
Drawn by: TJL
Date: 04/13/11
App'd:
Scale: N
Dwg No.:

RISATower

Centek Engineering Inc.

63-2 North Branford Road
Branford, CT 06405
Phone: 203.488.0580
FAX: 203.488.8587

Job

11021.CO45 - CT5431 ~ Shelton North East

Page

1 of 29

Project

140-ft FWT Monopole - Shelton, CT

Date

08:59:44 04/13/11

Client

AT&T Mobility

Designed by

TJL

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 0.500 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.

Weld together tower sections have flange connections..

Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..

Welds are fabricated with ER-70S-6 electrodes..

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 | Retention 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	140.000- 101.580	38.420	0.000	18	13.161	21.882	0.188	0.750	A572-65 (65 ksi)
L2	101.580-58.580	43.000	0.000	18	21.882	31.643	0.313	1.250	A572-65 (65 ksi)
L3	58.580-48.580	10.000	4.420	18	31.643	33.913	0.583	2.333	A572-65

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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
L4	48.580-0.000	53.000		18	31.743	44.317	0.663	2.654	(65 ksi) 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	13.364	7.721	164.179	4.606	6.686	24.556	328.574	3.861	1.986	10.594
	22.220	12.911	767.705	7.702	11.116	69.063	1536.421	6.457	3.521	18.78
L2	22.220	21.394	1257.519	7.657	11.116	113.126	2516.693	10.699	3.301	10.564
	32.131	31.076	3853.864	11.122	16.075	239.748	7712.799	15.541	5.019	16.061
L3	32.131	57.504	7008.549	11.026	16.075	436.000	14026.320	28.757	4.543	7.788
	34.436	61.706	8660.253	11.832	17.228	502.690	17331.901	30.859	4.942	8.473
L4	33.298	65.442	7986.355	11.033	16.125	495.263	15983.219	32.727	4.419	6.661
	45.001	91.918	22129.930	15.497	22.513	982.983	44288.978	45.968	6.632	9.997

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 140.000- 101.580				1	1	1		
L2 101.580- 58.580				1	1	1		
L3 58.580- 48.580				1	1	1		
L4 48.580- 0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf
LDF5-50A (7/8 FOAM) (Unknown Existing)	C	No	Inside Pole	140.000 - 8.000	1	No Ice 1/2" Ice	0.000 0.000	0.000 0.000
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	75.000 - 8.000	6	No Ice 1/2" Ice	0.000 0.000	0.001 0.001
(Sprint - Existing) 2" Rigid Conduit (Clearwire Existing)	C	No	Inside Pole	75.000 - 8.000	2	No Ice 1/2" Ice	0.000 0.000	0.003 0.003
LDF4-50A (1/2 FOAM) (Clearwire Existing)	C	No	Inside Pole	75.000 - 8.000	3	No Ice 1/2" Ice	0.000 0.000	0.000 0.000
LDF5-50A (7/8 FOAM) (AT&T - Existing)	C	No	Inside Pole	95.000 - 8.000	6	No Ice 1/2" Ice	0.000 0.000	0.000 0.000
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	140.000 - 8.000	12	No Ice 1/2" Ice	0.000 0.000	0.001 0.001
(Verizon - Existing) LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	120.000 - 8.000	3	No Ice 1/2" Ice	0.198 0.298	0.001 0.002

RISATower Centek Engineering Inc. 63-2 North Branford Road Branford, CT 06405 Phone: 203.488.0580 FAX: 203.488.8587	Job	11021.CO45 - CT5431 ~ Shelton North East	Page	3 of 29
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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf
(T-Mobile - Existing)								
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	120.000 - 8.000	15	No Ice 1/2" Ice	0.000 0.000	0.001 0.000
(T-Mobile - Existing)								
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	110.000 - 8.000	6	No Ice 1/2" Ice	0.000 0.000	0.001 0.002
(MetroPCS - Existing)								
FLC 158-50J (1 5/8 FOAM)	C	No	CaAa (Out Of Face)	140.000 - 8.000	1	No Ice 1/2" Ice	0.202 0.302	0.001 0.002
(Verizon - Existing)								
FLC 158-50J (1 5/8 FOAM)	C	No	CaAa (Out Of Face)	140.000 - 8.000	5	No Ice 1/2" Ice	0.000 0.000	0.001 0.002
(Verizon - Existing)								
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	110.000 - 8.000	6	No Ice 1/2" Ice	0.000 0.000	0.001 0.002
(MetroPCS - Reserved)								
RG6-Fiber	C	No	Inside Pole	95.000 - 8.000	1	No Ice 1/2" Ice	0.000 0.000	0.001 0.001
(AT&T - Propsoed)								
#8 AWG Copper Wlre (AT&T - Propsoed)	C	No	Inside Pole	95.000 - 8.000	2	No Ice 1/2" Ice	0.000 0.000	0.000 0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	140.000-101.580	A	0.000	0.000	0.000	10.941	0.650
		B	0.000	0.000	0.000	0.000	0.083
		C	0.000	0.000	0.000	7.761	0.225
L2	101.580-58.580	A	0.000	0.000	0.000	25.542	1.058
		B	0.000	0.000	0.000	0.000	0.423
		C	0.000	0.000	0.000	8.686	0.528
L3	58.580-48.580	A	0.000	0.000	0.000	5.940	0.246
		B	0.000	0.000	0.000	0.000	0.098
		C	0.000	0.000	0.000	2.020	0.189
L4	48.580-0.000	A	0.000	0.000	0.000	24.105	0.998
		B	0.000	0.000	0.000	0.000	0.399
		C	0.000	0.000	0.000	8.197	0.769

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	140.000-101.580	A	0.500	0.000	0.000	0.000	16.467	0.507
		B		0.000	0.000	0.000	0.000	0.236
		C		0.000	0.000	0.000	11.603	0.580
L2	101.580-58.580	A	0.500	0.000	0.000	0.000	38.442	0.724
		B		0.000	0.000	0.000	0.000	1.205
		C		0.000	0.000	0.000	12.986	0.925
L3	58.580-48.580	A	0.500	0.000	0.000	0.000	8.940	0.168
		B		0.000	0.000	0.000	0.000	0.280
		C		0.000	0.000	0.000	3.020	0.282
L4	48.580-0.000	A	0.500	0.000	0.000	0.000	36.278	0.684
		B		0.000	0.000	0.000	0.000	1.137

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Tower Section	Tower Elevation ft	Face or Leg C	Ice Thickness in	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
				0.000	0.000	0.000	12.255	1.143

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	140.000-101.580	-0.197	-0.248	-0.252	-0.321
L2	101.580-58.580	-0.193	-0.545	-0.249	-0.708
L3	58.580-48.580	-0.203	-0.573	-0.267	-0.759
L4	48.580-0.000	-0.177	-0.499	-0.239	-0.679

Discrete Tower Loads

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight K</i>
9-ft Omni (Unknown)	A	From Face	4.000 0.000 6.500	0.000	138.000	No Ice 1/2" Ice	2.250 3.180	2.250 3.180	0.030 0.050
DB846F65ZAXY (Verizon Existing)	A	From Face	3.000 -6.000 2.000	0.000	138.000	No Ice 1/2" Ice	7.033 7.536	6.158 6.619	0.021 0.070
MG D3-800T0 (Verizon Existing)	A	From Face	3.000 -4.000 2.000	0.000	138.000	No Ice 1/2" Ice	3.454 3.802	2.222 2.555	0.015 0.035
P65-16-XL-2 (Verizon Existing)	A	From Face	3.000 0.000 2.000	0.000	138.000	No Ice 1/2" Ice	8.400 8.949	4.117 4.558	0.020 0.065
DB846F65ZAXY (Verizon Existing)	A	From Face	3.000 6.000 2.000	0.000	138.000	No Ice 1/2" Ice	7.033 7.536	6.158 6.619	0.021 0.070
DB846F65ZAXY (Verizon Existing)	B	From Face	3.000 -6.000 2.000	0.000	138.000	No Ice 1/2" Ice	7.033 7.536	6.158 6.619	0.021 0.070
MG D3-800T0 (Verizon Existing)	B	From Face	3.000 -4.000 2.000	0.000	138.000	No Ice 1/2" Ice	3.454 3.802	2.222 2.555	0.015 0.035
P65-16-XL-2 (Verizon Existing)	B	From Face	3.000 0.000 2.000	0.000	138.000	No Ice 1/2" Ice	8.400 8.949	4.117 4.558	0.020 0.065
DB846F65ZAXY (Verizon Existing)	B	From Face	3.000 6.000 2.000	0.000	138.000	No Ice 1/2" Ice	7.033 7.536	6.158 6.619	0.021 0.070
SC 6016-DIN (Verizon Existing)	C	From Face	3.000 -6.000 2.000	0.000	138.000	No Ice 1/2" Ice	13.378 14.043	9.725 10.282	0.045 0.131
MG D3-800T0	C	From Face	3.000	0.000	138.000	No Ice	3.454	2.222	0.015

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Client	AT&T Mobility	Designed by	TJL

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(Verizon Existing)			-4.000			1/2" Ice	3.802	2.555	0.035
LNx-6514DS-T4M	C	From Face	2.000						
(Verizon Existing)			3.000	0.000	138.000	No Ice	8.411	5.405	0.038
			0.000			1/2" Ice	8.964	5.863	0.089
SC 6016-DIN	C	From Face	2.000						
(Verizon Existing)			3.000	0.000	138.000	No Ice	13.378	9.725	0.045
			6.000			1/2" Ice	14.043	10.282	0.131
			2.000						
Valmont 13' Low Profile Platform	C	None		0.000	138.000	No Ice	15.700	15.700	1.300
(Verizon Existing)						1/2" Ice	20.100	20.100	1.765
(2) APX16PV-16PVL-E	A	From Face	3.000	0.000	120.000	No Ice	6.647	1.981	0.053
(T-Mobile Existing)			0.000			1/2" Ice	7.079	2.304	0.084
			0.000						
(2) APX16PV-16PVL-E	B	From Face	3.000	0.000	120.000	No Ice	6.647	1.981	0.053
(T-Mobile Existing)			0.000			1/2" Ice	7.079	2.304	0.084
			0.000						
(2) APX16PV-16PVL-E	C	From Face	3.000	0.000	120.000	No Ice	6.647	1.981	0.053
(T-Mobile Existing)			0.000			1/2" Ice	7.079	2.304	0.084
			0.000						
(2) DTMA-1819-DD-12	A	From Face	3.000	0.000	120.000	No Ice	0.706	0.411	0.014
(T-Mobile Existing)			0.000			1/2" Ice	0.831	0.521	0.019
			0.000						
(2) DTMA-1819-DD-12	B	From Face	3.000	0.000	120.000	No Ice	0.706	0.411	0.014
(T-Mobile Existing)			0.000			1/2" Ice	0.831	0.521	0.019
			0.000						
(2) DTMA-1819-DD-12	C	From Face	3.000	0.000	120.000	No Ice	0.706	0.411	0.014
(T-Mobile Existing)			0.000			1/2" Ice	0.831	0.521	0.019
			0.000						
Valmont T-Arm (1)	A	None		0.000	120.000	No Ice	10.540	10.540	0.336
(T-Mobile Existing)						1/2" Ice	14.450	14.450	0.412
Valmont T-Arm (1)	B	None		0.000	120.000	No Ice	10.540	10.540	0.336
(T-Mobile Existing)						1/2" Ice	14.450	14.450	0.412
Valmont T-Arm (1)	C	None		0.000	120.000	No Ice	10.540	10.540	0.336
(T-Mobile Existing)						1/2" Ice	14.450	14.450	0.412
800-10504	A	From Face	3.000	0.000	110.000	No Ice	3.658	2.255	0.018
(MetroPCS Existing)			2.500			1/2" Ice	4.007	2.587	0.039
			0.000						
800-10504	B	From Face	3.000	0.000	110.000	No Ice	3.658	2.255	0.018
(MetroPCS Existing)			2.500			1/2" Ice	4.007	2.587	0.039
			0.000						
800-10504	C	From Face	3.000	0.000	110.000	No Ice	3.658	2.255	0.018
(MetroPCS Existing)			2.500			1/2" Ice	4.007	2.587	0.039
			0.000						
742-351	A	From Face	3.000	0.000	110.000	No Ice	5.885	1.731	0.030
(MetroPCS Existing)			-2.500			1/2" Ice	6.299	2.043	0.057
			0.000						
742-351	B	From Face	3.000	0.000	110.000	No Ice	5.885	1.731	0.030
(MetroPCS Existing)			-2.500			1/2" Ice	6.299	2.043	0.057
			0.000						
742-351	C	From Face	3.000	0.000	110.000	No Ice	5.885	1.731	0.030
(MetroPCS Existing)			-2.500			1/2" Ice	6.299	2.043	0.057
			0.000						
(2) 860-10025 RET	A	From Face	3.000	0.000	110.000	No Ice	0.177	0.148	0.002
(MetroPCS Existing)			0.000			1/2" Ice	0.246	0.214	0.004
			0.000						
(2) 860-10025 RET	B	From Face	3.000	0.000	110.000	No Ice	0.177	0.148	0.002

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Client	AT&T Mobility	Designed by	TJL

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(MetroPCS Existing)			0.000					
(2) 860-10025 RET (MetroPCS Existing)	C	From Face	0.000 3.000 0.000 0.000	0.000	110.000	1/2" Ice No Ice 1/2" Ice 0.246 0.177 0.246	0.214 0.148 0.214	0.004 0.002 0.004
3-ft Standoff T-Arm (5-ft face width) (MetroPCS Existing)	A	From Face	1.500 0.000 0.000	0.000	110.000	No Ice 1/2" Ice 1.460 1.910	1.460 1.910	0.090 0.120
3-ft Standoff T-Arm (5-ft face width) (MetroPCS Existing)	B	From Face	1.500 0.000 0.000	0.000	110.000	No Ice 1/2" Ice 1.460 1.910	1.460 1.910	0.090 0.120
3-ft Standoff T-Arm (5-ft face width) (MetroPCS Existing)	C	From Face	1.500 0.000 0.000	0.000	110.000	No Ice 1/2" Ice 1.460 1.910	1.460 1.910	0.090 0.120
(2) RRUS-11 (AT&T - Proposed)	A	From Face	0.500 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 2.994 3.226	1.246 1.412	0.050 0.070
(2) RRUS-11 (AT&T - Proposed)	B	From Face	0.500 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 2.994 3.226	1.246 1.412	0.050 0.070
(2) RRUS-11 (AT&T - Proposed)	C	From Face	0.500 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 2.994 3.226	1.246 1.412	0.050 0.070
DC6-48-60-18-8F Surge Arrestor (AT&T - Proposed)	C	From Face	0.500 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 2.228 2.447	2.228 2.447	0.020 0.039
Valmont Uni-Tri Bracket (AT&T - Proposed)	C	None		0.000	99.000	No Ice 1/2" Ice 1.750 1.940	1.750 1.940	0.290 0.306
7770.00 (AT&T Existing)	A	From Face	3.000 -6.000 0.000	0.000	95.000	No Ice 1/2" Ice 5.882 6.314	2.928 3.273	0.035 0.068
P65-16-XLH-RR (AT&T - Proposed)	A	From Face	3.000 6.000 0.000	0.000	95.000	No Ice 1/2" Ice 8.400 8.949	4.700 5.147	0.060 0.107
7770.00 (AT&T Existing)	B	From Face	3.000 -6.000 0.000	0.000	95.000	No Ice 1/2" Ice 5.882 6.314	2.928 3.273	0.035 0.068
P65-16-XLH-RR (AT&T - Proposed)	B	From Face	3.000 6.000 0.000	0.000	95.000	No Ice 1/2" Ice 8.400 8.949	4.700 5.147	0.060 0.107
7770.00 (AT&T Existing)	C	From Face	3.000 -6.000 0.000	0.000	95.000	No Ice 1/2" Ice 5.882 6.314	2.928 3.273	0.035 0.068
P65-16-XLH-RR (AT&T - Proposed)	C	From Face	3.000 6.000 0.000	0.000	95.000	No Ice 1/2" Ice 8.400 8.949	4.700 5.147	0.060 0.107
(2) LGP214nn TMA (AT&T Existing)	A	From Face	3.000 0.000 0.000	0.000	95.000	No Ice 1/2" Ice 1.288 1.445	0.233 0.313	0.014 0.021
(2) LGP214nn TMA (AT&T Existing)	B	From Face	3.000 0.000 0.000	0.000	95.000	No Ice 1/2" Ice 1.288 1.445	0.233 0.313	0.014 0.021
(2) LGP214nn TMA (AT&T Existing)	C	From Face	3.000 0.000 0.000	0.000	95.000	No Ice 1/2" Ice 1.288 1.445	0.233 0.313	0.014 0.021
13' Platform w/Rails (AT&T Existing)	C	None		0.000	95.000	No Ice 1/2" Ice 17.200 22.300	17.200 22.300	2.000 3.000

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Project

140-ft FWT Monopole - Shelton, CT

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TJL

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(2) RR65-18-04DPL2 (Sprint Existing)	A	From Face	3.000 0.000 2.000	0.000	73.000	No Ice 1/2" Ice	4.356 4.775	1.974 2.312	0.018 0.040
(2) RR65-18-04DPL2 (Sprint Existing)	B	From Face	3.000 0.000 2.000	0.000	73.000	No Ice 1/2" Ice	4.356 4.775	1.974 2.312	0.018 0.040
(2) RR65-18-04DPL2 (Sprint Existing)	C	From Face	3.000 0.000 2.000	0.000	73.000	No Ice 1/2" Ice	4.356 4.775	1.974 2.312	0.018 0.040
LLPX310R (Clearwire Existing)	A	From Face	3.000 0.000 2.000	0.000	73.000	No Ice 1/2" Ice	4.830 5.183	1.945 2.214	0.029 0.055
LLPX310R (Clearwire Existing)	B	From Face	3.000 0.000 2.000	0.000	73.000	No Ice 1/2" Ice	4.830 5.183	1.945 2.214	0.029 0.055
LLPX310R (Clearwire Existing)	C	From Face	3.000 0.000 2.000	0.000	73.000	No Ice 1/2" Ice	4.830 5.183	1.945 2.214	0.029 0.055
Remote Radio Head FD R6 RRH (Clearwire Existing)	A	From Face	3.000 0.000 2.000	0.000	73.000	No Ice 1/2" Ice	1.804 1.988	0.778 0.918	0.033 0.045
Remote Radio Head FD R6 RRH (Clearwire Existing)	B	From Face	3.000 0.000 2.000	0.000	73.000	No Ice 1/2" Ice	1.804 1.988	0.778 0.918	0.033 0.045
Remote Radio Head FD R6 RRH (Clearwire Existing)	C	From Face	3.000 0.000 2.000	0.000	73.000	No Ice 1/2" Ice	1.804 1.988	0.778 0.918	0.033 0.045
Horizon ODU (Clearwire Existing)	A	None		0.000	73.000	No Ice 1/2" Ice	0.787 0.908	0.175 0.251	0.000 0.004
Horizon ODU (Clearwire Existing)	C	None		0.000	73.000	No Ice 1/2" Ice	0.787 0.908	0.175 0.251	0.000 0.004
Valmont 13' Low Profile Platform (Sprint Existing)	C	None		0.000	73.000	No Ice 1/2" Ice	15.700 20.100	15.700 20.100	1.300 1.765

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
A-Ant-23G-2-C (Nextel Existing)	A	Paraboloid w/Radome	From Face	3.100 -2.520 2.000	Worst		73.000	2.175	No Ice 1/2" Ice	3.715 4.006 0.027 0.050
A-Ant-23G-2-C (Nextel Existing)	C	Paraboloid w/Radome	From Face	3.800 -1.240 2.000	Worst		73.000	2.175	No Ice 1/2" Ice	3.715 4.006 0.027 0.050

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Tower Pressures - No Ice

$$G_H = 1.690$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		ksf	ft ²		ft ²	ft ²	ft ²			
L1 140.000- 101.580	119.411	1.444	0.027	56.098	A	0.000	56.098	56.098	100.00	0.000	10.941
					B	0.000	56.098		100.00	0.000	0.000
					C	0.000	56.098		100.00	0.000	7.761
L2 101.580- 58.580	79.185	1.284	0.024	95.899	A	0.000	95.899	95.899	100.00	0.000	25.542
					B	0.000	95.899		100.00	0.000	0.000
					C	0.000	95.899		100.00	0.000	8.686
L3 58.580- 48.580	53.522	1.148	0.021	27.315	A	0.000	27.315	27.315	100.00	0.000	5.940
					B	0.000	27.315		100.00	0.000	0.000
					C	0.000	27.315		100.00	0.000	2.020
L4 48.580- 0.000	23.235	1	0.019	156.081	A	0.000	156.081	156.081	100.00	0.000	24.105
					B	0.000	156.081		100.00	0.000	0.000
					C	0.000	156.081		100.00	0.000	8.197

Tower Pressure - With Ice

$$G_H = 1.690$$

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		ksf	in	ft ²		ft ²	ft ²	ft ²			
L1 140.000- 101.580	119.411	1.444	0.020	0.500	59.300	A	0.000	59.300	59.300	100.00	0.000	16.467
						B	0.000	59.300		100.00	0.000	0.000
						C	0.000	59.300		100.00	0.000	11.603
L2 101.580- 58.580	79.185	1.284	0.018	0.500	99.482	A	0.000	99.482	99.482	100.00	0.000	38.442
						B	0.000	99.482		100.00	0.000	0.000
						C	0.000	99.482		100.00	0.000	12.986
L3 58.580- 48.580	53.522	1.148	0.016	0.500	28.148	A	0.000	28.148	28.148	100.00	0.000	8.940
						B	0.000	28.148		100.00	0.000	0.000
						C	0.000	28.148		100.00	0.000	3.020
L4 48.580-0.000	23.235	1	0.014	0.500	160.129	A	0.000	160.129	160.129	100.00	0.000	36.278
						B	0.000	160.129		100.00	0.000	0.000
						C	0.000	160.129		100.00	0.000	12.255

Tower Pressure - Service

$$G_H = 1.690$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		ksf	ft ²		ft ²	ft ²	ft ²			
L1 140.000- 101.580	119.411	1.444	0.009	56.098	A	0.000	56.098	56.098	100.00	0.000	10.941
					B	0.000	56.098		100.00	0.000	0.000
					C	0.000	56.098		100.00	0.000	7.761
L2 101.580-	79.185	1.284	0.008	95.899	A	0.000	95.899	95.899	100.00	0.000	25.542

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Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
ft	ft		ksf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
58.580					B	0.000	95.899		100.00	0.000	0.000
L3 58.580- 48.580	53.522	1.148	0.007	27.315	C	0.000	95.899		100.00	0.000	8.686
					A	0.000	27.315	27.315	100.00	0.000	5.940
					B	0.000	27.315		100.00	0.000	0.000
					C	0.000	27.315		100.00	0.000	2.020
L4 48.580- 0.000	23.235	1	0.006	156.081	A	0.000	156.081	156.081	100.00	0.000	24.105
					B	0.000	156.081		100.00	0.000	0.000
					C	0.000	156.081		100.00	0.000	8.197

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000- 101.580	0.958	1.349	A	1	0.65	1	1	1	56.098	2.487	0.065	C
			B	1	0.65	1	1	1	56.098			
			C	1	0.65	1	1	1	56.098			
L2 101.580- 58.580	2.009	3.839	A	1	0.65	1	1	1	95.899	3.863	0.090	C
			B	1	0.65	1	1	1	95.899			
			C	1	0.65	1	1	1	95.899			
L3 58.580- 48.580	0.534	2.028	A	1	0.65	1	1	1	27.315	0.923	0.092	C
			B	1	0.65	1	1	1	27.315			
			C	1	0.65	1	1	1	27.315			
L4 48.580- 0.000	2.166	14.190	A	1	0.65	1	1	1	156.081	4.231	0.087	C
			B	1	0.65	1	1	1	156.081			
			C	1	0.65	1	1	1	156.081			
Sum Weight:	5.667	21.405						OTM	750.603 kip-ft	11.504		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000- 101.580	0.958	1.349	A	1	0.65	1	1	1	56.098	2.487	0.065	C
			B	1	0.65	1	1	1	56.098			
			C	1	0.65	1	1	1	56.098			
L2 101.580- 58.580	2.009	3.839	A	1	0.65	1	1	1	95.899	3.863	0.090	C
			B	1	0.65	1	1	1	95.899			
			C	1	0.65	1	1	1	95.899			
L3 58.580- 48.580	0.534	2.028	A	1	0.65	1	1	1	27.315	0.923	0.092	C
			B	1	0.65	1	1	1	27.315			
			C	1	0.65	1	1	1	27.315			
L4 48.580- 0.000	2.166	14.190	A	1	0.65	1	1	1	156.081	4.231	0.087	C
			B	1	0.65	1	1	1	156.081			
			C	1	0.65	1	1	1	156.081			
Sum Weight:	5.667	21.405						OTM	750.603 kip-ft	11.504		

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	Client	AT&T Mobility	Designed by	TJL

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000-101.580	0.958	1.349	A	1	0.65	1	1	1	56.098	2.487	0.065	C
			B	1	0.65	1	1	1	56.098			
			C	1	0.65	1	1	1	56.098			
L2 101.580-58.580	2.009	3.839	A	1	0.65	1	1	1	95.899	3.863	0.090	C
			B	1	0.65	1	1	1	95.899			
			C	1	0.65	1	1	1	95.899			
L3 58.580-48.580	0.534	2.028	A	1	0.65	1	1	1	27.315	0.923	0.092	C
			B	1	0.65	1	1	1	27.315			
			C	1	0.65	1	1	1	27.315			
L4 48.580-0.000	2.166	14.190	A	1	0.65	1	1	1	156.081	4.231	0.087	C
			B	1	0.65	1	1	1	156.081			
			C	1	0.65	1	1	1	156.081			
Sum Weight:	5.667	21.405						OTM	750.603 kip-ft	11.504		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000-101.580	0.958	1.349	A	1	0.65	1	1	1	56.098	2.487	0.065	C
			B	1	0.65	1	1	1	56.098			
			C	1	0.65	1	1	1	56.098			
L2 101.580-58.580	2.009	3.839	A	1	0.65	1	1	1	95.899	3.863	0.090	C
			B	1	0.65	1	1	1	95.899			
			C	1	0.65	1	1	1	95.899			
L3 58.580-48.580	0.534	2.028	A	1	0.65	1	1	1	27.315	0.923	0.092	C
			B	1	0.65	1	1	1	27.315			
			C	1	0.65	1	1	1	27.315			
L4 48.580-0.000	2.166	14.190	A	1	0.65	1	1	1	156.081	4.231	0.087	C
			B	1	0.65	1	1	1	156.081			
			C	1	0.65	1	1	1	156.081			
Sum Weight:	5.667	21.405						OTM	750.603 kip-ft	11.504		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000-101.580	1.323	1.776	A	1	0.65	1	1	1	59.300	2.253	0.059	C
			B	1	0.65	1	1	1	59.300			
			C	1	0.65	1	1	1	59.300			
L2 101.580-58.580	2.854	4.562	A	1	0.65	1	1	1	99.482	3.483	0.081	C
			B	1	0.65	1	1	1	99.482			

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Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w klf	Ctrl. Face
L3 58.580-48.580	0.730	2.234	C	1	0.65	1	1	1	99.482			
			A	1	0.65	1	1	1	28.148	0.814	0.081	C
			B	1	0.65	1	1	1	28.148			
L4 48.580-0.000	2.964	15.361	C	1	0.65	1	1	1	28.148			
			A	1	0.65	1	1	1	160.129	3.621	0.075	C
			B	1	0.65	1	1	1	160.129			
Sum Weight:	7.871	23.933	C	1	0.65	1	1	1	160.129			
								OTM	672.523 kip-ft	10.171		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w klf	Ctrl. Face
L1 140.000-101.580	1.323	1.776	A	1	0.65	1	1	1	59.300	2.253	0.059	C
			B	1	0.65	1	1	1	59.300			
			C	1	0.65	1	1	1	59.300			
L2 101.580-58.580	2.854	4.562	A	1	0.65	1	1	1	99.482	3.483	0.081	C
			B	1	0.65	1	1	1	99.482			
			C	1	0.65	1	1	1	99.482			
L3 58.580-48.580	0.730	2.234	A	1	0.65	1	1	1	28.148	0.814	0.081	C
			B	1	0.65	1	1	1	28.148			
			C	1	0.65	1	1	1	28.148			
L4 48.580-0.000	2.964	15.361	A	1	0.65	1	1	1	160.129	3.621	0.075	C
			B	1	0.65	1	1	1	160.129			
			C	1	0.65	1	1	1	160.129			
Sum Weight:	7.871	23.933						OTM	672.523 kip-ft	10.171		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w klf	Ctrl. Face
L1 140.000-101.580	1.323	1.776	A	1	0.65	1	1	1	59.300	2.253	0.059	C
			B	1	0.65	1	1	1	59.300			
			C	1	0.65	1	1	1	59.300			
L2 101.580-58.580	2.854	4.562	A	1	0.65	1	1	1	99.482	3.483	0.081	C
			B	1	0.65	1	1	1	99.482			
			C	1	0.65	1	1	1	99.482			
L3 58.580-48.580	0.730	2.234	A	1	0.65	1	1	1	28.148	0.814	0.081	C
			B	1	0.65	1	1	1	28.148			
			C	1	0.65	1	1	1	28.148			
L4 48.580-0.000	2.964	15.361	A	1	0.65	1	1	1	160.129	3.621	0.075	C
			B	1	0.65	1	1	1	160.129			
			C	1	0.65	1	1	1	160.129			
Sum Weight:	7.871	23.933						OTM	672.523 kip-ft	10.171		

RISATower

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Date

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Client

AT&T Mobility

Designed by

TJL

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000- 101.580	1.323	1.776	A	1	0.65	1	1	1	59.300	2.253	0.059	C
			B	1	0.65	1	1	1	59.300			
			C	1	0.65	1	1	1	59.300			
L2 101.580- 58.580	2.854	4.562	A	1	0.65	1	1	1	99.482	3.483	0.081	C
			B	1	0.65	1	1	1	99.482			
			C	1	0.65	1	1	1	99.482			
L3 58.580- 48.580	0.730	2.234	A	1	0.65	1	1	1	28.148	0.814	0.081	C
			B	1	0.65	1	1	1	28.148			
			C	1	0.65	1	1	1	28.148			
L4 48.580- 0.000	2.964	15.361	A	1	0.65	1	1	1	160.129	3.621	0.075	C
			B	1	0.65	1	1	1	160.129			
			C	1	0.65	1	1	1	160.129			
Sum Weight:	7.871	23.933						OTM	672.523 kip-ft	10.171		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000- 101.580	0.958	1.349	A	1	0.65	1	1	1	56.098	0.861	0.022	C
			B	1	0.65	1	1	1	56.098			
			C	1	0.65	1	1	1	56.098			
L2 101.580- 58.580	2.009	3.839	A	1	0.65	1	1	1	95.899	1.337	0.031	C
			B	1	0.65	1	1	1	95.899			
			C	1	0.65	1	1	1	95.899			
L3 58.580- 48.580	0.534	2.028	A	1	0.65	1	1	1	27.315	0.319	0.032	C
			B	1	0.65	1	1	1	27.315			
			C	1	0.65	1	1	1	27.315			
L4 48.580- 0.000	2.166	14.190	A	1	0.65	1	1	1	156.081	1.464	0.030	C
			B	1	0.65	1	1	1	156.081			
			C	1	0.65	1	1	1	156.081			
Sum Weight:	5.667	21.405						OTM	259.724 kip-ft	3.981		

Tower Forces - Service - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000- 101.580	0.958	1.349	A	1	0.65	1	1	1	56.098	0.861	0.022	C
			B	1	0.65	1	1	1	56.098			
			C	1	0.65	1	1	1	56.098			

RISATower

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L2 101.580- 58.580	2.009	3.839	A	1	0.65	1	1	1	95.899	1.337	0.031	C
			B	1	0.65	1	1	1	95.899			
			C	1	0.65	1	1	1	95.899			
L3 58.580- 48.580	0.534	2.028	A	1	0.65	1	1	1	27.315	0.319	0.032	C
			B	1	0.65	1	1	1	27.315			
			C	1	0.65	1	1	1	27.315			
L4 48.580- 0.000	2.166	14.190	A	1	0.65	1	1	1	156.081	1.464	0.030	C
			B	1	0.65	1	1	1	156.081			
			C	1	0.65	1	1	1	156.081			
Sum Weight:	5.667	21.405						OTM	259.724 kip-ft	3.981		

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000- 101.580	0.958	1.349	A	1	0.65	1	1	1	56.098	0.861	0.022	C
			B	1	0.65	1	1	1	56.098			
			C	1	0.65	1	1	1	56.098			
L2 101.580- 58.580	2.009	3.839	A	1	0.65	1	1	1	95.899	1.337	0.031	C
			B	1	0.65	1	1	1	95.899			
			C	1	0.65	1	1	1	95.899			
L3 58.580- 48.580	0.534	2.028	A	1	0.65	1	1	1	27.315	0.319	0.032	C
			B	1	0.65	1	1	1	27.315			
			C	1	0.65	1	1	1	27.315			
L4 48.580- 0.000	2.166	14.190	A	1	0.65	1	1	1	156.081	1.464	0.030	C
			B	1	0.65	1	1	1	156.081			
			C	1	0.65	1	1	1	156.081			
Sum Weight:	5.667	21.405						OTM	259.724 kip-ft	3.981		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
L1 140.000- 101.580	0.958	1.349	A	1	0.65	1	1	1	56.098	0.861	0.022	C
			B	1	0.65	1	1	1	56.098			
			C	1	0.65	1	1	1	56.098			
L2 101.580- 58.580	2.009	3.839	A	1	0.65	1	1	1	95.899	1.337	0.031	C
			B	1	0.65	1	1	1	95.899			
			C	1	0.65	1	1	1	95.899			
L3 58.580- 48.580	0.534	2.028	A	1	0.65	1	1	1	27.315	0.319	0.032	C
			B	1	0.65	1	1	1	27.315			
			C	1	0.65	1	1	1	27.315			
L4 48.580- 0.000	2.166	14.190	A	1	0.65	1	1	1	156.081	1.464	0.030	C
			B	1	0.65	1	1	1	156.081			
			C	1	0.65	1	1	1	156.081			

RISATower**Centek Engineering Inc.**

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Project

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	klf	
Sum Weight:	5.667	21.405						OTM	259.724 kip-ft	3.981		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M _x kip-ft	Sum of Overturning Moments, M _z kip-ft	Sum of Torques kip-ft
Leg Weight	21.405					
Bracing Weight	0.000					
Total Member Self-Weight	21.405					
Total Weight	35.162					
Wind 0 deg - No Ice		0.000	-25.251	-2305.869	-0.178	-1.076
Wind 30 deg - No Ice		12.524	-21.868	-1997.031	-1138.633	-0.182
Wind 45 deg - No Ice		17.712	-17.855	-1630.691	-1610.197	0.300
Wind 60 deg - No Ice		21.693	-12.625	-1153.268	-1972.040	0.761
Wind 90 deg - No Ice		25.049	0.000	-0.666	-2277.088	1.500
Wind 120 deg - No Ice		21.693	12.625	1151.936	-1972.040	1.837
Wind 135 deg - No Ice		17.712	17.855	1629.359	-1610.197	1.821
Wind 150 deg - No Ice		12.524	21.868	1995.699	-1138.633	1.682
Wind 180 deg - No Ice		0.000	25.251	2304.538	-0.178	1.076
Wind 210 deg - No Ice		-12.524	21.868	1995.699	1138.277	0.182
Wind 225 deg - No Ice		-17.712	17.855	1629.359	1609.841	-0.300
Wind 240 deg - No Ice		-21.693	12.625	1151.936	1971.684	-0.761
Wind 270 deg - No Ice		-25.049	0.000	-0.666	2276.732	-1.500
Wind 300 deg - No Ice		-21.693	-12.625	-1153.268	1971.684	-1.837
Wind 315 deg - No Ice		-17.712	-17.855	-1630.691	1609.841	-1.821
Wind 330 deg - No Ice		-12.524	-21.868	-1997.031	1138.277	-1.682
Member Ice	2.527					
Total Weight Ice	43.838					
Wind 0 deg - Ice		0.000	-22.080	-2014.168	-0.875	-1.040
Wind 30 deg - Ice		10.962	-19.121	-1743.956	-998.406	-0.433
Wind 45 deg - Ice		15.502	-15.613	-1423.435	-1411.597	-0.074
Wind 60 deg - Ice		18.986	-11.040	-1005.724	-1728.650	0.290
Wind 90 deg - Ice		21.924	0.000	2.721	-1995.938	0.935
Wind 120 deg - Ice		18.986	11.040	1011.165	-1728.650	1.330
Wind 135 deg - Ice		15.502	15.613	1428.877	-1411.597	1.397
Wind 150 deg - Ice		10.962	19.121	1749.398	-998.406	1.368
Wind 180 deg - Ice		0.000	22.080	2019.610	-0.875	1.040
Wind 210 deg - Ice		-10.962	19.121	1749.398	996.657	0.433
Wind 225 deg - Ice		-15.502	15.613	1428.877	1409.848	0.074
Wind 240 deg - Ice		-18.986	11.040	1011.165	1726.901	-0.290
Wind 270 deg - Ice		-21.924	0.000	2.721	1994.188	-0.935
Wind 300 deg - Ice		-18.986	-11.040	-1005.724	1726.901	-1.330
Wind 315 deg - Ice		-15.502	-15.613	-1423.435	1409.848	-1.397
Wind 330 deg - Ice		-10.962	-19.121	-1743.956	996.657	-1.368
Total Weight	35.162					
Wind 0 deg - Service		0.000	-8.737	-797.317	0.219	-0.372
Wind 30 deg - Service		4.334	-7.567	-690.453	-393.710	-0.063
Wind 45 deg - Service		6.129	-6.178	-563.691	-556.881	0.104
Wind 60 deg - Service		7.506	-4.369	-398.493	-682.086	0.263
Wind 90 deg - Service		8.667	0.000	0.331	-787.639	0.519
Wind 120 deg - Service		7.506	4.369	399.155	-682.086	0.636
Wind 135 deg - Service		6.129	6.178	564.354	-556.881	0.630
Wind 150 deg - Service		4.334	7.567	691.115	-393.710	0.582

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 180 deg - Service		0.000	8.737	797.979	0.219	0.372
Wind 210 deg - Service		-4.334	7.567	691.115	394.148	0.063
Wind 225 deg - Service		-6.129	6.178	564.354	557.319	-0.104
Wind 240 deg - Service		-7.506	4.369	399.155	682.524	-0.263
Wind 270 deg - Service		-8.667	0.000	0.331	788.077	-0.519
Wind 300 deg - Service		-7.506	-4.369	-398.493	682.524	-0.636
Wind 315 deg - Service		-6.129	-6.178	-563.691	557.319	-0.630
Wind 330 deg - Service		-4.334	-7.567	-690.453	394.148	-0.582

Load Combinations

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

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Comb. No.	Description
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	140 - 101.58	Pole	Max. Tension	10	0.000	-0.000	0.000
			Max. Compression	18	-8.304	0.390	-0.659
			Max. Mx	14	-4.772	285.644	-0.012
			Max. My	10	-4.735	0.181	-293.452
			Max. Vy	14	-11.248	285.644	-0.012
			Max. Vx	2	-11.458	0.180	293.338
			Max. Torque	7			-1.246
L2	101.58 - 58.58	Pole	Max. Tension	1	0.000	0.000	0.000
			Max. Compression	18	-22.550	0.025	-1.691
			Max. Mx	14	-15.514	1004.764	0.148
			Max. My	2	-15.496	0.107	1021.823
			Max. Vy	14	-20.469	1004.764	0.148
			Max. Vx	2	-20.679	0.107	1021.823
			Max. Torque	7			-2.036
L3	58.58 - 48.58	Pole	Max. Tension	1	0.000	0.000	0.000
			Max. Compression	18	-24.184	-0.063	-1.801
			Max. Mx	14	-17.011	1120.189	0.200
			Max. My	2	-16.995	0.080	1138.500
			Max. Vy	6	20.943	-1120.014	0.200
			Max. Vx	2	-21.152	0.080	1138.500
			Max. Torque	7			-1.987
L4	48.58 - 0	Pole	Max. Tension	1	0.000	0.000	0.000
			Max. Compression	18	-43.838	-0.863	-2.802
			Max. Mx	6	-35.145	-2339.933	0.690
			Max. My	2	-35.145	-0.180	2369.618
			Max. Vy	6	25.072	-2339.933	0.690
			Max. Vx	2	-25.275	-0.180	2369.618
			Max. Torque	7			-1.956

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	43.838	-0.000	-22.080
	Max. H _x	14	35.162	25.049	-0.000
	Max. H _z	2	35.162	0.000	25.251
	Max. M _x	2	2369.618	0.000	25.251
	Max. M _z	6	2339.933	-25.049	-0.000
	Max. Torsion	15	1.812	21.693	12.625
	Min. Vert	1	35.162	0.000	0.000
	Min. H _x	6	35.162	-25.049	-0.000

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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H _z	10	35.162	0.000	-25.251
	Min. M _x	10	-2368.267	0.000	-25.251
	Min. M _z	14	-2339.585	25.049	-0.000
	Min. Torsion	7	-1.833	-21.693	-12.625

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	35.162	0.000	0.000	-0.666	-0.178	-0.000
Dead+Wind 0 deg - No Ice	35.162	-0.000	-25.251	-2369.618	-0.180	-1.072
Dead+Wind 30 deg - No Ice	35.162	12.524	-21.868	-2052.274	-1170.001	-0.196
Dead+Wind 45 deg - No Ice	35.162	17.712	-17.855	-1675.827	-1654.582	0.280
Dead+Wind 60 deg - No Ice	35.162	21.693	-12.625	-1185.209	-2026.432	0.740
Dead+Wind 90 deg - No Ice	35.162	25.049	0.000	-0.691	-2339.933	1.486
Dead+Wind 120 deg - No Ice	35.162	21.693	12.625	1183.836	-2026.445	1.833
Dead+Wind 135 deg - No Ice	35.162	17.712	17.855	1674.461	-1654.598	1.820
Dead+Wind 150 deg - No Ice	35.162	12.524	21.868	2050.915	-1170.015	1.681
Dead+Wind 180 deg - No Ice	35.162	-0.000	25.251	2368.267	-0.180	1.072
Dead+Wind 210 deg - No Ice	35.162	-12.524	21.868	2050.920	1169.658	0.175
Dead+Wind 225 deg - No Ice	35.162	-17.712	17.855	1674.467	1654.244	-0.304
Dead+Wind 240 deg - No Ice	35.162	-21.693	12.625	1183.841	2026.095	-0.761
Dead+Wind 270 deg - No Ice	35.162	-25.049	0.000	-0.691	2339.585	-1.486
Dead+Wind 300 deg - No Ice	35.162	-21.693	-12.625	-1185.215	2026.081	-1.812
Dead+Wind 315 deg - No Ice	35.162	-17.712	-17.855	-1675.833	1654.228	-1.796
Dead+Wind 330 deg - No Ice	35.162	-12.524	-21.868	-2052.279	1169.644	-1.660
Dead+Ice+Temp	43.838	-0.000	0.000	2.802	-0.863	-0.000
Dead+Wind 0 deg+Ice+Temp	43.838	0.000	-22.080	-2095.100	-0.885	-1.043
Dead+Wind 30 deg+Ice+Temp	43.838	10.962	-19.121	-1814.043	-1038.370	-0.436
Dead+Wind 45 deg+Ice+Temp	43.838	15.502	-15.613	-1480.651	-1468.125	-0.074
Dead+Wind 60 deg+Ice+Temp	43.838	18.986	-11.040	-1046.153	-1797.897	0.294
Dead+Wind 90 deg+Ice+Temp	43.838	21.924	-0.000	2.855	-2075.918	0.951
Dead+Wind 120 deg+Ice+Temp	43.838	18.986	11.040	1051.865	-1797.901	1.353
Dead+Wind 135 deg+Ice+Temp	43.838	15.502	15.613	1486.365	-1468.128	1.419
Dead+Wind 150 deg+Ice+Temp	43.838	10.962	19.121	1819.759	-1038.373	1.386
Dead+Wind 180 deg+Ice+Temp	43.838	0.000	22.080	2100.817	-0.885	1.043
Dead+Wind 210 deg+Ice+Temp	43.838	-10.962	19.121	1819.766	1036.607	0.421
Dead+Wind 225 deg+Ice+Temp	43.838	-15.502	15.613	1486.373	1466.366	0.057
Dead+Wind 240 deg+Ice+Temp	43.838	-18.986	11.040	1051.872	1796.143	-0.309
Dead+Wind 270 deg+Ice+Temp	43.838	-21.924	-0.000	2.855	2074.165	-0.951
Dead+Wind 300 deg+Ice+Temp	43.838	-18.986	-11.040	-1046.160	1796.140	-1.338
Dead+Wind 315 deg+Ice+Temp	43.838	-15.502	-15.613	-1480.660	1466.363	-1.401
Dead+Wind 330 deg+Ice+Temp	43.838	-10.962	-19.121	-1814.051	1036.604	-1.371
Dead+Wind 0 deg - Service	35.162	-0.000	-8.737	-821.511	-0.172	-0.375
Dead+Wind 30 deg - Service	35.162	4.334	-7.567	-711.541	-405.505	-0.065
Dead+Wind 45 deg - Service	35.162	6.129	-6.178	-581.097	-573.400	0.103
Dead+Wind 60 deg - Service	35.162	7.506	-4.369	-411.097	-702.231	0.264
Dead+Wind 90 deg - Service	35.162	8.667	0.000	-0.678	-810.843	0.523
Dead+Wind 120 deg - Service	35.162	7.506	4.369	409.742	-702.233	0.641
Dead+Wind 135 deg - Service	35.162	6.129	6.178	579.742	-573.402	0.636
Dead+Wind 150 deg - Service	35.162	4.334	7.567	710.188	-405.506	0.587
Dead+Wind 180 deg - Service	35.162	-0.000	8.737	820.158	-0.172	0.375
Dead+Wind 210 deg - Service	35.162	-4.334	7.567	710.188	405.162	0.062
Dead+Wind 225 deg - Service	35.162	-6.129	6.178	579.743	573.058	-0.106
Dead+Wind 240 deg - Service	35.162	-7.506	4.369	409.742	701.889	-0.266
Dead+Wind 270 deg - Service	35.162	-8.667	0.000	-0.678	810.499	-0.523

Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
Dead+Wind 300 deg - Service	35.162	-7.506	-4.369	-411.098	701.888	-0.639
Dead+Wind 315 deg - Service	35.162	-6.129	-6.178	-581.097	573.056	-0.633
Dead+Wind 330 deg - Service	35.162	-4.334	-7.567	-711.542	405.160	-0.585

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-35.162	0.000	0.000	35.162	0.000	0.000%
2	0.000	-35.162	-25.251	0.000	35.162	25.251	0.000%
3	12.524	-35.162	-21.868	-12.524	35.162	21.868	0.000%
4	17.712	-35.162	-17.855	-17.712	35.162	17.855	0.000%
5	21.693	-35.162	-12.625	-21.693	35.162	12.625	0.000%
6	25.049	-35.162	0.000	-25.049	35.162	-0.000	0.000%
7	21.693	-35.162	12.625	-21.693	35.162	-12.625	0.000%
8	17.712	-35.162	17.855	-17.712	35.162	-17.855	0.000%
9	12.524	-35.162	21.868	-12.524	35.162	-21.868	0.000%
10	0.000	-35.162	25.251	0.000	35.162	-25.251	0.000%
11	-12.524	-35.162	21.868	12.524	35.162	-21.868	0.000%
12	-17.712	-35.162	17.855	17.712	35.162	-17.855	0.000%
13	-21.693	-35.162	12.625	21.693	35.162	-12.625	0.000%
14	-25.049	-35.162	0.000	25.049	35.162	-0.000	0.000%
15	-21.693	-35.162	-12.625	21.693	35.162	12.625	0.000%
16	-17.712	-35.162	-17.855	17.712	35.162	17.855	0.000%
17	-12.524	-35.162	-21.868	12.524	35.162	21.868	0.000%
18	0.000	-43.838	0.000	0.000	43.838	-0.000	0.000%
19	0.000	-43.838	-22.080	-0.000	43.838	22.080	0.000%
20	10.962	-43.838	-19.121	-10.962	43.838	19.121	0.000%
21	15.502	-43.838	-15.613	-15.502	43.838	15.613	0.000%
22	18.986	-43.838	-11.040	-18.986	43.838	11.040	0.000%
23	21.924	-43.838	0.000	-21.924	43.838	0.000	0.000%
24	18.986	-43.838	11.040	-18.986	43.838	-11.040	0.000%
25	15.502	-43.838	15.613	-15.502	43.838	-15.613	0.000%
26	10.962	-43.838	19.121	-10.962	43.838	-19.121	0.000%
27	0.000	-43.838	22.080	-0.000	43.838	-22.080	0.000%
28	-10.962	-43.838	19.121	10.962	43.838	-19.121	0.000%
29	-15.502	-43.838	15.613	15.502	43.838	-15.613	0.000%
30	-18.986	-43.838	11.040	18.986	43.838	-11.040	0.000%
31	-21.924	-43.838	0.000	21.924	43.838	0.000	0.000%
32	-18.986	-43.838	-11.040	18.986	43.838	11.040	0.000%
33	-15.502	-43.838	-15.613	15.502	43.838	15.613	0.000%
34	-10.962	-43.838	-19.121	10.962	43.838	19.121	0.000%
35	0.000	-35.162	-8.737	0.000	35.162	8.737	0.000%
36	4.334	-35.162	-7.567	-4.334	35.162	7.567	0.000%
37	6.129	-35.162	-6.178	-6.129	35.162	6.178	0.000%
38	7.506	-35.162	-4.369	-7.506	35.162	4.369	0.000%
39	8.667	-35.162	0.000	-8.667	35.162	-0.000	0.000%
40	7.506	-35.162	4.369	-7.506	35.162	-4.369	0.000%
41	6.129	-35.162	6.178	-6.129	35.162	-6.178	0.000%
42	4.334	-35.162	7.567	-4.334	35.162	-7.567	0.000%
43	0.000	-35.162	8.737	0.000	35.162	-8.737	0.000%
44	-4.334	-35.162	7.567	4.334	35.162	-7.567	0.000%
45	-6.129	-35.162	6.178	6.129	35.162	-6.178	0.000%
46	-7.506	-35.162	4.369	7.506	35.162	-4.369	0.000%
47	-8.667	-35.162	0.000	8.667	35.162	-0.000	0.000%
48	-7.506	-35.162	-4.369	7.506	35.162	4.369	0.000%
49	-6.129	-35.162	-6.178	6.129	35.162	6.178	0.000%

<i>RISA</i>Tower Centek Engineering Inc. 63-2 North Branford Road Branford, CT 06405 Phone: 203.488.0580 FAX: 203.488.8587	Job	11021.CO45 - CT5431 ~ Shelton North East	Page	19 of 29
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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
50	-4.334	-35.162	-7.567	4.334	35.162	7.567	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	0.00032922
3	Yes	5	0.00000001	0.00023135
4	Yes	5	0.00000001	0.00024550
5	Yes	5	0.00000001	0.00022195
6	Yes	4	0.00000001	0.00061412
7	Yes	5	0.00000001	0.00024484
8	Yes	5	0.00000001	0.00024597
9	Yes	5	0.00000001	0.00021868
10	Yes	4	0.00000001	0.00032921
11	Yes	5	0.00000001	0.00022964
12	Yes	5	0.00000001	0.00024505
13	Yes	5	0.00000001	0.00023769
14	Yes	4	0.00000001	0.00061418
15	Yes	5	0.00000001	0.00021658
16	Yes	5	0.00000001	0.00024742
17	Yes	5	0.00000001	0.00024398
18	Yes	4	0.00000001	0.00000983
19	Yes	5	0.00000001	0.00021576
20	Yes	5	0.00000001	0.00067127
21	Yes	5	0.00000001	0.00074840
22	Yes	5	0.00000001	0.00066250
23	Yes	5	0.00000001	0.00021704
24	Yes	5	0.00000001	0.00069847
25	Yes	5	0.00000001	0.00075361
26	Yes	5	0.00000001	0.00065821
27	Yes	5	0.00000001	0.00021634
28	Yes	5	0.00000001	0.00067961
29	Yes	5	0.00000001	0.00075259
30	Yes	5	0.00000001	0.00068494
31	Yes	5	0.00000001	0.00021707
32	Yes	5	0.00000001	0.00065222
33	Yes	5	0.00000001	0.00075147
34	Yes	5	0.00000001	0.00069573
35	Yes	4	0.00000001	0.00007133
36	Yes	4	0.00000001	0.00053113
37	Yes	4	0.00000001	0.00060522
38	Yes	4	0.00000001	0.00049215
39	Yes	4	0.00000001	0.00012222
40	Yes	4	0.00000001	0.00059444
41	Yes	4	0.00000001	0.00061315
42	Yes	4	0.00000001	0.00048144
43	Yes	4	0.00000001	0.00007130
44	Yes	4	0.00000001	0.00052416
45	Yes	4	0.00000001	0.00060462
46	Yes	4	0.00000001	0.00056051
47	Yes	4	0.00000001	0.00012236
48	Yes	4	0.00000001	0.00047644
49	Yes	4	0.00000001	0.00062018
50	Yes	4	0.00000001	0.00059171

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 101.58	34.682	35	2.739	0.020
L2	101.58 - 58.58	15.552	35	1.798	0.005
L3	58.58 - 48.58	4.202	35	0.701	0.001
L4	53 - 0	3.429	35	0.621	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.000	9-ft Omni	35	33.590	2.693	0.020	12288
120.000	(2) APX16PV-16PVL-E	35	24.023	2.271	0.011	3071
110.000	800-10504	35	19.182	2.022	0.007	2046
99.000	(2) RRUS-11	35	14.540	1.726	0.004	1646
95.000	7770.00	35	13.067	1.612	0.004	1712
75.000	A-Ant-23G-2-C	35	7.284	1.051	0.002	2192
73.000	(2) RR65-18-04DPL2	35	6.837	1.001	0.002	2255

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 101.58	99.740	2	7.874	0.057
L2	101.58 - 58.58	44.792	2	5.177	0.013
L3	58.58 - 48.58	12.114	2	2.021	0.003
L4	53 - 0	9.887	2	1.791	0.003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.000	9-ft Omni	2	96.605	7.743	0.058	4398
120.000	(2) APX16PV-16PVL-E	2	69.131	6.537	0.033	1096
110.000	800-10504	2	55.224	5.822	0.022	728
99.000	(2) RRUS-11	2	41.883	4.970	0.012	582
95.000	7770.00	2	37.646	4.642	0.010	604
75.000	A-Ant-23G-2-C	2	20.999	3.030	0.004	766
73.000	(2) RR65-18-04DPL2	2	19.709	2.884	0.004	787

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	Client	AT&T Mobility	Designed by	TJL

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 K	Allow. P _a K	Ratio P P _a
L1	140 - 138.079	TP21.882x13.161x0.188	38.420	0.000	0.0	39.000	7.980	-0.122	311.234	0.000
	138.079 - 136.158					39.000	8.240	-1.153	321.355	0.004
	136.158 - 134.237					39.000	8.499	-1.245	331.475	0.004
	134.237 - 132.316					39.000	8.759	-1.340	341.596	0.004
	132.316 - 130.395					39.000	9.018	-1.438	351.717	0.004
	130.395 - 128.474					39.000	9.278	-1.539	361.837	0.004
	128.474 - 126.553					39.000	9.537	-1.643	371.958	0.004
	126.553 - 124.632					39.000	9.797	-1.750	382.079	0.005
	124.632 - 122.711					39.000	10.056	-1.860	392.199	0.005
	122.711 - 120.79					39.000	10.316	-1.972	402.320	0.005
	120.79 - 118.869					39.000	10.575	-3.156	412.441	0.008
	118.869 - 116.948					39.000	10.835	-3.282	422.561	0.008
	116.948 - 115.027					39.000	11.094	-3.411	432.682	0.008
	115.027 - 113.106					39.000	11.354	-3.544	442.803	0.008
	113.106 - 111.185					39.000	11.613	-3.681	452.923	0.008
	111.185 - 109.264					39.000	11.873	-4.125	463.044	0.009
	109.264 - 107.343					39.000	12.132	-4.272	473.165	0.009
	107.343 - 105.422					39.000	12.392	-4.423	483.285	0.009
	105.422 - 103.501					39.000	12.651	-4.577	493.406	0.009
	103.501 - 101.58					39.000	12.911	-4.735	503.527	0.009
L2	101.58 - 99.43	TP31.643x21.882x0.313	43.000	0.000	0.0	39.000	21.878	-5.013	853.255	0.006
	99.43 - 97.28					39.000	22.362	-5.834	872.134	0.007
	97.28 - 95.13					39.000	22.847	-6.117	891.014	0.007
	95.13 - 92.98					39.000	23.331	-8.577	909.893	0.009
	92.98 - 90.83					39.000	23.815	-8.876	928.772	0.010
	90.83 - 88.68					39.000	24.299	-9.179	947.651	0.010
	88.68 - 86.53					39.000	24.783	-9.488	966.531	0.010
	86.53 - 84.38					39.000	25.267	-9.802	985.410	0.010
	84.38 - 82.23					39.000	25.751	-10.120	1004.290	0.010
	82.23 - 80.08					39.000	26.235	-10.444	1023.170	0.010
	80.08 - 77.93					39.000	26.719	-10.772	1042.050	0.010
	77.93 - 75.78					39.000	27.203	-11.104	1060.930	0.010

RISATower

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Project

140-ft FWT Monopole - Shelton, CT

Date

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Client

AT&T Mobility

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TJL

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L3	75.78 - 73.63	TP33.913x31.643x0.583	10.000	0.000	0.0	39.000	27.687	-11.481	1079.810	0.011
	73.63 - 71.48					39.000	28.171	-13.308	1098.690	0.012
	71.48 - 69.33					39.000	28.656	-13.661	1117.570	0.012
	69.33 - 67.18					39.000	29.140	-14.019	1136.440	0.012
	67.18 - 65.03					39.000	29.624	-14.381	1155.320	0.012
	65.03 - 62.88					39.000	30.108	-14.748	1174.200	0.013
	62.88 - 60.73					39.000	30.592	-15.120	1193.080	0.013
	60.73 - 58.58					39.000	31.076	-15.496	1211.960	0.013
	58.58 - 57.464					39.000	57.973	-15.809	2260.940	0.007
	57.464 - 56.348					39.000	58.442	-16.102	2279.230	0.007
	56.348 - 55.232					39.000	58.911	-16.398	2297.520	0.007
	55.232 - 54.116					39.000	59.380	-16.696	2315.810	0.007
	54.116 - 53					39.000	59.849	-16.995	2334.100	0.007
L4	53 - 48.58	TP44.317x31.743x0.663	53.000	0.000	0.0	39.000	61.706	-9.203	2406.550	0.004
	48.58 - 46.0232					39.000	67.650	-9.954	2638.360	0.004
	46.0232 - 43.4663					39.000	68.928	-19.895	2688.180	0.007
	43.4663 - 40.9095					39.000	70.205	-20.647	2737.990	0.008
	40.9095 - 38.3526					39.000	71.482	-21.410	2787.800	0.008
	38.3526 - 35.7958					39.000	72.759	-22.184	2837.620	0.008
	35.7958 - 33.2389					39.000	74.037	-22.970	2887.430	0.008
	33.2389 - 30.6821					39.000	75.314	-23.767	2937.240	0.008
	30.6821 - 28.1253					39.000	76.591	-24.575	2987.060	0.008
	28.1253 - 25.5684					39.000	77.868	-25.394	3036.870	0.008
	25.5684 - 23.0116					39.000	79.146	-26.224	3086.680	0.008
	23.0116 - 20.4547					39.000	80.423	-27.066	3136.500	0.009
	20.4547 - 17.8979					39.000	81.700	-27.919	3186.310	0.009
	17.8979 - 15.3411					39.000	82.978	-28.782	3236.120	0.009
	15.3411 - 12.7842					39.000	84.255	-29.658	3285.940	0.009
	12.7842 - 10.2274					39.000	85.532	-30.544	3335.750	0.009
	10.2274 - 7.67053					39.000	86.809	-31.442	3385.560	0.009
	7.67053 - 5.11368					39.000	86.809	-31.477	3385.560	0.009
	5.11368 - 2.55684					39.000	88.087	-32.386	3435.380	0.009
	2.55684 - 0					39.000	89.364	-33.306	3485.190	0.010
						39.000	90.641	-34.237	3535.000	0.010

Pole Bending Design Data

RISATower

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Project

140-ft FWT Monopole - Shelton, CT

Date

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Client

AT&T Mobility

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Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	140 - 138.079	TP21.882x13.161x0.188	0.115	0.052	39.000	0.001	0.000	0.000	39.000	0.000
	138.079 - 136.158		17.590	7.540	39.000	0.193	0.000	0.000	39.000	0.000
	136.158 - 134.237		27.318	11.002	39.000	0.282	0.000	0.000	39.000	0.000
	134.237 - 132.316		37.271	14.128	39.000	0.362	0.000	0.000	39.000	0.000
	132.316 - 130.395		47.453	16.962	39.000	0.435	0.000	0.000	39.000	0.000
	130.395 - 128.474		57.869	19.537	39.000	0.501	0.000	0.000	39.000	0.000
	128.474 - 126.553		68.523	21.885	39.000	0.561	0.000	0.000	39.000	0.000
	126.553 - 124.632		79.419	24.032	39.000	0.616	0.000	0.000	39.000	0.000
	124.632 - 122.711		90.562	26.000	39.000	0.667	0.000	0.000	39.000	0.000
	122.711 - 120.79		101.954	27.809	39.000	0.713	0.000	0.000	39.000	0.000
	120.79 - 118.869		116.881	30.327	39.000	0.778	0.000	0.000	39.000	0.000
	118.869 - 116.948		134.353	33.202	39.000	0.851	0.000	0.000	39.000	0.000
	116.948 - 115.027		152.082	35.837	39.000	0.919	0.000	0.000	39.000	0.000
	115.027 - 113.106		170.070	38.256	39.000	0.981	0.000	0.000	39.000	0.000
	113.106 - 111.185		188.321	40.481	39.000	1.038	0.000	0.000	39.000	0.000
	111.185 - 109.264		207.699	42.707	39.000	1.095	0.000	0.000	39.000	0.000
	109.264 - 107.343		228.729	45.032	39.000	1.155	0.000	0.000	39.000	0.000
	107.343 - 105.422		250.030	47.176	39.000	1.210	0.000	0.000	39.000	0.000
	105.422 - 103.501		271.603	49.157	39.000	1.260	0.000	0.000	39.000	0.000
	103.501 - 101.58		293.452	50.989	39.000	1.307	0.000	0.000	39.000	0.000
L2	101.58 - 99.43	TP31.643x21.882x0.313	318.244	32.270	39.000	0.827	0.000	0.000	39.000	0.000
	99.43 - 97.28		344.768	33.453	39.000	0.858	0.000	0.000	39.000	0.000
	97.28 - 95.13		371.981	34.570	39.000	0.886	0.000	0.000	39.000	0.000
	95.13 - 92.98		404.624	36.049	39.000	0.924	0.000	0.000	39.000	0.000
	92.98 - 90.83		437.973	37.440	39.000	0.960	0.000	0.000	39.000	0.000
	90.83 - 88.68		471.738	38.726	39.000	0.993	0.000	0.000	39.000	0.000
	88.68 - 86.53		505.887	39.913	39.000	1.023	0.000	0.000	39.000	0.000
	86.53 - 84.38		540.422	41.010	39.000	1.052	0.000	0.000	39.000	0.000
	84.38 - 82.23		575.344	42.024	39.000	1.078	0.000	0.000	39.000	0.000
	82.23 - 80.08		610.656	42.963	39.000	1.102	0.000	0.000	39.000	0.000
	80.08 - 77.93		646.358	43.833	39.000	1.124	0.000	0.000	39.000	0.000
	77.93 - 75.78		682.454	44.639	39.000	1.145	0.000	0.000	39.000	0.000
	75.78 - 73.63		719.161	45.401	39.000	1.164	0.000	0.000	39.000	0.000
	73.63 - 71.48		762.343	46.478	39.000	1.192	0.000	0.000	39.000	0.000
	71.48 - 69.33		804.610	47.403	39.000	1.215	0.000	0.000	39.000	0.000
	69.33 - 67.18		847.267	48.263	39.000	1.238	0.000	0.000	39.000	0.000
	67.18 - 65.03		890.317	49.063	39.000	1.258	0.000	0.000	39.000	0.000
	65.03 - 62.88		933.758	49.807	39.000	1.277	0.000	0.000	39.000	0.000
	62.88 - 60.73		977.592	50.500	39.000	1.295	0.000	0.000	39.000	0.000
	60.73 - 58.58		1021.82	51.145	39.000	1.311	0.000	0.000	39.000	0.000

RISATower**Centek Engineering Inc.**

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Project

140-ft FWT Monopole - Shelton, CT

Date

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Client

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Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L3	58.58 - 57.464	TP33.913x31.643x0.583	1044.94 2	28.292	39.000	0.725	0.000	0.000	39.000	0.000
	57.464 - 56.348		1068.16 7	28.454	39.000	0.730	0.000	0.000	39.000	0.000
	56.348 - 55.232		1091.50 0	28.611	39.000	0.734	0.000	0.000	39.000	0.000
	55.232 - 54.116		1114.95 0	28.761	39.000	0.737	0.000	0.000	39.000	0.000
	54.116 - 53		1138.50 0	28.906	39.000	0.741	0.000	0.000	39.000	0.000
L4	53 - 48.58	TP44.317x31.743x0.663	612.018	14.610	39.000	0.375	0.000	0.000	39.000	0.000
	53 - 48.58		620.987	14.070	39.000	0.361	0.000	0.000	39.000	0.000
	48.58 - 46.0232		1288.48 3	28.112	39.000	0.721	0.000	0.000	39.000	0.000
	46.0232 - 43.4663		1344.42 5	28.265	39.000	0.725	0.000	0.000	39.000	0.000
	43.4663 - 40.9095		1400.84 2	28.398	39.000	0.728	0.000	0.000	39.000	0.000
	40.9095 - 38.3526		1457.71 7	28.513	39.000	0.731	0.000	0.000	39.000	0.000
	38.3526 - 35.7958		1515.07 5	28.612	39.000	0.734	0.000	0.000	39.000	0.000
	35.7958 - 33.2389		1572.90 8	28.696	39.000	0.736	0.000	0.000	39.000	0.000
	33.2389 - 30.6821		1631.22 5	28.767	39.000	0.738	0.000	0.000	39.000	0.000
	30.6821 - 28.1253		1690.01 7	28.826	39.000	0.739	0.000	0.000	39.000	0.000
	28.1253 - 25.5684		1749.30 8	28.873	39.000	0.740	0.000	0.000	39.000	0.000
	25.5684 - 23.0116		1809.07 5	28.911	39.000	0.741	0.000	0.000	39.000	0.000
	23.0116 - 20.4547		1869.35 0	28.940	39.000	0.742	0.000	0.000	39.000	0.000
	20.4547 - 17.8979		1930.10 8	28.960	39.000	0.743	0.000	0.000	39.000	0.000
	17.8979 - 15.3411		1991.37 5	28.973	39.000	0.743	0.000	0.000	39.000	0.000
	15.3411 - 12.7842		2053.14 2	28.979	39.000	0.743	0.000	0.000	39.000	0.000
	12.7842 - 10.2274		2115.40 8	28.979	39.000	0.743	0.000	0.000	39.000	0.000
	10.2274 - 7.67053		2115.40 8	28.979	39.000	0.743	0.000	0.000	39.000	0.000
	7.67053 - 5.11368		2178.19 2	28.973	39.000	0.743	0.000	0.000	39.000	0.000
	5.11368 - 2.55684		2241.48 3	28.963	39.000	0.743	0.000	0.000	39.000	0.000
	2.55684 - 0		2305.29 2	28.947	39.000	0.742	0.000	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
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RISATower**Centek Engineering Inc.**

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Project

140-ft FWT Monopole - Shelton, CT

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Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	140 - 138.079	TP21.882x13.161x0.188	0.106	0.013	26.000	0.001	0.003	0.001	26.000	0.000
	138.079 - 136.158		5.009	0.608	26.000	0.047	0.436	0.091	26.000	0.003
	136.158 - 134.237		5.126	0.603	26.000	0.046	0.437	0.086	26.000	0.003
	134.237 - 132.316		5.244	0.599	26.000	0.046	0.439	0.081	26.000	0.003
	132.316 - 130.395		5.365	0.595	26.000	0.046	0.441	0.077	26.000	0.003
	130.395 - 128.474		5.488	0.592	26.000	0.045	0.443	0.073	26.000	0.003
	128.474 - 126.553		5.613	0.589	26.000	0.045	0.444	0.069	26.000	0.003
	126.553 - 124.632		5.741	0.586	26.000	0.045	0.446	0.066	26.000	0.003
	124.632 - 122.711		5.870	0.584	26.000	0.045	0.448	0.063	26.000	0.002
	122.711 - 120.79		6.002	0.582	26.000	0.045	0.450	0.060	26.000	0.002
	120.79 - 118.869		9.036	0.854	26.000	0.066	0.452	0.057	26.000	0.002
	118.869 - 116.948		9.169	0.846	26.000	0.065	0.454	0.055	26.000	0.002
	116.948 - 115.027		9.304	0.839	26.000	0.064	0.455	0.052	26.000	0.002
	115.027 - 113.106		9.440	0.831	26.000	0.064	0.457	0.050	26.000	0.002
	113.106 - 111.185		9.578	0.825	26.000	0.063	0.459	0.048	26.000	0.002
	111.185 - 109.264		10.888	0.917	26.000	0.071	0.461	0.046	26.000	0.002
	109.264 - 107.343		11.028	0.909	26.000	0.070	0.464	0.044	26.000	0.002
	107.343 - 105.422		11.169	0.901	26.000	0.069	0.466	0.043	26.000	0.002
	105.422 - 103.501		11.313	0.894	26.000	0.069	0.468	0.041	26.000	0.002
	103.501 - 101.58		11.458	0.887	26.000	0.068	0.470	0.040	26.000	0.002
L2	101.58 - 99.43	TP31.643x21.882x0.313	11.636	0.532	26.000	0.041	0.472	0.023	26.000	0.001
	99.43 - 97.28		12.582	0.563	26.000	0.043	0.475	0.022	26.000	0.001
	97.28 - 95.13		12.764	0.559	26.000	0.043	0.478	0.022	26.000	0.001
	95.13 - 92.98		15.441	0.662	26.000	0.051	0.480	0.021	26.000	0.001
	92.98 - 90.83		15.620	0.656	26.000	0.050	0.483	0.020	26.000	0.001
	90.83 - 88.68		15.799	0.650	26.000	0.050	0.486	0.019	26.000	0.001
	88.68 - 86.53		15.978	0.645	26.000	0.050	0.488	0.019	26.000	0.001
	86.53 - 84.38		16.159	0.640	26.000	0.049	0.491	0.018	26.000	0.001
	84.38 - 82.23		16.340	0.635	26.000	0.049	0.494	0.018	26.000	0.001
	82.23 - 80.08		16.522	0.630	26.000	0.048	0.497	0.017	26.000	0.001
	80.08 - 77.93		16.704	0.625	26.000	0.048	0.500	0.016	26.000	0.001
	77.93 - 75.78		16.888	0.621	26.000	0.048	0.503	0.016	26.000	0.001
	75.78 - 73.63		17.329	0.626	26.000	0.048	0.973	0.030	26.000	0.001
	73.63 - 71.48		19.579	0.695	26.000	0.053	0.976	0.029	26.000	0.001
	71.48 - 69.33		19.761	0.690	26.000	0.053	0.979	0.028	26.000	0.001
	69.33 - 67.18		19.943	0.684	26.000	0.053	0.982	0.027	26.000	0.001
	67.18 - 65.03		20.126	0.679	26.000	0.052	0.985	0.026	26.000	0.001
	65.03 - 62.88		20.310	0.675	26.000	0.052	0.989	0.026	26.000	0.001
	62.88 - 60.73		20.494	0.670	26.000	0.052	0.992	0.025	26.000	0.001
	60.73 - 58.58		20.679	0.665	26.000	0.051	0.995	0.024	26.000	0.001
L3	58.58 - 57.464	TP33.913x31.643x0.583	20.760	0.358	26.000	0.028	0.997	0.013	26.000	0.001

RISATower Centek Engineering Inc. 63-2 North Branford Road Branford, CT 06405 Phone: 203.488.0580 FAX: 203.488.8587	Job	11021.CO45 - CT5431 ~ Shelton North East	Page	26 of 29
	Project	140-ft FWT Monopole - Shelton, CT	Date	08:59:44 04/13/11
	Client	AT&T Mobility	Designed by	TJL

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L4	57.464 - 56.348	TP44.317x31.743x0.663	20.858	0.357	26.000	0.027	0.998	0.013	26.000	0.000
	56.348 - 55.232		20.955	0.356	26.000	0.027	1.000	0.013	26.000	0.000
	55.232 - 54.116		21.054	0.355	26.000	0.027	1.002	0.012	26.000	0.000
	54.116 - 53		21.152	0.353	26.000	0.027	1.003	0.012	26.000	0.000
	53 - 48.58		10.828	0.175	26.000	0.013	0.503	0.006	26.000	0.000
	53 - 48.58		10.785	0.159	26.000	0.012	0.507	0.006	26.000	0.000
	48.58 - 46.0232		21.797	0.316	26.000	0.024	1.013	0.011	26.000	0.000
	46.0232 - 43.4663		21.980	0.313	26.000	0.024	1.016	0.010	26.000	0.000
	43.4663 - 40.9095		22.164	0.310	26.000	0.024	1.019	0.010	26.000	0.000
	40.9095 - 38.3526		22.349	0.307	26.000	0.024	1.022	0.010	26.000	0.000
	38.3526 - 35.7958		22.535	0.304	26.000	0.023	1.025	0.009	26.000	0.000
	35.7958 - 33.2389		22.723	0.302	26.000	0.023	1.028	0.009	26.000	0.000
	33.2389 - 30.6821		22.912	0.299	26.000	0.023	1.031	0.009	26.000	0.000
	30.6821 - 28.1253		23.102	0.297	26.000	0.023	1.034	0.009	26.000	0.000
	28.1253 - 25.5684		23.294	0.294	26.000	0.023	1.037	0.008	26.000	0.000
	25.5684 - 23.0116		23.486	0.292	26.000	0.022	1.040	0.008	26.000	0.000
	23.0116 - 20.4547		23.680	0.290	26.000	0.022	1.044	0.008	26.000	0.000
	20.4547 - 17.8979		23.875	0.288	26.000	0.022	1.047	0.008	26.000	0.000
	17.8979 - 15.3411		24.071	0.286	26.000	0.022	1.050	0.007	26.000	0.000
	15.3411 - 12.7842		24.269	0.284	26.000	0.022	1.054	0.007	26.000	0.000
	12.7842 - 10.2274		24.468	0.282	26.000	0.022	1.057	0.007	26.000	0.000
	10.2274 - 7.67053		24.668	0.284	26.000	0.022	1.061	0.007	26.000	0.000
	7.67053 - 5.11368		24.869	0.282	26.000	0.021	1.064	0.007	26.000	0.000
	5.11368 - 2.55684		25.071	0.281	26.000	0.021	1.068	0.007	26.000	0.000
	2.55684 - 0		25.275	0.279	26.000	0.021	1.072	0.007	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P P_a	Ratio f_{bx} F_{bx}	Ratio f_{by} F_{by}	Ratio f_v F_v	Ratio f_{vt} F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	140 - 138.079	0.000	0.001	0.000	0.001	0.000	0.002	1.333	H1-3+VT
	138.079 -	0.004	0.193	0.000	0.047	0.003	0.198	1.333	H1-3+VT

RISATower Centek Engineering Inc. 63-2 North Branford Road Branford, CT 06405 Phone: 203.488.0580 FAX: 203.488.8587	Job	11021.CO45 - CT5431 ~ Shelton North East	Page	27 of 29
	Project	140-ft FWT Monopole - Shelton, CT	Date	08:59:44 04/13/11
	Client	AT&T Mobility	Designed by	TJL

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	136.158								
	136.158 - 134.237	0.004	0.282	0.000	0.046	0.003	0.287 ✓	1.333	H1-3+VT ✓
	134.237 - 132.316	0.004	0.362	0.000	0.046	0.003	0.367 ✓	1.333	H1-3+VT ✓
	132.316 - 130.395	0.004	0.435	0.000	0.046	0.003	0.440 ✓	1.333	H1-3+VT ✓
	130.395 - 128.474	0.004	0.501	0.000	0.045	0.003	0.506 ✓	1.333	H1-3+VT ✓
	128.474 - 126.553	0.004	0.561	0.000	0.045	0.003	0.566 ✓	1.333	H1-3+VT ✓
	126.553 - 124.632	0.005	0.616	0.000	0.045	0.003	0.621 ✓	1.333	H1-3+VT ✓
	124.632 - 122.711	0.005	0.667	0.000	0.045	0.002	0.672 ✓	1.333	H1-3+VT ✓
	122.711 - 120.79	0.005	0.713	0.000	0.045	0.002	0.719 ✓	1.333	H1-3+VT ✓
	120.79 - 118.869	0.008	0.778	0.000	0.066	0.002	0.786 ✓	1.333	H1-3+VT ✓
	118.869 - 116.948	0.008	0.851	0.000	0.065	0.002	0.860 ✓	1.333	H1-3+VT ✓
	116.948 - 115.027	0.008	0.919	0.000	0.064	0.002	0.928 ✓	1.333	H1-3+VT ✓
	115.027 - 113.106	0.008	0.981	0.000	0.064	0.002	0.990 ✓	1.333	H1-3+VT ✓
	113.106 - 111.185	0.008	1.038	0.000	0.063	0.002	1.047 ✓	1.333	H1-3+VT ✓
	111.185 - 109.264	0.009	1.095	0.000	0.071	0.002	1.105 ✓	1.333	H1-3+VT ✓
	109.264 - 107.343	0.009	1.155	0.000	0.070	0.002	1.165 ✓	1.333	H1-3+VT ✓
	107.343 - 105.422	0.009	1.210	0.000	0.069	0.002	1.220 ✓	1.333	H1-3+VT ✓
	105.422 - 103.501	0.009	1.260	0.000	0.069	0.002	1.271 ✓	1.333	H1-3+VT ✓
	103.501 - 101.58	0.009	1.307	0.000	0.068	0.002	1.318 ✓	1.333	H1-3+VT ✓
L2	101.58 - 99.43	0.006	0.827	0.000	0.041	0.001	0.834 ✓	1.333	H1-3+VT ✓
	99.43 - 97.28	0.007	0.858	0.000	0.043	0.001	0.865 ✓	1.333	H1-3+VT ✓
	97.28 - 95.13	0.007	0.886	0.000	0.043	0.001	0.894 ✓	1.333	H1-3+VT ✓
	95.13 - 92.98	0.009	0.924	0.000	0.051	0.001	0.934 ✓	1.333	H1-3+VT ✓
	92.98 - 90.83	0.010	0.960	0.000	0.050	0.001	0.970 ✓	1.333	H1-3+VT ✓
	90.83 - 88.68	0.010	0.993	0.000	0.050	0.001	1.003 ✓	1.333	H1-3+VT ✓
	88.68 - 86.53	0.010	1.023	0.000	0.050	0.001	1.034 ✓	1.333	H1-3+VT ✓
	86.53 - 84.38	0.010	1.052	0.000	0.049	0.001	1.062 ✓	1.333	H1-3+VT ✓
	84.38 - 82.23	0.010	1.078	0.000	0.049	0.001	1.088 ✓	1.333	H1-3+VT ✓
	82.23 - 80.08	0.010	1.102	0.000	0.048	0.001	1.112 ✓	1.333	H1-3+VT ✓
	80.08 - 77.93	0.010	1.124	0.000	0.048	0.001	1.135 ✓	1.333	H1-3+VT ✓
	77.93 - 75.78	0.010	1.145	0.000	0.048	0.001	1.156 ✓	1.333	H1-3+VT ✓
	75.78 - 73.63	0.011	1.164	0.000	0.048	0.001	1.175 ✓	1.333	H1-3+VT ✓
	73.63 - 71.48	0.012	1.192	0.000	0.053	0.001	1.205 ✓	1.333	H1-3+VT ✓
	71.48 - 69.33	0.012	1.215	0.000	0.053	0.001	1.228 ✓	1.333	H1-3+VT ✓
	69.33 - 67.18	0.012	1.238	0.000	0.053	0.001	1.251 ✓	1.333	H1-3+VT ✓

RISATower

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Project

140-ft FWT Monopole - Shelton, CT

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Section No.	Elevation ft	Ratio P P_a	Ratio f_{hx} F_{bx}	Ratio f_{hy} F_{by}	Ratio f_v F_v	Ratio f_{vt} F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L3	67.18 - 65.03	0.012	1.258	0.000	0.052	0.001	1.271 ✓	1.333	H1-3+VT ✓
	65.03 - 62.88	0.013	1.277	0.000	0.052	0.001	1.290 ✓	1.333	H1-3+VT ✓
	62.88 - 60.73	0.013	1.295	0.000	0.052	0.001	1.308 ✓	1.333	H1-3+VT ✓
	60.73 - 58.58	0.013	1.311	0.000	0.051	0.001	1.325 ✓	1.333	H1-3+VT ✓
	58.58 - 57.464	0.007	0.725	0.000	0.028	0.001	0.733 ✓	1.333	H1-3+VT ✓
	57.464 - 56.348	0.007	0.730	0.000	0.027	0.000	0.737 ✓	1.333	H1-3+VT ✓
	56.348 - 55.232	0.007	0.734	0.000	0.027	0.000	0.741 ✓	1.333	H1-3+VT ✓
	55.232 - 54.116	0.007	0.737	0.000	0.027	0.000	0.745 ✓	1.333	H1-3+VT ✓
	54.116 - 53	0.007	0.741	0.000	0.027	0.000	0.749 ✓	1.333	H1-3+VT ✓
	53 - 48.58	0.004	0.375	0.000	0.013	0.000	0.378 ✓	1.333	H1-3+VT ✓
L4	53 - 48.58	0.004	0.361	0.000	0.012	0.000	0.365 ✓	1.333	H1-3+VT ✓
	48.58 - 46.0232	0.007	0.721	0.000	0.024	0.000	0.728 ✓	1.333	H1-3+VT ✓
	46.0232 - 43.4663	0.008	0.725	0.000	0.024	0.000	0.732 ✓	1.333	H1-3+VT ✓
	43.4663 - 40.9095	0.008	0.728	0.000	0.024	0.000	0.736 ✓	1.333	H1-3+VT ✓
	40.9095 - 38.3526	0.008	0.731	0.000	0.024	0.000	0.739 ✓	1.333	H1-3+VT ✓
	38.3526 - 35.7958	0.008	0.734	0.000	0.023	0.000	0.742 ✓	1.333	H1-3+VT ✓
	35.7958 - 33.2389	0.008	0.736	0.000	0.023	0.000	0.744 ✓	1.333	H1-3+VT ✓
	33.2389 - 30.6821	0.008	0.738	0.000	0.023	0.000	0.746 ✓	1.333	H1-3+VT ✓
	30.6821 - 28.1253	0.008	0.739	0.000	0.023	0.000	0.748 ✓	1.333	H1-3+VT ✓
	28.1253 - 25.5684	0.008	0.740	0.000	0.023	0.000	0.749 ✓	1.333	H1-3+VT ✓
	25.5684 - 23.0116	0.009	0.741	0.000	0.022	0.000	0.750 ✓	1.333	H1-3+VT ✓
	23.0116 - 20.4547	0.009	0.742	0.000	0.022	0.000	0.751 ✓	1.333	H1-3+VT ✓
	20.4547 - 17.8979	0.009	0.743	0.000	0.022	0.000	0.752 ✓	1.333	H1-3+VT ✓
	17.8979 - 15.3411	0.009	0.743	0.000	0.022	0.000	0.752 ✓	1.333	H1-3+VT ✓
	15.3411 - 12.7842	0.009	0.743	0.000	0.022	0.000	0.752 ✓	1.333	H1-3+VT ✓
	12.7842 - 10.2274	0.009	0.743	0.000	0.022	0.000	0.752 ✓	1.333	H1-3+VT ✓
	10.2274 - 7.67053	0.009	0.743	0.000	0.022	0.000	0.752 ✓	1.333	H1-3+VT ✓
	7.67053 - 5.11368	0.009	0.743	0.000	0.021	0.000	0.752 ✓	1.333	H1-3+VT ✓
	5.11368 - 2.55684	0.010	0.743	0.000	0.021	0.000	0.752 ✓	1.333	H1-3+VT ✓
	2.55684 - 0	0.010	0.742	0.000	0.021	0.000	0.752 ✓	1.333	H1-3+VT ✓

RISATower

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Job	11021.CO45 - CT5431 ~ Shelton North East	Page	29 of 29
Project	140-ft FWT Monopole - Shelton, CT	Date	08:59:44 04/13/11
Client	AT&T Mobility	Designed by	TJL

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
L1	140 - 101.58	Pole	TP21.882x13.161x0.188	1	-4.735	671.201	98.9	Pass
L2	101.58 - 58.58	Pole	TP31.643x21.882x0.313	2	-15.496	1615.543	99.4	Pass
L3	58.58 - 48.58	Pole	TP33.913x31.643x0.583	3	-16.995	3111.355	56.2	Pass
L4	48.58 - 0	Pole	TP44.317x31.743x0.663	4	-31.477	4512.951	56.4	Pass
							Summary	
							Pole (L2)	99.4 Pass
							RATING =	99.4 Pass

Program Version 5.4.2.0 - 6/17/2010 File:J:\Jobs\1102100.W\CO-45 - CT5431 - Oliver Terrace, Shelton, CT/Structural/Calcs/ERI Files/140' Monopole_Shelton_CT.eri

Flange Bolt and Flange Plate Analysis:**Input Data:**Tower Reactions:

Overturning Moment =	OM := 293-ft-kips	(Input From RisaTower)
Shear Force =	Shear := 11.5-kips	(Input From RisaTower)
Axial Force =	Axial := 8.3-kips	(Input From RisaTower)

Flange Bolt Data:

Use ASTM A325

Number of Flange Bolts =	N := 16	(User Input)
Diameter of Bolt Circle =	$D_{bc} := 26.0\text{-in}$	(User Input)
Bolt Ultimate Strength =	$F_u := 120\text{-ksi}$	(User Input)
Bolt Yield Strength =	$F_y := 92\text{-ksi}$	(User Input)
Bolt Modulus =	$E := 29000\text{-ksi}$	(User Input)
Diameter of Flange Bolts =	$D := 1.0\text{-in}$	(User Input)
Threads per Inch =	$n := 8$	(User Input)

Flange Plate Data:

Use ASTM A36

Plate Yield Strength =	$F_{y_{bp}} := 50\text{-ksi}$	(User Input)
Flange Plate Thickness =	$t_{bp} := 1.5\text{-in}$	(User Input)
Flange Plate Diameter =	$D_{bp} := 30.0\text{-in}$	(User Input)
Outer Pole Diameter =	$D_{pole} := 21.882\text{-in}$	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =

$$R_{bc} := \frac{D_{bc}}{2} = 13\text{-in}$$

Distance to Bolts =

$$i := 1..N$$

$$d_i := \begin{cases} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N} \right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{cases}$$

$$d_1 = 4.97\text{-in} \quad d_7 = 4.97\text{-in}$$

$$d_2 = 9.19\text{-in} \quad d_8 = 0.00\text{-in}$$

$$d_3 = 12.01\text{-in} \quad d_9 = -4.97\text{-in}$$

$$d_4 = 13.00\text{-in} \quad d_{10} = -9.19\text{-in}$$

$$d_5 = 12.01\text{-in} \quad d_{11} = -12.01\text{-in}$$

$$d_6 = 9.19\text{-in} \quad d_{12} = -13.00\text{-in}$$

Critical Distances For Bending in Plate:

Outer Pole Radius =

$$R_{pole} := \frac{D_{pole}}{2} = 10.9\text{-in}$$

Moment Arms of Bolts about Neutral Axis =

$$MA_i := \text{if}(d_i \geq R_{pole}, d_i - R_{pole}, 0\text{in})$$

$$MA_1 = 0.00\text{-in} \quad MA_7 = 0.00\text{-in}$$

$$MA_2 = 0.00\text{-in} \quad MA_8 = 0.00\text{-in}$$

$$MA_3 = 1.07\text{-in} \quad MA_9 = 0.00\text{-in}$$

$$MA_4 = 2.06\text{-in} \quad MA_{10} = 0.00\text{-in}$$

$$MA_5 = 1.07\text{-in} \quad MA_{11} = 0.00\text{-in}$$

$$MA_6 = 0.00\text{-in} \quad MA_{12} = 0.00\text{-in}$$

Effective Width of Flangeplate for Bending =

$$B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2} \right)^2 - \left(\frac{D_{pole}}{2} \right)^2} = 16.4\text{-in}$$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia =

$$I_p := \sum_i (d_i)^2 = 1.352 \times 10^3 \cdot \text{in}^2$$

Gross Area of Bolt =

$$A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot \text{in}^2$$

Net Area of Bolt =

$$A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^2 = 0.606 \cdot \text{in}^2$$

Net Diameter =

$$D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 0.878 \cdot \text{in}$$

Radius of Gyration of Bolt =

$$r := \frac{D_n}{4} = 0.22 \cdot \text{in}$$

Section Modulus of Bolt =

$$S_x := \frac{\pi \cdot D_n^3}{32} = 0.066 \cdot \text{in}^3$$

Check Flange Bolt Tension Force:

Maximum Tensile Force =

$$T_{\text{Max}} := OM \cdot \frac{R_{bc}}{I_p} - \frac{\text{Axial}}{N} = 33.3 \cdot \text{kips}$$

Allowable Tensile Force =

$$T_{\text{ALL.Gross}} := 1.333 \cdot (0.33 \cdot A_g \cdot F_u) = 41.5 \cdot \text{kips} \quad (1.333 \text{ increase allowed per TIA/EIA})$$

Bolt Tension % of Capacity =

$$\frac{T_{\text{Max}}}{T_{\text{ALL.Gross}}} = 80.3 \cdot \%$$

Condition1 =

$$\text{Condition1} := \text{if} \left(\frac{T_{\text{Max}}}{T_{\text{ALL.Gross}}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$$

Condition1 = "OK"

Flange Plate Analysis:

Force from Bolts =
$$C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$$

$C_1 = 13.5 \text{ kips}$	$C_7 = 13.5 \text{ kips}$
$C_2 = 24.4 \text{ kips}$	$C_8 = 0.5 \text{ kips}$
$C_3 = 31.8 \text{ kips}$	$C_9 = -12.4 \text{ kips}$
$C_4 = 34.3 \text{ kips}$	$C_{10} = -23.4 \text{ kips}$
$C_5 = 31.8 \text{ kips}$	$C_{11} = -30.7 \text{ kips}$
$C_6 = 24.4 \text{ kips}$	$C_{12} = -33.3 \text{ kips}$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot M A_i}{(B_{eff} t_{bp}^2)} = 22.5 \text{ ksi}$$

Allowable Bending Stress in Plate =

$$F_{bp} := 1.33 \cdot 0.75 \cdot F_y = 49.9 \text{ ksi}$$

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 45.1 \%$$

Condition3 =

$$\text{Condition2} := \text{if} \left(\frac{f_{bp}}{F_{bp}} < 1.00, \text{"Ok"}, \text{"Overstressed"} \right)$$

Condition2 = "Ok"

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	M := 2370-ft-kips	(Input From RisaTower)
Shear Force =	V := 25-kips	(Input From RisaTower)
Axial Force =	P := 35-kips	(Input From RisaTower)

Anchor Bolt Data:

Use ASTM A615 Grade 75		
Number of Anchor Bolts =	N := 12	(User Input)
Diameter of Bolt Circle =	d _{bc} := 51-in	(User Input)
Bolt Ultimate Strength =	F _u := 100-ksi	(User Input)
Bolt Yield Strength =	F _y := 75-ksi	(User Input)
Bolt Modulus =	E := 29000-ksi	(User Input)
Diameter of Anchor Bolts =	D := 2.25-in	(User Input)
Threads per Inch =	n _t := 4.5	(User Input)

Base Plate Data:

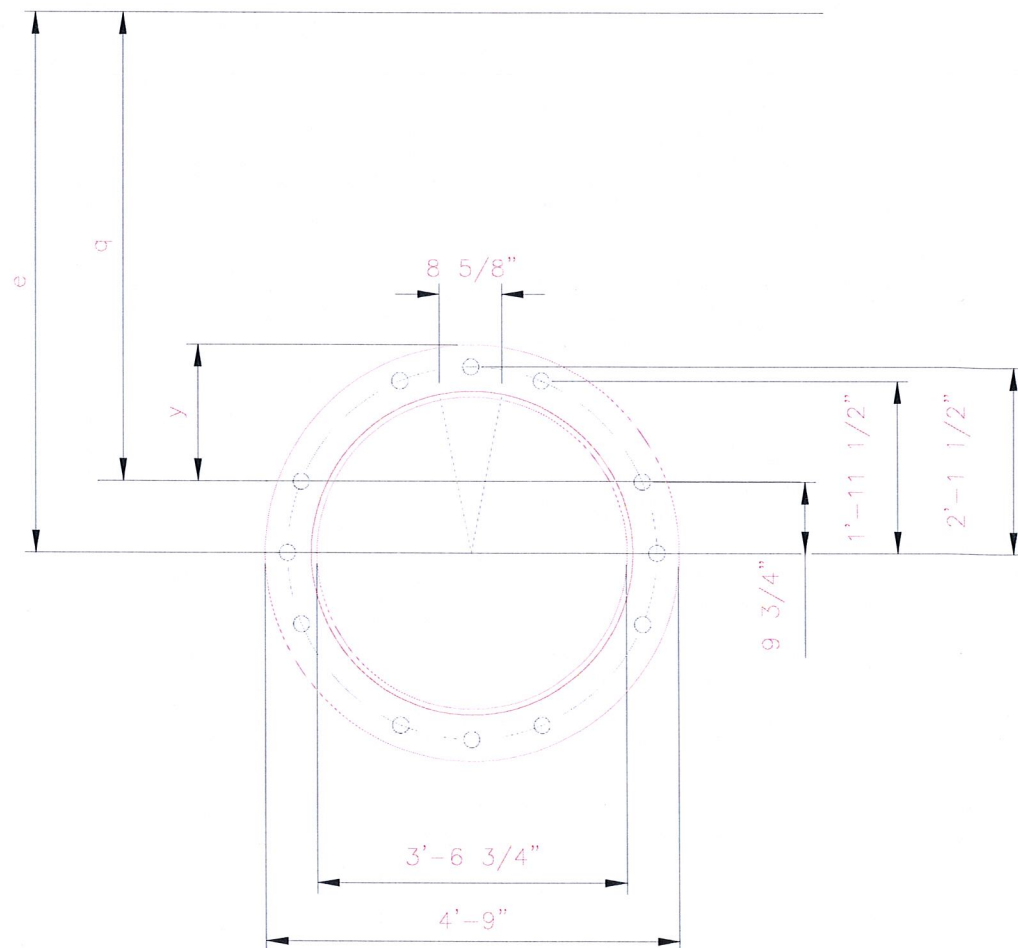
Plate Yield Strength =	F _{ybp} := 60-ksi	(User Input)
Base Plate Thickness =	t _{bp} := 2.25-in	(User Input)
Base Plate Diameter =	d _{bp} := 57.0-in	(User Input)
Outer Pole Diameter =	d _{pole} := 44.317-in	(User Input)
Inner Plate Diameter =	d _i := 42.75-in	(User Input)
Grout Strength =	F _c := 3000 psi	(User Input)
Effective Width of Baseplate for Bending =	b _{eff} := 8.625-in	(User Input) (Per Bolt)
Axial Load Eccentricity from Center of Base Plate =	$e := \frac{M}{P} = 67.714 \text{ ft}$	
Distance to Axial Load from Neutral Axis =	q := 802.729-in	(User Input) (Computed Based Complete Circular Base Plate Method)

$$n := \frac{29000}{57 \cdot \sqrt{F_c}} = 9.289$$

$$A_{\text{bolt}} := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n_t} \right)^2 = 3.248 \cdot \text{in}^2$$

Distance to Bolts =

$y_1 := 0\text{-in}$	$y_5 := 23.5625\text{-in}$	$y_9 := -23.5625\text{-in}$
$y_2 := 9.75\text{-in}$	$y_6 := 9.75\text{-in}$	$y_{10} := -25.5\text{-in}$
$y_3 := 23.5625\text{-in}$	$y_7 := 0\text{-in}$	$y_{11} := -23.5625\text{-in}$
$y_4 := 25.5\text{-in}$	$y_8 := -9.75\text{-in}$	$y_{12} := -9.75\text{-in}$



Anchor Bolt Check:

Maximum Bolt Force in Compression =

$$C_{\max} := 35 \text{ kips}$$

Maximum Bolt Force in Tension =

$$T_{\max} := 88 \text{ kips}$$

Check Anchor Bolt Tension Force:

Allowable Tensile Force =

$$T_{\text{ALL}} := 1.333 \cdot (0.60 \cdot A_{\text{bolt}} \cdot F_y) = 194.812 \text{ kips} \quad (1.333 \text{ increase allowed per TIA/EIA})$$

Bolt Tension % of Capacity =

$$\frac{T_{\max}}{T_{\text{ALL}}} = 45.2 \%$$

Condition1 =

$$\text{Condition1} := \text{if} \left(\frac{T_{\max}}{T_{\text{ALL}}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$$

Condition1 = "OK"

Grout Check:

Grout Stress at Edge of Plate =

$$y := .5 \cdot d_{\text{bp}} - e + q_{\text{calc}} = 18.658 \text{ in}$$

$$f_{\text{cmax}} := \frac{P \cdot y}{q \cdot A_T - Q_T} = 1536.9 \text{ psi}$$

$$y_{\text{bc}} := .5 \cdot d_{\text{bc}} - e + q_{\text{calc}} = 15.658 \text{ in}$$

Grout Stress at Bolt =

$$f_c := \frac{P \cdot y_{\text{bc}}}{q \cdot A_T - Q_T} = 1289.8 \text{ psi}$$

Plate Bending Stress % of Capacity =

$$\frac{f_{\text{cmax}}}{F_c \cdot \text{psi}} = 51.2 \%$$

Condition2 =

$$\text{Condition2} := \text{if} \left(\frac{f_{\text{cmax}}}{F_c \cdot \text{psi}} < 1.00, \text{"Ok"}, \text{"Overstressed"} \right)$$

Condition2 = "Ok"

Base Plate Check:

$$y_{\text{pole}} := .5 \cdot d_{\text{pole}} - e + q_{\text{calc}} = 12.3 \cdot \text{in}$$

Allowable Bending Stress in Plate =

$$F_{\text{bp}} := 1.33 \cdot 0.75 \cdot F_y = 59.9 \cdot \text{ksi}$$

Check Bending on Compression Side:

Grout Stress at the Pole Face =

$$f_{\text{pole}} := \frac{P \cdot y_{\text{pole}}}{q \cdot A_T - Q_T} = 1.015 \cdot \text{ksi}$$

Maximum Moment in Plate =

$$M_{\text{max}} := \frac{b_{\text{eff}} f_{\text{pole}} \left(\frac{d_{\text{bp}} - d_{\text{pole}}}{2} \right)^2}{2} + \frac{b_{\text{eff}} (f_{\text{cmax}} - f_{\text{pole}}) \left(\frac{d_{\text{bp}} - d_{\text{pole}}}{2} \right)^2}{3} + C_{\text{max}} \left(\frac{d_{\text{bc}} - d_{\text{pole}}}{2} \right) = 353 \cdot \text{k} \cdot \text{in}$$

Maximum Bending Stress in Plate =

$$f_b := \frac{6 \cdot M_{\text{max}}}{b_{\text{eff}} t_{\text{bp}}} = 48.5 \cdot \text{ksi}$$

Plate Bending Stress % of Capacity =

$$\frac{f_b}{F_{\text{bp}}} = 81.1 \cdot \%$$

Condition3 =

$$\text{Condition3} := \text{if} \left(\frac{f_b}{F_{\text{bp}}} < 1.00, \text{"Ok"}, \text{"Overstressed"} \right)$$

Condition3 = "Ok"

Check Bending on Tension Side:

Maximum Moment in Plate =

$$M_{\text{max}} := T_{\text{max}} \left(\frac{d_{\text{bc}} - d_{\text{pole}}}{2} \right) = 294 \cdot \text{k} \cdot \text{in}$$

Maximum Bending Stress in Plate =

$$f_b := \frac{6 \cdot M_{\text{max}}}{b_{\text{eff}} t_{\text{bp}}} = 40.4 \cdot \text{ksi}$$

Plate Bending Stress % of Capacity =

$$\frac{f_b}{F_{\text{bp}}} = 67.5 \cdot \%$$

Condition4 =

$$\text{Condition4} := \text{if} \left(\frac{f_b}{F_{\text{bp}}} < 1.00, \text{"Ok"}, \text{"Overstressed"} \right)$$

Condition4 = "Ok"

Caisson Foundation:Input Data:

Shear Force =	S := 25k	USER INPUT-FROM PLS-Pole
Overturning Moment =	M := 2370ft-k	USER INPUT-FROM PLS-Pole
Applied Axial Load =	A1 := 35k	USER INPUT-FROM PLS-Pole
Bending Moment =	Mu := 2501.7ft-k	USER INPUT-FROM LPILE
Moment Capacity =	Mn := 6093.1ft-k	USER INPUT-FROM LPILE
Foundation Diameter =	d := 6.0ft	USER INPUT
Overall Length of Caisson =	L _c := 14.5ft	USER INPUT
Depth From Top of Caisson to Grade =	L _{pag} := 0.5ft	USER INPUT
Number of Rebar =	n := 26	USER INPUT
Area of Rebar =	Ar := 1.56in ²	USER INPUT
Rebar Yield Strength =	fy := 60ksi	USER INPUT
Concrete Comp Strength =	f'c := 4.0ksi	USER INPUT

Check Foundation Depth:

Depth of Caisson Below Ground Level = $LD := L_c - L_{pag} = 14\text{ft}$ (TIA/EIA-222-F 7.2.5)

Depth Required = $LD1 := 2.0\text{ft} + \left(\frac{S \cdot \text{ft}^2}{3k \cdot d} \right) + 2\text{ft} \cdot 5 \left(\frac{M \cdot \text{ft}}{3 \cdot kd} + \frac{S \cdot \text{ft}}{2k} + \frac{S^2 \cdot \text{ft}^3}{18k^2 \cdot d^2} \right)^{.5} = 27.48\text{ft}$

DepthCheck := if(LD1 ≤ LD, "OK", "NO GOOD")

DepthCheck = "NO GOOD"

Note: Result not applicable.
Actual soil is better than normal
soil as defined in TIA/EIA 222 F.
Refer to L-Pile analysis.

Check Moment Capacity:

Factor of Safety = $FS := \frac{Mn}{Mu} = 2.4$

Factor of Safety Required = $FS_{reqd} := 1.3$

FOSCheck := if(FS ≥ FS_{reqd}, "OK", "NO GOOD")

FOSCheck = "OK"

Check Axial Capacity:

Concrete Weight = $A2 := .150 \frac{k}{\text{ft}^3} \cdot LD \cdot \pi \frac{d^2}{4} = 59.4 \cdot \text{kips}$

Total Axial Load = $AT := A1 + A2 = 94.4 \cdot \text{kips}$

Area of Concrete = $Ag := \pi \frac{d^2}{4} = 28.27\text{ft}^2$

Axial Capacity = $Po := n \cdot Ar \cdot fy + (Ag - n \cdot Ar) \cdot 0.85 \cdot f'c = 16138.8 \cdot \text{kips}$

AxialCheck := if(AT ≤ Po, "OK", "NO GOOD")

AxialCheck = "OK"

Caisson Analysis.lpo

LPILE Plus for windows, Version 5.0 (5.0.39)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

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This program is licensed to:

Staff
Natcomm, Inc.

Path to file locations: J:\Jobs\1102100.WI\CO-45 - CT5431 - Oliver
Terrace, Shelton, CT\Structural\Calcs\MathCad\Foundation\
Name of input data file: Caisson Analysis.lpd
Name of output file: Caisson Analysis.lpo
Name of plot output file: Caisson Analysis.lpp
Name of runtime file: Caisson Analysis.lpr

Time and Date of Analysis

Date: April 13, 2011 Time: 14:29:26

Problem Title

11021.C045 - Shelton North East

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:

- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:

- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis includes automatic computation of pile-top deflection vs. pile embedment length
- Analysis includes computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:

- Number of pile increments = 100

P65-16-XLH-RR**Dual Broadband Antennas**

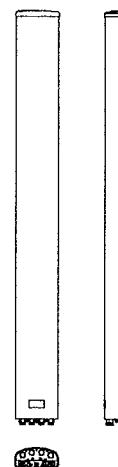
POLARIZATION: Dual linear $\pm 45^\circ$
 FREQUENCY (MHz): 698-894, 1710-2170
 HORIZONTAL BEAM WIDTH ($^\circ$): 65, 65
 GAIN (dBi/dBd): 15.5/13.4 17.5/15.4
 TILT: 1-12, 0-8
 LENGTH: 72"

ELECTRICAL SPECIFICATIONS*

	698-894		1710-2170		
Frequency range (MHz)	698-806	806-894	1710-1880	1850-1990	1900-2170
Frequency band (MHz)	14.8/12.7	15.5/13.4	16.9/14.8	17.2/15.1	17.5/15.4
Gain (dBi/dBd)	Dual Linear ± 45		Dual Linear ± 45		
Polarization	50		50		
Nominal Impedance (Ω)	< 1.5:1		< 1.5:1		
VSWR	66	65	60	63	63
Horizontal beam width, -3 dB ($^\circ$)	14.7	12.5	6.8	6.4	5.7
Vertical beam width, -3 dB ($^\circ$)	1 to 12		0 to 8		
Electrical down tilt ($^\circ$)	> 16	> 16	> 16		
Side lobe suppression, vertical 1st upper (dB)	> 16	> 16	> 16		
Isolation between inputs (dB)	> 30	> 30	> 30	> 30	
Inter band Isolation (dB)	> 40		> 40		
Tracking, horizontal plane $\pm 60^\circ$ (dB)	< 2		< 2	< 2	< 2
First null fill (dB)			> -20	> -20	> -20
Vertical beam squint ($^\circ$)	< 0.8	< 0.8	< 0.5	< 0.5	< 0.5
Front to back ratio (dB) $180^\circ \pm 30^\circ$ copolar	> 24	> 24	> 30	> 30	> 28
Front to back ratio (dB) $180^\circ \pm 30^\circ$ total power					
Cross polar discrimination (XPD) 0° (dB)	> 15	> 15	> 15	> 15	> 15
Cross polar discrimination (XPD) $\pm 60^\circ$ (dB)	> 10	> 10	> 10	> 10	> 10
Far field coupling					
IM3, 2xTx@43dBm (dBc)	< -153		< -153		
IM7, 2xTx@43dBm (dBc)					
Power handling, average per input (W)	500		250		
Power handling, average total (W)	1000		500		

MECHANICAL SPECIFICATIONS*

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 6" (1829 x 305 x 152)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	29 (64)
Weight, without brackets, kg (lbs)	24 (53)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	1380
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40C to +60C
Radome material	PVC, IP55
Packet size, HxWxD, mm (ft)	87" x 16" x 10" (2225 x 400 x 225)
Radome colour	Light Grey
Shipping weight, kg (lbs)	34 (75)
RET	iRET AISGv1.1, MET and AISGv2.0
Brackets	7256.00, 7454.00A



*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

For detailed patterns visit <http://www.powerwave.com/rpa/>.

POWER

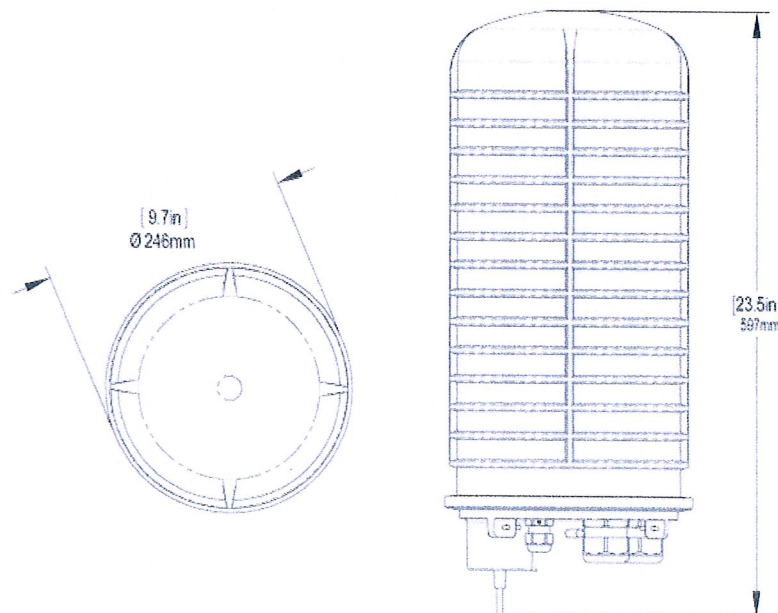
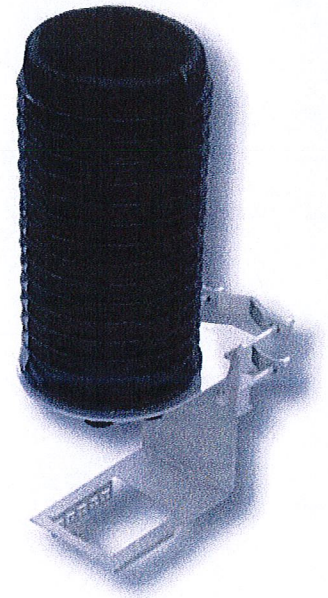
DC6-48-60-18-8F

DC Surge Suppression Solution

The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

FEATURES

- Protects up to 6 Remote Radio Heads, each with its own protection circuit.
- Flexible design allows for installation at the top of a tower for Remote Radio Head protection.
- Includes fiber connections for up to 18 pairs of fiber.
- LED indicators on individual circuits provide visual indication of suppressor status.
- Form 'C' relays allow for remote monitoring of the suppressor status.
- Patented Strikesorb technology provides over 60 kA of surge current capacity per circuit.
- Strikesorb suppression modules are fully recognized to UL 1449-3rd Edition Safety Standard, meeting all intermediate and high current fault requirements to facilitate use in OEM applications.
- Raycap recommends that DC protection system be installed within 2 meters or 6 feet of the radio.
- Dome design is lightweight and aerodynamic providing maximum flexibility for installation on top of towers.



Raycap

DC6-48-60-18-8F

DC Power Surge Protection

Electrical Specifications	
Model Number	DC6-48-60-18-8F
Nominal Operating Voltage	48 VDC
Nominal Discharge Current (I_n)	20 kA 8/20 μ s
Maximum Discharge Current (I_{max}) per NEMA LS-1	60 kA 8/20 μ s
Maximum Continuous Operating Voltage (U_c)	75 VDC
Voltage Protection Rating	400 V

Mechanical Specifications	
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum
Fiber Connection Method	LC-LC Single mode duplex
Environmental Rating	IP 68, 7m 72hrs
Operating Temperature	-40° C to + 80° C
Storage Temperature	-70° C to + 80° C
Cold Temperature Cycling	IEC 61300-2-22e -30° C to + 60° C 200 hrs @ 5 psi
Resistance to Aggressive Materials	CEI IEC 61073-2 including acids and bases
UV Protection	ISO 4892-2 Method A Xenon-Arc 2160 hrs
Weight	20 lbs without Mounting Bracket

STANDARDS

Strikesorb modules are compliant to the following Surge Protection Device (SPD) Standards:

- ANSI/UL 1449 - 3rd Edition
- IEEE C62.41
- NEMA LS-1, IEC 61643-1:2005 2nd Edition:2005
- IEC 61643-12
- EN 61643-11:2002 (including A11:2007)



Raycap

G02-00-068 REV 050610



GS-07F-0435V



Certified to
ISO 9001:2000



TUV Rheinland
of North America

Raycap, Inc. 806 W. Clearwater Loop • Post Falls • Idaho • 83854 • USA
Phone 208.777.1166 • Toll Free 800.890.2569 • Fax 208.777.4466 • www.raycapsurgeprotection.com

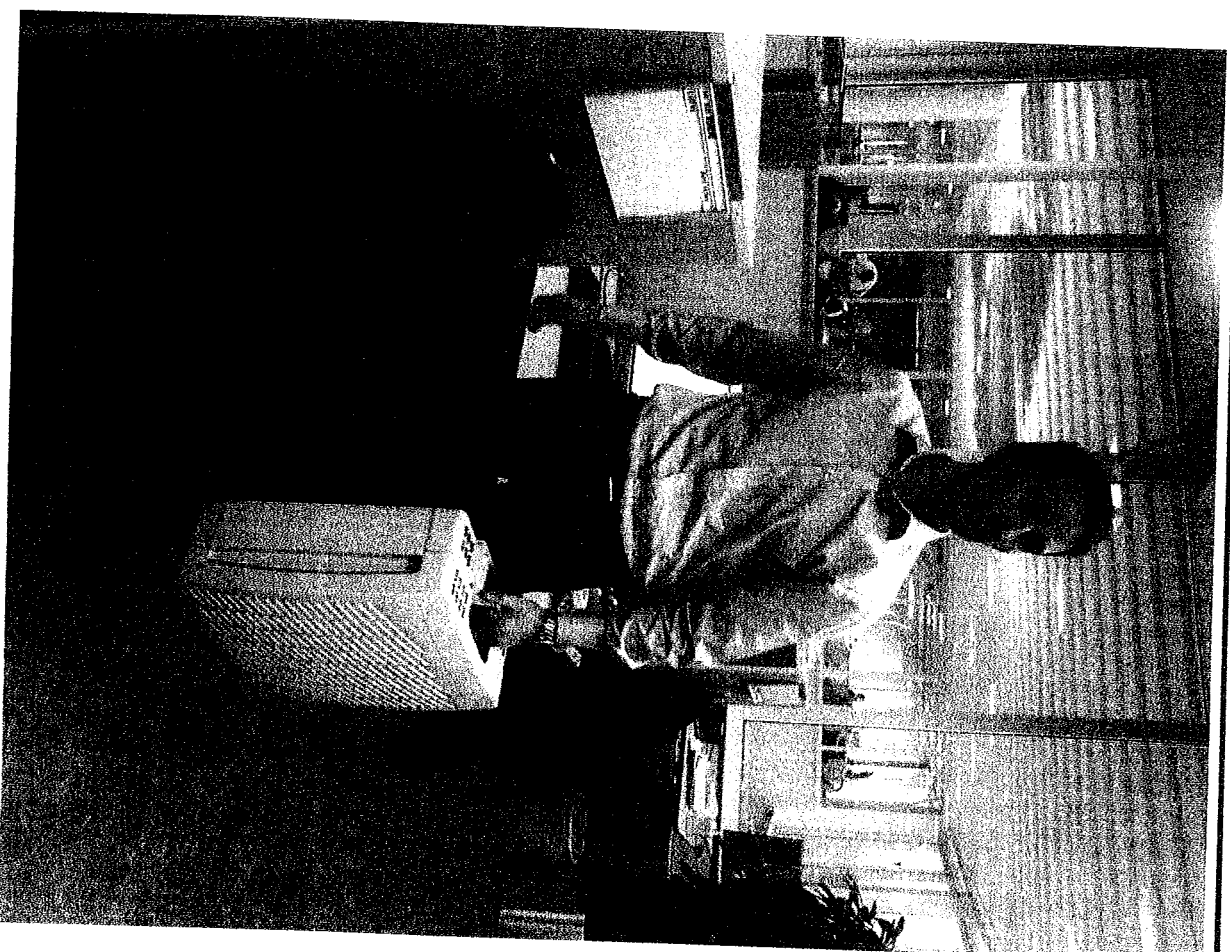
RRUS 11 – Dual PA RRU.

Technical Data



RBS6000

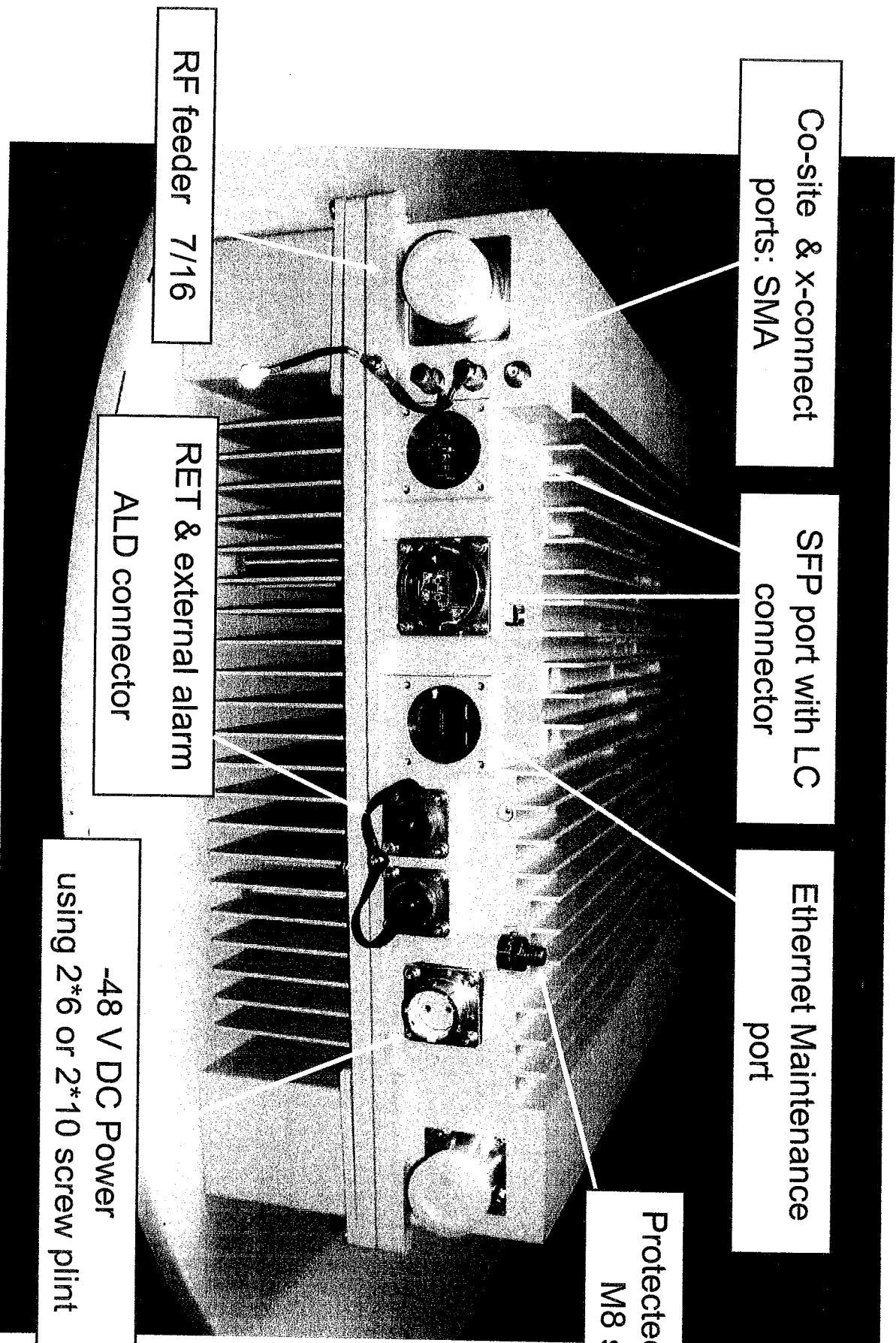
- > Multi standard
- > RF: 2x30 Watts
- > Carrier BW: 1.4 – 20 MHz
- > Alarms: 2
- > Dimensions (with sunshield):
 - Width: 17.0 in
 - Height: 17.8 in
 - Depth: 7.2 in
 - Weight: 55 lbs (Band 12)
50 lbs (Band 4)
 - Weight: 50 lbs (Band 4)
- > Temperature: -40 to +131 F
- > Cooling: Self convection
- > Power: -48 VDC
- > Rec. fuse size 20 Amp
 - Rec. DC cable:
 - 6 mm² up to 60 meters
 - 10 mm² over 60 meters
- > Shielded
- > Power Cons: 200 Watts typ.



RRUS-11 I/F



RBS6000



Co-site & x-connect
ports: SMA

SFP port with LC
connector

Ethernet Maintenance
port

Protected ground
M8 stud

RF feeder 7/16

RET & external alarm
ALD connector

-48 V DC Power
using 2*6 or 2*10 screw plint



New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

May 9, 2011

Mayor Mark A. Lauretti
Mayor, City of Shelton
Shelton City Hall
54 Hill Street
Shelton, CT 06484

Re: Telecommunications Facility – 30 Oliver Terrace (70 Platt Road) Shelton, CT

Dear Mayor Lauretti:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes Cingular's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures; please call me at (860) 463-5511 or Ms. Linda Roberts, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Enclosure