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

November 30, 2012

Melanie Howlett
HPC Wireless Services
46 Mill Plain Road, Floor 2
Danbury, CT 06811

RE: **EM-CING-070-121109A** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 14 Route 80, Killingworth, Connecticut.

Dear Ms. Howlett:

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 more 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 November 7, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding

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,

LRoberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Catherine Iino, First Selectman, Town of Killingworth
Cathie Jefferson, Zoning Enforcement Officer, Town of Killingworth

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

November 13, 2012

The Honorable Catherine Iino
First Selectman
Town of Killingworth
323 Route 81
Killingworth, CT 06419-1298

RE: **EM-CING-070-121109A** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 14 Route 80, Killingworth, Connecticut.

Dear First Selectman Iino:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72. A copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by November 27, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/cm

c: Cathie Jefferson, Zoning Enforcement Officer, Town of Killingworth

EM-CING-070-121109A

HPC Wireless Services
Mill Plain Rd.
or 2
nbury, CT, 06811
203.797.1112

HPC WIRELESS SERVICES

November 7, 2012

RECEIVED
NOV - 9 2012
CONNECTICUT
SITING COUNCIL

VIA OVERNIGHT COURIER

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

Re: New Cingular Wireless PCS, LLC – Exempt Modification
14 Route 80, Killingworth

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of New Cingular Wireless PCS, LLC ("AT&T"). AT&T is making modifications to certain existing sites in its Connecticut system in order to implement LTE technology. Please accept this letter and attachments as notification, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies ("R.S.C.A."), of construction that 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 First Selectwoman of the Town of Killingworth.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle and located at 14 Route 80, Killingworth (coordinates 41°-21'-26.43" N, 72°-31'-11.32" W). Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to AT&T's operations at the site.

The changes to the facility do not constitute a modification 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. 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. AT&T will add three (3) LTE panel antennas to new mounts and attached to existing T-arms at a centerline height of approximately 90'. Six (6) RRHS (remote radio units) and one (1) Surge Arrestor will be placed on new mounting pipes and attached to the Tower leg at a centerline height of approximately 90'. AT&T will also place DC

power and fiber runs from the equipment to the antennas along the existing coaxial cable run. These changes will not extend the height of the approximately 160' structure.

2. AT&T will remove one (1) cabinet and install two (2) stacked cabinets and a DC Plant on the existing concrete pad. AT&T will also mount a new GPS antenna on a proposed post at the base of the Tower, and one (1) Surge Suppressor on the existing Ice Bridge Post. These changes will be within the existing compound and will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six (6) decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility 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. As indicated on the attached report prepared by C Squared Systems, LLC, AT&T's operations at the site will result in a power density of approximately 3.97%; the combined site operations will result in a total power density of approximately 25.87%.

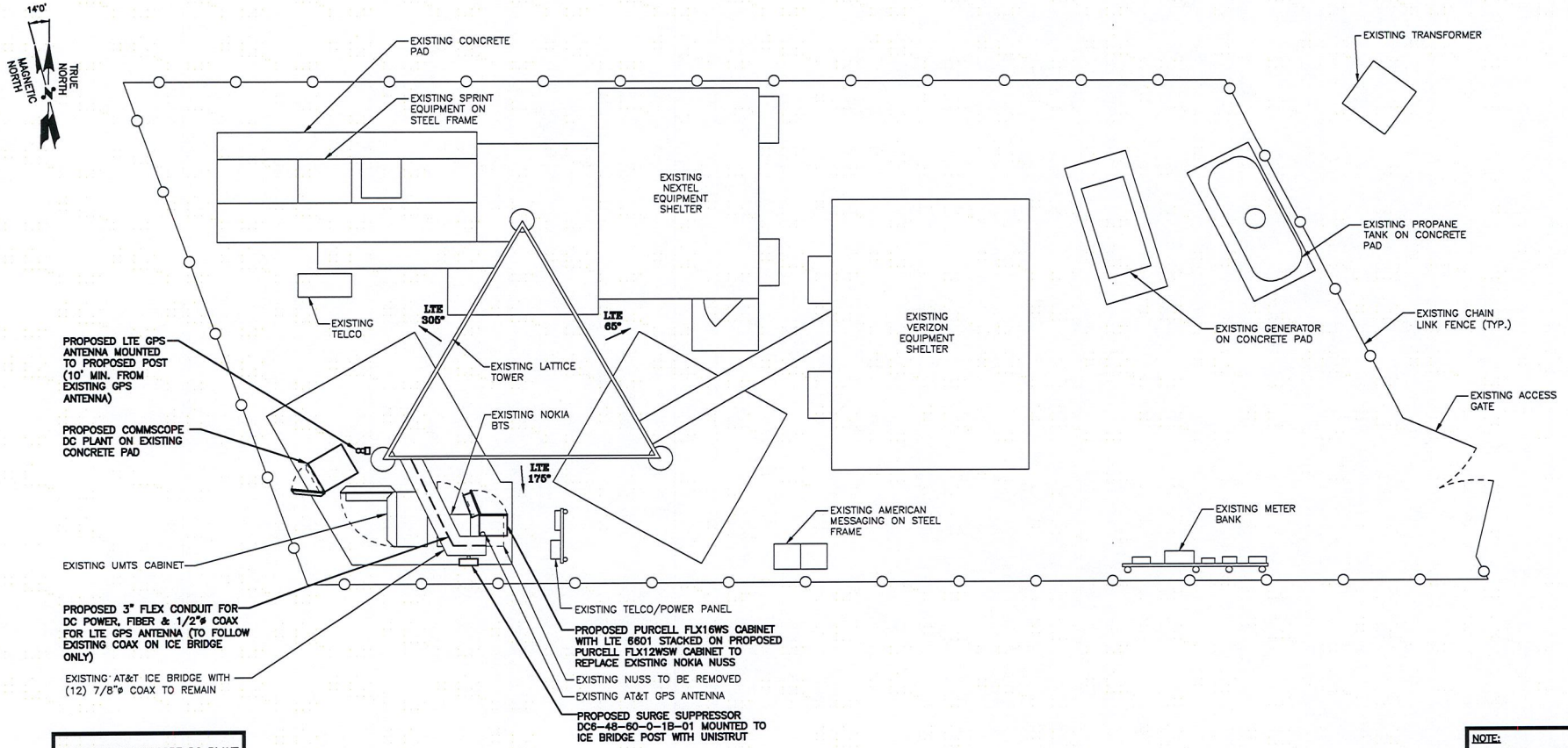
Please do not hesitate to contact me by phone at (203) 610-1071 or by e-mail at mjhowlett@optonline.net, with questions concerning this matter. Thank you for your consideration.

Respectfully yours,

Melanie J. Howlett

Attachments

cc: Honorable Catherine Lino, First Selectwoman, Town of Killingworth
14 Route 80, LLC (underlying property owner)



PROPOSED COMMSCOPE DC PLANT TO BE INSTALLED AND LIVE PRIOR TO NOKIA NUSS REMOVAL AND PURCELL INSTALLATION.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

COMPOUND PLAN

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

0 2'-0" 4'-0" 8'-0" 12'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT5875
SITE NAME: KILLINGWORTH SE
CROWN CASTLE SITE ID: 806387
14 ROUTE 80
KILLINGWORTH, CT 06419
MIDDLESEX COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	10/15/12	ISSUED FOR CONSTRUCTION	CA	DP	DPG
0	08/24/12	ISSUED FOR REVIEW	CC	DC	DPG

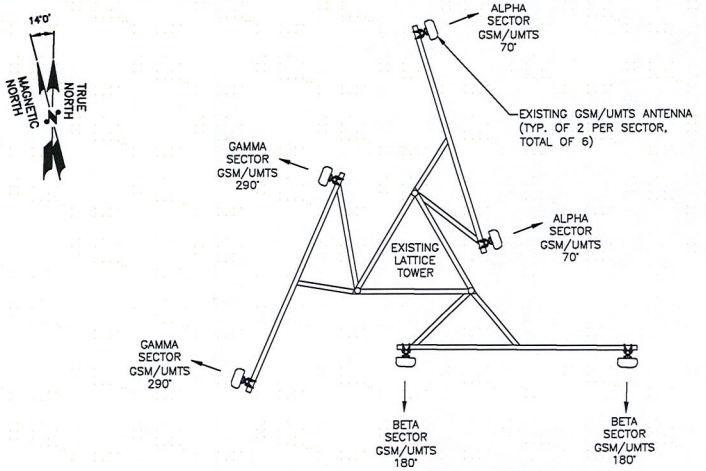
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: CC

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28557
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND PLAN & EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5875.01	A-1	1



EXISTING GSM/UMTS ANTENNA PLAN

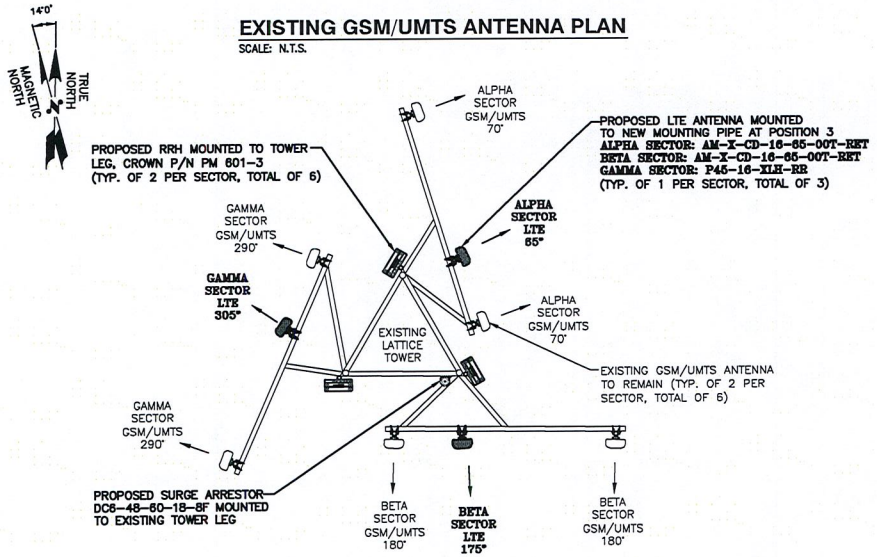
SCALE: N.T.S.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

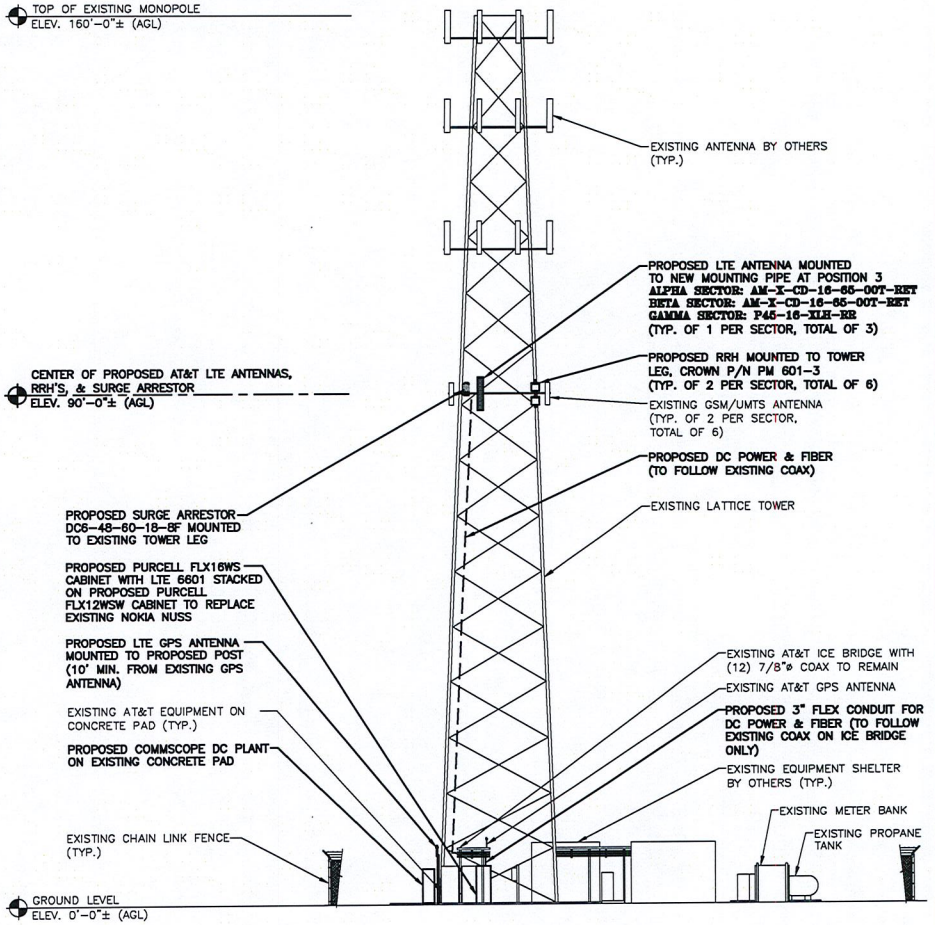
NOTE:

ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



NORTH ELEVATION

SCALE: 3/32"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Groupuc
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT5875
SITE NAME: KILLINGWORTH SE
CROWN CASTLE SITE ID: 806387
14 ROUTE 80
KILLINGWORTH, CT 06419
MIDDLESEX COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK APPD
1	10/15/12	ISSUED FOR CONSTRUCTION	CC	DC
0	08/24/12	ISSUED FOR REVIEW	CC	DC

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: CC

STATE OF CONNECTICUT · DEREK J. CREASER · NO. 26551 · LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA PLAN & ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5875.01	A-2	1

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

at&t

CT5875

(AWE - Killingworth SE)

14 Route 80, Killingworth, CT 06419

October 15, 2012

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the lattice tower located on 14 Route 80 in Killingworth, CT. The coordinates of the tower are 41° 21' 26.43" N, 72° 31' 11.83" W.

AT&T is proposing the following modifications:

1) Install three multi-band (700/850/1900/2100 MHz) antennas for their LTE network (one per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. 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 cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \text{x Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical patterns of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
AT&T UMTS	*92*	*880*	*1*	*500*	*0.0212*	*0.5867*	*3.62%*
AT&T GSM	*92*	*1900*	*2*	*427*	*0.0363*	*1.0000*	*3.63%*
AT&T GSM	*92*	*880*	*4*	*296*	*0.0503*	*0.5867*	*8.57%*
Nextel	120	851	9	100	0.0225	0.5673	3.96%
Sprint	140	1962.5	11	122	0.0246	1.0000	2.46%
Verizon cellular	160	869	9	292	0.0369	0.5793	6.37%
Verizon PCS	160	1970	11	262	0.0405	1.0000	4.05%
Verizon AWS	160	2145	1	654	0.0092	1.0000	0.92%
Verizon LTE	160	698	2	686	0.0193	0.4653	4.14%
AT&T UMTS	90	880	2	565	0.0050	0.5867	0.86%
AT&T UMTS	90	1900	2	875	0.0078	1.0000	0.78%
AT&T LTE	90	734	1	1313	0.0058	0.4893	1.19%
AT&T GSM	90	880	1	283	0.0013	0.5867	0.21%
AT&T GSM	90	1900	4	525	0.0093	1.0000	0.93%
						Total	**25.87%**

Table 1: Carrier Information[1] [2] [3]

[1] The existing CSC filing for AT&T should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 7/26/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[3] Antenna height listed for AT&T is in reference to the Paul J. Ford and Company Structural Analysis dated August 21, 2012.

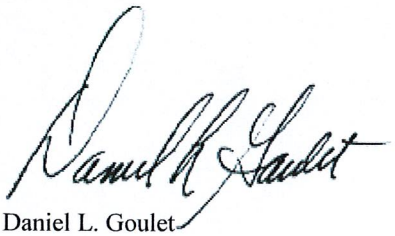
5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **25.87% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.



Daniel L. Goulet
C Squared Systems, LLC

October 15, 2012
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ 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	6

(B) Limits for General Population/Uncontrolled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ 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 2: FCC Limits for Maximum Permissible Exposure (MPE)

[4] 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 occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[5] 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 cannot exercise control over their exposure.

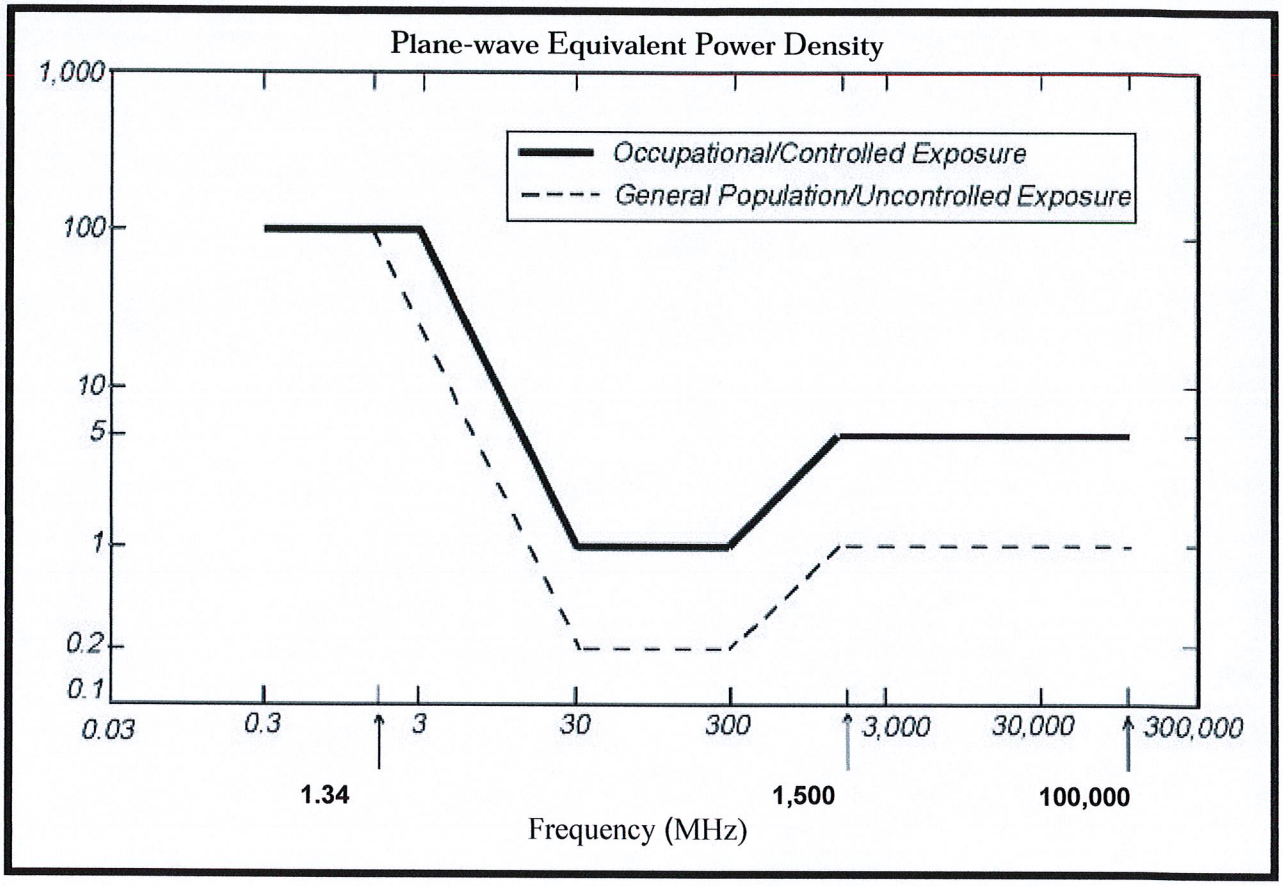
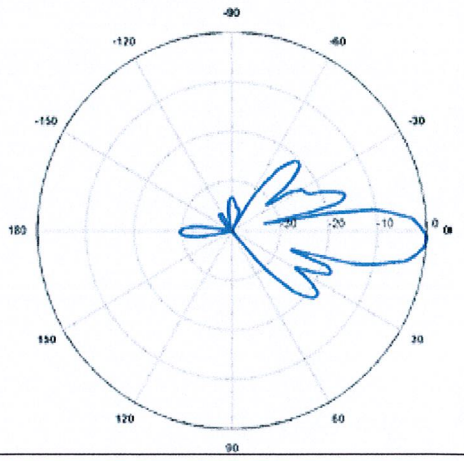


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

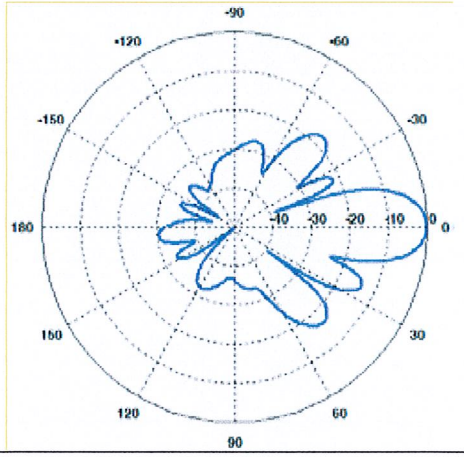
700 MHz

Manufacturer:	KMW
Model #:	AM-X-CD-16-65-00T-RET
Frequency Band:	698-806 MHz
Gain:	13.35 dBd
Vertical Beamwidth:	12.3°
Horizontal Beamwidth:	65°
Polarization:	Dual Slant ± 45°
Size L x W x D:	72.0" x 11.8" x 5.9"



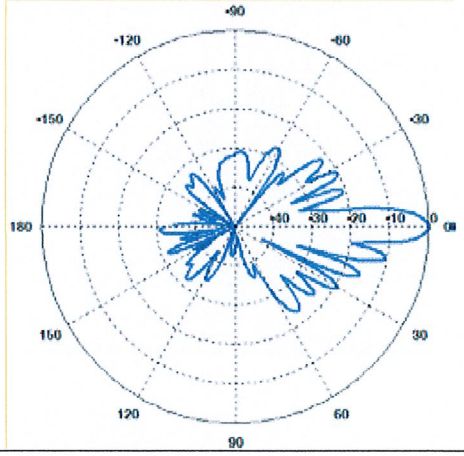
850 MHz

Manufacturer:	Powerwave
Model #:	7770.00
Frequency Band:	824-896 MHz
Gain:	11.5 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	82°
Polarization:	Dual Linear ± 45°
Size L x W x D:	55" x 11.0" x 5.0"



1900 MHz

Manufacturer:	Powerwave
Model #:	7770.00
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	86°
Polarization:	± 45°
Size L x W x D:	55" x 11.0" x 5.0"



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **August 21, 2012**

Veronica Harris
Crown Castle USA Inc.
1200 McArthur Blvd
Mahwah, NJ 07430
1-201-236-9094

Paul J Ford and Company
250 E Broad St Suite 1500
Columbus, OH 43215
614-221-6679
jjacobs@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5875
	Carrier Site Name:	AWE-Killingworth SE
Crown Castle Designation:	**Crown Castle BU Number:**	806387
	Crown Castle Site Name:	HRT 088 943629
	Crown Castle JDE Job Number:	199637
	Crown Castle Work Order Number:	519955
	Crown Castle Application Number:	158137 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37512-2206
Site Data:	**#14 Route 80, KILLINGWORTH, Middlesex County, CT** **Latitude *41° 21' 26.43"*, Longitude *-72° 31' 11.83"*** **160 Foot - Self Support Tower**	

Dear Ms. Harris,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 482150, in accordance with application 158137, revision 1.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

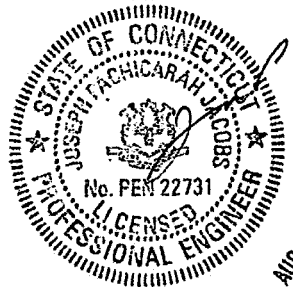
LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard based upon a wind speed of 85 mph fastest mile with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc.. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Joseph Jacobs, PE
Project Manager



AUG 21 2012

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **August 21, 2012**

Veronica Harris
Crown Castle USA Inc.
1200 McArthur Blvd
Mahwah, NJ 07430
1-201-236-9094

Paul J Ford and Company
250 E Broad St Suite 1500
Columbus, OH 43215
614-221-6679
jjacobs@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5875
	Carrier Site Name:	AWE-Killingworth SE
Crown Castle Designation:	**Crown Castle BU Number:**	806387
	Crown Castle Site Name:	HRT 088 943629
	Crown Castle JDE Job Number:	199637
	Crown Castle Work Order Number:	519955
	Crown Castle Application Number:	158137 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37512-2206
Site Data:	**#14 Route 80, KILLINGWORTH, Middlesex County, CT** **Latitude *41° 21' 26.43"*, Longitude *-72° 31' 11.83"*** **160 Foot - Self Support Tower**	

Dear Ms. Harris,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 482150, in accordance with application 158137, revision 1.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard based upon a wind speed of 85 mph fastest mile with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc.. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Joseph Jacobs, PE
Project Manager

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 160 ft Self Support tower designed by ROHN
The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
90.0	90.0	6	ericsson	RRUS-11	3	3/8
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe		
		1	powerwave technologies	P45-16-XLH-RR w/ Mount Pipe		
		1	raycap	DC6-48-60-18-8F		
		1	tower mounts	Pipe Mount [PM 601-3]		

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
157.0	157.0	3	antel	BXA-171085-8BF-EDIN-2 w/ Mount Pipe	12	1 5/8	1
		3	antel	BXA-70063-6CF-2 w/ Mount Pipe			
		6	antel	LPA-80080/6CF w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Sector Mount [SM 508-3]			
142.0	142.0	6	decibel	DB978H90T2E-M w/ Mount Pipe	6	1 5/8	1
		1	tower mounts	Sector Mount [SM 506-3]			
132.0	132.0	1		P4-57W	1 1	EW90 EW52	1
		1		PAR6-59			
		2	tower mounts	Pipe Mount [PM 601-1]			
130.0	136.0	1	rfs celwave	PD1110	1	1 1/4	1
	130.0	1	tower mounts	Side Arm Mount [SO 306-1]			
120.0	120.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1 5/8	1
		1	tower mounts	Sector Mount [SM 404-3]			
110.0	110.0	1	andrew	P2-122E	1	EW52	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	tower mounts	Pipe Mount [PM 601-1]			
100.0	106.0	1	rfs celwave	PD1110	2 1	EW52 7/8	1
	100.0	2		PAR6-59			
		2	tower mounts	Pipe Mount [PM 601-1]			
		1	tower mounts	Side Arm Mount [SO 308-1]			
90.0	90.0	6	powerwave technologies	7770.00 w/ Mount Pipe	12	7/8	1
		6	powerwave technologies	LGP21401			
		6	powerwave technologies	LGP21901			
		1	tower mounts	Sector Mount [SM 802-3]			
58.0	58.0	1	andrew	P4-57W	1	1/2	1
		1	tower mounts	Pipe Mount [PM 601-1]			
50.0	50.0	1	lucent	KS24019-L112A	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 306-1]			

Notes:
1) Existing Equipment

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	JGI Eastern 05204G March 25, 2005	1237256	CCISITES
4-POST-MODIFICATION INSPECTION	PJF 37508-0397 JUNE 22, 2009	2450760	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn/ HEB Civil Engineers	821498	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.3.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	160 - 140	Leg	Rohn 2.375" x 0.218" (2 EH)	2	-15.01	43.84	34.2	Pass
		Diagonal	L 1.5 x 1.5 x 1/8	10	-2.70	3.81	71.0 97.3 (b)	Pass
		Top Girt	L 2 x 2 x 1/8	6	-0.32	2.83	11.4	Pass
T2	140 - 120	Leg	Rohn 2.875" x 0.276" (2.5 EH)	37	-37.84	65.60	57.7	Pass
		Diagonal	2L 1.5 x 1.5 x 1/8 (3/16)	44	-3.11	8.80	35.3 56.7 (b)	Pass
		Top Girt	L 2 x 2 x 1/8	40	-0.19	2.79	6.8	Pass
T3	120 - 100	Leg	Rohn 4" x 0.318" (3.5 EH)	68	-63.37	110.27	57.5	Pass
		Diagonal	2L 2 x 2 x 3/16 (3/16)	73	-4.53	19.84	22.8 70.6 (b)	Pass
T4	100 - 80	Leg	Rohn 4" x 0.318" (3.5 EH) (GR)	89	-93.73	138.31	67.8	Pass
		Diagonal	2L 2.5 x 2.5 x 3/16 (3/16)	91	-6.50	24.50	26.5 59.1 (b)	Pass
T5	80 - 60	Leg	ROHN 4 EH (GR)	110	-124.04	178.28	69.6	Pass
		Diagonal	2L 3 x 3 x 3/16 (1/4)	115	-6.43	35.10	18.3 58.6 (b)	Pass
T6	60 - 40	Leg	Rohn 5.563" x 0.375" (5 EH) (GR)	131	-150.49	231.92	64.9	Pass
		Diagonal	2L 3 x 3 x 3/16 (1/4)	136	-7.80	25.48	30.6 62.3 (b)	Pass
T7	40 - 20	Leg	Rohn 5.563" x 0.375" (5 EH) (GR)	146	-177.34	231.90	76.5	Pass
		Diagonal	2L 3 x 3 x 1/4 (1/4)	151	-7.80	31.05	25.1 62.4 (b)	Pass
T8	20 - 0	Leg	Rohn 6.625" x 0.432" (6 EH) (GR)	161	-203.05	352.62	57.6 67.9 (b)	Pass
		Diagonal	2L 3.5 x 3.5 x 1/4 (1/4)	166	-8.64	45.23	19.1 66.6 (b)	Pass
							Summary	
						Leg (T7)	76.5	Pass
						Diagonal (T1)	97.3	Pass
						Top Girt (T1)	11.4	Pass
						Bolt Checks	97.3	Pass
						Rating =	97.3	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	% Capacity	Pass / Fail
	Anchor Rods	68	Pass
	Base Foundation	27	Pass
	Base Foundation Soil Interaction	84	Pass

Structure Rating (max from all components) =	97.3%

APPENDIX A

TNXTOWER OUTPUT

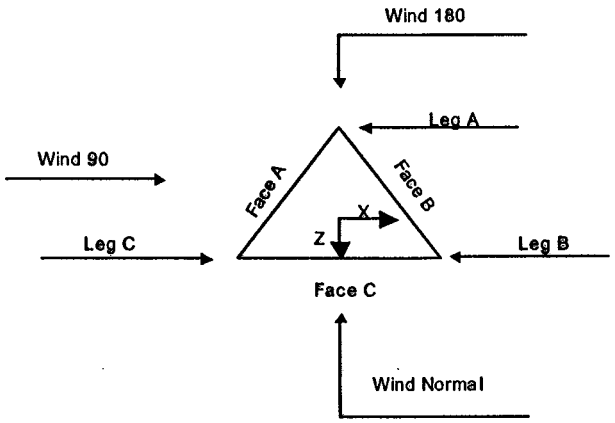
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 160.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.52 ft at the top and 20.86 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

2) Tower is located in Middlesex County, Connecticut.
3) Basic wind speed of 85 mph.
4) Nominal ice thickness of 0.7500 in.
5) Ice thickness is considered to increase with height.
6) Ice density of 56 pcf.
7) A wind speed of 38 mph is used in combination with ice.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Grouted pipe f'_c is 7 ksi.
11) Pressures are calculated at each section.
12) Stress ratio used in tower member design is 1.333.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	160.00-140.00			6.52	1	20.00
T2	140.00-120.00			6.56	1	20.00
T3	120.00-100.00			8.60	1	20.00
T4	100.00-80.00			10.64	1	20.00
T5	80.00-60.00			12.68	1	20.00
T6	60.00-40.00			14.77	1	20.00
T7	40.00-20.00			16.77	1	20.00
T8	20.00-0.00			18.85	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	160.00-140.00	4.00	X Brace	No	No	0.0000	0.0000
T2	140.00-120.00	5.00	X Brace	No	No	0.0000	0.0000
T3	120.00-100.00	6.67	X Brace	No	No	0.0000	0.0000
T4	100.00-80.00	6.67	X Brace	No	No	0.0000	0.0000
T5	80.00-60.00	6.67	X Brace	No	No	0.0000	0.0000
T6	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T7	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T8	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 160.00-140.00	Pipe	Rohn 2.375" x 0.218" (2 EH)	A572-50 (50 ksi)	Single Angle	L 1.5 x 1.5 x 1/8	A36 (36 ksi)
T2 140.00-120.00	Pipe	Rohn 2.875" x 0.276" (2.5 EH)	A572-50 (50 ksi)	Double Angle	2L 1.5 x 1.5 x 1/8 (3/16)	A36 (36 ksi)
T3 120.00-100.00	Pipe	Rohn 4" x 0.318" (3.5 EH)	A572-50 (50 ksi)	Double Angle	2L 2 x 2 x 3/16 (3/16)	A36 (36 ksi)
T4 100.00-80.00	Grouted Pipe	Rohn 4" x 0.318" (3.5 EH)	A572-50 (50 ksi)	Double Angle	2L 2.5 x 2.5 x 3/16 (3/16)	A36 (36 ksi)
T5 80.00-60.00	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L 3 x 3 x 3/16 (1/4)	A36 (36 ksi)
T6 60.00-40.00	Grouted Pipe	Rohn 5.563" x 0.375" (5 EH)	A572-50 (50 ksi)	Double Angle	2L 3 x 3 x 3/16 (1/4)	A36 (36 ksi)
T7 40.00-20.00	Grouted Pipe	Rohn 5.563" x 0.375" (5 EH)	A572-50 (50 ksi)	Double Angle	2L 3 x 3 x 1/4 (1/4)	A36 (36 ksi)
T8 20.00-0.00	Grouted Pipe	Rohn 6.625" x 0.432" (6 EH)	A572-50 (50 ksi)	Double Angle	2L 3.5 x 3.5 x 1/4 (1/4)	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 160.00-140.00	Equal Angle	L 2 x 2 x 1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T2 140.00-120.00	Equal Angle	L 2 x 2 x 1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 160.00-140.00	1.62	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000
T2 140.00-120.00	1.35	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000
T3 120.00-100.00	1.08	0.1875	A36 (36 ksi)	1	1	1	36.0000	30.0000
T4 100.00-80.00	1.08	0.4375	A36 (36 ksi)	1	1	1	48.0000	30.0000
T5 80.00-60.00	1.08	0.4375	A36 (36 ksi)	1	1	1	48.0000	30.0000
T6 60.00-40.00	1.04	0.2500	A36 (36 ksi)	1	1	1	60.0000	30.0000
T7 40.00-20.00	1.04	0.2500	A36 (36 ksi)	1	1	1	60.0000	30.0000
T8 20.00-0.00	1.04	0.2500	A36 (36 ksi)	1	1	1	60.0000	30.0000

Tower Section Geometry *(cont'd)*

	K Factors[1]

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 160.00-140.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 140.00-120.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 120.00-100.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 100.00-80.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 80.00-60.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 60.00-40.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 40.00-20.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 20.00-0.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

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

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 160.00-140.00	2.5000	3.5000	2.5000	3.5000	0.0000	0.0000	0.0000	0.0000
T2 140.00-120.00	2.5000	4.4000	2.5000	4.4000	0.0000	0.0000	0.0000	0.0000
T3 120.00-100.00	2.5000	4.9000	2.5000	4.9000	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T4 100.00-80.00	2.5000	4.9000	2.5000	4.9000	0.0000	0.0000	0.0000	0.0000
T5 80.00-60.00	2.5000	4.8000	2.5000	4.8000	0.0000	0.0000	0.0000	0.0000
T6 60.00-40.00	2.5000	5.3000	2.5000	5.3000	0.0000	0.0000	0.0000	0.0000
T7 40.00-20.00	2.5000	5.4000	2.5000	5.4000	0.0000	0.0000	0.0000	0.0000
T8 20.00-0.00	2.5000	5.4000	2.5000	5.4000	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 160.00-140.00	Flange	0.6250 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 140.00-120.00	Flange	0.6250 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 120.00-100.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 100.00-80.00	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T5 80.00-60.00	Flange	1.0000 A325N	6	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T6 60.00-40.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 40.00-20.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T8 20.00-0.00	Flange	1.0000 A449	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
Rohn 4" x 0.318" (3.5 EH) (GR)	50	3.6784	8.8880	31.033	4769	38218	64
ROHN 4 EH (GR)	50	4.4074	11.4969	38.949	4769	38952	66
Rohn 5.563" x 0.375" (5 EH) (GR)	50	6.1120	18.1937	58.701	4769	40357	68
Rohn 6.625" x 0.432" (6 EH) (GR)	50	8.4049	26.0667	82.906	4769	40832	68

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
FACE C												
LDF7-50A(1-5/8")	A	Yes	Ar (CfAe)	142.00 - 5.00	0.0000	0.45	6	6	1.0000 0.5000	1.9800		0.82
LDF4-50A(1/2")	A	Yes	Ar (CfAe)	50.00 - 5.00	0.0000	0.42	1	1	0.6300	0.6300		0.15
Feedline Ladder (Af)	A	Yes	Af (CfAe)	142.00 - 5.00	0.0000	0.45	1	1	3.0000	3.0000	12.0000	8.40
FACE B												
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	157.00 - 120.00	0.0000	0.4	12	10	1.0000	1.9800		0.82
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	120.00 - 5.00	-3.0000	0.4	24	10	1.0000	1.9800		0.82
Feedline Ladder (Af)	B	Yes	Af (CfAe)	120.00 - 5.00	-1.0000	0.4	2	1	1.0000	3.0000	12.0000	8.40
FACE C												
EW52(ELLIPTICAL)	C	Yes	Ar (CfAe)	132.00 - 110.00	0.0000	-0.4	1	1	0.5000	2.2100		0.59
EW52(ELLIPTICAL)	C	Yes	Ar (CfAe)	110.00 - 100.00	0.0000	-0.4	2	2	0.5000	2.2100		0.59
EW52(ELLIPTICAL)	C	Yes	Ar (CfAe)	100.00 - 5.00	0.0000	-0.4	4	4	0.5000	2.2100		0.59
EW90(ELLIPTICAL)	C	Yes	Ar (CfAe)	132.00 - 5.00	0.0000	-0.43	1	1	1.2800	1.2800		0.32
LDF6-50A(1-1/4")	C	Yes	Ar (CfAe)	130.00 - 5.00	0.0000	-0.37	1	1	1.5500	1.5500		0.66
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	100.00 - 5.00	0.0000	-0.36	2	2	1.5500 1.0900	1.0900		0.33
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	58.00 - 5.00	0.0000	-0.35	1	1	0.6300	0.6300		0.15
Feedline Ladder (Af)	C	Yes	Af (CfAe)	132.00 - 5.00	0.0000	-0.4	1	1	3.0000	3.0000	12.0000	8.40
LEG C												
LDF5-50A(7/8")	C	No	Ar (Leg)	92.00 - 5.00	0.0000	0.05	12	4	1.0000	1.0900		0.33
T-Brackets (Af)	C	No	Af (Leg)	92.00 - 5.00	0.0000	0.05	1	1	1.0000	1.0000	4.0000	8.40
FB-L98B-002-75000(3/8") (Proposed)	C	No	Ar (CfAe)	90.00 - 0.00	0.0000	0.05	1	1	0.3937	0.3937		0.06
WR-VG122ST-BRDA(3/8) (Proposed)	C	No	Ar (CfAe)	90.00 - 0.00	0.0000	0.05	2	2	0.3850	0.3850		0.20

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.56 5.11 5.61 6.65 8.83	10.73 11.99 12.97 14.98 19.22	0.05 0.11 0.19 0.36 0.86
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.97 4.86 6.77	3.35 3.97 4.60 5.90 8.89	0.03 0.06 0.10 0.19 0.49

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							4" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.56 5.11 5.61 6.65 8.83	10.73 11.99 12.97 14.98 19.22	0.05 0.11 0.19 0.36 0.86
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.97 4.86 6.77	3.35 3.97 4.60 5.90 8.89	0.03 0.06 0.10 0.19 0.49
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) FD9R6004/2C-3L	B	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.56 5.11 5.61 6.65 8.83	10.73 11.99 12.97 14.98 19.22	0.05 0.11 0.19 0.36 0.86
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.97 4.86 6.77	3.35 3.97 4.60 5.90 8.89	0.03 0.06 0.10 0.19 0.49
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 0.00		0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
Sector Mount [SM 508-3]	C	None			0.0000	157.00	No Ice 1/2" Ice 1" Ice	36.69 52.22 67.75 98.81	36.69 52.22 67.75 98.81	1.78 2.41 3.04 4.31

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice 4" Ice	160.93	160.93	6.84
*									
(2) DB978H90T2E-M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.22 3.60 4.02 4.91 6.82	2.89 3.49 4.10 5.38 8.24	0.03 0.05 0.09 0.18 0.47
(2) DB978H90T2E-M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.22 3.60 4.02 4.91 6.82	2.89 3.49 4.10 5.38 8.24	0.03 0.05 0.09 0.18 0.47
(2) DB978H90T2E-M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.22 3.60 4.02 4.91 6.82	2.89 3.49 4.10 5.38 8.24	0.03 0.05 0.09 0.18 0.47
Sector Mount [SM 506-3]	C	None		0.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	35.47 50.60 65.73 95.99 156.51	35.47 50.60 65.73 95.99 156.51	1.74 2.35 2.95 4.16 6.59
4' x 2" Pipe Mount	A	From Leg	4.00 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.03 0.04 0.04 0.07 0.17
4' x 2" Pipe Mount	B	From Leg	4.00 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.03 0.04 0.04 0.07 0.17
4' x 2" Pipe Mount	C	From Leg	4.00 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.03 0.04 0.04 0.07 0.17
*									
Pipe Mount [PM 601-1] (x)	A	From Leg	0.50 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
Pipe Mount [PM 601-1] (x)	C	From Leg	0.50 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
*									
PD1110 (x)	B	From Leg	4.00 0.00 6.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.50 3.84 5.20 7.97 11.61	2.50 3.84 5.20 7.97 11.61	0.02 0.04 0.07 0.15 0.42

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Side Arm Mount [SO 306-1]	B	From Leg	2.00	0.0000	130.00	No Ice	0.98	2.18	0.04
			0.00			1/2" Ice	1.70	3.80	0.06
(x)			0.00			1" Ice	2.42	5.42	0.08
						2" Ice	3.86	8.66	0.12
						4" Ice	6.74	15.14	0.20
*									
(4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.00	0.0000	120.00	No Ice	3.30	4.92	0.03
			0.00			1/2" Ice	3.69	5.60	0.07
(x)			0.00			1" Ice	4.12	6.28	0.12
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.56
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.00	0.0000	120.00	No Ice	3.30	4.92	0.03
			0.00			1/2" Ice	3.69	5.60	0.07
(x)			0.00			1" Ice	4.12	6.28	0.12
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.56
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.00	0.0000	120.00	No Ice	3.30	4.92	0.03
			0.00			1/2" Ice	3.69	5.60	0.07
(x)			0.00			1" Ice	4.12	6.28	0.12
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.56
Sector Mount [SM 404-3]	C	None		0.0000	120.00	No Ice	20.47	20.47	0.92
(x)						1/2" Ice	28.97	28.97	1.34
						1" Ice	37.47	37.47	1.75
						2" Ice	54.47	54.47	2.58
						4" Ice	88.47	88.47	4.25
*									
Pipe Mount [PM 601-1]	B	From Leg	0.50	0.0000	110.00	No Ice	3.00	0.90	0.07
(x)			0.00			1/2" Ice	3.74	1.12	0.08
			0.00			1" Ice	4.48	1.34	0.09
						2" Ice	5.96	1.78	0.12
						4" Ice	8.92	2.66	0.18
*									
PD1110	A	From Leg	6.00	0.0000	100.00	No Ice	2.50	2.50	0.02
			0.00			1/2" Ice	3.84	3.84	0.04
			6.00			1" Ice	5.20	5.20	0.07
						2" Ice	7.97	7.97	0.15
						4" Ice	11.61	11.61	0.42
Side Arm Mount [SO 308-1]	A	From Leg	3.00	0.0000	100.00	No Ice	0.98	3.03	0.05
			0.00			1/2" Ice	1.70	5.22	0.08
			0.00			1" Ice	2.42	7.41	0.10
						2" Ice	3.86	11.79	0.16
						4" Ice	6.74	20.55	0.26
Pipe Mount [PM 601-1]	B	From Leg	0.50	0.0000	100.00	No Ice	3.00	0.90	0.07
			0.00			1/2" Ice	3.74	1.12	0.08
			0.00			1" Ice	4.48	1.34	0.09
						2" Ice	5.96	1.78	0.12
						4" Ice	8.92	2.66	0.18
Pipe Mount [PM 601-1]	C	From Leg	0.50	0.0000	100.00	No Ice	3.00	0.90	0.07
			0.00			1/2" Ice	3.74	1.12	0.08
			0.00			1" Ice	4.48	1.34	0.09
						2" Ice	5.96	1.78	0.12
						4" Ice	8.92	2.66	0.18
*									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	90.00	No Ice	6.12	4.25	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(x)			0.00				1/2" Ice	6.63	5.01	0.10
			0.00				1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
(2) LGP21401	A	From Leg	4.00	0.0000		90.00	No Ice	1.29	0.23	0.01
			0.00				1/2" Ice	1.45	0.31	0.02
			0.00				1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
							4" Ice	2.79	1.12	0.14
(2) LGP21901	A	From Leg	4.00	0.0000		90.00	No Ice	0.27	0.18	0.01
			0.00				1/2" Ice	0.34	0.25	0.01
			0.00				1" Ice	0.43	0.32	0.01
							2" Ice	0.62	0.49	0.02
							4" Ice	1.10	0.94	0.07
(2) 7770.00 w/ Mount Pipe (x)	B	From Leg	4.00	0.0000		90.00	No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			0.00				1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
(2) LGP21401	B	From Leg	4.00	0.0000		90.00	No Ice	1.29	0.23	0.01
			0.00				1/2" Ice	1.45	0.31	0.02
			0.00				1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
							4" Ice	2.79	1.12	0.14
(2) LGP21901	B	From Leg	4.00	0.0000		90.00	No Ice	0.27	0.18	0.01
			0.00				1/2" Ice	0.34	0.25	0.01
			0.00				1" Ice	0.43	0.32	0.01
							2" Ice	0.62	0.49	0.02
							4" Ice	1.10	0.94	0.07
(2) 7770.00 w/ Mount Pipe (x)	C	From Leg	4.00	0.0000		90.00	No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			0.00				1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
(2) LGP21401	C	From Leg	4.00	0.0000		90.00	No Ice	1.29	0.23	0.01
			0.00				1/2" Ice	1.45	0.31	0.02
			0.00				1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
							4" Ice	2.79	1.12	0.14
(2) LGP21901	C	From Leg	4.00	0.0000		90.00	No Ice	0.27	0.18	0.01
			0.00				1/2" Ice	0.34	0.25	0.01
			0.00				1" Ice	0.43	0.32	0.01
							2" Ice	0.62	0.49	0.02
							4" Ice	1.10	0.94	0.07
Sector Mount [SM 802-3]	C	None		0.0000		90.00	No Ice	24.41	24.41	0.93
							1/2" Ice	31.39	31.39	1.36
							1" Ice	38.37	38.37	1.79
							2" Ice	52.33	52.33	2.66
							4" Ice	80.25	80.25	4.39
Pipe Mount [PM 601-1] (x)	B	From Leg	0.50	0.0000		58.00	No Ice	3.00	0.90	0.07
			0.00				1/2" Ice	3.74	1.12	0.08
			0.00				1" Ice	4.48	1.34	0.09
							2" Ice	5.96	1.78	0.12
								8.92	2.66	0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
KS24019-L112A (x)	B	From Leg	4.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06
Side Arm Mount [SO 306-1] (x)	B	From Leg	2.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.98 1.70 2.42 3.86 6.74	2.18 3.80 5.42 8.66 15.14	0.04 0.06 0.08 0.12 0.20
(2) RRUS-11 (Proposed)	A	From Leg	4.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.42 4.71 5.00 5.61 6.94	1.19 1.35 1.53 1.90 2.75	0.05 0.07 0.10 0.17 0.36
P45-16-XLH-RR w/ Mount Pipe (Proposed)	A	From Leg	4.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.37 9.91 10.45 11.56 13.89	4.83 5.57 6.27 7.80 11.11	0.04 0.10 0.17 0.33 0.78
(2) RRUS-11 (Proposed)	B	From Leg	4.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.42 4.71 5.00 5.61 6.94	1.19 1.35 1.53 1.90 2.75	0.05 0.07 0.10 0.17 0.36
AM-X-CD-16-65-00T-RET w/ Mount Pipe (Proposed)	B	From Leg	4.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
DC6-48-60-18-8F (Proposed)	B	From Leg	4.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.47 1.67 1.88 2.33 3.38	1.47 1.67 1.88 2.33 3.38	0.02 0.04 0.06 0.11 0.24
Pipe Mount [PM 601-3] (x)	B	From Leg	0.50 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
(2) RRUS-11 (Proposed)	C	From Leg	4.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.42 4.71 5.00 5.61 6.94	1.19 1.35 1.53 1.90 2.75	0.05 0.07 0.10 0.17 0.36
AM-X-CD-16-65-00T-RET w/ Mount Pipe (Proposed)	C	From Leg	4.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
P4-57W (x)	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	30.0000		132.00	4.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	12.57 13.09 13.61 14.65 16.72	0.10 0.17 0.24 0.37 0.64
PAR6-59 (x)	C	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	10.0000		132.00	6.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.27 29.05 29.83 31.39 34.51	0.14 0.29 0.44 0.74 1.34
P2-122E (x)	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	20.0000		110.00	2.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.41 3.68 4.21 5.28	0.03 0.04 0.06 0.09 0.16
PAR6-59 (x)	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	10.0000		100.00	6.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.27 29.05 29.83 31.39 34.51	0.14 0.29 0.44 0.74 1.34
PAR6-59 (x)	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	20.0000		100.00	6.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.27 29.05 29.83 31.39 34.51	0.14 0.29 0.44 0.74 1.34
P4-57W (x)	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	25.0000		58.00	4.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	12.57 13.10 13.62 14.68 16.80	0.10 0.17 0.24 0.37 0.64

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	160 - 140	4.140	31	0.2347	0.0226
T2	140 - 120	3.162	31	0.2195	0.0184
T3	120 - 100	2.272	31	0.1846	0.0154
T4	100 - 80	1.529	31	0.1517	0.0135
T5	80 - 60	0.946	31	0.1147	0.0102
T6	60 - 40	0.522	31	0.0787	0.0072
T7	40 - 20	0.227	31	0.0511	0.0041
T8	20 - 0	0.059	31	0.0218	0.0019

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.00	(2) LPA-80080/6CF w/ Mount Pipe	31	3.991	0.2332	0.0220	211410
142.00	(2) DB978H90T2E-M w/ Mount Pipe	31	3.258	0.2220	0.0188	58896

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
132.00	P4-57W	31	2.791	0.2069	0.0171	40640
130.00	PD1110	31	2.701	0.2033	0.0167	38377
120.00	(4) DB844H90E-XY w/ Mount Pipe	31	2.272	0.1846	0.0154	30557
110.00	P2-122E	31	1.881	0.1679	0.0145	30374
100.00	PAR6-59	31	1.529	0.1517	0.0135	30576
90.00	(2) 7770.00 w/ Mount Pipe	31	1.217	0.1338	0.0119	29245
58.00	P4-57W	31	0.488	0.0757	0.0069	40418
50.00	KS24019-L112A	31	0.360	0.0646	0.0056	39220

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	160 - 140	11.753	6	0.6670	0.0654
T2	140 - 120	8.973	6	0.6238	0.0533
T3	120 - 100	6.443	6	0.5235	0.0447
T4	100 - 80	4.337	6	0.4294	0.0389
T5	80 - 60	2.684	6	0.3247	0.0294
T6	60 - 40	1.485	6	0.2227	0.0207
T7	40 - 20	0.647	6	0.1447	0.0120
T8	20 - 0	0.168	6	0.0617	0.0054

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.00	(2) LPA-80080/6CF w/ Mount Pipe	6	11.329	0.6629	0.0635	73484
142.00	(2) DB978H90T2E-M w/ Mount Pipe	6	9.244	0.6309	0.0544	20470
132.00	P4-57W	6	7.919	0.5876	0.0493	14138
130.00	PD1110	6	7.663	0.5772	0.0484	13342
120.00	(4) DB844H90E-XY w/ Mount Pipe	6	6.443	0.5235	0.0447	10606
110.00	P2-122E	6	5.334	0.4756	0.0420	10615
100.00	PAR6-59	6	4.337	0.4294	0.0389	10761
90.00	(2) 7770.00 w/ Mount Pipe	6	3.453	0.3787	0.0344	10336
58.00	P4-57W	6	1.385	0.2142	0.0199	14283
50.00	KS24019-L112A	6	1.023	0.1828	0.0163	13855

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	160	Leg	A325N	0.6250	4	3.04	13.50	0.225 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2.70	2.08	1.297 ✔	1.333	Member Block Shear
		Top Girt	A325N	0.5000	1	0.32	2.72	0.116 ✔	1.333	Member Bearing
T2	140	Leg	A325N	0.6250	4	8.26	13.50	0.612 ✔	1.333	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.5000	1	3.15	4.17	0.755 ✓	1.333	Member Block Shear
		Top Girt	A325N	0.5000	1	0.18	2.72	0.066 ✓	1.333	Member Bearing
T3	120	Leg	A325N	0.7500	4	13.95	19.44	0.717 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	4.48	4.76	0.941 ✓	1.333	Gusset Bearing
T4	100	Leg	A325N	0.8750	4	20.19	26.46	0.763 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	6.50	8.25	0.788 ✓	1.333	Bolt Shear
T5	80	Leg	A325N	1.0000	6	17.78	34.56	0.514 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	6.44	8.25	0.781 ✓	1.333	Bolt Shear
T6	60	Leg	A325N	1.0000	6	21.39	34.56	0.619 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	7.53	9.06	0.831 ✓	1.333	Gusset Bearing
T7	40	Leg	A325N	1.0000	6	24.92	34.56	0.721 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	7.53	9.06	0.831 ✓	1.333	Gusset Bearing
T8	20	Leg	A449	1.0000	6	28.16	31.10	0.906 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	8.05	9.06	0.888 ✓	1.333	Gusset Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	160 - 140	Rohn 2.375" x 0.218" (2 EH)	20.00	4.00	62.6 K=1.00	22.265	1.4773	-15.01	32.89	0.456 ✓
T2	140 - 120	Rohn 2.875" x 0.276" (2.5 EH)	20.03	5.01	65.0 K=1.00	21.838	2.2535	-37.84	49.21	0.769 ✓
T3	120 - 100	Rohn 4" x 0.318" (3.5 EH)	20.03	6.68	61.3 K=1.00	22.489	3.6784	-63.37	82.72	0.766 ✓
T4	100 - 80	Rohn 4" x 0.318" (3.5 EH) (GR)	20.03	6.68	61.3 K=1.00	28.208	3.6784	-93.73	103.76	0.903 ✓
T5	80 - 60	ROHN 4 EH (GR)	20.04	6.68	54.3 K=1.00	30.344	4.4074	-124.04	133.74	0.927 ✓
T6	60 - 40	Rohn 5.563" x 0.375" (5 EH) (GR)	20.03	10.02	65.4 K=1.00	28.466	6.1120	-150.49	173.98	0.865 ✓
T7	40 - 20	Rohn 5.563" x 0.375" (5 EH) (GR)	20.04	10.02	65.4 K=1.00	28.463	6.1120	-177.34	173.97	1.019 ✓
T8	20 - 0	Rohn 6.625" x 0.432" (6 EH) (GR)	20.03	10.02	54.8 K=1.00	31.473	8.4049	-203.05	264.53	0.768 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	160 - 140	L 1.5 x 1.5 x 1/8	6.97	3.38	137.0 K=1.00	7.956	0.3594	-2.70	2.86	0.946 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	140 - 120	2L 1.5 x 1.5 x 1/8 (3/16)	8.89	4.48	127.5 K=1.00	9.189	0.7188	-3.11	6.60	0.470 ✓
T3	120 - 100	2L 'a' > 25.9035 in - 44 2L 2 x 2 x 3/16 (3/16)	11.36	5.76	119.1 K=1.00	10.413	1.4297	-4.53	14.89	0.305 ✓
T4	100 - 80	2L 'a' > 33.6652 in - 73 2L 2.5 x 2.5 x 3/16 (3/16)	13.11	6.63	120.7 K=1.00	10.182	1.8047	-6.50	18.38	0.354 ✓
T5	80 - 60	2L 'a' > 39.5944 in - 91 2L 3 x 3 x 3/16 (1/4)	14.99	7.57	105.5 K=1.00	12.080	2.1797	-6.43	26.33	0.244 ✓
T6	60 - 40	2L 'a' > 45.8605 in - 115 2L 3 x 3 x 3/16 (1/4)	18.13	9.22	130.5 K=1.00	8.770	2.1797	-7.80	19.12	0.408 ✓
T7	40 - 20	2L 'a' > 52.9407 in - 136 2L 3 x 3 x 1/4 (1/4)	19.90	10.11	135.8 K=1.00	8.102	2.8750	-7.80	23.29	0.335 ✓
T8	20 - 0	2L 'a' > 57.9396 in - 151 2L 3.5 x 3.5 x 1/4 (1/4)	21.70	11.00	121.6 K=1.00	10.054	3.3750	-8.64	33.93	0.254 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	160 - 140	L 2 x 2 x 1/8	6.52	6.11	184.6 K=1.00	4.383	0.4844	-0.32	2.12	0.152 ✓
T2	140 - 120	L 2 x 2 x 1/8	6.56	6.16	185.8 K=1.00	4.324	0.4844	-0.19	2.09	0.091 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	160 - 140	Rohn 2.375" x 0.218" (2 EH)	20.00	4.00	62.6	30.000	1.4773	12.16	44.32	0.274 ✓
T2	140 - 120	Rohn 2.875" x 0.276" (2.5 EH)	20.03	5.01	65.0	30.000	2.2535	33.03	67.61	0.489 ✓
T3	120 - 100	Rohn 4" x 0.318" (3.5 EH)	20.03	6.68	61.3	30.000	3.6784	55.79	110.35	0.506 ✓
T4	100 - 80	Rohn 4" x 0.318" (3.5 EH) (GR)	20.03	6.68	61.3	30.000	3.6784	80.78	110.35	0.732 ✓
T5	80 - 60	ROHN 4 EH (GR)	20.04	6.68	54.3	30.000	4.4074	106.66	132.22	0.807 ✓
T6	60 - 40	Rohn 5.563" x 0.375" (5 EH) (GR)	20.03	10.02	65.4	30.000	6.1120	128.34	183.36	0.700 ✓
T7	40 - 20	Rohn 5.563" x 0.375" (5 EH) (GR)	20.04	10.02	65.4	30.000	6.1120	149.55	183.36	0.816 ✓
T8	20 - 0	Rohn 6.625" x 0.432" (6 EH) (GR)	20.03	10.02	54.8	30.000	8.4049	168.98	252.15	0.670

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

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	160 - 140	L 1.5 x 1.5 x 1/8	6.97	3.38	89.9	29.000	0.2109	2.70	6.12	0.442 ✓
T2	140 - 120	2L 1.5 x 1.5 x 1/8 (3/16)	8.46	4.26	112.6	29.000	0.4219	3.15	12.23	0.257 ✓
T3	120 - 100	2L 'a' > 24.9804 in - 49 2L 2 x 2 x 3/16 (3/16)	11.36	5.76	114.0	29.000	0.8965	4.48	26.00	0.172 ✓
T4	100 - 80	2L 'a' > 33.6652 in - 72 2L 2.5 x 2.5 x 3/16 (3/16)	13.11	6.63	103.8	29.000	1.1777	6.36	34.15	0.186 ✓
T5	80 - 60	2L 'a' > 39.5944 in - 93 2L 3 x 3 x 3/16 (1/4)	14.99	7.57	98.1	29.000	1.4590	6.36	42.31	0.150 ✓
T6	60 - 40	2L 'a' > 45.8605 in - 114 2L 3 x 3 x 3/16 (1/4)	18.13	9.22	119.4	29.000	1.4238	7.53	41.29	0.182 ✓
T7	40 - 20	2L 'a' > 52.9407 in - 135 2L 3 x 3 x 1/4 (1/4)	19.90	10.11	132.0	29.000	1.8750	7.53	54.38	0.139 ✓
T8	20 - 0	2L 'a' > 57.9396 in - 150 2L 3.5 x 3.5 x 1/4 (1/4)	21.70	11.00	122.2	29.000	2.2500	8.05	65.25	0.123 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	160 - 140	L 2 x 2 x 1/8	6.52	6.11	121.2	29.000	0.3047	0.32	8.84	0.036 ✓
T2	140 - 120	L 2 x 2 x 1/8	6.56	6.16	122.0	29.000	0.3047	0.18	8.84	0.020 ✓

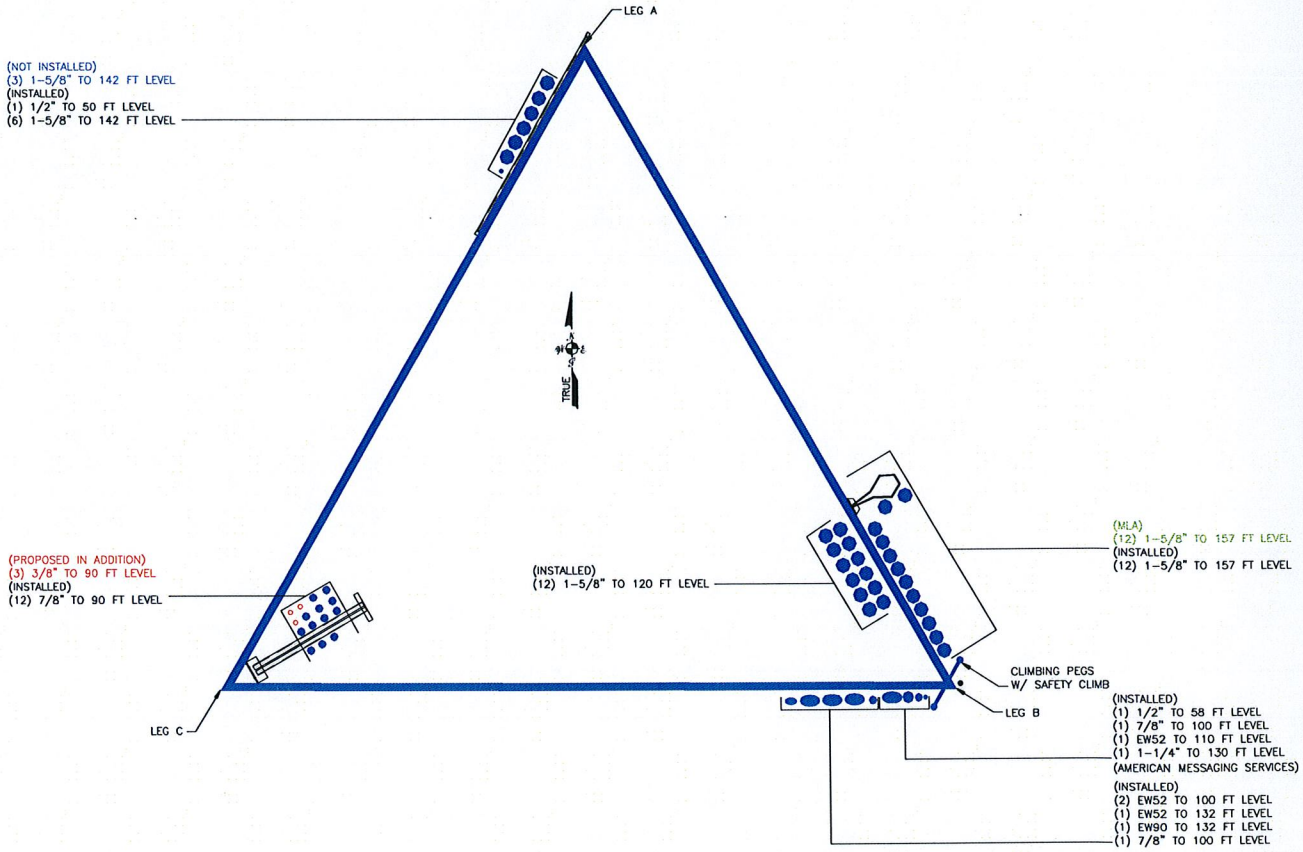
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	160 - 140	Leg	Rohn 2.375" x 0.218" (2 EH)	2	-15.01	43.84	34.2	Pass
		Diagonal	L 1.5 x 1.5 x 1/8	10	-2.70	3.81	71.0 97.3 (b)	Pass
		Top Girt	L 2 x 2 x 1/8	6	-0.32	2.83	11.4	Pass
T2	140 - 120	Leg	Rohn 2.875" x 0.276" (2.5 EH)	37	-37.84	65.60	57.7	Pass
		Diagonal	2L 1.5 x 1.5 x 1/8 (3/16)	44	-3.11	8.80	35.3 56.7 (b)	Pass
		Top Girt	L 2 x 2 x 1/8	40	-0.19	2.79	6.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T3	120 - 100	Leg	Rohn 4" x 0.318" (3.5 EH)	68	-63.37	110.27	57.5	Pass
		Diagonal	2L 2 x 2 x 3/16 (3/16)	73	-4.53	19.84	22.8	Pass
							70.6 (b)	
T4	100 - 80	Leg	Rohn 4" x 0.318" (3.5 EH) (GR)	89	-93.73	138.31	67.8	Pass
		Diagonal	2L 2.5 x 2.5 x 3/16 (3/16)	91	-6.50	24.50	26.5	Pass
							59.1 (b)	
T5	80 - 60	Leg	ROHN 4 EH (GR)	110	-124.04	178.28	69.6	Pass
		Diagonal	2L 3 x 3 x 3/16 (1/4)	115	-6.43	35.10	18.3	Pass
							58.6 (b)	
T6	60 - 40	Leg	Rohn 5.563" x 0.375" (5 EH) (GR)	131	-150.49	231.92	64.9	Pass
		Diagonal	2L 3 x 3 x 3/16 (1/4)	136	-7.80	25.48	30.6	Pass
							62.3 (b)	
T7	40 - 20	Leg	Rohn 5.563" x 0.375" (5 EH) (GR)	146	-177.34	231.90	76.5	Pass
		Diagonal	2L 3 x 3 x 1/4 (1/4)	151	-7.80	31.05	25.1	Pass
							62.4 (b)	
T8	20 - 0	Leg	Rohn 6.625" x 0.432" (6 EH) (GR)	161	-203.05	352.62	57.6	Pass
							67.9 (b)	
		Diagonal	2L 3.5 x 3.5 x 1/4 (1/4)	166	-8.64	45.23	19.1	Pass
							66.6 (b)	
							Summary	
						Leg (T7)	76.5	Pass
						Diagonal (T1)	97.3	Pass
						Top Girt (T1)	11.4	Pass
						Bolt Checks	97.3	Pass
						RATING =	**97.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

PJF job no. **37512-2206** Project name **0**

Foundation Loads:

Tower leg compression =	210	(kips)
Tower leg tension =	174	(kips)
Horizontal load at top of pier =	24	(kips)
Overturning moment at top of pier=	0	(ft-kips)

Design criteria:

Safety factor against overturning =	1.5	
Uplift safety factor: conc. weight =	1.25	
Uplift safety factor for soil weight =	2	

Soil Properties:

Soil density =	115	(pcf)
Allowable soil bearing =	8	(ksf)
Soil cone of uplift =	35	(degrees)
Uplift cone from top or bottom of ftg	T	("T" or "B")
Depth to water table =	18	(ft)

Dimensions:

Pier shape (round or square)	R	("R" or "S")
Pier width =	3.5	(ft)
Pier height above grade =	0.5	(ft)
depth to bottom of footing =	12	(ft)
Footing thickness =	2	(ft)
Footing width =	10	(ft)
Footing length =	10	(ft)

Concrete:

Concrete strength =	3	(ksi)
Rebar strength =	60	(ksi)
ultimate load factor =	1.3	

Reinforcing Steel:

Pad

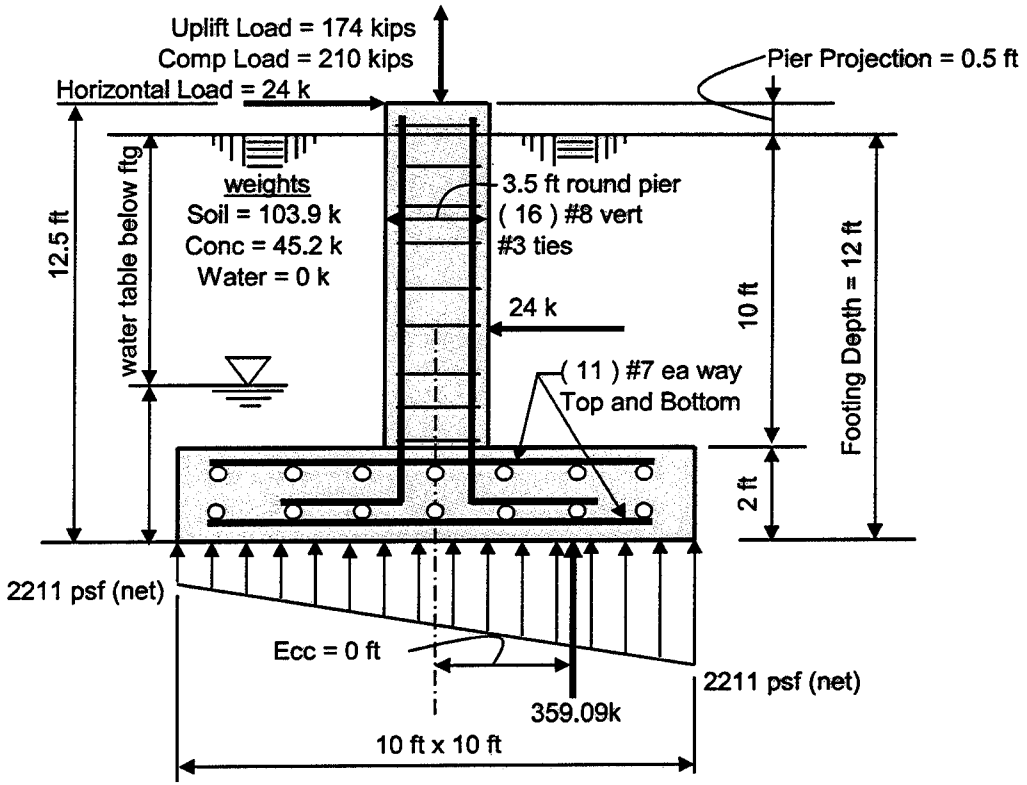
minimum cover over rebar =	3	inches
size of pad rebar =	#7	bar
quantity of pad rebar =	11	(ea direction)

Pier

size of vert rebar in pier=	#8	bar
vertical rebar quantity =	16	
size of pier ties =	#3	bar
minimum cover over rebar =	3	inches

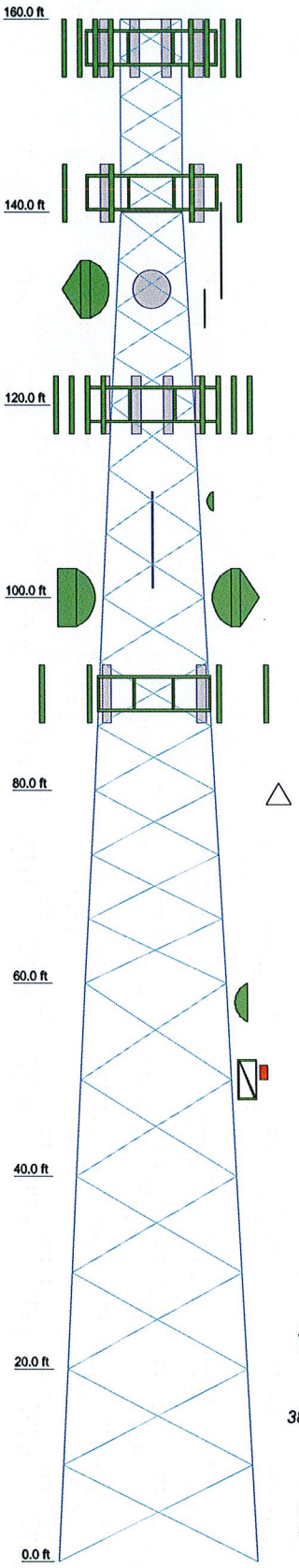
Total volume of concrete = 11.1 cu yd each

(Total volume of concrete = 33.4 cu yd for 3)



Summary of analysis results	
Maximum Net Soil Bearing = 2.211 ksf Allowable Net Soil Bearing = 8 ksf **Soil Bearing Stress Ratio = 0.28 Okay**	Ult Punching Shear Capacity = 711 kips Ult Punching Shear Force = 124 kips **Punching Shear Stress Ratio = 0.17 OK**
Net Ftg Uplift Resistance = 206.2 kips Uplift Force = 174 kips Net Uplift Safety Factor = 2.21 **Ratio to Required Safety factor = 0.84 OK**	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 34 psi **Bending Shear Stress Ratio = 0.31 Okay**
Ftg Overturning Resistance = 1795 ft-kips Overturning Moment = 0 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 999 **Ratio = 0 Okay**	Pad Bending Moment Capacity= 566 ft-k Pad Bending Moment = 147 ft-k **Bending Moment Stress Ratio = 0.26 OK**
	Allow Tension in Pier Rebar = 41.54 ksi Calc Vert Rebar Tension = 15.91 ksi **Ratio = 0.383 Okay**

Section	T8	T7	T6	T5	T4	T3	T2	T1
Legs	A	Rohn 5.563" x 0.375" (5 EH) (GR)		ROHN 4 EH (GR)	Rohn 4" x 0.318" (3.5 EH) (GR)	Rohn 4" x 0.318" (3.5 EH)	Rohn 2.875" x 0.276" (2.5 EH)	Rohn 2.375" x 0.216" (2 EH)
Leg Grade	A572-50							
Diagonals	2L 3.5 x 3.5 x 1/4 (1/4)	2L 3 x 3 x 1/4 (1/4)	2L 3 x 3 x 3/16 (1/4)		2L 2.5 x 2.5 x 3/16 (3/16)	2L 2 x 2 x 3/16 (3/16)	2L 1.5 x 1.5 x 1/8 (3/16)	L 1.5 x 1.5 x 1/8
Diagonal Grade	A36							
Top Girts	N.A.					L 2 x 2 x 1/8		
Face Width (ft)	20.8646	18.8542	16.7708	14.7708	12.6771	10.6354	8.60417	6.5625	6.52083
# Panels @ (ft)	24.7	6.3	4.7	4.0	3.6	2.8	1.7	1.0	0.8
Weight (K)			6 @ 10		9 @ 6.66667		4 @ 5	5 @ 4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) LPA-80080/6CF w/ Mount Pipe	157	Pipe Mount [PM 601-1] (x)	110
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	157	P2-122E (x)	110
		Pipe Mount [PM 601-1]	100
BXA-70063-6CF-2 w/ Mount Pipe	157	Side Arm Mount [SO 308-1]	100
(2) FD9R6004/2C-3L	157	PD1110	100
(2) LPA-80080/6CF w/ Mount Pipe	157	Pipe Mount [PM 601-1]	100
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	157	PAR6-59 (x)	100
		PAR6-59 (x)	100
BXA-70063-6CF-2 w/ Mount Pipe	157	(2) LGP21901	90
(2) FD9R6004/2C-3L	157	(2) 7770.00 w/ Mount Pipe (x)	90
(2) LPA-80080/6CF w/ Mount Pipe	157	(2) LGP21401	90
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	157	(2) LGP21901	90
		Sector Mount [SM 802-3]	90
BXA-70063-6CF-2 w/ Mount Pipe	157	(2) RRUS-11 (Proposed)	90
(2) FD9R6004/2C-3L	157	P45-16-XLH-RR w/ Mount Pipe (Proposed)	90
Sector Mount [SM 508-3]	157		
(2) DB978H90T2E-M w/ Mount Pipe	142	(2) RRUS-11 (Proposed)	90
(2) DB978H90T2E-M w/ Mount Pipe	142	AM-X-CD-16-65-00T-RET w/ Mount Pipe (Proposed)	90
(2) DB978H90T2E-M w/ Mount Pipe	142		
Sector Mount [SM 506-3]	142	DC6-48-60-18-8F (Proposed)	90
4' x 2" Pipe Mount	142	(2) RRUS-11 (Proposed)	90
4' x 2" Pipe Mount	142	AM-X-CD-16-65-00T-RET w/ Mount Pipe (Proposed)	90
4' x 2" Pipe Mount	142		
Pipe Mount [PM 601-1] (x)	132	(2) 7770.00 w/ Mount Pipe (x)	90
Pipe Mount [PM 601-1] (x)	132	(2) LGP21401	90
P4-57W (x)	132	(2) LGP21901	90
PAR6-59 (x)	132	(2) 7770.00 w/ Mount Pipe (x)	90
PD1110 (x)	130	(2) LGP21401	90
Side Arm Mount [SO 306-1] (x)	130	Pipe Mount [PM 601-3] (x)	58
(4) DB844H90E-XY w/ Mount Pipe (x)	120	Pipe Mount [PM 601-1] (x)	58
Sector Mount [SM 404-3] (x)	120	P4-57W (x)	58
(4) DB844H90E-XY w/ Mount Pipe (x)	120	KS24019-L112A (x)	50
(4) DB844H90E-XY w/ Mount Pipe (x)	120	Side Arm Mount [SO 306-1] (x)	50

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Rohn 6.625" x 0.432" (6 EH) (GR)		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex 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 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. REACTIONS AT BASE:
6. TOWER RATING: 97.3%

MAX. CO... DOWN: ... K
SHEAR: 24 K

UPLIFT: -173 K
SHEAR: 20 K

AXIAL 83 K
SHEAR 11 K *MOMENT 1125734 lb-ft*
TORQUE 8892 lb-ft
38 mph WIND - 0.7500 in ICE

AXIAL 43 K
SHEAR 37 K *MOMENT 3524952 lb-ft*
TORQUE 36323 lb-ft
REACTIONS - 85 mph WIND

Paul J Ford and Company
250 E Broad St Suite 1500
Columbus, OH 43215
Phone: Software\TNX\Settings
FAX:
HKEY_CURRENT_USER

Job:	*HRT 088, CT BU#806387*
Project:	*PJF JOB # 37508-0397*
Client: Crown Castle	Drawn by: Joseph Jacobs / App'd:
Code: TIA/EIA-222-F	Date: 08/21/12 / Scale: NTS
Path: G:\TOWERS\375_Crown_Castle\2012\37512-2206 BU 806387\37512-2206.eri	Dwg No. E-1