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-030-121109 -** New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 14 Thompson Hill Road, Columbia, 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

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 Carmen L. Vance, First Selectman, Town of Columbia
Jana Butts, Town Planner, Town of Columbia

EM-CING-030-121109

HPC Wireless Services
46 Mill Plain Rd.
Floor 2
Danbury, CT, 06811
P.: 203.797.1112

HP
WIRELESS SERVICES

November 7, 2012

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 Thompson Hill Road, Columbia

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 Selectman of the Town of Columbia.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle and located at 14 Thompson Hill Road, Columbia (coordinates 41°-43'-3" N, 72°-17'-57.8" 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 and one (1) Surge Arrestor on new mounts to the existing platform at a centerline height of approximately 140'. Six (6) RRHS (remote radio units) will be added on new mounting pipes at a centerline height of approximately 138'. 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 180' structure.

2. AT&T will remove one (1) cabinet and install two (2) stacked cabinets on the existing concrete pad, and place a DC Plant on a proposed concrete pad extension of 3'-0" X 6'-0" (18 square feet). AT&T will also mount a new GPS antenna to the existing Ice Bridge, and a 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 1.64%; the combined site operations will result in a total power density of approximately 25.97%.

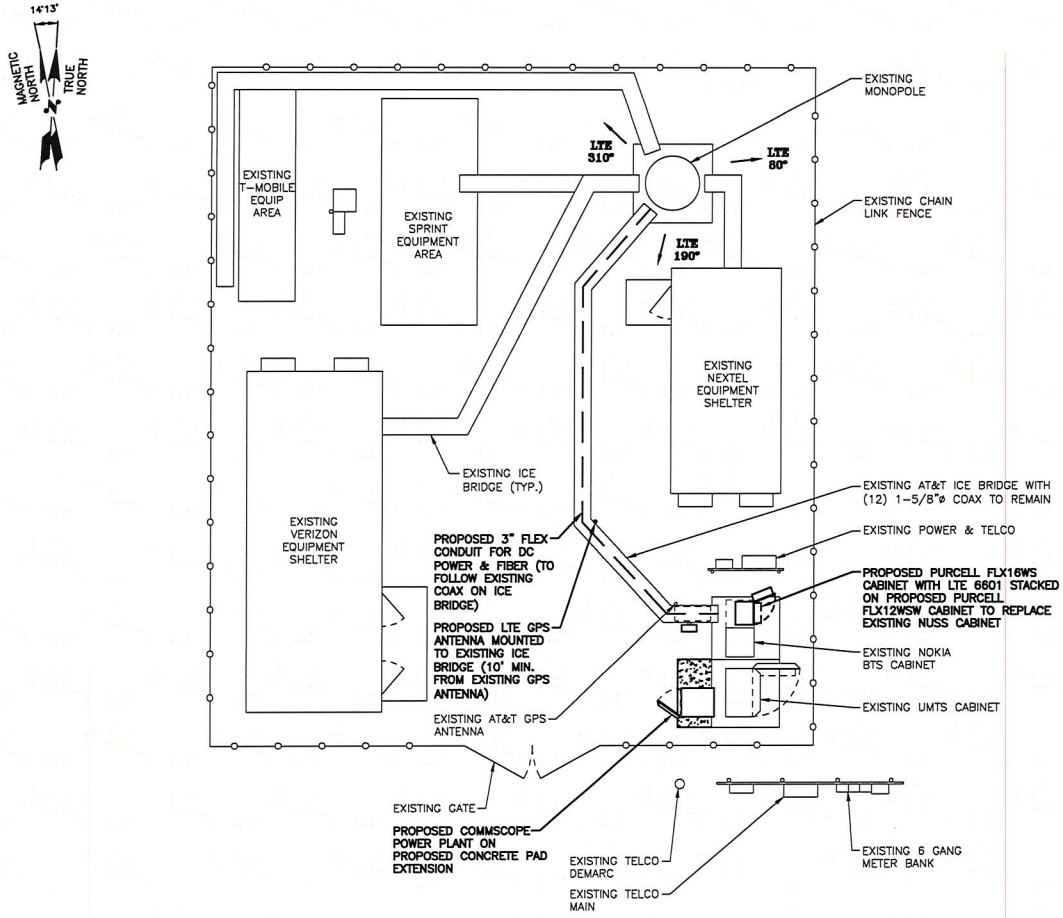
Please do not hesitate to contact me by phone at (203) 610-1071 or by e-mail at mjhowlett@optonline.net, with questions concerning this matter. Thank you for your consideration.

Respectfully yours,

Melanie J. Howlett

Attachments

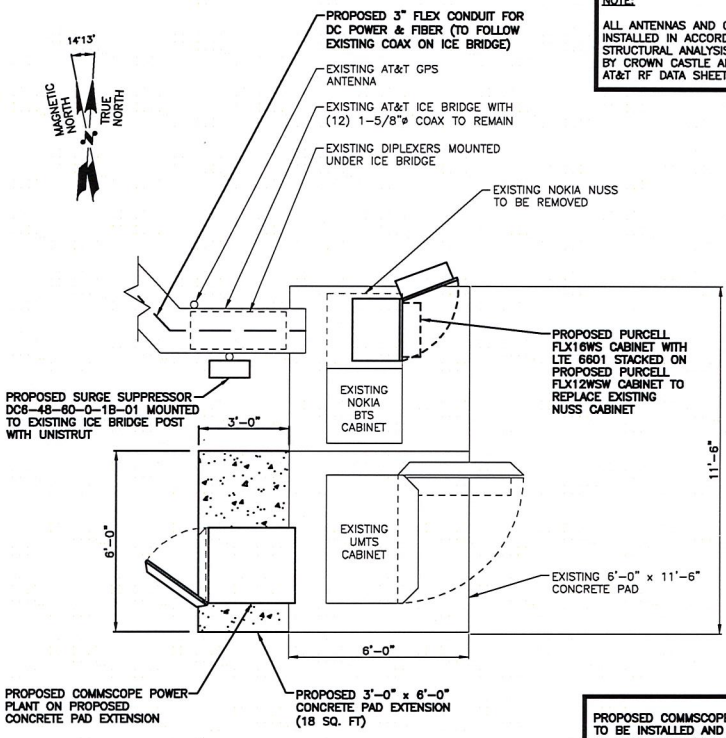
cc: Honorable Carmen Vance, First Selectman, Town of Columbia
Joshua & Eileen Lanati (underlying property owners)



COMPOUND PLAN

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

0 2'-8" 5'-4" 10'-8" 16'-0"



EQUIPMENT PLAN

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

0 1'-0" 2'-0" 4'-0" 6'-0"

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

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: CT5861
SITE NAME: COLUMBIA NORTH
CROWN CASTLE ID: 876391
14 THOMPSON HILL ROAD
COLUMBIA, CT 06237
TOLLAND 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	DC	DGH
0	08/22/12	ISSUED FOR REVIEW	RM	DC

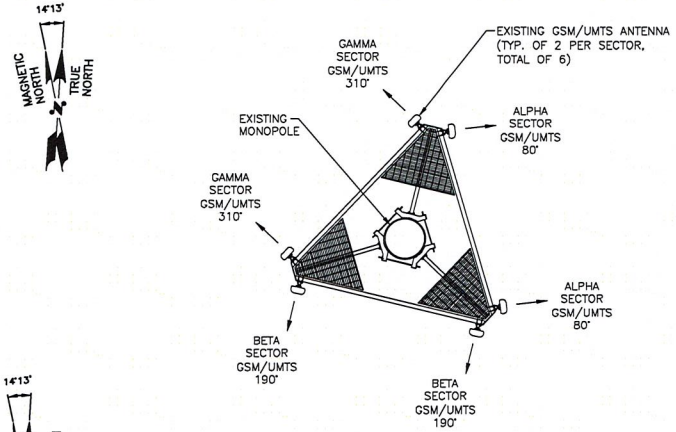
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

STATE OF CONNECTICUT
DEREK J. CREAGER
No. 28951
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND AND EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5861.01	A-1	1



EXISTING GSM/UMTS ANTENNA PLAN

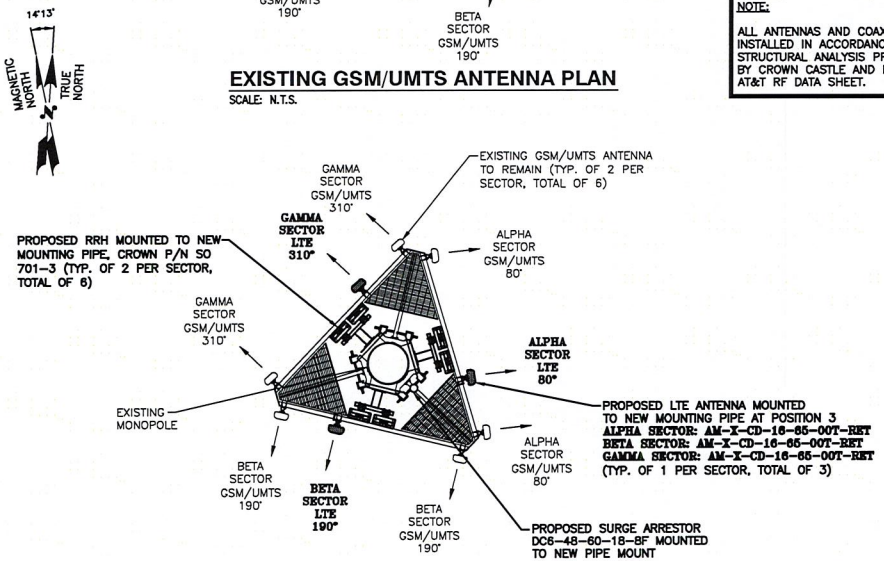
SCALE: N.T.S.

NOTE:

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

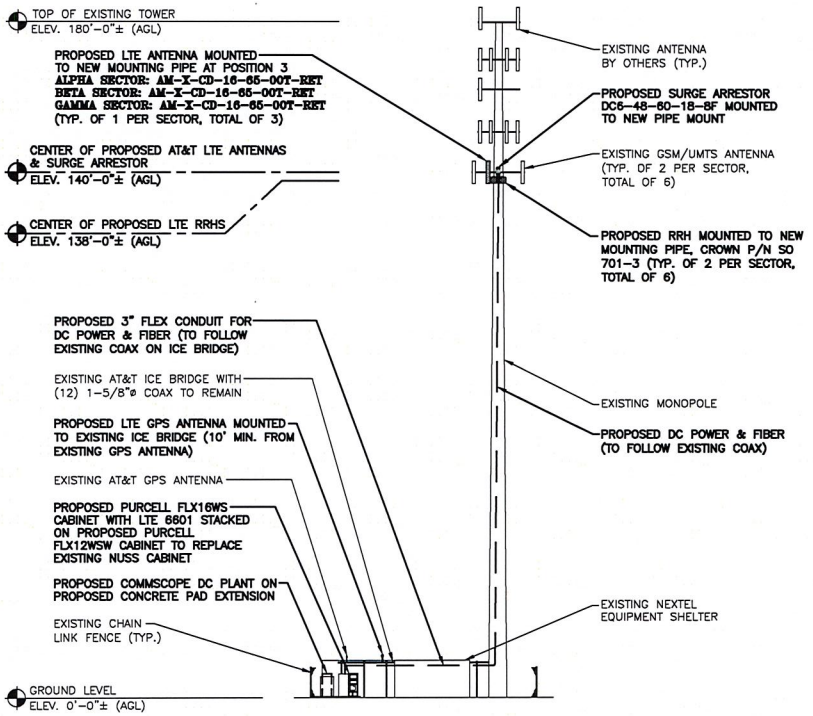
NOTE:

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.



WEST ELEVATION

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

Hudson Design Groupllc
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5566

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

SITE NUMBER: CT5861
SITE NAME: COLUMBIA NORTH
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14 THOMPSON HILL ROAD
COLUMBIA, CT 06237
TOLLAND 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	CM	DC	DPR
0	08/22/12	ISSUED FOR REVIEW	RM	DC	DPR

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED PROFESSIONAL ENGINEER

AT&T

ELEVATION & ANTENNA PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5861.01	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

CT5861

(AWE - Columbia North)

14 Thompson Hill Road, Columbia, CT 06237

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 monopole tower located on 14 Thompson Hill Road in Columbia, CT. The coordinates of the tower are 41° 43' 3.44" N, 72° 17' 59.09" 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
Cingular GSM	*140*	*1900*	*2*	*427*	*0.0157*	*1.0000*	*1.57%*
Cingular GSM	*140*	*880*	*4*	*296*	*0.0217*	*0.5867*	*3.70%*
Cingular UMTS	*140*	*880*	*1*	*500*	*0.0092*	*0.5867*	*1.56%*
Sprint	178	1950	4	250	0.0113	1.0000	1.13%
Nextel	170	851	9	100	0.0112	0.5673	1.97%
Verizon	150	869	9	357	0.0513	0.5793	8.86%
Verizon	150	1970	11	434	0.0763	1.0000	7.63%
Verizon	150	757	1	616	0.0098	0.5047	1.95%
VoiceStream	160	1935	8	247	0.0278	1.0000	2.78%
AT&T UMTS	140	880	2	565	0.0021	0.5867	0.35%
AT&T UMTS	140	1900	2	875	0.0032	1.0000	0.32%
AT&T LTE	140	734	1	1313	0.0024	0.4893	0.49%
AT&T GSM	140	880	1	283	0.0005	0.5867	0.09%
AT&T GSM	140	1900	4	525	0.0039	1.0000	0.39%
						Total	**25.97%**

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

[1] The existing CSC filing for Cingular 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 GPD Group Structural Analysis dated August 17, 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 **25.97% 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.

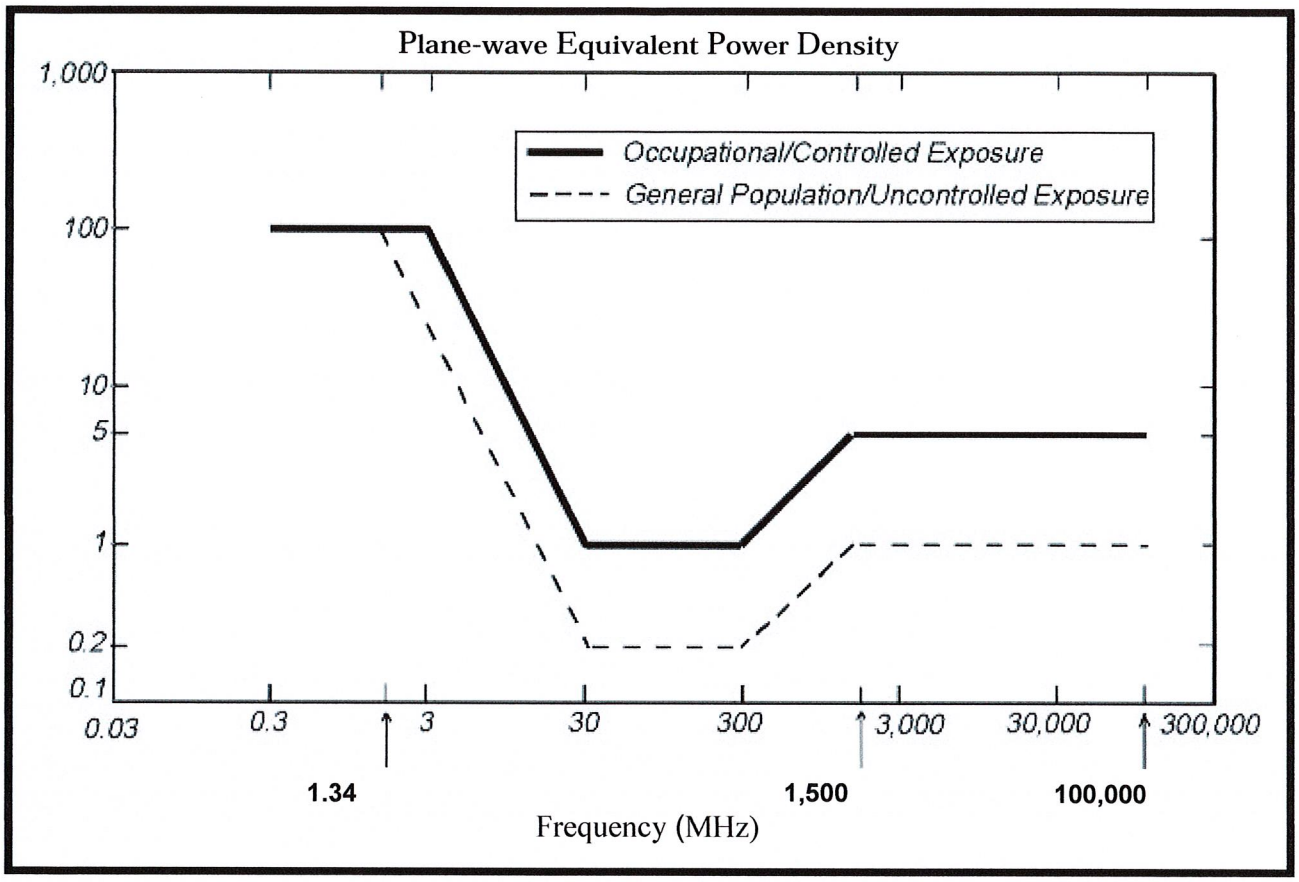
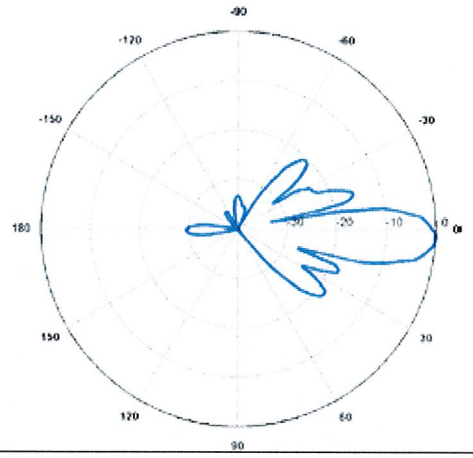


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

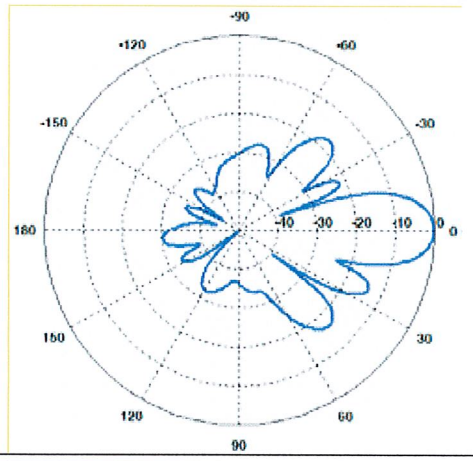
700 MHz

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"



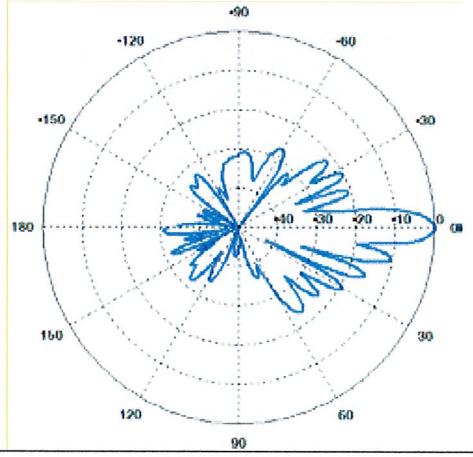
850 MHz

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"



Date: **August 17, 2012**

Veronica Harris
Crown Castle
1200 McArthur Blvd
Mahwah, NJ 07430
(201) 236-9094

GPD GROUP
520 South Main Street, Suite 2531
Akron, OH 44311
(614) 859-1607
dpalkovic@gpdgroup.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5861
	Carrier Site Name:	AWE-Columbia North
Crown Castle Designation:	**Crown Castle BU Number:**	876391
	Crown Castle Site Name:	COLUMBIA / DEOJAY
	Crown Castle JDE Job Number:	199655
	Crown Castle Work Order Number:	520126
	Crown Castle Application Number:	158135 Rev. 2
Engineering Firm Designation:	**GPD GROUP Project Number:**	2012775.876391.01
Site Data:	**14 Thompson Hill Rd, COLUMBIA, CT 06237, Tolland County** **Latitude *41° 43' 3.44"*, Longitude *-72° 17' 59.09"*** **180 Foot – EEI Monopole Tower**	

Dear Ms. Veronica Harris,

GPD GROUP 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 482389, in accordance with application 158135, revision 2.

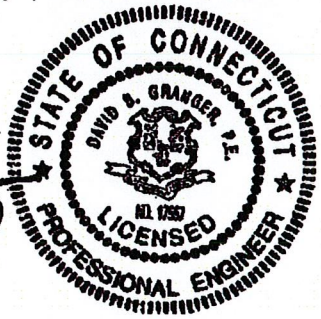
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Reserved + 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 and 2005 CT State Building Code standard and all local requirements based upon a wind speed of 85 mph fastest mile.

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

Respectfully submitted by:



David B. Granger, P.E.
Connecticut #: 17557

TABLE OF CONTENTS

1) INTRODUCTION

The existing monopole has four major sections connected by slip joints. It has 18 sides and is evenly tapered from 57.25" (flat-flat) at the base to 21.0" (flat-flat) at the top. The structure is galvanized and has no tower lighting.

This tower is a 180 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in December of 1999. The tower was originally designed for a wind speed of 90 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, 28 mph with 1 inch ice thickness in accordance with ASCE 7-05 ice conditions 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)	Note
140.0	140.0	3	KMW Communications	AM-X-CD-16-65-00T-RET	3	3/8	1
		1	Raycap	DC6-48-60-18-8F			
138.0	138.0	1		Side Arm Mount [SO 701-3]			
		6	Ericsson	TME-RRUS-11			

Notes:
1) See Appendix B for proposed coax configuration.

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
180.0	181.0	2	Decibel	950F65T2ZE-M	6	1-5/8	
		4	Decibel	DB980H90E-M			
	180.0	1		Platform Mount [LP 712-1]			
169.0	170.0	12	Decibel	DB844H90E-XY	12	1-1/4	
	169.0	1		Platform Mount [LP 303-1]			
161.0	162.0	3	EMS Wireless	RR90-17-02DP	6	1-5/8	
	161.0	1		Platform Mount [LP 305-1]			
146.0	150.0	3	Antel	BXA-171085-8BF-EDIN-2			1
		3	Antel	BXA-70063-6CF-2			
		4	RFS Celwave	APL868013			
		2	RFS Celwave	APL866513			
		6	RFS Celwave	FD9R6004/1C-3L			
		1	Lucent	KS24019-L112A	1	1/2	
	146.0	1		Platform Mount [LP 712-1]	12	1-5/8	

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
140.0	140.0	1		Platform Mount [LP 303-1]	12	1-5/8	
		6	Powerwave Technologies	7770.00			
		6	Powerwave Technologies	LGP 17201			
		6	Powerwave Technologies	LGP13519			
83.0	84.0	2	Kathrein	OG-860/1920/GPS-A	2	1/2	
	83.0	2		Side Arm Mount [SO 702-1]			
78.0	79.0	1	Lucent	KS24019-L112A	1	1/2	
	78.0	1		Side Arm Mount [SO 702-1]			

Notes:
1) Reserved equipment.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Previous Structural Analysis	Tower Engineering Professionals, Project #: 113166, dated 9/26/2011	Doc ID#: 2965729	Crown DMZ
Original Tower Drawings	EEI, Project #: 6151, dated 12/20/1999	Doc ID#: 1614546	Crown DMZ
Foundation Drawings	EEI, Project #: 6151, dated 12/20/1999	Doc ID#: 1613632	Crown DMZ
Geotechnical Report	Sprint Spectrum L.P., Site #: CT33XC571, dated 6/8/1999	Doc ID#: 1613526	Crown DMZ

3.1) Analysis Method

tnxTower (version 6.0.4.0), 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.
5) Mount sizes, weights, and manufacturers are best estimates based on site photos provided and were determined without the benefit of a site visit by GPD.
6) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
7) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package dated 8/14/2012 with any adjustments as noted below.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 131.91	Pole	TP31.375x21x0.25	1	-11.06	1244.62	56.4	Pass
L2	131.91 - 86.84	Pole	TP40.4688x29.9214x0.375	2	-19.62	2407.45	74.4	Pass
L3	86.84 - 43.32	Pole	TP48.9688x38.5317x0.4375	3	-31.47	3401.90	78.2	Pass
L4	43.32 - 0	Pole	TP57.25x46.6863x0.5	4	-49.36	4682.07	75.5	Pass
						Summary	ELC:	Load Case 7
						Pole (L3)	78.2	Pass
						Rating =	78.2	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	74.5	Pass
1	Base Plate	0	87.0	Pass
1	Base Foundation	0	84.3	Pass

Structure Rating (max from all components) =	**87.0%**

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The existing tower and its foundation are sufficient for the proposed loading and do not require modifications.

5) DISCLAIMER OF WARRANTIES

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

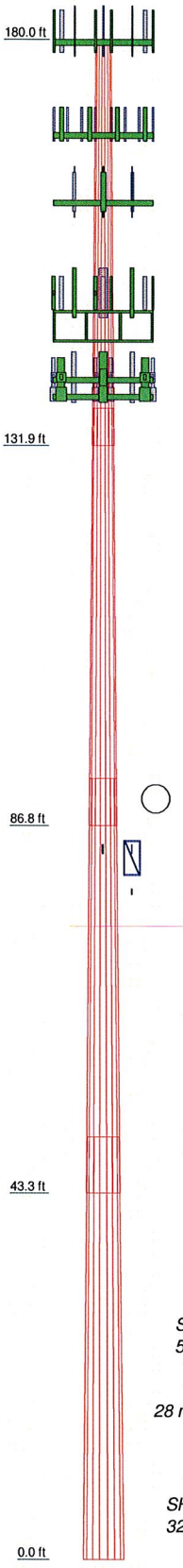
Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT

Section	4	3	2	1
Length (ft)	49.94	49.09	49.49	48.09
Number of Sides	18	18	18	18
Thickness (in)	0.5000	0.4375	0.3750	0.2500
Socket Length (ft)		6.62	5.57	4.42
Top Dia (in)	46.6863	38.5317	29.9214	21.0000
Bot Dia (in)	57.2500	48.9688	40.4688	31.3750
Grade	A572-65			
Weight (K) 34.3	13.9	10.0	7.0	3.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 712-1]	180	(2) APL866513 w/ Mount Pipe	146
(2) 950F65T2ZE-M w/ Mount Pipe	180	(2) FD9R6004/1C-3L	146
(2) DB980H90E-M w/ Mount Pipe	180	(2) FD9R6004/1C-3L	146
(2) DB980H90E-M w/ Mount Pipe	180	(2) FD9R6004/1C-3L	146
(2) Pipe Mount 6'x2.375"	180	Platform Mount [LP 303-1]	140
(2) Pipe Mount 6'x2.375"	180	(2) 7770.00 w/ Mount Pipe	140
(2) Pipe Mount 6'x2.375"	180	(2) 7770.00 w/ Mount Pipe	140
Platform Mount [LP 303-1]	169	(2) 7770.00 w/ Mount Pipe	140
(4) DB844H90E-XY w/ Mount Pipe	169	(2) LGP 17201	140
(4) DB844H90E-XY w/ Mount Pipe	169	(2) LGP 17201	140
(4) DB844H90E-XY w/ Mount Pipe	169	(2) LGP 17201	140
Platform Mount [LP 305-1]	161	(2) LGP13519	140
RR90-17-02DP w/ Mount Pipe	161	(2) LGP13519	140
RR90-17-02DP w/ Mount Pipe	161	(2) LGP13519	140
RR90-17-02DP w/ Mount Pipe	161	AM-X-CD-16-65-00T-RET w/ Mount Pipe	140
Pipe Mount 6'x2.375"	161		
Pipe Mount 6'x2.375"	161	AM-X-CD-16-65-00T-RET w/ Mount Pipe	140
Pipe Mount 6'x2.375"	161		
Platform Mount [LP 712-1]	146	AM-X-CD-16-65-00T-RET w/ Mount Pipe	140
KS24019-L112A	146		
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	146	DC6-48-60-18-8F	140
		Side Arm Mount [SO 701-3]	138
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	146	(2) TME-RRUS-11	138
		(2) TME-RRUS-11	138
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	146	(2) TME-RRUS-11	138
		Side Arm Mount [SO 702-1]	83
BXA-70063-6CF-2 w/ Mount Pipe	146	Side Arm Mount [SO 702-1]	83
BXA-70063-6CF-2 w/ Mount Pipe	146	OG-860/1920/GPS-A	83
BXA-70063-6CF-2 w/ Mount Pipe	146	OG-860/1920/GPS-A	83
(2) APL868013 w/ Mount Pipe	146	Side Arm Mount [SO 702-1]	78
(2) APL868013 w/ Mount Pipe	146	KS24019-L112A	78

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

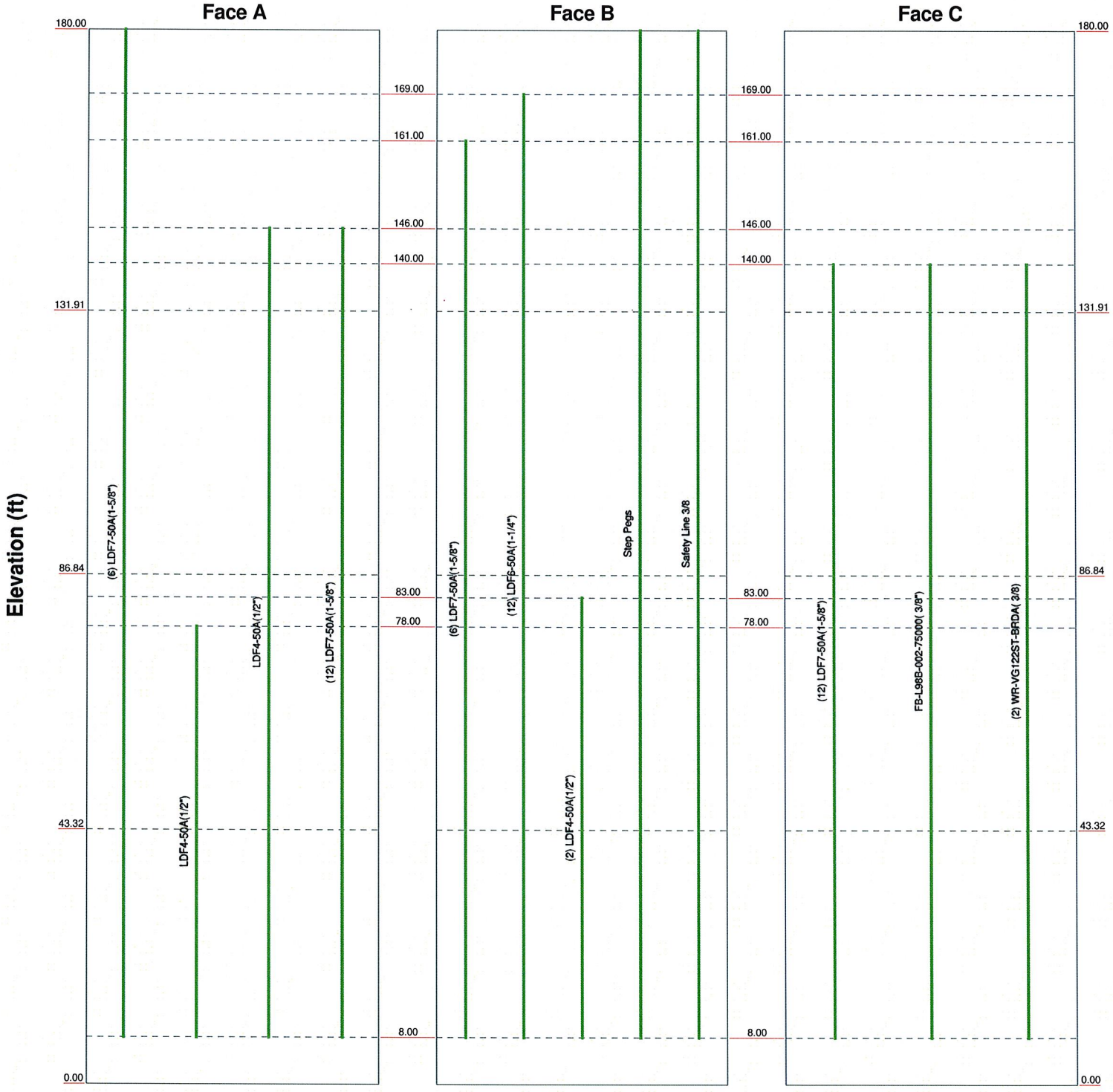
1. Tower is located in Tolland County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 78.2%

GPD GROUP
Consulting Engineers
GPD GROUP
520 South Main St, Suite 2531
Akron Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job:	Columbia/ DEOJAY BU#: 876391
Project:	2012775.876391.01
Client: Crown Castle, Inc.	Drawn by: jhuffine App'd:
Code: TIA/EIA-222-F	Date: 08/17/12 Scale: NTS
Path: O:\2012\2012775\876391\01\TNX\876391.eri	Dwg No. E-1

Feedline Distribution Chart
0' - 180'

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



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Job: ***Columbia/ DEOJAY BU#: 876391***			
Project: ***2012775.876391.01***			
Client: Crown Castle, Inc.	Drawn by: jhuffine	App'd:	
Code: TIA/EIA-222-F	Date: 08/17/12	Scale: NTS	
Path: O:\2012\2012775\876391\01\TNX\876391.eri		Dwg No. E-7	

tnxTower	Job	Page
GPD GROUP 520 South Main St, Suite 2531 Akron Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	Columbia/ DEOJAY BU#: 876391	1 of 23
	Project 2012775.876391.01	Date 09:29:19 08/17/12
	Client Crown Castle, Inc.	Designed by jhuffine

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 Tolland County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 1.0000 in.
Ice density of 56 pcf.
A wind speed of 28 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	180.00-131.91	48.09	4.42	18	21.0000	31.3750	0.2500	1.0000	A572-65 (65 ksi)
L2	131.91-86.84	49.49	5.57	18	29.9214	40.4688	0.3750	1.5000	A572-65 (65 ksi)
L3	86.84-43.32	49.09	6.62	18	38.5317	48.9688	0.4375	1.7500	A572-65 (65 ksi)
L4	43.32-0.00	49.94		18	46.6863	57.2500	0.5000	2.0000	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	21.3240	16.4651	895.6507	7.3663	10.6680	83.9568	1792.4800	8.2341	3.2560	13.024
	31.8590	24.6977	3022.8212	11.0494	15.9385	189.6553	6049.6199	12.3512	5.0820	20.328
L2	31.3395	35.1676	3878.7374	10.4890	15.2001	255.1787	7762.5785	17.5872	4.6062	12.283
	41.0931	47.7216	9691.8637	14.2333	20.5582	471.4366	19396.4803	23.8654	6.4625	17.233
L3	40.3286	52.8986	9698.3864	13.5234	19.5741	495.4701	19409.5341	26.4543	6.0116	13.741
	49.7242	67.3918	20053.4087	17.2286	24.8762	806.1299	40133.2041	33.7023	7.8485	17.939
L4	48.8284	73.2977	19753.9654	16.3961	23.7166	832.9156	39533.9235	36.6558	7.3368	14.674
	58.1332	90.0622	36644.7678	20.1462	29.0830	1260.0065	73337.7538	45.0397	9.1960	18.392

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 180.00-131.91				1	1	1		
L2 131.91-86.84				1	1	1		
L3 86.84-43.32				1	1	1		
L4 43.32-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF7-50A(1-5/8")	A	No	Inside Pole	180.00 - 8.00	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF4-50A(1/2")	A	No	CaAa (Out Of Face)	78.00 - 8.00	1	No Ice	0.06	0.00
						1/2" Ice	0.16	0.00
						1" Ice	0.26	0.00
LDF4-50A(1/2")	A	No	Inside Pole	146.00 - 8.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF7-50A(1-5/8")	A	No	Inside Pole	146.00 - 8.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF7-50A(1-5/8")	B	No	Inside Pole	161.00 - 8.00	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF6-50A(1-1/4")	B	No	Inside Pole	169.00 - 8.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF4-50A(1/2")	B	No	CaAa (Out Of Face)	83.00 - 8.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF7-50A(1-5/8")	C	No	Inside Pole	140.00 - 8.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
Step Pegs	B	No	CaAa (Out Of Face)	180.00 - 8.00	1	No Ice	0.08	0.00
						1/2" Ice	0.18	0.00
						1" Ice	0.28	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
Safety Line 3/8	B	No	CaAa (Out Of Face)	180.00 - 8.00	1	No Ice	0.04	0.00
						1/2" Ice	0.14	0.00
						1" Ice	0.24	0.00
FB-L98B-002-75000(3/8")	C	No	Inside Pole	140.00 - 8.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
WR-VG122ST-BRDA(3/8)	C	No	Inside Pole	140.00 - 8.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.00-131.91	A	0.000	0.000	0.000	0.000	0.38
		B	0.000	0.000	0.000	5.651	0.58
		C	0.000	0.000	0.000	0.000	0.08
L2	131.91-86.84	A	0.000	0.000	0.000	0.000	0.67
		B	0.000	0.000	0.000	5.296	0.71
		C	0.000	0.000	0.000	0.000	0.46
L3	86.84-43.32	A	0.000	0.000	0.000	2.185	0.65
		B	0.000	0.000	0.000	5.114	0.70
		C	0.000	0.000	0.000	0.000	0.45
L4	43.32-0.00	A	0.000	0.000	0.000	2.225	0.53
		B	0.000	0.000	0.000	4.150	0.57
		C	0.000	0.000	0.000	0.000	0.36

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.00-131.91	A	1.000	0.000	0.000	0.000	0.000	0.38
		B		0.000	0.000	0.000	24.887	0.73
		C		0.000	0.000	0.000	0.000	0.08
L2	131.91-86.84	A	1.000	0.000	0.000	0.000	0.000	0.67
		B		0.000	0.000	0.000	23.324	0.86
		C		0.000	0.000	0.000	0.000	0.46
L3	86.84-43.32	A	1.000	0.000	0.000	0.000	9.121	0.72
		B		0.000	0.000	0.000	22.522	0.83
		C		0.000	0.000	0.000	0.000	0.45
L4	43.32-0.00	A	1.000	0.000	0.000	0.000	9.289	0.60
		B		0.000	0.000	0.000	18.278	0.67
		C		0.000	0.000	0.000	0.000	0.36

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	180.00-131.91	0.1448	0.0836	0.5118	0.2955
L2	131.91-86.84	0.1468	0.0848	0.5465	0.3155
L3	86.84-43.32	0.1460	0.0107	0.5413	0.0540
L4	43.32-0.00	0.1185	-0.0049	0.4559	-0.0043

Discrete Tower Loads

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
Platform Mount [LP 712-1]	C	None			0.0000	180.00	No Ice	24.53	24.53	1.34
							1/2" Ice	29.94	29.94	1.65
							1" Ice	35.35	35.35	1.96
(2) 950F65T2ZE-M w/ Mount Pipe	A	From Centroid-Leg	4.00	0.00	0.0000	180.00	No Ice	4.23	4.20	0.03
			0.00				1/2" Ice	4.70	5.07	0.07
			1.00				1" Ice	5.15	5.81	0.12
(2) DB980H90E-M w/ Mount Pipe	B	From Centroid-Leg	4.00	0.00	0.0000	180.00	No Ice	4.04	3.62	0.03
			0.00				1/2" Ice	4.50	4.48	0.06
			1.00				1" Ice	4.95	5.22	0.11
(2) DB980H90E-M w/ Mount Pipe	C	From Centroid-Leg	4.00	0.00	0.0000	180.00	No Ice	4.04	3.62	0.03
			0.00				1/2" Ice	4.50	4.48	0.06
			1.00				1" Ice	4.95	5.22	0.11
(2) Pipe Mount 6'x2.375"	A	From Centroid-Leg	4.00	0.00	0.0000	180.00	No Ice	1.43	1.43	0.03
			0.00				1/2" Ice	1.92	1.92	0.04
			1.00				1" Ice	2.29	2.29	0.05
(2) Pipe Mount 6'x2.375"	B	From Centroid-Leg	4.00	0.00	0.0000	180.00	No Ice	1.43	1.43	0.03
			0.00				1/2" Ice	1.92	1.92	0.04
			1.00				1" Ice	2.29	2.29	0.05
(2) Pipe Mount 6'x2.375"	C	From Centroid-Leg	4.00	0.00	0.0000	180.00	No Ice	1.43	1.43	0.03
			0.00				1/2" Ice	1.92	1.92	0.04
			1.00				1" Ice	2.29	2.29	0.05
Platform Mount [LP 303-1]	C	None			0.0000	169.00	No Ice	14.66	14.66	1.25
							1/2" Ice	18.87	18.87	1.48
							1" Ice	23.08	23.08	1.71
(4) DB844H90E-XY w/ Mount Pipe	A	From Centroid-Face	4.00	0.00	0.0000	169.00	No Ice	3.10	4.65	0.03
			0.00				1/2" Ice	3.44	5.27	0.06
			1.00				1" Ice	3.81	5.91	0.11
(4) DB844H90E-XY w/ Mount Pipe	B	From Centroid-Face	4.00	0.00	0.0000	169.00	No Ice	3.10	4.65	0.03
			0.00				1/2" Ice	3.44	5.27	0.06
			1.00				1" Ice	3.81	5.91	0.11
(4) DB844H90E-XY w/ Mount Pipe	C	From Centroid-Face	4.00	0.00	0.0000	169.00	No Ice	3.10	4.65	0.03
			0.00				1/2" Ice	3.44	5.27	0.06
			1.00				1" Ice	3.81	5.91	0.11
Platform Mount [LP 305-1]	C	None			0.0000	161.00	No Ice	18.01	18.01	1.12
							1/2" Ice	23.33	23.33	1.35
							1" Ice	28.65	28.65	1.58
RR90-17-02DP w/ Mount Pipe	A	From Centroid-Face	4.00	0.00	0.0000	161.00	No Ice	4.59	3.32	0.03
			0.00				1/2" Ice	5.09	4.09	0.07
			1.00				1" Ice	5.58	4.78	0.11
RR90-17-02DP w/ Mount Pipe	B	From Centroid-Face	4.00	0.00	0.0000	161.00	No Ice	4.59	3.32	0.03
			0.00				1/2" Ice	5.09	4.09	0.07
			1.00				1" Ice	5.58	4.78	0.11

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
RR90-17-02DP w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice	4.59 5.09 5.58	3.32 4.09 4.78	0.03 0.07 0.11
Pipe Mount 6'x2.375"	A	From Centroid-Face	4.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.03 0.04 0.05
Pipe Mount 6'x2.375"	B	From Centroid-Face	4.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.03 0.04 0.05
Pipe Mount 6'x2.375"	C	From Centroid-Face	4.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.03 0.04 0.05
Platform Mount [LP 712-1]	C	None		0.0000	146.00	No Ice 1/2" Ice 1" Ice	24.53 29.94 35.35	24.53 29.94 35.35	1.34 1.65 1.96
KS24019-L112A	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.16 0.22 0.30	0.16 0.22 0.30	0.01 0.01 0.01
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	3.41 3.88 4.35	3.58 4.38 5.06	0.03 0.06 0.11
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	3.41 3.88 4.35	3.58 4.38 5.06	0.03 0.06 0.11
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	3.41 3.88 4.35	3.58 4.38 5.06	0.03 0.06 0.11
BXA-70063-6CF-2 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	7.97 8.61 9.22	5.80 6.95 7.82	0.04 0.10 0.17
BXA-70063-6CF-2 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	7.97 8.61 9.22	5.80 6.95 7.82	0.04 0.10 0.17
BXA-70063-6CF-2 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	7.97 8.61 9.22	5.80 6.95 7.82	0.04 0.10 0.17
(2) APL868013 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	3.10 3.48 3.88	4.92 5.60 6.28	0.02 0.06 0.11
(2) APL868013 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	3.10 3.48 3.88	4.92 5.60 6.28	0.02 0.06 0.11
(2) APL866513 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	4.53 4.97 5.41	4.92 5.60 6.28	0.03 0.08 0.13
(2) FD9R6004/1C-3L	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01
(2) FD9R6004/1C-3L	B	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01
(2) FD9R6004/1C-3L	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01
Platform Mount [LP 303-1]	C	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice	14.66 18.87 23.08	14.66 18.87 23.08	1.25 1.48 1.71

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) 7770.00 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.12 6.63 7.13	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.12 6.63 7.13	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.12 6.63 7.13	4.25 5.01 5.71	0.06 0.10 0.16
(2) LGP 17201	A	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.95 2.13 2.33	0.52 0.64 0.77	0.03 0.04 0.06
(2) LGP 17201	C	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.95 2.13 2.33	0.52 0.64 0.77	0.03 0.04 0.06
(2) LGP 17201	B	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.95 2.13 2.33	0.52 0.64 0.77	0.03 0.04 0.06
(2) LGP13519	A	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.34 0.42 0.51	0.21 0.28 0.36	0.01 0.01 0.01
(2) LGP13519	B	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.34 0.42 0.51	0.21 0.28 0.36	0.01 0.01 0.01
(2) LGP13519	C	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.34 0.42 0.51	0.21 0.28 0.36	0.01 0.01 0.01
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.30 7.48 8.37	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.30 7.48 8.37	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.30 7.48 8.37	0.07 0.14 0.21
DC6-48-60-18-8F	C	From Centroid-Face	4.00 0.00 0.00		0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.22 2.44 2.66	2.22 2.44 2.66	0.02 0.04 0.06
Side Arm Mount [SO 701-3]	C	None			0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.83 3.92 5.01	2.83 3.92 5.01	0.20 0.24 0.28
(2) TME-RRUS-11	A	From Centroid-Face	4.00 0.00 0.00		0.0000	138.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.09
(2) TME-RRUS-11	B	From Centroid-Face	4.00 0.00 0.00		0.0000	138.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.09
(2) TME-RRUS-11	C	From Centroid-Face	4.00 0.00 0.00		0.0000	138.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.09
Side Arm Mount [SO 702-1]	B	From Centroid-Face	4.00 0.00 0.00		0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.00 1.00 1.00	1.43 2.05 2.67	0.03 0.04 0.05
Side Arm Mount [SO 702-1]	C	From Centroid-Face	4.00 0.00 0.00		0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.00 1.00 1.00	1.43 2.05 2.67	0.03 0.04 0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
OG-860/1920/GPS-A	B	From Centroid-Face	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.14 0.23 0.33	0.14 0.23 0.33	0.00 0.00 0.01
OG-860/1920/GPS-A	C	From Centroid-Face	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.14 0.23 0.33	0.14 0.23 0.33	0.00 0.00 0.01
Side Arm Mount [SO 702-1]	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	78.00	No Ice 1/2" Ice 1" Ice	1.00 1.00 1.00	1.43 2.05 2.67	0.03 0.04 0.05
KS24019-L112A	B	From Centroid-Leg	4.00 0.00 1.00	0.0000	78.00	No Ice 1/2" Ice 1" Ice	0.16 0.22 0.30	0.16 0.22 0.30	0.01 0.01 0.01

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 180.00-131.91	154.63	1.555	0	104.946	A	0.000	104.946	104.946	100.00	0.000	0.000
					B	0.000	104.946		100.00	0.000	5.651
					C	0.000	104.946		100.00	0.000	0.000
L2 131.91-86.84	108.70	1.406	0	133.956	A	0.000	133.956	133.956	100.00	0.000	0.000
					B	0.000	133.956		100.00	0.000	5.296
					C	0.000	133.956		100.00	0.000	0.000
L3 86.84-43.32	64.85	1.213	0	160.815	A	0.000	160.815	160.815	100.00	0.000	2.185
					B	0.000	160.815		100.00	0.000	5.114
					C	0.000	160.815		100.00	0.000	0.000
L4 43.32-0.00	21.03	1	0	190.133	A	0.000	190.133	190.133	100.00	0.000	2.225
					B	0.000	190.133		100.00	0.000	4.150
					C	0.000	190.133		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 180.00-131.91	154.63	1.555	0	1.0000	112.961	A	0.000	112.961	112.961	100.00	0.000	0.000
						B	0.000	112.961		100.00	0.000	24.887
						C	0.000	112.961		100.00	0.000	0.000
L2 131.91-86.84	108.70	1.406	0	1.0000	141.468	A	0.000	141.468	141.468	100.00	0.000	0.000
						B	0.000	141.468		100.00	0.000	23.324

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	0.000	141.468		100.00	0.000	0.000
L3 86.84-43.32	64.85	1.213	0	1.0000	168.068	A	0.000	168.068	168.068	100.00	0.000	9.121
						B	0.000	168.068		100.00	0.000	22.522
						C	0.000	168.068		100.00	0.000	0.000
L4 43.32-0.00	21.03	1	0	1.0000	197.353	A	0.000	197.353	197.353	100.00	0.000	9.289
						B	0.000	197.353		100.00	0.000	18.278
						C	0.000	197.353		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	154.63	1.555	0	104.946	A	0.000	104.946	104.946	100.00	0.000	0.000
180.00-131.91					B	0.000	104.946		100.00	0.000	5.651
					C	0.000	104.946		100.00	0.000	0.000
L2	108.70	1.406	0	133.956	A	0.000	133.956	133.956	100.00	0.000	0.000
131.91-86.84					B	0.000	133.956		100.00	0.000	5.296
					C	0.000	133.956		100.00	0.000	0.000
L3 86.84-43.32	64.85	1.213	0	160.815	A	0.000	160.815	160.815	100.00	0.000	2.185
					B	0.000	160.815		100.00	0.000	5.114
					C	0.000	160.815		100.00	0.000	0.000
L4 43.32-0.00	21.03	1	0	190.133	A	0.000	190.133	190.133	100.00	0.000	2.225
					B	0.000	190.133		100.00	0.000	4.150
					C	0.000	190.133		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.04	3.37	A	1	0.65	1	1	1	104.946	3.59	0.07	C
180.00-131.91			B	1	0.65	1	1	1	104.946			
			C	1	0.65	1	1	1	104.946			
L2	1.85	6.98	A	1	0.65	1	1	1	133.956	4.05	0.09	C
131.91-86.84			B	1	0.65	1	1	1	133.956			
			C	1	0.65	1	1	1	133.956			
L3	1.80	10.05	A	1	0.65	1	1	1	160.815	4.22	0.10	C
86.84-43.32			B	1	0.65	1	1	1	160.815			
			C	1	0.65	1	1	1	160.815			
L4 43.32-0.00	1.46	13.88	A	1	0.65	1	1	1	190.133	4.06	0.09	C
			B	1	0.65	1	1	1	190.133			
			C	1	0.65	1	1	1	190.133			
Sum Weight:	6.15	34.27						OTM	1353.72 kip-ft	15.92		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.04	3.37	A	1	0.65	1	1	1	104.946	3.59	0.07	C
180.00-131.91			B	1	0.65	1	1	1	104.946			
			C	1	0.65	1	1	1	104.946			
L2	1.85	6.98	A	1	0.65	1	1	1	133.956	4.05	0.09	C
131.91-86.84			B	1	0.65	1	1	1	133.956			
			C	1	0.65	1	1	1	133.956			
L3	1.80	10.05	A	1	0.65	1	1	1	160.815	4.22	0.10	C
86.84-43.32			B	1	0.65	1	1	1	160.815			
			C	1	0.65	1	1	1	160.815			
L4 43.32-0.00	1.46	13.88	A	1	0.65	1	1	1	190.133	4.06	0.09	C
			B	1	0.65	1	1	1	190.133			
			C	1	0.65	1	1	1	190.133			
Sum Weight:	6.15	34.27						OTM	1353.72 kip-ft	15.92		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.04	3.37	A	1	0.65	1	1	1	104.946	3.59	0.07	C
180.00-131.91			B	1	0.65	1	1	1	104.946			
			C	1	0.65	1	1	1	104.946			
L2	1.85	6.98	A	1	0.65	1	1	1	133.956	4.05	0.09	C
131.91-86.84			B	1	0.65	1	1	1	133.956			
			C	1	0.65	1	1	1	133.956			
L3	1.80	10.05	A	1	0.65	1	1	1	160.815	4.22	0.10	C
86.84-43.32			B	1	0.65	1	1	1	160.815			
			C	1	0.65	1	1	1	160.815			
L4 43.32-0.00	1.46	13.88	A	1	0.65	1	1	1	190.133	4.06	0.09	C
			B	1	0.65	1	1	1	190.133			
			C	1	0.65	1	1	1	190.133			
Sum Weight:	6.15	34.27						OTM	1353.72 kip-ft	15.92		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.20	4.98	A	1	0.65	1	1	1	112.961	0.52	0.01	C
180.00-131.91			B	1	0.65	1	1	1	112.961			
			C	1	0.65	1	1	1	112.961			
L2	1.99	9.02	A	1	0.65	1	1	1	141.468	0.55	0.01	C
131.91-86.84			B	1	0.65	1	1	1	141.468			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
			C	1	0.65	1	1	1	141.468			
L3	2.00	12.48	A	1	0.65	1	1	1	168.068	0.58	0.01	C
86.84-43.32			B	1	0.65	1	1	1	168.068			
			C	1	0.65	1	1	1	168.068			
L4 43.32-0.00	1.64	16.75	A	1	0.65	1	1	1	197.353	0.53	0.01	C
			B	1	0.65	1	1	1	197.353			
			C	1	0.65	1	1	1	197.353			
Sum Weight:	6.83	43.23						OTM	188.22 kip-ft	2.17		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.20	4.98	A	1	0.65	1	1	1	112.961	0.52	0.01	C
180.00-131.91			B	1	0.65	1	1	1	112.961			
			C	1	0.65	1	1	1	112.961			
L2	1.99	9.02	A	1	0.65	1	1	1	141.468	0.55	0.01	C
131.91-86.84			B	1	0.65	1	1	1	141.468			
			C	1	0.65	1	1	1	141.468			
L3	2.00	12.48	A	1	0.65	1	1	1	168.068	0.58	0.01	C
86.84-43.32			B	1	0.65	1	1	1	168.068			
			C	1	0.65	1	1	1	168.068			
L4 43.32-0.00	1.64	16.75	A	1	0.65	1	1	1	197.353	0.53	0.01	C
			B	1	0.65	1	1	1	197.353			
			C	1	0.65	1	1	1	197.353			
Sum Weight:	6.83	43.23						OTM	188.22 kip-ft	2.17		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.20	4.98	A	1	0.65	1	1	1	112.961	0.52	0.01	C
180.00-131.91			B	1	0.65	1	1	1	112.961			
			C	1	0.65	1	1	1	112.961			
L2	1.99	9.02	A	1	0.65	1	1	1	141.468	0.55	0.01	C
131.91-86.84			B	1	0.65	1	1	1	141.468			
			C	1	0.65	1	1	1	141.468			
L3	2.00	12.48	A	1	0.65	1	1	1	168.068	0.58	0.01	C
86.84-43.32			B	1	0.65	1	1	1	168.068			
			C	1	0.65	1	1	1	168.068			
L4 43.32-0.00	1.64	16.75	A	1	0.65	1	1	1	197.353	0.53	0.01	C
			B	1	0.65	1	1	1	197.353			
			C	1	0.65	1	1	1	197.353			
Sum Weight:	6.83	43.23						OTM	188.22 kip-ft	2.17		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.04	3.37	A	1	0.65	1	1	1	104.946	1.24	0.03	C
180.00-131.91			B	1	0.65	1	1	1	104.946			
			C	1	0.65	1	1	1	104.946			
L2	1.85	6.98	A	1	0.65	1	1	1	133.956	1.40	0.03	C
131.91-86.84			B	1	0.65	1	1	1	133.956			
			C	1	0.65	1	1	1	133.956			
L3	1.80	10.05	A	1	0.65	1	1	1	160.815	1.46	0.03	C
86.84-43.32			B	1	0.65	1	1	1	160.815			
			C	1	0.65	1	1	1	160.815			
L4 43.32-0.00	1.46	13.88	A	1	0.65	1	1	1	190.133	1.41	0.03	C
			B	1	0.65	1	1	1	190.133			
			C	1	0.65	1	1	1	190.133			
Sum Weight:	6.15	34.27						OTM	468.41 kip-ft	5.51		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.04	3.37	A	1	0.65	1	1	1	104.946	1.24	0.03	C
180.00-131.91			B	1	0.65	1	1	1	104.946			
			C	1	0.65	1	1	1	104.946			
L2	1.85	6.98	A	1	0.65	1	1	1	133.956	1.40	0.03	C
131.91-86.84			B	1	0.65	1	1	1	133.956			
			C	1	0.65	1	1	1	133.956			
L3	1.80	10.05	A	1	0.65	1	1	1	160.815	1.46	0.03	C
86.84-43.32			B	1	0.65	1	1	1	160.815			
			C	1	0.65	1	1	1	160.815			
L4 43.32-0.00	1.46	13.88	A	1	0.65	1	1	1	190.133	1.41	0.03	C
			B	1	0.65	1	1	1	190.133			
			C	1	0.65	1	1	1	190.133			
Sum Weight:	6.15	34.27						OTM	468.41 kip-ft	5.51		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.04	3.37	A	1	0.65	1	1	1	104.946	1.24	0.03	C
180.00-131.91			B	1	0.65	1	1	1	104.946			
			C	1	0.65	1	1	1	104.946			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L2	1.85	6.98	A	1	0.65	1	1	1	133.956	1.40	0.03	C
131.91-86.84			B	1	0.65	1	1	1	133.956			
			C	1	0.65	1	1	1	133.956			
L3	1.80	10.05	A	1	0.65	1	1	1	160.815	1.46	0.03	C
86.84-43.32			B	1	0.65	1	1	1	160.815			
			C	1	0.65	1	1	1	160.815			
L4 43.32-0.00	1.46	13.88	A	1	0.65	1	1	1	190.133	1.41	0.03	C
			B	1	0.65	1	1	1	190.133			
			C	1	0.65	1	1	1	190.133			
Sum Weight:	6.15	34.27						OTM	468.41 kip-ft	5.51		

Discrete Appurtenance Pressures - No Ice $G_H = 1.690$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft²	C_AA_C Side ft²
Platform Mount [LP 712-1]	0.0000	1.34	0.00	0.00	180.00	1.624	0	24.53	24.53
950F65T2ZE-M w/ Mount Pipe	0.0000	0.06	0.00	-4.00	181.00	1.626	0	8.46	8.41
DB980H90E-M w/ Mount Pipe	120.0000	0.06	3.46	2.00	181.00	1.626	0	8.07	7.24
DB980H90E-M w/ Mount Pipe	240.0000	0.06	-3.46	2.00	181.00	1.626	0	8.07	7.24
Pipe Mount 6'x2.375"	0.0000	0.06	0.00	-4.00	181.00	1.626	0	2.85	2.85
Pipe Mount 6'x2.375"	120.0000	0.06	3.46	2.00	181.00	1.626	0	2.85	2.85
Pipe Mount 6'x2.375"	240.0000	0.06	-3.46	2.00	181.00	1.626	0	2.85	2.85
Platform Mount [LP 303-1]	0.0000	1.25	0.00	0.00	169.00	1.595	0	14.66	14.66
DB844H90E-XY w/ Mount Pipe	300.0000	0.12	-3.46	-2.00	170.00	1.597	0	12.39	18.60
DB844H90E-XY w/ Mount Pipe	60.0000	0.12	3.46	-2.00	170.00	1.597	0	12.39	18.60
DB844H90E-XY w/ Mount Pipe	180.0000	0.12	0.00	4.00	170.00	1.597	0	12.39	18.60
Platform Mount [LP 305-1]	0.0000	1.12	0.00	0.00	161.00	1.573	0	18.01	18.01
RR90-17-02DP w/ Mount Pipe	300.0000	0.03	-3.46	-2.00	162.00	1.576	0	4.59	3.32
RR90-17-02DP w/ Mount Pipe	60.0000	0.03	3.46	-2.00	162.00	1.576	0	4.59	3.32
RR90-17-02DP w/ Mount Pipe	180.0000	0.03	0.00	4.00	162.00	1.576	0	4.59	3.32
Pipe Mount 6'x2.375"	300.0000	0.03	-3.46	-2.00	162.00	1.576	0	1.43	1.43
Pipe Mount 6'x2.375"	60.0000	0.03	3.46	-2.00	162.00	1.576	0	1.43	1.43
Pipe Mount 6'x2.375"	180.0000	0.03	0.00	4.00	162.00	1.576	0	1.43	1.43
Platform Mount [LP 712-1]	0.0000	1.34	0.00	0.00	146.00	1.529	0	24.53	24.53
KS24019-L112A	120.0000	0.01	3.46	2.00	150.00	1.541	0	0.16	0.16
BXA-171085-8BF-EDIN -2 w/ Mount Pipe	0.0000	0.03	0.00	-4.00	150.00	1.541	0	3.41	3.58
BXA-171085-8BF-EDIN -2 w/ Mount Pipe	120.0000	0.03	3.46	2.00	150.00	1.541	0	3.41	3.58
BXA-171085-8BF-EDIN -2 w/ Mount Pipe	240.0000	0.03	-3.46	2.00	150.00	1.541	0	3.41	3.58

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
BXA-70063-6CF-2 w/ Mount Pipe	0.0000	0.04	0.00	-4.00	150.00	1.541	0	7.97	5.80
BXA-70063-6CF-2 w/ Mount Pipe	120.0000	0.04	3.46	2.00	150.00	1.541	0	7.97	5.80
BXA-70063-6CF-2 w/ Mount Pipe	240.0000	0.04	-3.46	2.00	150.00	1.541	0	7.97	5.80
APL868013 w/ Mount Pipe	0.0000	0.04	0.00	-4.00	150.00	1.541	0	6.21	9.84
APL868013 w/ Mount Pipe	120.0000	0.04	3.46	2.00	150.00	1.541	0	6.21	9.84
APL866513 w/ Mount Pipe	240.0000	0.06	-3.46	2.00	150.00	1.541	0	9.06	9.84
FD9R6004/1C-3L	0.0000	0.01	0.00	-4.00	150.00	1.541	0	0.73	0.17
FD9R6004/1C-3L	120.0000	0.01	3.46	2.00	150.00	1.541	0	0.73	0.17
FD9R6004/1C-3L	240.0000	0.01	-3.46	2.00	150.00	1.541	0	0.73	0.17
Platform Mount [LP 303-1]	0.0000	1.25	0.00	0.00	140.00	1.511	0	14.66	14.66
7770.00 w/ Mount Pipe	300.0000	0.12	-3.46	-2.00	140.00	1.511	0	12.24	8.51
7770.00 w/ Mount Pipe	60.0000	0.12	3.46	-2.00	140.00	1.511	0	12.24	8.51
7770.00 w/ Mount Pipe	180.0000	0.12	0.00	4.00	140.00	1.511	0	12.24	8.51
LGP 17201	300.0000	0.06	-3.46	-2.00	140.00	1.511	0	3.89	1.04
LGP 17201	180.0000	0.06	0.00	4.00	140.00	1.511	0	3.89	1.04
LGP 17201	60.0000	0.06	3.46	-2.00	140.00	1.511	0	3.89	1.04
LGP13519	300.0000	0.01	-3.46	-2.00	140.00	1.511	0	0.68	0.41
LGP13519	60.0000	0.01	3.46	-2.00	140.00	1.511	0	0.68	0.41
LGP13519	180.0000	0.01	0.00	4.00	140.00	1.511	0	0.68	0.41
AM-X-CD-16-65-00T-RET w/ Mount Pipe	300.0000	0.07	-3.46	-2.00	140.00	1.511	0	8.50	6.30
AM-X-CD-16-65-00T-RET w/ Mount Pipe	60.0000	0.07	3.46	-2.00	140.00	1.511	0	8.50	6.30
AM-X-CD-16-65-00T-RET w/ Mount Pipe	180.0000	0.07	0.00	4.00	140.00	1.511	0	8.50	6.30
DC6-48-60-18-8F	180.0000	0.02	0.00	4.00	140.00	1.511	0	2.22	2.22
Side Arm Mount [SO 701-3]	0.0000	0.20	0.00	0.00	138.00	1.505	0	2.83	2.83
TME-RRUS-11	300.0000	0.10	-3.46	-2.00	138.00	1.505	0	6.50	2.75
TME-RRUS-11	60.0000	0.10	3.46	-2.00	138.00	1.505	0	6.50	2.75
TME-RRUS-11	180.0000	0.10	0.00	4.00	138.00	1.505	0	6.50	2.75
Side Arm Mount [SO 702-1]	60.0000	0.03	3.46	-2.00	83.00	1.302	0	1.00	1.43
Side Arm Mount [SO 702-1]	180.0000	0.03	0.00	4.00	83.00	1.302	0	1.00	1.43
OG-860/1920/GPS-A	60.0000	0.00	3.46	-2.00	84.00	1.306	0	0.14	0.14
OG-860/1920/GPS-A	180.0000	0.00	0.00	4.00	84.00	1.306	0	0.14	0.14
Side Arm Mount [SO 702-1]	0.0000	0.03	0.00	-4.00	78.00	1.279	0	1.00	1.43
KS24019-L112A	120.0000	0.01	3.46	2.00	79.00	1.283	0	0.16	0.16
	Sum Weight:	8.95							

Discrete Appurtenance Pressures - With Ice $G_H = 1.690$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Platform Mount [LP 712-1]	0.0000	1.96	0.00	0.00	180.00	1.624	0	35.35	35.35	1.0000
950F65T2ZE-M w/	0.0000	0.23	0.00	-4.00	181.00	1.626	0	10.29	11.63	1.0000

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Mount Pipe DB980H90E-M w/ Mount Pipe	120.0000	0.21	3.46	2.00	181.00	1.626	0	9.89	10.44	1.0000
Mount Pipe DB980H90E-M w/ Mount Pipe	240.0000	0.21	-3.46	2.00	181.00	1.626	0	9.89	10.44	1.0000
Pipe Mount 6'x2.375"	0.0000	0.10	0.00	-4.00	181.00	1.626	0	4.59	4.59	1.0000
Pipe Mount 6'x2.375"	120.0000	0.10	3.46	2.00	181.00	1.626	0	4.59	4.59	1.0000
Pipe Mount 6'x2.375"	240.0000	0.10	-3.46	2.00	181.00	1.626	0	4.59	4.59	1.0000
Platform Mount [LP 303-1]	0.0000	1.71	0.00	0.00	169.00	1.595	0	23.08	23.08	1.0000
DB844H90E-XY w/ Mount Pipe	300.0000	0.43	-3.46	-2.00	170.00	1.597	0	15.26	23.65	1.0000
DB844H90E-XY w/ Mount Pipe	60.0000	0.43	3.46	-2.00	170.00	1.597	0	15.26	23.65	1.0000
DB844H90E-XY w/ Mount Pipe	180.0000	0.43	0.00	4.00	170.00	1.597	0	15.26	23.65	1.0000
Platform Mount [LP 305-1]	0.0000	1.58	0.00	0.00	161.00	1.573	0	28.65	28.65	1.0000
RR90-17-02DP w/ Mount Pipe	300.0000	0.11	-3.46	-2.00	162.00	1.576	0	5.58	4.78	1.0000
RR90-17-02DP w/ Mount Pipe	60.0000	0.11	3.46	-2.00	162.00	1.576	0	5.58	4.78	1.0000
RR90-17-02DP w/ Mount Pipe	180.0000	0.11	0.00	4.00	162.00	1.576	0	5.58	4.78	1.0000
Pipe Mount 6'x2.375"	300.0000	0.05	-3.46	-2.00	162.00	1.576	0	2.29	2.29	1.0000
Pipe Mount 6'x2.375"	60.0000	0.05	3.46	-2.00	162.00	1.576	0	2.29	2.29	1.0000
Pipe Mount 6'x2.375"	180.0000	0.05	0.00	4.00	162.00	1.576	0	2.29	2.29	1.0000
Platform Mount [LP 712-1]	0.0000	1.96	0.00	0.00	146.00	1.529	0	35.35	35.35	1.0000
KS24019-L112A	120.0000	0.01	3.46	2.00	150.00	1.541	0	0.30	0.30	1.0000
BXA-171085-8BF-EDIN -2 w/ Mount Pipe	0.0000	0.11	0.00	-4.00	150.00	1.541	0	4.35	5.06	1.0000
BXA-171085-8BF-EDIN -2 w/ Mount Pipe	120.0000	0.11	3.46	2.00	150.00	1.541	0	4.35	5.06	1.0000
BXA-171085-8BF-EDIN -2 w/ Mount Pipe	240.0000	0.11	-3.46	2.00	150.00	1.541	0	4.35	5.06	1.0000
BXA-70063-6CF-2 w/ Mount Pipe	0.0000	0.17	0.00	-4.00	150.00	1.541	0	9.22	7.82	1.0000
BXA-70063-6CF-2 w/ Mount Pipe	120.0000	0.17	3.46	2.00	150.00	1.541	0	9.22	7.82	1.0000
BXA-70063-6CF-2 w/ Mount Pipe	240.0000	0.17	-3.46	2.00	150.00	1.541	0	9.22	7.82	1.0000
APL868013 w/ Mount Pipe	0.0000	0.21	0.00	-4.00	150.00	1.541	0	7.76	12.57	1.0000
APL868013 w/ Mount Pipe	120.0000	0.21	3.46	2.00	150.00	1.541	0	7.76	12.57	1.0000
APL866513 w/ Mount Pipe	240.0000	0.26	-3.46	2.00	150.00	1.541	0	10.83	12.57	1.0000
FD9R6004/1C-3L	0.0000	0.02	0.00	-4.00	150.00	1.541	0	1.09	0.39	1.0000
FD9R6004/1C-3L	120.0000	0.02	3.46	2.00	150.00	1.541	0	1.09	0.39	1.0000
FD9R6004/1C-3L	240.0000	0.02	-3.46	2.00	150.00	1.541	0	1.09	0.39	1.0000
Platform Mount [LP 303-1]	0.0000	1.71	0.00	0.00	140.00	1.511	0	23.08	23.08	1.0000
7770.00 w/ Mount Pipe	300.0000	0.31	-3.46	-2.00	140.00	1.511	0	14.26	11.42	1.0000
7770.00 w/ Mount Pipe	60.0000	0.31	3.46	-2.00	140.00	1.511	0	14.26	11.42	1.0000
7770.00 w/ Mount Pipe	180.0000	0.31	0.00	4.00	140.00	1.511	0	14.26	11.42	1.0000
LGP 17201	300.0000	0.11	-3.46	-2.00	140.00	1.511	0	4.66	1.54	1.0000
LGP 17201	180.0000	0.11	0.00	4.00	140.00	1.511	0	4.66	1.54	1.0000
LGP 17201	60.0000	0.11	3.46	-2.00	140.00	1.511	0	4.66	1.54	1.0000
LGP13519	300.0000	0.02	-3.46	-2.00	140.00	1.511	0	1.03	0.72	1.0000
LGP13519	60.0000	0.02	3.46	-2.00	140.00	1.511	0	1.03	0.72	1.0000

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
LGP13519	180.0000	0.02	0.00	4.00	140.00	1.511	0	1.03	0.72	1.0000
AM-X-CD-16-65-00T-RET w/ Mount Pipe	300.0000	0.21	-3.46	-2.00	140.00	1.511	0	9.77	8.37	1.0000
AM-X-CD-16-65-00T-RET w/ Mount Pipe	60.0000	0.21	3.46	-2.00	140.00	1.511	0	9.77	8.37	1.0000
AM-X-CD-16-65-00T-RET w/ Mount Pipe	180.0000	0.21	0.00	4.00	140.00	1.511	0	9.77	8.37	1.0000
DC6-48-60-18-8F	180.0000	0.06	0.00	4.00	140.00	1.511	0	2.66	2.66	1.0000
Side Arm Mount [SO 701-3]	0.0000	0.28	0.00	0.00	138.00	1.505	0	5.01	5.01	1.0000
TME-RRUS-11	300.0000	0.18	-3.46	-2.00	138.00	1.505	0	7.48	3.48	1.0000
TME-RRUS-11	60.0000	0.18	3.46	-2.00	138.00	1.505	0	7.48	3.48	1.0000
TME-RRUS-11	180.0000	0.18	0.00	4.00	138.00	1.505	0	7.48	3.48	1.0000
Side Arm Mount [SO 702-1]	60.0000	0.05	3.46	-2.00	83.00	1.302	0	1.00	2.67	1.0000
Side Arm Mount [SO 702-1]	180.0000	0.05	0.00	4.00	83.00	1.302	0	1.00	2.67	1.0000
OG-860/1920/GPS-A	60.0000	0.01	3.46	-2.00	84.00	1.306	0	0.33	0.33	1.0000
OG-860/1920/GPS-A	180.0000	0.01	0.00	4.00	84.00	1.306	0	0.33	0.33	1.0000
Side Arm Mount [SO 702-1]	0.0000	0.05	0.00	-4.00	78.00	1.279	0	1.00	2.67	1.0000
KS24019-L112A	120.0000	0.01	3.46	2.00	79.00	1.283	0	0.30	0.30	1.0000
	Sum Weight:	16.29								

Discrete Appurtenance Pressures - Service $G_H = 1.690$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
Platform Mount [LP 712-1]	0.0000	1.34	0.00	0.00	180.00	1.624	0	24.53	24.53
950F65T2ZE-M w/ Mount Pipe	0.0000	0.06	0.00	-4.00	181.00	1.626	0	8.46	8.41
DB980H90E-M w/ Mount Pipe	120.0000	0.06	3.46	2.00	181.00	1.626	0	8.07	7.24
DB980H90E-M w/ Mount Pipe	240.0000	0.06	-3.46	2.00	181.00	1.626	0	8.07	7.24
Pipe Mount 6'x2.375"	0.0000	0.06	0.00	-4.00	181.00	1.626	0	2.85	2.85
Pipe Mount 6'x2.375"	120.0000	0.06	3.46	2.00	181.00	1.626	0	2.85	2.85
Pipe Mount 6'x2.375"	240.0000	0.06	-3.46	2.00	181.00	1.626	0	2.85	2.85
Platform Mount [LP 303-1]	0.0000	1.25	0.00	0.00	169.00	1.595	0	14.66	14.66
DB844H90E-XY w/ Mount Pipe	300.0000	0.12	-3.46	-2.00	170.00	1.597	0	12.39	18.60
DB844H90E-XY w/ Mount Pipe	60.0000	0.12	3.46	-2.00	170.00	1.597	0	12.39	18.60
DB844H90E-XY w/ Mount Pipe	180.0000	0.12	0.00	4.00	170.00	1.597	0	12.39	18.60
Platform Mount [LP 305-1]	0.0000	1.12	0.00	0.00	161.00	1.573	0	18.01	18.01
RR90-17-02DP w/ Mount Pipe	300.0000	0.03	-3.46	-2.00	162.00	1.576	0	4.59	3.32
RR90-17-02DP w/ Mount Pipe	60.0000	0.03	3.46	-2.00	162.00	1.576	0	4.59	3.32
RR90-17-02DP w/ Mount Pipe	180.0000	0.03	0.00	4.00	162.00	1.576	0	4.59	3.32
Pipe Mount 6'x2.375"	300.0000	0.03	-3.46	-2.00	162.00	1.576	0	1.43	1.43

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
Pipe Mount 6'x2.375"	60.0000	0.03	3.46	-2.00	162.00	1.576	0	1.43	1.43
Pipe Mount 6'x2.375"	180.0000	0.03	0.00	4.00	162.00	1.576	0	1.43	1.43
Platform Mount [LP 712-1]	0.0000	1.34	0.00	0.00	146.00	1.529	0	24.53	24.53
KS24019-L112A	120.0000	0.01	3.46	2.00	150.00	1.541	0	0.16	0.16
BXA-171085-8BF-EDIN -2 w/ Mount Pipe	0.0000	0.03	0.00	-4.00	150.00	1.541	0	3.41	3.58
BXA-171085-8BF-EDIN -2 w/ Mount Pipe	120.0000	0.03	3.46	2.00	150.00	1.541	0	3.41	3.58
BXA-171085-8BF-EDIN -2 w/ Mount Pipe	240.0000	0.03	-3.46	2.00	150.00	1.541	0	3.41	3.58
BXA-70063-6CF-2 w/ Mount Pipe	0.0000	0.04	0.00	-4.00	150.00	1.541	0	7.97	5.80
BXA-70063-6CF-2 w/ Mount Pipe	120.0000	0.04	3.46	2.00	150.00	1.541	0	7.97	5.80
BXA-70063-6CF-2 w/ Mount Pipe	240.0000	0.04	-3.46	2.00	150.00	1.541	0	7.97	5.80
APL868013 w/ Mount Pipe	0.0000	0.04	0.00	-4.00	150.00	1.541	0	6.21	9.84
APL868013 w/ Mount Pipe	120.0000	0.04	3.46	2.00	150.00	1.541	0	6.21	9.84
APL866513 w/ Mount Pipe	240.0000	0.06	-3.46	2.00	150.00	1.541	0	9.06	9.84
FD9R6004/1C-3L	0.0000	0.01	0.00	-4.00	150.00	1.541	0	0.73	0.17
FD9R6004/1C-3L	120.0000	0.01	3.46	2.00	150.00	1.541	0	0.73	0.17
FD9R6004/1C-3L	240.0000	0.01	-3.46	2.00	150.00	1.541	0	0.73	0.17
Platform Mount [LP 303-1]	0.0000	1.25	0.00	0.00	140.00	1.511	0	14.66	14.66
7770.00 w/ Mount Pipe	300.0000	0.12	-3.46	-2.00	140.00	1.511	0	12.24	8.51
7770.00 w/ Mount Pipe	60.0000	0.12	3.46	-2.00	140.00	1.511	0	12.24	8.51
7770.00 w/ Mount Pipe	180.0000	0.12	0.00	4.00	140.00	1.511	0	12.24	8.51
LGP 17201	300.0000	0.06	-3.46	-2.00	140.00	1.511	0	3.89	1.04
LGP 17201	180.0000	0.06	0.00	4.00	140.00	1.511	0	3.89	1.04
LGP 17201	60.0000	0.06	3.46	-2.00	140.00	1.511	0	3.89	1.04
LGP13519	300.0000	0.01	-3.46	-2.00	140.00	1.511	0	0.68	0.41
LGP13519	60.0000	0.01	3.46	-2.00	140.00	1.511	0	0.68	0.41
LGP13519	180.0000	0.01	0.00	4.00	140.00	1.511	0	0.68	0.41
AM-X-CD-16-65-00T-RET w/ Mount Pipe	300.0000	0.07	-3.46	-2.00	140.00	1.511	0	8.50	6.30
AM-X-CD-16-65-00T-RET w/ Mount Pipe	60.0000	0.07	3.46	-2.00	140.00	1.511	0	8.50	6.30
AM-X-CD-16-65-00T-RET w/ Mount Pipe	180.0000	0.07	0.00	4.00	140.00	1.511	0	8.50	6.30
DC6-48-60-18-8F	180.0000	0.02	0.00	4.00	140.00	1.511	0	2.22	2.22
Side Arm Mount [SO 701-3]	0.0000	0.20	0.00	0.00	138.00	1.505	0	2.83	2.83
TME-RRUS-11	300.0000	0.10	-3.46	-2.00	138.00	1.505	0	6.50	2.75
TME-RRUS-11	60.0000	0.10	3.46	-2.00	138.00	1.505	0	6.50	2.75
TME-RRUS-11	180.0000	0.10	0.00	4.00	138.00	1.505	0	6.50	2.75
Side Arm Mount [SO 702-1]	60.0000	0.03	3.46	-2.00	83.00	1.302	0	1.00	1.43
Side Arm Mount [SO 702-1]	180.0000	0.03	0.00	4.00	83.00	1.302	0	1.00	1.43
OG-860/1920/GPS-A	60.0000	0.00	3.46	-2.00	84.00	1.306	0	0.14	0.14
OG-860/1920/GPS-A	180.0000	0.00	0.00	4.00	84.00	1.306	0	0.14	0.14
Side Arm Mount [SO 702-1]	0.0000	0.03	0.00	-4.00	78.00	1.279	0	1.00	1.43
KS24019-L112A	120.0000	0.01	3.46	2.00	79.00	1.283	0	0.16	0.16
	Sum Weight:	8.95							

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 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	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	180 - 131.91	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.65	-0.14	-0.43
			Max. Mx	5	-11.07	-427.95	0.67
			Max. My	8	-11.09	0.79	-425.27
			Max. Vy	5	20.43	-427.95	0.67
			Max. Vx	8	20.31	0.79	-425.27
			Max. Torque	11			-0.24
L2	131.91 - 86.84	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.89	-0.48	-0.63

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	5	-19.62	-1412.99	3.30
			Max. My	8	-19.63	3.35	-1405.24
			Max. Vy	5	24.43	-1412.99	3.30
			Max. Vx	8	24.31	3.35	-1405.24
			Max. Torque	4			-0.27
L3	86.84 - 43.32	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.76	-1.11	-0.68
			Max. Mx	5	-31.47	-2540.19	5.60
			Max. My	8	-31.47	5.40	-2526.57
			Max. Vy	5	28.45	-2540.19	5.60
			Max. Vx	8	28.32	5.40	-2526.57
			Max. Torque	4			-0.50
L4	43.32 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-66.35	-1.59	-0.77
			Max. Mx	5	-49.36	-4059.82	8.12
			Max. My	8	-49.36	7.80	-4039.25
			Max. Vy	5	32.30	-4059.82	8.12
			Max. Vx	8	32.17	7.80	-4039.25
			Max. Torque	3			-0.47

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	66.35	0.00	0.00
	Max. H_x	11	49.38	32.27	-0.05
	Max. H_z	2	49.38	-0.05	32.14
	Max. M_x	2	4038.21	-0.05	32.14
	Max. M_z	5	4059.82	-32.27	0.05
	Max. Torsion	9	0.47	16.18	-27.86
	Min. Vert	1	49.38	0.00	0.00
	Min. H_x	5	49.38	-32.27	0.05
	Min. H_z	8	49.38	0.05	-32.14
	Min. M_x	8	-4039.25	0.05	-32.14
	Min. M_z	11	-4058.15	32.27	-0.05
	Min. Torsion	3	-0.47	-16.18	27.86

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	49.38	0.00	0.00	0.50	-0.81	0.00
Dead+Wind 0 deg - No Ice	49.38	0.05	-32.14	-4038.21	-9.48	0.45
Dead+Wind 30 deg - No Ice	49.38	16.18	-27.86	-3501.42	-2037.83	0.47
Dead+Wind 60 deg - No Ice	49.38	27.97	-16.11	-2026.30	-3520.34	0.37
Dead+Wind 90 deg - No Ice	49.38	32.27	-0.05	-8.12	-4059.82	0.16
Dead+Wind 120 deg - No Ice	49.38	27.92	16.02	2012.40	-3511.74	-0.09
Dead+Wind 150 deg - No Ice	49.38	16.09	27.80	3493.86	-2022.89	-0.31
Dead+Wind 180 deg - No Ice	49.38	-0.05	32.14	4039.25	7.80	-0.45
Dead+Wind 210 deg - No Ice	49.38	-16.18	27.86	3502.46	2036.16	-0.47
Dead+Wind 240 deg - No Ice	49.38	-27.97	16.11	2027.34	3518.67	-0.36

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 270 deg - No Ice	49.38	-32.27	0.05	9.16	4058.15	-0.16
Dead+Wind 300 deg - No Ice	49.38	-27.92	-16.02	-2011.36	3510.07	0.08
Dead+Wind 330 deg - No Ice	49.38	-16.09	-27.80	-3492.82	2021.22	0.31
Dead+Ice+Temp	66.35	0.00	0.00	0.77	-1.59	0.00
Dead+Wind 0 deg+Ice+Temp	66.35	0.00	-4.56	-596.27	-2.53	0.15
Dead+Wind 30 deg+Ice+Temp	66.35	2.29	-3.95	-516.69	-302.49	0.15
Dead+Wind 60 deg+Ice+Temp	66.35	3.97	-2.28	-298.43	-521.86	0.11
Dead+Wind 90 deg+Ice+Temp	66.35	4.58	-0.00	0.01	-601.84	0.04
Dead+Wind 120 deg+Ice+Temp	66.35	3.96	2.27	298.68	-521.02	-0.04
Dead+Wind 150 deg+Ice+Temp	66.35	2.29	3.94	517.55	-301.05	-0.11
Dead+Wind 180 deg+Ice+Temp	66.35	-0.00	4.56	597.96	-0.86	-0.15
Dead+Wind 210 deg+Ice+Temp	66.35	-2.29	3.95	518.38	299.11	-0.15
Dead+Wind 240 deg+Ice+Temp	66.35	-3.97	2.28	300.13	518.47	-0.11
Dead+Wind 270 deg+Ice+Temp	66.35	-4.58	0.00	1.68	598.46	-0.04
Dead+Wind 300 deg+Ice+Temp	66.35	-3.96	-2.27	-296.99	517.64	0.04
Dead+Wind 330 deg+Ice+Temp	66.35	-2.29	-3.94	-515.85	297.66	0.11
Dead+Wind 0 deg - Service	49.38	0.02	-11.12	-1398.74	-3.83	0.16
Dead+Wind 30 deg - Service	49.38	5.60	-9.64	-1212.77	-706.58	0.16
Dead+Wind 60 deg - Service	49.38	9.68	-5.58	-701.70	-1220.23	0.13
Dead+Wind 90 deg - Service	49.38	11.17	-0.02	-2.47	-1407.14	0.06
Dead+Wind 120 deg - Service	49.38	9.66	5.54	697.56	-1217.24	-0.03
Dead+Wind 150 deg - Service	49.38	5.57	9.62	1210.83	-701.40	-0.11
Dead+Wind 180 deg - Service	49.38	-0.02	11.12	1399.78	2.15	-0.16
Dead+Wind 210 deg - Service	49.38	-5.60	9.64	1213.82	704.91	-0.16
Dead+Wind 240 deg - Service	49.38	-9.68	5.58	702.75	1218.55	-0.13
Dead+Wind 270 deg - Service	49.38	-11.17	0.02	3.52	1405.46	-0.06
Dead+Wind 300 deg - Service	49.38	-9.66	-5.54	-696.52	1215.56	0.03
Dead+Wind 330 deg - Service	49.38	-5.57	-9.62	-1209.78	699.72	0.11

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-49.38	0.00	0.00	49.38	0.00	0.000%
2	0.05	-49.38	-32.14	-0.05	49.38	32.14	0.000%
3	16.18	-49.38	-27.86	-16.18	49.38	27.86	0.000%
4	27.97	-49.38	-16.11	-27.97	49.38	16.11	0.000%
5	32.27	-49.38	-0.05	-32.27	49.38	0.05	0.000%
6	27.92	-49.38	16.02	-27.92	49.38	-16.02	0.000%
7	16.09	-49.38	27.80	-16.09	49.38	-27.80	0.000%
8	-0.05	-49.38	32.14	0.05	49.38	-32.14	0.000%
9	-16.18	-49.38	27.86	16.18	49.38	-27.86	0.000%
10	-27.97	-49.38	16.11	27.97	49.38	-16.11	0.000%
11	-32.27	-49.38	0.05	32.27	49.38	-0.05	0.000%
12	-27.92	-49.38	-16.02	27.92	49.38	16.02	0.000%
13	-16.09	-49.38	-27.80	16.09	49.38	27.80	0.000%
14	0.00	-66.35	0.00	0.00	66.35	0.00	0.000%
15	0.00	-66.35	-4.56	-0.00	66.35	4.56	0.000%
16	2.29	-66.35	-3.95	-2.29	66.35	3.95	0.000%
17	3.97	-66.35	-2.28	-3.97	66.35	2.28	0.000%
18	4.58	-66.35	-0.00	-4.58	66.35	0.00	0.000%
19	3.96	-66.35	2.27	-3.96	66.35	-2.27	0.000%
20	2.29	-66.35	3.94	-2.29	66.35	-3.94	0.000%
21	-0.00	-66.35	4.56	0.00	66.35	-4.56	0.000%
22	-2.29	-66.35	3.95	2.29	66.35	-3.95	0.000%
23	-3.97	-66.35	2.28	3.97	66.35	-2.28	0.000%
24	-4.58	-66.35	0.00	4.58	66.35	-0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
25	-3.96	-66.35	-2.27	3.96	66.35	2.27	0.000%
26	-2.29	-66.35	-3.94	2.29	66.35	3.94	0.000%
27	0.02	-49.38	-11.12	-0.02	49.38	11.12	0.000%
28	5.60	-49.38	-9.64	-5.60	49.38	9.64	0.000%
29	9.68	-49.38	-5.58	-9.68	49.38	5.58	0.000%
30	11.17	-49.38	-0.02	-11.17	49.38	0.02	0.000%
31	9.66	-49.38	5.54	-9.66	49.38	-5.54	0.000%
32	5.57	-49.38	9.62	-5.57	49.38	-9.62	0.000%
33	-0.02	-49.38	11.12	0.02	49.38	-11.12	0.000%
34	-5.60	-49.38	9.64	5.60	49.38	-9.64	0.000%
35	-9.68	-49.38	5.58	9.68	49.38	-5.58	0.000%
36	-11.17	-49.38	0.02	11.17	49.38	-0.02	0.000%
37	-9.66	-49.38	-5.54	9.66	49.38	5.54	0.000%
38	-5.57	-49.38	-9.62	5.57	49.38	9.62	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	0.00033390
3	Yes	5	0.00000001	0.00072043
4	Yes	5	0.00000001	0.00071541
5	Yes	4	0.00000001	0.00026558
6	Yes	5	0.00000001	0.00071155
7	Yes	5	0.00000001	0.00071202
8	Yes	4	0.00000001	0.00026479
9	Yes	5	0.00000001	0.00071422
10	Yes	5	0.00000001	0.00072083
11	Yes	4	0.00000001	0.00031314
12	Yes	5	0.00000001	0.00071031
13	Yes	5	0.00000001	0.00070827
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00010473
16	Yes	5	0.00000001	0.00011326
17	Yes	5	0.00000001	0.00011352
18	Yes	5	0.00000001	0.00010579
19	Yes	5	0.00000001	0.00011354
20	Yes	5	0.00000001	0.00011333
21	Yes	5	0.00000001	0.00010524
22	Yes	5	0.00000001	0.00011318
23	Yes	5	0.00000001	0.00011339
24	Yes	5	0.00000001	0.00010517
25	Yes	5	0.00000001	0.00011255
26	Yes	5	0.00000001	0.00011230
27	Yes	4	0.00000001	0.00007816
28	Yes	5	0.00000001	0.00005177
29	Yes	5	0.00000001	0.00005095
30	Yes	4	0.00000001	0.00007526
31	Yes	5	0.00000001	0.00005082
32	Yes	5	0.00000001	0.00005090
33	Yes	4	0.00000001	0.00007565
34	Yes	5	0.00000001	0.00005076
35	Yes	5	0.00000001	0.00005183
36	Yes	4	0.00000001	0.00007691
37	Yes	5	0.00000001	0.00005052

38	Yes	5	0.00000001	0.00005020

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 131.91	41.506	29	2.0476	0.0006
L2	136.33 - 86.84	23.775	29	1.7195	0.0004
L3	92.41 - 43.32	10.507	29	1.1135	0.0002
L4	49.94 - 0	2.983	29	0.5503	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Platform Mount [LP 712-1]	29	41.506	2.0476	0.0006	36825
169.00	Platform Mount [LP 303-1]	29	36.826	1.9822	0.0004	16738
161.00	Platform Mount [LP 305-1]	29	33.472	1.9307	0.0004	9690
146.00	Platform Mount [LP 712-1]	29	27.424	1.8147	0.0004	5414
140.00	Platform Mount [LP 303-1]	29	25.132	1.7579	0.0004	4603
138.00	Side Arm Mount [SO 701-3]	29	24.388	1.7374	0.0004	4408
83.00	Side Arm Mount [SO 702-1]	29	8.378	0.9792	0.0002	4126
78.00	Side Arm Mount [SO 702-1]	29	7.352	0.9101	0.0002	4073

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 131.91	119.499	5	5.9001	0.0016
L2	136.33 - 86.84	68.492	4	4.9565	0.0012
L3	92.41 - 43.32	30.294	4	3.2110	0.0007
L4	49.94 - 0	8.607	4	1.5875	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Platform Mount [LP 712-1]	5	119.499	5.9001	0.0016	13023
169.00	Platform Mount [LP 303-1]	5	106.036	5.7124	0.0013	5918
161.00	Platform Mount [LP 305-1]	5	96.387	5.5643	0.0012	3424
146.00	Platform Mount [LP 712-1]	4	78.985	5.2304	0.0012	1910
140.00	Platform Mount [LP 303-1]	4	72.394	5.0671	0.0012	1623
138.00	Side Arm Mount [SO 701-3]	4	70.254	5.0079	0.0012	1554

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
83.00	Side Arm Mount [SO 702-1]	4	24.160	2.8240	0.0006	1439
78.00	Side Arm Mount [SO 702-1]	4	21.200	2.6248	0.0005	1420

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 $\frac{P}{P_a}$
L1	180 - 131.91 (1)	TP31.375x21x0.25	48.09	0.00	0.0	39.000	23.9410	-11.06	933.70	0.012
L2	131.91 - 86.84 (2)	TP40.4688x29.9214x0.375	49.49	0.00	0.0	39.000	46.3087	-19.62	1806.04	0.011
L3	86.84 - 43.32 (3)	TP48.9688x38.5317x0.4375	49.09	0.00	0.0	39.000	65.4373	-31.47	2552.06	0.012
L4	43.32 - 0 (4)	TP57.25x46.6863x0.5	49.94	0.00	0.0	39.000	90.0622	-49.36	3512.43	0.014

Pole Bending Design Data

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	180 - 131.91 (1)	TP31.375x21x0.25	427.96	28.824	39.000	0.739	0.00	0.000	39.000	0.000
L2	131.91 - 86.84 (2)	TP40.4688x29.9214x0.375	1413.96	38.232	39.000	0.980	0.00	0.000	39.000	0.000
L3	86.84 - 43.32 (3)	TP48.9688x38.5317x0.4375	2541.73	40.141	39.000	1.029	0.00	0.000	39.000	0.000
L4	43.32 - 0 (4)	TP57.25x46.6863x0.5	4061.86	38.684	39.000	0.992	0.00	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 $\frac{f_{vt}}{F_{vt}}$
L1	180 - 131.91 (1)	TP31.375x21x0.25	20.45	0.854	26.000	0.066	0.22	0.007	26.000	0.000
L2	131.91 - 86.84 (2)	TP40.4688x29.9214x0.375	24.45	0.528	26.000	0.041	0.27	0.004	26.000	0.000
L3	86.84 - 43.32 (3)	TP48.9688x38.5317x0.4375	28.47	0.435	26.000	0.033	0.34	0.003	26.000	0.000
L4	43.32 - 0 (4)	TP57.25x46.6863x0.5	32.31	0.359	26.000	0.028	0.37	0.002	26.000	0.000

Pole Interaction Design Data

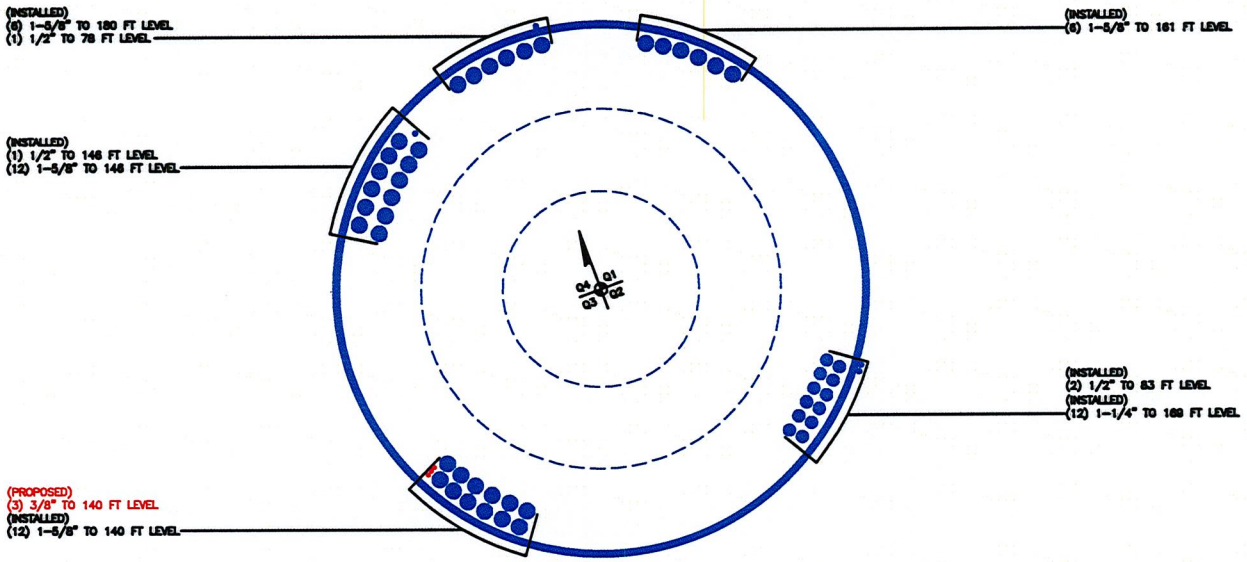
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 131.91 (1)	0.012	0.739	0.000	0.066	0.000	0.752 ✔	1.333	H1-3+VT ✔
L2	131.91 - 86.84 (2)	0.011	0.980	0.000	0.041	0.000	0.992 ✔	1.333	H1-3+VT ✔
L3	86.84 - 43.32 (3)	0.012	1.029	0.000	0.033	0.000	1.042 ✔	1.333	H1-3+VT ✔
L4	43.32 - 0 (4)	0.014	0.992	0.000	0.028	0.000	1.006 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	180 - 131.91	Pole	TP31.375x21x0.25	1	-11.06	1244.62	56.4	Pass
L2	131.91 - 86.84	Pole	TP40.4688x29.9214x0.375	2	-19.62	2407.45	74.4	Pass
L3	86.84 - 43.32	Pole	TP48.9688x38.5317x0.4375	3	-31.47	3401.90	78.2	Pass
L4	43.32 - 0	Pole	TP57.25x46.6863x0.5	4	-49.36	4682.07	75.5	Pass
						Summary	ELC:	Load Case 7
						Pole (L3)	78.2	Pass
						Rating =	78.2	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876391 TOWER ID: C_BASELEVEL

DRAWN BY: KGN
CHECKED BY: JM
DRAWING DATE: 10/12/07

SITE NUMBER:
SITE NAME:

SITE NAME

COLUMBIA / DEOJAY

BUSINESS UNIT NUMBER

876391

SITE ADDRESS

14 THOMPSON HILL RD
COLUMBIA, CT 06237
TOLLAND COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING

SCALE 1" = 1'-0" | 1

PLOT DATE: 8/14/2012 FILE NAME: 876391_BASELEVEL.DWG

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *876391*
Site Name: *Columbia/DEOJAY*
App #: *158135 Rev. 2*

Pole Manufacturer:	*Other*

Reactions		
Moment:	4062	ft-kips
Axial:	49	kips
Shear:	32	kips

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	66	in

Plate Data		
Diam:	72	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	9.09	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	5	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	57.25	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

		Rigid
Maximum Rod Tension:	145.3 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	74.5% **Pass**	

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	52.2 ksi	Service ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	87.0% **Pass**	Y.L. Length: 32.84

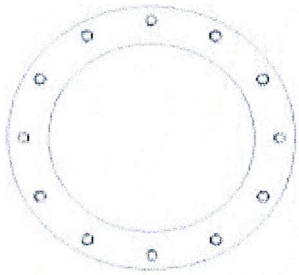
n/a

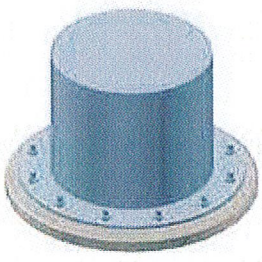
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

GPD GROUP

Mat Foundation Analysis
Columbia/DEOJAY BU#: 876391
2012775.876391.01

General Info	
Code	TIA/EIA-222-F (LRFD)
Bearing On	Soil
Foundation Type	Mono Pad
Pier Type	Square
Reinforcing Known	Yes
Max Capacity	1

Tower Reactions		
Moment, M	4062	k-ft
Axial, P	49	k
Shear, V	32	k

Pad & Pier Geometry		
Pier Width, ø	7	ft
Pad Length, L	26	ft
Pad Width, W	26	ft
Pad Thickness, t	3	ft
Depth, D	7	ft
Height Above Grade, HG	1	ft

Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	4	ksi
Clear Cover	3	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 9	
Pad Quantity Per Layer	33	
Pier Rebar Size	# 8	
Pier Quantity of Rebar	39	

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	110	pcf
Angle of Friction, ø	30	°
Bearing Type	Gross	
Ultimate Bearing	12	ksf
Water Table Depth	5	ft
Frost Depth	3.333	ft

Bearing Summary			Load Case
Qxmax	5.00	ksf	0.9D+1.6W
Qymax	5.00	ksf	0.9D+1.6W
Qmax @ 45°	4.82	ksf	0.9D+1.6W
$Q_{(all)\ Gross}$	9.00	ksf	
Controlling Capacity	**55.6%**	**Pass**	

Overturning Summary (Required FS=1.0)			Load Case
FS(ot)x	1.19	≥1.0	0.9D+1.6W
FS(ot)y	1.19	≥1.0	0.9D+1.6W
Controlling Capacity	**84.3%**	**Pass**