July 22, 2014

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Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT23XC558
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876364
	Crown Castle Site Name:	Cromwell / First Line Emergenc
	Crown Castle JDE Job Number:	286438
	Crown Castle Work Order Number:	804305
	Crown Castle Application Number:	245691 Rev. 5
Engineering Firm Designation:	**B+T Group Project Number:**	84470.009.01
Site Data:	**201 Main St., Cromwell, Middlesex County, CT** **Latitude *41° 35' 0.11"*, Longitude *-72° 38' 59.14"*** **125 Foot - Monopole Tower**	

Dear Charles Trask,

B+T 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 669752, in accordance with application 245691, revision 5.

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 1 and Table 2 for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

All equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *B+T 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:
B+T Engineering, Inc.

STATE OF CONNECTICUT
CHAD TUTTLE
NO. 23924
LICENSED
PROFESSIONAL ENGINEER
7/22/14

Jennifer Tillson
Project Engineer

Chad E. Tuttle, P.E.
President

tnxTower Report - version 6.1.4.1

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1) INTRODUCTION

This tower is a 125 ft Monopole tower designed by Engineered Endeavors, Inc. in February of 2002. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. This tower has modified by multiple times and those modifications are incorporated in this analysis.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
125.0	127.0	3	Alcatel Lucent	TD-RRH8x20-25	1	1 1/4	--
		3	RFS Celwave	APXVTM14-C-120			

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
125.0	129.0	3	Argus Tech.	LLPX310R-V1	3 3 2 3	5/16 1/4 1/2 1 1/4	1
	127.0	3	RFS Celwave	APXVSPP18-C-A20			
	125.0	2	Dragonwave	HORIZON COMPACT			
		3	Samsung Telecom.	WIMAX DAP HEAD			
		1	--	Platform Mount [LP 712-1]			
	124.0	1	Andrew	VHLP2-11			
		1	Andrew	VHLP2-18			
123.0	123.0	3	Alcatel Lucent	800MHZ 2X50W RRH W/FILTER	--	--	1
		3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz			
		1	--	Side Arm Mount [SO 102-3]			
115.0	117.0	6	Communication Components Inc.	DTMABP7819VG12A	12 2 1	1 1/4 3/4 3/8	1
		3	Ericsson	RRUS-11			
		9	KMW Com.	AM-X-CD-16-65-00T-RET			
		1	Raycap	DC6-48-60-18-8F			
	115.0	1	--	Platform Mount [LP 303-1]			
105.0	105.0	3	Alcatel Lucent	RRH2X40-AWS	1	1 5/8	2
		3	Andrew	HBX-6517DS-VTM			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		3	Andrew	LNX-6514DS-VTM			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	Antel	BXA-171063-8BF-EDIN-2	12	1 5/8	1
		3	Antel	BXA-70063-6CF-EDIN-0			
		6	RFS Celwave	FD9R6004/2C-3L			
		1	--	Platform Mount [LP 712-1]			
95.0	95.0	**12**	**Decibel**	**DB844H65E-XY**	**12**	**1 5/8**	**3**
		1	**--**	**Platform Mount [LP 303-1]**			
85.0	85.0	3	Kathrein	742 213	6	1 5/8	1
		1	--	Pipe Mount [PM 601-3]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be Removed

Table 3 - Design 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)
125	125	1	Generic	L.P.Platform	--	--
		6	Decibel	DB980H65		
		3	Decibel	DB980H90		
115	115	1	Generic	T-Arm	--	--
		6	Allgon	7250		
105	105	1	Generic	L.P.Platform	--	--
		12	Decibel	DB844		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Sprint PCS Co-Locate Rev # 5	245691	CCI Sites
Tower Manufacturer Drawings	EEI, Job No. 10554	2068958	CCI Sites
Tower Modification Drawings	Semaan Engineering Solutions, Job No. CT23XC558	2055765	CCI Sites
Post-Modification Inspection	VSI, Job No. 2007-004-138	2182292	CCI Sites
Tower Modification Drawings	B+T Group, Project No. 84890.001	3373019	CCI Sites
Post Modification Inspection	B+T Group, Project No. 84890.002	3394680	CCI Sites
Tower Modification Drawings	B+T Group, Project No. 84470.006.01	3669962	CCI Sites
Post-Modification Inspection	TEP, Project No. 131001.876364	4009982	CCI Sites
Foundation Drawings	EEI, Project No. 6464	1613909	CCI Sites
Base Plate Details	Crown Project No. 320820	2608627	CCI Sites
Geotech Report	Dr. Clarence Welti, P.E., Date: 08/02/1999	1532312	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 06/10/2014	CCI Sites

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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 areas and weights are assumed based on photographs provided.
6) The existing base plate grout was not considered in this analysis.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	125 - 94.45	Pole	TP25.067x18.5x0.188	1	-7.702	769.746	98.1	Pass
L2	94.45 - 85.04	Pole	TP27.09x25.067x0.439	2	-8.523	1445.985	62.5	Pass
L3	85.04 - 73.5	Pole	TP29.158x25.873x0.475	3	-11.951	1743.737	76.0	Pass
L4	73.5 - 73	Pole	TP29.264x29.158x0.609	4	-12.079	2235.441	60.4	Pass
L5	73 - 60.5	Pole	TP31.921x29.264x0.367	5	-14.510	1908.243	87.0	Pass
L6	60.5 - 40.457	Pole	TP36.18x31.921x0.436	6	-18.341	2492.137	80.1	Pass
L7	40.457 - 30.5	Pole	TP37.787x34.6x0.485	7	-23.437	2983.507	78.2	Pass
L8	30.5 - 0	Pole	TP44.25x37.787x0.456	8	-32.786	3297.309	87.2	Pass
							Summary	
						Pole (L1)	98.1	Pass
						Rating =	98.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	83.4	Pass
1	Base Plate	Base	80.4	Pass
1	Base Foundation (Soil Interaction)	Base	77.7	Pass

Structure Rating (max from all components) =	98.1%

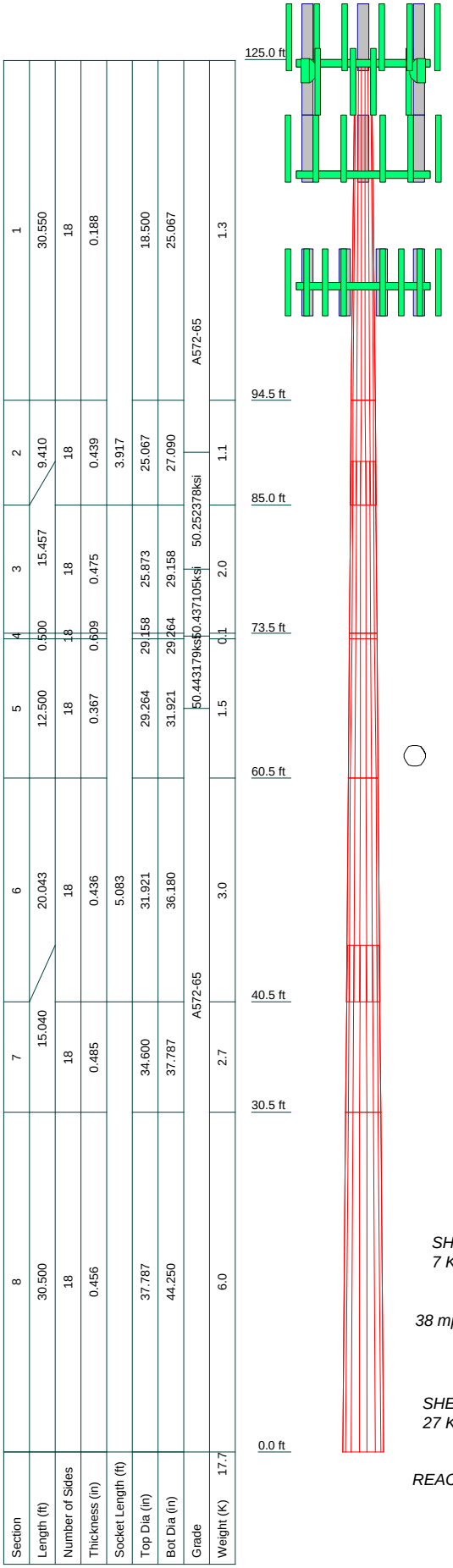
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT



Section	1	2	3	4	5	6	7	8
Length (ft)	30.550	9.410	15.457	0.500	12.500	20.043	15.040	30.500
Number of Sides	18	18	18	18	18	18	18	18
Thickness (in)	0.188	0.439	0.475	0.609	0.367	0.436	0.485	0.456
Socket Length (ft)		3.917				5.083		
Top Dia (in)	18.500	25.067	25.873	29.158	29.264	31.921	34.600	37.787
Bot Dia (in)	25.067	27.090	29.158	29.264	31.921	36.180	37.787	44.250
Grade	A572-65	50.252378ksi	50.437105ksi	50.443179ksi		A572-65		
Weight (K)	1.3	1.1	2.0	0.1	1.5	3.0	2.7	6.0

17.7

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVTM14-C-120 w/ Mount Pipe (P)	125	(2) DTMABP7819VG12A (E)	115
APXVTM14-C-120 w/ Mount Pipe (P)	125	RRUS-11 (E)	115
APXVTM14-C-120 w/ Mount Pipe (P)	125	RRUS-11 (E)	115
TD-RRH8x20-25 (P)	125	RRUS-11 (E)	115
TD-RRH8x20-25 (P)	125	DC6-48-60-18-8F (E)	115
TD-RRH8x20-25 (P)	125	Platform Mount [LP 303-1] (E)	115
LLPX310R-V1 w/ Mount Pipe (E)	125	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	115
LLPX310R-V1 w/ Mount Pipe (E)	125	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	115
LLPX310R-V1 w/ Mount Pipe (E)	125	BXA-70063-6CF-EDIN-0 w/ Mount Pipe (E)	105
APXVSPP18-C-A20 w/ Mount Pipe (E)	125	BXA-171063-8BF-EDIN-2 w/ Mount Pipe (E)	105
APXVSPP18-C-A20 w/ Mount Pipe (E)	125	BXA-171063-8BF-EDIN-2 w/ Mount Pipe (E)	105
APXVSPP18-C-A20 w/ Mount Pipe (E)	125	BXA-171063-8BF-EDIN-2 w/ Mount Pipe (E)	105
WIMAX DAP HEAD (E)	125	(2) FD9R6004/2C-3L (E)	105
WIMAX DAP HEAD (E)	125	(2) FD9R6004/2C-3L (E)	105
WIMAX DAP HEAD (E)	125	(2) FD9R6004/2C-3L (E)	105
HORIZON COMPACT (E)	125	LNX-6514DS-VTM w/ Mount Pipe (R)	105
HORIZON COMPACT (E)	125	LNX-6514DS-VTM w/ Mount Pipe (R)	105
(2) 6' x 2" Mount Pipe (E)	125	LNX-6514DS-VTM w/ Mount Pipe (R)	105
(2) 6' x 2" Mount Pipe (E)	125	HBX-6517DS-VTM w/ Mount Pipe (R)	105
(2) 6' x 2" Mount Pipe (E)	125	HBX-6517DS-VTM w/ Mount Pipe (R)	105
Platform Mount [LP 712-1] (E)	125	HBX-6517DS-VTM w/ Mount Pipe (R)	105
VHLP2-18 (E)	125	RRH2X40-AWS (R)	105
VHLP2-11 (E)	125	RRH2X40-AWS (R)	105
PCS 1900MHz 4x45W-65MHz w / Mount Pipe (E)	123	RRH2X40-AWS (R)	105
800MHZ 2X50W RRH W/FILTER w / Mount Pipe (E)	123	DB-T1-6Z-8AB-0Z (R)	105
800MHZ 2X50W RRH W/FILTER w / Mount Pipe (E)	123	Platform Mount [LP 712-1] (E)	105
800MHZ 2X50W RRH W/FILTER w / Mount Pipe (E)	123	BXA-70063-6CF-EDIN-0 w/ Mount Pipe (E)	105
Side Arm Mount [SO 102-3] (E)	123	BXA-70063-6CF-EDIN-0 w/ Mount Pipe (E)	105
PCS 1900MHz 4x45W-65MHz w / Mount Pipe (E)	123	742 213 w/ Mount Pipe (E)	85
PCS 1900MHz 4x45W-65MHz w / Mount Pipe (E)	123	Pipe Mount [PM 601-3] (E)	85
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	115	742 213 w/ Mount Pipe (E)	85
(2) DTMABP7819VG12A (E)	115	742 213 w/ Mount Pipe (E)	85
(2) DTMABP7819VG12A (E)	115		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	50.437105ksi	50 ksi	65 ksi
50.252378ksi	50 ksi	65 ksi	50.443179ksi	50 ksi	65 ksi

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.1%

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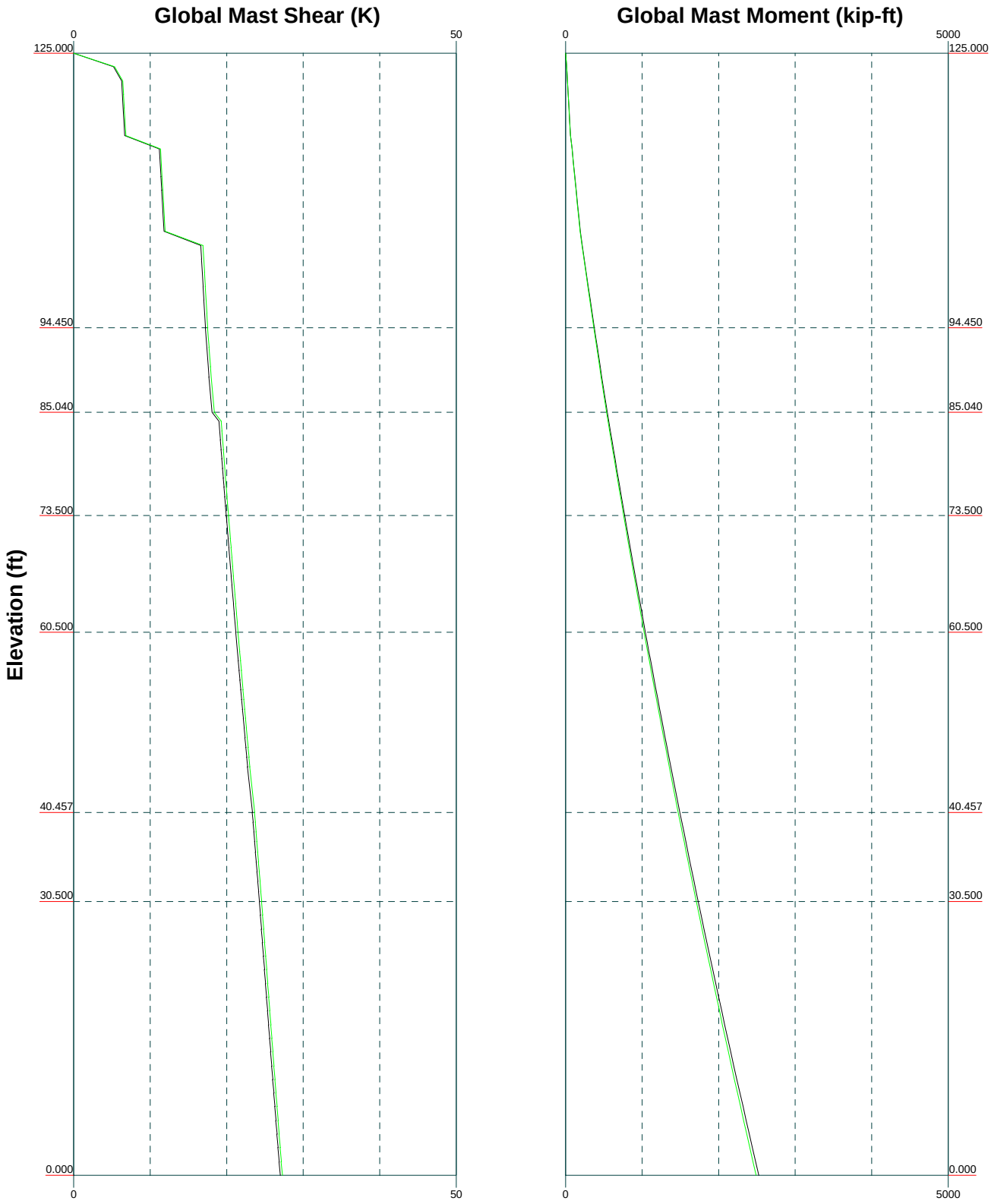
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 84470.009.01 - Cromwell/First Line Emergencl, CT (BU# 87636		
Project:		
Client: Crown Castle	Drawn by: JTillson	App'd:
Code: TIA/EIA-222-F	Date: 07/22/14	Scale: NTS
Path: S:\Projects\Crown Castle\84470_876364_Cromwell\Engineering\tnxTower\84470_009_01_Cromwell_First Line Emergenc_CT_ASIeri		Dwg No. E-1

TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Maximum Values

Vx Vz Mx Mz



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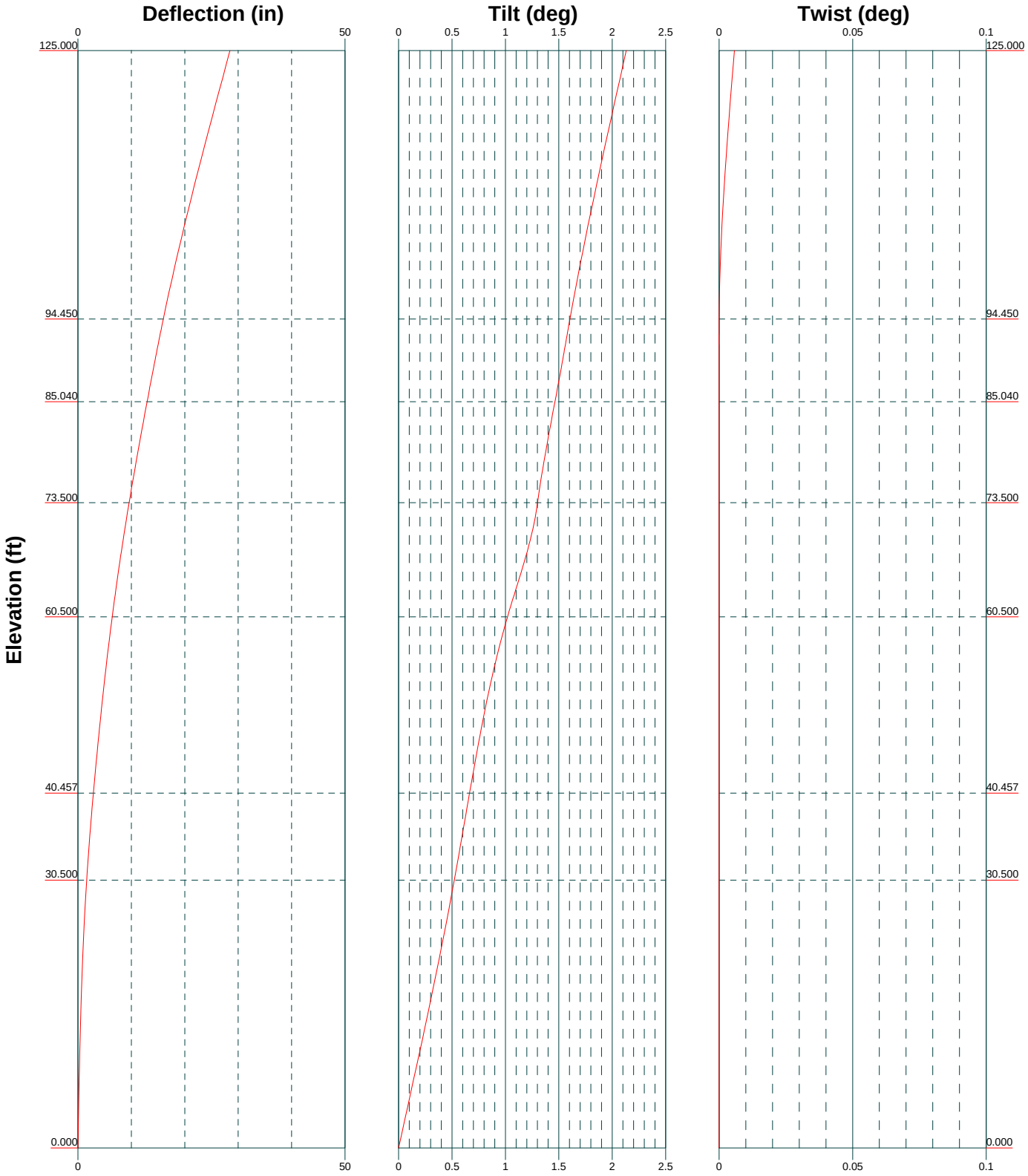
TIA/EIA-222-F - Service - 50 mph

Maximum Values



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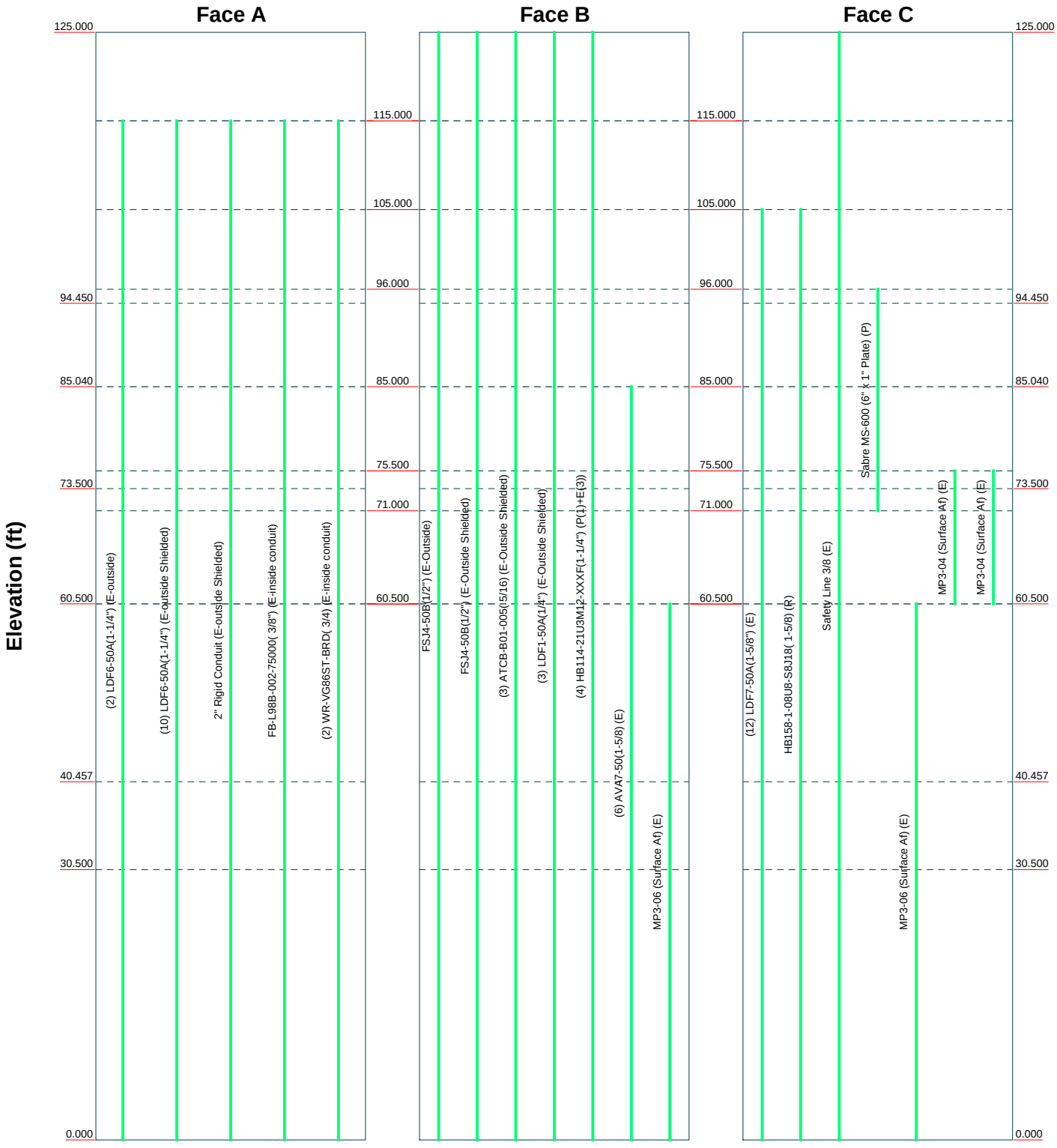
Client: Crown Castle	Drawn by: JTillson	App'd:
Code: TIA/EIA-222-F	Date: 07/22/14	Scale: NTS
Path: S:\Projects\Crown Castle\84470_876364_Cromwell\Engineering\tnxTower\84470_009_01_Cromwell_First Line Emergenc_CT_ASIeri		Dwg No. E-5

Feed Line Distribution Chart
0' - 125'

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



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Project:		
Client: Crown Castle	Drawn by: JTillson	App'd:
Code: TIA/EIA-222-F	Date: 07/22/14	Scale: NTS
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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 Middlesex County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
TOWER RATING: 98.1%.
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, feed line 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	Use TIA-222-G Tension Splice Capacity Exemption	

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	125.000-94.450	30.550	0.000	18	18.500	25.067	0.188	0.750	A572-65 (65 ksi)
L2	94.450-85.040	9.410	3.917	18	25.067	27.090	0.439	1.757	50.252378ksi (50 ksi)
L3	85.040-73.500	15.457	0.000	18	25.873	29.158	0.475	1.899	50.437105ksi (50 ksi)
L4	73.500-73.000	0.500	0.000	18	29.158	29.264	0.609	2.437	50.443179ksi

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
L5	73.000-60.500	12.500	0.000	18	29.264	31.921	0.367	1.466	(50 ksi) A572-65 (65 ksi)
L6	60.500-40.457	20.043	5.083	18	31.921	36.180	0.436	1.743	A572-65 (65 ksi)
L7	40.457-30.500	15.040	0.000	18	34.600	37.787	0.485	1.939	A572-65 (65 ksi)
L8	30.500-0.000	30.500		18	37.787	44.250	0.456	1.825	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	18.785	10.898	461.730	6.501	9.398	49.131	924.069	5.450	2.926	15.605
	25.454	14.807	1157.924	8.832	12.734	90.931	2317.371	7.405	4.082	21.77
L2	25.454	34.331	2630.769	8.743	12.734	206.592	5265.000	17.169	3.639	8.285
	27.508	37.151	3333.705	9.461	13.762	242.245	6671.796	18.579	3.995	9.096
L3	27.117	38.276	3119.391	9.016	13.143	237.334	6242.888	19.142	3.718	7.83
	29.608	43.226	4493.011	10.182	14.812	303.332	8991.935	21.617	4.296	9.048
L4	29.608	55.204	5684.267	10.135	14.812	383.756	11376.014	27.607	4.060	6.664
	29.716	55.409	5747.975	10.172	14.866	386.648	11503.512	27.710	4.078	6.694
L5	29.716	33.616	3546.548	10.259	14.866	238.565	7097.762	16.811	4.505	12.293
	32.413	36.706	4617.275	11.202	16.216	284.742	9240.626	18.357	4.973	13.569
L6	32.413	43.541	5453.050	11.177	16.216	336.283	10913.275	21.775	4.851	11.134
	36.738	49.432	7979.124	12.689	18.379	434.133	15968.747	24.720	5.601	12.855
L7	36.227	52.486	7717.450	12.111	17.577	439.073	15445.054	26.248	5.236	10.803
	38.370	57.389	10088.726	13.242	19.196	525.572	20190.728	28.700	5.797	11.96
L8	38.370	54.065	9518.850	13.252	19.196	495.884	19050.225	27.038	5.847	12.815
	44.933	63.426	15368.309	15.547	22.479	683.674	30756.839	31.719	6.985	15.308

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 125.000-94.450				1	1	1		
L2 94.450-85.040				1	1	0.93228		
L3 85.040-73.500				1	1	0.947822		
L4 73.500-73.000				1	1	0.93408		
L5 73.000-60.500				1	1	0.976519		
L6 60.500-40.457				1	1	0.959022		
L7 40.457-30.500				1	1	0.966927		
L8 30.500-0.000				1	1	0.9761		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
$$$										

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
FSJ4-50B(1/2") (E-Outside)	B	No	CaAa (Out Of Face)	125.000 - 0.000	1	No Ice	0.052	0.000
						1/2" Ice	0.152	0.001
						1" Ice	0.252	0.002
						2" Ice	0.452	0.006
						4" Ice	0.852	0.022
FSJ4-50B(1/2") (E-Outside Shielded)	B	No	CaAa (Out Of Face)	125.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.022
ATCB-B01-005(5/16) (E-Outside Shielded)	B	No	CaAa (Out Of Face)	125.000 - 0.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.021
LDF1-50A(1/4") (E-Outside Shielded)	B	No	CaAa (Out Of Face)	125.000 - 0.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.021
HB114-21U3M12-XXX F(1-1/4") (P(1)+E(3))	B	No	Inside Pole	125.000 - 0.000	4	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
$$$								
LDF6-50A(1-1/4") (E-outside)	A	No	CaAa (Out Of Face)	115.000 - 0.000	2	No Ice	0.155	0.001
						1/2" Ice	0.255	0.002
						1" Ice	0.355	0.004
						2" Ice	0.555	0.009
						4" Ice	0.955	0.028
LDF6-50A(1-1/4") (E-outside Shielded)	A	No	CaAa (Out Of Face)	115.000 - 0.000	10	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.009
						4" Ice	0.000	0.028
2" Rigid Conduit (E-outside Shielded)	A	No	CaAa (Out Of Face)	115.000 - 0.000	1	No Ice	0.000	0.003
						1/2" Ice	0.000	0.004
						1" Ice	0.000	0.006
						2" Ice	0.000	0.013
						4" Ice	0.000	0.032
FB-L98B-002-75000(3/8") (E-inside conduit)	A	No	CaAa (Out Of Face)	115.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.022
WR-VG86ST-BRD(3/4)	A	No	CaAa (Out Of	115.000 - 0.000	2	No Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
(E-inside conduit)			Face)			1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.007
						4" Ice	0.000	0.024
$$$								
LDF7-50A(1-5/8")	C	No	Inside Pole	105.000 - 0.000	12	No Ice	0.000	0.001
(E)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
HB158-1-08U8-S8J18(	C	No	Inside Pole	105.000 - 0.000	1	No Ice	0.000	0.001
1-5/8)						1/2" Ice	0.000	0.001
(R)						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
$$$								
$$$								
AVA7-50(1-5/8)	B	No	Inside Pole	85.000 - 0.000	6	No Ice	0.000	0.001
(E)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
$$$								
Safety Line 3/8	C	No	CaAa (Out Of	125.000 - 0.000	1	No Ice	0.037	0.000
(E)			Face)			1/2" Ice	0.137	0.001
						1" Ice	0.238	0.001
						2" Ice	0.437	0.002
						4" Ice	0.838	0.004
$$$								
Sabre MS-600 (6" x 1"	C	No	CaAa (Out Of	96.000 - 71.000	1	No Ice	0.167	0.000
Plate)			Face)			1/2" Ice	0.250	0.000
(P)						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000
$$$								
$$$								
MP3-06 (Surface Af)	C	No	CaAa (Out Of	60.500 - 0.000	1	No Ice	0.434	0.029
(E)			Face)			1/2" Ice	0.518	0.031
						1" Ice	0.601	0.034
						2" Ice	0.768	0.040
						4" Ice	1.101	0.057
MP3-06 (Surface Af)	B	No	CaAa (Out Of	60.500 - 0.000	1	No Ice	0.434	0.029
(E)			Face)			1/2" Ice	0.518	0.031
						1" Ice	0.601	0.034
						2" Ice	0.768	0.040
						4" Ice	1.101	0.057
$$$								
MP3-04 (Surface Af)	C	No	CaAa (Out Of	75.500 - 60.500	1	No Ice	0.268	0.014
(E)			Face)			1/2" Ice	0.352	0.016
						1" Ice	0.435	0.018
						2" Ice	0.602	0.022
						4" Ice	0.935	0.036
MP3-04 (Surface Af)	C	No	CaAa (Out Of	75.500 - 60.500	1	No Ice	0.268	0.014
(E)			Face)			1/2" Ice	0.352	0.016
						1" Ice	0.435	0.018
						2" Ice	0.602	0.022
						4" Ice	0.935	0.036
$$$								

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	125.000-94.450	A	0.000	0.000	0.000	6.371	0.246
		B	0.000	0.000	0.000	1.589	0.170
		C	0.000	0.000	0.000	1.404	0.124
L2	94.450-85.040	A	0.000	0.000	0.000	2.917	0.113
		B	0.000	0.000	0.000	0.489	0.052
		C	0.000	0.000	0.000	1.921	0.107
L3	85.040-73.500	A	0.000	0.000	0.000	3.577	0.138
		B	0.000	0.000	0.000	0.600	0.113
		C	0.000	0.000	0.000	3.429	0.187
L4	73.500-73.000	A	0.000	0.000	0.000	0.155	0.006
		B	0.000	0.000	0.000	0.026	0.005
		C	0.000	0.000	0.000	0.370	0.020
L5	73.000-60.500	A	0.000	0.000	0.000	3.875	0.149
		B	0.000	0.000	0.000	0.650	0.122
		C	0.000	0.000	0.000	7.510	0.494
L6	60.500-40.457	A	0.000	0.000	0.000	6.213	0.240
		B	0.000	0.000	0.000	9.748	0.773
		C	0.000	0.000	0.000	9.457	0.805
L7	40.457-30.500	A	0.000	0.000	0.000	3.087	0.119
		B	0.000	0.000	0.000	4.842	0.384
		C	0.000	0.000	0.000	4.698	0.400
L8	30.500-0.000	A	0.000	0.000	0.000	9.455	0.365
		B	0.000	0.000	0.000	14.833	1.177
		C	0.000	0.000	0.000	14.391	1.225

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	125.000-94.450	A	0.866	0.000	0.000	0.000	13.487	1.056
		B		0.000	0.000	0.000	6.878	0.506
		C		0.000	0.000	0.000	6.917	0.152
L2	94.450-85.040	A	0.846	0.000	0.000	0.000	6.100	0.473
		B		0.000	0.000	0.000	2.081	0.152
		C		0.000	0.000	0.000	4.839	0.115
L3	85.040-73.500	A	0.833	0.000	0.000	0.000	7.481	0.580
		B		0.000	0.000	0.000	2.552	0.235
		C		0.000	0.000	0.000	7.571	0.209
L4	73.500-73.000	A	0.825	0.000	0.000	0.000	0.320	0.025
		B		0.000	0.000	0.000	0.109	0.010
		C		0.000	0.000	0.000	0.659	0.023
L5	73.000-60.500	A	0.816	0.000	0.000	0.000	7.955	0.607
		B		0.000	0.000	0.000	2.690	0.248
		C		0.000	0.000	0.000	13.223	0.575
L6	60.500-40.457	A	0.789	0.000	0.000	0.000	12.538	0.943
		B		0.000	0.000	0.000	15.545	1.043
		C		0.000	0.000	0.000	15.254	0.900
L7	40.457-30.500	A	0.756	0.000	0.000	0.000	6.229	0.468
		B		0.000	0.000	0.000	7.722	0.518
		C		0.000	0.000	0.000	7.578	0.447
L8	30.500-0.000	A	0.750	0.000	0.000	0.000	18.605	1.367
		B		0.000	0.000	0.000	23.221	1.560
		C		0.000	0.000	0.000	22.778	1.362

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	125.000-94.450	0.005	-0.217	-0.003	-0.226
L2	94.450-85.040	-0.157	-0.216	-0.224	-0.247
L3	85.040-73.500	-0.252	-0.156	-0.333	-0.181
L4	73.500-73.000	-0.616	0.089	-0.734	0.098
L5	73.000-60.500	-0.517	0.017	-0.606	-0.001
L6	60.500-40.457	0.013	0.175	0.010	0.118
L7	40.457-30.500	0.013	0.179	0.011	0.122
L8	30.500-0.000	0.014	0.185	0.011	0.130

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
APXVTM14-C-120 w/ Mount Pipe (P)	A	From Leg	4.000 0.000 2.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.077 0.131 0.193 0.338 0.752
APXVTM14-C-120 w/ Mount Pipe (P)	B	From Leg	4.000 0.000 2.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.077 0.131 0.193 0.338 0.752
APXVTM14-C-120 w/ Mount Pipe (P)	C	From Leg	4.000 0.000 2.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.077 0.131 0.193 0.338 0.752
TD-RRH8x20-25 (P)	A	From Leg	4.000 0.000 2.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
TD-RRH8x20-25 (P)	B	From Leg	4.000 0.000 2.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
TD-RRH8x20-25 (P)	C	From Leg	4.000 0.000 2.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
LLPX310R-V1 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	125.000	No Ice 1/2" Ice	5.065 5.480	2.983 3.526	0.045 0.083

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			4.000			1" Ice	5.905	4.086	0.126
						2" Ice	6.788	5.313	0.232
						4" Ice	8.704	8.131	0.544
LLPX310R-V1 w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	125.000	No Ice 1/2" Ice	5.065 5.480	2.983 3.526	0.045 0.083
(E)			4.000			1" Ice	5.905	4.086	0.126
						2" Ice	6.788	5.313	0.232
						4" Ice	8.704	8.131	0.544
LLPX310R-V1 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	125.000	No Ice 1/2" Ice	5.065 5.480	2.983 3.526	0.045 0.083
(E)			4.000			1" Ice	5.905	4.086	0.126
						2" Ice	6.788	5.313	0.232
						4" Ice	8.704	8.131	0.544
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	125.000	No Ice 1/2" Ice	8.498 9.149	6.946 8.127	0.083 0.151
(E)			2.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	125.000	No Ice 1/2" Ice	8.498 9.149	6.946 8.127	0.083 0.151
(E)			2.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	125.000	No Ice 1/2" Ice	8.498 9.149	6.946 8.127	0.083 0.151
(E)			2.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
WIMAX DAP HEAD	A	From Leg	4.000	0.000	125.000	No Ice	1.804	0.778	0.033
(E)			0.000			1/2" Ice	1.988	0.918	0.045
			0.000			1" Ice	2.180	1.067	0.058
						2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
WIMAX DAP HEAD	B	From Leg	4.000	0.000	125.000	No Ice	1.804	0.778	0.033
(E)			0.000			1/2" Ice	1.988	0.918	0.045
			0.000			1" Ice	2.180	1.067	0.058
						2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
WIMAX DAP HEAD	C	From Leg	4.000	0.000	125.000	No Ice	1.804	0.778	0.033
(E)			0.000			1/2" Ice	1.988	0.918	0.045
			0.000			1" Ice	2.180	1.067	0.058
						2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
HORIZON COMPACT	A	From Leg	4.000	0.000	125.000	No Ice	0.841	0.429	0.012
(E)			0.000			1/2" Ice	0.966	0.525	0.018
			0.000			1" Ice	1.099	0.629	0.026
						2" Ice	1.392	0.863	0.048
						4" Ice	2.082	1.435	0.122
HORIZON COMPACT	C	From Leg	4.000	0.000	125.000	No Ice	0.841	0.429	0.012
(E)			0.000			1/2" Ice	0.966	0.525	0.018
			0.000			1" Ice	1.099	0.629	0.026
						2" Ice	1.392	0.863	0.048
						4" Ice	2.082	1.435	0.122
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	125.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	4.702	4.702	0.231
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	125.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	125.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
Platform Mount [LP 712-1]	C	None		0.000	125.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
$$$									
PCS 1900MHz 4x45W-65MHz w / Mount Pipe	A	From Leg	1.000	0.000	123.000	No Ice	2.905	3.218	0.071
			0.000			1/2" Ice	3.206	3.647	0.101
(E)			0.000			1" Ice	3.519	4.094	0.138
						2" Ice	4.187	5.064	0.225
						4" Ice	5.703	7.343	0.480
PCS 1900MHz 4x45W-65MHz w / Mount Pipe	B	From Leg	1.000	0.000	123.000	No Ice	2.905	3.218	0.071
			0.000			1/2" Ice	3.206	3.647	0.101
(E)			0.000			1" Ice	3.519	4.094	0.138
						2" Ice	4.187	5.064	0.225
						4" Ice	5.703	7.343	0.480
PCS 1900MHz 4x45W-65MHz w / Mount Pipe	C	From Leg	1.000	0.000	123.000	No Ice	2.905	3.218	0.071
			0.000			1/2" Ice	3.206	3.647	0.101
(E)			0.000			1" Ice	3.519	4.094	0.138
						2" Ice	4.187	5.064	0.225
						4" Ice	5.703	7.343	0.480
800MHZ 2X50W RRH W/FILTER w / Mount Pipe	A	From Leg	1.000	0.000	123.000	No Ice	2.586	2.731	0.073
			0.000			1/2" Ice	2.861	3.102	0.101
(E)			0.000			1" Ice	3.149	3.490	0.135
						2" Ice	3.780	4.371	0.216
						4" Ice	5.207	6.396	0.453
800MHZ 2X50W RRH W/FILTER w / Mount Pipe	B	From Leg	1.000	0.000	123.000	No Ice	2.586	2.731	0.073
			0.000			1/2" Ice	2.861	3.102	0.101
(E)			0.000			1" Ice	3.149	3.490	0.135
						2" Ice	3.780	4.371	0.216
						4" Ice	5.207	6.396	0.453
800MHZ 2X50W RRH W/FILTER w / Mount Pipe	C	From Leg	1.000	0.000	123.000	No Ice	2.586	2.731	0.073
			0.000			1/2" Ice	2.861	3.102	0.101
(E)			0.000			1" Ice	3.149	3.490	0.135
						2" Ice	3.780	4.371	0.216
						4" Ice	5.207	6.396	0.453
Side Arm Mount [SO 102-3]	C	None		0.000	123.000	No Ice	3.000	3.000	0.081
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
$$$									
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000	0.000	115.000	No Ice	8.498	6.304	0.074
			0.000			1/2" Ice	9.149	7.479	0.139
(E)			2.000			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	13.679	14.024	0.874
(3)	B	From Leg	4.000	0.000	115.000	No Ice	8.498	6.304	0.074
AM-X-CD-16-65-00T-RET			0.000			1/2" Ice	9.149	7.479	0.139
w/ Mount Pipe			2.000			1" Ice	9.767	8.368	0.212
(E)						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
(3)	C	From Leg	4.000	0.000	115.000	No Ice	8.498	6.304	0.074
AM-X-CD-16-65-00T-RET			0.000			1/2" Ice	9.149	7.479	0.139
w/ Mount Pipe			2.000			1" Ice	9.767	8.368	0.212
(E)						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
(2) DTMABP7819VG12A	A	From Leg	4.000	0.000	115.000	No Ice	1.139	0.391	0.019
(E)			0.000			1/2" Ice	1.284	0.488	0.026
			2.000			1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
(2) DTMABP7819VG12A	B	From Leg	4.000	0.000	115.000	No Ice	1.139	0.391	0.019
(E)			0.000			1/2" Ice	1.284	0.488	0.026
			2.000			1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
(2) DTMABP7819VG12A	C	From Leg	4.000	0.000	115.000	No Ice	1.139	0.391	0.019
(E)			0.000			1/2" Ice	1.284	0.488	0.026
			2.000			1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
RRUS-11	A	From Leg	4.000	0.000	115.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS-11	B	From Leg	4.000	0.000	115.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS-11	C	From Leg	4.000	0.000	115.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
DC6-48-60-18-8F	A	From Leg	4.000	0.000	115.000	No Ice	1.467	1.467	0.019
(E)			0.000			1/2" Ice	1.667	1.667	0.037
			2.000			1" Ice	1.878	1.878	0.057
						2" Ice	2.333	2.333	0.105
						4" Ice	3.378	3.378	0.239
Platform Mount [LP 303-1]	C	None		0.000	115.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
						2" Ice	31.500	31.500	2.175
						4" Ice	48.340	48.340	3.101
$$$									
BXA-70063-6CF-EDIN-0 w/	A	From Leg	4.000	0.000	105.000	No Ice	7.969	5.801	0.042
Mount Pipe			0.000			1/2" Ice	8.609	6.953	0.103
(E)			0.000			1" Ice	9.216	7.819	0.171
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.804

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-70063-6CF-EDIN-0 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.969 8.609 9.216 10.459 13.066	5.801 6.953 7.819 9.601 13.366	0.042 0.103 0.171 0.335 0.804
BXA-70063-6CF-EDIN-0 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.969 8.609 9.216 10.459 13.066	5.801 6.953 7.819 9.601 13.366	0.042 0.103 0.171 0.335 0.804
BXA-171063-8BF-EDIN-2 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.179 3.555 3.964 4.853 6.767	3.353 3.971 4.595 5.893 8.885	0.029 0.061 0.099 0.193 0.488
BXA-171063-8BF-EDIN-2 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.179 3.555 3.964 4.853 6.767	3.353 3.971 4.595 5.893 8.885	0.029 0.061 0.099 0.193 0.488
BXA-171063-8BF-EDIN-2 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.179 3.555 3.964 4.853 6.767	3.353 3.971 4.595 5.893 8.885	0.029 0.061 0.099 0.193 0.488
(2) FD9R6004/2C-3L (E)	A	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L (E)	B	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L (E)	C	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
LNX-6514DS-VTM w/ Mount Pipe (R)	A	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.568 9.220 9.838 11.104 13.754	7.004 8.185 9.081 10.904 14.926	0.059 0.127 0.204 0.384 0.890
LNX-6514DS-VTM w/ Mount Pipe (R)	B	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.568 9.220 9.838 11.104 13.754	7.004 8.185 9.081 10.904 14.926	0.059 0.127 0.204 0.384 0.890
LNX-6514DS-VTM w/ Mount Pipe (R)	C	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.568 9.220 9.838 11.104 13.754	7.004 8.185 9.081 10.904 14.926	0.059 0.127 0.204 0.384 0.890
HBX-6517DS-VTM w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	105.000	No Ice 1/2" Ice	5.541 6.112	5.021 6.223	0.045 0.092

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(R)			0.000			1" Ice	6.654	7.167	0.146
						2" Ice	7.750	9.011	0.281
						4" Ice	10.109	12.898	0.692
HBX-6517DS-VTM w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	105.000	No Ice 1/2" Ice	5.541 6.112	5.021 6.223	0.045 0.092
(R)			0.000			1" Ice	6.654	7.167	0.146
						2" Ice	7.750	9.011	0.281
						4" Ice	10.109	12.898	0.692
HBX-6517DS-VTM w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	105.000	No Ice 1/2" Ice	5.541 6.112	5.021 6.223	0.045 0.092
(R)			0.000			1" Ice	6.654	7.167	0.146
						2" Ice	7.750	9.011	0.281
						4" Ice	10.109	12.898	0.692
RRH2X40-AWS	A	From Leg	4.000	0.000	105.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2X40-AWS	B	From Leg	4.000	0.000	105.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2X40-AWS	C	From Leg	4.000	0.000	105.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
DB-T1-6Z-8AB-0Z	A	From Leg	4.000	0.000	105.000	No Ice	5.600	2.333	0.044
(R)			0.000			1/2" Ice	5.915	2.558	0.080
			0.000			1" Ice	6.240	2.791	0.120
						2" Ice	6.914	3.284	0.213
						4" Ice	8.365	4.373	0.455
Platform Mount [LP 712-1]	C	None		0.000	105.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
$$$									
$$$									
742 213 w/ Mount Pipe	A	From Leg	1.000	0.000	85.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.094
			0.000			1" Ice	6.501	6.982	0.146
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.683
742 213 w/ Mount Pipe	B	From Leg	1.000	0.000	85.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.094
			0.000			1" Ice	6.501	6.982	0.146
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.683
742 213 w/ Mount Pipe	C	From Leg	1.000	0.000	85.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.094
			0.000			1" Ice	6.501	6.982	0.146
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.683
Pipe Mount [PM 601-3]	C	None		0.000	85.000	No Ice	4.390	4.390	0.195
(E)						1/2" Ice	5.480	5.480	0.237

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
+									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2-18 (E)	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 -1.000	62.000		125.000	2.175	No Ice	3.720	0.031
									1/2" Ice	4.010	0.050
									1" Ice	4.300	0.070
									2" Ice	4.880	0.110
									4" Ice	6.040	0.200
VHLP2-11 (E)	C	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 -1.000	90.000		125.000	2.175	No Ice	3.720	0.027
									1/2" Ice	4.010	0.050
									1" Ice	4.300	0.070
									2" Ice	4.880	0.110
									4" Ice	6.040	0.190
$$$											

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

Comb. No.	Description
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	125 - 94.45	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-16.869	-0.161	1.453
			Max. Mx	5	-7.747	-368.623	-2.888
			Max. My	2	-7.702	1.337	374.922
			Max. Vy	5	17.226	-368.623	-2.888
			Max. Vx	2	-17.517	1.337	374.922
			Max. Torque	5			-0.950
L2	94.45 - 85.04	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-18.069	-0.215	1.735
			Max. Mx	5	-8.565	-464.480	-3.443
			Max. My	2	-8.523	1.582	472.447
			Max. Vy	5	17.690	-464.480	-3.443
			Max. Vx	2	-17.982	1.582	472.447
			Max. Torque	9			-0.532
L3	85.04 - 73.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-23.108	-0.305	2.527
			Max. Mx	5	-11.990	-758.462	-5.036
			Max. My	2	-11.951	2.334	771.182
			Max. Vy	5	19.941	-758.462	-5.036
			Max. Vx	2	-20.235	2.334	771.182
			Max. Torque	9			-0.563
L4	73.5 - 73	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-23.269	-0.292	2.545
			Max. Mx	5	-12.117	-768.429	-5.096
			Max. My	2	-12.079	2.371	781.309
			Max. Vy	5	19.995	-768.429	-5.096
			Max. Vx	2	-20.289	2.371	781.309
			Max. Torque	9			-0.565
L5	73 - 60.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-26.555	0.038	2.994
			Max. Mx	11	-14.540	1025.810	3.024
			Max. My	2	-14.510	3.317	1042.254
			Max. Vy	5	21.196	-1025.364	-6.560
			Max. Vx	2	-21.489	3.317	1042.254
			Max. Torque	9			-0.610

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L6	60.5 - 40.457	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-31.450	-0.132	3.180
			Max. Mx	11	-18.364	1354.091	3.223
			Max. My	2	-18.341	3.983	1374.671
			Max. Vy	5	22.737	-1353.778	-8.624
			Max. Vx	8	23.030	-4.216	-1374.148
			Max. Torque	9			-0.609
L7	40.457 - 30.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-37.841	-0.311	3.375
			Max. Mx	11	-23.454	1708.106	3.400
			Max. My	8	-23.437	-5.118	-1733.070
			Max. Vy	5	24.285	-1707.926	-10.714
			Max. Vx	8	24.576	-5.118	-1733.070
			Max. Torque	9			-0.590
L8	30.5 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-49.260	-0.697	3.742
			Max. Mx	5	-32.787	-2489.288	-14.999
			Max. My	8	-32.787	-6.923	-2524.077
			Max. Vy	5	27.006	-2489.288	-14.999
			Max. Vx	2	-27.289	5.968	2522.012
			Max. Torque	9			-0.581

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	49.260	0.010	6.926
	Max. H_x	11	32.804	26.978	0.036
	Max. H_z	2	32.804	0.043	27.268
	Max. M_x	2	2522.012	0.043	27.268
	Max. M_z	5	2489.288	-26.986	-0.109
	Max. Torsion	3	0.237	-13.430	23.646
	Min. Vert	1	32.804	0.000	0.000
	Min. H_x	5	32.804	-26.986	-0.109
	Min. H_z	8	32.804	-0.057	-27.268
	Min. M_x	8	-2524.077	-0.057	-27.268
	Min. M_z	11	-2489.188	26.978	0.036
	Min. Torsion	9	-0.552	13.389	-23.631

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	32.804	0.000	0.000	1.042	0.430	0.000
Dead+Wind 0 deg - No Ice	32.804	-0.043	-27.268	-2522.012	5.968	-0.067
Dead+Wind 30 deg - No Ice	32.804	13.430	-23.646	-2187.990	-1236.269	-0.237
Dead+Wind 60 deg - No Ice	32.804	23.316	-13.688	-1267.517	-2148.785	-0.109
Dead+Wind 90 deg - No Ice	32.804	26.986	0.109	14.999	-2489.288	0.167
Dead+Wind 120 deg - No Ice	32.804	23.370	13.718	1273.327	-2155.675	0.077
Dead+Wind 150 deg - No Ice	32.804	13.500	23.639	2189.139	-1245.236	0.154
Dead+Wind 180 deg - No Ice	32.804	0.057	27.268	2524.077	-6.923	0.409

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 210 deg - No Ice	32.804	-13.389	23.631	2188.149	1231.955	0.552
Dead+Wind 240 deg - No Ice	32.804	-23.343	13.617	1260.356	2153.150	0.039
Dead+Wind 270 deg - No Ice	32.804	-26.978	-0.036	-3.625	2489.188	-0.078
Dead+Wind 300 deg - No Ice	32.804	-23.327	-13.721	-1271.712	2151.088	0.377
Dead+Wind 330 deg - No Ice	32.804	-13.487	-23.645	-2187.851	1244.506	0.234
Dead+Ice+Temp	49.260	0.000	-0.000	-3.742	-0.697	-0.000
Dead+Wind 0 deg+Ice+Temp	49.260	-0.010	-6.926	-658.351	0.558	-0.032
Dead+Wind 30 deg+Ice+Temp	49.260	3.418	-6.005	-571.572	-322.425	-0.082
Dead+Wind 60 deg+Ice+Temp	49.260	5.933	-3.475	-332.691	-559.572	-0.057
Dead+Wind 90 deg+Ice+Temp	49.260	6.865	0.024	-0.635	-647.863	0.010
Dead+Wind 120 deg+Ice+Temp	49.260	5.945	3.481	325.884	-561.159	0.002
Dead+Wind 150 deg+Ice+Temp	49.260	3.434	6.003	563.695	-324.485	0.036
Dead+Wind 180 deg+Ice+Temp	49.260	0.013	6.926	650.680	-2.399	0.109
Dead+Wind 210 deg+Ice+Temp	49.260	-3.409	6.001	563.461	319.813	0.152
Dead+Wind 240 deg+Ice+Temp	49.260	-5.939	3.459	322.905	558.949	0.041
Dead+Wind 270 deg+Ice+Temp	49.260	-6.863	-0.008	-4.906	646.217	0.010
Dead+Wind 300 deg+Ice+Temp	49.260	-5.936	-3.482	-333.658	558.482	0.101
Dead+Wind 330 deg+Ice+Temp	49.260	-3.431	-6.004	-571.545	322.694	0.052
Dead+Wind 0 deg - Service	32.804	-0.015	-9.435	-873.187	2.362	-0.023
Dead+Wind 30 deg - Service	32.804	4.647	-8.182	-757.442	-428.060	-0.084
Dead+Wind 60 deg - Service	32.804	8.068	-4.737	-438.497	-744.221	-0.039
Dead+Wind 90 deg - Service	32.804	9.338	0.038	5.876	-862.194	0.059
Dead+Wind 120 deg - Service	32.804	8.087	4.747	441.869	-746.617	0.028
Dead+Wind 150 deg - Service	32.804	4.671	8.180	759.198	-431.170	0.054
Dead+Wind 180 deg - Service	32.804	0.020	9.435	875.256	-2.105	0.143
Dead+Wind 210 deg - Service	32.804	-4.633	8.177	758.847	427.151	0.193
Dead+Wind 240 deg - Service	32.804	-8.077	4.712	437.368	746.321	0.013
Dead+Wind 270 deg - Service	32.804	-9.335	-0.013	-0.579	862.747	-0.027
Dead+Wind 300 deg - Service	32.804	-8.072	-4.748	-439.954	745.611	0.133
Dead+Wind 330 deg - Service	32.804	-4.667	-8.182	-757.398	431.505	0.083

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-32.804	0.000	0.000	32.804	0.000	0.000%
2	-0.043	-32.804	-27.268	0.043	32.804	27.268	0.000%
3	13.430	-32.804	-23.646	-13.430	32.804	23.646	0.000%
4	23.316	-32.804	-13.688	-23.316	32.804	13.688	0.000%
5	26.986	-32.804	0.109	-26.986	32.804	-0.109	0.000%
6	23.370	-32.804	13.718	-23.370	32.804	-13.718	0.000%
7	13.500	-32.804	23.639	-13.500	32.804	-23.639	0.000%
8	0.057	-32.804	27.268	-0.057	32.804	-27.268	0.000%
9	-13.389	-32.804	23.631	13.389	32.804	-23.631	0.000%
10	-23.343	-32.804	13.617	23.343	32.804	-13.617	0.000%
11	-26.978	-32.804	-0.036	26.978	32.804	0.036	0.000%
12	-23.327	-32.804	-13.721	23.327	32.804	13.721	0.000%
13	-13.487	-32.804	-23.645	13.487	32.804	23.645	0.000%
14	0.000	-49.260	0.000	-0.000	49.260	0.000	0.000%
15	-0.010	-49.260	-6.926	0.010	49.260	6.926	0.000%
16	3.418	-49.260	-6.005	-3.418	49.260	6.005	0.000%
17	5.933	-49.260	-3.475	-5.933	49.260	3.475	0.000%
18	6.865	-49.260	0.024	-6.865	49.260	-0.024	0.000%
19	5.945	-49.260	3.481	-5.945	49.260	-3.481	0.000%
20	3.434	-49.260	6.003	-3.434	49.260	-6.003	0.000%
21	0.013	-49.260	6.926	-0.013	49.260	-6.926	0.000%
22	-3.409	-49.260	6.001	3.409	49.260	-6.001	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
23	-5.939	-49.260	3.459	5.939	49.260	-3.459	0.000%
24	-6.863	-49.260	-0.008	6.863	49.260	0.008	0.000%
25	-5.936	-49.260	-3.482	5.936	49.260	3.482	0.000%
26	-3.431	-49.260	-6.004	3.431	49.260	6.004	0.000%
27	-0.015	-32.804	-9.435	0.015	32.804	9.435	0.000%
28	4.647	-32.804	-8.182	-4.647	32.804	8.182	0.000%
29	8.068	-32.804	-4.737	-8.068	32.804	4.737	0.000%
30	9.338	-32.804	0.038	-9.338	32.804	-0.038	0.000%
31	8.087	-32.804	4.747	-8.087	32.804	-4.747	0.000%
32	4.671	-32.804	8.180	-4.671	32.804	-8.180	0.000%
33	0.020	-32.804	9.435	-0.020	32.804	-9.435	0.000%
34	-4.633	-32.804	8.177	4.633	32.804	-8.177	0.000%
35	-8.077	-32.804	4.712	8.077	32.804	-4.712	0.000%
36	-9.335	-32.804	-0.013	9.335	32.804	0.013	0.000%
37	-8.072	-32.804	-4.748	8.072	32.804	4.748	0.000%
38	-4.667	-32.804	-8.182	4.667	32.804	8.182	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	0.00043426
3	Yes	6	0.00000001	0.00004481
4	Yes	6	0.00000001	0.00004541
5	Yes	4	0.00000001	0.00080934
6	Yes	6	0.00000001	0.00004547
7	Yes	6	0.00000001	0.00004516
8	Yes	4	0.00000001	0.00038907
9	Yes	6	0.00000001	0.00004564
10	Yes	6	0.00000001	0.00004504
11	Yes	4	0.00000001	0.00031240
12	Yes	6	0.00000001	0.00004586
13	Yes	6	0.00000001	0.00004501
14	Yes	4	0.00000001	0.00006405
15	Yes	5	0.00000001	0.00048968
16	Yes	5	0.00000001	0.00062559
17	Yes	5	0.00000001	0.00062658
18	Yes	5	0.00000001	0.00047988
19	Yes	5	0.00000001	0.00061620
20	Yes	5	0.00000001	0.00061690
21	Yes	5	0.00000001	0.00048093
22	Yes	5	0.00000001	0.00061365
23	Yes	5	0.00000001	0.00061031
24	Yes	5	0.00000001	0.00047907
25	Yes	5	0.00000001	0.00062771
26	Yes	5	0.00000001	0.00062689
27	Yes	4	0.00000001	0.00014403
28	Yes	5	0.00000001	0.00011368
29	Yes	5	0.00000001	0.00011604
30	Yes	4	0.00000001	0.00015516
31	Yes	5	0.00000001	0.00011631
32	Yes	5	0.00000001	0.00011524
33	Yes	4	0.00000001	0.00017011
34	Yes	5	0.00000001	0.00011788
35	Yes	5	0.00000001	0.00011416

36	Yes	4	0.00000001	0.00013815
37	Yes	5	0.00000001	0.00011856
38	Yes	5	0.00000001	0.00011497

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 94.45	28.464	27	2.134	0.003
L2	94.45 - 85.04	15.992	27	1.604	0.001
L3	88.957 - 73.5	14.194	33	1.522	0.001
L4	73.5 - 73	9.583	33	1.302	0.001
L5	73 - 60.5	9.447	33	1.296	0.001
L6	60.5 - 40.457	6.417	33	1.019	0.000
L7	45.54 - 30.5	3.665	33	0.738	0.000
L8	30.5 - 0	1.638	33	0.522	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.000	APXVTM14-C-120 w/ Mount Pipe	27	28.464	2.134	0.003	11144
124.000	VHLP2-18	27	28.022	2.115	0.003	11144
123.000	PCS 1900MHz 4x45W-65MHz w / Mount Pipe	27	27.581	2.097	0.003	11144
115.000	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	27	24.082	1.951	0.002	5572
105.000	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	27	19.915	1.774	0.001	2785
85.000	742 213 w/ Mount Pipe	33	12.952	1.464	0.001	5089

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 94.45	81.960	2	6.144	0.009
L2	94.45 - 85.04	46.097	2	4.621	0.003
L3	88.957 - 73.5	40.919	8	4.387	0.003
L4	73.5 - 73	27.631	8	3.754	0.002
L5	73 - 60.5	27.239	8	3.735	0.002
L6	60.5 - 40.457	18.504	8	2.939	0.001
L7	45.54 - 30.5	10.568	8	2.129	0.001
L8	30.5 - 0	4.722	8	1.504	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.000	APXVTM14-C-120 w/ Mount Pipe	2	81.960	6.144	0.009	3951
124.000	VHLP2-18	2	80.690	6.091	0.009	3951
123.000	PCS 1900MHz 4x45W-65MHz w / Mount Pipe	2	79.421	6.038	0.008	3951
115.000	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	2	69.363	5.618	0.006	1975
105.000	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	2	57.384	5.111	0.005	985
85.000	742 213 w/ Mount Pipe	8	37.339	4.220	0.003	1787

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	125 - 94.45 (1)	TP25.067x18.5x0.188	30.550	0.000	0.0	39.000	14.807	-7.702	577.454	0.013
L2	94.45 - 85.04 (2)	TP27.09x25.067x0.439	9.410	0.000	0.0	30.151	35.977	-8.523	1084.760	0.008
L3	85.04 - 73.5 (3)	TP29.158x25.873x0.475	15.457	0.000	0.0	30.262	43.227	-11.951	1308.130	0.009
L4	73.5 - 73 (4)	TP29.264x29.158x0.609	0.500	0.000	0.0	30.266	55.409	-12.079	1677.000	0.007
L5	73 - 60.5 (5)	TP31.921x29.264x0.367	12.500	0.000	0.0	39.000	36.706	-14.510	1431.540	0.010
L6	60.5 - 40.457 (6)	TP36.18x31.921x0.436	20.043	0.000	0.0	39.000	47.938	-18.341	1869.570	0.010
L7	40.457 - 30.5 (7)	TP37.787x34.6x0.485	15.040	0.000	0.0	39.000	57.389	-23.437	2238.190	0.010
L8	30.5 - 0 (8)	TP44.25x37.787x0.456	30.500	0.000	0.0	39.000	63.426	-32.786	2473.600	0.013

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	125 - 94.45 (1)	TP25.067x18.5x0.188	374.925	49.478	39.000	1.269	0.000	0.000	39.000	0.000
L2	94.45 - 85.04 (2)	TP27.09x25.067x0.439	472.450	24.969	30.151	0.828	0.000	0.000	30.151	0.000
L3	85.04 - 73.5 (3)	TP29.158x25.873x0.475	771.185	30.509	30.262	1.008	0.000	0.000	30.262	0.000
L4	73.5 - 73 (4)	TP29.264x29.158x0.609	781.313	24.249	30.266	0.801	0.000	0.000	30.266	0.000
L5	73 - 60.5 (5)	TP31.921x29.264x0.367	1042.258	43.924	39.000	1.126	0.000	0.000	39.000	0.000
L6	60.5 - 40.457 (6)	TP36.18x31.921x0.436	1374.675	40.418	39.000	1.036	0.000	0.000	39.000	0.000
L7	40.457 - 30.5 (7)	TP37.787x34.6x0.485	1733.075	39.570	39.000	1.015	0.000	0.000	39.000	0.000
L8	30.5 - 0 (8)	TP44.25x37.787x0.456	2524.083	44.303	39.000	1.136	0.000	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	125 - 94.45 (1)	TP25.067x18.5x0.188	17.517	1.183	26.000	0.091	0.013	0.001	26.000	0.000
L2	94.45 - 85.04 (2)	TP27.09x25.067x0.439	17.982	0.500	20.101	0.050	0.009	0.000	20.101	0.000
L3	85.04 - 73.5 (3)	TP29.158x25.873x0.475	20.235	0.468	20.175	0.046	0.018	0.000	20.175	0.000
L4	73.5 - 73 (4)	TP29.264x29.158x0.609	20.289	0.366	20.177	0.036	0.020	0.000	20.177	0.000
L5	73 - 60.5 (5)	TP31.921x29.264x0.367	21.489	0.585	26.000	0.045	0.074	0.002	26.000	0.000
L6	60.5 - 40.457 (6)	TP36.18x31.921x0.436	23.030	0.480	26.000	0.037	0.072	0.001	26.000	0.000
L7	40.457 - 30.5 (7)	TP37.787x34.6x0.485	24.576	0.428	26.000	0.033	0.414	0.005	26.000	0.000
L8	30.5 - 0 (8)	TP44.25x37.787x0.456	27.289	0.430	26.000	0.033	0.409	0.003	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	125 - 94.45 (1)	0.013	1.269	0.000	0.091	0.000	1.284 ✔	1.333	H1-3+VT ✔
L2	94.45 - 85.04 (2)	0.008	0.828	0.000	0.050	0.000	0.837 ✔	1.333	H1-3+VT ✔
L3	85.04 - 73.5 (3)	0.009	1.008	0.000	0.046	0.000	1.018 ✔	1.333	H1-3+VT ✔
L4	73.5 - 73 (4)	0.007	0.801	0.000	0.036	0.000	0.809 ✔	1.333	H1-3+VT ✔
L5	73 - 60.5 (5)	0.010	1.126	0.000	0.045	0.000	1.137 ✔	1.333	H1-3+VT ✔
L6	60.5 - 40.457 (6)	0.010	1.036	0.000	0.037	0.000	1.047 ✔	1.333	H1-3+VT ✔
L7	40.457 - 30.5 (7)	0.010	1.015	0.000	0.033	0.000	1.025 ✔	1.333	H1-3+VT ✔
L8	30.5 - 0 (8)	0.013	1.136	0.000	0.033	0.000	1.150 ✔	1.333	H1-3+VT ✔

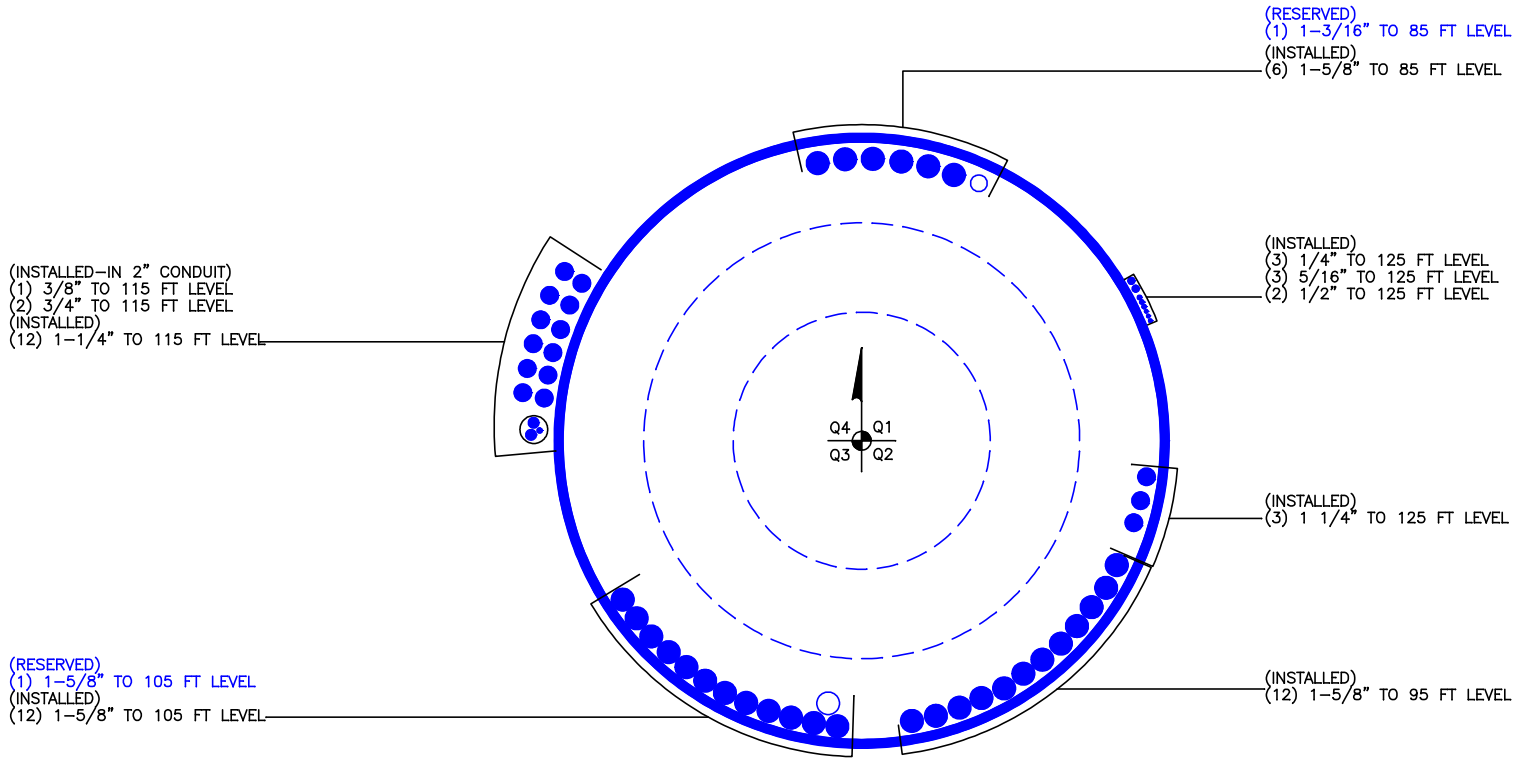
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
L1	125 - 94.45	Pole	TP25.067x18.5x0.188	1	-7.702	769.746	**	**
L2	94.45 - 85.04	Pole	TP27.09x25.067x0.439	2	-8.523	1445.985	**	**
L3	85.04 - 73.5	Pole	TP29.158x25.873x0.475	3	-11.951	1743.737	**	**
L4	73.5 - 73	Pole	TP29.264x29.158x0.609	4	-12.079	2235.441	**	**
L5	73 - 60.5	Pole	TP31.921x29.264x0.367	5	-14.510	1908.243	**	**
L6	60.5 - 40.457	Pole	TP36.18x31.921x0.436	6	-18.341	2492.137	**	**
L7	40.457 - 30.5	Pole	TP37.787x34.6x0.485	7	-23.437	2983.507	**	**
L8	30.5 - 0	Pole	TP44.25x37.787x0.456	8	-32.786	3297.309	**	**
							Summary	
						Pole (L1)	98.1	Pass
						RATING =	**98.1**	**Pass**

**See additional calculations

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876364 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Reinforcement 1						
Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	30.5	3	MP406	F	0	T&C
30.5	60.5	3	MP406	F	0	T&C
60.5	73.5	3	MP404	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 2						
Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
73	87.45	3	MS-600	F	0	T&C
87.45	94.45	3	MS-600	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 3						
Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

	Bottom Elevation	Top Elevation	Original Thickness	Original Yield Stress	Original Ultimate Stress	Reinforced Shaft Capacity	Reinf. 1 QTY	Reinf. 1 Type	Rein. 1 Capacity	Reinf. 2 QTY	Reinf. 2 Type	Rein. 2 Capacity	Reinf. 3 QTY	Reinf. 3 Type	Rein. 3 Capacity	Control Stress Ratio	Top Height	Section Length	Lap Splice	# of Sides	Top Diameter	Bottom Diameter	Equivalent Shaft Thickness	Equivalent Shaft Fy	Equivalent Weight Mult.
1	94.4500	125.0000	0.1875	65	80	98.1%										**98.1%**	125.0000	30.5500	0.0000	18	18.5000	25.0672	0.1875	65.0	1.00
2	85.0400	94.4500	0.1875	65	80	49.2%				3	MS-600	62.5%				**62.5%**	94.4500	9.4100	3.9170	18	25.0672	27.0900	0.4392	50.3	0.93
3	73.5000	88.9570	0.2500	65	80	59.8%				3	MS-600	76.0%				**76.0%**	88.9570	15.4570	0.0000	18	25.8730	29.1578	0.4748	50.4	0.95
4	73.0000	73.5000	0.2500	65	80	47.7%	3	MP404	43.9%	3	MS-600	60.4%				**60.4%**	73.5000	0.5000	0.0000	18	29.1578	29.2641	0.6092	50.4	0.93
5	60.5000	73.0000	0.2500	65	80	87.0%	3	MP404	83.1%							**87.0%**	73.0000	12.5000	0.0000	18	29.2641	31.9205	0.3665	65.0	0.98
6	40.4570	60.5000	0.2500	65	80	80.1%	3	MP406	76.5%							**80.1%**	60.5000	20.0430	5.0830	18	31.9205	36.1800	0.4357	65.0	0.96
7	30.5000	45.5400	0.3125	65	80	78.2%	3	MP406	74.5%							**78.2%**	45.5400	15.0400	0.0000	18	34.5998	37.7869	0.4847	65.0	0.97
8	0.0000	30.5000	0.3125	65	80	87.2%	3	MP406	82.7%							**87.2%**	30.5000	30.5000	0.0000	18	37.7869	44.2500	0.4563	65.0	0.98
9																									
10																									
11																									
12																									
13																									
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25																									
26																									
27																									
28																									
29																									
30																									

	Top Elevation Failure	Bottom Elevation Failure	Section Failure %
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

Reinforcement Capacity

AeroSolutions LLC
Optimizing Your Tower Infrastructure
5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
Model	*Wt*	*A*	*Ix*	*Iy*	*Y*	*X*	*Tw*	*W*	*Wf*	*Tf*	*Dh*	*Fy*	*Fu*	*Kx*	*Lx*	*Ky*	*Ly*	*PAll*	*PAll.inc*	*Ptype.ASD*	*phiPn*	*Ptype.LRFD*
MP404	12.1	3.56	0.17	6.70	0.375	0	0.75	4.75	0	0	1.21875	100	110	0.80	14	1.00	14	143.1	190.8	Rupture	**214.6**	Rupture
MP406	20.7	6.09	0.79	12.07	0.625	0	1.25	4.875	0	0	1.21875	100	110	0.80	23	1.00	23	247.1	329.4	Rupture	**370.6**	Rupture
MS-600	20.4	6.00	0.50	18.00	0.5	0	1	6	0	0	1.21875	65	80	0.80	16.375	1.00	16.375	187.8	250.4	Compress.	283.1	Rupture

Rein1

Bottom	Top	Qty	Model	Position	T or T&C
0	30.5	3	MP406	F	T&C
30.5	60.5	3	MP406	F	T&C
60.5	73.5	3	MP404	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Flats (Used for relative orientation only. Actual flat numbers may vary.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		1						1						1			
			1						1						1		
		1						1						1			

Rein2

Bottom	Top	Qty	Model	Position	T or T&C
73	87.45	3	MS-600	F	T&C
87.45	94.45	3	MS-600	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1						1						1					
	1						1						1				

Rein3

Bottom	Top	Qty	Model	Position	T or T&C
0				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Anchor Rod Information for TIA/EIA-222-F and TIA-222-G-2

Site Information	
ID:	876364
Name:	CROMWELL - FIRST LINE EMERGENC
App. #:	245691Revision # 5

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Base Reactions		
Moment:	2554	ft-kip
Axial:	26	kip
Shear:	27	kip
Base Plate Type:	Circular	

Design Information	
TIA Code:	F
ASIF:	1.333
Failure:	100%
eta Factor:	0.50

Original Anchor Rod Data

Quantity:	12	
Diameter:	2.25	in
Material:	#18J	
Bolt Circle:	53.0	in
Bolt Spacing:		in
Bolt Group Area:	47.71	in^2
Bolt Group MOIx:	16753	in^4

Reactions Seen by Original AR Group

Moment:	2141.9	kip-ft
Axial:	26.3	kip
Shear:	27.3	kip

Original AR Capacity Check

Tension Load:	159.5	kip
Allowable load:	194.8	kip
AR Capacity:	81.9%	Pass

First Added Anchor Rod Data

Quantity:	3	
Diameter:	1.75	in
Material:	A193 B7	
Bolt Circle:	59.8	in
Bolt Group Area:	7.22	in^2
Bolt Group MOIx:	3220	in^4

Reactions Seen by First Added AR Group

Moment:	411.7	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

First Added AR Capacity Check

Tension Load:	110.2	kip
Allowable load:	132.3	kip
AR Capacity:	83.4%	Pass

Second Added Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Third Added Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

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

TIA Rev F

Site Data

BU#:	*876364*
Site Name:	*CROMWELL - FIRST LINE*
App #:	*245691Revision # 5*
Pole Manufacturer:	*Other*

Reactions		
Moment:	2141.93	ft-kips
Axial:	26.3366	kips
Shear:	27.301961	kips

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	53	in

Plate Data		
Diam:	59	in
Thick:	1.75	in
Grade:	60	ksi
Single-Rod B-eff:	11.70	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.625	in
Fillet V. Weld:	0.375	in
Width:	7	in
Height:	22	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	44.25	in
Thick:	0.3125	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

		Stiffened
Maximum Rod Tension:	159.5 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	81.8% **Pass**	

Base Plate Results

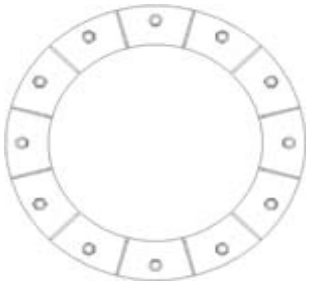
	Flexural Check	Stiffened
Base Plate Stress:	48.2 ksi	Service, ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	80.4% **Pass**	Y.L. Length: N/A, Roark

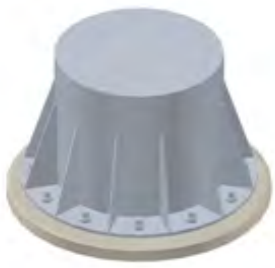
Stiffener Results

Horizontal Weld :	71.3% **Pass**
Vertical Weld:	37.9% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	14.8% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	61.9% **Pass**
Plate Comp. (AISC Bracket):	62.6% **Pass**

Pole Results

Pole Punching Shear Check:	11.8% **Pass**





* 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

PROJECT	**876364 - CROMWELL / FIRST LINE EMERGENC, CT**				
SUBJECT	**Foundation Analysis**				
DATE	**07/22/14**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74159
(918) 587-4630

Monopole Pad & Pier Foundation Analysis

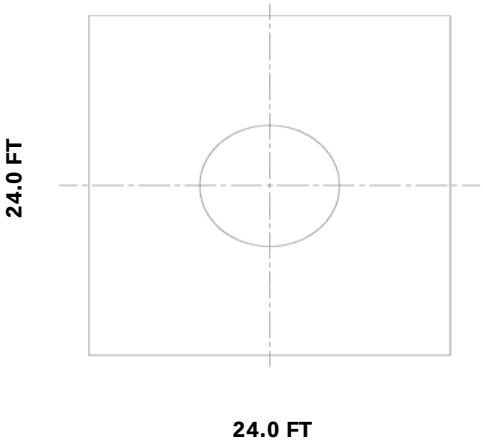
Rev. Type: F

Design Loads:

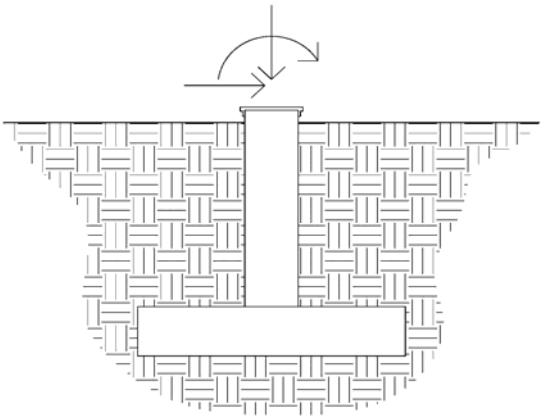
	Input unfactored loads	
Shear:	27.0	kips
Moment:	2,524.0	ft-kips
Tower Height:	125.0	ft
Tower Weight:	33.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	44.25	in
Bearing Depth:	5.0	ft
Pad Width:	24.0	ft
Neglected Depth:	3.3	ft
Thickness:	3.0	ft
Pier Diameter:	14.0	ft
Pier Height Above Grade:	1.0	ft
BP Dist. Above Pier:	0.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	8	
Pier Rebar Quanity:	24	
Pad Rebar Size:	8	
Pad Rebar Quanity:	30	
Pier Tie Size:	4	
Tie Quanity:	4	
Rebar Yield Strength:	60000	psi
Concrete Strength:	3000	psi
Concrete Unit Weight:	0.15	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.125	kcf
Ult. Bearing Capacity:	8.000	ksf
Angle of Friction:	30.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.300	

Summary of Results

Req'd Pier Diam.	OK
Overturning	77.7%
Shear Capacity	37.4%
Bearing	41.7%
Pad Shear - 1-way	18.2%
Pad Shear - 2-way	6.6%
Pad Moment Capacity	13.0%
Pier Moment Capacity	48.2%

** Notes: