

Date: **March 22, 2017**

Charles McGuirt
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277



Crown Castle
2000 Corporate Drive
Canonsburg, PA, 15317
(724) 416-9160

Subject: **Structural Analysis Report**

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: CT5841
Carrier Site Name: Durham Central

Crown Castle Designation: **Crown Castle BU Number:** 806364
Crown Castle Site Name: HRT 106(B) 943202
Crown Castle JDE Job Number: 430682
Crown Castle Work Order Number: 1378401
Crown Castle Application Number: 383797 Rev. 1

Engineering Firm Designation: **Crown Castle Project Number:** 1378401

Site Data: **143 R Old Blue Hill Road, DURHAM, Middlesex County, CT**
Latitude 41° 27' 33.67", Longitude -72° 39' 45.83"
120 Foot - Monopole Tower

Dear Charles McGuirt,

Crown Castle 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 1378401, in accordance with application 383797, revision 1.

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

LC7: Existing + Reserved + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

All modifications and 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 *Crown Castle* 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.

Structural analysis prepared by: Michael Lopienski, E.I.T. / AGH

Respectfully submitted by:

Bradley E. Byrom, P.E., S.E.
Senior Project Engineer

tnxTower Report - version 7.0.5.1

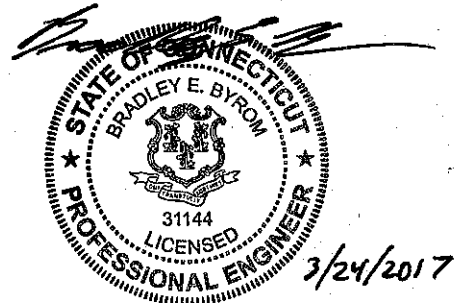


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1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by VALMONT in March of 1994. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-E.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 101 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B.

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
114.0	114.0	6	andrew	SBNHH-1D65A w/ Mount Pipe	4 2 6	3/8 3/4 1-5/8	-
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 32 B2			
		1	raycap	DC6-48-60-18-8C			
		1	tower mounts	Sabre-C10-116-912			
		1	tower mounts	Sabre-C10-851-001			
		1	tower mounts	Sabre-C10-112-300			

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
118.0	125.0	1	decibel	DB809MT3-XT	3	7/8	1
	123.0	1	decibel	DB201-A			
	118.0	2	tower mounts	Side Arm Mount [SO 701-1]			
107.0	107.0	1	gabriel electronics	GLF6-450	1	7/8	1
		1	tower mounts	Pipe Mount [PM 601-1]			
98.0	100.0	3	alcatel lucent	B13 RRH4X30-4R	12 1	1-5/8	2
		3	alcatel lucent	B66A RRH4X45			
		6	andrew	SBNHH-1D65B w/ Mount Pipe			
		1	antel	LPA-80080/6CF w/ Mount Pipe			
		2	raycap	RXXDC-3315-PF-48			
		3	alcatel lucent	RRH2X60-PCS			
	5	antel	LPA-80080/6CF w/ Mount Pipe				
98.0	1	tower mounts	Platform Mount [LP 602-1]				
87.0	89.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1-1/4	1
	87.0	1	tower mounts	Platform Mount [LP 602-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
73.0	79.0	1	decibel	DB636-C	1	7/8	1
	74.0	6	ericsson	RRUS 11	1 2 12 1	3/8 3/4 7/8 2" Conduit	3
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		6	powerwave technologies	LGP21903			
	1	raycap	DC6-48-60-18-8F				
73.0	1	tower mounts	Platform Mount [LP 1201-1]	-	-	1	
50.0	57.0	1	rfs celwave	PD1142-1	1 3	1/2 7/8	1
	54.0	1	decibel	ASP-655			
	53.0	1	celwave	PD1121-6			
	50.0	1	decibel	DB492A			
		1	tower mounts	Side Arm Mount [SO 701-3]			
40.0	41.0	1	tekelec systemes	EPSILON GPS ANTENNA 35 DB	1 1	1/2 2" conduit	1
	40.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment to be Removed, Not Considered in this Analysis

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)
97	97	12	-	8RL41OC4R105	-	-
87	87	9	-	8RL41OC4R105	-	-
75	75	1	-	ASP710	-	-
		1	Telewave	450F6 Antenna		
50	50	1	-	ASP701	-	-
		1	-	ASP710		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti	262150	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	SAC	297341	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	262153	CCISITES
4-TOWER EXTENSION DESIGN	Valmont	942187	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), 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) 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. Crown Castle 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	120 - 100	Pole	TP20.263x15.0403x0.1875	1	-3.63	829.59	25.0	Pass
L2	100 - 47.0833	Pole	TP33.13x20.263x0.2813	2	-16.63	1920.74	71.0	Pass
L3	47.0833 - 0	Pole	TP44x31.372x0.375	3	-29.31	3477.10	66.5	Pass
							Summary	
						Pole (L2)	71.0	Pass
						Rating =	71.0	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	100.0	36.6	Pass
1	Flange Plate		10.0	Pass
1	Anchor Rods	0	62.4	Pass
1	Base Plate	0	33.8	Pass
1	Base Foundation	0	24.3	Pass
1	Base Foundation Soil Interaction	0	26.7	Pass

Structure Rating (max from all components) =	71.0%
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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

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DB809MT3-XT	118	(2) SBNHH-1D65B w/ Mount Pipe	98
DB201-A	118	(2) SBNHH-1D65B w/ Mount Pipe	98
6' x 2" Mount Pipe	118	LPA-80080/6CF w/ Mount Pipe	98
6' x 2" Mount Pipe	118	B13 RRH4X30-4R	98
Side Arm Mount [SO 102-3]	118	B13 RRH4X30-4R	98
Side Arm Mount [SO 701-1]	118	B13 RRH4X30-4R	98
Side Arm Mount [SO 701-1]	118	B66A RRH4X45	98
(2) SBNHH-1D65A w/ Mount Pipe	114	B66A RRH4X45	98
(2) SBNHH-1D65A w/ Mount Pipe	114	B66A RRH4X45	98
(2) SBNHH-1D65A w/ Mount Pipe	114	(2) RXXDC-3315-PF-48	98
RRUS 11	114	Platform Mount [LP 602-1]	98
RRUS 11	114	(2) LPA-80080/6CF w/ Mount Pipe	98
RRUS 11	114	(2) DB980H90E-M w/ Mount Pipe	87
RRUS 32 B2	114	(2) DB980H90E-M w/ Mount Pipe	87
RRUS 32 B2	114	6' x 2" Mount Pipe	87
RRUS 32 B2	114	Platform Mount [LP 602-1]	87
DC6-48-60-18-8C	114	(2) DB980H90E-M w/ Mount Pipe	87
Miscellaneous [NA 507-1]	114	6' x 2" Mount Pipe	73
Side Arm Mount [SO 102-3]	114	Platform Mount [LP 1201-1]	73
Platform Mount [LP 601-1]	114	DB636-C	73
Pipe Mount [PM 601-1]	107	DB492A	50
GLF6-450	107	ASP-655	50
(2) LPA-80080/6CF w/ Mount Pipe	98	PD1121-6	50
LPA-80080/6CF w/ Mount Pipe	98	Side Arm Mount [SO 701-3]	50
RRH2X60-PCS	98	PD1142-1	50
RRH2X60-PCS	98	Side Arm Mount [SO 701-1]	40
RRH2X60-PCS	98	EPSILON GPS ANTENNA 35 DB	40
(2) SBNHH-1D65B w/ Mount Pipe	98		

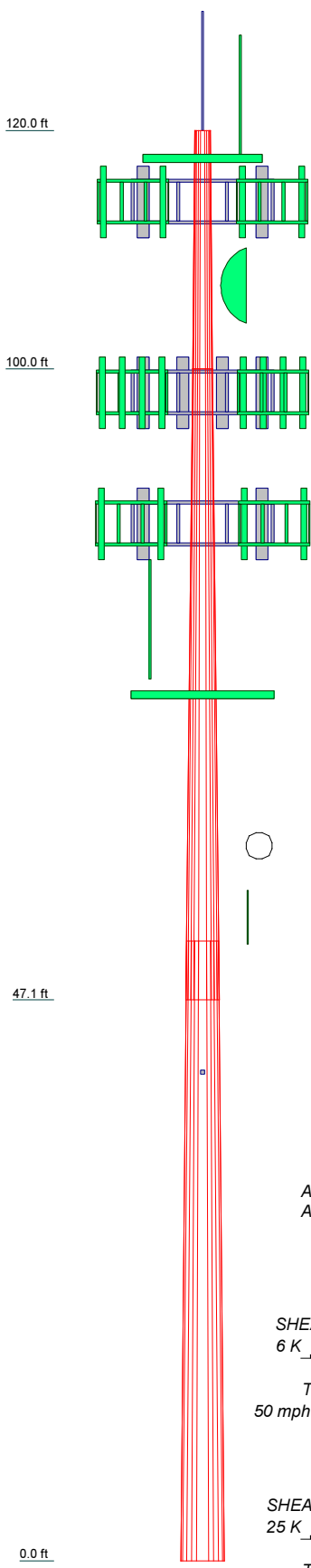
MATERIAL STRENGTH

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

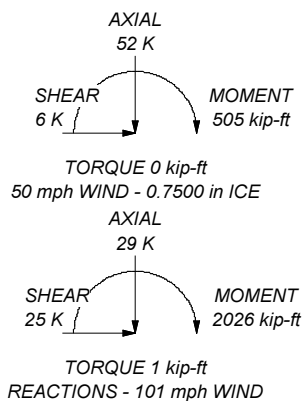
TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 71%

Section	1	2	3
Length (ft)	20.00	52.92	52.00
Number of Sides	12	12	12
Thickness (in)	0.1875	0.2813	0.3750
Socket Length (ft)		4.92	31.3720
Top Dia (in)	15.0403	20.2630	44.0000
Bot Dia (in)	20.2630	33.1300	
Grade		A572-65	
Weight (K)	0.7	4.3	8.0



ALL REACTIONS ARE FACTORED



Crown Castle
 2000 Corporate Drive
 Canonsburg, PA, 15317
 Phone: (724) 416-9160
 FAX:

Job: BU# 806364		
Project:	Client: CCI	App'd:
Code: TIA-222-G	Drawn by: MLopienski	Scale: NTS
Path:	Date: 03/22/17	Dwg No. E-1

R:\SA Models - Letters\Work Area\MLopienski\WPI\806364 WO 1378401\806364.dwg

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- 4) Tower is located in Middlesex County, Connecticut.
- 5) Basic wind speed of 101 mph.
- 6) Structure Class II.
- 7) Exposure Category B.
- 8) Topographic Category 1.
- 9) Crest Height 0.00 ft.
- 10) Nominal ice thickness of 0.7500 in.
- 11) Ice thickness is considered to increase with height.
- 12) Ice density of 56.00 pcf.
- 13) A wind speed of 50 mph is used in combination with ice.
- 14) Deflections calculated using a wind speed of 60 mph.
- 15) A non-linear (P-delta) analysis was used.
- 16) Pressures are calculated at each section.
- 17) Stress ratio used in pole design is 1.
- 18) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
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Tapered Pole Section Geometry

Section	Elevation <i>ft</i>	Section Length <i>ft</i>	Splice Length <i>ft</i>	Number of Sides	Top Diameter <i>in</i>	Bottom Diameter <i>in</i>	Wall Thickness <i>in</i>	Bend Radius <i>in</i>	Pole Grade
L1	120.00-100.00	20.00	0.00	12	15.0403	20.2630	0.1875	0.7500	A572-65 (65 ksi)
L2	100.00-47.08	52.92	4.92	12	20.2630	33.1300	0.2813	1.1250	A572-65 (65 ksi)
L3	47.08-0.00	52.00		12	31.3720	44.0000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	15.5709	8.9674	252.5039	5.3173	7.7909	32.4102	511.6414	4.4135	3.5283	18.818
	20.9778	12.1206	623.5083	7.1870	10.4962	59.4030	1263.3968	5.9654	4.9280	26.283
L2	20.9778	18.0960	922.2208	7.1535	10.4962	87.8621	1868.6694	8.9063	4.6767	16.628
	34.2987	29.7486	4097.2352	11.7599	17.1613	238.7480	8302.1094	14.6414	8.1251	28.889
L3	33.7148	37.4288	4590.1943	11.0969	16.2507	282.4616	9300.9781	18.4213	7.4027	19.741
	45.5522	52.6772	12796.152	15.6177	22.7920	561.4318	25928.474	25.9261	10.7870	28.765

6

3

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1 120.00-100.00				1	1	1			
L2 100.00-47.08				1	1	1			
L3 47.08-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
			ft				in	in	klf
2" Rigid Conduit	C	Surface Ar (CaAa)	40.00 - 0.00	1	1	0.200 0.500	2.0000		0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C _A A _A	Weight
				ft			ft ² /ft	klf
LDF5-50A(7/8")	A	No	Inside Pole	118.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00

VXL5-50(7/8")	A	No	Inside Pole	107.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00

LDF5-50A(7/8")	C	No	Inside Pole	98.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	98.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00

LDF6-50A(1-1/4")	C	No	Inside Pole	87.00 - 0.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00

VXL5-50(7/8")	A	No	Inside Pole	73.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00

LDF4-50A(1/2")	A	No	Inside Pole	50.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00
LDF5-50A(7/8")	A	No	Inside Pole	50.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf

LDF4-50A(1/2")	C	No	Inside Pole	40.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00
*								
LDF2-50(3/8)	A	No	Inside Pole	110.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00
LDF7-50A(1-5/8)	A	No	Inside Pole	110.00 - 0.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00
FB-L98B-034-XXX(3/8)	A	No	Inside Pole	110.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	110.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	120.00-100.00	A	0.000	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	100.00-47.08	A	0.000	0.000	0.000	0.000	0.42
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.49
L3	47.08-0.00	A	0.000	0.000	0.000	0.000	0.43
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	8.000	0.000	0.61

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	120.00-100.00	A	1.691	0.000	0.000	0.000	0.000	0.08
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	100.00-47.08	A	1.622	0.000	0.000	0.000	0.000	0.42
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.49
L3	47.08-0.00	A	1.444	0.000	0.000	0.000	0.000	0.43
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	20.975	0.000	0.90

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	120.00-100.00	0.0000	0.0000	0.0000	0.0000
L2	100.00-47.08	0.0000	0.0000	0.0000	0.0000
L3	47.08-0.00	-0.1684	0.1870	-0.3815	0.4237

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _s No Ice	K _s Ice
L2	21	2" Rigid Conduit	47.08 - 40.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement		C _A A _A Front	C _A A _A Side	Weight
			Vert ft	°	ft		ft ²	ft ²	K
DB809MT3-XT	A	From Leg	3.00	0.00	118.00	No Ice	2.84	2.84	0.03
			0.00			1/2"	4.29	4.29	0.05
			7.00			Ice	5.75	5.75	0.08
DB201-A	B	From Leg	3.00	0.00	118.00	No Ice	1.10	1.10	0.03
			0.00			1/2"	1.98	1.98	0.03
			5.00			Ice	2.86	2.86	0.04
6' x 2" Mount Pipe	A	From Leg	3.00	0.00	118.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
6' x 2" Mount Pipe	B	From Leg	3.00	0.00	118.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
Side Arm Mount [SO 102-3]	B	None		0.00	118.00	No Ice	3.00	3.00	0.08
						1/2"	3.48	3.48	0.11
						Ice	3.96	3.96	0.14
Side Arm Mount [SO 701-1]	A	From Leg	0.00	0.00	118.00	No Ice	0.85	1.67	0.07
			0.00			1/2"	1.14	2.34	0.08
			0.00			Ice	1.43	3.01	0.09
Side Arm Mount [SO 701-1]	B	From Leg	0.00	0.00	118.00	No Ice	0.85	1.67	0.07
			0.00			1/2"	1.14	2.34	0.08
			0.00			Ice	1.43	3.01	0.09

(2) SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.00	0.00	114.00	No Ice	5.95	5.19	0.06
			0.00			1/2"	6.39	5.96	0.11
			0.00			Ice	6.82	6.66	0.17
(2) SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.00	0.00	114.00	No Ice	5.95	5.19	0.06
			0.00			1/2"	6.39	5.96	0.11
			0.00			Ice	6.82	6.66	0.17
(2) SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.00	0.00	114.00	No Ice	5.95	5.19	0.06
			0.00			1/2"	6.39	5.96	0.11
			0.00			Ice	6.82	6.66	0.17
RRUS 11	A	From Leg	4.00	0.00	114.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			0.00			Ice	3.21	1.49	0.09
RRUS 11	B	From Leg	4.00	0.00	114.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			0.00			Ice	3.21	1.49	0.09
RRUS 11	C	From Leg	4.00	0.00	114.00	No Ice	2.78	1.19	0.05

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
			0.00			1/2"	2.99	1.33	0.07	
			0.00			Ice	3.21	1.49	0.09	
RRUS 32 B2	A	From Leg	4.00		0.00	114.00	1" Ice	2.73	1.67	0.05
			0.00				No Ice	2.95	1.86	0.07
			0.00				1/2"	3.18	2.05	0.10
							Ice			
RRUS 32 B2	B	From Leg	4.00		0.00	114.00	1" Ice	2.73	1.67	0.05
			0.00				No Ice	2.95	1.86	0.07
			0.00				1/2"	3.18	2.05	0.10
							Ice			
RRUS 32 B2	C	From Leg	4.00		0.00	114.00	1" Ice	2.73	1.67	0.05
			0.00				No Ice	2.95	1.86	0.07
			0.00				1/2"	3.18	2.05	0.10
							Ice			
DC6-48-60-18-8C	A	From Leg	4.00		0.00	114.00	1" Ice	2.74	2.74	0.03
			0.00				No Ice	2.96	2.96	0.05
			0.00				1/2"	3.20	3.20	0.08
							Ice			
Miscellaneous [NA 507-1]	A	None			0.00	114.00	1" Ice	4.80	4.80	0.25
							No Ice	6.70	6.70	0.29
							1/2"	8.60	8.60	0.34
							Ice			
Side Arm Mount [SO 102-3]	A	None			0.00	114.00	1" Ice	3.00	3.00	0.08
							No Ice	3.48	3.48	0.11
							1/2"	3.96	3.96	0.14
							Ice			
Platform Mount [LP 601-1]	A	None			0.00	114.00	1" Ice	28.47	28.47	1.12
							No Ice	33.59	33.59	1.51
							1/2"	38.71	38.71	1.91
							Ice			
							1" Ice			
*										
Pipe Mount [PM 601-1]	B	None			0.00	107.00	No Ice	3.00	0.90	0.07
							1/2"	3.74	1.12	0.08
							Ice	4.48	1.34	0.09
							1" Ice			

(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.00		0.00	98.00	No Ice	4.56	10.26	0.05
			0.00				1/2"	5.11	11.43	0.11
			2.00				Ice	5.61	12.31	0.19
							1" Ice			
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00		0.00	98.00	No Ice	4.56	10.26	0.05
			0.00				1/2"	5.11	11.43	0.11
			2.00				Ice	5.61	12.31	0.19
							1" Ice			
LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00		0.00	98.00	No Ice	4.56	10.26	0.05
			0.00				1/2"	5.11	11.43	0.11
			2.00				Ice	5.61	12.31	0.19
							1" Ice			
RRH2X60-PCS	A	From Leg	4.00		0.00	98.00	No Ice	2.20	1.72	0.06
			0.00				1/2"	2.39	1.90	0.08
			2.00				Ice	2.59	2.09	0.10
							1" Ice			
RRH2X60-PCS	B	From Leg	4.00		0.00	98.00	No Ice	2.20	1.72	0.06
			0.00				1/2"	2.39	1.90	0.08
			2.00				Ice	2.59	2.09	0.10
							1" Ice			
RRH2X60-PCS	C	From Leg	4.00		0.00	98.00	No Ice	2.20	1.72	0.06
			0.00				1/2"	2.39	1.90	0.08
			2.00				Ice	2.59	2.09	0.10
							1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00		0.00	98.00	No Ice	8.39	7.08	0.08
			0.00				1/2"	8.95	8.28	0.15
			2.00				Ice	9.48	9.19	0.22
							1" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						ft
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00	0.00	0.00	98.00	No Ice	8.39	7.08	0.08
			0.00				1/2"	8.95	8.28	0.15
			2.00				Ice	9.48	9.19	0.22
							1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.00	0.00	98.00	No Ice	8.39	7.08	0.08
			0.00				1/2"	8.95	8.28	0.15
			2.00				Ice	9.48	9.19	0.22
							1" Ice			
LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00	0.00	0.00	98.00	No Ice	4.56	10.26	0.05
			0.00				1/2"	5.11	11.43	0.11
			2.00				Ice	5.61	12.31	0.19
							1" Ice			
B13 RRH4X30-4R	A	From Leg	4.00	0.00	0.00	98.00	No Ice	2.16	1.62	0.06
			0.00				1/2"	2.35	1.79	0.08
			2.00				Ice	2.55	1.97	0.10
							1" Ice			
B13 RRH4X30-4R	B	From Leg	4.00	0.00	0.00	98.00	No Ice	2.16	1.62	0.06
			0.00				1/2"	2.35	1.79	0.08
			2.00				Ice	2.55	1.97	0.10
							1" Ice			
B13 RRH4X30-4R	C	From Leg	4.00	0.00	0.00	98.00	No Ice	2.16	1.62	0.06
			0.00				1/2"	2.35	1.79	0.08
			2.00				Ice	2.55	1.97	0.10
							1" Ice			
B66A RRH4X45	A	From Leg	4.00	0.00	0.00	98.00	No Ice	2.58	1.63	0.07
			0.00				1/2"	2.79	1.81	0.09
			2.00				Ice	3.01	2.00	0.11
							1" Ice			
B66A RRH4X45	B	From Leg	4.00	0.00	0.00	98.00	No Ice	2.58	1.63	0.07
			0.00				1/2"	2.79	1.81	0.09
			2.00				Ice	3.01	2.00	0.11
							1" Ice			
B66A RRH4X45	C	From Leg	4.00	0.00	0.00	98.00	No Ice	2.58	1.63	0.07
			0.00				1/2"	2.79	1.81	0.09
			2.00				Ice	3.01	2.00	0.11
							1" Ice			
(2) RXXDC-3315-PF-48	C	From Leg	4.00	0.00	0.00	98.00	No Ice	3.01	1.96	0.02
			0.00				1/2"	3.23	2.15	0.05
			2.00				Ice	3.46	2.35	0.08
							1" Ice			
Platform Mount [LP 602-1]	C	None			0.00	98.00	No Ice	32.03	32.03	1.34
							1/2"	38.71	38.71	1.80
							Ice	45.39	45.39	2.26
							1" Ice			

(2) DB980H90E-M w/ Mount Pipe	A	From Leg	4.00	0.00	0.00	87.00	No Ice	4.04	3.62	0.03
			0.00				1/2"	4.50	4.48	0.07
			2.00				Ice	4.95	5.22	0.11
							1" Ice			
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.00	0.00	0.00	87.00	No Ice	4.04	3.62	0.03
			0.00				1/2"	4.50	4.48	0.07
			2.00				Ice	4.95	5.22	0.11
							1" Ice			
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.00	0.00	0.00	87.00	No Ice	4.04	3.62	0.03
			0.00				1/2"	4.50	4.48	0.07
			2.00				Ice	4.95	5.22	0.11
							1" Ice			
6' x 2" Mount Pipe	C	From Leg	0.00	0.00	0.00	87.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice			
Platform Mount [LP 602-1]	C	None			0.00	87.00	No Ice	32.03	32.03	1.34
							1/2"	38.71	38.71	1.80
							Ice	45.39	45.39	2.26
							1" Ice			

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K

DB636-C	C	From Leg	4.00	0.00	73.00	0.00	No Ice	2.51	2.51	0.03
			0.00				1/2"	3.59	3.59	0.05
			6.00				Ice	4.68	4.68	0.07
							1" Ice			
6' x 2" Mount Pipe	C	From Leg	4.00	0.00	73.00	0.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			3.00				Ice	2.29	2.29	0.05
							1" Ice			
Platform Mount [LP 1201-1]	C	None			73.00	0.00	No Ice	23.10	23.10	2.10
							1/2"	26.80	26.80	2.50
							Ice	30.50	30.50	2.90
							1" Ice			

PD1142-1	A	From Leg	3.00	0.00	50.00	0.00	No Ice	1.32	1.32	0.01
			0.00				1/2"	3.21	3.21	0.02
			7.00				Ice	5.12	5.12	0.05
							1" Ice			
DB492A	A	From Leg	3.00	0.00	50.00	0.00	No Ice	1.10	1.10	0.01
			0.00				1/2"	1.98	1.98	0.01
			0.00				Ice	2.86	2.86	0.01
							1" Ice			
ASP-655	B	From Leg	3.00	0.00	50.00	0.00	No Ice	0.56	0.56	0.00
			0.00				1/2"	1.02	1.02	0.01
			4.00				Ice	1.30	1.30	0.01
							1" Ice			
PD1121-6	C	From Leg	3.00	0.00	50.00	0.00	No Ice	0.23	0.23	0.00
			0.00				1/2"	0.41	0.41	0.00
			3.00				Ice	0.60	0.60	0.00
							1" Ice			
Side Arm Mount [SO 701-3]	C	None			50.00	0.00	No Ice	2.83	2.83	0.20
							1/2"	3.92	3.92	0.24
							Ice	5.01	5.01	0.28
							1" Ice			

EPSILON GPS ANTENNA 35 DB	A	From Leg	3.00	0.00	40.00	0.00	No Ice	0.11	0.11	0.00
			0.00				1/2"	0.16	0.16	0.00
			1.00				Ice	0.21	0.21	0.00
							1" Ice			
Side Arm Mount [SO 701-1]	A	None			40.00	0.00	No Ice	0.85	1.67	0.07
							1/2"	1.14	2.34	0.08
							Ice	1.43	3.01	0.09
							1" Ice			
*										

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:			Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz	Lateral	Vert						
				ft	ft	ft	°	°	ft	ft	ft ²	K
GLF6-450	B	Grid	From Leg	1.00	0.00	107.00	0.00		6.40	No Ice	32.17	0.20
				0.00						1/2" Ice	33.01	0.37
				0.00						1" Ice	33.86	0.54

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 100	Pole	Max Tension	36	0.00	0.00	-0.00
			Max. Compression	26	-9.59	-1.77	0.55
			Max. Mx	8	-3.64	-82.71	-0.26
			Max. My	2	-3.67	-0.11	80.30
			Max. Vy	8	6.50	-82.71	-0.26
			Max. Vx	14	6.28	-1.10	-80.22
			Max. Torque	24			
L2	100 -	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	47.0833		Max. Compression	26	-35.09	0.29	-0.63
			Max. Mx	8	-16.63	-863.33	-2.57
			Max. My	14	-16.66	-4.87	-848.84
			Max. Vy	20	-19.67	863.14	-0.34
			Max. Vx	14	19.41	-4.87	-848.84
			Max. Torque	24			-1.81
L3	47.0833 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.55	0.69	-0.71
			Max. Mx	20	-29.31	2019.52	-0.65
			Max. My	14	-29.31	-9.08	-1991.56
			Max. Vy	20	-24.58	2019.52	-0.65
			Max. Vx	14	24.32	-9.08	-1991.56
			Max. Torque	24			-0.66

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	51.55	5.66	0.18
	Max. H _x	20	29.34	24.55	-0.00
	Max. H _z	3	22.00	0.04	24.28
	Max. M _x	2	1989.07	0.04	24.28
	Max. M _z	8	2019.38	-24.55	-0.04
	Max. Torsion	12	0.58	-12.31	-21.14
	Min. Vert	5	22.00	-12.18	20.87
	Min. H _x	8	29.34	-24.55	-0.04
	Min. H _z	15	22.00	-0.08	-24.29
	Min. M _x	14	-1991.56	-0.08	-24.29
	Min. M _z	20	-2019.52	24.55	-0.00
	Min. Torsion	24	-0.66	12.27	21.17

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	24.45	0.00	0.00	0.23	0.06	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	29.34	-0.04	-24.28	-1989.07	4.64	0.50
0.9 Dead+1.6 Wind 0 deg - No Ice	22.00	-0.04	-24.28	-1971.78	4.58	0.49
1.2 Dead+1.6 Wind 30 deg - No Ice	29.34	12.18	-20.87	-1705.05	-999.77	0.09
0.9 Dead+1.6 Wind 30 deg - No Ice	22.00	12.18	-20.87	-1690.26	-991.05	0.08
1.2 Dead+1.6 Wind 60 deg - No Ice	29.34	21.17	-12.08	-987.43	-1739.43	0.25
0.9 Dead+1.6 Wind 60 deg - No Ice	22.00	21.17	-12.08	-978.88	-1724.24	0.25
1.2 Dead+1.6 Wind 90 deg - No Ice	29.34	24.55	0.04	4.86	-2019.38	0.19
0.9 Dead+1.6 Wind 90 deg - No Ice	22.00	24.55	0.04	4.75	-2001.73	0.19
1.2 Dead+1.6 Wind 120 deg - No Ice	29.34	21.33	12.26	1008.70	-1757.02	-0.22
0.9 Dead+1.6 Wind 120 deg - No Ice	22.00	21.33	12.26	999.81	-1741.66	-0.21
1.2 Dead+1.6 Wind 150 deg - No Ice	29.34	12.31	21.14	1736.46	-1013.64	-0.58

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
0.9 Dead+1.6 Wind 150 deg - No Ice	22.00	12.31	21.14	1721.21	-1004.78	-0.56
1.2 Dead+1.6 Wind 180 deg - No Ice	29.34	0.08	24.29	1991.56	-9.08	-0.48
0.9 Dead+1.6 Wind 180 deg - No Ice	22.00	0.08	24.29	1974.10	-9.00	-0.46
1.2 Dead+1.6 Wind 210 deg - No Ice	29.34	-12.06	20.94	1713.60	986.06	-0.09
0.9 Dead+1.6 Wind 210 deg - No Ice	22.00	-12.06	20.94	1698.58	977.45	-0.08
1.2 Dead+1.6 Wind 240 deg - No Ice	29.34	-21.14	12.10	990.98	1735.61	-0.28
0.9 Dead+1.6 Wind 240 deg - No Ice	22.00	-21.14	12.10	982.26	1720.43	-0.27
1.2 Dead+1.6 Wind 270 deg - No Ice	29.34	-24.55	0.00	0.65	2019.52	-0.27
0.9 Dead+1.6 Wind 270 deg - No Ice	22.00	-24.55	0.00	0.58	2001.85	-0.27
1.2 Dead+1.6 Wind 300 deg - No Ice	29.34	-21.26	-12.22	-1003.54	1749.19	0.22
0.9 Dead+1.6 Wind 300 deg - No Ice	22.00	-21.26	-12.22	-994.84	1733.87	0.21
1.2 Dead+1.6 Wind 330 deg - No Ice	29.34	-12.27	-21.17	-1738.38	1009.49	0.66
0.9 Dead+1.6 Wind 330 deg - No Ice	22.00	-12.27	-21.17	-1723.26	1000.65	0.64
1.2 Dead+1.0 Ice	51.55	0.00	0.00	0.71	0.69	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	51.55	-0.30	-5.57	-489.73	35.25	-0.11
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	51.55	2.72	-4.69	-408.14	-237.36	0.08
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	51.55	4.78	-2.71	-236.07	-418.71	0.05
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	51.55	5.55	-0.00	0.71	-486.76	-0.04
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	51.55	4.84	2.78	245.12	-425.30	-0.27
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	51.55	2.77	4.78	420.21	-242.99	-0.43
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	51.55	0.03	5.48	480.01	-2.50	-0.32
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	51.55	-2.72	4.69	409.98	238.21	-0.08
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	51.55	-5.00	2.53	216.12	445.55	0.39
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	51.55	-5.66	-0.18	-19.95	500.98	0.44
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	51.55	-4.94	-2.84	-250.39	438.53	0.27
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	51.55	-2.98	-4.79	-419.35	268.82	0.03
Dead+Wind 0 deg - Service	24.45	-0.01	-4.79	-390.52	0.95	0.10
Dead+Wind 30 deg - Service	24.45	2.40	-4.12	-334.73	-196.33	0.02
Dead+Wind 60 deg - Service	24.45	4.18	-2.38	-193.78	-341.63	0.05
Dead+Wind 90 deg - Service	24.45	4.84	0.01	1.14	-396.63	0.04
Dead+Wind 120 deg - Service	24.45	4.21	2.42	198.32	-345.09	-0.04
Dead+Wind 150 deg - Service	24.45	2.43	4.17	341.27	-199.07	-0.11
Dead+Wind 180 deg - Service	24.45	0.02	4.79	391.37	-1.74	-0.09
Dead+Wind 210 deg - Service	24.45	-2.38	4.13	336.77	193.72	-0.02
Dead+Wind 240 deg - Service	24.45	-4.17	2.39	194.83	340.96	-0.05
Dead+Wind 270 deg - Service	24.45	-4.84	0.00	0.31	396.73	-0.05
Dead+Wind 300 deg - Service	24.45	-4.20	-2.41	-196.95	343.63	0.04

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 330 deg - Service	24.45	-2.42	-4.18	-341.29	198.33	0.13

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-24.45	0.00	0.00	24.45	0.00	0.000%
2	-0.04	-29.34	-24.28	0.04	29.34	24.28	0.000%
3	-0.04	-22.00	-24.28	0.04	22.00	24.28	0.000%
4	12.18	-29.34	-20.87	-12.18	29.34	20.87	0.000%
5	12.18	-22.00	-20.87	-12.18	22.00	20.87	0.000%
6	21.17	-29.34	-12.08	-21.17	29.34	12.08	0.000%
7	21.17	-22.00	-12.08	-21.17	22.00	12.08	0.000%
8	24.55	-29.34	0.04	-24.55	29.34	-0.04	0.000%
9	24.55	-22.00	0.04	-24.55	22.00	-0.04	0.000%
10	21.33	-29.34	12.26	-21.33	29.34	-12.26	0.000%
11	21.33	-22.00	12.26	-21.33	22.00	-12.26	0.000%
12	12.31	-29.34	21.14	-12.31	29.34	-21.14	0.000%
13	12.31	-22.00	21.14	-12.31	22.00	-21.14	0.000%
14	0.08	-29.34	24.29	-0.08	29.34	-24.29	0.000%
15	0.08	-22.00	24.29	-0.08	22.00	-24.29	0.000%
16	-12.06	-29.34	20.94	12.06	29.34	-20.94	0.000%
17	-12.06	-22.00	20.94	12.06	22.00	-20.94	0.000%
18	-21.14	-29.34	12.10	21.14	29.34	-12.10	0.000%
19	-21.14	-22.00	12.10	21.14	22.00	-12.10	0.000%
20	-24.55	-29.34	0.00	24.55	29.34	-0.00	0.000%
21	-24.55	-22.00	0.00	24.55	22.00	-0.00	0.000%
22	-21.26	-29.34	-12.22	21.26	29.34	12.22	0.000%
23	-21.26	-22.00	-12.22	21.26	22.00	12.22	0.000%
24	-12.27	-29.34	-21.17	12.27	29.34	21.17	0.000%
25	-12.27	-22.00	-21.17	12.27	22.00	21.17	0.000%
26	0.00	-51.55	0.00	0.00	51.55	0.00	0.000%
27	-0.30	-51.55	-5.57	0.30	51.55	5.57	0.000%
28	2.72	-51.55	-4.69	-2.72	51.55	4.69	0.000%
29	4.78	-51.55	-2.71	-4.78	51.55	2.71	0.000%
30	5.55	-51.55	-0.00	-5.55	51.55	0.00	0.000%
31	4.84	-51.55	2.78	-4.84	51.55	-2.78	0.000%
32	2.77	-51.55	4.78	-2.77	51.55	-4.78	0.000%
33	0.03	-51.55	5.48	-0.03	51.55	-5.48	0.000%
34	-2.72	-51.55	4.69	2.72	51.55	-4.69	0.000%
35	-5.00	-51.55	2.53	5.00	51.55	-2.53	0.000%
36	-5.66	-51.55	-0.18	5.66	51.55	0.18	0.000%
37	-4.94	-51.55	-2.84	4.94	51.55	2.84	0.000%
38	-2.98	-51.55	-4.79	2.98	51.55	4.79	0.000%
39	-0.01	-24.45	-4.79	0.01	24.45	4.79	0.000%
40	2.40	-24.45	-4.12	-2.40	24.45	4.12	0.000%
41	4.18	-24.45	-2.38	-4.18	24.45	2.38	0.000%
42	4.84	-24.45	0.01	-4.84	24.45	-0.01	0.000%
43	4.21	-24.45	2.42	-4.21	24.45	-2.42	0.000%
44	2.43	-24.45	4.17	-2.43	24.45	-4.17	0.000%
45	0.02	-24.45	4.79	-0.02	24.45	-4.79	0.000%
46	-2.38	-24.45	4.13	2.38	24.45	-4.13	0.000%
47	-4.17	-24.45	2.39	4.17	24.45	-2.39	0.000%
48	-4.84	-24.45	0.00	4.84	24.45	-0.00	0.000%
49	-4.20	-24.45	-2.41	4.20	24.45	2.41	0.000%
50	-2.42	-24.45	-4.18	2.42	24.45	4.18	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	5	0.00000001	0.00005547
3	Yes	4	0.00000001	0.00081193
4	Yes	5	0.00000001	0.00067728
5	Yes	5	0.00000001	0.00028692
6	Yes	5	0.00000001	0.00065972
7	Yes	5	0.00000001	0.00027746
8	Yes	4	0.00000001	0.00035553
9	Yes	4	0.00000001	0.00020043
10	Yes	5	0.00000001	0.00067540
11	Yes	5	0.00000001	0.00028190
12	Yes	5	0.00000001	0.00072431
13	Yes	5	0.00000001	0.00030572
14	Yes	5	0.00000001	0.00006761
15	Yes	4	0.00000001	0.00098584
16	Yes	5	0.00000001	0.00064123
17	Yes	5	0.00000001	0.00027097
18	Yes	5	0.00000001	0.00068386
19	Yes	5	0.00000001	0.00028907
20	Yes	4	0.00000001	0.00035123
21	Yes	4	0.00000001	0.00019842
22	Yes	5	0.00000001	0.00070643
23	Yes	5	0.00000001	0.00029753
24	Yes	5	0.00000001	0.00064956
25	Yes	5	0.00000001	0.00027121
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00029700
28	Yes	5	0.00000001	0.00011958
29	Yes	4	0.00000001	0.00097449
30	Yes	4	0.00000001	0.00025946
31	Yes	5	0.00000001	0.00010403
32	Yes	5	0.00000001	0.00015198
33	Yes	4	0.00000001	0.00062526
34	Yes	4	0.00000001	0.00090321
35	Yes	4	0.00000001	0.00089951
36	Yes	4	0.00000001	0.00062018
37	Yes	5	0.00000001	0.00014516
38	Yes	5	0.00000001	0.00012113
39	Yes	4	0.00000001	0.00007000
40	Yes	4	0.00000001	0.00019285
41	Yes	4	0.00000001	0.00016943
42	Yes	4	0.00000001	0.00001778
43	Yes	4	0.00000001	0.00017471
44	Yes	4	0.00000001	0.00023222
45	Yes	4	0.00000001	0.00007169
46	Yes	4	0.00000001	0.00016021
47	Yes	4	0.00000001	0.00019364
48	Yes	4	0.00000001	0.00001887
49	Yes	4	0.00000001	0.00020915
50	Yes	4	0.00000001	0.00016327

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 100	14.98	43	1.08	0.01
L2	100 - 47.0833	10.54	43	1.01	0.00
L3	52 - 0	2.69	43	0.49	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	DB809MT3-XT	43	14.53	1.08	0.01	31255
114.00	(2) SBNHH-1D65A w/ Mount Pipe	43	13.62	1.07	0.00	26046
107.00	GLF6-450	43	12.06	1.05	0.00	12021
98.00	(2) LPA-80080/6CF w/ Mount Pipe	43	10.12	1.00	0.00	7560
87.00	(2) DB980H90E-M w/ Mount Pipe	43	7.92	0.91	0.00	6226
73.00	DB636-C	43	5.47	0.75	0.00	5101
50.00	PD1142-1	43	2.49	0.46	0.00	4197
40.00	EPSILON GPS ANTENNA 35 DB	43	1.64	0.36	0.00	5217

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 100	76.17	10	5.49	0.03
L2	100 - 47.0833	53.62	10	5.16	0.01
L3	52 - 0	13.68	10	2.49	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	DB809MT3-XT	10	73.86	5.47	0.03	6344
114.00	(2) SBNHH-1D65A w/ Mount Pipe	10	69.26	5.43	0.02	5286
107.00	GLF6-450	10	61.32	5.32	0.02	2438
98.00	(2) LPA-80080/6CF w/ Mount Pipe	10	51.48	5.10	0.01	1529
87.00	(2) DB980H90E-M w/ Mount Pipe	10	40.33	4.63	0.01	1247
73.00	DB636-C	10	27.86	3.82	0.00	1014
50.00	PD1142-1	10	12.65	2.37	0.00	826
40.00	EPSILON GPS ANTENNA 35 DB	10	8.37	1.81	0.00	1026

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	120 - 100 (1)	TP20.263x15.0403x0.187 5	20.00	0.00	0.0	12.120 6	-3.63	829.59	0.004
L2	100 - 47.0833 (2)	TP33.13x20.263x0.2813	52.92	0.00	0.0	28.666 0	-16.63	1920.74	0.009
L3	47.0833 - 0 (3)	TP44x31.372x0.375	52.00	0.00	0.0	52.677 2	-29.31	3477.10	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux}	ϕM_{nx}	Ratio	M_{uy}	ϕM_{ny}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L1	120 - 100 (1)	TP20.263x15.0403x0.187 5	83.05	338.82	0.245	0.00	338.82	0.000
L2	100 - 47.0833 (2)	TP33.13x20.263x0.2813	866.78	1237.43	0.700	0.00	1237.43	0.000
L3	47.0833 - 0 (3)	TP44x31.372x0.375	2025.98	3088.23	0.656	0.00	3088.23	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual	ϕV_n	Ratio	Actual	ϕT_n	Ratio
			V_u K	K	$\frac{V_u}{\phi V_n}$	T_u kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	120 - 100 (1)	TP20.263x15.0403x0.187 5	6.60	414.80	0.016	1.09	687.02	0.002
L2	100 - 47.0833 (2)	TP33.13x20.263x0.2813	19.73	960.37	0.021	0.09	2509.12	0.000
L3	47.0833 - 0 (3)	TP44x31.372x0.375	24.63	1738.55	0.014	0.22	6261.97	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$\frac{P_u}{\phi P_n}$	$\frac{M_{ux}}{\phi M_{nx}}$	$\frac{M_{uy}}{\phi M_{ny}}$	$\frac{V_u}{\phi V_n}$	$\frac{T_u}{\phi T_n}$			
L1	120 - 100 (1)	0.004	0.245	0.000	0.016	0.002	0.250	1.000	4.8.2 ✓
L2	100 - 47.0833 (2)	0.009	0.700	0.000	0.021	0.000	0.710	1.000	4.8.2 ✓
L3	47.0833 - 0 (3)	0.008	0.656	0.000	0.014	0.000	0.665	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	120 - 100	Pole	TP20.263x15.0403x0.1875	1	-3.63	829.59	25.0	Pass	
L2	100 - 47.0833	Pole	TP33.13x20.263x0.2813	2	-16.63	1920.74	71.0	Pass	
L3	47.0833 - 0	Pole	TP44x31.372x0.375	3	-29.31	3477.10	66.5	Pass	
							Summary		
							Pole (L2)	71.0	Pass
							RATING =	71.0	Pass

APPENDIX B
BASE LEVEL DRAWING



(INSTALLED)
(1) 7/8" TO 73 FT LEVEL

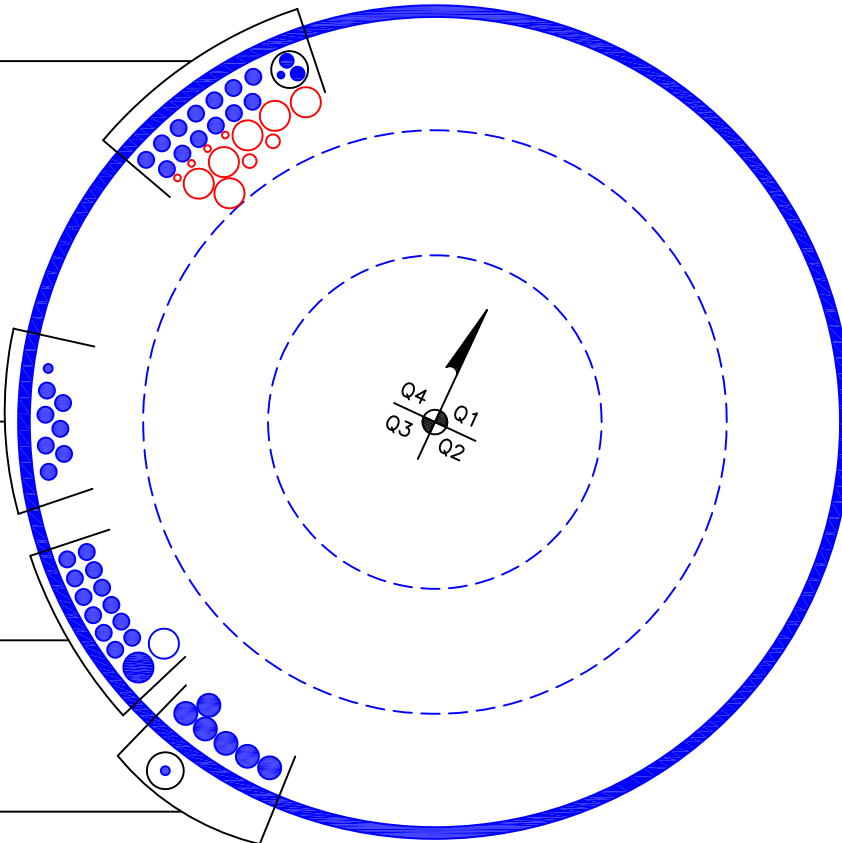
(PROPOSED)
(4) 3/8" TO 114 FT LEVEL
(2) 3/4" TO 114 FT LEVEL
(6) 1-5/8" TO 114 FT LEVEL
(INSTALLED-IN CONDUIT-TO BE REMOVED)
(1) 3/8" TO 73 FT LEVEL
(2) 3/4" TO 73 FT LEVEL
(INSTALLED-TO BE REMOVED)
(12) 7/8" TO 73 FT LEVEL

(INSTALLED)
(1) 1/2" TO 50 FT LEVEL
(3) 7/8" TO 50 FT LEVEL
(1) 7/8" TO 107 FT LEVEL
(3) 7/8" TO 118 FT LEVEL

(RESERVED)
(1) 1-5/8" TO 98 FT LEVEL

(INSTALLED)
(12) 7/8" TO 98 FT LEVEL
(1) 1-5/8" TO 98 FT LEVEL

(INSTALLED-IN CONDUIT)
(1) 1/2" TO 40 FT LEVEL
(INSTALLED)
(6) 1-1/4" TO 87 FT LEVEL



APPENDIX C
ADDITIONAL CALCULATIONS

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

TIA Rev G

Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: 806364

Site Name: HRT 106(B) 943202

App #: 383797 Rev. 1

Pole Manufacturer: *Other*

Anchor Rod Data

Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	52.05	in

Plate Data

Diam:	58.05	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	11.79	in

Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	44	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions

Mu:	2026	ft-kips
Axial, Pu:	29	kips
Shear, Vu:	25	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria: **AISC LRFD** <-Only Applicable to Unstiffened Cases

Anchor Rod Results

Max Rod (Cu+ Vu/η): 162.2 Kips
 Allowable Axial, Φ*Fu*Anet: 260.0 Kips
 Anchor Rod Stress Ratio: 62.4% **Pass**

Rigid

AISC LRFD

φ*Tn

Base Plate Results

Base Plate Stress: 18.2 ksi
 Allowable Plate Stress: 54.0 ksi
 Base Plate Stress Ratio: 33.8% **Pass**

Flexural Check

Rigid

AISC LRFD

φ*Fy

Y.L. Length:

27.81

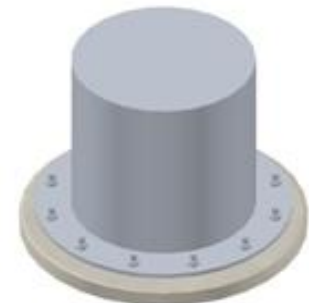
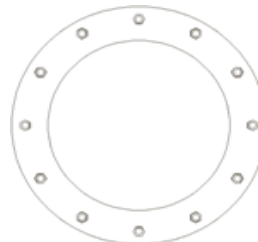
n/a

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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 806364
 Site Name: HRT 106(B) 943202
 App #: 383797 Rev. 1

Pole Manufacturer: Other

Bolt Data

Qty:	8	
Diameter (in.):	1	Bolt Fu: 120
Bolt Material:	A325	Bolt Fy: 92
N/A:	100	<-- Disregard
N/A:	75	<-- Disregard
Circle (in.):	24.41	

Plate Data

Diam:	26.91	in
Thick, t:	1.5	in
Grade (Fy):	60	ksi
Strength, Fu:	75	ksi
Single-Rod B-eff:	8.14	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	20.263	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions

Mu	83.05	ft-kips
Axial, Pu:	3.63	kips
Shear, Vu:	6.60	kips
Elevation:	100	feet

Bolt Threads:

X-Excluded
$\phi V_n = \phi(0.55 A_b F_u)$
$\phi = 0.75, \phi V_n$ (kips):
38.88

If No stiffeners, Criteria: TIA G <-Only Applicable to Unstiffened Cases

Flange Bolt Results

Bolt Tension Capacity, $\phi^*T_n, B1$:	54.54 kips
Adjusted ϕ^*T_n (due to $V_u = V_u/Q_t$), B:	54.53 kips
Max Bolt directly applied Tu:	19.96 Kips
Min. PL "tc" for B cap. w/o Pry:	0.799 in
Min PL "treq" for actual T w/ Pry:	0.354 in
Min PL "t1" for actual T w/o Pry:	0.483 in
T allowable w/o Prying:	54.54 kips
Prying Force, q:	0.00 kips
Total Bolt Tension=Tu+q:	19.96 kips
Non-Prying Bolt Stress Ratio, Tu/B:	36.6% Pass

Rigid

ϕ^*T_n
$\phi T_n [(1 - (V_u/\phi V_n)^2)^{0.5}]$

$\alpha < 0$ case

Exterior Flange Plate Results

Flexural Check	
Compression Side Plate Stress:	5.4 ksi
Allowable Plate Stress:	54.0 ksi
Compression Plate Stress Ratio:	10.0% Pass
No Prying	
Tension Side Stress Ratio, $(treq/t)^2$:	5.6% Pass

Rigid

TIA G
ϕ^*F_y
Comp. Y.L. Length:
13.61

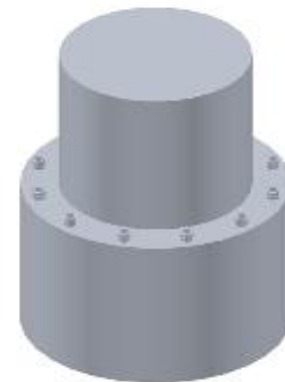
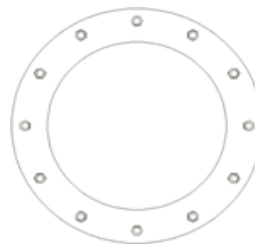
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$:	n/a
Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$:	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

Monopole Block Foundation

Checks capacity of monolithic block foundation for a monopole tower per TIA-222-G



BU #: 806364
 Site Name: HRT 106(B) 943202
 App No.: 383797 Rev. 1

Factored Design Reactions		
Shear, S:	25.00	kips
Moment, M:	2026.00	ft*kips
Height, H:	120.00	ft
Weight, Wt:	29.00	kips
Base Diameter, BD:	44.0	in

Foundation Dimensions		
Depth, D:	6.0	ft
Block Width, W:	27.0	ft
Neglected Depth, N:	3.3	ft
Ext. Above Grade, E:	0.0	ft
Anchor Steel Length, Lst:	97.0	in
Clear Cover, cc:	4.0	in

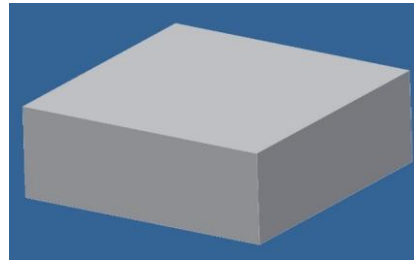
Soil Properties		
Soil Unit Weight, γ:	0.125	kcf
Ultimate Bearing, Bc:	8.000	ksf
Int. Angle of Friction, Φ:	34.00	deg
Cohesion, Co:	0.000	ksf
Passive Pressure, Pp:	0.000	kcf
Base Friction, μ:	0.2	
Seismic Zone, z:	1	

Material Properties		
Rebar Yield Strength, Fy:	60000	psi
Concrete Strength, F'c:	3000	psi
Concrete Density, δc:	0.150	kcf

Rebar Properties		
Pad Rebar Size, sp:	11	
Rebar Quantity, mp:	26	14

Design Checks				
	Capacity/Availability	Demands/Limits	Check	% Capacity
Shear (ksf)	102.77	25.00	OK	24.33
Overturning (ft*kips)	9285.13	2176.00	OK	23.44
Bearing (ksf)	6.00	1.60	OK	26.72
Shear - 1-Way (kips)	102.77	25.00	OK	24.33
Pad Rebar Area (in ²)	40.60	21.00	OK	
Bar Spacing (in)	11.17	18 > Bs > 2	OK	
Development Length (in)	158.00	60.24	OK	

Modification Checks			
	Capacity/Availability	Demands/Limits	Check
Minimum Extra Thickness (in)	0.00	0.00	Not Used
Pad Rebar Area-short (in ²)	8.84	0.00	Not Used
Pad Rebar Area-long (in2)	2.21	0.00	Not Used
Pad Rebar Spacing-short (in2)	15.84	18 > Bs > 2	Not Used
Pad Rebar Spacing-long (in2)	78.06	18 > Bs > 2	Not Used
End Cap Width (in)	0.00	0.00	Not Used
End Cap Rebar Area (in2)	4.81	0.00	Not Used
EC Rebar Spacing (in)	-2.02	18 > Bs > 2	Not Used
Tie Spacing (in)	16.13	316 > s > 4.5	Not Used
Dowel Area (in2)	8.84	0.00	Not Used
Dowel Embedment (in)	6.00	6.00	Not Used
Shear Strength of Cone (kips)	9.87	23.86	Not Used
Dowel Edge Distance (in)	12.00	5.19	Not Used
Dowel Spacing (in)	33.33	12.00	Not Used
Dowel Edge Distance (vert) (in)	36.00	5.19	Not Used
Dowel Devel. Length (in)	-4.00	15.38	Not Used



Modifications					
Pad Thickness, Te:	0	in	End Cap Width, Wec:	0	in
Revised Pad Thickness, Tx:	6	ft	Revised Width, Wx:	27	ft
Pad Rebar Size, Se:	6		EC Rebar Size, Sec:	7	per side, top & bottom
Rebar Quantity (long), me:	20	0	EC Rebar Quantity, mec:	8	0
Rebar Quantity (short), mex:	5	0	EC Tie Size, Sect:	4	per side
Dowel Size, Sed:	7		Tie Quantity, mect:	20	0
Dowel Quantity, med:	20	0	EC Dowel Size, Secd:	6	per side
			Dowel Quantity, meed:	20	0
			Rows of Dowels, Nd:	2	
			Dowel Depth, dec:	6	in
			Edge Distance, eed:	12	in

USGS Design Maps Summary Report

User-Specified Input

Report Title 806364
Tue October 4, 2016 18:04:22 UTC

Building Code Reference Document 2012/2015 International Building Code
(which utilizes USGS hazard data available in 2008)

Site Coordinates 41.45935°N, 72.66273°W

Site Soil Classification Site Class D – “Stiff Soil”

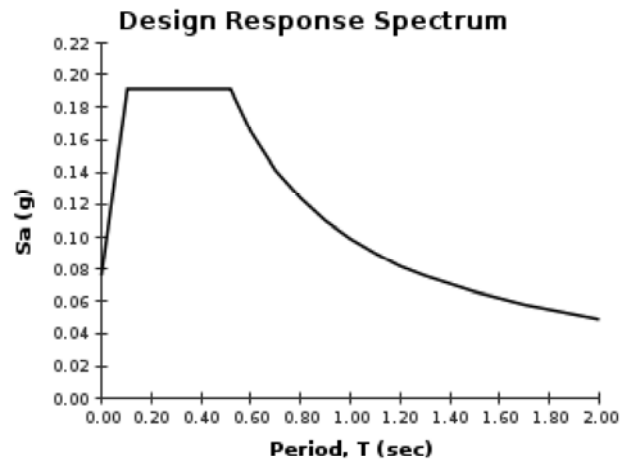
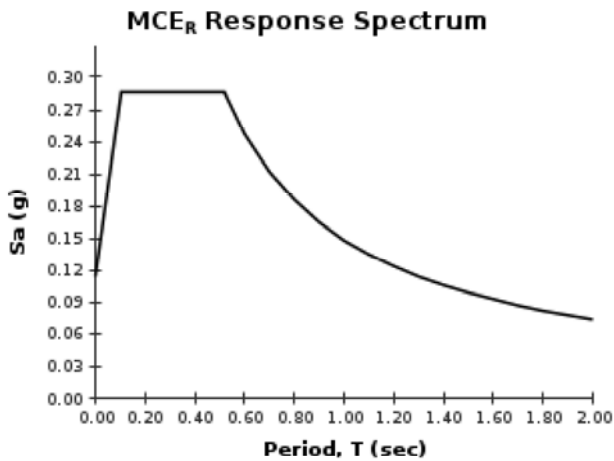
Risk Category I/II/III



USGS-Provided Output

$S_s = 0.179 \text{ g}$	$S_{MS} = 0.286 \text{ g}$	$S_{DS} = 0.191 \text{ g}$
$S_1 = 0.062 \text{ g}$	$S_{M1} = 0.148 \text{ g}$	$S_{D1} = 0.099 \text{ g}$

For information on how the S_s and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the “2009 NEHRP” building code reference document.



CCISeismic - Design Category

Per 2012/2015 IBC

Site BU: 806364
 Work Order: 1378401
 Application: 383797 Rev. 1



	Degrees	Minutes	Seconds		
Site Latitude =	41	27	33.67	41.4594	degrees
Site Longitude =	-72	39	45.83	-72.6627	degrees
Ground Supported Structure =	Yes				
Structure Class =	II				(Table 2-1)
Site Class =	D - Stiff Soil				(Table 2-11)
Spectral response acceleration short periods, S_S =	0.179				USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.062				
Importance Factor, I =	1.0				(Table 2-3)
Acceleration-based site coefficient, F_a =	1.6				(Table 2-12)
Velocity-based site coefficient, F_v =	2.4				(Table 2-13)
Design spectral response acceleration short period, S_{DS} =	0.191				(2.7.6)
Design spectral response acceleration 1 s period, S_{D1} =	0.099				(2.7.6)
Seismic Design Category - Short Period Response =	B				ASCE 7-05 Table 11.6-1
Seismic Design Category - 1s Period Response =	B				ASCE 7-05 Table 11.6-2
Worst Case Seismic Design Category =	B				ASCE 7-05 Tables 11.6-1 and 6-2