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November 19, 2019

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: AT&T-Exempt Modification – EM-AT&T-168-160922

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. There were no deviations or material changes to the proposed installation. Pursuant to the Connecticut Siting Council 10/11/2016 approval of **EM-AT&T-168-160922**, this letter is to satisfy item numbers one and four of the CSC decision.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Barbadora', with a large, stylized initial 'J'.

Jeffrey Barbadora
781-970-0053

carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Melanie A. Bachman
Acting Executive Director

MAB/CW/cm

c: The Honorable William J. Butterly Jr., First Selectman, Town of Woodbury
Kathy Castagnetta, AICP, Town Planner, Town of Woodbury
Bryan Jodie



Date: October 12, 2016

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

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

Subject: Structural Analysis Report

Carrier Designation: AT&T Mobility Co-Locate
Carrier Site Number: CTL01279
Carrier Site Name: Woodbury Paper Mill Rd

Crown Castle Designation:
Crown Castle BU Number: 857528
Crown Castle Site Name: WOODBURY PAPER MILL RD
Crown Castle JDE Job Number: 402684
Crown Castle Work Order Number: 1313132
Crown Castle Application Number: 365853 Rev. 0

Engineering Firm Designation: Crown Castle Project Number: 1313132

Site Data: 85 PAPER MILL ROAD, WOODBURY, Litchfield County, CT
Latitude 41° 34' 23.07", Longitude -73° 13' 39.51"
150 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 1313132, in accordance with application 365853, revision 0.

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

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing 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 120 mph converted to a nominal 3-second gust wind speed of 93 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.

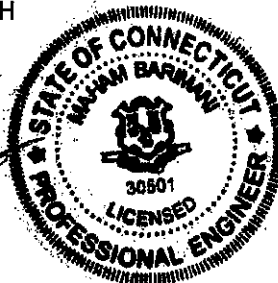
We at Crown Castle appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects, please give us a call.

Structural analysis prepared by: Kibreab Gebremariam/ AGH

Respectfully submitted by:

Maham Barimani, P.E.
Sr. Project Engineer
tnxTower Report - version
7.0.5.1

Barimani



10-14-2016

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1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Ehresmann Engineering 1995 in October of 2009. The tower was originally designed for a wind speed of 100 mph per TIA-222-G.

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 93 mph with no ice, 40 mph with 1-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
147.0	148.0	3	ericsson	RRUS 11	-	-	-

Table 2 - Existing 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
147.0	148.0	3	ericsson	RRUS 11	12 2 2 1	1-5/8 5/8 1/2 3/8	1
		1	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe			
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	P90-14-XLH-RR w/ Mount Pipe			
		6	powerwave technologies	TT19-08BP111-001			
	1	raycap	DC6-48-60-18-8F				
	147.0	1	tower mounts	Platform Mount [LP 714-1]			

Notes:

- Existing Equipment

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)
147	147	9	Generic	7770	-	-
		6	Powerwave	TT08-19DB111-001		
137	137	9	Generic	7770	-	-
		6	Powerwave	TT08-19DB111-001		
127	127	9	Generic	7770	-	-
		6	Powerwave	TT08-19DB111-001		
117	117	9	Generic	7770	-	-
		6	Powerwave	TT08-19DB111-001		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Ehresmann Engineering, Inc	4724414	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Ehresmann Engineering, Inc	4724415	CCISITES
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C.	4570959	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.

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	150 - 104.5	Pole	TP28.1875x18x0.1875	1	-5.51	1063.40	34.5	Pass
L2	104.5 - 68.75	Pole	TP35.75x26.8609x0.25	2	-9.71	1834.88	35.5	Pass
L3	68.75 - 34	Pole	TP43x34.0833x0.3125	3	-15.98	2800.65	33.1	Pass
L4	34 - 0	Pole	TP50x41.0375x0.3125	4	-24.99	3120.39	39.7	Pass
							Summary	
						Pole (L4)	39.7	Pass
						Rating =	39.7	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	17.6	Pass
1	Base Plate	0	25.5	Pass
1	Base Foundation (Structure)	0	22.3	Pass
1	Base Foundation (Soil Interaction)	0	35.8	Pass

Structure Rating (max from all components) =	39.7%
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Notes:

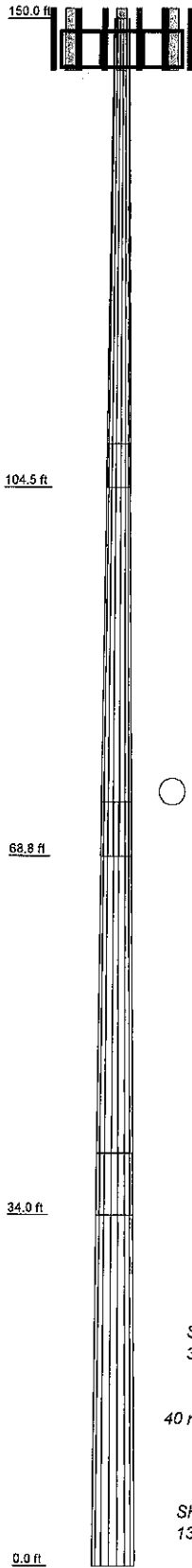
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	4	5.2	3.4	2.1
Length (ft)	45.50	40.00	40.00	40.00	43.0000	35.7500	28.1875
Number of Sides	18	18	18	18	34.0833	26.8603	18.0000
Thickness (in)	0.1875	0.2500	0.3125	0.3125	0.3125	0.2500	0.1875
Socket Length (ft)	4.25	5.25	6.00	6.00	41.0375	26.8603	4.25
Top Dia (in)	18.0000	26.8603	34.0833	41.0375	41.0375	26.8603	18.0000
Bot Dia (in)	28.1875	35.7500	43.0000	50.0000	43.0000	35.7500	28.1875
Grade					A572-65	A572-65	
Weight (K)	2.1	3.4	5.2	6.1			



DESIGNED APPURTENANCE LOADING

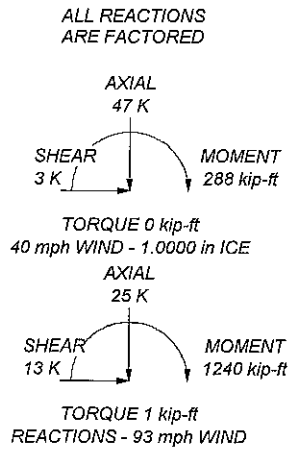
TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 5/8" x 4'	152	(2) TT19-08BP111-001	147
AM-X-CD-16-65-00T-RET w/ Mount Pipe	147	(2) TT19-08BP111-001	147
AM-X-CD-16-65-00T-RET w/ Mount Pipe	147	DC6-48-60-18-8F	147
AM-X-CD-14-65-00T-RET w/ Mount Pipe	147	RRUS 11	147
AM-X-CD-14-65-00T-RET w/ Mount Pipe	147	RRUS 11	147
(2) P90-14-XLH-RR w/ Mount Pipe	147	RRUS 11	147
(2) P90-14-XLH-RR w/ Mount Pipe	147	RRUS 11	147
(2) P90-14-XLH-RR w/ Mount Pipe	147	RRUS 11	147
(2) TT19-08BP111-001	147	6' x 2" Mount Pipe	147
		Platform Mount [LP 714-1]	147

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 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: 39.7%



<p>CROWN CASTLE The Foundation for a wireless World</p>	Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2000 FAX: (724) 416-2254		Job: BU# 857528
	Project:	Client: Crown Castle USA	Drawn by: Kibreab Gebremariam
	Code: TIA-222-G	Date: 10/12/16	App'd: [Signature]
	Path: C:\Users\kgebremariam\Desktop\857528 WO 1313132\857528.eri	Scale: NTS	Dwg No. E-1

Tower Input Data

There is a pole section.

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

The following design criteria apply:

- 1) Tower is located in Litchfield County, Connecticut.
- 2) Basic wind speed of 93 mph.
- 3) Structure Class II.
- 4) Exposure Category B.
- 5) Topographic Category 1.
- 6) Crest Height 0.00 ft.
- 7) Nominal ice thickness of 1.0000 in.
- 8) Ice thickness is considered to increase with height.
- 9) Ice density of 56 pcf.
- 10) A wind speed of 40 mph is used in combination with ice.
- 11) Temperature drops of 50 °F.
- 12) Deflections calculated using a wind speed of 60 mph.
- 13) A non-linear (P-delta) analysis was used.
- 14) Pressures are calculated at each section.
- 15) Stress ratio used in pole design is 1.
- 16) 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
Poles
✓ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets |
|--|--|--|

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	150.00-104.50	45.50	4.25	18	18.0000	28.1875	0.1875	0.7500	A572-65 (65 ksi)
L2	104.50-68.75	40.00	5.25	18	26.8609	35.7500	0.2500	1.0000	A572-65 (65 ksi)
L3	68.75-34.00	40.00	6.00	18	34.0833	43.0000	0.3125	1.2500	A572-65 (65 ksi)
L4	34.00-0.00	40.00		18	41.0375	50.0000	0.3125	1.2500	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	I/Q in ²	w in	w/t
L1	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136
	28.6223	16.6635	1650.5160	9.9400	14.3193	115.2655	3303.2038	8.3333	4.6310	24.699
L2	28.2343	21.1158	1889.1397	9.4469	13.6453	138.4457	3780.7651	10.5599	4.2875	17.15
	36.3015	28.1692	4485.0722	12.6025	18.1610	246.9617	8976.0460	14.0873	5.8520	23.408
L3	35.7975	33.4964	4826.3494	11.9886	17.3143	278.7490	9659.0495	16.7514	5.4487	17.436
	43.6633	42.3407	9747.5744	15.1541	21.8440	446.2358	19507.974	21.1744	7.0180	22.458
L4	43.0357	40.3941	8464.0370	14.4574	20.8470	406.0065	16939.211	20.2009	6.6726	21.352
	50.7713	49.2838	15372.193	17.6391	25.4000	605.2045	30764.613	24.6466	8.2500	26.4

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 150.00-104.50				1	1	1			
L2 104.50-68.75				1	1	1			
L3 68.75-34.00				1	1	1			
L4 34.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

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	plf
LDF7-50A(1-5/8")	B	No	Inside Pole	147.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.82 0.82
LDF4-75A(5/8")	B	No	Inside Pole	147.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.14 0.14
LDF2-50A(3/8")	B	No	Inside Pole	147.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.08 0.08
*							
LDF4P-50A(1/2")	B	No	Inside Pole	147.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.15 0.15
*							

Feed Line/Linear Appurtenances Section Areas

Tower Section 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	150.00-104.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.45
		C	0.000	0.000	0.000	0.000	0.00
L2	104.50-68.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.38
		C	0.000	0.000	0.000	0.000	0.00
L3	68.75-34.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.36
		C	0.000	0.000	0.000	0.000	0.00
L4	34.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.36
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section 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	150.00-104.50	A	2.286	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.45
		C		0.000	0.000	0.000	0.000	0.00
L2	104.50-68.75	A	2.201	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.38
		C		0.000	0.000	0.000	0.000	0.00
L3	68.75-34.00	A	2.090	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.36
		C		0.000	0.000	0.000	0.000	0.00
L4	34.00-0.00	A	1.866	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.36
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	150.00-104.50	0.0000	0.0000	0.0000	0.0000
L2	104.50-68.75	0.0000	0.0000	0.0000	0.0000
L3	68.75-34.00	0.0000	0.0000	0.0000	0.0000
L4	34.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral	Vert					
Lighting Rod 5/8" x 4'	C	None	0.0000	152.00	No Ice	0.25	0.25	0.03		
					1/2" Ice	0.66	0.66	0.03		
					Ice	0.97	0.97	0.04		
					1" Ice					
**										
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	8.26	6.30	0.07	
						1/2" Ice	8.82	7.48	0.14	
						Ice	9.35	8.37	0.21	
						1" Ice				
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	8.26	6.30	0.07	
						1/2" Ice	8.82	7.48	0.14	
						Ice	9.35	8.37	0.21	
						1" Ice				
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	5.23	4.02	0.03	
						1/2" Ice	5.62	4.63	0.08	
						Ice	6.01	5.26	0.13	
						1" Ice				
(2) P90-14-XLH-RR w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	5.30	4.05	0.05	
						1/2" Ice	5.69	4.67	0.09	
						Ice	6.09	5.29	0.15	
						1" Ice				
(2) P90-14-XLH-RR w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	5.30	4.05	0.05	
						1/2" Ice	5.69	4.67	0.09	
						Ice	6.09	5.29	0.15	
						1" Ice				
(2) P90-14-XLH-RR w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	5.30	4.05	0.05	
						1/2" Ice	5.69	4.67	0.09	
						Ice	6.09	5.29	0.15	
						1" Ice				
(2) TT19-08BP111-001	A	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	0.55	0.44	0.02	
						1/2" Ice	0.64	0.53	0.02	
						Ice	0.74	0.63	0.03	
						1" Ice				
(2) TT19-08BP111-001	B	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	0.55	0.44	0.02	
						1/2" Ice	0.64	0.53	0.02	
						Ice	0.74	0.63	0.03	
						1" Ice				
(2) TT19-08BP111-001	C	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	0.55	0.44	0.02	
						1/2" Ice	0.64	0.53	0.02	
						Ice	0.74	0.63	0.03	
						1" Ice				
DC6-48-60-18-8F	B	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	0.79	0.79	0.02	
						1/2" Ice	1.27	1.27	0.04	
						Ice	1.45	1.45	0.05	
						1" Ice				
RRUS 11	A	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	2.78	1.19	0.05	
						1/2" Ice	2.99	1.33	0.07	
						Ice	3.21	1.49	0.09	
						1" Ice				
RRUS 11	B	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	2.78	1.19	0.05	
						1/2" Ice	2.99	1.33	0.07	
						Ice	3.21	1.49	0.09	
						1" Ice				
RRUS 11	C	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	2.78	1.19	0.05	
						1/2" Ice	2.99	1.33	0.07	
						Ice	3.21	1.49	0.09	
						1" Ice				
RRUS 11	A	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	2.78	1.19	0.05	
						1/2" Ice	2.99	1.33	0.07	
						Ice	3.21	1.49	0.09	
						1" Ice				
RRUS 11	B	From Leg	4.00 0.00 1.00	0.0000	147.00	No Ice	2.78	1.19	0.05	
						1/2" Ice	2.99	1.33	0.07	
						Ice	3.21	1.49	0.09	
						1" Ice				

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			Lateral	ft	°	ft	ft ²	ft ²	K
RRUS 11	C	From Leg	4.00	0.0000	147.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			1.00			Ice	3.21	1.49	0.09
6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	147.00	1" Ice			
			0.00			No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
Platform Mount [LP 714-1]	C	None			147.00	Ice	2.29	2.29	0.05
						1" Ice			
						No Ice	37.47	37.47	1.60
						1/2"	44.23	44.23	2.04
						Ice	50.99	50.99	2.48
						1" Ice			
**									
**									
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**									

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+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
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	150 - 104.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-14.76	-1.79	-0.20
			Max. Mx	8	-5.51	-200.75	-0.48
			Max. My	14	-5.51	-0.87	-200.90
			Max. Vy	8	6.19	-200.75	-0.48
			Max. Vx	2	-6.20	0.09	200.90
			Max. Torque	3			-0.68
L2	104.5 - 68.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.43	-1.85	-0.20
			Max. Mx	8	-9.71	-452.15	-0.91
			Max. My	14	-9.71	-1.32	-452.79
			Max. Vy	8	8.30	-452.15	-0.91
			Max. Vx	2	-8.31	0.50	452.79
			Max. Torque	3			-0.68
L3	68.75 - 34	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.72	-1.85	-0.20
			Max. Mx	8	-15.98	-771.47	-1.33
			Max. My	14	-15.98	-1.75	-772.59
			Max. Vy	8	10.45	-771.47	-1.33
			Max. Vx	2	-10.47	0.91	772.59
			Max. Torque	3			-0.68
L4	34 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.64	-1.85	-0.20
			Max. Mx	8	-24.99	-1237.42	-1.81
			Max. My	14	-24.99	-2.23	-1239.09
			Max. Vy	8	12.84	-1237.42	-1.81
			Max. Vx	2	-12.85	1.39	1239.09
			Max. Torque	3			-0.67

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	46.64	-0.00	-0.00
	Max. H _x	20	25.00	12.83	0.01
	Max. H _z	2	25.00	0.01	12.85
	Max. M _x	2	1239.09	0.01	12.85
	Max. M _z	8	1237.42	-12.83	-0.01
	Max. Torsion	15	0.67	-0.01	-12.85
	Min. Vert	19	18.75	11.11	-6.41
	Min. H _x	8	25.00	-12.83	-0.01
	Min. H _z	14	25.00	-0.01	-12.85

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. M _x	14	-1239.09	-0.01	-12.85
	Min. M _z	20	-1236.58	12.83	0.01
	Min. Torsion	3	-0.67	0.01	12.85

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	20.83	0.00	0.00	0.00	-0.33	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	25.00	-0.01	-12.85	-1239.09	1.39	0.67
0.9 Dead+1.6 Wind 0 deg - No Ice	18.75	-0.01	-12.85	-1229.54	1.49	0.67
1.2 Dead+1.6 Wind 30 deg - No Ice	25.00	6.41	-11.12	-1072.18	-617.35	0.58
0.9 Dead+1.6 Wind 30 deg - No Ice	18.75	6.41	-11.12	-1063.91	-612.49	0.58
1.2 Dead+1.6 Wind 60 deg - No Ice	25.00	11.11	-6.41	-617.98	-1070.79	0.33
0.9 Dead+1.6 Wind 60 deg - No Ice	18.75	11.11	-6.41	-613.21	-1062.43	0.33
1.2 Dead+1.6 Wind 90 deg - No Ice	25.00	12.83	0.01	1.81	-1237.42	-0.01
0.9 Dead+1.6 Wind 90 deg - No Ice	18.75	12.83	0.01	1.80	-1227.77	-0.01
1.2 Dead+1.6 Wind 120 deg - No Ice	25.00	11.12	6.43	621.12	-1072.60	-0.34
0.9 Dead+1.6 Wind 120 deg - No Ice	18.75	11.12	6.43	616.33	-1064.22	-0.34
1.2 Dead+1.6 Wind 150 deg - No Ice	25.00	6.43	11.13	1074.00	-620.49	-0.59
0.9 Dead+1.6 Wind 150 deg - No Ice	18.75	6.43	11.13	1065.71	-615.60	-0.59
1.2 Dead+1.6 Wind 180 deg - No Ice	25.00	0.01	12.85	1239.09	-2.23	-0.67
0.9 Dead+1.6 Wind 180 deg - No Ice	18.75	0.01	12.85	1229.54	-2.11	-0.67
1.2 Dead+1.6 Wind 210 deg - No Ice	25.00	-6.41	11.12	1072.18	616.51	-0.58
0.9 Dead+1.6 Wind 210 deg - No Ice	18.75	-6.41	11.12	1063.91	611.87	-0.58
1.2 Dead+1.6 Wind 240 deg - No Ice	25.00	-11.11	6.41	617.98	1069.95	-0.33
0.9 Dead+1.6 Wind 240 deg - No Ice	18.75	-11.11	6.41	613.21	1061.81	-0.33
1.2 Dead+1.6 Wind 270 deg - No Ice	25.00	-12.83	-0.01	-1.81	1236.58	0.01
0.9 Dead+1.6 Wind 270 deg - No Ice	18.75	-12.83	-0.01	-1.80	1227.15	0.01
1.2 Dead+1.6 Wind 300 deg - No Ice	25.00	-11.12	-6.43	-621.12	1071.76	0.34
0.9 Dead+1.6 Wind 300 deg - No Ice	18.75	-11.12	-6.43	-616.32	1063.60	0.34
1.2 Dead+1.6 Wind 330 deg - No Ice	25.00	-6.43	-11.13	-1073.99	619.65	0.59
0.9 Dead+1.6 Wind 330 deg - No Ice	18.75	-6.43	-11.13	-1065.71	614.98	0.59
1.2 Dead+1.0 Ice+1.0 Temp	46.64	0.00	0.00	0.20	-1.85	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	46.64	0.00	-2.92	-285.75	-1.98	0.15
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	46.64	1.46	-2.53	-247.46	-144.98	0.14
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	46.64	2.53	-1.46	-142.80	-249.65	0.09

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
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	46.64	2.92	-0.00	0.17	-287.95	0.01
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	46.64	2.53	1.46	143.15	-249.61	-0.06
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	46.64	1.46	2.53	247.84	-144.91	-0.12
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	46.64	-0.00	2.92	286.17	-1.90	-0.15
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	46.64	-1.46	2.53	247.88	141.10	-0.14
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	46.64	-2.53	1.46	143.23	245.77	-0.09
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	46.64	-2.92	0.00	0.26	284.07	-0.01
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	46.64	-2.53	-1.46	-142.73	245.73	0.06
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	46.64	-1.46	-2.53	-247.41	141.03	0.12
Dead+Wind 0 deg - Service	20.83	-0.00	-2.99	-287.07	0.07	0.16
Dead+Wind 30 deg - Service	20.83	1.49	-2.59	-248.40	-143.28	0.14
Dead+Wind 60 deg - Service	20.83	2.59	-1.49	-143.17	-248.33	0.08
Dead+Wind 90 deg - Service	20.83	2.99	0.00	0.42	-286.93	-0.00
Dead+Wind 120 deg - Service	20.83	2.59	1.50	143.90	-248.75	-0.08
Dead+Wind 150 deg - Service	20.83	1.50	2.59	248.82	-144.00	-0.14
Dead+Wind 180 deg - Service	20.83	0.00	2.99	287.07	-0.77	-0.16
Dead+Wind 210 deg - Service	20.83	-1.49	2.59	248.40	142.58	-0.14
Dead+Wind 240 deg - Service	20.83	-2.59	1.49	143.17	247.63	-0.08
Dead+Wind 270 deg - Service	20.83	-2.99	-0.00	-0.42	286.23	0.00
Dead+Wind 300 deg - Service	20.83	-2.59	-1.50	-143.90	248.05	0.08
Dead+Wind 330 deg - Service	20.83	-1.50	-2.59	-248.82	143.30	0.14

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	-20.83	0.00	0.00	20.83	0.00	0.000%
2	-0.01	-25.00	-12.85	0.01	25.00	12.85	0.000%
3	-0.01	-18.75	-12.85	0.01	18.75	12.85	0.000%
4	6.41	-25.00	-11.12	-6.41	25.00	11.12	0.000%
5	6.41	-18.75	-11.12	-6.41	18.75	11.12	0.000%
6	11.11	-25.00	-6.41	-11.11	25.00	6.41	0.000%
7	11.11	-18.75	-6.41	-11.11	18.75	6.41	0.000%
8	12.83	-25.00	0.01	-12.83	25.00	-0.01	0.000%
9	12.83	-18.75	0.01	-12.83	18.75	-0.01	0.000%
10	11.12	-25.00	6.43	-11.12	25.00	-6.43	0.000%
11	11.12	-18.75	6.43	-11.12	18.75	-6.43	0.000%
12	6.43	-25.00	11.13	-6.43	25.00	-11.13	0.000%
13	6.43	-18.75	11.13	-6.43	18.75	-11.13	0.000%
14	0.01	-25.00	12.85	-0.01	25.00	-12.85	0.000%
15	0.01	-18.75	12.85	-0.01	18.75	-12.85	0.000%
16	-6.41	-25.00	11.12	6.41	25.00	-11.12	0.000%
17	-6.41	-18.75	11.12	6.41	18.75	-11.12	0.000%
18	-11.11	-25.00	6.41	11.11	25.00	-6.41	0.000%
19	-11.11	-18.75	6.41	11.11	18.75	-6.41	0.000%
20	-12.83	-25.00	-0.01	12.83	25.00	0.01	0.000%
21	-12.83	-18.75	-0.01	12.83	18.75	0.01	0.000%
22	-11.12	-25.00	-6.43	11.12	25.00	6.43	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
23	-11.12	-18.75	-6.43	11.12	18.75	6.43	0.000%
24	-6.43	-25.00	-11.13	6.43	25.00	11.13	0.000%
25	-6.43	-18.75	-11.13	6.43	18.75	11.13	0.000%
26	0.00	-46.64	0.00	-0.00	46.64	-0.00	0.000%
27	0.00	-46.64	-2.92	-0.00	46.64	2.92	0.000%
28	1.46	-46.64	-2.53	-1.46	46.64	2.53	0.000%
29	2.53	-46.64	-1.46	-2.53	46.64	1.46	0.000%
30	2.92	-46.64	-0.00	-2.92	46.64	0.00	0.000%
31	2.53	-46.64	1.46	-2.53	46.64	-1.46	0.000%
32	1.46	-46.64	2.53	-1.46	46.64	-2.53	0.000%
33	-0.00	-46.64	2.92	0.00	46.64	-2.92	0.000%
34	-1.46	-46.64	2.53	1.46	46.64	-2.53	0.000%
35	-2.53	-46.64	1.46	2.53	46.64	-1.46	0.000%
36	-2.92	-46.64	0.00	2.92	46.64	-0.00	0.000%
37	-2.53	-46.64	-1.46	2.53	46.64	1.46	0.000%
38	-1.46	-46.64	-2.53	1.46	46.64	2.53	0.000%
39	-0.00	-20.83	-2.99	0.00	20.83	2.99	0.000%
40	1.49	-20.83	-2.59	-1.49	20.83	2.59	0.000%
41	2.59	-20.83	-1.49	-2.59	20.83	1.49	0.000%
42	2.99	-20.83	0.00	-2.99	20.83	-0.00	0.000%
43	2.59	-20.83	1.50	-2.59	20.83	-1.50	0.000%
44	1.50	-20.83	2.59	-1.50	20.83	-2.59	0.000%
45	0.00	-20.83	2.99	-0.00	20.83	-2.99	0.000%
46	-1.49	-20.83	2.59	1.49	20.83	-2.59	0.000%
47	-2.59	-20.83	1.49	2.59	20.83	-1.49	0.000%
48	-2.99	-20.83	-0.00	2.99	20.83	0.00	0.000%
49	-2.59	-20.83	-1.50	2.59	20.83	1.50	0.000%
50	-1.50	-20.83	-2.59	1.50	20.83	2.59	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	0.00033615
3	Yes	4	0.00000001	0.00022205
4	Yes	5	0.00000001	0.00014014
5	Yes	5	0.00000001	0.00006722
6	Yes	5	0.00000001	0.00013075
7	Yes	5	0.00000001	0.00006245
8	Yes	4	0.00000001	0.00008936
9	Yes	4	0.00000001	0.00003957
10	Yes	5	0.00000001	0.00013195
11	Yes	5	0.00000001	0.00006298
12	Yes	5	0.00000001	0.00014147
13	Yes	5	0.00000001	0.00006781
14	Yes	4	0.00000001	0.00036276
15	Yes	4	0.00000001	0.00023992
16	Yes	5	0.00000001	0.00012825
17	Yes	5	0.00000001	0.00006125
18	Yes	5	0.00000001	0.00013687
19	Yes	5	0.00000001	0.00006564
20	Yes	4	0.00000001	0.00009021
21	Yes	4	0.00000001	0.00004052
22	Yes	5	0.00000001	0.00013826
23	Yes	5	0.00000001	0.00006626
24	Yes	5	0.00000001	0.00012951
25	Yes	5	0.00000001	0.00006180
26	Yes	4	0.00000001	0.00002630
27	Yes	5	0.00000001	0.00019317
28	Yes	5	0.00000001	0.00020593
29	Yes	5	0.00000001	0.00020671
30	Yes	5	0.00000001	0.00019715
31	Yes	5	0.00000001	0.00020717
32	Yes	5	0.00000001	0.00020656

33	Yes	5	0.00000001	0.00019398
34	Yes	5	0.00000001	0.00020149
35	Yes	5	0.00000001	0.00020062
36	Yes	5	0.00000001	0.00018978
37	Yes	5	0.00000001	0.00019997
38	Yes	5	0.00000001	0.00020067
39	Yes	4	0.00000001	0.00002380
40	Yes	4	0.00000001	0.00006287
41	Yes	4	0.00000001	0.00005138
42	Yes	4	0.00000001	0.00001470
43	Yes	4	0.00000001	0.00005186
44	Yes	4	0.00000001	0.00006352
45	Yes	4	0.00000001	0.00002408
46	Yes	4	0.00000001	0.00004941
47	Yes	4	0.00000001	0.00005818
48	Yes	4	0.00000001	0.00001461
49	Yes	4	0.00000001	0.00005889
50	Yes	4	0.00000001	0.00004994

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 104.5	13.746	43	0.8773	0.0038
L2	108.75 - 68.75	6.928	44	0.6385	0.0011
L3	74 - 34	3.110	44	0.3971	0.0005
L4	40 - 0	0.919	44	0.2084	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	Lighting Rod 5/8" x 4'	43	13.746	0.8773	0.0038	51325
147.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	43	13.210	0.8612	0.0036	51325

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 104.5	59.292	12	3.7778	0.0163
L2	108.75 - 68.75	29.906	12	2.7573	0.0049
L3	74 - 34	13.427	12	1.7150	0.0020
L4	40 - 0	3.965	12	0.8995	0.0008

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	Lighting Rod 5/8" x 4'	12	59.292	3.7778	0.0163	12040
147.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	12	56.985	3.7095	0.0153	12040

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	150 - 104.5 (1)	TP28.1875x18x0.1875	45.50	0.00	0.0	16.097 2	-5.51	1063.40	0.005
L2	104.5 - 68.75 (2)	TP35.75x26.8609x0.25	40.00	0.00	0.0	27.243 5	-9.71	1834.88	0.005
L3	68.75 - 34 (3)	TP43x34.0833x0.3125	40.00	0.00	0.0	41.014 0	-15.98	2800.65	0.006
L4	34 - 0 (4)	TP50x41.0375x0.3125	40.00	0.00	0.0	49.283 8	-24.99	3120.39	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio M _{ux} / φM _{nx}	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio M _{uy} / φM _{ny}
L1	150 - 104.5 (1)	TP28.1875x18x0.1875	201.38	592.01	0.340	0.00	592.01	0.000
L2	104.5 - 68.75 (2)	TP35.75x26.8609x0.25	453.53	1296.18	0.350	0.00	1296.18	0.000
L3	68.75 - 34 (3)	TP43x34.0833x0.3125	773.57	2382.08	0.325	0.00	2382.08	0.000
L4	34 - 0 (4)	TP50x41.0375x0.3125	1240.35	3193.20	0.388	0.00	3193.20	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio V _u / φV _n	Actual T _u kip-ft	φT _n kip-ft	Ratio T _u / φT _n
L1	150 - 104.5 (1)	TP28.1875x18x0.1875	6.21	531.70	0.012	0.59	1185.47	0.000
L2	104.5 - 68.75 (2)	TP35.75x26.8609x0.25	8.32	917.44	0.009	0.59	2595.53	0.000
L3	68.75 - 34 (3)	TP43x34.0833x0.3125	10.47	1400.33	0.007	0.59	4770.00	0.000
L4	34 - 0 (4)	TP50x41.0375x0.3125	12.86	1560.20	0.008	0.59	6394.20	0.000

Pole Interaction Design Data

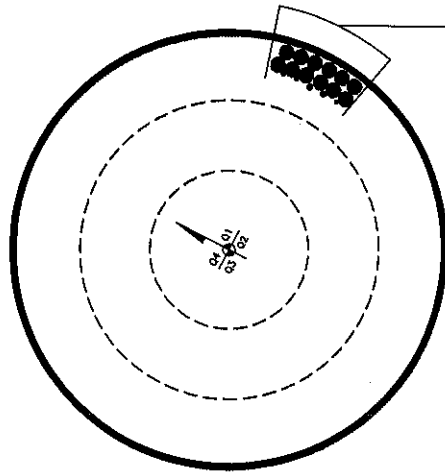
Section No.	Elevation ft	Ratio P _u / φP _n	Ratio M _{ux} / φM _{nx}	Ratio M _{uy} / φM _{ny}	Ratio V _u / φV _n	Ratio T _u / φT _n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 104.5 (1)	0.005	0.340	0.000	0.012	0.000	0.345	1.000	4.8.2 ✓
L2	104.5 - 68.75 (2)	0.005	0.350	0.000	0.009	0.000	0.355	1.000	4.8.2 ✓
L3	68.75 - 34 (3)	0.006	0.325	0.000	0.007	0.000	0.331	1.000	4.8.2 ✓

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$\frac{P_u}{\phi P_n}$	$\frac{M_{ux}}{\phi M_{nx}}$	$\frac{M_{uy}}{\phi M_{ny}}$	$\frac{V_u}{\phi V_n}$	$\frac{T_u}{\phi T_n}$			
L4	34 - 0 (4)	0.008	0.388	0.000	0.008	0.000	0.397	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	150 - 104.5	Pole	TP28.1875x18x0.1875	1	-5.51	1063.40	34.5	Pass
L2	104.5 - 68.75	Pole	TP35.75x26.8609x0.25	2	-9.71	1834.88	35.5	Pass
L3	68.75 - 34	Pole	TP43x34.0833x0.3125	3	-15.98	2800.65	33.1	Pass
L4	34 - 0	Pole	TP50x41.0375x0.3125	4	-24.99	3120.39	39.7	Pass
Summary								
Pole (L4)							39.7	Pass
RATING =							39.7	Pass

APPENDIX B
BASE LEVEL DRAWING



- (INSTALLED)
- (1) 3/8" TO 147 FT LEVEL
- (2) 1/2" TO 147 FT LEVEL
- (2) 5/8" TO 147 FT LEVEL
- (12) 1-5/8" TO 147 FT LEVEL

BUSINESS UNIT: 657528 TOWER ID: C_BASELEVEL

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#: 857528
Site Name: WOODBURY PAPER MILL RD
App #: 365853, Rev. 0
Pole Manufacturer: <i>Other</i>

Anchor Rod Data

Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	57	in

Plate Data

Diam:	64	in
Thick:	2.25	in
Grade:	50	ksi
Single-Rod B-eff:	6.61	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:	50	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	1240	ft-kips
Axial, Pu:	25	kips
Shear, Vu:	13	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): 45.6 Kips
 Allowable Axial, Φ*Fu*Anet: 260.0 Kips
 Anchor Rod Stress Ratio: 17.6% **Pass**

Rigid
AISC LRFD
φ*Tn

Base Plate Results

Base Plate Stress: 11.5 ksi
 Allowable Plate Stress: 45.0 ksi
 Base Plate Stress Ratio: 25.5% **Pass**

Flexural Check

Rigid
AISC LRFD
φ*Fy
Y.L. Length: 27.37

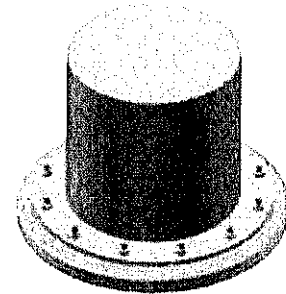
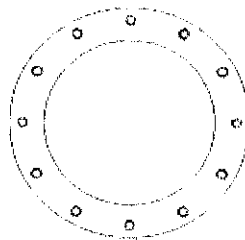
n/a

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

Monopole Pier and Pad Foundation

BU #: 857528

Site Name: WOODBURY PAPER MILL F

App. Number: 365853, Rev. 0

TIA-222 Revision: **G**



Design Reactions		
Shear, S:	13	kips
Moment, M:	1240	ft-kips
Tower Height, H:	150	ft
Tower Weight, Wt:	25	kips
Base Diameter, BD:	4.17	ft

Design Checks			
	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam. (ft)	6.5	5.667	OK
Overturing (ft-kips)	3467.60	1240.00	35.8%
Shear Capacity (kips)	79.01	13.00	16.5%
Bearing (ksf)	9.00	1.10	12.2%
Pad Shear - 1-way (kips)	720.35	160.63	22.3%
Pad Shear - 2-way (kips)	1640.15	49.89	3.0%
Pad Moment Capacity (k-ft)	4457.26	433.78	9.7%
Pier Moment Capacity (k-ft)	6260.01	1272.50	20.3%

Foundation Dimensions		
Depth, D:	4.5	ft
Pad Width, W:	24	ft
Neglected Depth, N:	4.167	ft
Thickness, T:	2.50	ft
Pier Diameter, Pd:	6.50	ft
Ext. Above Grade, E:	0.50	ft
BP Dist. Above Pier:	3	in.
Clear Cover, Cc:	3.0	in

Soil Properties		
Soil Unit Weight, γ :	0.090	kcf
Ult. Bearing Capacity, Bc:	12.0	ksf
Angle of Friction, Φ :	0	deg
Cohesion, Co:	0.000	ksf
Passive Pressure, Pp:	0.000	ksf
Base Friction, μ :	0.30	

Material Properties		
Rebar Yield Strength, Fy:	60000	psi
Concrete Strength, F'c:	4000	psi
Concrete Unit Weight, δ_c :	0.150	kcf
Seismic Zone, z:	1	

Rebar Properties		
Pier Rebar Size, Sp:	10	
Pier Rebar Quantity, mp:	34	19
Pad Rebar Size, Spad:	10	
Pad Rebar Quantity, mpad:	31	7
Pier Tie Size, St:	4	3
Tie Quantity, mt:	5	4

Maximum Allowable Moment of a Circular Pier

Axial Load (Negative for Compression) = kips

<u>Pier Properties</u>		<u>Material Properties</u>	
Concrete:		Concrete compressive strength =	<input type="text" value="4000"/> psi
Pier Diameter =	<input type="text" value="6.5"/> ft	Reinforcement yield strength =	<input type="text" value="60000"/> psi
Concrete Area =	4778.4 in ²	Modulus of elasticity =	<input type="text" value="29000"/> ksi
Reinforcement:		Reinforcement yield strain =	<input type="text" value="0.00207"/>
Clear Cover =	<input type="text" value="3.00"/> in	Limiting compressive strain =	<input type="text" value="0.003"/>
Cage Diameter =	5.89 ft	<u>Seismic Properties</u>	
Bar Size =	<input type="text" value="10"/>	Seismic Zone =	<input type="text" value="1"/>
Bar Diameter =	1.27 in		
Bar Area =	1.27 in ²		
Number of Bars =	<input type="text" value="34"/>		

Minimum Area of Steel

Required area of steel = 23.89 in²

Provided area of steel = 43.18 in²

OK

Axial Loading

Load factor =

Reduction factor = 0.9

Factored axial load = -27.7778 kips

Neutral Axis

Distance from extreme edge to neutral axis = 13.31 in

Equivalent compression zone factor = 0.85

Distance from extreme edge to equivalent compression zone factor = 11.31 in

Distance from centroid to neutral axis = 25.69 in

Compression Zone

Area of steel in compression zone = 10.16 in²

Angle from centroid of pier to intersection of equivalent compression zone and edge of pier = 44.77 deg

Area of concrete in compression = 428.06 in²

Force in concrete = $0.85 * f_c * Acc$ = 1455.40 kips

Total reinforcement forces = -1427.62 kips

Factored axial load = -27.78 kips

Force in concrete = -1455.40 kips

Sum of the forces in concrete = 0.00 kips **OK**

Maximum Moment

First moment of the concrete

area in compression about the centroid = 13814.96 in³

Distance between centroid of concrete

in compression and centroid of pier = 32.27 in

Moment of concrete in compression = 46970.87 in-kips

Total reinforcement moment = 36495.94 in-kips

Nominal moment strength of column = 83466.81 in-kips

Factored moment strength of column = 75120.13 in-kips

Maximum Allowable Moment = ft-kips

Individual Bars

Bar #	Angle from first bar (deg)	Distance to centroid (in)	Distance to neutral axis (in)	Distance to equivalent comp. zone (in)	Strain	Area of steel in compression (in ²)	Stress (ksi)	Axial force (kips)
1	0.00	0.00	-25.69	-27.69	-0.0057906	0.00	-60.00	-76.20
2	10.59	6.50	-19.19	-21.19	-0.0043259	0.00	-60.00	-76.20
3	21.18	12.78	-12.91	-14.91	-0.002911	0.00	-60.00	-76.20
4	31.76	18.62	-7.07	-9.07	-0.0015943	0.00	-46.23	-58.72
5	42.35	23.83	-1.87	-3.86	-0.0004204	0.00	-12.19	-15.48
6	52.94	28.22	2.53	0.54	0.0005706	1.27	16.55	16.70
7	63.53	31.66	5.97	3.97	0.001345	1.27	39.00	45.22
8	74.12	34.01	8.32	6.33	0.0018764	1.27	54.41	64.79
9	84.71	35.21	9.52	7.53	0.0021467	1.27	60.00	71.88
10	95.29	35.21	9.52	7.53	0.0021467	1.27	60.00	71.88
11	105.88	34.01	8.32	6.33	0.0018764	1.27	54.41	64.79
12	116.47	31.66	5.97	3.97	0.001345	1.27	39.00	45.22
13	127.06	28.22	2.53	0.54	0.0005706	1.27	16.55	16.70
14	137.65	23.83	-1.87	-3.86	-0.0004204	0.00	-12.19	-15.48
15	148.24	18.62	-7.07	-9.07	-0.0015943	0.00	-46.23	-58.72
16	158.82	12.78	-12.91	-14.91	-0.002911	0.00	-60.00	-76.20
17	169.41	6.50	-19.19	-21.19	-0.0043259	0.00	-60.00	-76.20
18	180.00	0.00	-25.69	-27.69	-0.0057906	0.00	-60.00	-76.20
19	190.59	-6.50	-32.19	-34.19	-0.0072553	0.00	-60.00	-76.20
20	201.18	-12.78	-38.47	-40.46	-0.0086701	0.00	-60.00	-76.20
21	211.76	-18.62	-44.31	-46.30	-0.0099869	0.00	-60.00	-76.20
22	222.35	-23.83	-49.52	-51.51	-0.0111608	0.00	-60.00	-76.20
23	232.94	-28.22	-53.91	-55.91	-0.0121518	0.00	-60.00	-76.20
24	243.53	-31.66	-57.35	-59.34	-0.0129261	0.00	-60.00	-76.20
25	254.12	-34.01	-59.71	-61.70	-0.0134575	0.00	-60.00	-76.20
26	264.71	-35.21	-60.90	-62.90	-0.0137278	0.00	-60.00	-76.20
27	275.29	-35.21	-60.90	-62.90	-0.0137278	0.00	-60.00	-76.20
28	285.88	-34.01	-59.71	-61.70	-0.0134575	0.00	-60.00	-76.20
29	296.47	-31.66	-57.35	-59.34	-0.0129261	0.00	-60.00	-76.20
30	307.06	-28.22	-53.91	-55.91	-0.0121518	0.00	-60.00	-76.20
31	317.65	-23.83	-49.52	-51.51	-0.0111608	0.00	-60.00	-76.20
32	328.24	-18.62	-44.31	-46.30	-0.0099869	0.00	-60.00	-76.20
33	338.82	-12.78	-38.47	-40.46	-0.0086701	0.00	-60.00	-76.20
34	349.41	-6.50	-32.19	-34.19	-0.0072553	0.00	-60.00	-76.20

USGS Design Maps Summary Report

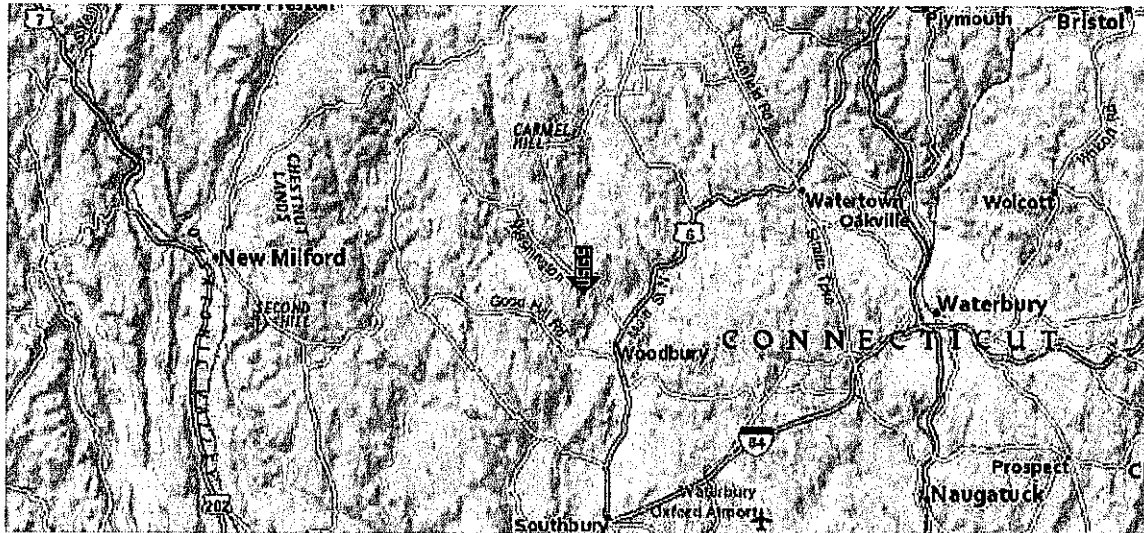
User-Specified Input

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

Site Coordinates 41.5731°N, 73.226°W

Site Soil Classification Site Class D - "Stiff Soil"

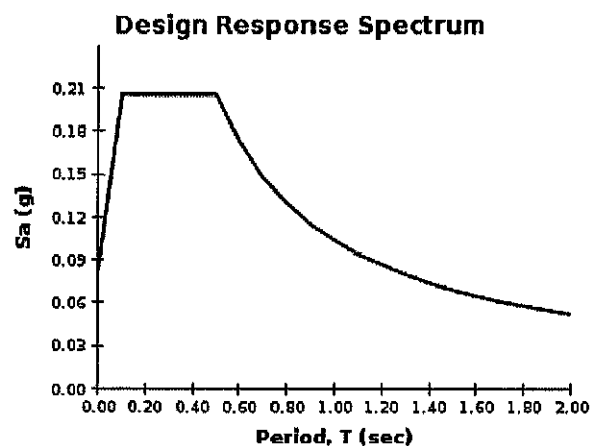
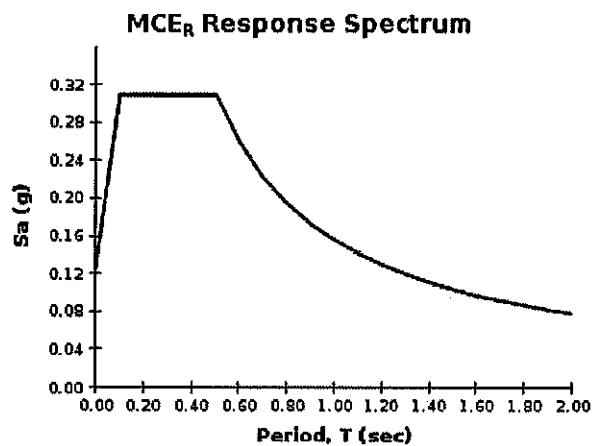
Risk Category I/II/III



USGS-Provided Output

$S_s = 0.193 \text{ g}$	$S_{MS} = 0.309 \text{ g}$	$S_{DS} = 0.206 \text{ g}$
$S_1 = 0.065 \text{ g}$	$S_{M1} = 0.156 \text{ g}$	$S_{D1} = 0.104 \text{ g}$

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.



Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

CCISeismic - Design Category

Per 2012/2015 IBC

Site BU: 857528
 Work Order: 1313132
 Application: 365853 Rev. 0



	Degrees	Minutes	Seconds	
Site Latitude =	41	34	23.00	41.5731 degrees
Site Longitude =	-73	13	39.51	-73.2276 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 =	0.193			USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.065			
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} =	0.206			(2.7.6)
Design spectral response acceleration 1 s period, S_{D1} =	0.104			(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



12 Gill Street
Suite 5800
Woburn, Ma 01801

Telephone: 781-771-2255
Email
jeff.barbadora@crowncastle.com

November 19, 2019

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: AT&T-Exempt Modification – EM-AT&T-119-160907

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. There were no deviations or material changes to the proposed installation. Pursuant to the Connecticut Siting Council 9/26/2016 approval of **EM-AT&T-119-160907**, this letter is to satisfy item numbers two, three and five of the CSC decision.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Barbadora', written in a cursive style.

Jeffrey Barbadora
781-970-0053



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

September 26, 2016

Jeff Barbadora
Crown Castle
12 Gill Street, Ste. 5800
Woburn, MA 01801

RE: **EM-AT&T-119-160907** – AT&T notice of intent to modify an existing telecommunications facility located at 52 New Britain Avenue, Rocky Hill, Connecticut.

Dear Mr. Barbadora:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

1. Prior to commencement of installation, AT&T shall provide one copy of the Structural Analysis Report to the Council referencing Revision G of the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures* as adopted by the Connecticut State Building Code effective October 1, 2016;
2. Modifications shall be installed in accordance with the structural analysis report and associated drawings prepared by B+T Group dated July 29, 2016 and stamped by Chad Tuttle or subsequent structural analysis report in accordance with Revision G as stated in the condition above;
3. Within 45 days following completion of equipment installation, AT&T shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations of the structural analysis;
4. Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
5. Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
6. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
7. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function;
8. The validity of this action shall expire one year from the date of this letter; and
9. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.



CONNECTICUT SITING COUNCIL
Affirmative Action / Equal Opportunity Employer

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated September 6, 2016. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Melanie A. Bachman
Acting Executive Director

MAB/CW/cm

- c: The Honorable Claudia Baio, Mayor, Town of Rocky Hill
John Mehr, Interim Town Manager, Town of Rocky Hill
Kimberly Ricci, Director of Planning, Town of Rocky Hill

January 5, 2017

Mr. Dan Vadney
Crown Castle USA, Inc.
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
(518) 373-3510
Dan.Vadney@crowncastle.com



Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351 (office)
(919) 661-6350 (fax)
PMI@tepgroup.net

Subject: Modification Inspection Report

Crown Castle Designation:	Crown Castle BU Number:	842872
	Crown Castle Site Name:	Rocky Hill
	Crown Castle JDE Job Number:	363239
Engineering Firm Designation:	TEP Project Number:	25659.61347

Site Data: 52 New Britain Avenue.
Rocky Hill, Hartford County, CT 06067
Latitude N 41° 39' 36.89", Longitude W 72° 40' 50.58"
182 Foot – Monopole Tower

Dear Mr. Vadney,

Tower Engineering Professionals is pleased to submit this "**Modification Inspection Report**" (MI Report) to Crown Castle for the modification/reinforcement to the subject structure. This Modification Inspection (MI) was performed in accordance with Crown Castle ENG-SOW-10007 Modification Inspection SOW, Contract Documents, and Crown Castle Purchase Order number 972238. The purpose of this MI is to confirm that the modification installation configuration and workmanship are in accordance with the contract document(s) listed in Table 2. The MI is not a review of the adequacy or effectiveness of the modification/reinforcement solution.

Table 1 – General Information

	Company	Contact	Dates on Site
MI Inspector	Tower Engineering Professionals	Kevin R. Arnett, P.E., C.W.I.	N/A
MI Inspector Field Representative (if applicable)	Tower Engineering Professionals	James Harms.	12/20/2016
<input checked="" type="checkbox"/> Independent <input type="checkbox"/> EOR <input type="checkbox"/> Turnkey			
Modification Design EOR	B+T Engineering Inc.	Robbie Frazier	N/A
General Contractor	Sabre	Gatan Waddell	12/16/2016
Sub to the General Contractor	Kennedy Construction	Tim Staples	12/16/2016
Field CWI for the General Contractor	Reese Tower Services	Brian Reese	12/16/2016
Field NDE for the General Contractor	Reese Tower Services	Brian Reese	12/16/2016

Table 2 – Documents

Document(s)	Remarks	Source
Modification Drawings Date: 10/27/2016 EOR: Robbie Frazier Job#: 95171.012.01	Creator of Drawings: EOR Company B+T Engineering Job #: 95171.012.01 Date of Drawings: 10/27/2016	CCI sites Drawing File: 6525881

Based on our inspection, Tower Engineering Professionals, Inc. determines this project:

PASSING MI

The configuration, materials and/or workmanship of the modifications are installed in accordance with the Contract Documents and no deficiencies were found.

PASS AS NOTED MI

The configuration, materials and/or workmanship of the modifications are accepted as noted (see detail below).

FAILED MI

The configuration, materials and/or workmanship of the modifications are NOT installed in accordance with the Contract Documents. The rejection is based on non-conformance in the following area(s):

- Materials (see detail below)
- Workmanship (see detail below)
- Configuration (see detail below)

-The EOR and Crown Castle waived the requirement for the EOR approved shop drawings, material test reports (MTRs), and packing slips. See e-mail correspondence in section 6.3.4 ENGINEER OF RECORD EMAIL for more details

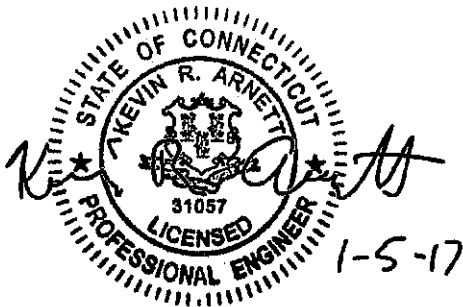
-The EOR approved changes to the layout of the modification. See 6.3.4 ENGINEER OF RECORD EMAIL for Details.

Discrepancies were noted between the As-Built field conditions and the structural modification drawings. The As-Built field conditions were approved by the Engineer of Record. All discrepancies are noted in the executive summary.

All observations were performed after the construction was complete. Tower Engineering Professionals, Inc. was not present during the construction phase. The onsite PMI was performed by James Harms and Dan Modal of Tower Engineering Professionals, Inc., (919) 661-6351.

We at Tower Engineering Professionals, Inc. 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,



Kevin R Arnett, P.E., C.W.I.



Crown Castle
12 Gill Street, Suite 5800
Woburn, Ma 01801

Tel: 781-970-0053

www.crowncastle.com

October 6, 2016

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: EM-AT&T-119-160907- Crown Site BU: 842872
AT&T Site ID: CTL05123
Site Address: 52 New Britain Avenue

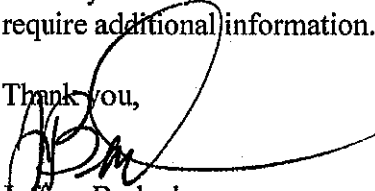
Dear Ms. Bachman:

The purpose of this letter is to notify you that Crown Castle was issued the building permit in Rocky Hill prior to the adoption of the new Rev G code change by the October 1, 2016 deadline. Please note that Crown Castle has demonstrated compliance with condition #1 of the issued decision because the building permit was issued from the town of Rocky Hill on September 16, 2016.

Attached for your file are the issued decision and building permit.

Thank you for your time on this matter and please let me know if you have any questions or require additional information.

Thank you,



Jeffrey Barbadora
Crown Castle
12 Gill Street
Suite 5800
Woburn, Ma 01801
P (781) 970-0053



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

September 26, 2016

Jeff Barbadora
Crown Castle
12 Gill Street, Ste. 5800
Woburn, MA 01801

RE: **EM-AT&T-119-160907** – AT&T notice of intent to modify an existing telecommunications facility located at 52 New Britain Avenue, Rocky Hill, Connecticut.

Dear Mr. Barbadora:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

1. Prior to commencement of installation, AT&T shall provide one copy of the Structural Analysis Report to the Council referencing Revision G of the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures* as adopted by the Connecticut State Building Code effective October 1, 2016;
2. Modifications shall be installed in accordance with the structural analysis report and associated drawings prepared by B+T Group dated July 29, 2016 and stamped by Chad Tuttle or subsequent structural analysis report in accordance with Revision G as stated in the condition above;
3. Within 45 days following completion of equipment installation, AT&T shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations of the structural analysis;
4. Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
5. Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
6. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
7. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function;
8. The validity of this action shall expire one year from the date of this letter; and
9. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.



CONNECTICUT SITING COUNCIL
Affirmative Action / Equal Opportunity Employer

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated September 6, 2016. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Melanie A. Bachman
Acting Executive Director

MAB/CW/cm

c: The Honorable Claudia Baio, Mayor, Town of Rocky Hill
John Mehr, Interim Town Manager, Town of Rocky Hill
Kimberly Ricci, Director of Planning, Town of Rocky Hill



State of Connecticut
Town of Rocky Hill
BUILDING PERMIT

Permit No: **BP-2017-104**
 Date Issued: **Sep 16, 2016**
 Amended Dates:
 Estimated Value: **\$20000**
 Permit Fee: **\$334.20**

PERMISSION IS HEREBY GRANTED TO: **Jeffrey Barbadora-Crown Castle** **ROCKY HILL TOWN OF**
 TO PERFORM WORK AT: **52 NEW BRITAIN AVENUE #**
 APPLICANT: **Jeffrey Barbadora-Crown Castle** OWNER: **ROCKY HILL TOWN OF**
 PROPERTY ADDRESS: **52 NEW BRITAIN AVENUE #** TENANT (IF APPLICABLE):
Crown Castle-Jeffrey Barbadora **MCO#0903225**
 CONTRACTOR: **Crown Castle-Jeffrey Barbadora** LICENSE NO. **MCO#0903225** USE GROUP(S):

TO PERFORM THE FOLLOWING WORK: **AT&T to add three (3) antennas and three (3) RRU's (non-antenna) to their existing antenna equipment on the tower. See sheet A-2 of the CD's for detail.**

This permit shall be deemed invalid unless worked authorized commences within six (6) months after it's issuance and proceeds in good faith continuously to completion.

Michael V. Little

Building Official

Below please find the list of all required inspections. You will need to call 24 hours in advance for all inspections. 860-258-2733

Electrical	Plumbing	Gas	Building	
Underground:	Underground:	Underground:	Footing/Round Steel:	Pre-Lath Fire Stopping:
Service:	Rough:	Meter:	Foundation Walls:	Insulation:
Rough:	Final:	Rough:	Foundation Drainage:	As-Builts:
Final:		Final:	Waterproofing:	Certificate of Occupancy:
Public Works	Mechanical	Fire	Floors Prior to Placement of Concrete:	
Meter:	HVAC Rough:	Oil:	Framing:	
House #:	Above Ceiling:	Smoke:	Deck Framing:	
Water:		Alarm:	Fireplace and Chimney at Throat:	
Sewer:		Sprinklers:		

POST THIS PERMIT SO IT IS VISIBLE FROM THE STREET.
 THIS PERMIT MAY BE REVOKED UPON VIOLATION OF ANY OF THE STATE ADOPTED CODES AND TOWN ORDINANCES.



12 Gill Street
Suite 5800
Woburn, Ma 01801

Telephone: 781-771-2255
Email
jeff.barbadora@crowncastle.com

November 19, 2019

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: AT&T-Exempt Modification – EM-AT&T-094-160211

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. There were no deviations or material changes to the proposed installation. Pursuant to the Connecticut Siting Council 3/7/2016 approval of **EM-AT&T-094-160211**, this letter is to satisfy item numbers One, two and five of the CSC decision.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Barbadora', with a large, stylized initial 'J'.

Jeffrey Barbadora
781-970-0053



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

March 7, 2016

Jeff Barbadora
Crown Castle

12 Gill Street, Ste. 5800
Woburn, MA 01801

RE: **EM-AT&T-094-160211** --AT&T notice of intent to modify an existing telecommunications facility located at 123 Costello Road, Newington, Connecticut.

Dear Mr. Barbadora:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

1. Reinforcements shall be made in accordance and consistent with the structural analysis report and modification drawings prepared by Paul J. Ford and Company dated November 11, 2015 and stamped by Justin T. Kline;
2. Within 45 days following completion of the equipment installation, AT&T shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations of the structural analysis;
3. Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
4. Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
5. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
6. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function;
7. The validity of this action shall expire one year from the date of this letter; and
8. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated February 10, 2016. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six



CONNECTICUT SITING COUNCIL

decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Melanie A. Bachman
Acting Executive Director

MAB/CH/cm

- c: The Honorable Roy Zartarian, Mayor, Town of Newington
- John L. Salomone, Town Manager, Town of Newington
- Craig Minor, Town Planner, Town of Newington
- Costello Industries Inc.

Engineered Tower Solutions, PLLC.
 2624 Leighton Ridge Dr. Suite 100
 Wake Forest, NC 27587
 (919) 782-2710
 Scott.Pyrch@ets-llc.com



Date: **February 29, 2016**

Dan Vadney
 Crown Castle USA, Inc.
 3 Corporate Park Drive, Suite 101
 Clifton Park, NY 12065

Subject: Modification Inspection Report

Crown Castle Designation: Crown Castle BU Number: 881364
 Crown Castle Site Name: Newington
 Crown Castle JDE Job Number: 350073

Engineering Firm Designation: ETS Project Number: 160020

Site Data: 123 Costelo Road, Newington, CT, Hartford County
 Latitude 41° 39' 18.72", Longitude -72° 43' 17.19"
 145 Foot – Monopole Tower

Engineered Tower Solutions, PLLC. is pleased to submit this “**Modification Inspection Report**” (MI Report) to Crown Castle for the modification/reinforcement to the subject structure. This Modification Inspection (MI) was performed in accordance with Crown Castle ENG-SOW-10007 Modification Inspection SOW, Contract Documents, and Crown Castle Purchase Order number 859041. The purpose of this MI is to confirm that the modification installation configuration and workmanship are in accordance with the contract document(s) listed in Table 2. The MI is not a review of the adequacy or effectiveness of the modification/reinforcement solution.

Table 1 – General Information

	Company	Contact	Dates on Site
MI Inspector	Engineered Tower Solutions, PLLC.	Scott Pyrch, E.I.	2/19/2016
MI Inspector Field Representative (if applicable)	N/A	N/A	N/A
<input checked="" type="checkbox"/> Independent <input type="checkbox"/> EOR <input type="checkbox"/> Turnkey			
Modification Design EOR	Paul J. Ford & Company	Justin T. Kline, P.E.	N/A
General Contractor	Skyclimber Wind Solutions, LLC	John Lawrence	2/16/2016 - 2/26/2016

Sub to the General Contractor	N/A	N/A	N/A
Field CWI for the General Contractor	N/A	N/A	N/A
Field NDE for the General Contractor	N/A	N/A	N/A

Table 2 – Documents

Document(s)	Remarks	Source
Tower Modification drawings 11/11/2015; PJF Job #: 37515-0757.007.7700	Justin T. Kline, P.E.; WO#: 1148446; Application ID: 310233	CCIsites Doc Number: 5976614

Based on our inspection, *Engineered Tower Solutions, PLLC.* determines this project:

PASSING MI

The configuration, materials and/or workmanship of the modifications are installed in accordance with the Contract Documents and no deficiencies were found.

PASS AS NOTED MI

The configuration, materials and/or workmanship of the modifications are accepted as noted (see detail below).

FAILED MI

The configuration, materials and/or workmanship of the modifications are NOT installed in accordance with the Contract Documents. The rejection is based on non-conformance in the following area(s):

- Materials (see detail below)
- Workmanship (see detail below)
- Configuration (see detail below)

We at *Engineered Tower Solutions, PLLC.* 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,

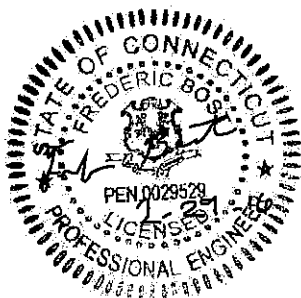


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Construction Complete Verification Letter

Contractor Company Name: Empire

Crown BU#: 881364

Crown Application #: 310233

Construction Start Date: 5/31/2016

Construction Complete Date: 9/18/2017

This letter is to verify the SOW for the above referenced site was completed within the dates noted above and submitted to Crown Castle within 48 hours of completion date. A time stamped winner photo of the structure on the last day of construction must be attached to or included with this form. This form will not be accepted without this photo. If you have any questions or need further information please contact the Project Manager or Construction Manager listed on your NTP.

Date: 9/18/2017

Submitted By: Martin Nagle

Authorized Signature:

Martin Nagle

Digitally signed by Martin Nagle
DN: cn=Martin Nagle, o=Empire, ou=Construction
Coordinator, email=mnagle@empiretelecomm.com, c=US
Date: 2017.09.20 13:30:44 -0400

(Electronic Signature Acceptable)

Insert picture below or attach separately. This form will not be accepted without a date stamped picture of either the Crown site ID sign posted on site or of the entire structure (no cell phone photos).





12 Gill Street
Suite 5800
Woburn, Ma 01801

Telephone: 781-771-2255
Email
jeff.barbadora@crowncastle.com

November 19, 2019

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: AT&T-Exempt Modification – EM-AT&T-085-160202

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. There were no deviations or material changes to the proposed installation. Pursuant to the Connecticut Siting Council 1/29/2016 approval of **EM-AT&T-085-160202**, this letter is to satisfy item numbers two and five of the CSC decision.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Barbadora', written in a cursive style.

Jeffrey Barbadora
781-970-0053



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

February 29, 2016

Jeff Barbadora
Crown Castle
12 Gill Street, Ste. 5800
Woburn, MA 01801

RE: **EM-AT&T-085-160202** –AT&T notice of intent to modify an existing telecommunications facility located at 230 Guinea Road, Monroe, Connecticut.

Dear Mr. Barbadora:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

1. The proposed feed lines shall be installed in accordance with the structural analysis report prepared by GPD Engineering and Architecture dated November 20, 2015 and stamped by Christopher J. Scheks;
2. Within 45 days following completion of the equipment installation, AT&T shall provide documentation that its installation complied with the recommendations of the structural analysis;
3. Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
4. Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
5. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
6. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function;
7. The validity of this action shall expire one year from the date of this letter; and
8. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated February 1, 2016. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission

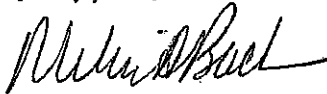


CONNECTICUT SITING COUNCIL

pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Melanie A. Bachman
Acting Executive Director

MAB/CH/cm

- c: The Honorable Stephen Vavrek, First Selectman, Town of Monroe
- William Agresta, AICP, Planning and Zoning Administrator, Town of Monroe



12 Gill Street
Suite 5800
Woburn, Ma 01801

Telephone: 781-771-2255
Email
jeff.barbadora@crowncastle.com

November 18, 2019

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: AT&T-Exempt Modification – EM-AT&T-059T-171129

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. There were no deviations or material changes to the proposed installation. Pursuant to the Connecticut Siting Council 12/26/2017 approval of **EM-AT&T-059T-171129**, this letter is to satisfy item numbers one, two and five of the CSC decision.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Barbadora".

Jeffrey Barbadora
781-970-0053



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

December 26, 2017

Jefferey Barbadora
Real Estate Specialist
Crown Catle
12 Gill Street, Suite 5800
Woburn, MA 01801

RE: **EM-AT&T-059T-171129** – AT&T notice of intent to modify an existing telecommunications facility located at 75 Roberts Road, Groton, Connecticut.

Dear Mr. Barbadora:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

1. The proposed modifications shall be installed in accordance with the drawings in Appendix D of the Structural Analysis Report prepared by B+T Group dated August 31, 2017 and stamped by Chad Tuttle;
2. Within 45 days following completion of equipment installation, AT&T shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations presented in the Structural Analysis Report;
3. Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
4. Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
5. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
6. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function;
7. The validity of this action shall expire one year from the date of this letter; and
8. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated November 20, 2017, and additional information submitted on December 12, 2017. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the



Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Melanie A. Bachman
Executive Director

MAB/CMW/bm

- c: The Honorable Bruce Flax, Mayor, Town of Groton
- John Burt, Town Manager, Town of Groton
- Jonathan J. Reiner, AICP, Director of Planning, Town of Groton

Engineered Tower Solutions, PLLC.
 2624 Leighton Ridge Dr. Suite 100
 Wake Forest, NC 27587
 (919) 782-2710
 Kurt.Vandeventer@ets-pllc.com



Date: **December 20, 2017**

Dan Vadney
 Crown Castle USA, Inc.
 3 Corporate Park Drive, Suite 101
 Clifton Park, NY 12065

Subject: Modification Inspection Report

Crown Castle Designation: Crown Castle BU Number: 881533
 Crown Castle Site Name: Groton Tower
 Crown Castle JDE Job Number: 415559

Engineering Firm Designation: ETS Project Number: 173016

Site Data: 75 Roberts Road, Groton, CT, New London County
 Latitude 41° 21' 36.80", Longitude -72° 2' 55.10"
 144.5 Foot – Monopole Tower

Engineered Tower Solutions, PLLC. is pleased to submit this “**Modification Inspection Report**” (MI Report) to Crown Castle for the modification/reinforcement to the subject structure. This Modification Inspection (MI) was performed in accordance with Crown Castle ENG-SOW-10007 Modification Inspection SOW, Contract Documents, and Crown Castle Purchase Order number 1097957. The purpose of this MI is to confirm that the modification installation configuration and workmanship are in accordance with the contract document(s) listed in Table 2. The MI is not a review of the adequacy or effectiveness of the modification/reinforcement solution.

Table 1 – General Information

	Company	Contact	Dates on Site
MI Inspector	Engineered Tower Solutions, PLLC	Paul White, EI	12/12/2017
MI Inspector Field Representative (if applicable)	N/A	N/A	N/A
<input checked="" type="checkbox"/> Independent <input type="checkbox"/> EOR <input type="checkbox"/> Turnkey			N/A
Modification Design EOR	B+T Group	Chad Tuttle, PE	N/A
General Contractor	Skyclimber Wind Solutions, LLC.	John Lawrence	11/7/2017 – 12/6/2017

Sub to the General Contractor	N/A	N/A	N/A
Field CWI for the General Contractor	N/A	N/A	N/A
Field NDE for the General Contractor	N/A	N/A	N/A

Table 2 – Documents

Document(s)	Remarks	Source
Tower Modification drawings, 8/31/2017; B+T Job #: 92739.008.01	Chad Tuttle, PE WO#: 1445738 Application ID: 374247	CCIsites Doc Number: 7042669

Based on our inspection, *Engineered Tower Solutions, PLLC.* determines this project:

PASSING MI

The configuration, materials and/or workmanship of the modifications are installed in accordance with the Contract Documents and no deficiencies were found.

PASS AS NOTED MI

The configuration, materials and/or workmanship of the modifications are accepted as noted (see detail below).

FAILED MI

The configuration, materials and/or workmanship of the modifications are **NOT** installed in accordance with the Contract Documents. The rejection is based on non-conformance in the following area(s):

- Materials (see detail below)
- Workmanship (see detail below)
- Configuration (see detail below)

We at *Engineered Tower Solutions, PLLC.* 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,





Construction Complete Verification Letter

Contractor Company Name: SLU

Crown BU#: 811533

Crown Application #: 374247

Construction Start Date: 2/5/2018

Construction Complete Date: 2/16/2018

This letter is to verify the SOW for the above referenced site was completed within the dates noted above and submitted to Crown Castle within 48 hours of completion date. A time stamped winner photo of the structure on the last day of construction must be attached to or included with this form. This form will not be accepted without this photo. If you have any questions or need further information please contact the Project Manager or Construction Manager listed on your NTP.

Date: 2/16/2018

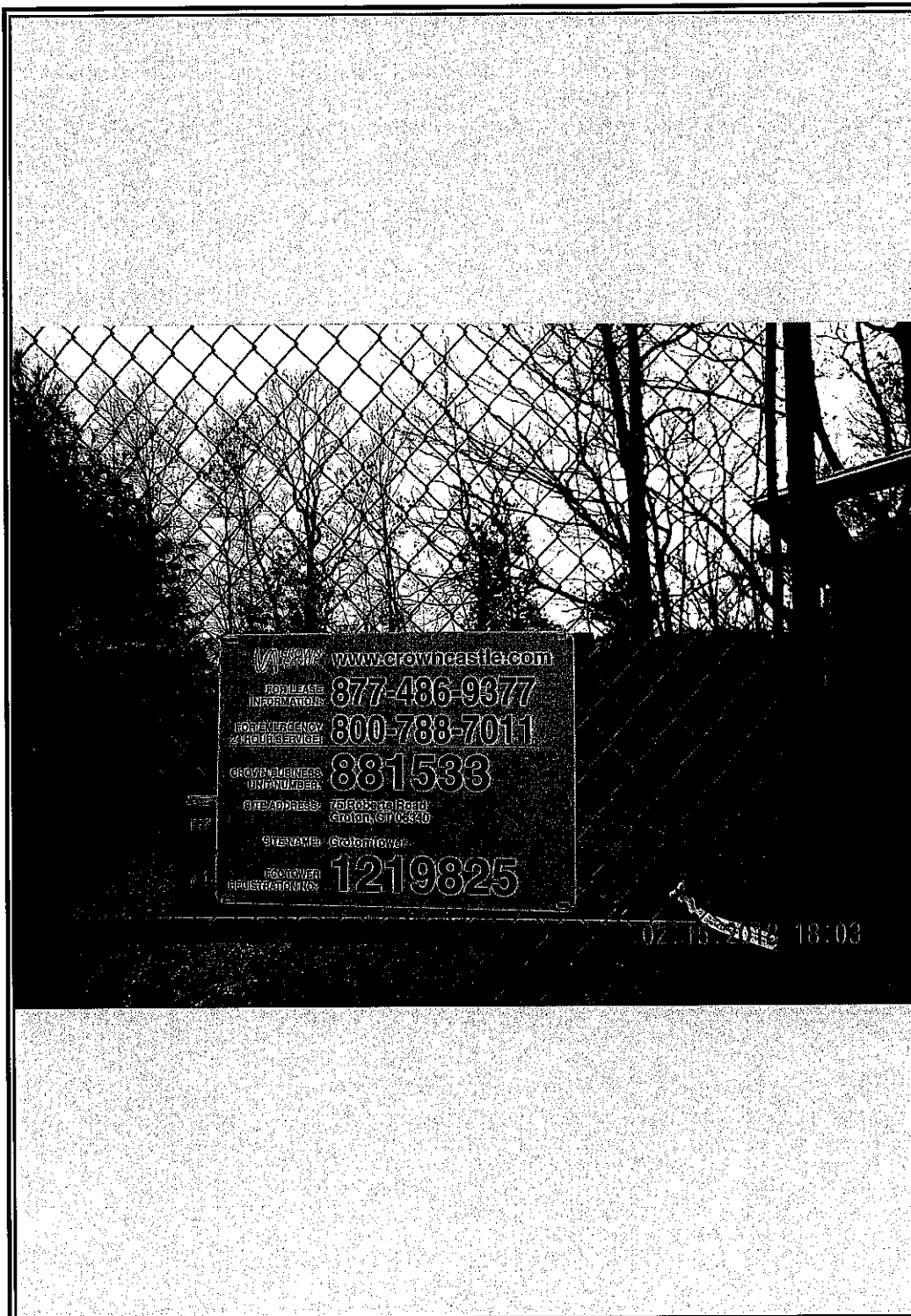
Submitted By: Samad Sharipov

Authorized Signature:

Samad Sharipov
(Electronic Signature Acceptable)

Digitally signed by Samad Sharipov
DN: cn=Samad Sharipov, o=Samad Sharipov, cn=United States, 1.3.6.1.5.5.4
email=SSharipov@universal.com
Reason: I am the author of this document
Location:
Date: 2018.02.20 14:42:05-05

Insert picture below or attach separately. This form will not be accepted without a date stamped picture of either the Crown site ID sign posted on site or of the entire structure (no cell phone photos).



www.crowncastle.com
877-486-9377
800-788-7011
881533
76 Robert Road
Arlon, GA 30840
1219825

02.19.2012 18:03



12 Gill Street
Suite 5800
Woburn, Ma 01801

Telephone: 781-771-2255
Email
jeff.barbadora@crowncastle.com

November 18, 2019

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: AT&T-Exempt Modification – EM-AT&T-014-160203

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. There were no deviations or material changes to the proposed installation. Pursuant to the Connecticut Siting Council 2/29/2016 approval of **EM-AT&T-014-160203**, this letter is to satisfy item numbers one, two and five of the CSC decision.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'J Barbadora', written in a cursive style.

Jeffrey Barbadora
781-970-0053



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

February 29, 2016

Jeff Barbadora
Crown Castle
12 Gill Street, Ste. 5800
Woburn, MA 01801

RE: **EM-AT&T-014-160203** -AT&T notice of intent to modify an existing telecommunications facility located at 10 Sylvia Street, Branford, Connecticut.

Dear Mr. Barbadora:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

1. Reinforcements shall be made in accordance with the structural analysis report prepared by B+T Group dated December 08, 2015 and stamped by Chad E. Tuttle, and consistent with the modification drawings B+T GRP Doc. ID# 5952282;
2. Within 45 days following completion of the equipment installation, AT&T shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations of the structural analysis;
3. Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
4. Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
5. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
6. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function;
7. The validity of this action shall expire one year from the date of this letter; and
8. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated February 2, 2016. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured



CONNECTICUT SITING COUNCIL

at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Melanie A. Bachman
Acting Executive Director

MAB/CH/cm

c: The Honorable James B. Cosgrove, First Selectman, Town of Branford
Harry Smith, Town Planner, Town of Branford
322 East Main Street LLC

April 11, 2016

Mr. Dan Vadney
Crown Castle USA, Inc.
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
(518) 373-3510
Dan.Vadney@crowncastle.com



Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351 (office)
(919) 661-6350 (fax)
PMI@tepgroup.net

Subject: Modification Inspection Report

Crown Castle Designation:	Crown Castle BU Number:	822765
	Crown Castle Site Name:	Branford
	Crown Castle JDE Job Number:	342870

Engineering Firm Designation:	TEP Project Number:	25582
--------------------------------------	----------------------------	-------

Site Data:	10 Sylvania Street
	Branford, New Haven County, CT 06405
	Latitude N 41° 17' 38.08", Longitude W 72° 47' 8.624"
	125 Foot – Monopole Tower

Dear Mr. Vadney,

Tower Engineering Professionals is pleased to submit this "**Modification Inspection Report**" (MI Report) to Crown Castle for the modification/reinforcement to the subject structure. This Modification Inspection (MI) was performed in accordance with Crown Castle ENG-SOW-10007 Modification Inspection SOW, Contract Documents, and Crown Castle Purchase Order number 853329. The purpose of this MI is to confirm that the modification installation configuration and workmanship are in accordance with the contract document(s) listed in Table 2. The MI is not a review of the adequacy or effectiveness of the modification/reinforcement solution.

Table 1 – General Information

	Company	Contact	Dates on Site
MI Inspector	Tower Engineering Professionals	Kevin R. Arnett, P.E., C.W.I.	N/A
MI Inspector Field Representative (if applicable)	Tower Engineering Professionals	Andrew Stroud	4/6/2016
<input checked="" type="checkbox"/> Independent <input type="checkbox"/> EOR <input type="checkbox"/> Turnkey			
Modification Design EOR	B&T Engineering	Chad E. Tuttle, P.E.	N/A
General Contractor	Sky Climber Tower Solutions	Tom Warchol	Unknown
Sub to the General Contractor	N/A	N/A	N/A
Field CWI for the General Contractor	N/A	N/A	N/A
Field NDE for the General Contractor	N/A	N/A	N/A

Table 2 – Documents

Document(s)	Remarks	Source
Modification Drawings Date: October 27, 2015 EOR: Chad E. Tuttle, P.E. Job#: 101126.001.01	Creator of Drawings: B&T Engineering Job #: 101126.001.01 Date of Drawings: 10/27/15	CCLsites Drawing File: 5952282

Based on our inspection, Tower Engineering Professionals, Inc. determines this project:

PASSING MI

The configuration, materials and/or workmanship of the modifications are installed in accordance with the Contract Documents and no deficiencies were found.

PASS AS NOTED MI

The configuration, materials and/or workmanship of the modifications are accepted as noted (see detail below).

FAILED MI

The configuration, materials and/or workmanship of the modifications are NOT installed in accordance with the Contract Documents. The rejection is based on non-conformance in the following area(s):

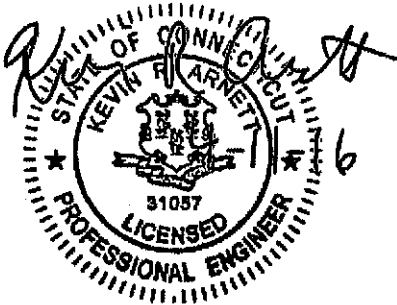
- Materials (see detail below)
- Workmanship (see detail below)
- Configuration (see detail below)

Discrepancies were noted between the As-Built field conditions and the structural modification drawings. The As-Built field conditions were approved by the Engineer of Record. All discrepancies are noted in the executive summary.

All observations were performed after the construction was complete. Tower Engineering Professionals, Inc. was not present during the construction phase. The onsite PMI was performed by Andrew Stroud and James Harms of Tower Engineering Professionals, Inc., (919) 661-6351.

We at Tower Engineering Professionals, Inc. 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,



Kevin R. Arnett, P.E., C.W.I.



Construction Complete Verification Letter

Contractor Company Name: Empire Telecom

Crown BU#: 822765

Crown Application #: 322855

Construction Start Date: 10-17-16

Construction Complete Date: 12-20-16

This letter is to verify the SOW for the above referenced site was completed within the dates noted above and submitted to Crown Castle within 48 hours of completion date. A time stamped winner photo of the structure on the last day of construction must be attached to or included with this form. This form will not be accepted without this photo. If you have any questions or need further information please contact the Project Manager or Construction Manager listed on your NTP.

Date: 12-20-16

Submitted By: Martin Nagle

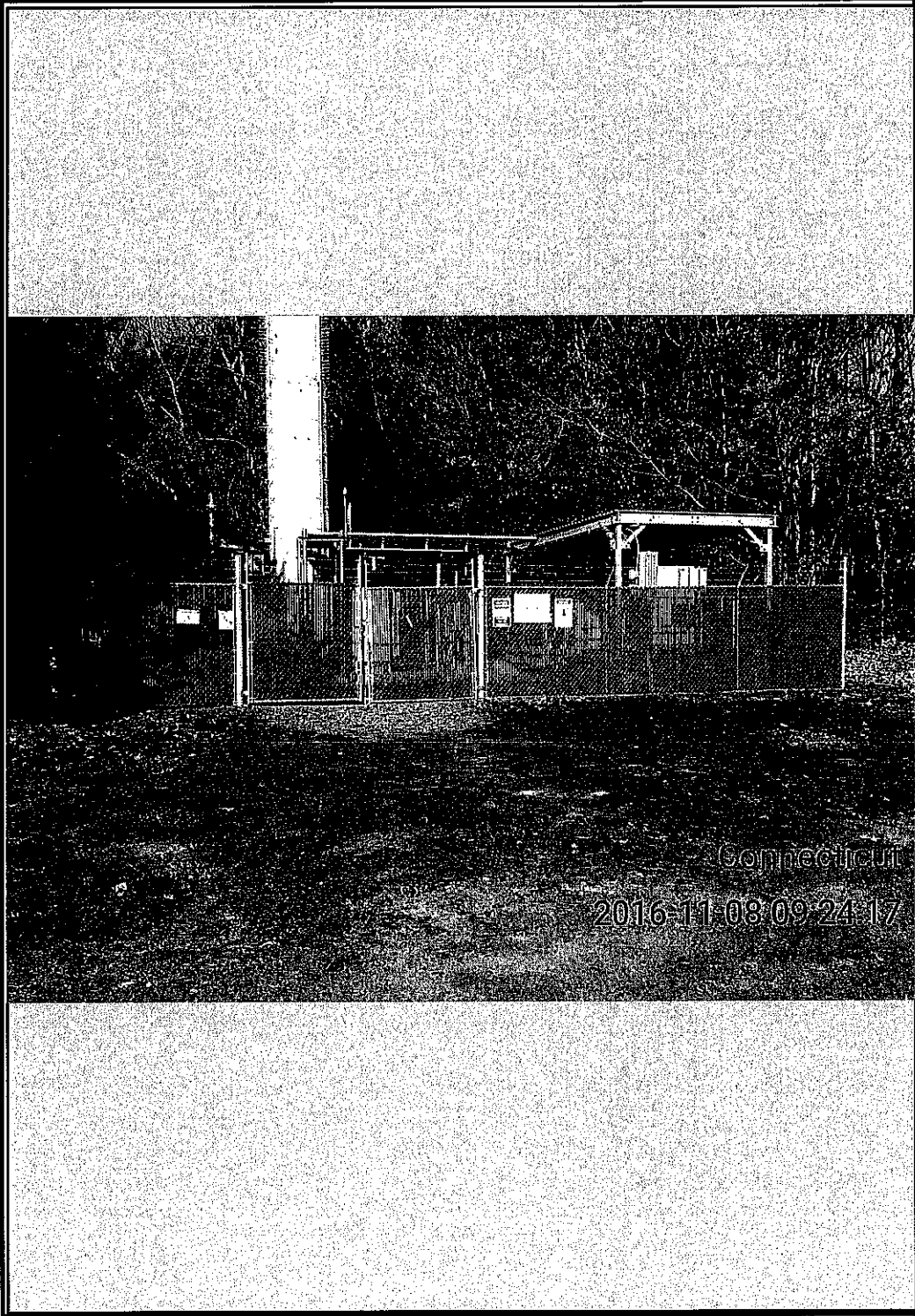
Authorized Signature:

Martin Nagle

Digitally signed by Martin Nagle
DN: cn=Martin Nagle, o=Empire, ou=Construction
Coordinator, email=mnagle@empiretelecomm.com, c=US
Date: 2016.12.20 14:32:13 -05'00'

(Electronic Signature Acceptable)

Insert picture below or attach separately. This form will not be accepted without a date stamped picture of either the Crown site ID sign posted on site or of the entire structure (no cell phone photos).





12 Gill Street
Suite 5800
Woburn, Ma 01801

Telephone: 781-771-2255
Email
jeff.barbadora@crowncastle.com

November 20, 2019

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: AT&T-Exempt Modification – EM-AT&T-077-160223

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. There were no deviations or material changes to the proposed installation. Pursuant to the Connecticut Siting Council 3/14/2016 approval of **EM-AT&T-077-160223**, this letter is to satisfy item numbers one, two and five of the CSC decision.

A revised SA was completed for ATT with the same scope of work as submitted to the CSC for ATT initially. The revised SA shows no modifications were required.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Barbadora', written in a cursive style.

Jeffrey Barbadora
781-970-0053



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

March 14, 2016

Amanda Goodall
Crown Castle
12 Gill Street, Ste. 5800
Woburn, MA 01801

RE: **EM-AT&T-077-160223** – AT&T notice of intent to modify an existing telecommunications facility located at 53 Slater Street, Manchester, Connecticut.

Dear Ms. Goodall:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

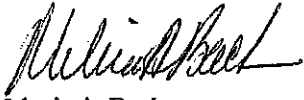
1. Reinforcements shall be made in accordance and consistent with the structural analysis report and modification drawings prepared by Paul J. Ford and Company dated January 12, 2016 and stamped by Justin T. Kline;
2. Within 45 days following completion of the equipment installation, AT&T shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations of the structural analysis;
3. Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
4. Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
5. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
6. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function;
7. The validity of this action shall expire one year from the date of this letter; and
8. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated February 22, 2016. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured

at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Melanie A. Bachman
Acting Executive Director

MAB/CH/cm

c: The Honorable Jay Moran, Mayor, Town of Manchester
Scott A. Shanley, General Manager, Town of Manchester
James Davis, Zoning Enforcement Officer, Town of Manchester
One Hundred Twenty One Connecticut Avenue Associates, LLC



**CROWN
CASTLE**

Construction Complete Verification Letter

Contractor Company
Name: Empire Telecom

Crown BU#: 876347

Crown Application #: 315907

Construction Start
Date: 11-02-16

Construction Complete
Date: 12-20-16

This letter is to verify the SOW for the above referenced site was completed within the dates noted above and submitted to Crown Castle within 48 hours of completion date. A time stamped winner photo of the structure on the last day of construction must be attached to or included with this form. This form will not be accepted without this photo. If you have any questions or need further information please contact the Project Manager or Construction Manager listed on your NTP.

Date: 12-20-16

Submitted By: Martin Nagle

Authorized Signature:

Martin Nagle

Digitally signed by Martin Nagle
DN: cn=Martin Nagle, o=Empire, ou=Construction
Coordinator, email=mnagle@empiretelecomm.com, c=US
Date: 2016.12.20 10:12:35 -0500

(Electronic Signature Acceptable)

Insert picture below or attach separately. This form will not be accepted without a date stamped picture of either the Crown site ID sign posted on site or of the entire structure (no cell phone photos).





Date: May 25, 2016

Rebecca Klein
Crown Castle
525 Alderman Lane
Fort Mill, SC 29715
704.405.5625

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jmeinerding@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation: AT&T Mobility Co-Locate
Carrier Site Number: CTL05307
Carrier Site Name: Manchester North

Crown Castle Designation: Crown Castle BU Number: 876347
Crown Castle Site Name: BUCKLAND MALL
Crown Castle JDE Job Number: 351390
Crown Castle Work Order Number: 1241070
Crown Castle Application Number: 315907 Rev. 3

Engineering Firm Designation: Paul J. Ford and Company Project Number: 37516-0064.003.7805

Site Data: 53 Slater Street, MANCHESTER, Hartford County, CT
Latitude 41° 48' 18", Longitude -72° 32' 1"
155 Foot - Monopole Tower

Dear Rebecca Klein,

Paul J. Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 906476, in accordance with application 315907, revision 3.

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

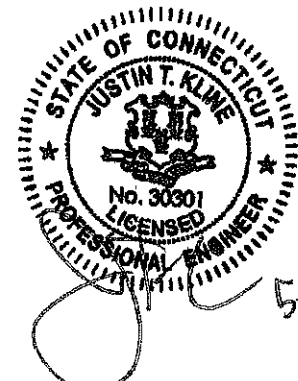
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

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

Respectfully submitted by:


Joey Meinerding, E.I.
Structural Designer 



52516



Date: May 25, 2016

Rebecca Klein
Crown Castle
525 Alderman Lane
Fort Mill, SC 29715
704.405.5625

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jmeinerding@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: CTL05307
Carrier Site Name: Manchester North

Crown Castle Designation: **Crown Castle BU Number:** 876347
Crown Castle Site Name: BUCKLAND MALL
Crown Castle JDE Job Number: 351390
Crown Castle Work Order Number: 1241070
Crown Castle Application Number: 315907 Rev. 3

Engineering Firm Designation: **Paul J. Ford and Company Project Number:** 37516-0064.003.7805

Site Data: **53 Slater Street, MANCHESTER, Hartford County, CT**
Latitude 41° 48' 18", Longitude -72° 32' 1"
155 Foot - Monopole Tower

Dear Rebecca Klein,

Paul J. Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 906476, in accordance with application 315907, revision 3.

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

LC7: Existing + Reserved + Proposed Equipment

Sufficient Capacity

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

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

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

Respectfully submitted by:

Joey Meinerding, E.I.
Structural Designer

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1) INTRODUCTION

This tower is a 155 ft. monopole tower designed by Summit in February of 2002. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 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
143.0	145.0	3	cci antennas	DTMABP7819VG12A	1 2	3/8 3/4	--
		3	ericsson	RRUS 32 B30			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			

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
155.0	155.0	3	alcatel lucent	TD-RRH8x20-25	3 5 1 1 3	5/16 1/2 5/8 3/4 1-1/4	1
		3	argus technologies	LPX310R w/ Mount Pipe			
		3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	samsung telecommunications	WIMAX DAP HEAD			
		1	tower mounts	Platform Mount [LP 713-1]			
	151.0	1	andrew	VHLP1-23			
		1	andrew	VHLP2-11			
		1	andrew	VHLP2.5-18			
		3	dragonwave	HORIZON COMPACT			
153.0	153.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	--	--	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Pipe Mount [PM 601-3]			
145.0	147.0	3	ericsson	RRUS 11	--	--	1
	145.0	1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
143.0	145.0	3	ericsson	RRUS-11	1 2 6	3/8 3/4 1-1/4	1
		3	kathrein	800 10121 w/ Mount Pipe			
		6	kathrein	860 10025			
		1	raycap	DC6-48-60-18-8F			
	143.0	1	tower mounts	T-Arm Mount [TA 702-3]	--	--	3
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
133.0	133.0	6	powerwave technologies	LGP21401	--	--	2
		3	ericsson	KRC 118 057/1 w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
113.0	113.0	1	tower mounts	Platform Mount [LP 403-1]	1 6 13	1-1/4 1-5/8	1
		3	alcatel lucent	RRH2X60-AWS			
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2x60-700			
		6	commscope	SBNHH-1D65B w/ Mount Pipe			
		3	andrew	LNx-6512DS-T0M w/ Mount Pipe			
		3	antel	BXA-70063/6CFx2 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
1	tower mounts	Platform Mount [LP 1201-1]					
78.0	78.0	1	tower mounts	Platform Mount [LP 303-1]	--	--	3
60.0	60.0	1	tower mounts	Side Arm Mount [SO 701-1]	1	1/2	3

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 1204605EG1, 06/12/2012	1533476	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit/PJF, 3960/29298-597, 09/11/1998	1615406	CCISITES
4-TOWER MANUFACTURER DRAWINGS	SEA/PJF, A02-T0021, 02/18/2002	2068033	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.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	155 - 115.5	Pole	TP29.31x22x0.25	1	-8.73	1080.07	62.9	Pass
L2	115.5 - 79.25	Pole	TP35.51x28.11x0.31	2	-17.06	1772.22	92.9	Pass
L3	79.25 - 43.75	Pole	TP41.46x34.06x0.38	3	-24.67	2481.90	99.6	Pass
L4	43.75 - 0	Pole	TP48.8x39.73x0.44	4	-38.45	3491.31	97.9	Pass
							Summary	
						Pole (L3)	99.6	Pass
						Rating =	99.6	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	91.0	Pass
1	Base Plate	0	78.1	Pass
1	Base Foundation Structural Steel	0	53.8	Pass
1	Base Foundation Soil Interaction	0	85.3	Pass

Structure Rating (max from all components) =	99.6%
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Notes:

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

4.1) Recommendations

The monopole 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

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 80.0 mph.
- 3) Nominal ice thickness of 1.00 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56 pcf.
- 6) A wind speed of 37.6 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50.0 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) 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="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px 0;">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 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	155.00-115.50	39.50	3.75	18	22.00	29.31	0.25	1.00	A607-60 (60 ksi)
L2	115.50-79.25	40.00	4.50	18	28.11	35.51	0.31	1.25	A607-65 (65 ksi)
L3	79.25-43.75	40.00	5.25	18	34.06	41.46	0.38	1.50	A607-65 (65 ksi)
L4	43.75-0.00	49.00		18	39.73	48.80	0.44	1.75	A607-65 (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	I/Q in ²	w in	w/t
L1	22.34	17.26	1031.48	7.72	11.18	92.29	2064.32	8.63	3.43	13.728
	29.76	23.06	2459.70	10.32	14.89	165.21	4922.63	11.53	4.72	18.873
L2	29.25	27.58	2692.83	9.87	14.28	188.55	5389.20	13.79	4.40	14.074
	36.06	34.92	5466.10	12.50	18.04	302.98	10939.40	17.46	5.70	18.241
L3	35.43	40.09	5745.80	11.96	17.30	332.11	11499.17	20.05	5.33	14.224
	42.10	48.90	10425.54	14.58	21.06	495.05	20864.80	24.45	6.64	17.697
L4	41.33	54.57	10646.61	13.95	20.19	527.44	21307.22	27.29	6.22	14.225
	49.55	67.16	19844.89	17.17	24.79	800.51	39715.89	33.59	7.82	17.872

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 155.00-115.50				1	1	1			
L2 115.50-79.25				1	1	1			
L3 79.25-43.75				1	1	1			
L4 43.75-0.00				1	1	1			

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	plf
ATCB-B01-005(5/16)	C	No	Inside Pole	155.00 - 0.00	3	No Ice	0.00	0.07
						1/2" Ice	0.00	0.07
						1" Ice	0.00	0.07
						2" Ice	0.00	0.07
						4" Ice	0.00	0.07
FSJ4-50B(1/2")	C	No	CaAa (Out Of Face)	155.00 - 0.00	5	No Ice	0.00	0.14
						1/2" Ice	0.00	0.76
						1" Ice	0.00	2.00
						2" Ice	0.00	6.30
						4" Ice	0.00	22.23
2" Conduit	C	No	CaAa (Out Of Face)	155.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	2.53
						1" Ice	0.00	4.51
						2" Ice	0.00	10.30
						4" Ice	0.00	29.21
2" Conduit	C	No	CaAa (Out Of Face)	155.00 - 0.00	1	No Ice	0.17	1.16
						1/2" Ice	0.27	2.53
						1" Ice	0.37	4.51
						2" Ice	0.57	10.30
						4" Ice	0.97	29.21
9776(3/4")	C	No	Inside Pole	155.00 - 0.00	1	No Ice	0.00	0.31
						1/2" Ice	0.00	0.31
						1" Ice	0.00	0.31
						2" Ice	0.00	0.31
						4" Ice	0.00	0.31
HB058-M12-XXXF(5/8")	C	No	Inside Pole	155.00 - 0.00	1	No Ice	0.00	0.24
						1/2" Ice	0.00	0.24
						1" Ice	0.00	0.24
						2" Ice	0.00	0.24
						4" Ice	0.00	0.24
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	155.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
						2" Ice	0.00	1.08
						4" Ice	0.00	1.08
*** LDF6-50A(1-1/4")	C	No	Inside Pole	143.00 - 0.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight
						ft ² /ft	plf	
FB-L98B-002-75000(3/8")	C	No	Inside Pole	143.00 - 0.00	1	2" Ice	0.00	0.66
						4" Ice	0.00	0.66
						No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	143.00 - 0.00	2	4" Ice	0.00	0.06
						No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
						2" Ice	0.00	0.59
						4" Ice	0.00	0.59
2" Conduit	C	No	Inside Pole	143.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
						1" Ice	0.00	1.16
						2" Ice	0.00	1.16
						4" Ice	0.00	1.16
						No Ice	0.00	0.05
FB-L98B-034-XXXXXX(3/8)	C	No	CaAa (Out Of Face)	143.00 - 0.00	1	1/2" Ice	0.00	0.60
						1" Ice	0.00	1.75
						2" Ice	0.00	5.90
						4" Ice	0.00	21.52
						No Ice	0.00	0.59
						1/2" Ice	0.00	1.37
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	143.00 - 0.00	1	1" Ice	0.00	2.76
						2" Ice	0.00	7.37
						4" Ice	0.00	23.92
						No Ice	0.08	0.59
						1/2" Ice	0.18	1.37
						1" Ice	0.28	2.76
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	143.00 - 0.00	1	2" Ice	0.48	7.37
						4" Ice	0.88	23.92
						No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
						2" Ice	0.00	1.22
HB114-21U3M12-XXXX(1-1/4")	C	No	Inside Pole	133.00 - 0.00	1	4" Ice	0.00	1.22
						No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
LCF158-50JA-A0(1 5/8")	C	No	Inside Pole	133.00 - 0.00	6	No Ice	0.00	1.35
						1/2" Ice	0.00	1.35
						1" Ice	0.00	1.35
						2" Ice	0.00	1.35
						4" Ice	0.00	1.35
						No Ice	0.00	1.30
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	113.00 - 0.00	1	1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
						No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	113.00 - 0.00	1	1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
						No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
2" Ice	0.00	1.30						
4" Ice	0.00	1.30						

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	155.00-115.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.002	0.52
L2	115.50-79.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.113	1.23
L3	79.25-43.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	8.925	1.25
L4	43.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	10.999	1.54

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	155.00-115.50	A	1.184	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	24.863	1.62
L2	115.50-79.25	A	1.138	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	26.277	2.33
L3	79.25-43.75	A	1.077	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	25.086	2.26
L4	43.75-0.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	29.851	2.66

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	155.00-115.50	-0.27	0.16	-0.60	0.35
L2	115.50-79.25	-0.30	0.17	-0.70	0.40
L3	79.25-43.75	-0.30	0.17	-0.72	0.41
L4	43.75-0.00	-0.31	0.18	-0.72	0.42

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
LPX310R w/ Mount Pipe	A	From Leg	4.00	0.000	155.00	No Ice	2.31	2.34	0.03
			0.00			1/2"	2.64	2.87	0.05
			0.00			Ice	2.99	3.41	0.08
						1" Ice	3.77	4.56	0.16
						2" Ice	5.50	7.24	0.40
LPX310R w/ Mount Pipe	B	From Leg	4.00	0.000	155.00	No Ice	2.31	2.34	0.03
			0.00			1/2"	2.64	2.87	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
			0.00						
						Ice	2.99	3.41	0.08
						1" Ice	3.77	4.56	0.16
						2" Ice	5.50	7.24	0.40
						4" Ice			
LPX310R w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice	2.31	2.34	0.03
						1/2"	2.64	2.87	0.05
						Ice	2.99	3.41	0.08
						1" Ice	3.77	4.56	0.16
						2" Ice	5.50	7.24	0.40
						4" Ice			
HORIZON COMPACT	A	From Leg	4.00 0.00 -4.00	0.000	155.00	No Ice	0.84	0.43	0.01
						1/2"	0.97	0.52	0.02
						Ice	1.10	0.63	0.03
						1" Ice	1.39	0.86	0.05
						2" Ice	2.08	1.43	0.12
						4" Ice			
HORIZON COMPACT	B	From Leg	4.00 0.00 -4.00	0.000	155.00	No Ice	0.84	0.43	0.01
						1/2"	0.97	0.52	0.02
						Ice	1.10	0.63	0.03
						1" Ice	1.39	0.86	0.05
						2" Ice	2.08	1.43	0.12
						4" Ice			
HORIZON COMPACT	C	From Leg	4.00 0.00 -4.00	0.000	155.00	No Ice	0.84	0.43	0.01
						1/2"	0.97	0.52	0.02
						Ice	1.10	0.63	0.03
						1" Ice	1.39	0.86	0.05
						2" Ice	2.08	1.43	0.12
						4" Ice			
WIMAX DAP HEAD	A	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice	1.80	0.78	0.03
						1/2"	1.99	0.92	0.04
						Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
WIMAX DAP HEAD	B	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice	1.80	0.78	0.03
						1/2"	1.99	0.92	0.04
						Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
WIMAX DAP HEAD	C	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice	1.80	0.78	0.03
						1/2"	1.99	0.92	0.04
						Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice	8.50	6.95	0.08
						1/2"	9.15	8.13	0.15
						Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice	8.50	6.95	0.08
						1/2"	9.15	8.13	0.15
						Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	155.00	No Ice	8.50	6.95	0.08
						1/2"	9.15	8.13	0.15
						Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXV/TM14-C-120 w/	A	From Leg	4.00	0.000	155.00	No Ice	7.13	4.96	0.08

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			Horz	Lateral						ft
Mount Pipe			0.00				1/2"	7.66	5.75	0.13
			0.00				Ice	8.18	6.47	0.19
							1" Ice	9.26	8.01	0.34
							2" Ice	11.53	11.41	0.75
							4" Ice			
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00		0.000	155.00	No Ice	7.13	4.96	0.08
			0.00				1/2"	7.66	5.75	0.13
			0.00				Ice	8.18	6.47	0.19
							1" Ice	9.26	8.01	0.34
							2" Ice	11.53	11.41	0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00		0.000	155.00	No Ice	7.13	4.96	0.08
			0.00				1/2"	7.66	5.75	0.13
			0.00				Ice	8.18	6.47	0.19
							1" Ice	9.26	8.01	0.34
							2" Ice	11.53	11.41	0.75
TD-RRH8x20-25	A	From Leg	4.00		0.000	155.00	No Ice	4.72	1.70	0.07
			0.00				1/2"	5.01	1.92	0.10
			0.00				Ice	5.32	2.15	0.13
							1" Ice	5.95	2.62	0.20
							2" Ice	7.31	3.68	0.40
TD-RRH8x20-25	B	From Leg	4.00		0.000	155.00	No Ice	4.72	1.70	0.07
			0.00				1/2"	5.01	1.92	0.10
			0.00				Ice	5.32	2.15	0.13
							1" Ice	5.95	2.62	0.20
							2" Ice	7.31	3.68	0.40
TD-RRH8x20-25	C	From Leg	4.00		0.000	155.00	No Ice	4.72	1.70	0.07
			0.00				1/2"	5.01	1.92	0.10
			0.00				Ice	5.32	2.15	0.13
							1" Ice	5.95	2.62	0.20
							2" Ice	7.31	3.68	0.40
Platform Mount [LP 713-1]	C	None			0.000	155.00	No Ice	31.27	31.27	1.51
							1/2"	39.68	39.68	1.93
							Ice	48.09	48.09	2.35
							1" Ice	64.91	64.91	3.19
							2" Ice	98.55	98.55	4.86
*** 800MHz 2X50W RRH W/FILTER	A	From Leg	1.00		0.000	153.00	No Ice	2.40	2.25	0.06
			0.00				1/2"	2.61	2.46	0.09
			0.00				Ice	2.83	2.68	0.11
							1" Ice	3.30	3.13	0.17
							2" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	1.00		0.000	153.00	No Ice	2.40	2.25	0.06
			0.00				1/2"	2.61	2.46	0.09
			0.00				Ice	2.83	2.68	0.11
							1" Ice	3.30	3.13	0.17
							2" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00		0.000	153.00	No Ice	2.40	2.25	0.06
			0.00				1/2"	2.61	2.46	0.09
			0.00				Ice	2.83	2.68	0.11
							1" Ice	3.30	3.13	0.17
							2" Ice	4.34	4.15	0.34
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.00		0.000	153.00	No Ice	2.71	2.61	0.06
			0.00				1/2"	2.95	2.85	0.08
			0.00				Ice	3.20	3.09	0.11
							1" Ice	3.72	3.61	0.17
							2" Ice	4.86	4.74	0.35

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.00	0.00	0.000	153.00	4" Ice			
							No Ice	2.71	2.61	0.06
							1/2" Ice	2.95	2.85	0.08
							1" Ice	3.20	3.09	0.11
							2" Ice	3.72	3.61	0.17
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.00	0.00	0.000	153.00	4" Ice			
							No Ice	2.71	2.61	0.06
							1/2" Ice	2.95	2.85	0.08
							1" Ice	3.20	3.09	0.11
							2" Ice	3.72	3.61	0.17
Pipe Mount [PM 601-3]	C	None			0.000	153.00	4" Ice			
							No Ice	4.39	4.39	0.20
							1/2" Ice	5.48	5.48	0.24
							1" Ice	6.57	6.57	0.28
							2" Ice	8.75	8.75	0.36
*** RRUS 11	A	From Leg	1.00	0.00	0.000	145.00	4" Ice			
							No Ice	3.26	1.38	0.05
							1/2" Ice	3.50	1.56	0.07
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
RRUS 11	B	From Leg	1.00	0.00	0.000	145.00	4" Ice			
							No Ice	3.26	1.38	0.05
							1/2" Ice	3.50	1.56	0.07
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
RRUS 11	C	From Leg	1.00	0.00	0.000	145.00	4" Ice			
							No Ice	3.26	1.38	0.05
							1/2" Ice	3.50	1.56	0.07
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
Pipe Mount [PM 601-3]	C	None			0.000	145.00	4" Ice			
							No Ice	4.39	4.39	0.20
							1/2" Ice	5.48	5.48	0.24
							1" Ice	6.57	6.57	0.28
							2" Ice	8.75	8.75	0.36
*** 800 10121 w/ Mount Pipe	A	From Leg	3.00	0.00	0.000	143.00	4" Ice			
							No Ice	6.03	4.95	0.07
							1/2" Ice	6.71	6.02	0.12
							1" Ice	7.30	6.81	0.18
							2" Ice	8.50	8.46	0.32
800 10121 w/ Mount Pipe	B	From Leg	3.00	0.00	0.000	143.00	4" Ice			
							No Ice	6.03	4.95	0.07
							1/2" Ice	6.71	6.02	0.12
							1" Ice	7.30	6.81	0.18
							2" Ice	8.50	8.46	0.32
800 10121 w/ Mount Pipe	C	From Leg	3.00	0.00	0.000	143.00	4" Ice			
							No Ice	6.03	4.95	0.07
							1/2" Ice	6.71	6.02	0.12
							1" Ice	7.30	6.81	0.18
							2" Ice	8.50	8.46	0.32
(2) 860 10025	A	From Leg	3.00	0.00	0.000	143.00	4" Ice			
							No Ice	0.16	0.13	0.00
							1/2" Ice	0.22	0.19	0.00

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			Horz ft	Lateral Vert ft						
				2.00						
(2) 860 10025	B	From Leg			0.000	143.00	Ice	0.29	0.26	0.01
							1" Ice	0.47	0.43	0.01
							2" Ice	0.92	0.87	0.05
							4" Ice			
							No Ice	0.16	0.13	0.00
							1/2"	0.22	0.19	0.00
(2) 860 10025	C	From Leg			0.000	143.00	Ice	0.29	0.26	0.01
							1" Ice	0.47	0.43	0.01
							2" Ice	0.92	0.87	0.05
							4" Ice			
							No Ice	0.16	0.13	0.00
							1/2"	0.22	0.19	0.00
RRUS-11	A	From Leg			0.000	143.00	Ice	0.29	0.26	0.01
							1" Ice	0.47	0.43	0.01
							2" Ice	0.92	0.87	0.05
							4" Ice			
							No Ice	3.26	1.38	0.05
							1/2"	3.50	1.56	0.07
RRUS-11	B	From Leg			0.000	143.00	Ice	3.75	1.74	0.09
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
							4" Ice			
							No Ice	3.26	1.38	0.05
							1/2"	3.50	1.56	0.07
RRUS-11	C	From Leg			0.000	143.00	Ice	3.75	1.74	0.09
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
							4" Ice			
							No Ice	3.26	1.38	0.05
							1/2"	3.50	1.56	0.07
DC6-48-60-18-8F	A	From Leg			0.000	143.00	Ice	3.75	1.74	0.09
							1" Ice	4.28	2.15	0.15
							2" Ice	5.44	3.05	0.31
							4" Ice			
							No Ice	1.47	1.47	0.02
							1/2"	1.67	1.67	0.04
QS66512-2 w/ Mount Pipe	A	From Leg			0.000	143.00	Ice	1.88	1.88	0.06
							1" Ice	2.33	2.33	0.11
							2" Ice	3.38	3.38	0.24
							4" Ice			
							No Ice	8.64	8.46	0.14
							1/2"	9.29	9.66	0.21
QS66512-2 w/ Mount Pipe	B	From Leg			0.000	143.00	Ice	9.91	10.62	0.30
							1" Ice	11.18	12.61	0.49
							2" Ice	13.83	16.81	1.03
							4" Ice			
							No Ice	8.64	8.46	0.14
							1/2"	9.29	9.66	0.21
QS66512-2 w/ Mount Pipe	C	From Leg			0.000	143.00	Ice	9.91	10.62	0.30
							1" Ice	11.18	12.61	0.49
							2" Ice	13.83	16.81	1.03
							4" Ice			
							No Ice	8.64	8.46	0.14
							1/2"	9.29	9.66	0.21
DTMABP7819VG12A	A	From Leg			0.000	143.00	Ice	9.91	10.62	0.30
							1" Ice	11.18	12.61	0.49
							2" Ice	13.83	16.81	1.03
							4" Ice			
							No Ice	1.14	0.39	0.02
							1/2"	1.28	0.49	0.03
DTMABP7819VG12A	B	From Leg			0.000	143.00	Ice	1.44	0.59	0.04
							1" Ice	1.77	0.83	0.06
							2" Ice	2.54	1.41	0.14
							4" Ice			
							No Ice	1.14	0.39	0.02
							1/2"	1.28	0.49	0.03

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
DTMABP7819VG12A	C	From Leg	3.00	0.00	143.00	No Ice	1.28	0.49	0.03
						1/2" Ice	1.44	0.59	0.04
						1" Ice	1.77	0.83	0.06
						2" Ice	2.54	1.41	0.14
						4" Ice			
						No Ice	1.14	0.39	0.02
						1/2" Ice	1.28	0.49	0.03
						1" Ice	1.44	0.59	0.04
						2" Ice	1.77	0.83	0.06
						4" Ice	2.54	1.41	0.14
RRUS 32 B30	A	From Leg	3.00	0.00	143.00	No Ice	3.87	2.76	0.08
						1/2" Ice	4.15	3.02	0.10
						1" Ice	4.44	3.29	0.14
						2" Ice	5.06	3.85	0.21
						4" Ice	6.38	5.08	0.41
						No Ice	3.87	2.76	0.08
RRUS 32 B30	B	From Leg	3.00	0.00	143.00	No Ice	3.87	2.76	0.08
						1/2" Ice	4.15	3.02	0.10
						1" Ice	4.44	3.29	0.14
						2" Ice	5.06	3.85	0.21
						4" Ice	6.38	5.08	0.41
						No Ice	3.87	2.76	0.08
RRUS 32 B30	C	From Leg	3.00	0.00	143.00	No Ice	3.87	2.76	0.08
						1/2" Ice	4.15	3.02	0.10
						1" Ice	4.44	3.29	0.14
						2" Ice	5.06	3.85	0.21
						4" Ice	6.38	5.08	0.41
						No Ice	3.87	2.76	0.08
DC6-48-60-18-8F	A	From Leg	3.00	0.00	143.00	No Ice	1.47	1.47	0.02
						1/2" Ice	1.67	1.67	0.04
						1" Ice	1.88	1.88	0.06
						2" Ice	2.33	2.33	0.11
						4" Ice	3.38	3.38	0.24
						No Ice	1.47	1.47	0.02
T-Arm Mount [TA 702-3]	C	None	0.00	0.00	143.00	No Ice	5.64	5.64	0.34
						1/2" Ice	6.55	6.55	0.43
						1" Ice	7.46	7.46	0.52
						2" Ice	9.28	9.28	0.70
						4" Ice	12.92	12.92	1.06
						No Ice	5.64	5.64	0.34
*** ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.00	133.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
						No Ice	6.83	5.64	0.11
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.00	133.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
						No Ice	6.83	5.64	0.11
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.00	133.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
						No Ice	6.83	5.64	0.11
KRY 112 144/1	A	From Leg	4.00	0.00	133.00	No Ice	0.41	0.20	0.01
						1/2" Ice	0.50	0.27	0.01
						1" Ice	0.59	0.35	0.02
						2" Ice	0.81	0.53	0.03
						4" Ice	1.36	1.00	0.08
						No Ice	0.41	0.20	0.01

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
KRY 112 144/1	B	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	0.41	0.20	0.01
							1/2"	0.50	0.27	0.01
							Ice	0.59	0.35	0.02
							1" Ice	0.81	0.53	0.03
							2" Ice	1.36	1.00	0.08
KRY 112 144/1	C	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	0.41	0.20	0.01
							1/2"	0.50	0.27	0.01
							Ice	0.59	0.35	0.02
							1" Ice	0.81	0.53	0.03
							2" Ice	1.36	1.00	0.08
KRC 118 057/1 w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	9.75	7.94	0.16
							1/2"	10.29	8.83	0.24
							Ice	10.84	9.65	0.33
							1" Ice	11.96	11.36	0.52
							2" Ice	14.31	14.98	1.05
KRC 118 057/1 w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	9.75	7.94	0.16
							1/2"	10.29	8.83	0.24
							Ice	10.84	9.65	0.33
							1" Ice	11.96	11.36	0.52
							2" Ice	14.31	14.98	1.05
KRC 118 057/1 w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	9.75	7.94	0.16
							1/2"	10.29	8.83	0.24
							Ice	10.84	9.65	0.33
							1" Ice	11.96	11.36	0.52
							2" Ice	14.31	14.98	1.05
RRUS 11 B12	A	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	3.31	1.36	0.05
							1/2"	3.55	1.54	0.07
							Ice	3.80	1.73	0.10
							1" Ice	4.33	2.13	0.15
							2" Ice	5.50	3.04	0.31
RRUS 11 B12	B	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	3.31	1.36	0.05
							1/2"	3.55	1.54	0.07
							Ice	3.80	1.73	0.10
							1" Ice	4.33	2.13	0.15
							2" Ice	5.50	3.04	0.31
RRUS 11 B12	C	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	3.31	1.36	0.05
							1/2"	3.55	1.54	0.07
							Ice	3.80	1.73	0.10
							1" Ice	4.33	2.13	0.15
							2" Ice	5.50	3.04	0.31
(2) 2.375" OD x 5' Mount Pipe	A	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	1.19	1.19	0.02
							1/2"	1.50	1.50	0.03
							Ice	1.81	1.81	0.04
							1" Ice	2.46	2.46	0.08
							2" Ice	3.92	3.92	0.20
(2) 2.375" OD x 5' Mount Pipe	B	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	1.19	1.19	0.02
							1/2"	1.50	1.50	0.03
							Ice	1.81	1.81	0.04
							1" Ice	2.46	2.46	0.08
							2" Ice	3.92	3.92	0.20
(2) 2.375" OD x 5' Mount Pipe	C	From Leg	4.00	0.00	0.000	133.00	4" Ice			
							No Ice	1.19	1.19	0.02
							1/2"	1.50	1.50	0.03
							Ice	1.81	1.81	0.04
							1" Ice	2.46	2.46	0.08
							2" Ice	3.92	3.92	0.20

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral	Vert					
			ft	ft	ft					
Platform Mount [LP 403-1]	C	None			0.000	133.00	2" Ice	3.92	3.92	0.20
							4" Ice			
							No Ice	18.85	18.85	1.50
							1/2" Ice	24.30	24.30	1.80
							1" Ice	29.75	29.75	2.09
							2" Ice	40.65	40.65	2.69
							62.45	62.45	3.87	
4" Ice										

BXA-70063/6CFx2 w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	113.00	No Ice	7.97	5.40	0.04
							1/2" Ice	8.61	6.55	0.10
							1" Ice	9.22	7.41	0.17
							2" Ice	10.46	9.18	0.33
							4" Ice	13.07	12.93	0.79
							No Ice	7.97	5.40	0.04
BXA-70063/6CFx2 w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	113.00	1/2" Ice	8.61	6.55	0.10
							1" Ice	9.22	7.41	0.17
							2" Ice	10.46	9.18	0.33
							4" Ice	13.07	12.93	0.79
							No Ice	7.97	5.40	0.04
							1/2" Ice	8.61	6.55	0.10
BXA-70063/6CFx2 w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	113.00	1" Ice	9.22	7.41	0.17
							2" Ice	10.46	9.18	0.33
							4" Ice	13.07	12.93	0.79
							No Ice	7.97	5.40	0.04
							1/2" Ice	8.61	6.55	0.10
							1" Ice	9.22	7.41	0.17
LNX-6512DS-T0M w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	113.00	2" Ice	10.46	9.18	0.33
							4" Ice	13.07	12.93	0.79
							No Ice	7.97	5.40	0.04
							1/2" Ice	8.61	6.55	0.10
							1" Ice	9.22	7.41	0.17
							2" Ice	10.46	9.18	0.33
LNX-6512DS-T0M w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	113.00	4" Ice	13.07	12.93	0.79
							No Ice	7.97	5.40	0.04
							1/2" Ice	8.61	6.55	0.10
							1" Ice	9.22	7.41	0.17
							2" Ice	10.46	9.18	0.33
							4" Ice	13.07	12.93	0.79
LNX-6512DS-T0M w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	113.00	No Ice	5.85	4.55	0.05
							1/2" Ice	6.31	5.23	0.09
							1" Ice	6.77	5.91	0.15
							2" Ice	7.74	7.34	0.28
							4" Ice	9.80	10.46	0.65
							No Ice	5.85	4.55	0.05
LNX-6512DS-T0M w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	113.00	1/2" Ice	6.31	5.23	0.09
							1" Ice	6.77	5.91	0.15
							2" Ice	7.74	7.34	0.28
							4" Ice	9.80	10.46	0.65
							No Ice	5.85	4.55	0.05
							1/2" Ice	6.31	5.23	0.09
LNX-6512DS-T0M w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	113.00	1" Ice	6.77	5.91	0.15
							2" Ice	7.74	7.34	0.28
							4" Ice	9.80	10.46	0.65
							No Ice	5.85	4.55	0.05
							1/2" Ice	6.31	5.23	0.09
							1" Ice	6.77	5.91	0.15
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.00	0.000	113.00	2" Ice	9.80	10.46	0.65
							4" Ice	13.07	12.93	0.79
							No Ice	5.60	2.33	0.04
							1/2" Ice	5.92	2.56	0.08
							1" Ice	6.24	2.79	0.12
							2" Ice	6.91	3.28	0.21
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	113.00	4" Ice	8.37	4.37	0.45
							No Ice	8.64	7.07	0.07
							1/2" Ice	9.30	8.26	0.14
							1" Ice	9.92	9.18	0.21
							2" Ice	11.20	11.01	0.39
							4" Ice	13.86	15.05	0.90
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	113.00	No Ice	8.64	7.07	0.07
							1/2" Ice	9.30	8.26	0.14
							1" Ice	9.92	9.18	0.21
							2" Ice	11.20	11.01	0.39
							4" Ice	13.86	15.05	0.90
							No Ice	8.64	7.07	0.07
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	113.00	1/2" Ice	9.30	8.26	0.14
							No Ice	8.64	7.07	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				ft ft ft	°	°	ft	ft	ft ²	K
VHLP1-23	A	Paraboloid w/o Radome	From Leg	4.00 0.00 -4.00	0.000		155.00	1.27	No Ice 1.28 1/2" Ice 1.45 1" Ice 1.62 2" Ice 1.97 4" Ice 2.66	0.01 0.02 0.03 0.04 0.07
VHLP2.5-18	B	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 -4.00	0.000		155.00	2.92	No Ice 6.68 1/2" Ice 7.07 1" Ice 7.46 2" Ice 8.23 4" Ice 9.78	0.05 0.08 0.12 0.19 0.34
VHLP2-11	C	Paraboloid w/o Radome	From Leg	4.00 0.00 -4.00	0.000		155.00	2.17	No Ice 3.72 1/2" Ice 4.01 1" Ice 4.30 2" Ice 4.88 4" Ice 6.04	0.03 0.05 0.07 0.11 0.19

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation	z	K _z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
ft	ft		psf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
L1 155.00-115.50	134.52	1.494	24	84.444	A	0.000	84.444	84.444	100.00	0.000	0.000
					B	0.000	84.444		100.00	0.000	0.000
					C	0.000	84.444		100.00	0.000	9.002
L2 115.50-79.25	96.99	1.361	22	97.153	A	0.000	97.153	97.153	100.00	0.000	0.000
					B	0.000	97.153		100.00	0.000	0.000
					C	0.000	97.153		100.00	0.000	9.113
L3 79.25-43.75	61.36	1.194	19	112.927	A	0.000	112.927	112.927	100.00	0.000	0.000
					B	0.000	112.927		100.00	0.000	0.000
					C	0.000	112.927		100.00	0.000	8.925
L4 43.75-0.00	21.22	1	16	163.162	A	0.000	163.162	163.162	100.00	0.000	0.000
					B	0.000	163.162		100.00	0.000	0.000
					C	0.000	163.162		100.00	0.000	10.999

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K _z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 155.00-115.50	134.52	1.494	5	1.18	92.237	A	0.000	92.237	92.237	100.00	0.000	0.000
						B	0.000	92.237	100.00	0.000	0.000	
						C	0.000	92.237	100.00	0.000	24.863	
L2 115.50-79.25	96.99	1.361	5	1.14	104.304	A	0.000	104.304	104.304	100.00	0.000	0.000
						B	0.000	104.304	100.00	0.000	0.000	
						C	0.000	104.304	100.00	0.000	26.277	
L3 79.25-43.75	61.36	1.194	4	1.08	119.661	A	0.000	119.661	119.661	100.00	0.000	0.000
						B	0.000	119.661	100.00	0.000	0.000	
						C	0.000	119.661	100.00	0.000	25.086	
L4 43.75-0.00	21.22	1	4	1.00	171.017	A	0.000	171.017	171.017	100.00	0.000	0.000
						B	0.000	171.017	100.00	0.000	0.000	
						C	0.000	171.017	100.00	0.000	29.851	

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K _z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 155.00-115.50	134.52	1.494	10	84.444	A	0.000	84.444	84.444	100.00	0.000	0.000
					B	0.000	84.444	100.00	0.000	0.000	
					C	0.000	84.444	100.00	0.000	9.002	
L2 115.50-79.25	96.99	1.361	9	97.153	A	0.000	97.153	97.153	100.00	0.000	0.000
					B	0.000	97.153	100.00	0.000	0.000	
					C	0.000	97.153	100.00	0.000	9.113	
L3 79.25-43.75	61.36	1.194	8	112.927	A	0.000	112.927	112.927	100.00	0.000	0.000
					B	0.000	112.927	100.00	0.000	0.000	
					C	0.000	112.927	100.00	0.000	8.925	
L4 43.75-0.00	21.22	1	6	163.162	A	0.000	163.162	163.162	100.00	0.000	0.000
					B	0.000	163.162	100.00	0.000	0.000	
					C	0.000	163.162	100.00	0.000	10.999	

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp

Comb. No.	Description
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	155 - 115.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-20.14	1	0
			Max. Mx	11	-8.74	390	4
			Max. My	2	-8.74	-1	388
			Max. Vy	5	15.54	-390	1
			Max. Vx	2	-15.50	-1	388
			Max. Torque	3			-1
L2	115.5 - 79.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-34.80	2	-1
			Max. Mx	11	-17.07	1147	8
			Max. My	2	-17.06	-2	1148
			Max. Vy	5	23.59	-1147	3
			Max. Vx	2	-23.68	-2	1148
			Max. Torque	5			1
L3	79.25 - 43.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-44.76	4	-2
			Max. Mx	11	-24.67	2010	12
			Max. My	2	-24.67	-2	2014
			Max. Vy	5	25.95	-2009	4
			Max. Vx	2	-26.04	-2	2014
			Max. Torque	5			1
L4	43.75 - 0	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-61.80	6	-3
			Max. Mx	11	-38.45	3349	17
			Max. My	2	-38.45	-3	3356
			Max. Vy	5	28.57	-3347	5
			Max. Vx	2	-28.66	-3	3356
			Max. Torque	5			1

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	61.80	-0.00	0.00
	Max. H _x	11	38.48	28.53	0.11
	Max. H _z	2	38.48	-0.03	28.62
	Max. M _x	2	3356	-0.03	28.62
	Max. M _z	5	3347	-28.54	0.04
	Max. Torsion	5	1	-28.54	0.04

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	2	38.48	-0.03	28.62
	Min. H _x	5	38.48	-28.54	0.04
	Min. H _z	8	38.48	-0.09	-28.57
	Min. M _x	8	-3348	-0.09	-28.57
	Min. M _z	11	-3349	28.53	0.11
	Min. Torsion	10	0	24.73	-14.22

Tower Mast Reaction Summary

Load Combination	Vertical	Shear _x	Shear _z	Overturing Moment, M _x	Overturing Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	38.48	-0.00	0.00	0	1	0
Dead+Wind 0 deg - No Ice	38.48	0.03	-28.62	-3356	-3	0
Dead+Wind 30 deg - No Ice	38.48	14.38	-24.70	-2893	-1691	0
Dead+Wind 60 deg - No Ice	38.48	24.77	-14.24	-1667	-2907	0
Dead+Wind 90 deg - No Ice	38.48	28.54	-0.04	-5	-3347	-1
Dead+Wind 120 deg - No Ice	38.48	24.80	14.23	1665	-2913	0
Dead+Wind 150 deg - No Ice	38.48	14.26	24.71	2896	-1672	0
Dead+Wind 180 deg - No Ice	38.48	0.09	28.57	3348	-13	0
Dead+Wind 210 deg - No Ice	38.48	-14.16	24.77	2905	1658	0
Dead+Wind 240 deg - No Ice	38.48	-24.73	14.22	1664	2904	0
Dead+Wind 270 deg - No Ice	38.48	-28.53	-0.11	-17	3349	0
Dead+Wind 300 deg - No Ice	38.48	-24.73	-14.32	-1679	2902	0
Dead+Wind 330 deg - No Ice	38.48	-14.34	-24.72	-2896	1686	0
Dead+Ice+Temp	61.80	0.00	-0.00	3	6	0
Dead+Wind 0 deg+Ice+Temp	61.80	0.01	-8.23	-1021	5	0
Dead+Wind 30 deg+Ice+Temp	61.80	4.13	-7.10	-880	-509	0
Dead+Wind 60 deg+Ice+Temp	61.80	7.12	-4.10	-506	-880	0
Dead+Wind 90 deg+Ice+Temp	61.80	8.21	-0.01	1	-1015	0
Dead+Wind 120 deg+Ice+Temp	61.80	7.13	4.09	511	-882	0
Dead+Wind 150 deg+Ice+Temp	61.80	4.10	7.11	887	-504	0
Dead+Wind 180 deg+Ice+Temp	61.80	0.02	8.22	1025	3	0
Dead+Wind 210 deg+Ice+Temp	61.80	-4.08	7.12	889	513	0
Dead+Wind 240 deg+Ice+Temp	61.80	-7.11	4.09	511	892	0
Dead+Wind 270 deg+Ice+Temp	61.80	-8.21	-0.03	-2	1028	0
Dead+Wind 300 deg+Ice+Temp	61.80	-7.11	-4.12	-509	892	0
Dead+Wind 330 deg+Ice+Temp	61.80	-4.12	-7.11	-881	521	0
Dead+Wind 0 deg - Service	38.48	0.01	-11.18	-1313	-1	0
Dead+Wind 30 deg - Service	38.48	5.62	-9.65	-1132	-661	0
Dead+Wind 60 deg - Service	38.48	9.67	-5.56	-652	-1137	0
Dead+Wind 90 deg - Service	38.48	11.15	-0.01	-2	-1310	0
Dead+Wind 120 deg - Service	38.48	9.69	5.56	652	-1140	0
Dead+Wind 150 deg - Service	38.48	5.57	9.65	1133	-654	0
Dead+Wind 180 deg - Service	38.48	0.03	11.16	1311	-5	0
Dead+Wind 210 deg - Service	38.48	-5.53	9.68	1137	649	0
Dead+Wind 240 deg - Service	38.48	-9.66	5.55	651	1137	0
Dead+Wind 270 deg - Service	38.48	-11.15	-0.04	-6	1311	0

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
Service Dead+Wind 300 deg - Service	38.48	-9.66	-5.59	-657	1136	0
Service Dead+Wind 330 deg - Service	38.48	-5.60	-9.66	-1133	660	0

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	-38.48	0.00	0.00	38.48	0.00	0.000%
2	0.03	-38.48	-28.62	-0.03	38.48	28.62	0.007%
3	14.38	-38.48	-24.70	-14.38	38.48	24.70	0.000%
4	24.77	-38.48	-14.24	-24.77	38.48	14.24	0.000%
5	28.54	-38.48	-0.04	-28.54	38.48	0.04	0.007%
6	24.80	-38.48	14.23	-24.80	38.48	-14.23	0.000%
7	14.26	-38.48	24.71	-14.26	38.48	-24.71	0.000%
8	0.09	-38.48	28.57	-0.09	38.48	-28.57	0.007%
9	-14.16	-38.48	24.77	14.16	38.48	-24.77	0.000%
10	-24.73	-38.48	14.22	24.73	38.48	-14.22	0.000%
11	-28.54	-38.48	-0.11	28.53	38.48	0.11	0.007%
12	-24.73	-38.48	-14.32	24.73	38.48	14.32	0.000%
13	-14.34	-38.48	-24.72	14.34	38.48	24.72	0.000%
14	0.00	-61.80	0.00	-0.00	61.80	0.00	0.002%
15	0.01	-61.80	-8.23	-0.01	61.80	8.23	0.002%
16	4.13	-61.80	-7.11	-4.13	61.80	7.10	0.001%
17	7.12	-61.80	-4.10	-7.12	61.80	4.10	0.001%
18	8.21	-61.80	-0.01	-8.21	61.80	0.01	0.002%
19	7.13	-61.80	4.09	-7.13	61.80	-4.09	0.001%
20	4.10	-61.80	7.11	-4.10	61.80	-7.11	0.001%
21	0.02	-61.80	8.22	-0.02	61.80	-8.22	0.002%
22	-4.08	-61.80	7.12	4.08	61.80	-7.12	0.001%
23	-7.11	-61.80	4.09	7.11	61.80	-4.09	0.001%
24	-8.21	-61.80	-0.03	8.21	61.80	0.03	0.002%
25	-7.11	-61.80	-4.12	7.11	61.80	4.12	0.001%
26	-4.12	-61.80	-7.11	4.12	61.80	7.11	0.001%
27	0.01	-38.48	-11.18	-0.01	38.48	11.18	0.004%
28	5.62	-38.48	-9.65	-5.62	38.48	9.65	0.002%
29	9.67	-38.48	-5.56	-9.67	38.48	5.56	0.002%
30	11.15	-38.48	-0.01	-11.15	38.48	0.01	0.004%
31	9.69	-38.48	5.56	-9.69	38.48	-5.56	0.002%
32	5.57	-38.48	9.65	-5.57	38.48	-9.65	0.002%
33	0.03	-38.48	11.16	-0.03	38.48	-11.16	0.004%
34	-5.53	-38.48	9.68	5.53	38.48	-9.68	0.002%
35	-9.66	-38.48	5.55	9.66	38.48	-5.55	0.002%
36	-11.15	-38.48	-0.04	11.15	38.48	0.04	0.004%
37	-9.66	-38.48	-5.59	9.66	38.48	5.59	0.002%
38	-5.60	-38.48	-9.66	5.60	38.48	9.66	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.0000001	0.0000001
2	Yes	15	0.00007344	0.00010318
3	Yes	20	0.0000001	0.00007583
4	Yes	20	0.0000001	0.00007512
5	Yes	15	0.00007346	0.00012216
6	Yes	20	0.0000001	0.00007453
7	Yes	20	0.0000001	0.00007483
8	Yes	15	0.00007348	0.00011208

9	Yes	20	0.00000001	0.00007409
10	Yes	20	0.00000001	0.00007431
11	Yes	15	0.00007345	0.00012363
12	Yes	20	0.00000001	0.00007570
13	Yes	20	0.00000001	0.00007505
14	Yes	9	0.00000001	0.00001430
15	Yes	16	0.00010751	0.00012727
16	Yes	17	0.00000001	0.00011588
17	Yes	17	0.00000001	0.00011542
18	Yes	16	0.00010753	0.00012661
19	Yes	17	0.00000001	0.00011593
20	Yes	17	0.00000001	0.00011534
21	Yes	16	0.00010749	0.00012757
22	Yes	17	0.00000001	0.00011757
23	Yes	17	0.00000001	0.00011747
24	Yes	16	0.00010751	0.00012826
25	Yes	17	0.00000001	0.00011776
26	Yes	17	0.00000001	0.00011791
27	Yes	15	0.00007933	0.00005309
28	Yes	16	0.00000001	0.00014873
29	Yes	16	0.00000001	0.00014676
30	Yes	15	0.00007935	0.00005441
31	Yes	16	0.00000001	0.00014356
32	Yes	16	0.00000001	0.00014605
33	Yes	15	0.00007933	0.00005308
34	Yes	16	0.00000001	0.00014367
35	Yes	16	0.00000001	0.00014364
36	Yes	15	0.00007934	0.00005361
37	Yes	16	0.00000001	0.00014869
38	Yes	16	0.00000001	0.00014517

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155 - 115.5	49.97	31	2.762	0.003
L2	119.25 - 79.25	30.15	27	2.417	0.001
L3	83.75 - 43.75	14.61	27	1.684	0.000
L4	49 - 0	4.92	27	0.931	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
155.00	LPX310R w/ Mount Pipe	31	49.97	2.762	0.003	22714
153.00	800MHz 2X50W RRH W/FILTER	31	48.82	2.749	0.003	22714
151.00	VHLP1-23	31	47.66	2.735	0.002	22714
145.00	RRUS 11	31	44.22	2.692	0.002	11356
143.00	800 10121 w/ Mount Pipe	31	43.08	2.677	0.002	9463
133.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	37.46	2.589	0.002	5161
113.00	BXA-70063/6CFx2 w/ Mount Pipe	27	27.05	2.313	0.001	3073

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155 - 115.5	127.31	2	7.045	0.006
L2	119.25 - 79.25	76.89	2	6.167	0.003
L3	83.75 - 43.75	37.28	2	4.300	0.001
L4	49 - 0	12.57	2	2.378	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
155.00	LPX310R w/ Mount Pipe	2	127.31	7.045	0.006	9152
153.00	800MHz 2X50W RRH W/FILTER	2	124.37	7.010	0.006	9152
151.00	VHLP1-23	2	121.44	6.976	0.005	9152
145.00	RRUS 11	2	112.68	6.866	0.005	4574
143.00	800 10121 w/ Mount Pipe	2	109.78	6.827	0.005	3811
133.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	95.50	6.604	0.004	2076
113.00	BXA-70063/6CFx2 w/ Mount Pipe	2	68.98	5.901	0.004	1230

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	F_a ksi	A in ²	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	155 - 115.5 (1)	TP29.31x22x0.25	39.50	0.00	0.0	36.00	22.51	-8.73	810.25	0.011
L2	115.5 - 79.25 (2)	TP35.51x28.11x0.31	40.00	0.00	0.0	39.00	34.09	-17.06	1329.50	0.013
L3	79.25 - 43.75 (3)	TP41.46x34.06x0.38	40.00	0.00	0.0	39.00	47.74	-24.67	1861.89	0.013
L4	43.75 - 0 (4)	TP48.8x39.73x0.44	49.00	0.00	0.0	39.00	67.16	-38.45	2619.14	0.015

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	155 - 115.5 (1)	TP29.31x22x0.25	390	29.76	36.00	0.827	0	0.00	36.00	0.000
L2	115.5 - 79.25 (2)	TP35.51x28.11x0.31	1150	47.77	39.00	1.225	0	0.00	39.00	0.000
L3	79.25 - 43.75 (3)	TP41.46x34.06x0.38	2014	51.22	39.00	1.313	0	0.00	39.00	0.000
L4	43.75 - 0 (4)	TP48.8x39.73x0.44	3356	50.31	39.00	1.290	0	0.00	39.00	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_t ksi	Allow. F_t ksi	Ratio $\frac{f_t}{F_t}$
L1	155 - 115.5 (1)	TP29.31x22x0.25	15.57	0.69	24.00	0.058	0	0.01	24.00	0.000
L2	115.5 - 79.25 (2)	TP35.51x28.11x0.31	23.65	0.69	26.00	0.053	1	0.01	26.00	0.000
L3	79.25 - 43.75 (3)	TP41.46x34.06x0.38	26.01	0.54	26.00	0.042	1	0.01	26.00	0.000
L4	43.75 - 0 (4)	TP48.8x39.73x0.44	28.66	0.43	26.00	0.033	0	0.00	26.00	0.000

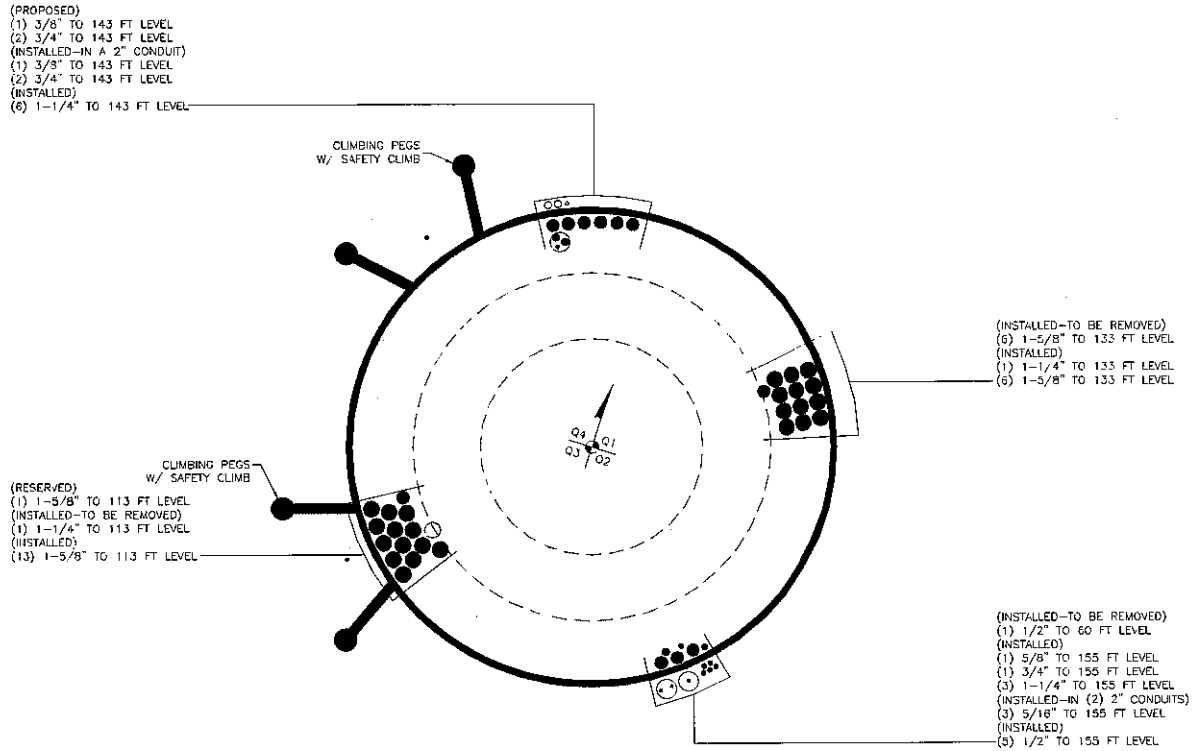
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P $\frac{P_a}{P}$	Ratio f_{bx} $\frac{F_{bx}}{F}$	Ratio f_{by} $\frac{F_{by}}{F}$	Ratio f_v $\frac{F_v}{F}$	Ratio f_t $\frac{F_t}{F}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	155 - 115.5 (1)	0.011	0.827	0.000	0.058	0.000	0.838	1.333	H1-3+VT ✓
L2	115.5 - 79.25 (2)	0.013	1.225	0.000	0.053	0.000	1.238	1.333	H1-3+VT ✓
L3	79.25 - 43.75 (3)	0.013	1.313	0.000	0.042	0.000	1.327	1.333	H1-3+VT ✓
L4	43.75 - 0 (4)	0.015	1.290	0.000	0.033	0.000	1.305	1.333	H1-3+VT ✓

Section Capacity Table

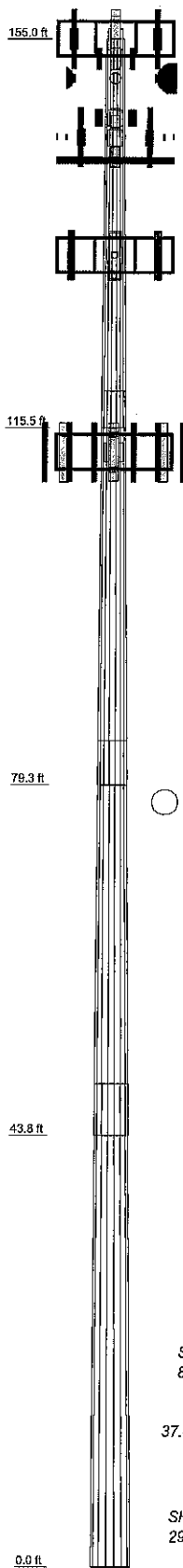
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF* P_{allow} K	% Capacity	Pass Fail
L1	155 - 115.5	Pole	TP29.31x22x0.25	1	-8.73	1080.07	62.9	Pass
L2	115.5 - 79.25	Pole	TP35.51x28.11x0.31	2	-17.06	1772.22	92.9	Pass
L3	79.25 - 43.75	Pole	TP41.46x34.06x0.38	3	-24.67	2481.90	99.6	Pass
L4	43.75 - 0	Pole	TP48.8x39.73x0.44	4	-38.45	3491.31	97.9	Pass
Summary								
Pole (L3)							99.6	Pass
RATING =							99.6	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Section	1	2	3	4
Length (ft)	39.50	40.00	40.00	49.00
Number of Sides	18	18	18	18
Thickness (in)	0.25	0.31	0.38	0.44
Socket Length (ft)	3.75	4.50	5.25	39.73
Top Dia (in)	22.00	28.11	34.06	48.80
Bot Dia (in)	29.31	35.51	41.46	10.1
Grade	A607-60			A607-65
Weight (K)	2.7	4.3	6.1	10.1



DESIGNED APPURTENANCE LOADING

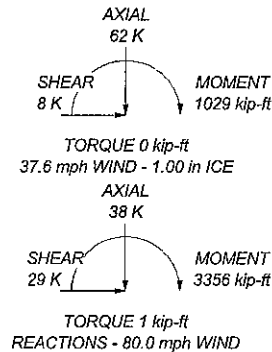
TYPE	ELEVATION	TYPE	ELEVATION
LPX310R w/ Mount Pipe	155	RRUS 32 B30	143
LPX310R w/ Mount Pipe	155	RRUS 32 B30	143
LPX310R w/ Mount Pipe	155	DC6-48-60-18-8F	143
HORIZON COMPACT	155	T-Arm Mount (TA 702-3)	143
HORIZON COMPACT	155	800 10121 w/ Mount Pipe	143
HORIZON COMPACT	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	800 10121 w/ Mount Pipe	143
WIMAX DAP HEAD	155	KRY 112 144/1	133
WIMAX DAP HEAD	155	KRY 112 144/1	133
APXVSP18-C-A20 w/ Mount Pipe	155	KRY 112 144/1	133
APXVSP18-C-A20 w/ Mount Pipe	155	KRC 118 057/1 w/ Mount Pipe	133
APXVSP18-C-A20 w/ Mount Pipe	155	KRC 118 057/1 w/ Mount Pipe	133
APXVTM14-C-120 w/ Mount Pipe	155	KRC 118 057/1 w/ Mount Pipe	133
APXVTM14-C-120 w/ Mount Pipe	155	RRUS 11 B12	133
APXVTM14-C-120 w/ Mount Pipe	155	RRUS 11 B12	133
TD-RRH8x20-25	155	RRUS 11 B12	133
TD-RRH8x20-25	155	(2) 2.375" OD x 5' Mount Pipe	133
TD-RRH8x20-25	155	(2) 2.375" OD x 5' Mount Pipe	133
Platform Mount (LP 713-1)	155	(2) 2.375" OD x 5' Mount Pipe	133
VHLP1-23	155	Platform Mount (LP 403-1)	133
VHLP2.5-18	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
VHLP2-11	155	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
PCS 1900MHz 4x45W-65MHz	153	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
PCS 1900MHz 4x45W-65MHz	153	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
PCS 1900MHz 4x45W-65MHz	153	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	133
Pipe Mount (PM 601-3)	153	LNX-6512DS-T0M w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	LNX-6512DS-T0M w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	LNX-6512DS-T0M w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	153	DB-T1-6Z-8AB-0Z	113
Pipe Mount (PM 601-3)	145	(2) SBNHH-1D65B w/ Mount Pipe	113
RRUS 11	146	(2) SBNHH-1D65B w/ Mount Pipe	113
RRUS 11	146	(2) SBNHH-1D65B w/ Mount Pipe	113
RRUS 11	145	RRH2X60-AWS	113
(2) 860 10025	143	RRH2X60-AWS	113
(2) 860 10025	143	RRH2X60-AWS	113
(2) 860 10025	143	RRH2X60-PCS	113
RRUS-11	143	RRH2X60-PCS	113
RRUS-11	143	RRH2X60-PCS	113
RRUS-11	143	RRH2x60-700	113
DC6-48-60-18-8F	143	RRH2x60-700	113
QS66512-2 w/ Mount Pipe	143	RRH2x60-700	113
QS66512-2 w/ Mount Pipe	143	Platform Mount (LP 1201-1)	113
QS66512-2 w/ Mount Pipe	143	BXA-70063/6CFx2 w/ Mount Pipe	113
DTMABP7819VG12A	143	BXA-70063/6CFx2 w/ Mount Pipe	113
DTMABP7819VG12A	143	BXA-70063/6CFx2 w/ Mount Pipe	113
DTMABP7819VG12A	143	BXA-70063/6CFx2 w/ Mount Pipe	113
RRUS 32 B30	143		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.0 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.6 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50.0 mph wind.
5. TOWER RATING: 99.6%



Paul J. Ford and Company 250 E. Broad Street, Suite 600 Columbus, OH 43215 Phone: 614.221.6679 FAX: 614.448.4105	Job: 155 ft Monopole / Buckland Mall		
	Project: PJF 37516-0064 / BU 876347		
	Client: Crown Castle	Drawn by: Joey Meinerding	App'd:
	Code: TIA/EIA-222-F	Date: 05/25/16	Scale: NTS
Path:		Dwg No. E-1	

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

- Assumptions:**
- 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
 - 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
 - 3) Clear space between bottom of leveling nut and top of concrete **not** exceeding $(1) \times (\text{Rod Diameter})$

Site Data

BU#: 876347
 Site Name: *Buckland Mall*
 App #:

Anchor Rod Data

Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	56	in
Anchor Spacing:	6	in

Plate Data

W=Side:	55	in
Thick:	3.25	in
Grade:	50	ksi
Clip Distance:	10	in

Stiffener Data (Welding at both sides)

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

Pole Data

Diam:	48.8	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor

ASD ASIF:	1.333	
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Base Reactions

TIA Revision:	F	
Unfactored Moment, M:	3356	ft-kips
Unfactored Axial, P:	38	kips
Unfactored Shear, V:	29	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension: 177.4 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 91.0% **Pass**

Base Plate Results

Base Plate Stress: 39.1 ksi
 Allowable PL Bending Stress: 50.0 ksi
 Base Plate Stress Ratio: 78.1% **Pass**

Flexural Check

PL Ref. Data

Yield Line (in):	28.98
Max PL Length:	28.98

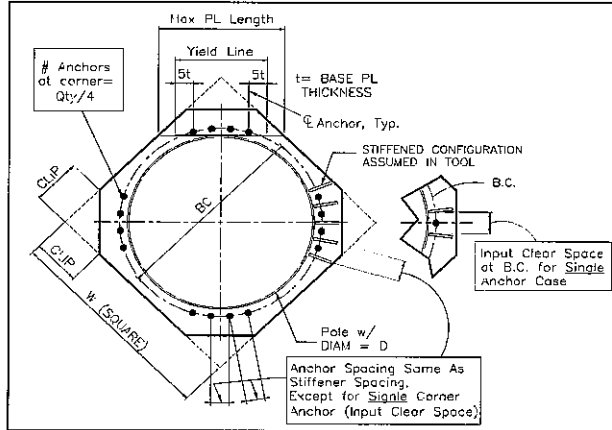
N/A - Unstiffened

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



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

Foundation Loads:

Pole weight or tower leg compression = 38 (kips)
 Horizontal load at top of pier = 29 (kips)
 Overturning moment at top of pier = 3356 (ft-kips)

Design criteria:

Safety factor against overturning = 2

Soil Properties:

Soil density = 105 (pcf)
 Allowable soil bearing = 15 (ksf)
 Depth to water table = 99 (ft)

Dimensions:

Pier shape (round or square) = S ("R" or "S")
 Pier width = 7 (ft)
 Pier height above grade = 0.5 (ft)
 depth to bottom of footing = 10 (ft)
 Footing thickness = 3 (ft)
 Footing width = 23 (ft)
 Footing length = 23 (ft)

Concrete:

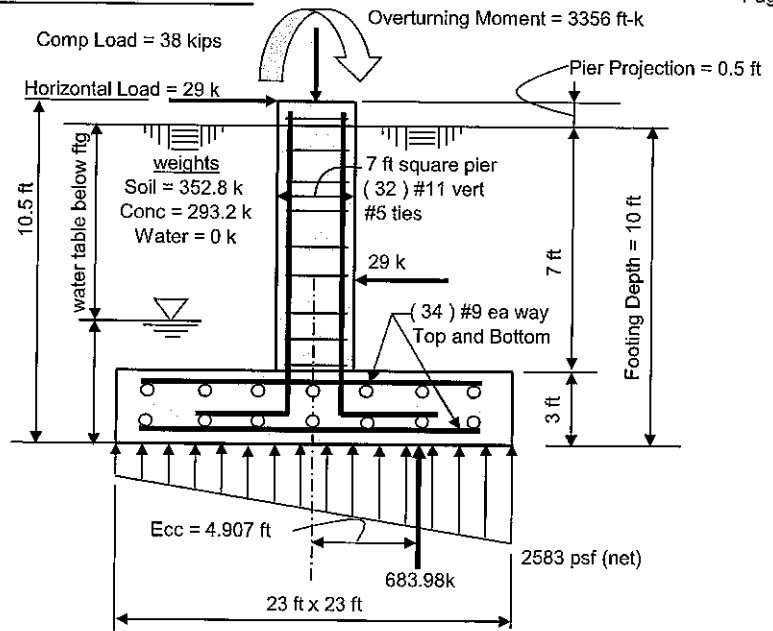
Concrete strength = 3 (ksi)
 Rebar strength = 60 (ksi)
 ultimate load factor = 1.3

Reinforcing Steel:

Pad
 minimum cover over rebar = 3 inches
 size of pad rebar = #9 bar
 quantity of pad rebar = 34 (ea direction)

Reinforcing Steel:

Pier
 size of vert rebar in pier = #11 bar
 vertical rebar quantity = 32
 size of pier ties = #5 bar
 minimum cover over rebar = 3 inches
 Total volume of concrete = 72.4 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 2.583 ksf Allowable Net Soil Bearing = 15 ksf Soil Bearing Stress Ratio = 0.17 Okay	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 36 psi Bending Shear Stress Ratio = 0.33 Okay
Ftg Overturning Resistance = 7866 ft-kips Overturning Moment = 3356 ft-kips Required Overturning Safety Factor = 2 Overturning Safety Factor = 2.344 Ratio = 0.85 Okay	Pad Bending Moment Capacity = 4569 ft-k Pad Bending Moment = 1355 ft-k Bending Moment Stress Ratio = 0.3 OK

General Information:

File Name: T:\375_Crown_Castle\2016\37516-0064_876347_BUCKLAND MALL\37516...\37516-0064.003.7805.col
 Project: 37516-0064.003.7805
 Column: Engineer: JWM
 Code: ACI 318-02 Units: English
 Run Option: Investigation Slenderness: Not considered
 Run Axis: X-axis Column Type: Structural

Material Properties:

Concrete: Standard Steel: Standard
 f'c = 3 ksi fy = 60 ksi
 Ec = 3122.02 ksi Es = 29000 ksi
 fc = 2.55 ksi Eps_yt = 0.00206897 in/in
 Eps_u = 0.003 in/in
 Beta1 = 0.85

Section:

Rectangular: Width = 84 in Depth = 84 in
 Gross section area, Ag = 7056 in^2
 Ix = 4.14893e+006 in^4 Iy = 4.14893e+006 in^4
 rx = 24.2487 in ry = 24.2487 in
 Xo = 0 in Yo = 0 in

Reinforcement:

Bar Set: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #5 ties with #11 bars, #5 with larger bars.
 phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Rectangular
 Pattern: All Sides Equal (Cover to transverse reinforcement)
 Total steel area: As = 49.92 in^2 at rho = 0.71% (Note: rho < 1.0%)
 Minimum clear spacing = 8.01 in

32 #11 Cover = 3 in

Factored Loads and Moments with Corresponding Capacities:

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu NA	depth in	Dt depth in	eps_t	Phi
1	38.00	4645.55	8634.73	1.859	8.71	79.67	0.02444	0.900

*** End of output ***