



Crown Castle  
3 Corporate Park Drive, Suite 101  
Clifton Park, NY 12065

December 17, 2018

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

**RE: Notice of Exempt Modification for Verizon Wireless: 803175**  
**Verizon Site ID: 34002**  
**167 Coccoimo CIR, New Britain, CT 06051**  
**Latitude: 41° -41' 11.80"/ Longitude: -72° -45' 27.80"**

Dear Ms. Bachman:

Verizon currently maintains twelve (12) antennas at the 149-foot level of the existing 188-foot monopole tower located at 167 Coccoimo CIR, New Britain, CT 06051. The tower is owned by Crown Castle as well the property. Verizon now intends to replace six (6) RRH's. Verizon also intends remove three (3) RRH's.

On December 17, 2018, an email was sent to City Planning Department in regard to a copy of the original zoning document. A copy of the email is included in this package.

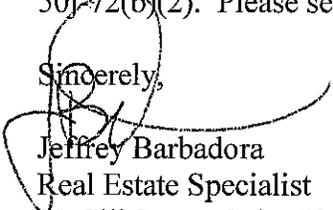
Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Honorable Erin E. Stewart, Mayor, City of New Britain and Mr. Steven P. Schiller, City Planner, AICP City of New Britain Planning Department. Crown Castle is the tower and property owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Verizon respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

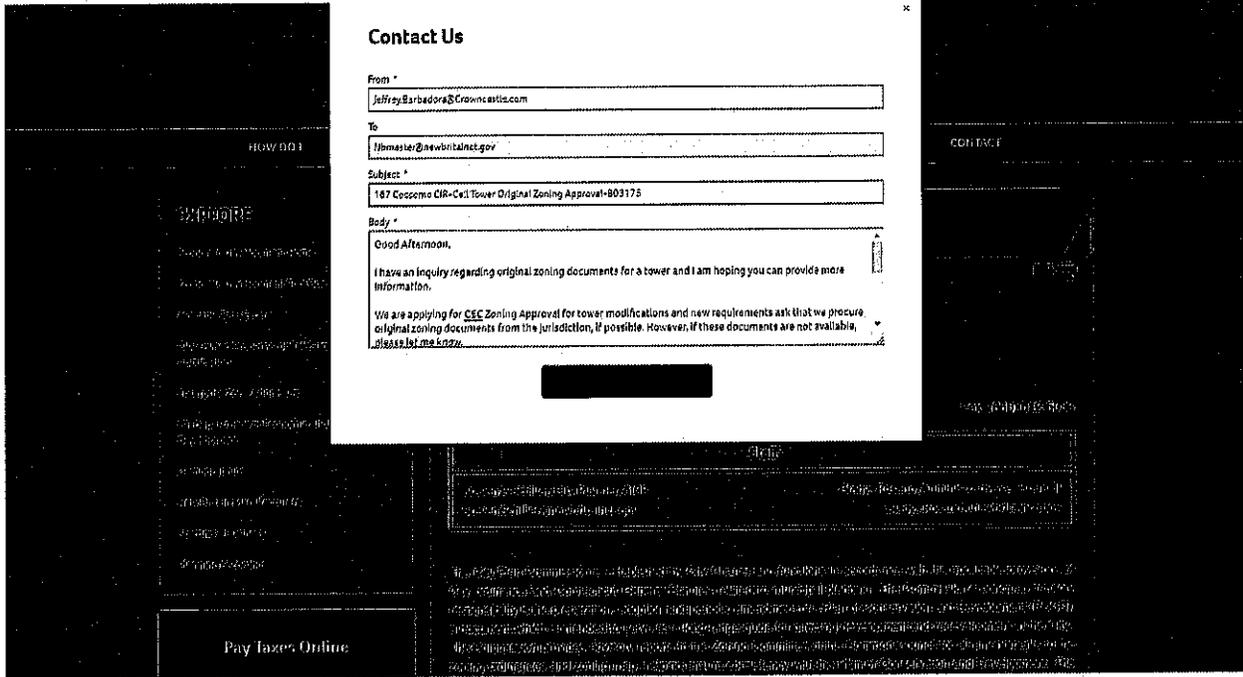
  
Jeffrey Barbadora  
Real Estate Specialist  
12 Gill Street, Suite 5800, Woburn, MA 01801  
781-729-0053  
[Jeff.Barbadora@crowncastle.com](mailto:Jeff.Barbadora@crowncastle.com)

Attachments:

- Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
- Tab 2: Exhibit-2: Structural Modification Report
- Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Erin E.  
Stewart, Mayor  
27 West Main Street  
New Britain, CT 06051

Steven P. Schiller, City  
Planner  
Planning and Zoning  
27 West Main Street  
New Britain, CT 06051



Email to City Planner requesting original zoning documents



Property Information

Property Location	167 COCCOMO CIR
Owner	CROWN ATLANTIC COMPANY LLC
Co-Owner	
Mailing Address	4017 WASHINGTON RD PMB 353 MCMURRAY PA 15317
Land Use	1010 Single Family
Land Class	R
Zoning Code	I2
Census Tract	416300

Neighborhood	104
Acreage	0.32
Utilities	All Public
Lot Setting/Desc	Level
Additional Info	

Photo



Sketch



Primary Construction Details

Year Built	1918
Stories	1.25
Building Style	Conventional
Building Use	Residential
Building Condition	C
Floors	Carpet
Total Rooms	4

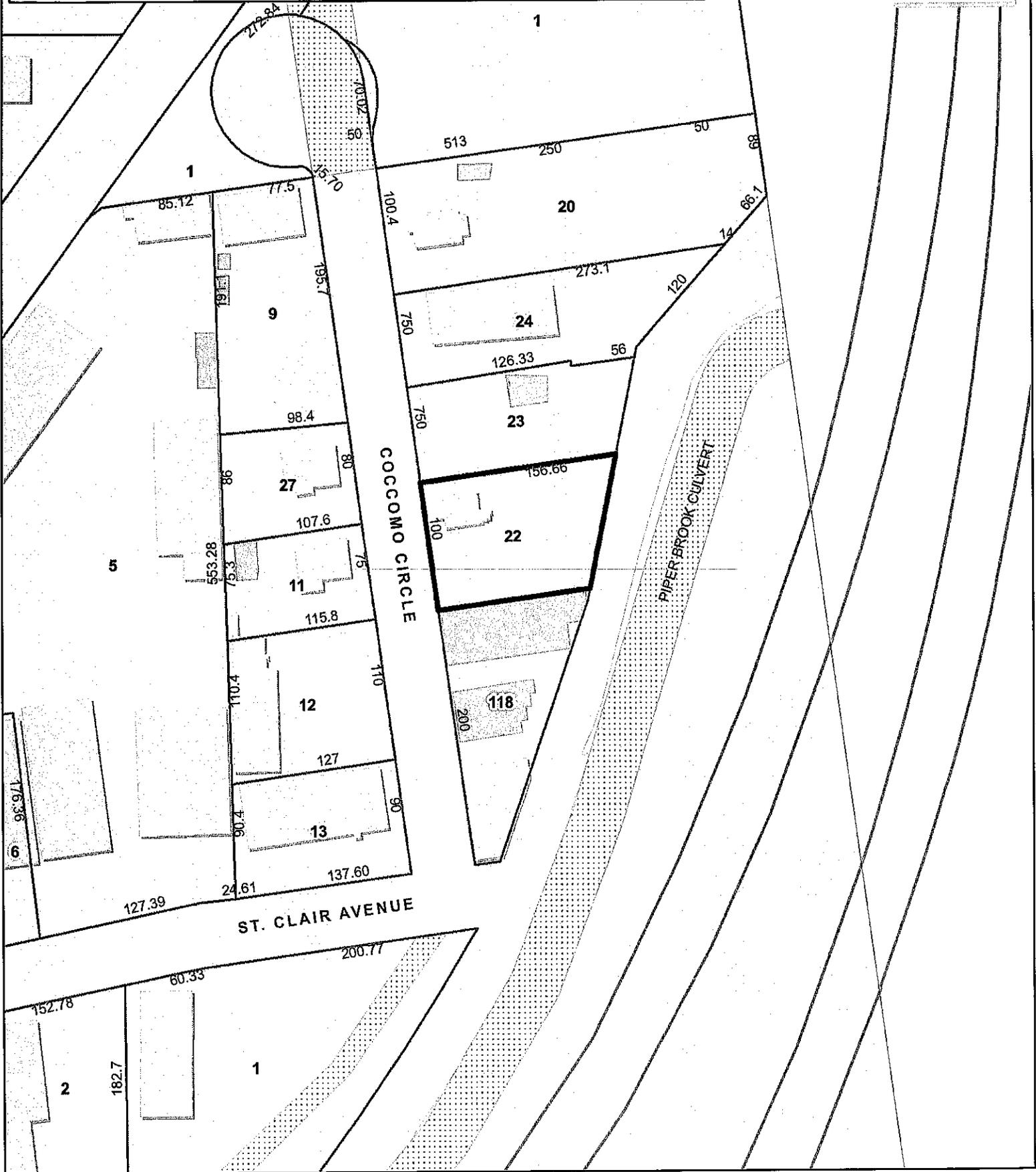
Bedrooms	2 Bedrooms
Full Bathrooms	1
Half Bathrooms	0
Bath Style	Average
Kitchen Style	Average
Roof Style	Gable
Roof Cover	Asphalt Shingl

Exterior Walls	Aluminum Sidin
Interior Walls	Plaster
Heating Type	99
Heating Fuel	Yes
AC Type	None
Gross Bldg Area	1988
Total Living Area	624

# City of New Britain, Connecticut - Assessment Parcel Map

MBL: A5D 22

Address: 167 COCCOMO CIR



Approximate Scale:  
1 inch = 100 feet

Disclaimer:  
This map is for informational purposes only.  
All information is subject to verification by any user.  
The City of New Britain and its mapping contractors  
assume no legal responsibility for the information contained herein.

Map Produced Feb 2017

CITY OF NEW BRITAIN CONNECTICUT GIS & Real Property Information 27 West Main Street New Britain, CT 06051 ph (860) 826-3323

Property Search

Name: ex. Smith [input field]

House No: [input field] 167

Street: COCCOMO CIR [dropdown menu]

Parcel Id: ex. C7C 34 [input field]



Information Updates

GIS Parcel Maps Updated October 2015

Property Info Data Updated Nightly

Current Parcel Count 17,434 +/-

Detailed Parcel Information

GIS ID 154-22 Parcel ID ASD 22 Unique ID 10590 Owner CROWN ATLANTIC COMPANY LLC Location 167 COCCOMO CIR MAILING ADDRESS 4017 WASHINGTON RD PMB 353 MCMURRAY PA 15317



Quick Links:

Quick Map VISION Card Summary Card

Scroll Down For Complete Property Detail

PARCEL VALUATIONS

Table with 3 columns: Category, Appraised Value, Assessed Value. Rows include Buildings, Land, and TOTAL.

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Date: **November 21, 2018**

Alicia Hansbrough  
Crown Castle  
8000 Avalon Blvd.  
Alpharetta, GA 30009



Tower Engineering Professionals  
326 Tryon Road  
Raleigh, NC 27603  
(919) 661-6351

**Subject: Structural Analysis Report**

**Carrier Designation:**

**Verizon Wireless Co-Locate**  
**Carrier Site Number:** 34002  
**Carrier Site Name:** New Britain 3 CT

**Crown Castle Designation:**

**Crown Castle BU Number:** 803175  
**Crown Castle Site Name:** CT New Britain 3 CAC 803175  
**Crown Castle JDE Job Number:** 518913  
**Crown Castle Work Order Number:** 1606072  
**Crown Castle Order Number:** 450305 Rev. 1

**Engineering Firm Designation:**

**TEP Project Number:** 25666.196650

**Site Data:**

**167 Cocomo, New Britain, Hartford County, CT 06051**  
**Latitude 41° 41' 11.80", Longitude -72° 45' 27.80"**  
**188 Foot - Monopole**

Dear Alicia Hansbrough,

Tower Engineering Professionals is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above-mentioned tower.

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: Proposed Equipment Configuration

**Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Isaac Merrill, EIT / KFO

Respectfully submitted by:

William H. Martin, P.E.



Electronic Copy

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**1) INTRODUCTION**

This tower is a 188-ft monopole tower designed by Paul J. Ford and Company. All information provided to TEP was assumed to be accurate and complete.

**2) ANALYSIS CRITERIA**

TIA-222 Revision: TIA-222-H  
 Risk Category: II  
 Wind Speed: 125 mph  
 Exposure Category: C  
 Topographic Factor: 1  
 Ice Thickness: 2.0 in  
 Wind Speed with Ice: 50 mph  
 Service Wind Speed: 60 mph

**Table 1 - Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
146.0	149.0	3	Amphenol	BXA-80063-6BF-EDIN-4 w/ Mount Pipe	1 13	1-1/2 1-5/8
		3	Andrew	LNX-6512DS-A1M w/ Mount Pipe		
		6	Andrew	SBNHH-1D65B w/ Mount Pipe		
		1	GPS	GPS_A		
		3	Samsung Telecommunications	RFV01U-D1A		
		3	Samsung Telecommunications	RFV01U-D2A		
	146.0	1	Tower Mounts	Miscellaneous [NA 509-3]		
	146.0	1	Tower Mounts	Platform Mount [LP 601-1]		
	145.0	2	Raycap	RHSDC-3315-PF-48		

**TABLE 2 - Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
190.0	190.0	1	Tower Mounts	Miscellaneous [NA 507-1]	2 6 6	3/8 3/4 1-5/8
		1	Tower Mounts	Miscellaneous [NA 509-3]		
		1	Tower Mounts	Platform Mount [LP 1201-1]		
	189.0	3	CCI Antennas	OPA-65R-LCUU-H4 w/ Mount Pipe		
		3	Ericsson	RRUS 12		
		3	Ericsson	RRUS 32 B2		
		3	Ericsson	RRUS 32 B30		
		3	Ericsson	RRUS 32 B66		
		3	Ericsson	RRUS-11		
		3	Kathrein	800 10121 w/ Mount Pipe		
		6	Kathrein	860 10025		
		6	Powerwave Technologies	LGP21401		
		3	Quintel Technology	QS66512-2 w/ Mount Pipe		
		1	Raycap	DC6-48-60-0-8F		
		2	Raycap	DC6-48-60-18-8F		
161.0	161.0	3	Ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	1 12	1-1/2 1-5/8
		3	Ericsson	AIR 21 B2A B4P w/ Mount Pipe		
		3	Ericsson	RADIO 4449 B12/B71		
		3	RFS Cellwave	ATMAA1412D-1A20		
		3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		1	Tower Mounts	Platform Mount [LP 601-1]		

**3) ANALYSIS PROCEDURE**

**Table 3 - Documents Provided**

Document	Remarks	Reference	Source
Geotechnical Report	Clough, Harbour & Associates LLP	679661	CCISites
Tower Foundation Drawings	Paul J. Ford and Company	679660	CCISites
Foundation Mapping Report	Tower Engineering Professionals	679660	CCISites
Tower Manufacturer Drawings	Paul J. Ford and Company	679659	CCISites
Mount Analysis Report	Infinigy Engineering, PLLC	7966285	CCISites

**3.1) Analysis Method**

tnxTower (version 8.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

### 3.2) Assumptions

- 1) The tower and foundation were built and maintained in accordance with the manufacturer's specification.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.
- 3) All tower components are in sufficient condition to carry their full design capacity.
- 4) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
- 5) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals 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)	$\phi P_{allow}$ (K)	% Capacity	Pass / Fail
L1	188 - 137	Pole	TP32.711x22x0.25	1	-13.62	1801.17	62.3	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-23.85	2867.54	87.9	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-37.66	4158.27	87.7	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-60.74	6892.95	69.3	Pass
							Summary	
						Pole (L2)	87.9	Pass
						<b>RATING =</b>	<b>87.9</b>	<b>Pass</b>

**Table 5 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	81.3	Pass
1,2	Base Plate	-	74.5	Pass
1,2	Base Foundation Soil Interaction	-	91.1	Pass
1,2	Base Foundation Structural	-	79.6	Pass

<b>Structure Rating (max from all components) =</b>	<b>91.1%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
- 2) Rating per TIA-222-H Section 15.5

#### 4.1) Recommendations

- 1) If the load differs from that described in Tables 1 and 2 of this report, the referenced drawings, or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
- 2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

**APPENDIX A**  
**TNXTOWER OUTPUT**

188.0 ft

Section	1	2	3	4
Length (ft)	51.00	51.00	51.00	51.00
Number of Sides	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.5000
Socket Length (ft)	4.25	5.25	6.50	48.8988
Top Dia (in)	22.0000	31.3164	40.3023	59.6100
Bot Dia (in)	32.7110	42.0000	51.0140	14.8
Grade		A607-65		
Weight (K)	3.7	6.3	9.4	34.1

137.0 ft

90.3 ft

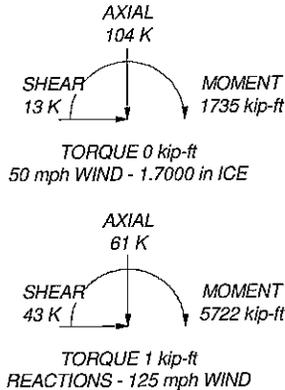
44.5 ft

0.0 ft

**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
800 10121 w/ Mount Pipe	190	APXVAARR24_43-U-NA20 w/ Mount Pipe	161
800 10121 w/ Mount Pipe	190	APXVAARR24_43-U-NA20 w/ Mount Pipe	161
800 10121 w/ Mount Pipe	190	APXVAARR24_43-U-NA20 w/ Mount Pipe	161
OPA-65R-LCUU-H6 w/ Mount Pipe	190	ATMAA1412D-1A20	161
OPA-65R-LCUU-H4 w/ Mount Pipe	190	ATMAA1412D-1A20	161
OPA-65R-LCUU-H6 w/ Mount Pipe	190	ATMAA1412D-1A20	161
QS66512-2 w/ Mount Pipe	190	RADIO 4449 B12/B71	161
QS46512-2 w/ Mount Pipe	190	RADIO 4449 B12/B71	161
QS66512-2 w/ Mount Pipe	190	RADIO 4449 B12/B71	161
(2) LGP21401	190	2.4" Dia x 8-ft Mount Pipe	161
(2) LGP21401	190	2.4" Dia x 8-ft Mount Pipe	161
(2) LGP21401	190	2.4" Dia x 8-ft Mount Pipe	161
RRUS 32 B30	190	Platform Mount [LP 601-1]	161
RRUS 32 B30	190	GPS_A	146
RRUS 32 B30	190	(2) SBNH-1D65B w/ Mount Pipe	146
RRUS-11	190	(2) SBNH-1D65B w/ Mount Pipe	146
RRUS-11	190	(2) SBNH-1D65B w/ Mount Pipe	146
RRUS-11	190	BXA-80063-6BF-EDIN-4 w/ Mount Pipe	146
DC6-48-60-18-8F	190	BXA-80063-6BF-EDIN-4 w/ Mount Pipe	146
DC6-48-60-18-8F	190	BXA-80063-6BF-EDIN-4 w/ Mount Pipe	146
DC6-48-60-0-8F	190	BXA-80063-6BF-EDIN-4 w/ Mount Pipe	146
(2) 860 10025	190	LNX-6512DS-A1M w/ Mount Pipe	146
(2) 860 10025	190	LNX-6512DS-A1M w/ Mount Pipe	146
(2) 860 10025	190	LNX-6512DS-A1M w/ Mount Pipe	146
RRUS 12	190	(2) RFV01U-D2A	146
RRUS 12	190	RFV01U-D2A	146
RRUS 12	190	RFV01U-D1A	146
RRUS 32 B2	190	(2) RFV01U-D1A	146
RRUS 32 B2	190	RHSDC-3315-PF-48	146
RRUS 32 B2	190	RHSDC-3315-PF-48	146
RRUS 32 B66	190	Platform Mount [LP 601-1]	146
RRUS 32 B66	190	Miscellaneous [NA 509-3]	146
RRUS 32 B66	190	2.4" Dia x 6-ft Pipe	133
2.4" Dia x 6-ft Pipe	190	2.4" Dia x 6-ft Pipe	100
2.4" Dia x 6-ft Pipe	190	Platform Mount [LP 1201-1]	100
Platform Mount [LP 1201-1]	190	Miscellaneous [NA 507-1]	100
Miscellaneous [NA 507-1]	190	Miscellaneous [NA 509-3]	70
Miscellaneous [NA 509-3]	190	Lighting Rod 3/4" x 8'	70
Lighting Rod 3/4" x 8'	188	AIR -32 B2A/B66AA w/ Mount Pipe	70
AIR -32 B2A/B66AA w/ Mount Pipe	161	AIR -32 B2A/B66AA w/ Mount Pipe	40
AIR -32 B2A/B66AA w/ Mount Pipe	161	AIR -32 B2A/B66AA w/ Mount Pipe	40
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	40
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	10
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	10
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	10
APXVAARR24_43-U-NA20 w/ Mount Pipe	161		

ALL REACTIONS ARE FACTORED



**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.70 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S
9. TOWER RATING: 87.9%

<p>Tower Engineering Professionals</p>	<p><b>Tower Engineering Professionals, Inc.</b></p> <p>326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350</p>		<p>Job: <b>CT New Britain 3 CAC 803175 (BU 803175)</b></p>	
	<p>Project: <b>TEP No. 25666.196650</b></p>		<p>Client: <b>Crown Castle</b>      Drawn by: <b>TIM</b>      App'd:</p>	
	<p>Code: <b>TIA-222-H</b></p>		<p>Date: <b>11/20/18</b>      Scale: <b>NTS</b></p>	
	<p>Path: <b>C:\Users\jerrill\Desktop\CT New Britain 3 CAC\803175 LC7.ar</b></p>		<p>Dwg No. <b>E-1</b></p>	

<b>tnxTower</b>  <b>Tower Engineering Professionals, Inc.</b> 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> CT New Britain 3 CAC 803175 (BU 803175)	<b>Page</b> 1 of 20
	<b>Project</b> TEP No. 25666.196650	<b>Date</b> 12:54:37 11/20/18
	<b>Client</b> Crown Castle	<b>Designed by</b> TIM

## Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

- Tower is located in Hartford County, Connecticut.
- Tower base elevation above sea level: 88.00 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 1.7000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- TIA-222-H Annex S.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>√ Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist. Exemption</li> <li>Use TIA-222-H Tension Splice Exemption</li> <li>Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Are Known</li> </ul> |
|--|---|---|

## Tapered Pole Section Geometry

<b>tnxTower</b>  <b>Tower Engineering Professionals, Inc.</b> 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> CT New Britain 3 CAC 803175 (BU 803175)	<b>Page</b> 2 of 20
	<b>Project</b> TEP No. 25666.196650	<b>Date</b> 12:54:37 11/20/18
	<b>Client</b> Crown Castle	<b>Designed by</b> TIM

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	188.00-137.00	51.00	4.25	18	22.0000	32.7110	0.2500	1.0000	A607-65 (65 ksi)
L2	137.00-90.25	51.00	5.25	18	31.3184	42.0300	0.3125	1.2500	A607-65 (65 ksi)
L3	90.25-44.50	51.00	6.50	18	40.3023	51.0140	0.3750	1.5000	A607-65 (65 ksi)
L4	44.50-0.00	51.00		18	48.8988	59.6100	0.5000	2.0000	A607-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	22.3008	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	33.1771	25.7578	3429.0204	11.5237	16.6172	206.3538	6862.5527	12.8813	5.3171	21.269
L2	32.6597	30.7540	3735.3228	11.0071	15.9098	234.7819	7475.5606	15.3799	4.9620	15.879
	42.6302	41.3785	9098.0688	14.8097	21.3512	426.1143	18208.1091	20.6932	6.8473	21.911
L3	41.9859	47.5235	9571.6471	14.1742	20.4736	467.5120	19155.8887	23.7663	6.4332	17.155
	51.7431	60.2731	19526.7966	17.9768	25.9151	753.4907	39079.2871	30.1423	8.3185	22.183
L4	50.9622	76.8089	22730.9630	17.1816	24.8406	915.0736	45491.8360	38.4117	7.7262	15.452
	60.4524	93.8076	41409.2395	20.9841	30.2819	1367.4593	82872.9664	46.9127	9.6114	19.223

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 188.00-137.00				1	1	1			
L2 137.00-90.25				1	1	1			
L3 90.25-44.50				1	1	1			
L4 44.50-0.00				1	1	1			

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***										
Step Pegs (5/8" SR) 7-in. w/30" step	C	No	Surface Ar (CaAa)	188.00 - 0.00	1	1	0.000 - 0.000	0.3500		0.49
Safety Line 3/8	C	No	Surface Ar (CaAa)	188.00 - 0.00	1	1	0.000 - 0.000	0.3750		0.22

### Feed Line/Linear Appurtenances - Entered As Area

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
*188									
LDF7-50A(1-5/8")	B	No	No	Inside Pole	188.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
FB-L98B-002-75000 (3/8")	B	No	No	Inside Pole	188.00 - 0.00	1	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
FB-L98B-002-75000 (3/8")	B	No	No	Inside Pole	188.00 - 0.00	1	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")	B	No	No	Inside Pole	188.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
2" Flex Conduit	B	No	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.36
							1/2" Ice	0.00	0.36
							1" Ice	0.00	0.36
							2" Ice	0.00	0.36
2" Flex Conduit	B	No	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.36
							1/2" Ice	0.00	0.36
							1" Ice	0.00	0.36
							2" Ice	0.00	0.36
WR-VG86ST-BRD(3/4")	B	No	No	Inside Pole	188.00 - 0.00	4	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
*161*									
33-597(1-1/2)	C	No	No	Inside Pole	161.00 - 0.00	1	No Ice	0.00	1.61
							1/2" Ice	0.00	1.61
							1" Ice	0.00	1.61
							2" Ice	0.00	1.61
LCF158-50J(1-5/8")	C	No	No	Inside Pole	161.00 - 0.00	10	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92
MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	C	No	No	Inside Pole	161.00 - 0.00	1	No Ice	0.00	1.07
							1/2" Ice	0.00	1.07
							1" Ice	0.00	1.07
							2" Ice	0.00	1.07
HCS 6X12 4AWG(1-5/8")	C	No	No	Inside Pole	161.00 - 0.00	1	No Ice	0.00	2.40
							1/2" Ice	0.00	2.40
							1" Ice	0.00	2.40
							2" Ice	0.00	2.40
*146*									
HB158-1-08U8-S8J 18( 1-5/8")	C	No	No	Inside Pole	146.00 - 0.00	1	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
33-597(1-1/2)	C	No	No	Inside Pole	146.00 - 0.00	1	No Ice	0.00	1.61
							1/2" Ice	0.00	1.61
							1" Ice	0.00	1.61
							2" Ice	0.00	1.61
LCF158-50J(1-5/8")	C	No	No	Inside Pole	146.00 - 0.00	11	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92
HB158-1-08U8-S8J	C	No	No	Inside Pole	146.00 - 0.00	1	No Ice	0.00	1.30

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
18( 1-5/8")							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30
***									
3/8-in Detuner Wire	A	No	No	CaAa (Out Of Face)	133.00 - 0.00	1	No Ice	0.02	0.10
							1/2" Ice	0.12	0.52
							1" Ice	0.22	1.55
							2" Ice	0.42	5.44
3/8-in Detuner Wire	B	No	No	CaAa (Out Of Face)	133.00 - 0.00	1	No Ice	0.02	0.10
							1/2" Ice	0.12	0.52
							1" Ice	0.22	1.55
							2" Ice	0.42	5.44
3/8-in Detuner Wire	C	No	No	CaAa (Out Of Face)	133.00 - 0.00	1	No Ice	0.02	0.10
							1/2" Ice	0.12	0.52
							1" Ice	0.22	1.55
							2" Ice	0.42	5.44

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	188.00-137.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.47
		C	0.000	0.000	3.697	0.000	0.51
L2	137.00-90.25	A	0.000	0.000	0.000	0.802	0.00
		B	0.000	0.000	0.000	0.802	0.44
		C	0.000	0.000	3.389	0.802	1.37
L3	90.25-44.50	A	0.000	0.000	0.000	0.858	0.00
		B	0.000	0.000	0.000	0.858	0.43
		C	0.000	0.000	3.317	0.858	1.35
L4	44.50-0.00	A	0.000	0.000	0.000	0.834	0.00
		B	0.000	0.000	0.000	0.834	0.42
		C	0.000	0.000	3.226	0.834	1.31

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	188.00-137.00	A	1.992	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.47
		C		0.000	0.000	44.335	0.000	1.09
L2	137.00-90.25	A	1.922	0.000	0.000	0.000	17.833	0.23
		B		0.000	0.000	0.000	17.833	0.66
		C		0.000	0.000	40.640	17.833	2.14
L3	90.25-44.50	A	1.825	0.000	0.000	0.000	18.448	0.24
		B		0.000	0.000	0.000	18.448	0.66
		C		0.000	0.000	38.497	18.448	2.07
L4	44.50-0.00	A	1.636	0.000	0.000	0.000	17.075	0.21
		B		0.000	0.000	0.000	17.075	0.62

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
		C		0.000	0.000	35.707	17.075	1.95

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>X</sub> in	CP <sub>Z</sub> in	CP <sub>X</sub> Ice in	CP <sub>Z</sub> Ice in
L1	188.00-137.00	0.0000	0.5709	0.0000	2.9809
L2	137.00-90.25	0.0000	0.5629	0.0000	2.6377
L3	90.25-44.50	0.0000	0.5666	0.0000	2.7512
L4	44.50-0.00	0.0000	0.5699	0.0000	2.8122

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	25	Step Pegs (5/8" SR) 7-in. w/30" step	137.00 - 188.00	1.0000	1.0000
L1	26	Safety Line 3/8	137.00 - 188.00	1.0000	1.0000
L2	25	Step Pegs (5/8" SR) 7-in. w/30" step	90.25 - 137.00	1.0000	1.0000
L2	26	Safety Line 3/8	90.25 - 137.00	1.0000	1.0000
L3	25	Step Pegs (5/8" SR) 7-in. w/30" step	44.50 - 90.25	1.0000	1.0000
L3	26	Safety Line 3/8	44.50 - 90.25	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K	
Lighting Rod 3/4" x 8'	C	From Leg	0.00	0.0000	188.00	No Ice	0.60	0.60	0.03
			0.00			1/2" Ice	1.41	1.41	0.04
			4.00			1" Ice	2.25	2.25	0.05
						2" Ice	3.67	3.67	0.09

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub>		Weight
			Horz Lateral	Vert			Front	Side	
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
800 10121 w/ Mount Pipe	A	From	4.00	0.0000	190.00	No Ice	5.39	4.60	0.07
		Centroid-Fa	0.00			1/2" Ice	5.81	5.35	0.11
		ce	-1.00			1" Ice	6.23	6.05	0.17
						2" Ice	7.10	7.48	0.30
800 10121 w/ Mount Pipe	B	From	4.00	0.0000	190.00	No Ice	5.39	4.60	0.07
		Centroid-Fa	0.00			1/2" Ice	5.81	5.35	0.11
		ce	-1.00			1" Ice	6.23	6.05	0.17
						2" Ice	7.10	7.48	0.30
800 10121 w/ Mount Pipe	C	From	4.00	0.0000	190.00	No Ice	5.39	4.60	0.07
		Centroid-Fa	0.00			1/2" Ice	5.81	5.35	0.11
		ce	-1.00			1" Ice	6.23	6.05	0.17
						2" Ice	7.10	7.48	0.30
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From	4.00	0.0000	190.00	No Ice	9.90	7.18	0.10
		Centroid-Fa	0.00			1/2" Ice	10.47	8.36	0.18
		ce	-1.00			1" Ice	11.01	9.26	0.26
						2" Ice	12.11	11.09	0.46
OPA-65R-LCUU-H4 w/ Mount Pipe	B	From	4.00	0.0000	190.00	No Ice	6.18	4.55	0.08
		Centroid-Fa	0.00			1/2" Ice	6.57	5.16	0.13
		ce	-1.00			1" Ice	6.98	5.78	0.19
						2" Ice	7.82	7.07	0.33
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From	4.00	0.0000	190.00	No Ice	9.90	7.18	0.10
		Centroid-Fa	0.00			1/2" Ice	10.47	8.36	0.18
		ce	-1.00			1" Ice	11.01	9.26	0.26
						2" Ice	12.11	11.09	0.46
QS66512-2 w/ Mount Pipe	A	From	4.00	0.0000	190.00	No Ice	8.37	8.46	0.14
		Centroid-Fa	0.00			1/2" Ice	8.93	9.66	0.21
		ce	-1.00			1" Ice	9.46	10.55	0.30
						2" Ice	10.53	12.35	0.49
QS46512-2 w/ Mount Pipe	B	From	4.00	0.0000	190.00	No Ice	5.79	5.88	0.12
		Centroid-Fa	0.00			1/2" Ice	6.21	6.58	0.18
		ce	-1.00			1" Ice	6.62	7.25	0.24
						2" Ice	7.48	8.65	0.39
QS66512-2 w/ Mount Pipe	C	From	4.00	0.0000	190.00	No Ice	8.37	8.46	0.14
		Centroid-Fa	0.00			1/2" Ice	8.93	9.66	0.21
		ce	-1.00			1" Ice	9.46	10.55	0.30
						2" Ice	10.53	12.35	0.49
(2) LGP21401	A	From	4.00	0.0000	190.00	No Ice	1.10	0.21	0.01
		Centroid-Fa	0.00			1/2" Ice	1.24	0.27	0.02
		ce	-1.00			1" Ice	1.38	0.35	0.03
						2" Ice	1.69	0.52	0.05
(2) LGP21401	B	From	4.00	0.0000	190.00	No Ice	1.10	0.21	0.01
		Centroid-Fa	0.00			1/2" Ice	1.24	0.27	0.02
		ce	-1.00			1" Ice	1.38	0.35	0.03
						2" Ice	1.69	0.52	0.05
(2) LGP21401	C	From	4.00	0.0000	190.00	No Ice	1.10	0.21	0.01
		Centroid-Fa	0.00			1/2" Ice	1.24	0.27	0.02
		ce	-1.00			1" Ice	1.38	0.35	0.03
						2" Ice	1.69	0.52	0.05
RRUS 32 B30	A	From	4.00	0.0000	190.00	No Ice	2.74	1.67	0.05
		Centroid-Fa	0.00			1/2" Ice	2.96	1.86	0.07
		ce	-1.00			1" Ice	3.19	2.05	0.10
						2" Ice	3.68	2.46	0.16
RRUS 32 B30	B	From	4.00	0.0000	190.00	No Ice	2.74	1.67	0.05
		Centroid-Fa	0.00			1/2" Ice	2.96	1.86	0.07
		ce	-1.00			1" Ice	3.19	2.05	0.10
						2" Ice	3.68	2.46	0.16
RRUS 32 B30	C	From	4.00	0.0000	190.00	No Ice	2.74	1.67	0.05

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight		
			Horz	Lateral						Vert	ft
RRUS-11	A	Centroid-Fa	0.00		0.0000	190.00	1/2" Ice	1.86	0.07		
		ce	-1.00						1" Ice	2.05	0.10
		From	4.00						2" Ice	2.46	0.16
		Centroid-Fa	0.00						No Ice	1.19	0.05
		ce	-1.00						1/2" Ice	1.34	0.07
									1" Ice	1.50	0.10
RRUS-11	B	From	4.00		0.0000	190.00	No Ice	1.19	0.05		
		Centroid-Fa	0.00						1/2" Ice	1.34	0.07
		ce	-1.00						1" Ice	1.50	0.10
									2" Ice	1.84	0.15
									No Ice	1.19	0.05
									1/2" Ice	1.34	0.07
RRUS-11	C	From	4.00		0.0000	190.00	No Ice	1.19	0.05		
		Centroid-Fa	0.00						1/2" Ice	1.34	0.07
		ce	-1.00						1" Ice	1.50	0.10
									2" Ice	1.84	0.15
									No Ice	1.19	0.05
									1/2" Ice	1.34	0.07
DC6-48-60-18-8F	B	From	4.00		0.0000	190.00	No Ice	1.21	0.03		
		Centroid-Fa	0.00						1/2" Ice	1.89	0.05
		ce	-1.00						1" Ice	2.11	0.08
									2" Ice	2.57	0.14
									No Ice	1.21	0.03
									1/2" Ice	1.89	0.05
DC6-48-60-18-8F	B	From	4.00		0.0000	190.00	No Ice	1.21	0.03		
		Centroid-Fa	0.00						1/2" Ice	1.89	0.05
		ce	-1.00						1" Ice	2.11	0.08
									2" Ice	2.57	0.14
									No Ice	1.21	0.03
									1/2" Ice	1.89	0.05
DC6-48-60-0-8F	C	From	4.00		0.0000	190.00	No Ice	2.20	0.03		
		Centroid-Fa	0.00						1/2" Ice	2.40	0.06
		ce	-1.00						1" Ice	2.60	0.08
									2" Ice	3.04	0.14
									No Ice	2.20	0.03
									1/2" Ice	2.40	0.06
(2) 860 10025	A	From	4.00		0.0000	190.00	No Ice	0.14	0.00		
		Centroid-Fa	0.00						1/2" Ice	0.19	0.00
		ce	-1.00						1" Ice	0.25	0.01
									2" Ice	0.40	0.01
									No Ice	0.14	0.00
									1/2" Ice	0.19	0.00
(2) 860 10025	B	From	4.00		0.0000	190.00	No Ice	0.14	0.00		
		Centroid-Fa	0.00						1/2" Ice	0.19	0.00
		ce	-1.00						1" Ice	0.25	0.01
									2" Ice	0.40	0.01
									No Ice	0.14	0.00
									1/2" Ice	0.19	0.00
(2) 860 10025	C	From	4.00		0.0000	190.00	No Ice	0.14	0.00		
		Centroid-Fa	0.00						1/2" Ice	0.19	0.00
		ce	-1.00						1" Ice	0.25	0.01
									2" Ice	0.40	0.01
									No Ice	0.14	0.00
									1/2" Ice	0.19	0.00
RRUS 12	A	From	4.00		0.0000	190.00	No Ice	3.15	0.06		
		Centroid-Fa	0.00						1/2" Ice	3.36	0.08
		ce	-1.00						1" Ice	3.59	0.11
									2" Ice	4.07	0.17
									No Ice	3.15	0.06
									1/2" Ice	3.36	0.08
RRUS 12	B	From	4.00		0.0000	190.00	No Ice	3.15	0.06		
		Centroid-Fa	0.00						1/2" Ice	3.36	0.08
		ce	-1.00						1" Ice	3.59	0.11
									2" Ice	4.07	0.17
									No Ice	3.15	0.06
									1/2" Ice	3.36	0.08
RRUS 12	C	From	4.00		0.0000	190.00	No Ice	3.15	0.06		
		Centroid-Fa	0.00						1/2" Ice	3.36	0.08
		ce	-1.00						1" Ice	3.59	0.11
									2" Ice	4.07	0.17
									No Ice	3.15	0.06
									1/2" Ice	3.36	0.08
RRUS 32 B2	A	From	4.00		0.0000	190.00	No Ice	2.73	0.05		
		Centroid-Fa	0.00						1/2" Ice	2.95	0.07
		ce	-1.00						1" Ice	3.18	0.10
									2" Ice	3.66	0.16
									No Ice	2.73	0.05
									1/2" Ice	2.95	0.07
RRUS 32 B2	B	From	4.00		0.0000	190.00	No Ice	2.73	0.05		
		Centroid-Fa	0.00						1/2" Ice	2.95	0.07
									1" Ice	3.18	0.10
									2" Ice	3.66	0.16
									No Ice	2.73	0.05
									1/2" Ice	2.95	0.07

<b>tnxTower</b>  <b>Tower Engineering Professionals, Inc.</b> 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	CT New Britain 3 CAC 803175 (BU 803175)	Page	8 of 20
	Project	TEP No. 25666.196650	Date	12:54:37 11/20/18
	Client	Crown Castle	Designed by	TIM

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
		ce	-1.00						
RRUS 32 B2	C	From	4.00	0.0000	190.00	1" Ice	3.18	2.05	0.10
		Centroid-Fa	0.00			2" Ice	3.66	2.46	0.16
		ce	-1.00			No Ice	2.73	1.67	0.05
						1/2" Ice	2.95	1.86	0.07
						1" Ice	3.18	2.05	0.10
						2" Ice	3.66	2.46	0.16
RRUS 32 B66	A	From	4.00	0.0000	190.00	No Ice	2.74	1.67	0.05
		Centroid-Fa	0.00			1/2" Ice	2.96	1.86	0.07
		ce	-1.00			1" Ice	3.19	2.05	0.10
						2" Ice	3.68	2.46	0.16
RRUS 32 B66	B	From	4.00	0.0000	190.00	No Ice	2.74	1.67	0.05
		Centroid-Fa	0.00			1/2" Ice	2.96	1.86	0.07
		ce	-1.00			1" Ice	3.19	2.05	0.10
						2" Ice	3.68	2.46	0.16
RRUS 32 B66	C	From	4.00	0.0000	190.00	No Ice	2.74	1.67	0.05
		Centroid-Fa	0.00			1/2" Ice	2.96	1.86	0.07
		ce	-1.00			1" Ice	3.19	2.05	0.10
						2" Ice	3.68	2.46	0.16
2.4" Dia x 6-ft Pipe	A	From	4.00	0.0000	190.00	No Ice	1.43	1.43	0.02
		Centroid-Fa	0.00			1/2" Ice	1.93	1.93	0.03
		ce	0.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia x 6-ft Pipe	B	From	4.00	0.0000	190.00	No Ice	1.43	1.43	0.02
		Centroid-Fa	0.00			1/2" Ice	1.93	1.93	0.03
		ce	0.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia x 6-ft Pipe	C	From	4.00	0.0000	190.00	No Ice	1.43	1.43	0.02
		Centroid-Fa	0.00			1/2" Ice	1.93	1.93	0.03
		ce	0.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
Platform Mount [LP 1201-1]	C	None		0.0000	190.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
						2" Ice	37.90	37.90	3.70
Miscellaneous [NA 507-1]	C	None		0.0000	190.00	No Ice	4.80	4.80	0.25
						1/2" Ice	6.70	6.70	0.29
						1" Ice	8.60	8.60	0.34
						2" Ice	12.40	12.40	0.44
Miscellaneous [NA 509-3]	C	None		0.0000	190.00	No Ice	11.84	11.84	0.28
						1/2" Ice	16.96	16.96	0.30
						1" Ice	22.08	22.08	0.32
						2" Ice	32.32	32.32	0.36
**161**									
AIR -32 B2A/B66AA w/ Mount Pipe	A	From	4.00	0.0000	161.00	No Ice	6.75	6.07	0.15
		Centroid-Fa	0.00			1/2" Ice	7.20	6.87	0.21
		ce	0.00			1" Ice	7.65	7.58	0.28
						2" Ice	8.57	9.06	0.44
AIR -32 B2A/B66AA w/ Mount Pipe	B	From	4.00	0.0000	161.00	No Ice	6.75	6.07	0.15
		Centroid-Fa	0.00			1/2" Ice	7.20	6.87	0.21
		ce	0.00			1" Ice	7.65	7.58	0.28
						2" Ice	8.57	9.06	0.44
AIR -32 B2A/B66AA w/ Mount Pipe	C	From	4.00	0.0000	161.00	No Ice	6.75	6.07	0.15
		Centroid-Fa	0.00			1/2" Ice	7.20	6.87	0.21
		ce	0.00			1" Ice	7.65	7.58	0.28
						2" Ice	8.57	9.06	0.44
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From	4.00	0.0000	161.00	No Ice	6.33	5.64	0.11
		Centroid-Fa	0.00			1/2" Ice	6.78	6.43	0.17

<b>tnxTower</b>  <b>Tower Engineering Professionals, Inc.</b> 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> CT New Britain 3 CAC 803175 (BU 803175)	<b>Page</b> 9 of 20
	<b>Project</b> TEP No. 25666.196650	<b>Date</b> 12:54:37 11/20/18
	<b>Client</b> Crown Castle	<b>Designed by</b> TIM

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub>		Weight K
			Horz Lateral ft	Vert ft			Front ft <sup>2</sup>	Side ft <sup>2</sup>	
		ce	0.00				1" Ice 7.21	7.13	0.23
							2" Ice 8.12	8.59	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 6.33	5.64	0.11	
						1/2" Ice 6.78	6.43	0.17	
						1" Ice 7.21	7.13	0.23	
						2" Ice 8.12	8.59	0.38	
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 6.33	5.64	0.11	
						1/2" Ice 6.78	6.43	0.17	
						1" Ice 7.21	7.13	0.23	
						2" Ice 8.12	8.59	0.38	
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 20.48	11.02	0.16	
						1/2" Ice 21.23	12.55	0.30	
						1" Ice 21.99	14.10	0.44	
						2" Ice 23.44	16.45	0.78	
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 20.48	11.02	0.16	
						1/2" Ice 21.23	12.55	0.30	
						1" Ice 21.99	14.10	0.44	
						2" Ice 23.44	16.45	0.78	
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 20.48	11.02	0.16	
						1/2" Ice 21.23	12.55	0.30	
						1" Ice 21.99	14.10	0.44	
						2" Ice 23.44	16.45	0.78	
ATMAA1412D-1A20	B	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 1.00	0.41	0.01	
						1/2" Ice 1.13	0.50	0.02	
						1" Ice 1.26	0.59	0.03	
						2" Ice 1.55	0.81	0.06	
ATMAA1412D-1A20	C	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 0.00	0.00	0.00	
						1/2" Ice 0.00	0.00	0.00	
						1" Ice 0.00	0.00	0.00	
						2" Ice 0.00	0.00	0.00	
ATMAA1412D-1A20	C	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 0.00	0.00	0.00	
						1/2" Ice 0.00	0.00	0.00	
						1" Ice 0.00	0.00	0.00	
						2" Ice 0.00	0.00	0.00	
RADIO 4449 B12/B71	A	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 1.65	1.16	0.07	
						1/2" Ice 1.81	1.30	0.09	
						1" Ice 1.98	1.45	0.11	
						2" Ice 2.34	1.76	0.16	
RADIO 4449 B12/B71	B	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 1.65	1.16	0.07	
						1/2" Ice 1.81	1.30	0.09	
						1" Ice 1.98	1.45	0.11	
						2" Ice 2.34	1.76	0.16	
RADIO 4449 B12/B71	C	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 1.65	1.16	0.07	
						1/2" Ice 1.81	1.30	0.09	
						1" Ice 1.98	1.45	0.11	
						2" Ice 2.34	1.76	0.16	
2.4" Dia x 8-ft Mount Pipe	A	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 1.90	1.90	0.03	
						1/2" Ice 2.73	2.73	0.04	
						1" Ice 3.40	3.40	0.06	
						2" Ice 4.40	4.40	0.12	
2.4" Dia x 8-ft Mount Pipe	B	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 1.90	1.90	0.03	
						1/2" Ice 2.73	2.73	0.04	
						1" Ice 3.40	3.40	0.06	
						2" Ice 4.40	4.40	0.12	
2.4" Dia x 8-ft Mount Pipe	C	From Centroid-Face	4.00 0.00	0.0000	161.00	No Ice 1.90	1.90	0.03	
						1/2" Ice 2.73	2.73	0.04	
						1" Ice 3.40	3.40	0.06	

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	<b>Project</b> TEP No. 25666.196650	<b>Date</b> 12:54:37 11/20/18
	<b>Client</b> Crown Castle	<b>Designed by</b> TIM

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz Lateral	Vert						°
Platform Mount [LP 601-1]	C	None			0.0000	161.00	2" Ice	4.40	4.40	0.12
							No Ice	28.47	28.47	1.12
							1/2" Ice	33.59	33.59	1.51
							1" Ice	38.71	38.71	1.91
							2" Ice	48.95	48.95	2.69
**146** GPS_A	A	From Centroid-Le g	4.00	0.00	0.0000	146.00	No Ice	0.26	0.26	0.00
							1/2" Ice	0.32	0.32	0.00
							1" Ice	0.39	0.39	0.01
							2" Ice	0.56	0.56	0.02
							No Ice	8.65	7.64	0.09
(2) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Le g	4.00	0.00	0.0000	146.00	1/2" Ice	9.32	8.93	0.16
							1" Ice	9.90	9.88	0.25
							2" Ice	11.10	11.82	0.44
							No Ice	8.65	7.64	0.09
							1/2" Ice	9.32	8.93	0.16
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Le g	4.00	0.00	0.0000	146.00	1" Ice	9.90	9.88	0.25
							2" Ice	11.10	11.82	0.44
							No Ice	8.65	7.64	0.09
							1/2" Ice	9.32	8.93	0.16
							1" Ice	9.90	9.88	0.25
(2) SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Le g	4.00	0.00	0.0000	146.00	2" Ice	11.10	11.82	0.44
							No Ice	8.65	7.64	0.09
							1/2" Ice	9.32	8.93	0.16
							1" Ice	9.90	9.88	0.25
							2" Ice	11.10	11.82	0.44
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	A	From Centroid-Le g	4.00	0.00	0.0000	146.00	No Ice	7.50	5.63	0.04
							1/2" Ice	8.03	6.72	0.10
							1" Ice	8.53	7.56	0.17
							2" Ice	9.56	9.29	0.33
							No Ice	7.50	5.63	0.04
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	B	From Centroid-Le g	4.00	0.00	0.0000	146.00	1/2" Ice	8.03	6.72	0.10
							1" Ice	8.53	7.56	0.17
							2" Ice	9.56	9.29	0.33
							No Ice	7.50	5.63	0.04
							1/2" Ice	8.03	6.72	0.10
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	C	From Centroid-Le g	4.00	0.00	0.0000	146.00	1" Ice	8.53	7.56	0.17
							2" Ice	9.56	9.29	0.33
							No Ice	7.50	5.63	0.04
							1/2" Ice	8.03	6.72	0.10
							1" Ice	8.53	7.56	0.17
LNX-6512DS-A1M w/ Mount Pipe	A	From Centroid-Le g	4.00	0.00	0.0000	146.00	2" Ice	9.56	9.29	0.33
							No Ice	5.33	4.53	0.05
							1/2" Ice	5.72	5.15	0.10
							1" Ice	6.12	5.77	0.15
							2" Ice	6.94	7.07	0.28
LNX-6512DS-A1M w/ Mount Pipe	B	From Centroid-Le g	4.00	0.00	0.0000	146.00	No Ice	5.33	4.53	0.05
							1/2" Ice	5.72	5.15	0.10
							1" Ice	6.12	5.77	0.15
							2" Ice	6.94	7.07	0.28
							No Ice	5.33	4.53	0.05
LNX-6512DS-A1M w/ Mount Pipe	C	From Centroid-Le g	4.00	0.00	0.0000	146.00	1/2" Ice	5.72	5.15	0.10
							1" Ice	6.12	5.77	0.15
							2" Ice	6.94	7.07	0.28
							No Ice	5.33	4.53	0.05
							1/2" Ice	5.72	5.15	0.10
(2) RFV01U-D2A	A	From Centroid-Le g	4.00	0.00	0.0000	146.00	No Ice	1.88	1.01	0.07
							1/2" Ice	2.05	1.14	0.09
							1" Ice	2.22	1.28	0.11
							2" Ice	2.60	1.59	0.15
							No Ice	1.88	1.01	0.07
RFV01U-D2A	B	From Centroid-Le g	4.00	0.00	0.0000	146.00	1/2" Ice	2.05	1.14	0.09
							1" Ice	2.22	1.28	0.11
							2" Ice	2.60	1.59	0.15
							No Ice	1.88	1.01	0.07
							1/2" Ice	2.05	1.14	0.09
RFV01U-D1A	B	From Centroid-Le g	4.00	0.00	0.0000	146.00	1" Ice	2.22	1.28	0.11
							2" Ice	2.60	1.59	0.15
							No Ice	1.88	1.25	0.08
							1/2" Ice	2.05	1.39	0.10
							1" Ice	2.22	1.54	0.12

<b>tnxTower</b>  <b>Tower Engineering Professionals, Inc.</b> 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> CT New Britain 3 CAC 803175 (BU 803175)	<b>Page</b> 11 of 20
	<b>Project</b> TEP No. 25666.196650	<b>Date</b> 12:54:37 11/20/18
	<b>Client</b> Crown Castle	<b>Designed by</b> TIM

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub>		Weight	
			Horz Lateral	Vert			Front	Side		
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
(2) RFV01U-D1A	C	From Centroid-Le g	4.00	0.00	0.0000	146.00	2" Ice	2.60	1.86	0.18
			0.00	3.00			No Ice	1.88	1.25	0.08
							1/2" Ice	2.05	1.39	0.10
							1" Ice	2.22	1.54	0.12
RHSDC-3315-PF-48	A	From Centroid-Le g	4.00	0.00	0.0000	146.00	2" Ice	2.60	1.86	0.18
			0.00	-1.00			No Ice	3.36	2.19	0.03
							1/2" Ice	3.60	2.39	0.06
							1" Ice	3.84	2.61	0.09
RHSDC-3315-PF-48	C	From Centroid-Le g	4.00	0.00	0.0000	146.00	2" Ice	4.34	3.05	0.17
			0.00	-1.00			No Ice	3.36	2.19	0.03
							1/2" Ice	3.60	2.39	0.06
							1" Ice	3.84	2.61	0.09
Platform Mount [LP 601-1]	C	None			0.0000	146.00	2" Ice	4.34	3.05	0.17
							No Ice	28.47	28.47	1.12
							1/2" Ice	33.59	33.59	1.51
							1" Ice	38.71	38.71	1.91
Miscellaneous [NA 509-3]	C	None			0.0000	146.00	2" Ice	48.95	48.95	2.69
							No Ice	11.84	11.84	0.28
							1/2" Ice	16.96	16.96	0.30
							1" Ice	22.08	22.08	0.32
**Detuner** Side Arm Mount [SO 701-3]	C	None			0.0000	133.00	2" Ice	32.32	32.32	0.36
							No Ice	2.83	2.83	0.20
							1/2" Ice	3.92	3.92	0.24
							1" Ice	5.01	5.01	0.28
***** 1" Dia x 3.5-ft	A	From Leg	1.50	0.00	0.0000	100.00	2" Ice	7.19	7.19	0.36
			0.00	0.00			No Ice	0.00	0.37	0.00
			0.00				1/2" Ice	0.00	0.68	0.01
							1" Ice	0.00	0.90	0.01
1" Dia x 3.5-ft	B	From Leg	1.50	0.00	0.0000	100.00	2" Ice	0.00	1.37	0.03
			0.00	0.00			No Ice	0.00	0.37	0.00
			0.00				1/2" Ice	0.00	0.68	0.01
							1" Ice	0.00	0.90	0.01
1" Dia x 3.5-ft	C	From Leg	1.50	0.00	0.0000	100.00	2" Ice	0.00	1.37	0.03
			0.00	0.00			No Ice	0.00	0.37	0.00
			0.00				1/2" Ice	0.00	0.68	0.01
							1" Ice	0.00	0.90	0.01
***** 1" Dia x 3.5-ft	A	From Leg	1.50	0.00	0.0000	70.00	2" Ice	0.00	1.37	0.03
			0.00	0.00			No Ice	0.00	0.37	0.00
			0.00				1/2" Ice	0.00	0.68	0.01
							1" Ice	0.00	0.90	0.01
1" Dia x 3.5-ft	B	From Leg	1.50	0.00	0.0000	70.00	2" Ice	0.00	1.37	0.03
			0.00	0.00			No Ice	0.00	0.37	0.00
			0.00				1/2" Ice	0.00	0.68	0.01
							1" Ice	0.00	0.90	0.01
1" Dia x 3.5-ft	C	From Leg	1.50	0.00	0.0000	70.00	2" Ice	0.00	1.37	0.03
			0.00	0.00			No Ice	0.00	0.37	0.00
			0.00				1/2" Ice	0.00	0.68	0.01
							1" Ice	0.00	0.90	0.01
***** 1" Dia x 3.5-ft	A	From Leg	1.50	0.00	0.0000	40.00	2" Ice	0.00	1.37	0.03
			0.00	0.00			No Ice	0.00	0.37	0.00
			0.00				1/2" Ice	0.00	0.68	0.01
							1" Ice	0.00	0.90	0.01
1" Dia x 3.5-ft		From Leg	1.50	0.00	0.0000	40.00	2" Ice	0.00	1.37	0.03
			0.00	0.00			No Ice	0.00	0.37	0.00
			0.00				1/2" Ice	0.00	0.68	0.01
							1" Ice	0.00	0.90	0.01

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub>		Weight
			Horz	Vert			Front	Side	
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
1" Dia x 3.5-ft	B	From Leg	1.50	0.0000	40.00	No Ice	0.00	0.37	0.00
			0.00	0.00		1/2" Ice	0.00	0.68	0.01
			0.00	0.00		1" Ice	0.00	0.90	0.01
						2" Ice	0.00	1.37	0.03
						No Ice	0.00	0.37	0.00
1" Dia x 3.5-ft	C	From Leg	1.50	0.0000	40.00	No Ice	0.00	0.37	0.00
			0.00	0.00		1/2" Ice	0.00	0.68	0.01
			0.00	0.00		1" Ice	0.00	0.90	0.01
						2" Ice	0.00	1.37	0.03
						No Ice	0.00	0.37	0.00
*****									
1" Dia x 3.5-ft	A	From Leg	1.50	0.0000	10.00	No Ice	0.00	0.37	0.00
			0.00	0.00		1/2" Ice	0.00	0.68	0.01
			0.00	0.00		1" Ice	0.00	0.90	0.01
						2" Ice	0.00	1.37	0.03
1" Dia x 3.5-ft	B	From Leg	1.50	0.0000	10.00	No Ice	0.00	0.37	0.00
			0.00	0.00		1/2" Ice	0.00	0.68	0.01
			0.00	0.00		1" Ice	0.00	0.90	0.01
						2" Ice	0.00	1.37	0.03
1" Dia x 3.5-ft	C	From Leg	1.50	0.0000	10.00	No Ice	0.00	0.37	0.00
			0.00	0.00		1/2" Ice	0.00	0.68	0.01
			0.00	0.00		1" Ice	0.00	0.90	0.01
						2" Ice	0.00	1.37	0.03

## Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice

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Comb. No.	Description
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
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	188 - 137	Pole	Max Tension	48	0.00	-0.00	0.00
			Max. Compression	26	-39.84	0.41	-0.96
			Max. Mx	20	-13.64	713.14	0.96
			Max. My	14	-13.62	-1.05	-714.74
			Max. Vy	20	-26.94	713.14	0.96
			Max. Vx	14	27.00	-1.05	-714.74
			Max. Torque	24			1.08
			Max Tension	1	0.00	0.00	0.00
L2	137 - 90.25	Pole	Max. Compression	26	-55.12	0.42	-1.89
			Max. Mx	20	-23.86	2075.54	0.81
			Max. My	14	-23.85	-0.95	-2080.05
			Max. Vy	20	-32.52	2075.54	0.81
			Max. Vx	14	32.58	-0.95	-2080.05
			Max. Torque	24			1.07
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.26	0.42	-2.88
L3	90.25 - 44.5	Pole	Max. Mx	20	-37.66	3642.58	0.65
			Max. My	14	-37.66	-0.86	-3649.93
			Max. Vy	20	-37.79	3642.58	0.65
			Max. Vx	14	37.85	-0.86	-3649.93
			Max. Torque	24			1.06
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-103.89	0.42	-4.11
			Max. Mx	20	-60.74	5711.75	0.45
L4	44.5 - 0	Pole	Max. My	14	-60.74	-0.77	-5722.28
			Max. Vy	20	-42.97	5711.75	0.45
			Max. Vx	14	43.03	-0.77	-5722.28
			Max. Torque	24			1.06

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
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### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	103.89	0.01	-12.78
	Max. H <sub>x</sub>	21	45.58	42.93	-0.00
	Max. H <sub>z</sub>	3	45.58	-0.00	42.98
	Max. M <sub>x</sub>	2	5721.52	-0.00	42.98
	Max. M <sub>z</sub>	8	5711.60	-42.93	0.00
	Max. Torsion	24	1.06	21.46	37.22
	Min. Vert	23	45.58	37.17	21.49
	Min. H <sub>x</sub>	9	45.58	-42.93	0.00
	Min. H <sub>z</sub>	15	45.58	0.00	-42.98
	Min. M <sub>x</sub>	14	-5722.28	0.00	-42.98
	Min. M <sub>z</sub>	20	-5711.75	42.93	-0.00
	Min. Torsion	12	-1.05	-21.46	-37.22

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturing Moment, M <sub>x</sub> kip-ft	Overturing Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	50.64	0.00	0.00	0.30	0.06	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	60.77	0.00	-42.98	-5721.52	0.88	-0.86
0.9 Dead+1.0 Wind 0 deg - No Ice	45.58	0.00	-42.98	-5643.92	0.84	-0.87
1.2 Dead+1.0 Wind 30 deg - No Ice	60.77	21.46	-37.23	-4954.55	-2855.04	-0.43
0.9 Dead+1.0 Wind 30 deg - No Ice	45.58	21.46	-37.23	-4887.38	-2816.31	-0.44
1.2 Dead+1.0 Wind 60 deg - No Ice	60.77	37.18	-21.49	-2859.90	-4945.97	0.11
0.9 Dead+1.0 Wind 60 deg - No Ice	45.58	37.18	-21.49	-2821.17	-4878.86	0.11
1.2 Dead+1.0 Wind 90 deg - No Ice	60.77	42.93	-0.00	1.19	-5711.60	0.63
0.9 Dead+1.0 Wind 90 deg - No Ice	45.58	42.93	-0.00	1.07	-5634.07	0.63
1.2 Dead+1.0 Wind 120 deg - No Ice	60.77	37.17	21.49	2862.05	-4946.78	0.97
0.9 Dead+1.0 Wind 120 deg - No Ice	45.58	37.17	21.49	2823.08	-4879.63	0.97
1.2 Dead+1.0 Wind 150 deg - No Ice	60.77	21.46	37.22	4956.10	-2856.46	1.05
0.9 Dead+1.0 Wind 150 deg - No Ice	45.58	21.46	37.22	4888.71	-2817.68	1.05
1.2 Dead+1.0 Wind 180 deg - No Ice	60.77	-0.00	42.98	5722.28	-0.77	0.85
0.9 Dead+1.0 Wind 180 deg - No Ice	45.58	-0.00	42.98	5644.48	-0.75	0.85

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Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>y</sub> K	Overturing Moment, M <sub>x</sub> kip-ft	Overturing Moment, M <sub>y</sub> kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 210 deg - No Ice	60.77	-21.46	37.23	4955.32	2855.17	0.43
0.9 Dead+1.0 Wind 210 deg - No Ice	45.58	-21.46	37.23	4887.95	2816.41	0.43
1.2 Dead+1.0 Wind 240 deg - No Ice	60.77	-37.18	21.49	2860.66	4946.12	-0.11
0.9 Dead+1.0 Wind 240 deg - No Ice	45.58	-37.18	21.49	2821.73	4878.97	-0.11
1.2 Dead+1.0 Wind 270 deg - No Ice	60.77	-42.93	0.00	-0.45	5711.75	-0.62
0.9 Dead+1.0 Wind 270 deg - No Ice	45.58	-42.93	0.00	-0.52	5634.18	-0.62
1.2 Dead+1.0 Wind 300 deg - No Ice	60.77	-37.17	-21.49	-2861.32	4946.91	-0.97
0.9 Dead+1.0 Wind 300 deg - No Ice	45.58	-37.17	-21.49	-2822.55	4879.73	-0.96
1.2 Dead+1.0 Wind 330 deg - No Ice	60.77	-21.46	-37.22	-4955.36	2856.57	-1.06
0.9 Dead+1.0 Wind 330 deg - No Ice	45.58	-21.46	-37.22	-4888.16	2817.77	-1.06
1.2 Dead+1.0 Ice+1.0 Temp	103.89	-0.00	0.00	4.11	0.42	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	103.89	0.01	-12.78	-1725.16	-0.77	-0.17
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	103.89	6.39	-11.07	-1494.05	-865.24	-0.08
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	103.89	11.07	-6.39	-861.43	-1497.74	0.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	103.89	12.77	-0.01	3.21	-1728.79	0.13
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	103.89	11.06	6.38	868.18	-1496.49	0.20
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	103.89	6.38	11.06	1501.72	-863.08	0.22
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	103.89	-0.01	12.78	1734.07	1.72	0.17
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	103.89	-6.39	11.07	1502.97	866.19	0.08
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	103.89	-11.07	6.39	870.34	1498.69	-0.03
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	103.89	-12.77	0.01	5.70	1729.74	-0.13
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	103.89	-11.06	-6.38	-859.27	1497.44	-0.20
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	103.89	-6.38	-11.06	-1492.81	864.03	-0.22
Dead+Wind 0 deg - Service	50.64	0.00	-8.86	-1172.12	0.23	-0.18
Dead+Wind 30 deg - Service	50.64	4.42	-7.67	-1014.96	-584.96	-0.09
Dead+Wind 60 deg - Service	50.64	7.66	-4.43	-585.76	-1013.39	0.02
Dead+Wind 90 deg - Service	50.64	8.85	-0.00	0.48	-1170.27	0.13
Dead+Wind 120 deg - Service	50.64	7.66	4.43	586.68	-1013.56	0.21
Dead+Wind 150 deg - Service	50.64	4.42	7.67	1015.76	-585.25	0.22
Dead+Wind 180 deg - Service	50.64	-0.00	8.86	1172.76	-0.11	0.18
Dead+Wind 210 deg - Service	50.64	-4.42	7.67	1015.60	585.08	0.09
Dead+Wind 240 deg - Service	50.64	-7.66	4.43	586.39	1013.51	-0.02
Dead+Wind 270 deg - Service	50.64	-8.85	0.00	0.15	1170.39	-0.13
Dead+Wind 300 deg - Service	50.64	-7.66	-4.43	-586.05	1013.68	-0.21
Dead+Wind 330 deg - Service	50.64	-4.42	-7.67	-1015.13	585.37	-0.22

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## 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	-50.64	0.00	0.00	50.64	0.00	0.000%
2	0.00	-60.77	-42.98	-0.00	60.77	42.98	0.000%
3	0.00	-45.58	-42.98	-0.00	45.58	42.98	0.000%
4	21.46	-60.77	-37.23	-21.46	60.77	37.23	0.000%
5	21.46	-45.58	-37.23	-21.46	45.58	37.23	0.000%
6	37.18	-60.77	-21.49	-37.18	60.77	21.49	0.000%
7	37.18	-45.58	-21.49	-37.18	45.58	21.49	0.000%
8	42.93	-60.77	-0.00	-42.93	60.77	0.00	0.000%
9	42.93	-45.58	-0.00	-42.93	45.58	0.00	0.000%
10	37.17	-60.77	21.49	-37.17	60.77	-21.49	0.000%
11	37.17	-45.58	21.49	-37.17	45.58	-21.49	0.000%
12	21.46	-60.77	37.22	-21.46	60.77	-37.22	0.000%
13	21.46	-45.58	37.22	-21.46	45.58	-37.22	0.000%
14	-0.00	-60.77	42.98	0.00	60.77	-42.98	0.000%
15	-0.00	-45.58	42.98	0.00	45.58	-42.98	0.000%
16	-21.46	-60.77	37.23	21.46	60.77	-37.23	0.000%
17	-21.46	-45.58	37.23	21.46	45.58	-37.23	0.000%
18	-37.18	-60.77	21.49	37.18	60.77	-21.49	0.000%
19	-37.18	-45.58	21.49	37.18	45.58	-21.49	0.000%
20	-42.93	-60.77	0.00	42.93	60.77	-0.00	0.000%
21	-42.93	-45.58	0.00	42.93	45.58	-0.00	0.000%
22	-37.17	-60.77	-21.49	37.17	60.77	21.49	0.000%
23	-37.17	-45.58	-21.49	37.17	45.58	21.49	0.000%
24	-21.46	-60.77	-37.22	21.46	60.77	37.22	0.000%
25	-21.46	-45.58	-37.22	21.46	45.58	37.22	0.000%
26	0.00	-103.89	0.00	0.00	103.89	-0.00	0.000%
27	0.01	-103.89	-12.78	-0.01	103.89	12.78	0.000%
28	6.39	-103.89	-11.07	-6.39	103.89	11.07	0.000%
29	11.07	-103.89	-6.39	-11.07	103.89	6.39	0.000%
30	12.77	-103.89	-0.01	-12.77	103.89	0.01	0.000%
31	11.06	-103.89	6.38	-11.06	103.89	-6.38	0.000%
32	6.38	-103.89	11.06	-6.38	103.89	-11.06	0.000%
33	-0.01	-103.89	12.78	0.01	103.89	-12.78	0.000%
34	-6.39	-103.89	11.07	6.39	103.89	-11.07	0.000%
35	-11.07	-103.89	6.39	11.07	103.89	-6.39	0.000%
36	-12.77	-103.89	0.01	12.77	103.89	-0.01	0.000%
37	-11.06	-103.89	-6.38	11.06	103.89	6.38	0.000%
38	-6.38	-103.89	-11.06	6.38	103.89	11.06	0.000%
39	0.00	-50.64	-8.86	-0.00	50.64	8.86	0.000%
40	4.42	-50.64	-7.67	-4.42	50.64	7.67	0.000%
41	7.66	-50.64	-4.43	-7.66	50.64	4.43	0.000%
42	8.85	-50.64	-0.00	-8.85	50.64	0.00	0.000%
43	7.66	-50.64	4.43	-7.66	50.64	-4.43	0.000%
44	4.42	-50.64	7.67	-4.42	50.64	-7.67	0.000%
45	-0.00	-50.64	8.86	0.00	50.64	-8.86	0.000%
46	-4.42	-50.64	7.67	4.42	50.64	-7.67	0.000%
47	-7.66	-50.64	4.43	7.66	50.64	-4.43	0.000%
48	-8.85	-50.64	0.00	8.85	50.64	-0.00	0.000%
49	-7.66	-50.64	-4.43	7.66	50.64	4.43	0.000%
50	-4.42	-50.64	-7.67	4.42	50.64	7.67	0.000%

## Non-Linear Convergence Results

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Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005539
3	Yes	4	0.00000001	0.00074160
4	Yes	6	0.00000001	0.00023705
5	Yes	6	0.00000001	0.00006536
6	Yes	6	0.00000001	0.00023751
7	Yes	6	0.00000001	0.00006553
8	Yes	5	0.00000001	0.00004865
9	Yes	4	0.00000001	0.00068929
10	Yes	6	0.00000001	0.00024050
11	Yes	6	0.00000001	0.00006650
12	Yes	6	0.00000001	0.00023558
13	Yes	6	0.00000001	0.00006478
14	Yes	5	0.00000001	0.00004838
15	Yes	4	0.00000001	0.00069334
16	Yes	6	0.00000001	0.00023897
17	Yes	6	0.00000001	0.00006602
18	Yes	6	0.00000001	0.00023838
19	Yes	6	0.00000001	0.00006582
20	Yes	5	0.00000001	0.00004184
21	Yes	4	0.00000001	0.00064588
22	Yes	6	0.00000001	0.00023563
23	Yes	6	0.00000001	0.00006481
24	Yes	6	0.00000001	0.00024067
25	Yes	6	0.00000001	0.00006656
26	Yes	4	0.00000001	0.00002357
27	Yes	6	0.00000001	0.00018081
28	Yes	6	0.00000001	0.00033291
29	Yes	6	0.00000001	0.00033279
30	Yes	6	0.00000001	0.00018130
31	Yes	6	0.00000001	0.00033700
32	Yes	6	0.00000001	0.00033371
33	Yes	6	0.00000001	0.00018197
34	Yes	6	0.00000001	0.00033734
35	Yes	6	0.00000001	0.00033744
36	Yes	6	0.00000001	0.00018151
37	Yes	6	0.00000001	0.00033105
38	Yes	6	0.00000001	0.00033433
39	Yes	4	0.00000001	0.00011615
40	Yes	4	0.00000001	0.00092863
41	Yes	4	0.00000001	0.00093323
42	Yes	4	0.00000001	0.00011325
43	Yes	4	0.00000001	0.00096915
44	Yes	4	0.00000001	0.00091627
45	Yes	4	0.00000001	0.00011574
46	Yes	4	0.00000001	0.00095079
47	Yes	4	0.00000001	0.00094407
48	Yes	4	0.00000001	0.00011280
49	Yes	4	0.00000001	0.00091564
50	Yes	4	0.00000001	0.00097061

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	37.860	45	1.8850	0.0029

<b>tnxTower</b>  <b>Tower Engineering Professionals, Inc.</b> 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> CT New Britain 3 CAC 803175 (BU 803175)	<b>Page</b> 18 of 20
	<b>Project</b> TEP No. 25666.196650	<b>Date</b> 12:54:37 11/20/18
	<b>Client</b> Crown Castle	<b>Designed by</b> TIM

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L2	141.25 - 90.25	20.710	45	1.5298	0.0010
L3	95.5 - 44.5	8.694	45	0.9349	0.0004
L4	51 - 0	2.295	45	0.4173	0.0001

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	800 10121 w/ Mount Pipe	45	37.860	1.8850	0.0030	41224
188.00	Lighting Rod 3/4" x 8'	45	37.860	1.8850	0.0030	41224
161.00	AIR -32 B2A/B66AA w/ Mount Pipe	45	27.573	1.7068	0.0017	7633
146.00	GPS_A	45	22.281	1.5780	0.0012	4906
133.00	Side Arm Mount [SO 701-3]	45	18.127	1.4363	0.0008	4430
100.00	1" Dia x 3.5-ft	45	9.627	0.9958	0.0004	4523
70.00	1" Dia x 3.5-ft	45	4.406	0.6184	0.0002	4697
40.00	1" Dia x 3.5-ft	45	1.474	0.3153	0.0001	6152
10.00	1" Dia x 3.5-ft	45	0.247	0.0743	0.0000	24605

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	184.473	14	9.2029	0.0138
L2	141.25 - 90.25	101.027	14	7.4721	0.0049
L3	95.5 - 44.5	42.441	14	4.5674	0.0018
L4	51 - 0	11.202	14	2.0379	0.0006

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	800 10121 w/ Mount Pipe	14	184.473	9.2029	0.0144	8837
188.00	Lighting Rod 3/4" x 8'	14	184.473	9.2029	0.0144	8837
161.00	AIR -32 B2A/B66AA w/ Mount Pipe	14	134.433	8.3354	0.0081	1630
146.00	GPS_A	14	108.674	7.7075	0.0055	1043
133.00	Side Arm Mount [SO 701-3]	14	88.441	7.0157	0.0039	935
100.00	1" Dia x 3.5-ft	14	46.997	4.8647	0.0020	939
70.00	1" Dia x 3.5-ft	14	21.511	3.0206	0.0011	967
40.00	1" Dia x 3.5-ft	14	7.196	1.5396	0.0004	1261
10.00	1" Dia x 3.5-ft	14	1.204	0.3629	0.0001	5039

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	<b>Project</b> TEP No. 25666.196650	<b>Date</b> 12:54:37 11/20/18
	<b>Client</b> Crown Castle	<b>Designed by</b> TIM

## Compression Checks

## Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> φP <sub>n</sub>
L1	188 - 137 (1)	TP32.711x22x0.25	51.00	0.00	0.0	25.0495	-13.62	1715.40	0.008
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	51.00	0.00	0.0	40.2848	-23.85	2730.99	0.009
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	51.00	0.00	0.0	58.6481	-37.66	3960.26	0.010
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	51.00	0.00	0.0	93.8076	-60.74	6564.71	0.009

## Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>ux</sub> kip-ft	Ratio M <sub>ux</sub> φM <sub>ux</sub>	M <sub>uy</sub> kip-ft	φM <sub>uy</sub> kip-ft	Ratio M <sub>uy</sub> φM <sub>uy</sub>
L1	188 - 137 (1)	TP32.711x22x0.25	715.20	1113.48	0.642	0.00	1113.48	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	2080.05	2281.22	0.912	0.00	2281.22	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	3649.93	4013.65	0.909	0.00	4013.65	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	5722.28	7974.63	0.718	0.00	7974.63	0.000

## Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> K	φV <sub>n</sub> K	Ratio V <sub>u</sub> φV <sub>n</sub>	Actual T <sub>u</sub> kip-ft	φT <sub>n</sub> kip-ft	Ratio T <sub>u</sub> φT <sub>n</sub>
L1	188 - 137 (1)	TP32.711x22x0.25	26.99	439.62	0.061	1.07	1196.20	0.001
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	32.58	698.57	0.047	0.86	2476.13	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	37.85	1019.71	0.037	0.85	4374.13	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	43.03	1632.62	0.026	0.85	8378.75	0.000

## Pole Interaction Design Data

Section No.	Elevation ft	Ratio P <sub>u</sub> φP <sub>n</sub>	Ratio M <sub>ux</sub> φM <sub>ux</sub>	Ratio M <sub>uy</sub> φM <sub>uy</sub>	Ratio V <sub>u</sub> φV <sub>n</sub>	Ratio T <sub>u</sub> φT <sub>n</sub>	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	188 - 137 (1)	0.008	0.642	0.000	0.061	0.001	0.654	1.050	4.8.2
L2	137 - 90.25 (2)	0.009	0.912	0.000	0.047	0.000	0.923	1.050	4.8.2
L3	90.25 - 44.5 (3)	0.010	0.909	0.000	0.037	0.000	0.920	1.050	4.8.2
L4	44.5 - 0 (4)	0.009	0.718	0.000	0.026	0.000	0.728	1.050	4.8.2

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	<b>Project</b> TEP No. 25666.196650	<b>Date</b> 12:54:37 11/20/18
	<b>Client</b> Crown Castle	<b>Designed by</b> TIM

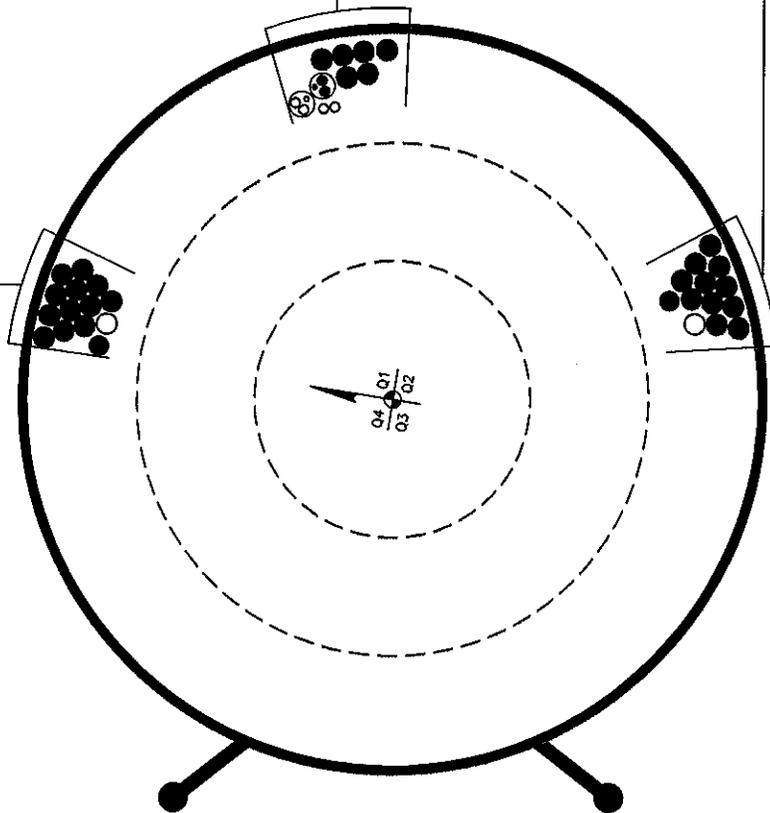
**Section Capacity Table**

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	188 - 137	Pole	TP32.711x22x0.25	1	-13.62	1801.17	62.3	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-23.85	2867.54	87.9	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-37.66	4158.27	87.6	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-60.74	6892.95	69.3	Pass
Summary								
Pole (L2)							87.9	Pass
<b>RATING =</b>							<b>87.9</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



(PROPOSED EQUIPMENT CONFIGURATION)  
(1) 1-1/2" TO 146 FT LEVEL  
(13) 1-5/8" TO 146 FT LEVEL



(OTHER CONSIDERED EQUIPMENT-IN 2" CONDUIT)  
(2) 3/8" TO 190 FT LEVEL  
(4) 3/4" TO 190 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(6) 1-5/8" TO 190 FT LEVEL  
(2) 3/4" TO 190 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(1) 1-1/2" TO 161 FT LEVEL  
(12) 1-5/8" TO 161 FT LEVEL

CLIMBING PEGS  
W/ SAFETY CLIMB

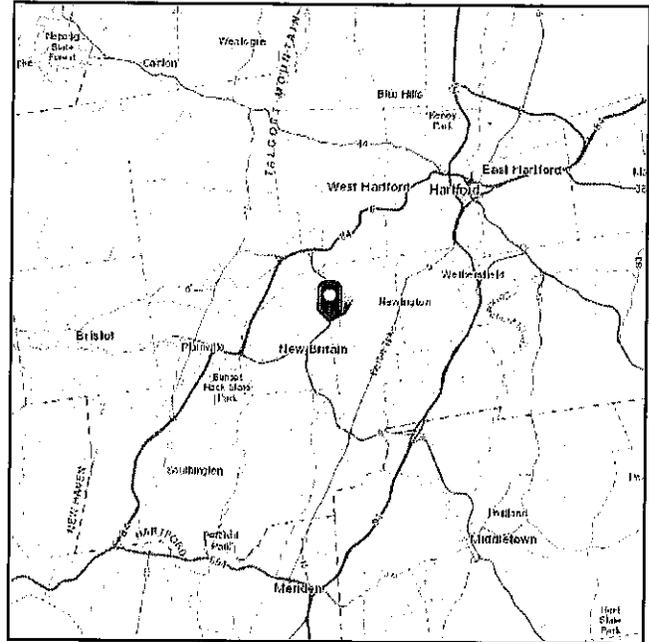
**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-10  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 88.33 ft (NAVD 88)  
**Latitude:** 41.686611  
**Longitude:** -72.757722



## Wind

<b>Results:</b>	<b>76 Vmph</b>
Wind Speed:	122 Vmph <b>125 mph per Appendix N of 2018 Connecticut State Building Code</b>
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	93 Vmph
100-year MRI	100 Vmph

**Data Source:** ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

**Date Accessed:** Mon Nov 19 2018

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

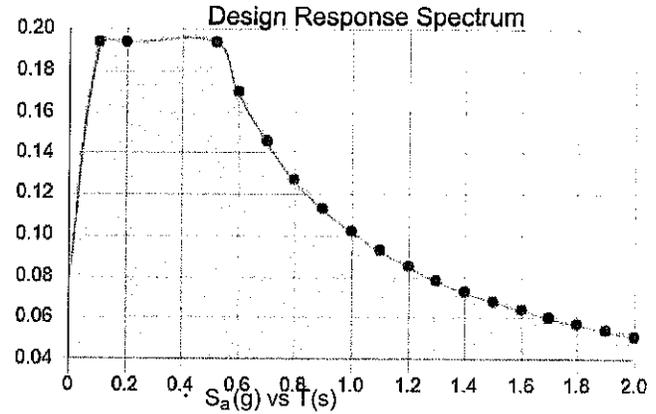
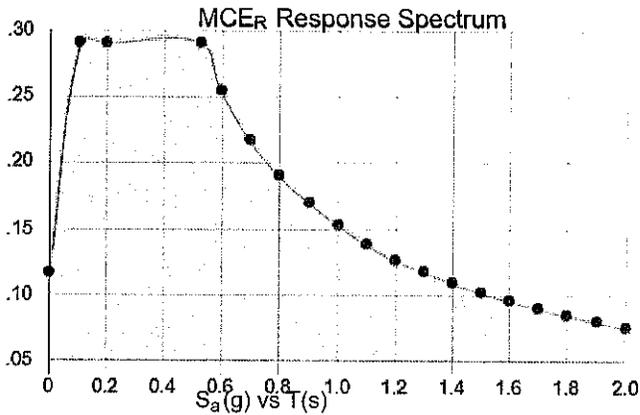
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_S$ :	0.182	$S_{DS}$ :	0.194
$S_1$ :	0.064	$S_{D1}$ :	0.102
$F_a$ :	1.600	$T_L$ :	6.000
$F_v$ :	2.400	PGA :	0.092
$S_{MS}$ :	0.292	PGA <sub>M</sub> :	0.148
$S_{M1}$ :	0.153	F <sub>PGA</sub> :	1.600
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Mon Nov 19 2018

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

**Results:**

Ice Thickness: 1.00 in.  
Concurrent Temperature: 5 F  
Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Mon Nov 19 2018

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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# Monopole Base Plate Connection

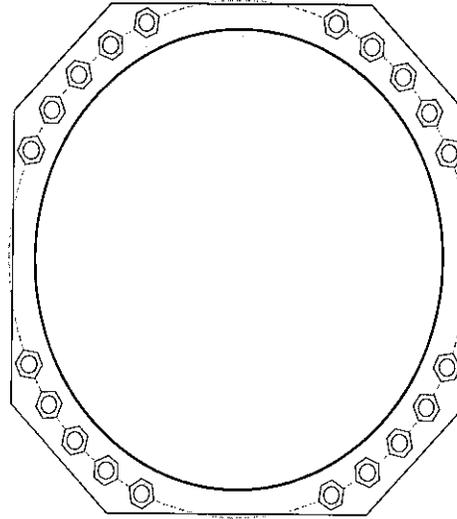


Site Info	
BU #	803175
Site Name	New Britain 3 CAC 803
Order #	450305 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{ar}$ (in)	1.25

Applied Loads	
Moment (kip-ft)	5722.28
Axial Force (kips)	60.74
Shear Force (kips)	43.03

\*TIA-222-H Section 15.5 Applied



Connection Properties		Analysis Results	
<b>Anchor Rod Data</b>		<b>Anchor Rod Summary</b>	
(20) 2-1/4" $\phi$ bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 67" BC		<i>(units of kips, kip-in)</i>	
<b>Base Plate Data</b>		Pu_c = 207.92	$\phi Pn_c = 243.75$ <b>Stress Rating</b>
66" OD x 3" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)		Vu = 2.15	$\phi Vn = 73.13$ <b>81.3%</b>
<b>Stiffener Data</b>		Mu = n/a	$\phi Mn = n/a$ <b>Pass</b>
N/A		<b>Base Plate Summary</b>	
<b>Pole Data</b>		Max Stress (ksi):	35.18 (Flexural)
59.61" x 0.5" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)		Allowable Stress (ksi):	45
		Stress Rating:	<b>74.5%</b> <b>Pass</b>

# Pier and Pad Foundation



BU #: 803175  
 Site Name: CT New Britain 3 C  
 App. Number: 450305 Rev. 1

TIA-222 Revision: H  
 Tower Type: Monopole

Block Foundation?:

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	61	kips
Base Shear, $V_{u\_comp}$ :	43	kips
Moment, $M_u$ :	5722	ft-kips
Tower Height, H:	188	ft
BP Dist. Above Fdn, $bp_{dist}$ :	3.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	221.86	43.00	18.5%	Pass
Bearing Pressure (ksf)	9.49	4.81	50.7%	Pass
Overturning (kip*ft)	6621.71	6035.54	91.1%	Pass
Pier Flexure (Comp.) (kip*ft)	9856.86	5894.00	56.9%	Pass
Pier Compression (kip)	30551.04	107.08	0.3%	Pass
Pad Flexure (kip*ft)	6473.47	3181.79	46.8%	Pass
Pad Shear - 1-way (kips)	766.05	413.39	51.4%	Pass
Pad Shear - 2-way (Comp) (ksi)	0.164	0.000	0.0%	Pass
Flexural 2-way (Comp) (kip*ft)	4232.07	3536.40	79.6%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$ :	8	ft
Ext. Above Grade, E:	1.0833	ft
Pier Rebar Size, $Sc$ :	11	
Pier Rebar Quantity, $mc$ :	36	
Pier Tie/Spiral Size, $St$ :	5	
Pier Tie/Spiral Quantity, $mt$ :	12	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	4	in

\*Rating per TIA-222-H Section 15.5

Soil Rating*:	91.1%
Structural Rating*:	79.6%

Pad Properties		
Depth, D:	5.9167	ft
Pad Width, W:	26	ft
Pad Thickness, T:	3	ft
Pad Rebar Size, $Sp$ :	11	
Pad Rebar Quantity, $mp$ :	33	
Pad Clear Cover, $cc_{pad}$ :	4	in

Material Properties		
Rebar Grade, $F_y$ :	60000	psi
Concrete Compressive Strength, $F'_c$ :	3000	psi
Dry Concrete Density, $\delta_c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	110	pcf
Ultimate Net Bearing, $Q_{net}$ :	12.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	30	degrees
SPT Blow Count, $N_{blows}$ :		
Base Friction, $\mu$ :		
Neglected Depth, N:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	17.9	ft

<--Toggle between Gross and Net



# Design Review – Historic Districts

## 2019 PUBLIC HEARING DATES

City of Boston – The Environment Dept.  
 Boston City Hall, Room 709, Boston MA 02201  
 617.635.3850  
[Boston.gov/landmarks](http://Boston.gov/landmarks)

Public design review hearings for each historic district and for the Landmarks Commission are held once a month at City Hall – please check each agenda for location and start time. Applications are accepted on a rolling basis. An application must be determined to be complete by staff fifteen (15) business days prior to the public hearing date. **Incomplete applications cannot be added to a public hearing agenda.**

<b>BEACON HILL</b>	<b>Complete Application</b>	<b>Hearing Date</b>
Meets 3 <sup>rd</sup> Thursday 5 PM Boston City Hall Piemonte Room (5 <sup>th</sup> Floor)	Wednesday, December 26 2018	Thursday, January 17 2019
	Wednesday, January 30	Thursday, February 21
	Thursday, February 28	Thursday, March 21
	Wednesday, March 27	Thursday, April 18
	Thursday, April 25	Thursday, May 16
	Thursday, May 30	Thursday, June 20
	Wednesday, June 26	Thursday, July 18
	Thursday, July 25	Thursday, August 15
	Wednesday, August 28	Thursday, September 19
	Wednesday, September 25	Thursday, October 17
	Wednesday, October 30	Thursday, November 21
	Wednesday, November 27	Thursday, December 19
	Tuesday, December 24	Thursday, January 16 2020

### **ABERDEEN and FORT POINT CHANNEL**

Meets 2 <sup>nd</sup> Thursday 4 PM/6 PM Boston City Hall Piemonte Room (5 <sup>th</sup> Floor)	Tuesday, December 18 2018	Thursday, January 10 2019
	Thursday, January 24	Thursday, February 14
	Thursday, February 21	Thursday, March 14
	Thursday, March 21	Thursday, April 11
	Thursday, April 18	Thursday, May 9
	Wednesday, May 22	Thursday, June 13
	Wednesday, June 19	Thursday, July 11
	Thursday, July 18	Thursday, August 8
	Wednesday, August 21	Thursday, September 12
	Thursday, September 19	Thursday, October 10
	Wednesday, October 23	Thursday, November 14
	Wednesday, November 20	Thursday, December 12
	Tuesday, December 17	Thursday, January 9 2020



# Design Review – Historic Districts

## 2019 PUBLIC HEARING DATES

City of Boston – The Environment Dept.  
 Boston City Hall, Room 709, Boston MA 02201  
 617.635.3850  
 Boston.gov/landmarks

Public design review hearings for historic districts and individual landmarks are held once a month at City Hall – please check each agenda for room location and start time. Applications are accepted on a rolling basis. To be added to an agenda, an application must be determined to be complete by staff fifteen (15) business days prior to the public hearing date. **Incomplete applications cannot be added to a public hearing agenda.**

<b>SOUTH END</b>	<b>Complete Application</b>	<b>Hearing Date</b>
Meets 1 <sup>st</sup> Tuesday 5:30 PM Boston City Hall Piemonte Room (5 <sup>th</sup> Floor)	Monday, December 10 2018	Wednesday, January 2*
	Monday, January 14	Tuesday, February 5
	Monday, February 11	Tuesday, March 5
	Tuesday, March 12	Tuesday, April 2
	Tuesday, April 16	Tuesday, May 7
	Monday, May 13	Tuesday, June 4
	Tuesday, June 11	Tuesday, July 2
	Tuesday, July 16	Tuesday, August 6
	Monday, August 12	Tuesday, September 3
	Tuesday, September 10	Tuesday, October 1
	Tuesday, October 15	Tuesday, November 5
	Friday, November 8	Tuesday, December 3
	Friday, December 13	Tuesday, January 7 2020

### **ST. BOTOLPH and MISSION HILL TRIANGLE**

Meets 3 <sup>rd</sup> Wednesday 4 PM/5:30 PM Boston City Hall Room 709	Monday, December 24 2018	Wednesday, January 16
	Tuesday, January 29	Wednesday, February 20
	Wednesday, February 27	Wednesday, March 20
	Tuesday, March 26	Wednesday, April 17
	Wednesday, April 24	Wednesday, May 15
	Wednesday, May 29	Wednesday, June 19
	Tuesday, June 25	Wednesday, July 17
	Wednesday, July 31	Wednesday, August 21
	Tuesday, August 27	Wednesday, September 18
	Tuesday, September 24	Wednesday, October 16
	Tuesday, October 29	Wednesday, November 20
	Tuesday, November 26	Wednesday, December 18
	Monday, December 23	Wednesday, January 15 2020

\*Note hearing day change

Date: **October 31, 2018**

Williams Gate  
Crown Castle  
3 Corporate Dr., St 101  
Clifton Park, NY 12065

**INFINIGY**  
FROM ZERO TO INFINIGY  
the solutions are endless  
Infinigy Engineering, PLLC  
1033 Watervliet Shaker Road  
Albany, NY 12205  
518-690-0790  
[structural@infinigy.com](mailto:structural@infinigy.com)

**Subject:** Mount Analysis Report

**Carrier Designation:** Verizon Upgrade  
**Carrier Site Number:** 34002  
**Carrier Site Name:** New Britain 3 CT

**Crown Castle Designation:** Crown Castle BU Number: 803175  
Crown Castle Site Name: CT New Britain 3 CAC 803175  
Crown Castle JDE Job Number: 518913  
Crown Castle Order Number: 450305, Rev 1

**Engineering Firm Designation:** Infinigy Report Designation: 1039-D0001-B

**Site Data:** 167 Cocomo, New Britain, CT, 06051  
Latitude 41°41'11.80" Longitude 72°45'27.80"

**Structure Information:** Tower Height & Type: 138.0 ft Monopole  
Mount Elevation: 146.0 ft  
Mount Type: 13.5 ft Mount-Platform

Dear Williams Gate,

Infinigy is pleased to submit this "**Mount Analysis Report**" to determine the structural integrity of Verizon's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

**Mount-Platform (typical)**

**Insufficient**

The analysis has been performed in accordance with the TIA-222-H Standard. This analysis utilizes an ultimate 3-second gust wind speed of 125 mph from the 2012 International Building Code with 2018 Connecticut State Building Code. Exposure Category C with a maximum topographic factor, Kzt, of 1.0 and Risk Category II was/were used in this analysis.

We at Infinigy Engineering, 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.

Mount analysis prepared by: Christopher Kudlacik  
Respectfully Submitted by:

Joseph R. Johnston, P.E.  
VP Structural Engineering / Principal



11-01-18

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### 1) INTRODUCTION

This mount is an existing 13.5 ft Mount-Platform mapped by Engineering Tower Solutions, PLLC. This mount is installed at the 146.0 ft elevation on 3 sector(s) of the 188.0 ft Monopole.

### 2) ANALYSIS CRITERIA

<b>Building Code:</b>	2012 IBC
<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Ultimate Wind Speed:</b>	125 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor at Base:</b>	1.0
<b>Topographic Factor at Mount:</b>	1.0
<b>Ice Thickness:</b>	2.0 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Live Loading Wind Speed:</b>	30 mph
<b>Man Live Load at Mid/End-Points:</b>	250 lb
<b>Man Live Load at Mount Pipes:</b>	500 lb

**Table 1 - Final Equipment Configuration**

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
146	149	3	Amphenol	BXA-80063-6BF-EDIN-4	Mount-Platform
		3	Andrew	LNK-6512DS-A1M	
		6	Andrew	SBNHH-1D65B	
		1	GPS	GPS_A	
	145	2	Raycap	RHSDC-3315-PF-48	Mounted to Monopole
	149	3	Samsung	RFV01U-D1A	Mount-Platform
		3	Samsung	RFV01U-D2A	

### 3) ANALYSIS PROCEDURE

**Table 2 - Documents Provided**

Document	Remarks	Reference	Source
Crown Application	Verizon Application	803175	CCI Sites
Mount Mapping	August 8, 2018	803175	CCI Sites
TIA Inspection	April 3, 2018	803175	CCI Sites

#### 3.1) Analysis Method

RISA-3D (Version 17.0.1), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision B).

**3.2) Assumptions**

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 4) Steel grades have been assumed as follows, unless noted otherwise:
 

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A53 (GR 35)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

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

**4) ANALYSIS RESULTS**

**Table 3 - Mount Component Stresses vs. Capacity (Mount-Platform, Typical)**

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2	Mount Pipe	MP7	146.0	120.5%	Fail
	Main Horizontal	M1	146.0	>200.0%	Fail
	Standoff	M24	146.0	63.3%	Pass
	Platform Angle	M23	146.0	77.7%	Pass
	Bolt Check	--	146.0	21.7%	Pass

<b>Structure Rating (max from all components) =</b>	<b>&gt;200.0%</b>
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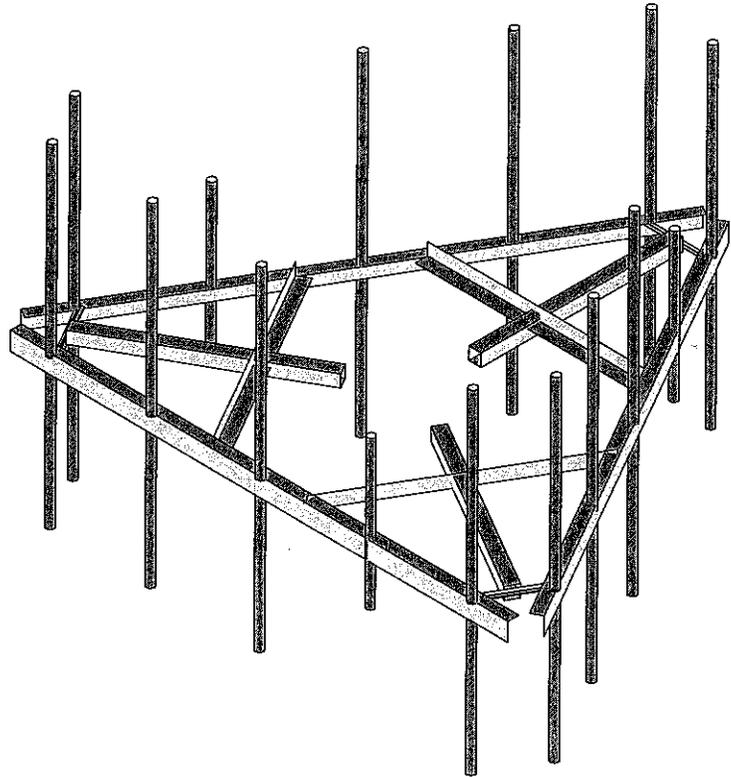
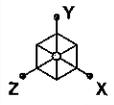
Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) All sectors are typical

**4.1) Recommendations**

The Sector Frame Mount has insufficient capacity to support the proposed loading. Recommend modify the current mount.

**APPENDIX A**  
**WIRE FRAME AND RENDERED MODELS**



Envelope Only Solution

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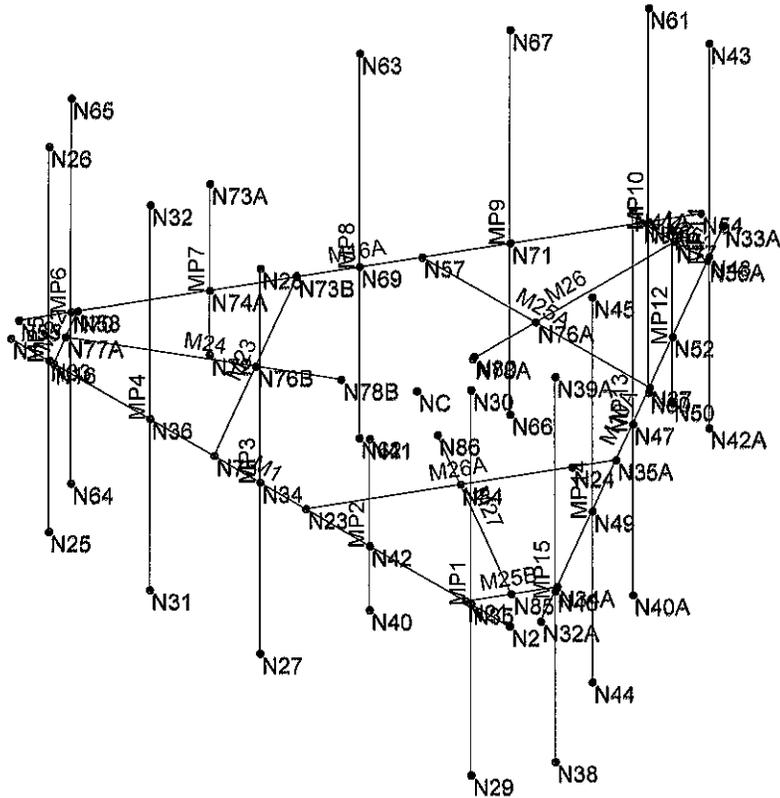
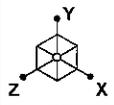
1039-D0001-B

CT New Britain 3 CAC 803175

Existing Configuration

Oct 31, 2018 at 6:29 PM

803175.R3D



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Infinigy Engineering, PLLC

CLK

1039-D0001-B

CT New Britain 3 CAC 803175

Wireframe

Oct 31, 2018 at 6:30 PM

803175.R3D

**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**



**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**

## Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2		180	frame Rail	Beam	Single Angle	A36 Gr.36	Typical
2	MP5	N25	N26			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
3	MP3	N27	N28			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
4	MP1	N29	N30			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
5	MP4	N31	N32			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
6	MP2	N40	N41			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
7	M10A	N32A	N33A		180	frame Rail	Beam	Single Angle	A36 Gr.36	Typical
8	MP15	N38	N39A			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
9	MP13	N40A	N41A			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
10	MP11	N42A	N43			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
11	MP14	N44	N45			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
12	MP12	N50	N51			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
13	M16A	N54	N55		180	frame Rail	Beam	Single Angle	A36 Gr.36	Typical
14	MP10	N60	N61			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
15	MP8	N62	N63			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
16	MP6	N64	N65			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
17	MP9	N66	N67			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
18	MP7	N72	N73A			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
19	M25	N56	N36A			RIGID	None	None	RIGID	Typical
20	M25A	N57	N37			Angle	Beam	Single Angle	A36 Gr.36	Typical
21	M26	N78A	N77			Arm	Beam	Tube	A500 Gr.B...	Typical
22	M22	N16	N58			RIGID	None	None	RIGID	Typical
23	M23	N75	N73B			Angle	Beam	Single Angle	A36 Gr.36	Typical
24	M24	N78B	N77A			Arm	Beam	Tube	A500 Gr.B...	Typical
25	M25B	N34A	N21			RIGID	None	None	RIGID	Typical
26	M26A	N35A	N23			Angle	Beam	Single Angle	A36 Gr.36	Typical
27	M27	N86	N85			Arm	Beam	Tube	A500 Gr.B...	Typical

## Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		3	64.4	0
3	Total General		3	64.4	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	L4X4X4	3	220.4	.1
7	A36 Gr.36	L6X3.5X5	3	486	.4
8	A500 Gr.B Rect	HSS4X4X4	3	196.4	.2
9	A53 Gr.B	PIPE 2.0	15	1440	.4
10	Total HR Steel		24	2342.8	1.1

## Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
1	Self Weight	DL		-1			37	3	
2	Wind Load AZI 000	WLZ					37	1	
3	Wind Load AZI 090	WLX					37	1	
4	Ice Weight	OL1					37	27	
5	Wind + Ice Load AZI ...	OL2					37	1	
6	Wind + Ice Load AZI ...	OL3					37	1	
7	Service Live 1	LL				12			
8	Service Live 2	OL4				6			
9	Service Live 3	OL5				6			
10	Service Live 4	OL6				6			

### Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...)	Surface(P...
11	Service Live 5	OL7				6			
12	Service Live 6	OL8				6			
13	BLC 1 Transient Area...	None						33	
14	BLC 2 Transient Area...	None						26	
15	BLC 3 Transient Area...	None						24	
16	BLC 5 Transient Area...	None						26	
17	BLC 6 Transient Area...	None						24	

### Load Combinations

	Description	Solve P...	S...	BLCFa...	BLCFa...	BLCFa...	BLCFa...	BLCFa...	BLCFa...	BLCFa...	BLCFa...	BLCFa...	BLCFa...
1	1.4D	Yes	Y	DL 1.4									
2	1.2D + 1.6W AZI 000	Yes	Y	DL 1.2	W... 1.6								
3	1.2D + 1.6W AZI 030	Yes	Y	DL 1.2	W... 1.3...	W... .8							
4	1.2D + 1.6W AZI 060	Yes	Y	DL 1.2	W... .8	W... 1.3...							
5	1.2D + 1.6W AZI 090	Yes	Y	DL 1.2		W... 1.6							
6	1.2D + 1.6W AZI 120	Yes	Y	DL 1.2	W... -.8	W... 1.3...							
7	1.2D + 1.6W AZI 150	Yes	Y	DL 1.2	W... -1...	W... .8							
8	1.2D + 1.6W AZI 180	Yes	Y	DL 1.2	W... -1.6								
9	1.2D + 1.6W AZI 210	Yes	Y	DL 1.2	W... -1...	W... -.8							
10	1.2D + 1.6W AZI 240	Yes	Y	DL 1.2	W... -.8	W... -1...							
11	1.2D + 1.6W AZI 270	Yes	Y	DL 1.2		W... -1.6							
12	1.2D + 1.6W AZI 300	Yes	Y	DL 1.2	W... .8	W... -1...							
13	1.2D + 1.6W AZI 330	Yes	Y	DL 1.2	W... 1.3...	W... -.8							
14	0.9D + 1.6W AZI 000	Yes	Y	DL .9	W... 1.6								
15	0.9D + 1.6W AZI 030	Yes	Y	DL .9	W... 1.3...	W... .8							
16	0.9D + 1.6W AZI 060	Yes	Y	DL .9	W... .8	W... 1.3...							
17	0.9D + 1.6W AZI 090	Yes	Y	DL .9		W... 1.6							
18	0.9D + 1.6W AZI 120	Yes	Y	DL .9	W... -.8	W... 1.3...							
19	0.9D + 1.6W AZI 150	Yes	Y	DL .9	W... -1...	W... .8							
20	0.9D + 1.6W AZI 180	Yes	Y	DL .9	W... -1.6								
21	0.9D + 1.6W AZI 210	Yes	Y	DL .9	W... -1...	W... -.8							
22	0.9D + 1.6W AZI 240	Yes	Y	DL .9	W... -.8	W... -1...							
23	0.9D + 1.6W AZI 270	Yes	Y	DL .9		W... -1.6							
24	0.9D + 1.6W AZI 300	Yes	Y	DL .9	W... .8	W... -1...							
25	0.9D + 1.6W AZI 330	Yes	Y	DL .9	W... 1.3...	W... -.8							
26	1.2D + 1.0Di	Yes	Y	DL 1.2	OL1 1								
27	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 1							
28	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 .866	OL3 .5						
29	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 .5	OL3 .866						
30	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1		OL3 1						
31	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 -.5	OL3 .866						
32	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 -.866	OL3 .5						
33	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 -.1							
34	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 -.866	OL3 -.5						
35	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 -.5	OL3 .866						
36	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1		OL3 -.1						
37	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 .5	OL3 .866						
38	1.2D + 1.0Di + 1.0Wi A...	Yes	Y	DL 1.2	OL1 1	OL2 .866	OL3 -.5						
39	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL 1.2	LL 1.5	W... .096							
40	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL 1.2	LL 1.5	W... .083	W... .048						
41	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL 1.2	LL 1.5	W... .048	W... .083						
42	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL 1.2	LL 1.5		W... .096						
43	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL 1.2	LL 1.5	W... -.048	W... .083						
44	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL 1.2	LL 1.5	W... -.083	W... .048						
45	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL 1.2	LL 1.5	W... -.096							

## Load Combinations (Continued)

Description	Solve P...	S...	BLCFa...											
46	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	LL	1.5	W...	.083	W...	-.048			
47	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	LL	1.5	W...	-.048	W...	-.083			
48	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	LL	1.5	W...		W...	-.096			
49	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	LL	1.5	W...	.048	W...	-.083			
50	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	LL	1.5	W...	.083	W...	-.048			
51	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	.058					
52	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	.05	W...	.029			
53	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	.029	W...	.05			
54	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...		W...	.058			
55	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	-.029	W...	.05			
56	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	-.05	W...	.029			
57	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	.058					
58	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	-.05	W...	-.029			
59	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	-.029	W...	-.05			
60	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...		W...	-.058			
61	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	.029	W...	-.05			
62	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL4	1.5	W...	.05	W...	-.029			
63	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	.058					
64	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	.05	W...	.029			
65	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	.029	W...	.05			
66	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...		W...	.058			
67	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	-.029	W...	.05			
68	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	-.05	W...	.029			
69	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	.058					
70	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	-.05	W...	-.029			
71	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	-.029	W...	-.05			
72	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...		W...	-.058			
73	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	.029	W...	-.05			
74	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL5	1.5	W...	.05	W...	-.029			
75	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	.058					
76	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	.05	W...	.029			
77	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	.029	W...	.05			
78	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...		W...	.058			
79	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	-.029	W...	.05			
80	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	-.05	W...	.029			
81	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	-.058					
82	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	-.05	W...	-.029			
83	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	-.029	W...	-.05			
84	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...		W...	-.058			
85	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	.029	W...	-.05			
86	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL6	1.5	W...	.05	W...	-.029			
87	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	.058					
88	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	.05	W...	.029			
89	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	.029	W...	.05			
90	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...		W...	.058			
91	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	-.029	W...	.05			
92	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	-.05	W...	.029			
93	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	-.058					
94	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	-.05	W...	-.029			
95	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	-.029	W...	-.05			
96	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...		W...	-.058			
97	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	.029	W...	-.05			
98	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL7	1.5	W...	.05	W...	-.029			
99	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	.058					
100	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	.05	W...	.029			
101	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	.029	W...	.05			
102	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...		W...	.058			

### Load Combinations (Continued)

	Description	Solve P...	S...	BLCFa...										
103	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	-.029	W...	.05			
104	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	-.05	W...	.029			
105	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	-.058					
106	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	-.05	W...	-.029			
107	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	-.029	W...	-.05			
108	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	-.058					
109	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	.029	W...	-.05			
110	1.2D + 1.5L + 1.0WL (3...	Yes	Y	DL	1.2	OL8	1.5	W...	.05	W...	-.029			

### Envelope Joint Reactions

Joint	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1 N78A	max 3287.499	17	3694.734	27	6459.824	14	9.178	27	4.435	23	2.072	11
2	min -3284.391	23	-1011.556	20	-6779.524	8	-4.242	20	-4.432	17	-2.06	5
3 N78B	max 5231.688	18	3738.443	31	4615.751	13	2.695	25	2.907	14	3.901	24
4	min -5512.642	12	-1013.495	24	-4461.484	19	-4.8	32	-2.898	20	-8.079	31
5 N86	max 5658.85	4	3699.664	35	4293.91	3	2.798	15	2.73	8	7.986	35
6	min -5381.525	22	-1014.195	16	-4134.131	21	-4.703	9	-2.732	14	-3.818	16
7 Totals:	max 13679.92	5	10294.779	33	13968.202	2						
8	min -13679.92	23	2191.481	14	-13968.202	8						

### Envelope AISC 14th(360-10): LRFD Steel Code Checks

Member	Shape	Code Ch...	Loc[in]	LC	Shear Check	Loc.....	LC	phi*Pnc [lb]	phi*Pn...	phi*M...	phi*M...	Eqn	
1	MP3	PIPE_2.0	1.205	48.375	8	.070	48....	8	12143.947	32130	1.872	1.872	1...H1-1b
2	MP4	PIPE_2.0	1.137	48.375	8	.053	48....	8	12143.947	32130	1.872	1.872	1...H1-1b
3	MP8	PIPE_2.0	1.115	48.375	5	.064	48....	5	12143.947	32130	1.872	1.872	1...H1-1b
4	MP13	PIPE_2.0	1.115	48.375	11	.064	48....	11	12143.947	32130	1.872	1.872	1...H1-1b
5	MP14	PIPE_2.0	1.055	48.375	11	.050	48....	11	12143.947	32130	1.872	1.872	1...H1-1b
6	MP9	PIPE_2.0	1.055	48.375	5	.050	48....	5	12143.947	32130	1.872	1.872	1...H1-1b
7	MP1	PIPE_2.0	1.026	48.375	8	.049	48....	8	12143.947	32130	1.872	1.872	1...H1-1b
8	MP6	PIPE_2.0	.936	48.375	5	.045	48....	5	12143.947	32130	1.872	1.872	1...H1-1b
9	MP11	PIPE_2.0	.936	48.375	11	.045	48....	11	12143.947	32130	1.872	1.872	1...H1-1b
10	MP5	PIPE_2.0	.908	48.375	8	.063	48....	8	12143.947	32130	1.872	1.872	1...H1-1b
11	MP15	PIPE_2.0	.838	48.375	11	.057	48....	11	12143.947	32130	1.872	1.872	1...H1-1b
12	MP10	PIPE_2.0	.838	48.375	11	.057	48....	11	12143.947	32130	1.872	1.872	1...H1-1b
13	M23	L4X4X4	.777	36.732	30	.055	36.... y	28	37361.608	62532	3.138	6.103	1...H2-1
14	M26A	L4X4X4	.775	36.732	34	.054	36.... y	32	37361.608	62532	3.138	6.104	1...H2-1
15	M25A	L4X4X4	.769	36.732	38	.055	36.... y	36	37361.608	62532	3.138	6.106	1...H2-1
16	M1	L6X3.5X5	.647	146.813	10	2.430	148.5 z	8	14635.191	93636	2.872	8.995	2...H2-1
17	M24	HSS4X4X4	.633	0	7	.208	0 z	3	123172.815	139518	16.181	16.181	2...H1-1b
18	M10A	L6X3.5X5	.623	146.812	2	2.090	13.5 z	12	14635.191	93636	2.872	9	2...H2-1
19	M16A	L6X3.5X5	.620	146.812	6	2.090	13.5 z	4	14635.191	93636	2.872	9.096	2...H2-1
20	M26	HSS4X4X4	.613	0	3	.237	0 z	11	123172.815	139518	16.181	16.181	2...H1-1b
21	M27	HSS4X4X4	.612	0	9	.207	0 z	7	123172.815	139518	16.181	16.181	2...H1-1b
22	MP2	PIPE_2.0	.220	18	8	.025	18	8	26521.424	32130	1.872	1.872	1 H1-1b
23	MP7	PIPE_2.0	.206	18	5	.024	18	5	26521.424	32130	1.872	1.872	2...H1-1b
24	MP12	PIPE_2.0	.206	18	11	.024	18	11	26521.424	32130	1.872	1.872	2...H1-1b

**APPENDIX D**  
**ADDITIONAL CALCUATIONS**

Date: 10/31/2018  
 Client: Crown Castle  
 Carrier: Verizon  
 Engineer: CLK  
 Site: 803175  
 Job #: 1039-D0001-B

Code: LRFD  
 Axial: 3738.00 lbs  
 Shear: 6779.00 lbs

Bolt Capacity (1/2" A307 Bolt)				
	Ult Load / Bolt	Factored Load ( $\phi=0.75$ )	# of Bolts	Factor Joint Capacity
Axial (lb)	8226.7	6170.0	4	24680
Shear(lb)	5133.3	3850.0	4	15400

Interaction Check	
$T / \phi T_n$	15.1%
$V / \phi V_n$	44.0%
$\leq 1.0$	21.7%
	OK

General Power Density

Site Name: New Britain 3, CT  
 Cumulative Power Density

Operator	Operating Frequency (MHz)	Number of Trans	ERP/Per Trans (watts)	Total ERP (watts)	Distance to Target (feet)	Calculated Power Density (mW/cm <sup>2</sup> )	Maximum Permissible Exposure (mW/cm <sup>2</sup> )	Fraction of MPE (%)
VZW PCS	1970	1	5500	5500	149	0.0891	1.0	8.91%
VZW Cellular LTE	869	1	2800	2800	149	0.0454	0.579333333	7.83%
VZW Cellular	869	3	389	1167	149	0.0189	0.579333333	3.26%
VZW AWS	2145	1	6200	6200	149	0.1004	1.0	10.04%
VZW 700	746	1	2100	2100	149	0.0340	0.497333333	6.84%

**Total Percentage of Maximum Permissible Exposure**

36.88%

\*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Section 1.13101 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1

MHz = Megahertz

mW/cm<sup>2</sup> = milliwatts per square centimeter

ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:

1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.

**Barbadora, Jeff**

**From:** TrackingUpdates@fedex.com  
**Sent:** Tuesday, December 18, 2018 11:34 AM  
**To:** Harrington, Christian  
**Subject:** FedEx Shipment 773997533236 Delivered

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

## Your package has been delivered

Tracking # 773997533236

Ship date:  
**Mon, 12/17/2018**  
Christian Harrington  
Woburn, MA 01801  
US

Delivery date:  
**Tue, 12/18/2018 11:29  
am**

**City Planner Stephen P.**

Schiller  
City of New Britain CT  
27 West Main Street  
Planning & Zoning  
NEW BRITAIN, CT 06051  
US



### Shipment Facts

Our records indicate that the following package has been delivered.

<b>Tracking number:</b>	<b><u>773997533236</u></b>
<b>Status:</b>	Delivered: 12/18/2018 11:29 AM Signed for By: S.SCHILLER
<b>Reference:</b>	1011.7680
<b>Signed for by:</b>	S.SCHILLER
<b>Delivery location:</b>	NEW BRITAIN, CT
<b>Delivered to:</b>	Receptionist/Front Desk
<b>Service type:</b>	FedEx Priority Overnight®
<b>Packaging type:</b>	FedEx® Envelope
<b>Number of pieces:</b>	1

**Barbadora, Jeff**

**From:** TrackingUpdates@fedex.com  
**Sent:** Tuesday, December 18, 2018 11:34 AM  
**To:** Harrington, Christian  
**Subject:** FedEx Shipment 773997432215 Delivered

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

## Your package has been delivered

Tracking # 773997432215

Ship date:  
**Mon, 12/17/2018**

**Christian Harrington**

Woburn, MA 01801

US

Delivery date:  
**Tue, 12/18/2018 11:27  
am**

**Mayor Erin E Stewart.**

City of New Britain CT

27 West Main Street

NEW BRITAIN, CT 06051

US



### Shipment Facts

Our records indicate that the following package has been delivered.

**Tracking number:** 773997432215

**Status:** Delivered: 12/18/2018 11:27 AM  
Signed for By: M.AMERONE

**Reference:** 1011.7680

**Signed for by:** M.AMERONE

**Delivery location:** NEW BRITAIN, CT

**Delivered to:** Receptionist/Front Desk

**Service type:** FedEx Priority Overnight®

**Packaging type:** FedEx® Envelope

**Number of pieces:** 1

**Weight:** 0.50 lb.