



Northeast Site Solutions
Denise Sabo
199 Brickyard Rd Farmington, CT 06032
860-209-4690
denise@northeastsitesolutions.com

October 3, 2017

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Exempt Modification Application
167 Cocomo Circle (f.k.a – 167 Lester Street) New Britain, CT 06051
Latitude: 41.686679
Longitude: -72.757857
T-Mobile Site#: CT11783B-MWAAV

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing 188-foot monopole located at 167 Cocomo Circle (f.k.a – 167 Lester Street) New Britain, CT 06051. T-Mobile currently has nine (9) antennas at the 163-foot level of the existing 188-foot tower. The property and monopole are owned by Crown Castle. T-Mobile now intends to install one (1) IBR1300 Dish. The new dish would be installed at the 163-foot and level of the tower.

Planned Modifications:

Remove:
NONE

Remove and Replace:
NONE

Install New:

(1)IBR1300 Dish
(1)Fiber line
(2)CAT6 Cables

Existing to Remain:

(12) 1-5/8" coax
(3) RRU
(3) AIR32 Antenna – 1900/2100 Mhz
(3) LNX6515 Antenna – 700 Mhz
(3) AIR21 Antenna – 1900/2100 Mhz
(3)Twin TMA

This facility was approved by the City of New Britain PZC. The PZ approval file is no longer available – See attached letter from the City Zoning Director



NSS **NORTHEAST**
SITE SOLUTIONS

Turnkey Wireless Development

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-SOj-73, a copy of this letter is being sent Mayor Erin Stewart, Elected Official and David Zajac, Zoning Enforcement for the City of New Britain, as well as the property owner and the tower owner (Crown Castle).

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications 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 Communications 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, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Denise Sabo
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 199 Brickyard Rd, Farmington, CT 06032
Email: denise@northeastsitesolutions.com

Attachments

cc: Erin Stewart- Mayor - as elected official
Davis Zajac, Zoning Enforcement Officer
Crown Castle - as tower owner and property owner

Exhibit A



City of New Britain
DEPARTMENT OF
LICENSES, PERMITS AND INSPECTIONS

*"New Britain:
A City for
All People"*

Tel (860) 826-3384

27 West Main Street, Suite 404 New Britain, CT 06051

Fax (860) 612-4212

June 1, 2016

Denise Sabo
Northeast Site Solutions
199 Brickyard Road
Farmington CT 06032

Subject: 167 Cocomo Street AKA 167 Lester Street
I-2 District (general industry) Zone

Dear Sir or Madam:

This is to advise you that the zoning and use of the above caption Premises are governed by the law and regulations of the City of New Britain and the Premises are located in an I-2 District (general industry) under the City of New Britain Zoning Ordinances Section 200.

The property is being used as a Telecommunication tower, 200-10-110 Industry--which is not specifically prohibited. Therefore is a permitted use.

A file check in this department revealed no violations or special conditions on file. Certificate of Occupancy (completion) was issued May 30, 2002. CT Siting Council approval TS-VER-089-010418

I hope this letter will suffice in satisfying your needs. If you have any questions, please call at (860) 612 5014.

Sincerely,

David D. Zajac
Building Inspector
Zoning Enforcement Officer

Cc:
enclosed
file

Exhibit B



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	Vinyl Siding
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

Exhibit C

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WIRELESS TELECOMMUNICATION FACILITY CO-LOCATION BY

T-Mobile T-MOBILE NORTHEAST LLC

SITE NUMBER: CT11783B
CROWN SITE NUMBER: 803175
SITE NAME: CROWN COMM. MONOPOLE
SITE ADDRESS: 167 COCCOMO CIRCLE
NEW BRITAIN, CT 06051

LEASE
EXHIBIT

PROJECT SCOPE:

ADDITION OF A BACKHAUL RADIO, (1) FIBER AND (2) CAT6 CABLES TO EXISTING TOWER.

PROJECT NOTES:

- THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
HANDICAPPED ACCESS IS NOT REQUIRED.
POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
- CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
- DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES, ORDINANCES AND SPECIFICATIONS.

APPLICABLE STATE ADOPTION CODES:

- 2016 CONNECTICUT STATE BUILDING CODE (CSBC).
- ANSI/TIA-222-G-2005 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.
- 2014 NATIONAL ELECTRICAL CODE (NFPA 70) FOR POWER AND GROUNDING REQUIREMENTS.

APPROVALS:

FSA CM	DATE
RF ENGINEER	DATE
FOPS	DATE
T-MOBILE ENGINEERING AND DEVELOPMENT	DATE
	DATE
	DATE

SITE IMAGE:



ZONING / VICINITY MAP:



PROJECT INFORMATION:

ADDRESS: 167 COCCOMO CIRCLE
NEW BRITAIN, CT 06051

STRUCTURE TYPE: MONOPOLE

ZONING DISTRICT: I2

COORDINATES: N 41.686679 & W -72.757857

STRUCTURE HEIGHT: 188' AGL

POWER PROVIDER: EVERSOURCE
107 SELDEN STREET
BERLIN, CT 06037

TELCO PROVIDER: LIGHT TOWER
260 FRANKLIN STREET
BOSTON, MA 02110

CALL BEFORE YOU DIG: 800-922-4455

PROJECT TEAM:

APPLICANT: T-MOBILE NORTHEAST, LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROPERTY OWNER: PATRICIA PELON
PROJECTMANAGER
T: 518-373-3507
M: 518-424-2396

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

PROJECT MANGER: NORTHEAST SITE SOLUTIONS
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
MATTHEW BANDLE
MATT@NORTHEASTSITESOLUTIONS.COM
201-776-8521

CONSULTANTS: FORESITE LLC
462 WALNUT ST
NEWTON, MA 02460
SAEED MOSSAVAT
SMOSSAVAT@FORESITELLC.COM
617-212-3123

SHEET INDEX:

T-1: TITLE SHEET
LE-1: PLAN
LE-2: ELEVATION AND DETAILS

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER
NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

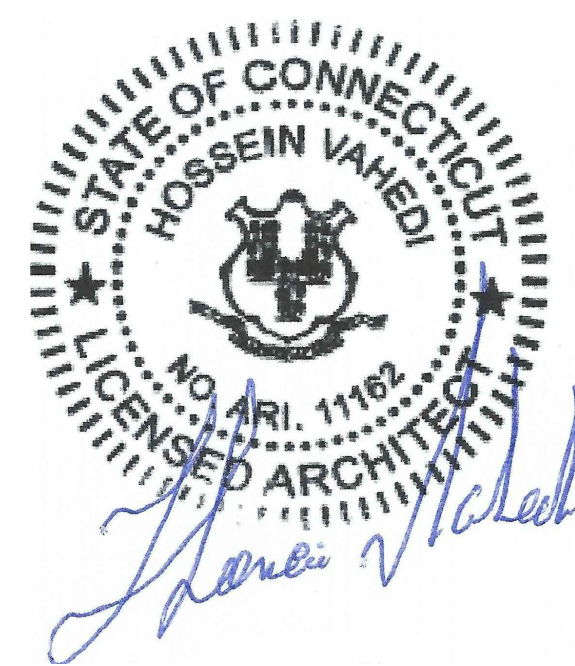
CONSULTANT:

FORESITE LLC

Innovative design solutions
Foresitelc.com

462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



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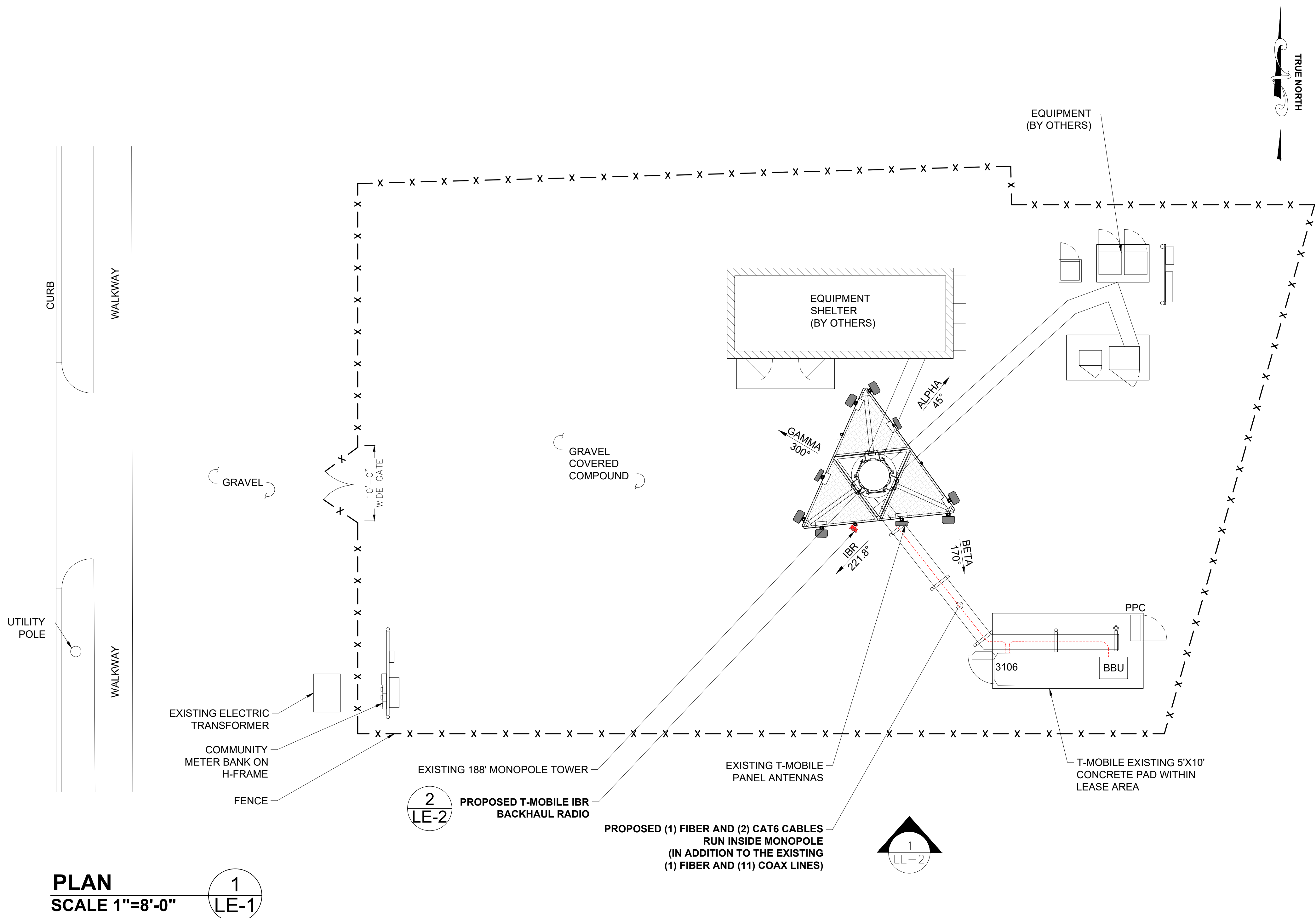
REV	DESCRIPTION	DATE
A	PRELIMINARY	09/25/17

SITE NUMBER: CT11783B
SITE NAME: CROWN COMM. MONOPOLE
SITE ADDRESS: 167 COCCOMO CIRCLE
NEW BRITAIN, CT 06051

SHEET TITLE:
T-1: TITLE SHEET

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COCCOMO CIRCLE



PLAN
SCALE 1"=8'-0"

1
LE-1

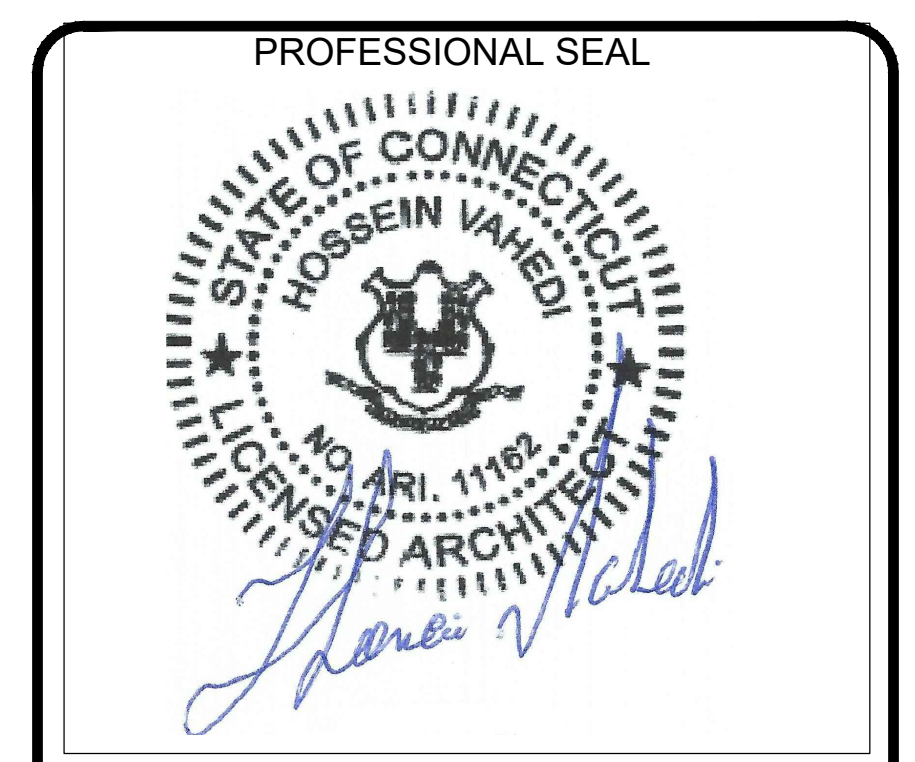
2
LE-2

1
LE-2

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER
NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
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203-275-6669

CONSULTANT:
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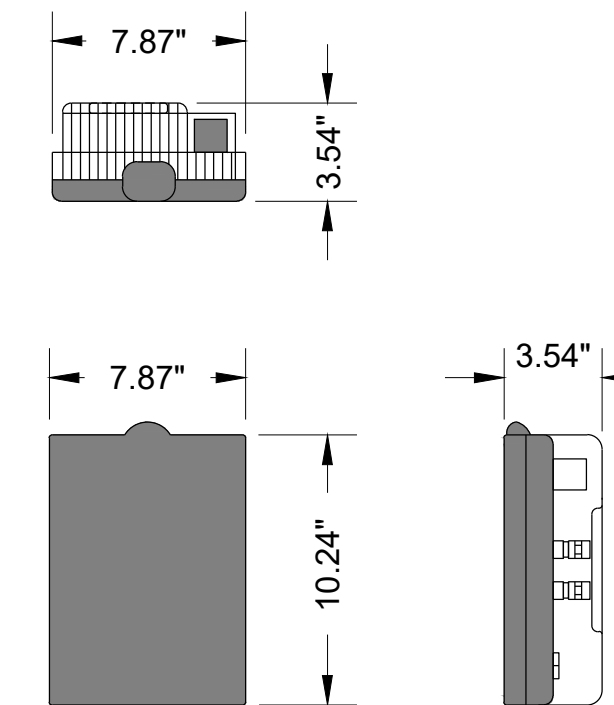
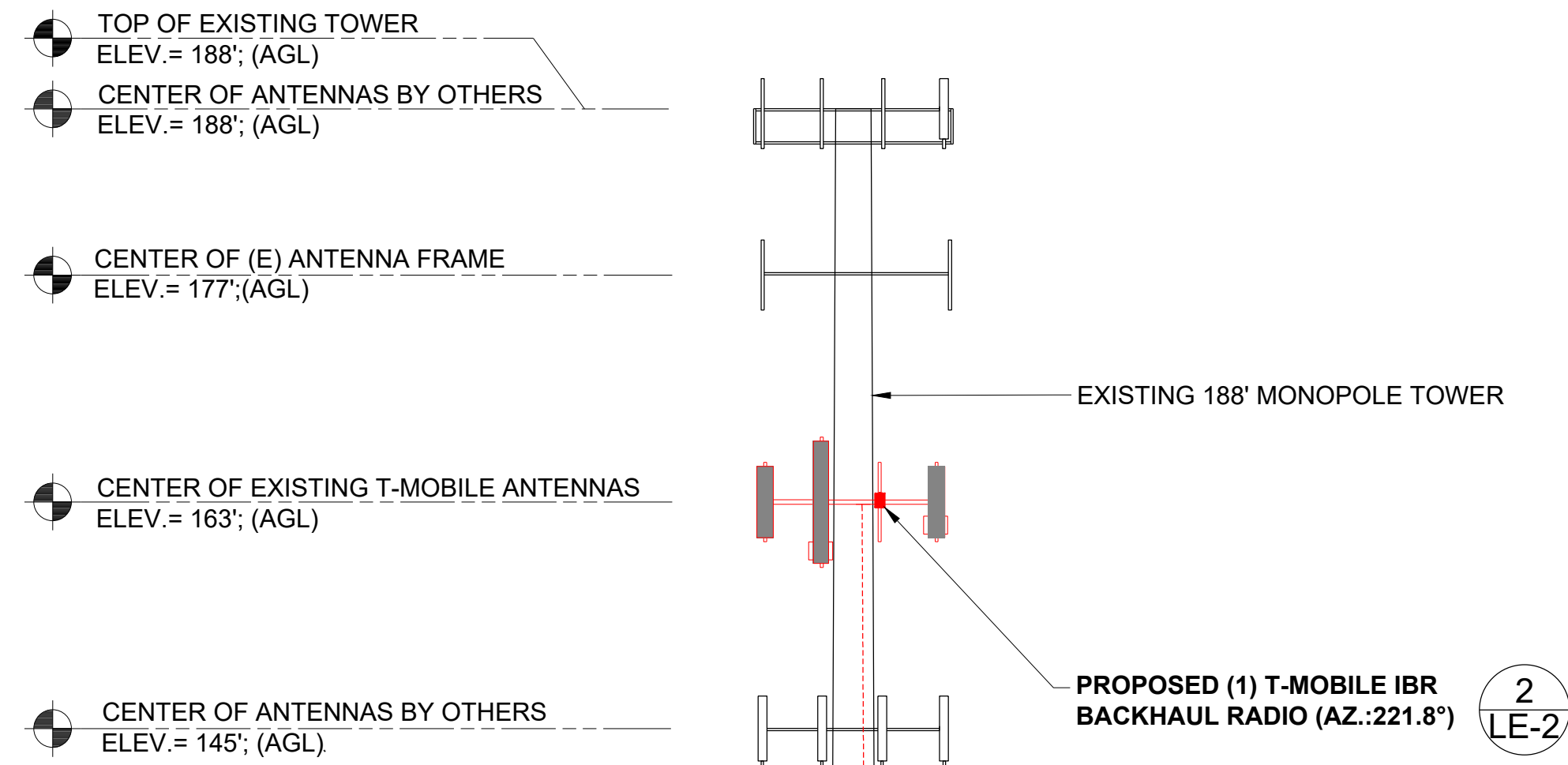
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A	PRELIMINARY	09/25/17

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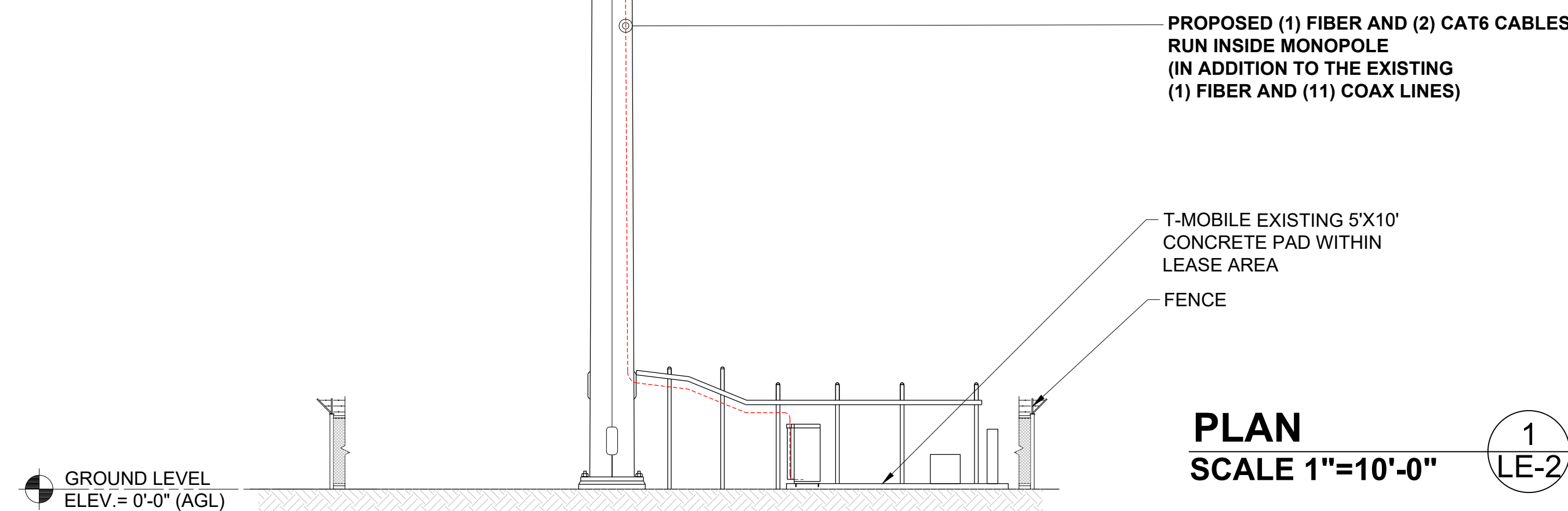
SHEET TITLE:
L-1: PLAN

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MANUFACTURER: FASTBACK
 MODEL: IBR 1300
 FOOTPRINT: 10.24"HX7.87"WX3.54"D
 WEIGHT: 8.82 LBS

BACKHAUL RADIO 2 LE-2
N.T.S



PLAN 1 LE-2
SCALE 1"=10'-0"

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

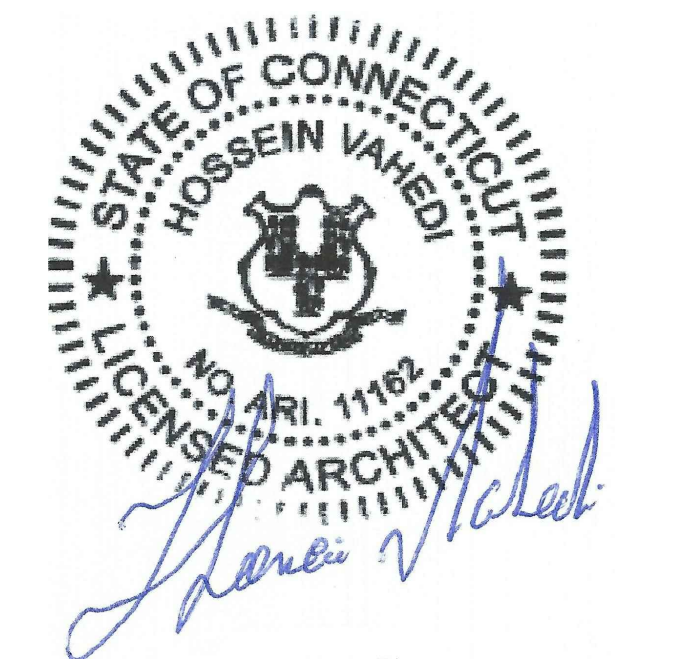
PROJECT MANGER
NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC

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REV	DESCRIPTION	DATE
A	PRELIMINARY	09/25/17

SITE NUMBER: CT11783B
 SITE NAME: CROWN COMM. MONOPOLE
 SITE ADDRESS: 167 COCCOMO CIRCLE
 NEW BRITAIN, CT 06051

SHEET TITLE:
 L-2: ELEVATION AND DETAILS

Exhibit D

Date: **September 22, 2017**

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



2000 Corporate Drive
Canonsburg, PA 15317
724-416-2000

Subject: Structural Analysis Report

Carrier Designation:

T-Mobile Co-Locate
Carrier Site Number:
Carrier Site Name:

CT11783A
Crown Comm.

Monopole

Crown Castle Designation:

Crown Castle BU Number: 803175
Crown Castle Site Name: CT NEW BRITAIN 3 CAC 803175
Crown Castle JDE Job Number: 462640
Crown Castle Work Order Number: 1464605
Crown Castle Application Number: 408505 Rev. 1

Engineering Firm Designation:

Crown Castle Project Number: 1464605

Site Data:

167 Cocomo, New Britain, Hartford County, CT
Latitude 41° 41' 11.8", Longitude -72° 45' 27.8"
188 Foot - Monopole Tower

Dear Charles McGuirt,

Crown Castle is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1464605, in accordance with application 408505, revision 1.

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

LC7: Existing + Reserved + Proposed Equipment

Sufficient Capacity

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C and Risk Category II were used in this analysis.

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

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

Structural analysis prepared by: Rohit Soni / Shan

Respectfully submitted by:

Terry P. Styran, P.E.
Senior Project Engineer



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1) INTRODUCTION

This tower is a 188 ft. Monopole tower designed by Summit Manufacturing, LLC / Paul J Ford and Company in November of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, exposure category C.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	163.0	1	fastback networks	IBR 1300	3	1/4	-

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note	
188.0	189.0	1	cci antennas	OPA-65R-LCUU-H4	2 1 1	3/4 3/8 conduit	2	
		2	cci antennas	OPA-65R-LCUU-H6				
		3	ericsson	RRUS 32 B2				
		3	ericsson	RRUS 32 B30				
		6	kathrein	860 10025				
		1	quintel tech	QS46512-2				
		2	quintel tech	QS66512-2				
		1	raycap	DC6-48-60-18-8F				
		3	ericsson	RRUS-11				
		3	kathrein	800 10121				
	6	powerwave tech	LGP21401					
	1	raycap	DC6-48-60-18-8F					
	1	188.0	1	tower mounts	Miscellaneous [NA 507-3]	1	1-5/8 3/4 3/8 conduit	1
	1	188.0	1	tower mounts	Platform Mount [LP 1201-1]			
160.0	163.0	3	commscope	LNx-6515DS-VTM w/ Mount Pipe	13	1-5/8	1	
		3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe				
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe				
		3	ericsson	RRUS 11 B12				
		3	rfs cellwave	ATMAA1412D-1A20				
	1	160.0	1	tower mounts				Platform Mount [LP 601-1]

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
145.0	150.0	1	gps	GPS_A	-	-	1
	145.0	3	alcatel lucent	RRH2X60-AWS	1	1-5/8	2
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2x60-700			
		6	andrew	SBNHH-1D65B w/ Mount Pipe			
		1	kathrein	800 10735V01 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		2	andrew	LNx-6512DS-T4M w/ Mount Pipe	13 1	1-5/8 1/2	1
	3	antel	BXA-80063/6 w/ Mount Pipe				
	1	tower mounts	Platform Mount [LP 601-1]				

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
188	188	12	Generic	1' x 5' x 3" Panel		-
177	177	12	Generic	1' x 5' x 3" Panel		-
162	162	12	Generic	1' x 5' x 3" Panel		-
147	147	12	Generic	1' x 5' x 3" Panel		-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clough, Harbor & Associates	679661	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing, LLC	679659	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Paul J Ford and Company	6709261	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer’s specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer’s specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	188 - 137	Pole	TP32.711x22x0.25	1	-12.65	1738.73	54.2	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-22.44	2768.52	80.6	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-35.79	4014.89	81.4	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-58.36	6652.09	64.9	Pass
							Summary	
						Pole (L3)	81.4	Pass
						Rating =	81.4	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	73.8	Pass
1	Base Plate	0	69.5	Pass
1	Base Foundation Structural	0	54.3	Pass
1	Base Foundation Soil Interaction	0	68.1	Pass

Structure Rating (max from all components) =	81.4%
---	--------------

Notes:

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

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 3/4" x 8'	188	RRUS 11 B12	160
800 10121	188	ATMAA1412D-1A20	160
800 10121	188	ATMAA1412D-1A20	160
800 10121	188	ATMAA1412D-1A20	160
DC6-48-60-18-8F	188	IBR 1300	160
(2) LGP21401	188	Platform Mount [LP 601-1]	160
(2) LGP21401	188	8' x 2" Mount Pipe	160
(2) LGP21401	188	8' x 2" Mount Pipe	160
RRUS-11	188	8' x 2" Mount Pipe	160
RRUS-11	188	BXA-80063/6 w/ Mount Pipe	145
RRUS-11	188	BXA-80063/6 w/ Mount Pipe	145
OPA-65R-LCUU-H6	188	BXA-80063/6 w/ Mount Pipe	145
OPA-65R-LCUU-H4	188	LNx-6512DS-T4M w/ Mount Pipe	145
OPA-65R-LCUU-H6	188	LNx-6512DS-T4M w/ Mount Pipe	145
QS66512-2	188	GPS_A	145
QS46512-2	188	(2) SBNHH-1D65B w/ Mount Pipe	145
QS66512-2	188	(2) SBNHH-1D65B w/ Mount Pipe	145
RRUS 32 B2	188	(2) SBNHH-1D65B w/ Mount Pipe	145
RRUS 32 B2	188	800 10735V01 w/ Mount Pipe	145
RRUS 32 B2	188	RRH2x60-700	145
RRUS 32 B30	188	RRH2x60-700	145
RRUS 32 B30	188	RRH2x60-700	145
RRUS 32 B30	188	RRH2x60-AWS	145
(2) 860 10025	188	RRH2X60-AWS	145
(2) 860 10025	188	RRH2X60-AWS	145
(2) 860 10025	188	RRH2X60-PCS	145
DC6-48-60-18-8F	188	RRH2X60-PCS	145
Platform Mount [LP 1201-1]	188	RRH2X60-PCS	145
Miscellaneous [NA 507-3]	188	DB-T1-6Z-8AB-0Z	145
LNx-6515DS-VTM w/ Mount Pipe	160	Platform Mount [LP 601-1]	145
LNx-6515DS-VTM w/ Mount Pipe	160	Side Arm Mount [SO 701-3]	133
LNx-6515DS-VTM w/ Mount Pipe	160	1" Dia x 3.5-ft	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	1" Dia x 3.5-ft	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	1" Dia x 3.5-ft	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	1" Dia x 3.5-ft	70
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	1" Dia x 3.5-ft	70
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	1" Dia x 3.5-ft	70
AIR -32 B2A/B66AA w/ Mount Pipe	160	1" Dia x 3.5-ft	40
AIR -32 B2A/B66AA w/ Mount Pipe	160	1" Dia x 3.5-ft	40
AIR -32 B2A/B66AA w/ Mount Pipe	160	1" Dia x 3.5-ft	40
RRUS 11 B12	160	1" Dia x 3.5-ft	10
RRUS 11 B12	160	1" Dia x 3.5-ft	10
RRUS 11 B12	160	1" Dia x 3.5-ft	10

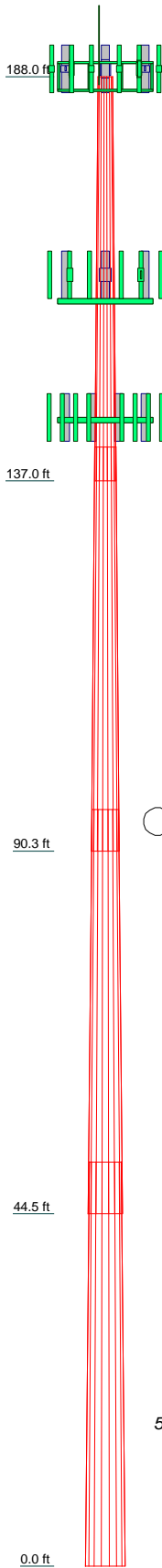
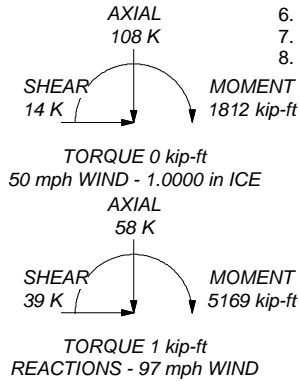
MATERIAL STRENGTH

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-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 81.4%

ALL REACTIONS
ARE FACTORED



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	51.00	18	0.2500	4.25	22.0000	32.7110	A607-65	3.7
2	51.00	18	0.3125	5.25	31.3184	42.0300	A607-65	6.3
3	51.00	18	0.3750	6.50	40.3023	51.0140	A607-65	9.4
4	51.00	18	0.5000	48.8988	59.6100		A607-65	14.8
								34.1

	Crown Castle		Job: BU 803175	
	2000 Corporate Drive Canonsburg, PA 15317 Phone: 724-416-2000 FAX:		Project: WO 1464605	Client: Crown Castle
		Code: TIA-222-G	Date: 09/22/17	App'd:
		Path: R:\SA Models - Letters\Work Area\Rsoni\WIP\803175_WO_1464605\803175.dwg		Scale: NTS
				Dwg No. E-1

Tower Input Data

There is a pole section.
 This tower is designed using the TIA-222-G standard.
 The following design criteria apply:

- 3) Tower is located in Hartford County, Connecticut.
- 4) Basic wind speed of 97 mph.
- 5) Structure Class II.
- 6) Exposure Category C.
- 7) Topographic Category 1.
- 8) Crest Height 0.00 ft.
- 9) Nominal ice thickness of 1.0000 in.
- 10) Ice thickness is considered to increase with height.
- 11) Ice density of 56 pcf.
- 12) A wind speed of 50 mph is used in combination with ice.
- 13) Temperature drop of 50 °F.
- 14) Deflections calculated using a wind speed of 60 mph.
- 15) A non-linear (P-delta) analysis was used.
- 16) Pressures are calculated at each section.
- 17) Stress ratio used in pole design is 1.
- 18) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|--|---|
| Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
✓ Use Code Stress Ratios
✓ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile

Include Bolts In Member Capacity

Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric | Distribute Leg Loads As Uniform
Assume Legs Pinned
✓ Assume Rigid Index Plate
✓ Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
✓ Bypass Mast Stability Checks
✓ Use Azimuth Dish Coefficients
✓ Project Wind Area of Appurt.

Autocalc Torque Arm Areas

Add IBC .6D+W Combination
✓ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder | Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
✓ Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-G Bracing Resist.
Exemption
Use TIA-222-G Tension Splice
Exemption

<div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets |
|--|--|---|

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	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 ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	22.3394	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	33.2156	25.7578	3429.0204	11.5237	16.6172	206.3538	6862.5527	12.8813	5.3171	21.269
L2	32.7080	30.7540	3735.3226	11.0071	15.9098	234.7819	7475.5603	15.3799	4.9620	15.879
	42.6784	41.3785	9098.0688	14.8097	21.3512	426.1143	18208.109	20.6932	6.8473	21.911
L3	42.0437	47.5235	9571.6471	14.1742	20.4736	467.5120	19155.888	23.7663	6.4332	17.155
	51.8010	60.2731	19526.796	17.9768	25.9151	753.4907	39079.287	30.1423	8.3185	22.183
L4	51.0393	76.8089	22730.963	17.1816	24.8406	915.0736	45491.836	38.4117	7.7262	15.452
	60.5296	93.8076	41409.239	20.9841	30.2819	1367.4593	82872.966	46.9127	9.6114	19.223

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1 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	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
			ft				in	in	plf
11700A(1/4)	C	Surface Ar (CaAa)	160.00 - 0.00	3	3	-0.500 -0.450	0.2850		0.04

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C _A A _A	Weight	
				ft		ft ² /ft	plf	
*188								
LDF7-50A(1-5/8")	B	No	Inside Pole	188.00 - 0.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
FB-L98B-002-75000(3/8")	B	No	Inside Pole	188.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
WR-VG86ST-BRD(3/4")	B	No	Inside Pole	188.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.58 0.58 0.58
2" Flex Conduit	B	No	Inside Pole	188.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.36 0.36 0.36
2" Flex Conduit	B	No	Inside Pole	188.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.36 0.36 0.36

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight plf
						In Face	Out Face	
FB-L98B-034-XXXXXX(3/8")	B	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.05
						1/2" Ice	0.00	0.05
						1" Ice	0.00	0.05
WR-VG86ST-BRD(3/4")	B	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
*160 LCF158-50J(1-5/8")	C	No	Inside Pole	160.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
MLE Hybrid 9Power/18Fiber RL 2(1-5/8") *145	C	No	Inside Pole	160.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07
HB158-1-08U8-S8J18(1-5/8")	C	No	Inside Pole	145.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
LCF12-50J(1/2")	C	No	Inside Pole	145.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LCF158-50J(1-5/8")	C	No	Inside Pole	145.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
HB158-1-08U8-S8J18(1-5/8")	C	No	Inside Pole	145.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
*** ***								
3/8-in Detuner Wire	A	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
3/8-in Detuner Wire	B	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
3/8-in Detuner Wire	C	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

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	188.00-137.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.41
		C	0.000	0.000	1.966	0.000	0.39
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	0.38
		C	0.000	0.000	3.997	0.802	1.22
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	0.37
		C	0.000	0.000	3.912	0.858	1.19
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	0.36
		C	0.000	0.000	3.805	0.834	1.16

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	188.00-137.00	A	2.344	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L2	137.00-90.25	B	2.262	0.000	0.000	0.000	0.000	0.41
		C		0.000	0.000	15.934	0.000	0.59
		A		0.000	0.000	0.000	20.839	0.34
L3	90.25-44.50	B	2.147	0.000	0.000	0.000	20.839	0.72
		C		0.000	0.000	32.387	20.839	1.96
		A		0.000	0.000	0.000	21.552	0.34
L4	44.50-0.00	B	1.925	0.000	0.000	0.000	21.552	0.71
		C		0.000	0.000	30.757	21.552	1.90
		A		0.000	0.000	0.000	19.941	0.29
		B		0.000	0.000	0.000	19.941	0.65
		C		0.000	0.000	28.639	19.941	1.78

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	188.00-137.00	0.0525	0.0341	0.3037	0.1972
L2	137.00-90.25	0.1023	0.0664	0.4393	0.2853
L3	90.25-44.50	0.1029	0.0668	0.4699	0.3051
L4	44.50-0.00	0.1033	0.0671	0.4924	0.3198

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	13	11700A(1/4)	137.00 - 160.00	1.0000	1.0000
L2	13	11700A(1/4)	90.25 - 137.00	1.0000	1.0000
L3	13	11700A(1/4)	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 Adjustmen t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	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"	1.41	1.41	0.04
			4.00			Ice	2.25	2.25	0.05
						1" Ice			
188 800 10121	A	From Leg	4.00	0.0000	188.00	No Ice	5.15	3.29	0.05
			0.00			1/2"	5.50	3.63	0.08
			1.00			Ice	5.86	3.99	0.12
						1" Ice			
800 10121	B	From Leg	4.00	0.0000	188.00	No Ice	5.15	3.29	0.05

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
			0.00			1/2"	5.50	3.63	0.08
			1.00			Ice	5.86	3.99	0.12
800 10121	C	From Leg	4.00	0.0000	188.00	1" Ice	5.15	3.29	0.05
			0.00			No Ice	5.50	3.63	0.08
			1.00			Ice	5.86	3.99	0.12
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	188.00	1" Ice	0.79	0.79	0.02
			0.00			No Ice	1.27	1.27	0.04
			1.00			Ice	1.45	1.45	0.05
(2) LGP21401	A	From Leg	4.00	0.0000	188.00	1" Ice	1.10	0.21	0.01
			0.00			No Ice	1.24	0.27	0.02
			1.00			Ice	1.38	0.35	0.03
(2) LGP21401	B	From Leg	4.00	0.0000	188.00	1" Ice	1.10	0.21	0.01
			0.00			No Ice	1.24	0.27	0.02
			1.00			Ice	1.38	0.35	0.03
(2) LGP21401	C	From Leg	4.00	0.0000	188.00	1" Ice	1.10	0.21	0.01
			0.00			No Ice	1.24	0.27	0.02
			1.00			Ice	1.38	0.35	0.03
RRUS-11	A	From Leg	4.00	0.0000	188.00	1" Ice	2.78	1.19	0.05
			0.00			No Ice	2.99	1.33	0.07
			1.00			Ice	3.21	1.49	0.09
RRUS-11	B	From Leg	4.00	0.0000	188.00	1" Ice	2.78	1.19	0.05
			0.00			No Ice	2.99	1.33	0.07
			1.00			Ice	3.21	1.49	0.09
RRUS-11	C	From Leg	4.00	0.0000	188.00	1" Ice	2.78	1.19	0.05
			0.00			No Ice	2.99	1.33	0.07
			1.00			Ice	3.21	1.49	0.09
OPA-65R-LCUU-H6	A	From Leg	4.00	0.0000	188.00	1" Ice	9.66	5.52	0.07
			0.00			No Ice	10.13	5.97	0.13
			1.00			Ice	10.61	6.43	0.20
OPA-65R-LCUU-H4	B	From Leg	4.00	0.0000	188.00	1" Ice	5.94	3.36	0.06
			0.00			No Ice	6.28	3.66	0.10
			1.00			Ice	6.62	3.97	0.14
OPA-65R-LCUU-H6	C	From Leg	4.00	0.0000	188.00	1" Ice	9.66	5.52	0.07
			0.00			No Ice	10.13	5.97	0.13
			1.00			Ice	10.61	6.43	0.20
QS66512-2	A	From Leg	4.00	0.0000	188.00	1" Ice	8.13	6.80	0.11
			0.00			No Ice	8.59	7.27	0.17
			1.00			Ice	9.05	7.72	0.23
QS46512-2	B	From Leg	4.00	0.0000	188.00	1" Ice	5.55	4.61	0.10
			0.00			No Ice	5.90	4.94	0.15
			1.00			Ice	6.26	5.29	0.19
QS66512-2	C	From Leg	4.00	0.0000	188.00	1" Ice	8.13	6.80	0.11
			0.00			No Ice	8.59	7.27	0.17
			1.00			Ice	9.05	7.72	0.23
RRUS 32 B2	A	From Leg	4.00	0.0000	188.00	1" Ice	2.73	1.67	0.05
			0.00			No Ice	2.95	1.86	0.07
			1.00			Ice	3.18	2.05	0.10
RRUS 32 B2	B	From Leg	4.00	0.0000	188.00	1" Ice	2.73	1.67	0.05
			0.00			No Ice	2.95	1.86	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			1.00			Ice 3.18	2.05	0.10	
RRUS 32 B2	C	From Leg	4.00	0.0000	188.00	1" Ice	2.73	1.67	0.05
			0.00			No Ice			
			1.00			1/2"			
RRUS 32 B30	A	From Leg	4.00	0.0000	188.00	Ice	2.69	1.57	0.06
			0.00			No Ice			
			1.00			1/2"			
RRUS 32 B30	B	From Leg	4.00	0.0000	188.00	Ice	2.69	1.57	0.06
			0.00			No Ice			
			1.00			1/2"			
RRUS 32 B30	C	From Leg	4.00	0.0000	188.00	Ice	2.69	1.57	0.06
			0.00			No Ice			
			1.00			1/2"			
(2) 860 10025	A	From Leg	4.00	0.0000	188.00	Ice	0.14	0.12	0.00
			0.00			No Ice			
			1.00			1/2"			
(2) 860 10025	B	From Leg	4.00	0.0000	188.00	Ice	0.14	0.12	0.00
			0.00			No Ice			
			1.00			1/2"			
(2) 860 10025	C	From Leg	4.00	0.0000	188.00	Ice	0.14	0.12	0.00
			0.00			No Ice			
			1.00			1/2"			
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	188.00	Ice	0.79	0.79	0.02
			0.00			No Ice			
			1.00			1/2"			
Platform Mount [LP 1201-1]	C	None		0.0000	188.00	Ice	23.10	23.10	2.10
						No Ice			
						1/2"			
Miscellaneous [NA 507-3]	C	None		0.0000	188.00	Ice	30.50	30.50	2.90
						No Ice			
						1/2"			
*160 LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	Ice	18.50	18.50	0.51
			0.00			No Ice			
			3.00			1/2"			
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	Ice	34.30	34.30	0.90
			0.00			No Ice			
			3.00			1/2"			
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	Ice	11.68	9.84	0.08
			0.00			No Ice			
			3.00			1/2"			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	Ice	11.68	9.84	0.08
			0.00			No Ice			
			3.00			1/2"			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	Ice	6.33	5.64	0.11
			0.00			No Ice			
			3.00			1/2"			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	Ice	6.33	5.64	0.11
			0.00			No Ice			
						1/2"			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			3.00			Ice 7.21	7.13	0.23
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 7.65	6.07 6.87 7.58	0.15 0.21 0.28
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 7.65	6.07 6.87 7.58	0.15 0.21 0.28
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 7.65	6.07 6.87 7.58	0.15 0.21 0.28
RRUS 11 B12	A	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 3.26	1.18 1.33 1.48	0.05 0.07 0.10
ATMAA1412D-1A20	A	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 0.59	1.00 1.13 1.26	0.01 0.02 0.03
ATMAA1412D-1A20	B	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 0.59	1.00 1.13 1.26	0.01 0.02 0.03
ATMAA1412D-1A20	C	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 0.00	0.00 0.00 0.00	0.00 0.00 0.00
IBR 1300	C	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 0.89	0.31 0.38 0.47	0.01 0.01 0.02
Platform Mount [LP 601-1]	C	None		0.0000	160.00	1" Ice No Ice 1/2" Ice 38.71	28.47 33.59 38.71	1.12 1.51 1.91
8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	160.00	1" Ice No Ice 1/2" Ice 3.40	1.90 2.73 3.40	0.03 0.04 0.06
*145 BXA-80063/6 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	145.00	1" Ice No Ice 1/2" Ice 8.89	5.41 6.56 7.42	0.04 0.10 0.17
BXA-80063/6 w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	145.00	1" Ice No Ice 1/2"	5.41 6.56	0.04 0.10

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft ²	ft ²	K	
					0.00		Ice	8.89	7.42	0.17	
BXA-80063/6 w/ Mount Pipe	C	From Leg			4.00	0.0000	145.00	1" Ice			
					0.00			No Ice	7.82	5.41	0.04
					0.00			1/2"	8.37	6.56	0.10
LNx-6512DS-T4M w/ Mount Pipe	A	From Leg			4.00	0.0000	145.00	Ice	8.89	7.42	0.17
					0.00			1" Ice			
					0.00			No Ice	5.27	4.48	0.04
LNx-6512DS-T4M w/ Mount Pipe	B	From Leg			4.00	0.0000	145.00	1/2"	5.65	5.08	0.09
					0.00			Ice	6.05	5.70	0.14
					0.00			1" Ice			
GPS_A	A	From Leg			4.00	0.0000	145.00	No Ice	0.26	0.26	0.00
					0.00			1/2"	0.32	0.32	0.00
					5.00			Ice	0.39	0.39	0.01
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg			4.00	0.0000	145.00	1" Ice			
					0.00			No Ice	8.39	7.08	0.08
					0.00			1/2"	8.95	8.28	0.15
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg			4.00	0.0000	145.00	Ice	9.48	9.19	0.22
					0.00			1" Ice			
					0.00			No Ice	8.39	7.08	0.08
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg			4.00	0.0000	145.00	1/2"	8.95	8.28	0.15
					0.00			Ice	9.48	9.19	0.22
					0.00			1" Ice			
800 10735V01 w/ Mount Pipe	C	From Leg			4.00	0.0000	145.00	No Ice	8.87	5.49	0.06
					0.00			1/2"	9.46	6.71	0.12
					0.00			Ice	10.01	7.69	0.19
RRH2x60-700	A	From Leg			4.00	0.0000	145.00	1" Ice			
					0.00			No Ice	3.50	1.82	0.06
					0.00			1/2"	3.76	2.05	0.08
RRH2x60-700	B	From Leg			4.00	0.0000	145.00	Ice	4.03	2.29	0.11
					0.00			1" Ice			
					0.00			No Ice	3.50	1.82	0.06
RRH2x60-700	C	From Leg			4.00	0.0000	145.00	1/2"	3.76	2.05	0.08
					0.00			Ice	4.03	2.29	0.11
					0.00			1" Ice			
RRH2X60-AWS	A	From Leg			4.00	0.0000	145.00	No Ice	3.50	1.82	0.06
					0.00			1/2"	3.76	2.05	0.08
					0.00			Ice	4.03	2.29	0.11
RRH2X60-AWS	B	From Leg			4.00	0.0000	145.00	1" Ice			
					0.00			No Ice	3.50	1.82	0.06
					0.00			1/2"	3.76	2.05	0.08
RRH2X60-AWS	C	From Leg			4.00	0.0000	145.00	Ice	4.03	2.29	0.11
					0.00			1" Ice			
					0.00			No Ice	3.50	1.82	0.06
RRH2X60-PCS	A	From Leg			4.00	0.0000	145.00	1/2"	3.76	2.05	0.08
					0.00			Ice	4.03	2.29	0.11
					0.00			1" Ice			
RRH2X60-PCS	B	From Leg			4.00	0.0000	145.00	No Ice	2.20	1.72	0.06
					0.00			1/2"	2.39	1.90	0.08
					0.00			Ice	2.59	2.09	0.10
RRH2X60-PCS	B	From Leg			4.00	0.0000	145.00	1" Ice			
					0.00			No Ice	2.20	1.72	0.06
					0.00			1/2"	2.39	1.90	0.08
					0.00		Ice	2.59	2.09	0.10	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
RRH2X60-PCS	C	From Leg	4.00 0.00 0.00	0.0000	145.00	1" Ice			
						No Ice	2.20	1.72	0.06
						1/2" Ice	2.39	1.90	0.08
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 0.00	0.0000	145.00	1" Ice			
						No Ice	4.80	2.00	0.04
						1/2" Ice	5.07	2.19	0.08
Platform Mount [LP 601-1]	C	None		0.0000	145.00	1" Ice			
						No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
Detuner Side Arm Mount [SO 701-3]	C	None		0.0000	133.00	1" Ice			
						No Ice	2.83	2.83	0.20
						1/2" Ice	3.92	3.92	0.24
***** 1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	100.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	100.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	100.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
***** 1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	70.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	70.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	70.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
***** 1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	40.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	40.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	40.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
***** 1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	10.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	10.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	10.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	10.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	10.00	1" Ice			
						No Ice	0.00	0.37	0.00
						1/2" Ice	0.00	0.68	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	10.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00 0.90	0.00 0.01 0.01

Load Combinations

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

Comb. No.	Description
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	26	0.00	0.00	0.00
			Max. Compression	26	-41.13	0.24	1.04
			Max. Mx	20	-12.69	597.73	-3.14
			Max. My	2	-12.66	-3.24	600.42
			Max. Vy	20	-24.35	597.73	-3.14
			Max. Vx	2	-24.46	-3.24	600.42
			Max. Torque	7			1.12
L2	137 - 90.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.22	-0.25	0.72
			Max. Mx	20	-22.47	1831.43	-8.94
			Max. My	2	-22.45	-9.04	1838.94
			Max. Vy	20	-29.49	1831.43	-8.94
			Max. Vx	2	-29.60	-9.04	1838.94
			Max. Torque	7			1.12
L3	90.25 - 44.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.31	-0.83	0.34
			Max. Mx	20	-35.80	3254.37	-14.54
			Max. My	2	-35.79	-14.65	3266.56
			Max. Vy	20	-34.36	3254.37	-14.54
			Max. Vx	2	-34.46	-14.65	3266.56
			Max. Torque	7			1.11
L4	44.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-108.06	-1.56	-0.13
			Max. Mx	8	-58.36	-5137.57	20.99
			Max. My	2	-58.36	-20.90	5154.96
			Max. Vy	20	-39.15	5137.57	-20.79
			Max. Vx	2	-39.25	-20.90	5154.96
			Max. Torque	7			1.10

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	28	108.06	-6.91	11.96
	Max. H _x	21	43.79	39.11	-0.12
	Max. H _z	3	43.79	-0.12	39.21
	Max. M _x	2	5154.96	-0.12	39.21
	Max. M _z	8	5137.57	-39.11	0.12
	Max. Torsion	7	1.10	-33.93	19.71
	Min. Vert	19	43.79	33.93	-19.71
	Min. H _x	9	43.79	-39.11	0.12
	Min. H _z	15	43.79	0.12	-39.21
	Min. M _x	14	-5154.74	0.12	-39.21
	Min. M _z	20	-5137.57	39.11	-0.12
	Min. Torsion	19	-1.09	33.93	-19.71

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	48.65	-0.00	0.00	-0.09	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	58.38	0.12	-39.21	-5154.96	-20.90	-0.75
0.9 Dead+1.6 Wind 0 deg - No Ice	43.79	0.12	-39.21	-5091.40	-20.61	-0.76
1.2 Dead+1.6 Wind 30 deg - No Ice	58.38	19.66	-34.02	-4474.71	-2586.80	-1.07
0.9 Dead+1.6 Wind 30 deg - No Ice	43.79	19.66	-34.02	-4419.53	-2554.90	-1.08
1.2 Dead+1.6 Wind 60 deg - No Ice	58.38	33.93	-19.71	-2595.59	-4459.61	-1.10
0.9 Dead+1.6 Wind 60 deg - No Ice	43.79	33.93	-19.71	-2563.56	-4404.65	-1.10
1.2 Dead+1.6 Wind 90 deg - No Ice	58.38	39.11	-0.12	-20.98	-5137.57	-0.82
0.9 Dead+1.6 Wind 90 deg - No Ice	43.79	39.11	-0.12	-20.67	-5074.27	-0.83
1.2 Dead+1.6 Wind 120 deg - No Ice	58.38	33.81	19.50	2559.32	-4438.89	-0.33
0.9 Dead+1.6 Wind 120 deg - No Ice	43.79	33.81	19.50	2527.83	-4384.22	-0.33
1.2 Dead+1.6 Wind 150 deg - No Ice	58.38	19.45	33.90	4453.79	-2550.72	0.25
0.9 Dead+1.6 Wind 150 deg - No Ice	43.79	19.45	33.90	4398.94	-2519.32	0.26
1.2 Dead+1.6 Wind 180 deg - No Ice	58.38	-0.12	39.21	5154.74	20.87	0.76
0.9 Dead+1.6 Wind 180 deg - No Ice	43.79	-0.12	39.21	5091.23	20.59	0.77
1.2 Dead+1.6 Wind 210 deg - No Ice	58.38	-19.66	34.02	4474.51	2586.76	1.06
0.9 Dead+1.6 Wind 210 deg - No Ice	43.79	-19.66	34.02	4419.38	2554.88	1.07
1.2 Dead+1.6 Wind 240 deg - No Ice	58.38	-33.93	19.71	2595.41	4459.58	1.08
0.9 Dead+1.6 Wind 240 deg - No Ice	43.79	-33.93	19.71	2563.42	4404.64	1.09
1.2 Dead+1.6 Wind 270 deg - No Ice	58.38	-39.11	0.12	20.79	5137.57	0.82
0.9 Dead+1.6 Wind 270 deg - No Ice	43.79	-39.11	0.12	20.53	5074.27	0.82
1.2 Dead+1.6 Wind 300 deg - No Ice	58.38	-33.81	-19.50	-2559.54	4438.89	0.33
0.9 Dead+1.6 Wind 300 deg - No Ice	43.79	-33.81	-19.50	-2527.99	4384.22	0.34
1.2 Dead+1.6 Wind 330 deg - No Ice	58.38	-19.45	-33.90	-4454.02	2550.70	-0.24
0.9 Dead+1.6 Wind 330 deg - No Ice	43.79	-19.45	-33.90	-4399.11	2519.31	-0.24
1.2 Dead+1.0 Ice+1.0 Temp	108.06	0.00	0.00	0.13	-1.56	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	108.06	0.02	-13.48	-1782.42	-5.05	-0.16
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	108.06	6.91	-11.96	-1568.09	-907.06	-0.18
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	108.06	11.71	-6.78	-896.55	-1547.92	-0.15
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	108.06	13.46	-0.02	-3.35	-1780.29	-0.09
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	108.06	11.64	6.72	888.31	-1540.34	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	108.06	6.71	11.66	1541.94	-888.11	0.09
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	108.06	-0.02	13.48	1782.41	1.63	0.16
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	108.06	-6.91	11.96	1568.08	903.64	0.18
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	108.06	-11.71	6.78	896.55	1544.51	0.15
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	108.06	-13.46	0.02	3.34	1776.88	0.09

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	108.06	-11.64	-6.72	-888.32	1536.93	-0.00
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	108.06	-6.71	-11.66	-1541.95	884.69	-0.09
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	48.65	0.03	-8.39	-1096.54	-4.44	-0.17
Dead+Wind 30 deg - Service	48.65	4.21	-7.28	-951.87	-550.22	-0.23
Dead+Wind 60 deg - Service	48.65	7.26	-4.22	-552.16	-948.57	-0.24
Dead+Wind 90 deg - Service	48.65	8.37	-0.03	-4.53	-1092.76	-0.18
Dead+Wind 120 deg - Service	48.65	7.23	4.17	544.29	-944.14	-0.07
Dead+Wind 150 deg - Service	48.65	4.16	7.25	947.24	-542.53	0.05
Dead+Wind 180 deg - Service	48.65	-0.03	8.39	1096.36	4.44	0.17
Dead+Wind 210 deg - Service	48.65	-4.21	7.28	951.68	550.22	0.23
Dead+Wind 240 deg - Service	48.65	-7.26	4.22	551.98	948.57	0.24
Dead+Wind 270 deg - Service	48.65	-8.37	0.03	4.35	1092.76	0.18
Dead+Wind 300 deg - Service	48.65	-7.23	-4.17	-544.47	944.13	0.07
Dead+Wind 330 deg - Service	48.65	-4.16	-7.25	-947.43	542.53	-0.05

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	-48.65	0.00	0.00	48.65	0.00	0.003%
2	0.12	-58.38	-39.21	-0.12	58.38	39.21	0.000%
3	0.12	-43.79	-39.21	-0.12	43.79	39.21	0.000%
4	19.66	-58.38	-34.02	-19.66	58.38	34.02	0.000%
5	19.66	-43.79	-34.02	-19.66	43.79	34.02	0.000%
6	33.93	-58.38	-19.71	-33.93	58.38	19.71	0.000%
7	33.93	-43.79	-19.71	-33.93	43.79	19.71	0.000%
8	39.11	-58.38	-0.12	-39.11	58.38	0.12	0.000%
9	39.11	-43.79	-0.12	-39.11	43.79	0.12	0.000%
10	33.81	-58.38	19.50	-33.81	58.38	-19.50	0.000%
11	33.81	-43.79	19.50	-33.81	43.79	-19.50	0.000%
12	19.45	-58.38	33.90	-19.45	58.38	-33.90	0.000%
13	19.45	-43.79	33.90	-19.45	43.79	-33.90	0.000%
14	-0.12	-58.38	39.21	0.12	58.38	-39.21	0.000%
15	-0.12	-43.79	39.21	0.12	43.79	-39.21	0.000%
16	-19.66	-58.38	34.02	19.66	58.38	-34.02	0.000%
17	-19.66	-43.79	34.02	19.66	43.79	-34.02	0.000%
18	-33.93	-58.38	19.71	33.93	58.38	-19.71	0.000%
19	-33.93	-43.79	19.71	33.93	43.79	-19.71	0.000%
20	-39.11	-58.38	0.12	39.11	58.38	-0.12	0.000%
21	-39.11	-43.79	0.12	39.11	43.79	-0.12	0.000%
22	-33.81	-58.38	-19.50	33.81	58.38	19.50	0.000%
23	-33.81	-43.79	-19.50	33.81	43.79	19.50	0.000%
24	-19.45	-58.38	-33.90	19.45	58.38	33.90	0.000%
25	-19.45	-43.79	-33.90	19.45	43.79	33.90	0.000%
26	0.00	-108.06	0.00	0.00	108.06	0.00	0.000%
27	0.02	-108.06	-13.48	-0.02	108.06	13.48	0.000%
28	6.91	-108.06	-11.96	-6.91	108.06	11.96	0.000%
29	11.71	-108.06	-6.78	-11.71	108.06	6.78	0.000%
30	13.46	-108.06	-0.02	-13.46	108.06	0.02	0.000%
31	11.64	-108.06	6.72	-11.64	108.06	-6.72	0.000%
32	6.71	-108.06	11.66	-6.71	108.06	-11.66	0.000%
33	-0.02	-108.06	13.48	0.02	108.06	-13.48	0.000%
34	-6.91	-108.06	11.96	6.91	108.06	-11.96	0.000%
35	-11.71	-108.06	6.78	11.71	108.06	-6.78	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
36	-13.46	-108.06	0.02	13.46	108.06	-0.02	0.000%
37	-11.64	-108.06	-6.72	11.64	108.06	6.72	0.000%
38	-6.71	-108.06	-11.66	6.71	108.06	11.66	0.000%
39	0.03	-48.65	-8.39	-0.03	48.65	8.39	0.000%
40	4.21	-48.65	-7.28	-4.21	48.65	7.28	0.000%
41	7.26	-48.65	-4.22	-7.26	48.65	4.22	0.000%
42	8.37	-48.65	-0.03	-8.37	48.65	0.03	0.000%
43	7.23	-48.65	4.17	-7.23	48.65	-4.17	0.000%
44	4.16	-48.65	7.25	-4.16	48.65	-7.25	0.000%
45	-0.03	-48.65	8.39	0.03	48.65	-8.39	0.000%
46	-4.21	-48.65	7.28	4.21	48.65	-7.28	0.000%
47	-7.26	-48.65	4.22	7.26	48.65	-4.22	0.000%
48	-8.37	-48.65	0.03	8.37	48.65	-0.03	0.000%
49	-7.23	-48.65	-4.17	7.23	48.65	4.17	0.000%
50	-4.16	-48.65	-7.25	4.16	48.65	7.25	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00005734
2	Yes	5	0.00000001	0.00001522
3	Yes	4	0.00000001	0.00033234
4	Yes	6	0.00000001	0.00013462
5	Yes	6	0.00000001	0.00003852
6	Yes	6	0.00000001	0.00013788
7	Yes	6	0.00000001	0.00003969
8	Yes	5	0.00000001	0.00006548
9	Yes	4	0.00000001	0.00076049
10	Yes	6	0.00000001	0.00013412
11	Yes	6	0.00000001	0.00003870
12	Yes	6	0.00000001	0.00013422
13	Yes	6	0.00000001	0.00003872
14	Yes	5	0.00000001	0.00006482
15	Yes	4	0.00000001	0.00075433
16	Yes	6	0.00000001	0.00013795
17	Yes	6	0.00000001	0.00003970
18	Yes	6	0.00000001	0.00013455
19	Yes	6	0.00000001	0.00003851
20	Yes	5	0.00000001	0.00001465
21	Yes	4	0.00000001	0.00032935
22	Yes	6	0.00000001	0.00013504
23	Yes	6	0.00000001	0.00003903
24	Yes	6	0.00000001	0.00013508
25	Yes	6	0.00000001	0.00003903
26	Yes	4	0.00000001	0.00000001
27	Yes	6	0.00000001	0.00018254
28	Yes	6	0.00000001	0.00034283
29	Yes	6	0.00000001	0.00034022
30	Yes	6	0.00000001	0.00018210
31	Yes	6	0.00000001	0.00033413
32	Yes	6	0.00000001	0.00033390
33	Yes	6	0.00000001	0.00018227
34	Yes	6	0.00000001	0.00034351
35	Yes	6	0.00000001	0.00033680
36	Yes	6	0.00000001	0.00018183
37	Yes	6	0.00000001	0.00033439
38	Yes	6	0.00000001	0.00033509
39	Yes	4	0.00000001	0.00007675
40	Yes	4	0.00000001	0.00063211
41	Yes	4	0.00000001	0.00067629
42	Yes	4	0.00000001	0.00008224
43	Yes	4	0.00000001	0.00062743
44	Yes	4	0.00000001	0.00062902
45	Yes	4	0.00000001	0.00008234

46	Yes	4	0.00000001	0.00067715
47	Yes	4	0.00000001	0.00063061
48	Yes	4	0.00000001	0.00007652
49	Yes	4	0.00000001	0.00064062
50	Yes	4	0.00000001	0.00064134

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	34.920	40	1.7135	0.0027
L2	141.25 - 90.25	19.238	40	1.4090	0.0011
L3	95.5 - 44.5	8.114	40	0.8700	0.0004
L4	51 - 0	2.147	40	0.3902	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	Lighting Rod 3/4" x 8'	40	34.920	1.7135	0.0027	47056
160.00	LNx-6515DS-VTM w/ Mount Pipe	40	25.194	1.5571	0.0016	8402
145.00	BXA-80063/6 w/ Mount Pipe	40	20.373	1.4430	0.0012	5472
133.00	Side Arm Mount [SO 701-3]	40	16.859	1.3256	0.0009	5007
100.00	1" Dia x 3.5-ft	40	8.983	0.9259	0.0005	4915
70.00	1" Dia x 3.5-ft	40	4.118	0.5775	0.0002	5055
40.00	1" Dia x 3.5-ft	40	1.381	0.2949	0.0001	6597
10.00	1" Dia x 3.5-ft	40	0.231	0.0696	0.0000	26389

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	163.836	4	8.0655	0.0126
L2	141.25 - 90.25	90.381	4	6.6323	0.0051
L3	95.5 - 44.5	38.158	4	4.0953	0.0019
L4	51 - 0	10.100	4	1.8357	0.0006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	Lighting Rod 3/4" x 8'	4	163.836	8.0655	0.0127	10378
160.00	LNx-6515DS-VTM w/ Mount Pipe	4	118.289	7.3292	0.0076	1848
145.00	BXA-80063/6 w/ Mount Pipe	4	95.701	6.7923	0.0056	1199
133.00	Side Arm Mount [SO 701-3]	4	79.224	6.2398	0.0043	1092
100.00	1" Dia x 3.5-ft	4	42.242	4.3581	0.0021	1058
70.00	1" Dia x 3.5-ft	4	19.371	2.7177	0.0011	1080
40.00	1" Dia x 3.5-ft	4	6.493	1.3875	0.0004	1403
10.00	1" Dia x 3.5-ft	4	1.088	0.3273	0.0001	5610

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	188 - 137 (1)	TP32.711x22x0.25	51.00	0.00	0.0	25.049	-12.65	1738.73	0.007
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	51.00	0.00	0.0	40.284	-22.44	2768.52	0.008
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	51.00	0.00	0.0	58.648	-35.79	4014.89	0.009
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	51.00	0.00	0.0	93.807	-58.36	6652.09	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{rx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M _{uy} kip-ft	φM _{ry} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L1	188 - 137 (1)	TP32.711x22x0.25	602.48	1128.63	0.534	0.00	1128.63	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	1844.80	2312.57	0.798	0.00	2312.57	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	3276.10	4069.02	0.805	0.00	4069.02	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	5168.61	8080.78	0.640	0.00	8080.78	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T _u kip-ft	φT _n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	188 - 137 (1)	TP32.711x22x0.25	24.54	869.37	0.028	1.08	2260.03	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	29.68	1384.26	0.021	1.08	4630.81	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	34.54	2007.45	0.017	1.07	8147.98	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	39.33	3326.05	0.012	1.07	16181.33	0.000

Pole Interaction Design Data

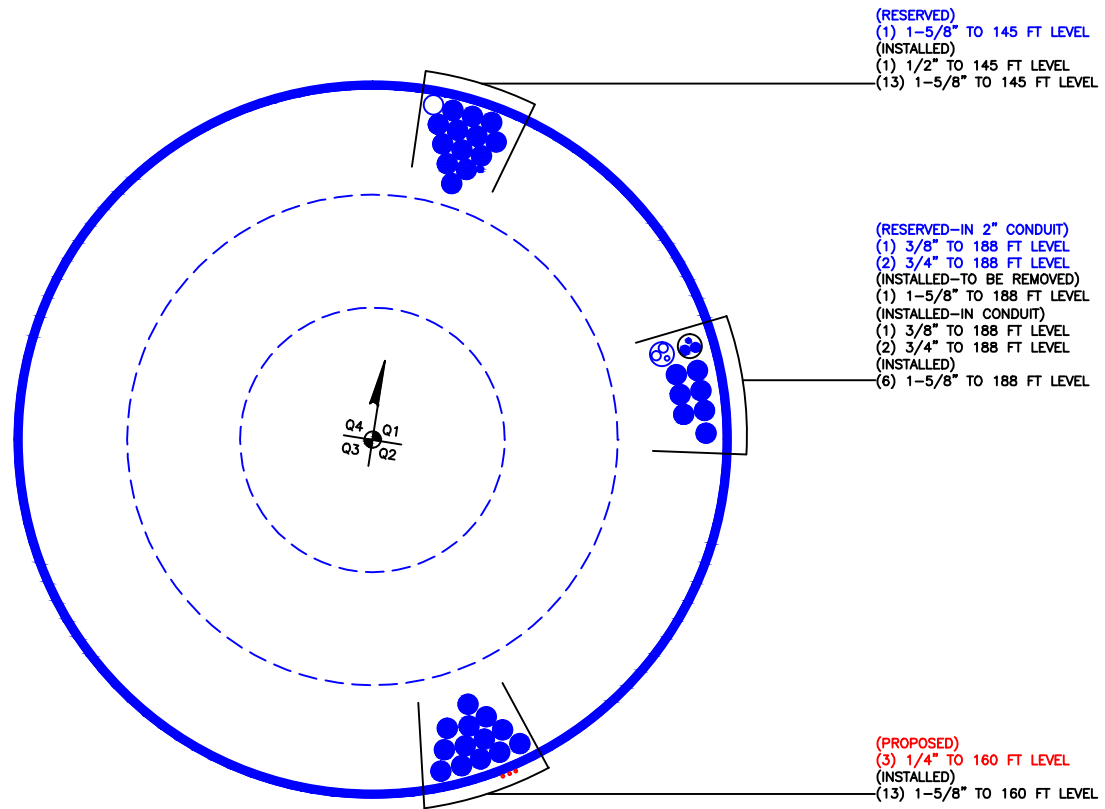
Section No.	Elevation ft	Ratio P _u φP _n	Ratio M _{ux} φM _{rx}	Ratio M _{uy} φM _{ry}	Ratio V _u φV _n	Ratio T _u φT _n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	188 - 137 (1)	0.007	0.534	0.000	0.028	0.000	0.542	1.000	4.8.2
L2	137 - 90.25 (2)	0.008	0.798	0.000	0.021	0.000	0.806	1.000	4.8.2
L3	90.25 - 44.5 (3)	0.009	0.805	0.000	0.017	0.000	0.814	1.000	4.8.2
L4	44.5 - 0 (4)	0.009	0.640	0.000	0.012	0.000	0.649	1.000	4.8.2

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
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Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	188 - 137	Pole	TP32.711x22x0.25	1	-12.65	1738.73	54.2	Pass	
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-22.44	2768.52	80.6	Pass	
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-35.79	4014.89	81.4	Pass	
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-58.36	6652.09	64.9	Pass	
							Summary		
							Pole (L3)	81.4	Pass
							RATING =	81.4	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: 803175		
Site Name: CT NEW BRITAIN 3 CAC 803		
App #: 408505 Rev 1		
Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	67	in
Anchor Spacing:	6.125	in

Plate Data

W=Side:	66	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	14	in

Stiffener Data (Welding at both sides)

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

Pole Data

Diam:	59.61	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	5169	ft-kips
Factored Axial, Pu:	58	kips
Factored Shear, Vu:	39	kips

Anchor Rod Results

TIA G --> Max Rod ($C_u + V_u/\eta$):	192.0 Kips
Axial Design Strength, $\Phi * F_u * A_{net}$:	260.0 Kips
Anchor Rod Stress Ratio:	73.8% Pass

Base Plate Results

Base Plate Stress:	31.3 ksi	Flexural Check
PL Design Bending Strength, $\Phi * F_y$:	45.0 ksi	
Base Plate Stress Ratio:	69.5% Pass	

PL Ref. Data	
Yield Line (in):	33.73
Max PL Length:	33.73

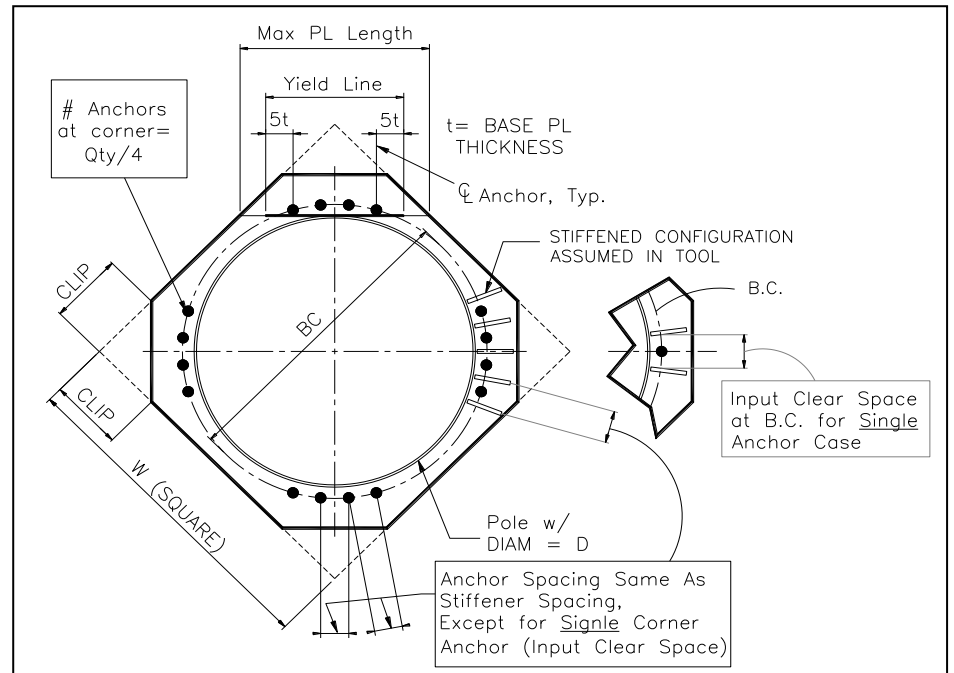
N/A - Unstiffened

Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$:	N/A
Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check:	N/A
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** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Pier and Pad Foundation



BU # : 803175
Site Name: CT NEW BRITAIN
App. Number: 408505 Rev 1

TIA-222 Revision: G
Tower Type: Monopole

Block Foundation?:

Superstructure Analysis Reactions		
Compression, P_{comp} :	58	kips
Base Shear, V_{u_comp} :	39	kips
Moment, M_u :	5169	ft-kips
Tower Height, H :	188	ft
BP Dist. Above Fdn, bp_{dist} :	3.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
<i>Lateral (Sliding) (kips)</i>	245.90	39.00	15.9%	Pass
<i>Bearing Pressure (ksf)</i>	13.50	2.92	21.6%	Pass
<i>Overtuning (kip*ft)</i>	8033.45	5472.88	68.1%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	9849.69	5344.50	54.3%	Pass
<i>Pier Compression (kip)</i>	30551.04	109.84	0.4%	Pass
<i>Pad Flexure (kip*ft)</i>	6836.89	2260.61	33.1%	Pass
<i>Pad Shear - 1-way (kips)</i>	766.05	348.51	45.5%	Pass
<i>Pad Shear - 2-way (ksi)</i>	0.16	0.05	27.9%	Pass

Soil Rating:	68.1%
Structural Rating:	54.3%

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	8.0	ft
Ext. Above Grade, E :	0.5	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

Pad Properties		
Depth, D :	7.0	ft
Pad Width, W :	26.0	ft
Pad Thickness, T :	3.0	ft
Pad Rebar Size, Sp :	11	
Pad Rebar Quantity, mp :	35	
Pad Clear Cover, cc_{pad} :	4	in

Material Properties		
Rebar Grade, Fy :	60000	psi
Concrete Compressive Strength, $F'c$:	3000	psi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	110	pcf
Ultimate Gross Bearing, Q_{ult} :	18.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	30	degrees
SPT Blow Count, N_{blows} :	11	
Base Friction, μ :	0.3	
Neglected Depth, N :	3.3	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	None	ft

<--Toggle between Gross and Net



[ASCE 7 Windspeed](#)
[ASCE 7 Ground Snow Load](#)
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Search Results

Query Date: Fri Sep 22 2017

Latitude: 41.6866

Longitude: -72.7577

**ASCE 7-10 Windspeeds
(3-sec peak gust in mph*):**

Risk Category I: 112

Risk Category II: 122

Risk Category III-IV: 132

MRI 10-Year:** 76

MRI 25-Year:** 86

MRI 50-Year:** 93

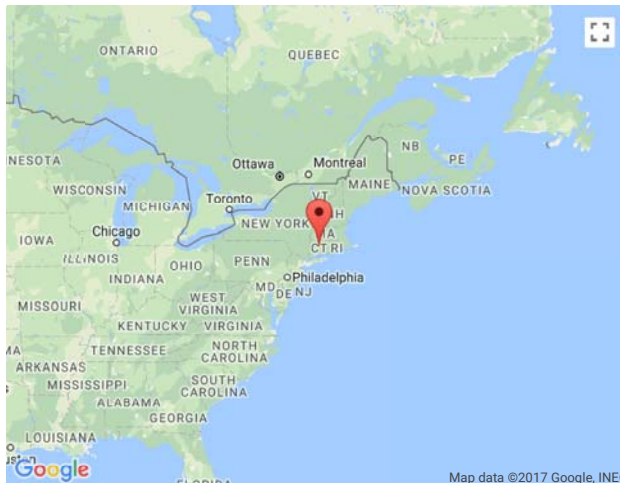
MRI 100-Year:** 99

ASCE 7-05 Windspeed:

100 (3-sec peak gust in mph)

ASCE 7-93 Windspeed:

80 (fastest mile in mph)



$$122V_{ult} = 97 V_{nom}$$

*Miles per hour
**Mean Recurrence Interval

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.



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CCISeismic - Design Category

Per 2012/2015 IBC

Site BU: 803175
 Work Order: 1464605
 Application: 408505 Rev. 1



	Degrees	Minutes	Seconds	
Site Latitude =	41	41	11.79	41.6866 degrees
Site Longitude =	-72	45	27.79	-72.7577 degrees
Ground Supported Structure =	Yes			
Structure Class =	II			(Table 2-1)
Site Class =	D - Stiff Soil			(Table 2-11)
Spectral response acceleration short periods, S_s =	0.183			USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.064			
Importance Factor, I =	1.0			(Table 2-3)
Acceleration-based site coefficient, F_a =	1.6			(Table 2-12)
Velocity-based site coefficient, F_v =	2.4			(Table 2-13)
Design spectral response acceleration short period, S_{DS} =	0.195			(2.7.6)
Design spectral response acceleration 1 s period, S_{D1} =	0.102			(2.7.6)
Seismic Design Category - Short Period Response =	B			ASCE 7-05 Table 11.6-1
Seismic Design Category - 1s Period Response =	B			ASCE 7-05 Table 11.6-2
Worst Case Seismic Design Category =	B			ASCE 7-05 Tables 11.6-1 and 6-2

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Seismic Design Category - 1s Period Response =	B			ASCE 7-05 Table 11.6-2
Worst Case Seismic Design Category =	B			ASCE 7-05 Tables 11.6-1 and 6-2

Exhibit E



RADIO FREQUENCY EMISSIONS ANALYSIS REPORT EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11783A (MW Add)

Crown Comm. Monopole
167 Lester Street
New Britain, CT 06051

September 27, 2017

EBI Project Number: 6217004236

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	8.084%



September 27, 2017

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11783A – Crown Comm. Monopole**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **167 Lester Street, New Britain, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu\text{W}/\text{cm}^2$, and the general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 5 GHz microwave bands is 1000 $\mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **167 Lester Street, New Britain, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel and microwave antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel
- 5) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.
- 6) 1 microwave backhaul channel (5 GHz) was considered for the microwave Link. This channel has a transmit power of 1 Watt.



- 7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antennas used in this modeling are the **Ericsson AIR32 B66A/B2A** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels, the **Commscope LNX-6515DS-A1M** for 700 MHz channels and the **Fastback Networks IBR 1300** for 5 GHz microwave backhaul. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR32 B66A/B2A** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. the **Fastback Networks IBR 1300 antenna** has a maximum gain of **10 dBd** at 5 GHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antenna mounting height centerline of the proposed antennas is **163 feet** above ground level (AGL) for all standard panel antennas and 5 GHz microwave radio / antenna.
- 11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 12) All calculations were done with respect to uncontrolled / general population threshold limits.



T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	163	Height (AGL):	163	Height (AGL):	163
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	1.362	Antenna B1 MPE%	1.362	Antenna C1 MPE%	1.362
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	163	Height (AGL):	163	Height (AGL):	163
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	0.681	Antenna B2 MPE%	0.681	Antenna C2 MPE%	0.681
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	163	Height (AGL):	163	Height (AGL):	163
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.270	Antenna B3 MPE%	0.270	Antenna C3 MPE%	0.270
				Antenna #:	4 (Microwave)
				Make / Model:	Fastback Networks IBR 1300
				Gain:	10.0 dBd
				Height (AGL):	163
				Frequency Bands	5.0 GHz
				Channel Count	1
				Total TX Power(W):	1
				ERP (W):	10 W
				Antenna C4 MPE%	0.001

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	2.314%
AT&T	1.510 %
Verizon Wireless	4.260 %
Site Total MPE %:	8.084%

T-Mobile Sector A Total:	2.313%
T-Mobile Sector B Total:	2.313%
T-Mobile Sector C Total:	2.314%
Site Total:	8.084%



T-Mobile Per Sector Maximum Power Values

T-Mobile _Max Values per sector (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	163	6.81	AWS - 2100 MHz	1000	0.681%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	163	6.81	PCS - 1900 MHz	1000	0.681%
T-Mobile AWS - 2100 MHz UMTS	2	1,167.14	163	3.40	AWS - 2100 MHz	1000	0.340%
T-Mobile PCS - 1900 MHz GSM	2	1,167.14	163	3.40	PCS - 1900 MHz	1000	0.340%
T-Mobile 700 MHz LTE	1	865.21	163	1.26	700 MHz	467	0.270%
	1	10.00	163	0.01	5 GHz Microwave	1000	0.001%
						Total*:	2.313%

*NOTE: Totals may vary by 0.001% due to summing of remainders

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	2.313%
Sector B:	2.313%
Sector C:	2.314%
T-Mobile Per Sector Maximum:	2.314%
Site Total:	8.084%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **8.084%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Exhibit F

CT11783B

UNIONVILLE
24 MILL ST
UNIONVILLE
CT
06085-9998
0883640185
(800)275-8777 1:11 PM

10/04/2017

Product Description	Sale Qty	Final Price
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PM 1-Day Flat Rate Env	1	\$6.65
------------------------	---	--------

(Domestic)
(NEW BRITAIN, CT 06051)
(Flat Rate)
(Expected Delivery Day)
(Thursday 10/05/2017)
(USPS Tracking #)
(9505 5119 1366 7277 1024 63)

Insurance	1	\$0.00
(Up to \$50.00 included)		

PM 1-Day Flat Rate Env	1	\$6.65
------------------------	---	--------

(Domestic)
(NEW BRITAIN, CT 06051)
(Flat Rate)
(Expected Delivery Day)
(Thursday 10/05/2017)
(USPS Tracking #)
(9505 5119 1366 7277 1024 70)

Insurance	1	\$0.00
(Up to \$50.00 included)		

PM 2-Day Flat Rate Env	1	\$6.65
------------------------	---	--------

(Domestic)
(CLIFTON PARK, NY 12065)
(Flat Rate)
(Expected Delivery Day)
(Friday 10/06/2017)
(USPS Tracking #)
(9505 5119 1366 7277 1024 87)

Insurance	1	\$0.00
(Up to \$50.00 included)		

Total		\$19.95
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Credit Card Remitd		\$19.95
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(Card Name:VISA)
(Account #:XXXXXXXXXXXX0717)
(Approval #:03556G)
(Transaction #:177)

Includes up to \$50 insurance

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