



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

July 11, 2016

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

RE: Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 881535
AT&T Site ID: CTL02093
425 Indian Ledge Park Rd, Trumbull, CT 06611
Latitude: 41° 16' 23.81"/ Longitude: -73° 12' 47.18"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 187-foot level of the existing 195-foot self-support tower at 425 Indian Ledge Park Road in Trumbull, CT. The tower is owned by Crown Castle. The property is owned by the Town of Trumbull. AT&T now intends to replace three (3) antennas with three (3) new 700 MHz antennas. These antennas would be installed at the 187-foot level of the tower. AT&T also intends to install three (3) RRU12/A2s.

Please be advised I have included an email from Gail Andreyka with the zoning department at the Town of Trumbull indicating they no longer have the original zoning approval on file as well as an email from myself indicating the same. Please use both emails to replace the zoning approval requirement.

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 Mr. Timothy Herbst, First Selectman, Town of Trumbull, as well as the property owner, and Crown Castle is the tower 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.

Melanie A. Bachman

July 11, 2016

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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, AT&T 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

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: Mr. Timothy Herbst
Town of Trumbull
5866 Main Street
Trumbull, CT 06611

Town of Trumbull
5866 Main Street
Trumbull, CT 06611

Hanlon, Dashanna

From: Myl, Kimberly
Sent: Friday, March 11, 2016 9:34 AM
To: siting.council@ct.gov
Subject: Existing Telecommunications Tower - 425 Indian Ledge Park Road, Trumbull (Crown: 881535 / T-Mobile CT11961A)

Good Morning,

Please be advised per the below email from the Town of Trumbull and on behalf of Crown Castle the Tower Owner, neither party have the original zoning approval on file. Please use this email notification to replace that requirement. Please let me know if you have any questions or need additional information. Thank you in advance.

KIMBERLY MYL

Real Estate Specialist

T: (201) 236-9069 | M: (201) 993-3697

CROWN CASTLE

1200 MacArthur Blvd, Suite 200

Mahwah, NJ 07430

From: Gail Andreyka [<mailto:gandreyka@trumbull-ct.gov>]
Sent: Tuesday, March 08, 2016 9:48 AM
To: Myl, Kimberly
Cc: Douglas Wenz
Subject: RE: Zoning Approval - Telecommunications Tower 425 Indian Ledge Park Road

Hi Kim,

We cannot locate the zoning approval. They never came to Planning & Zoning with an application as far as we know. If you have any further questions, please contact Doug Wenz 203-452-5052.

Thank you,

Gail Andreyka

From: Myl, Kimberly [<mailto:Kimberly.Myl@crowncastle.com>]
Sent: Monday, February 29, 2016 12:45 PM
To: Gail Andreyka
Subject: Zoning Approval - Telecommunications Tower 425 Indian Ledge Park Road

Good Afternoon Gail,

I have another existing telecommunications facility that I will need a copy of the original zoning resolution to submit into the CSC. Can you kindly forward this over to me so I can submit on behalf of T-Mobile, one of our tenants. If you do not have this document, kindly reply stating that the township does not have this on record and I can use your email in place of this requirement. Please call or email me if you have any questions or need additional information. Thank you in advance.

KIMBERLY MYL

Real Estate Specialist

T: (201) 236-9069 | M: (201) 993-3697

CROWN CASTLE
1200 MacArthur Blvd, Suite 200
Mahwah, NJ 07430

425 INDIAN LEDGE PARK ROAD

Location 425 INDIAN LEDGE PARK ROAD

Mblu F/05 / 00096/ 000/

Acct#

Owner TRUMBULL TOWN OF

Assessment \$1,320,620

Appraisal \$1,886,600

PID 12730

Building Count 1

Fire District T

Current Value

Appraisal	
Valuation Year	Total
2015	\$1,886,600

Assessment	
Valuation Year	Total
2015	\$1,320,620

Owner of Record

Owner TRUMBULL TOWN OF
Co-Owner
Address 5866 MAIN STREET
 TRUMBULL, CT 06611

Sale Price \$0
Certificate 1
Book & Page 1/ 466
Sale Date 06/15/1989

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
TRUMBULL TOWN OF	\$0	1	1/ 466	06/15/1989

Building Information

Building 1 : Section 1

Year Built:

Living Area: 0

Building Photo

Building Attributes	
Field	Description
Style	Outbuildings
Stories:	
Occupancy	
Exterior Wall 1	

Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Floor Covering	
Alt. Floor Cover	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Total Kitchens	
Total Elec Meters	



F05-96 05/04/2015

(http://images.vgsi.com/photos2/TrumbullCTPhotos//\00\02\19\51.JPG)

Building Layout

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 921
Description Mun Lnd Res
Zone AA
Neighborhood 320
Alt Land Appr Category No

Land Line Valuation

Size (Acres) 46.5
Frontage
Depth

Outbuildings

Outbuildings					Legend
Code	Description	Sub Code	Sub Description	Size	Bldg #
BHS1	Comm Bth Hse	CB	CindBk/Frame	200 S.F.	1

Valuation History

Appraisal	
Valuation Year	Total
2014	\$1,972,000

2013	\$1,972,000
2012	\$1,972,000

Assessment	
Valuation Year	Total
2014	\$1,380,400
2013	\$1,380,400
2012	\$1,380,400

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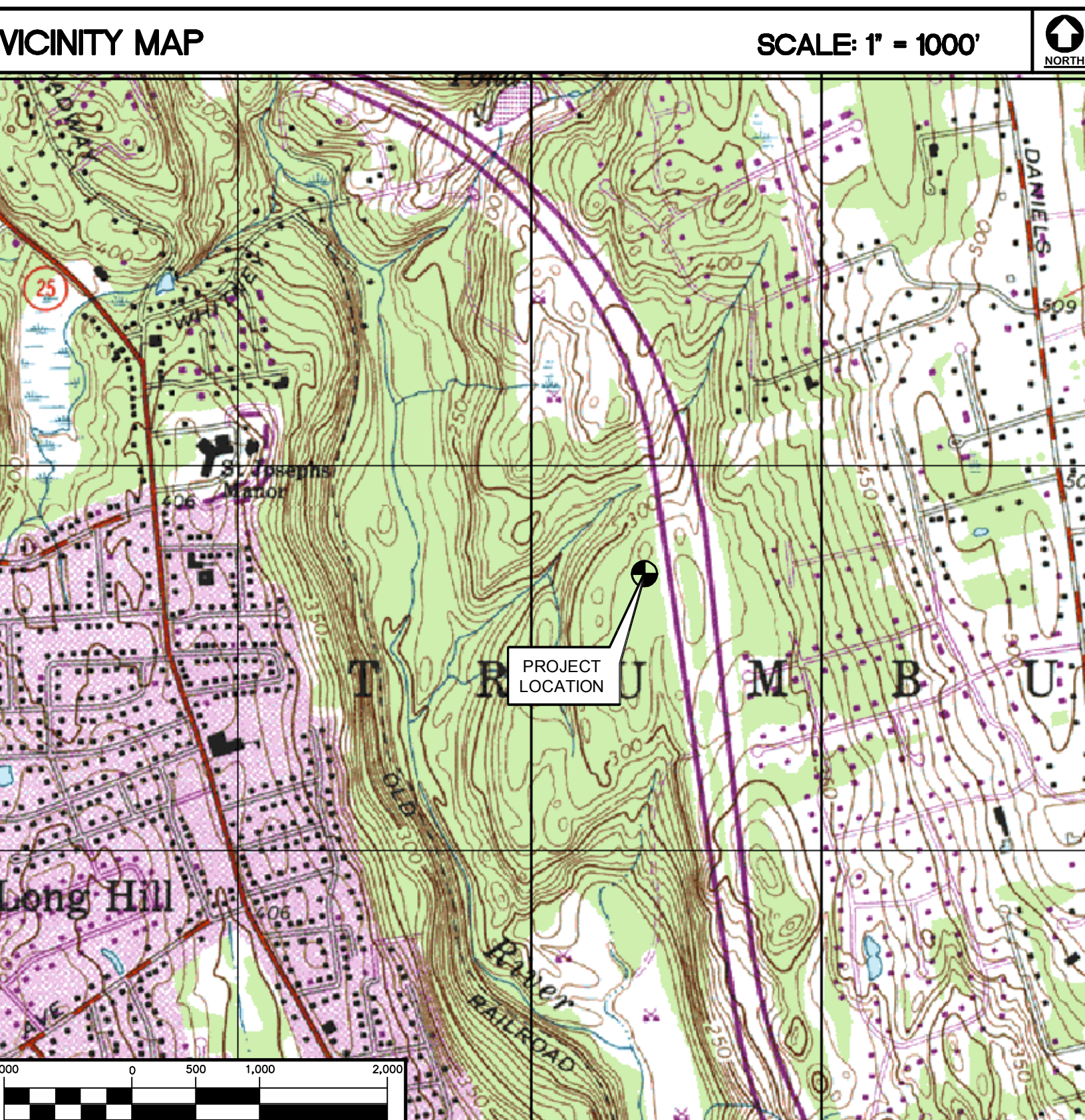
WIRELESS COMMUNICATIONS FACILITY CT2093 - LTE 2C TRUMBULL - INDIAN LEDGE CROWN CASTLE SITE NO.: 881535 425 INDIAN LEDGE PARK TRUMBULL, CT 06611

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2005 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM:	500 ENTERPRISE DRIVE ROCKY HILL, CONNECTICUT	TO:	INDIAN LEDGE PARK TRUMBULL, CT 06611
1.	Depart Enterprise Dr toward Capitol Blvd	0.3	mi.
2.	Turn left onto Capitol Blvd	0.2	mi.
3.	Turn left onto West St	0.3	mi.
4.	Take ramp left for I-91 South	9.7	mi.
5.	At exit 17, take ramp right for SR-15 South / Wilbur Cross Pkwy toward E. Main St	32.2	mi.
6.	At exit 49, take ramp right for SR-25 North toward Danbury	4.9	mi.
7.	Turn left onto SR-111 / Main St	0.8	mi.
8.	Turn left onto Whitney Ave	0.5	mi.
9.	Arrive at entrance to Indian Ledge Park on Right.		



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
 - A. REMOVE & REPLACE EXISTING POSITION 4 LTE ANTENNA FOR PROPOSED HEXPORT ANTENNA, (1) PER SECTOR/(3) TOTAL.
 - B. INSTALL (3) NEW RRUS-12+A2 BEHIND POSITION 4 ANTENNA.

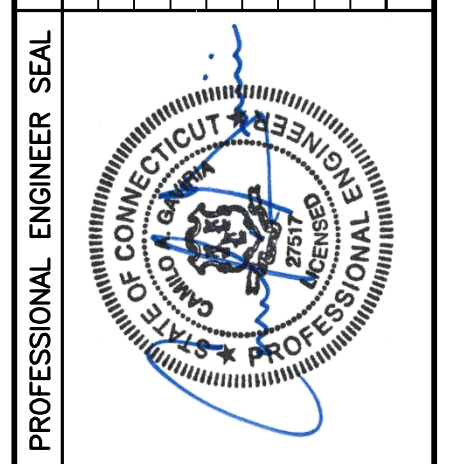
PROJECT INFORMATION

AT&T SITE NUMBER:	CT2093
AT&T SITE NAME:	TRUMBULL - INDIAN LEDGE
SITE ADDRESS:	CROWN CASTLE SITE NO.: 881535 INDIAN LEDGE PARK TRUMBULL, CT 06611
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENITEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT. 06405
PROJECT COORDINATES:	LATITUDE: 41°-16'-23.873" N LONGITUDE: 73°-12'-47.196" W GROUND ELEVATION: ±324' AMSL

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
N-1	NOTES AND SPECIFICATIONS	1
C-1	PLANS AND ELEVATION	1
C-2	LTE SYSTEM EQUIPMENT PLANS & DETAILS	1
E-1	ELECTRICAL DETAILS AND NOTES	1
E-2	ELECTRICAL DETAILS	1

1	6/15/16	CAS	LVP	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
0	05/09/16	KAW	CAS	CONSTRUCTION DOCUMENTS - ISSUED FOR CLIENT REVIEW
				DATE
				REVISION
				DRAWN BY
				CHK'D BY
				DESCRIPTION



CENITEK engineering
 Centek on Solutions
 (203) 488-0380
 (203) 488-3887
 632 North Branford Road
 Branford, CT 06405
 www.CentekEng.com

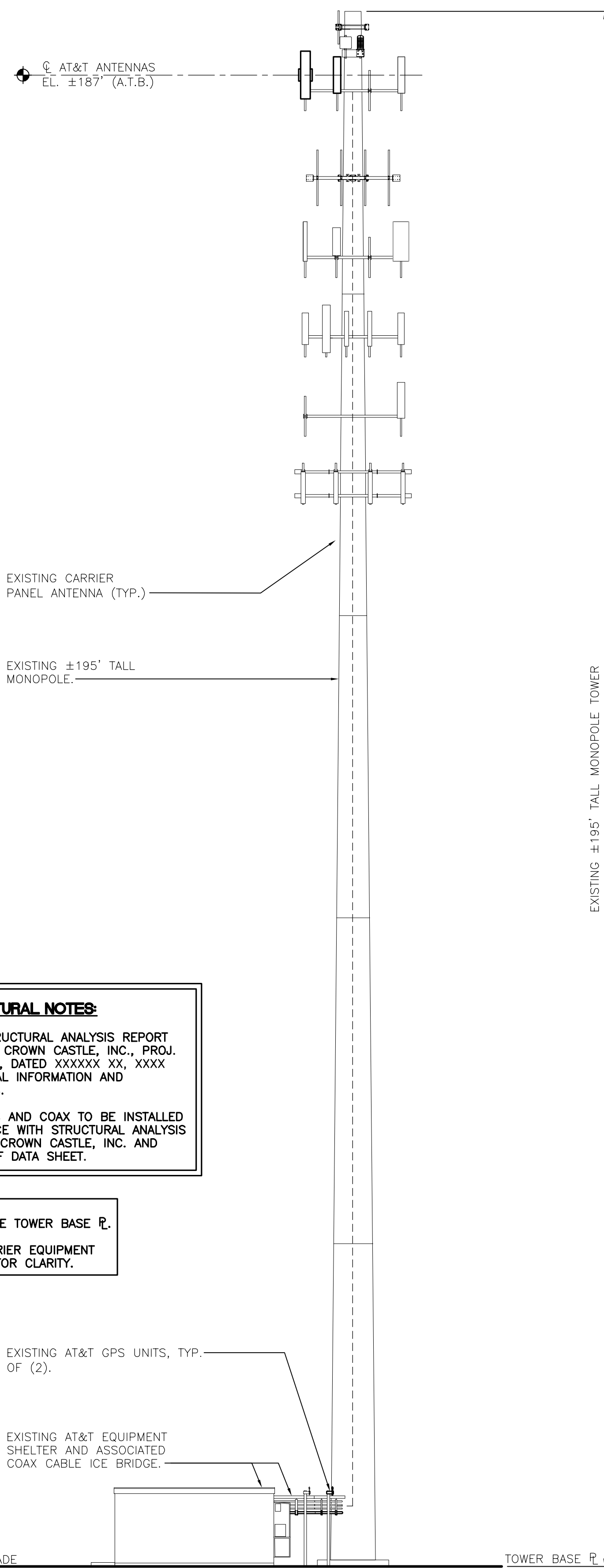
AT&T MOBILITY
TRUMBULL - INDIAN LEDGE
CT2093 - LTE 2C
425 INDIAN LEDGE PARK
TRUMBULL, CT 06611

DATE: 05/11/16
 SCALE: AS NOTED
 JOB NO. 16071.07

TITLE SHEET

T-1

Sheet No. 1 of 7



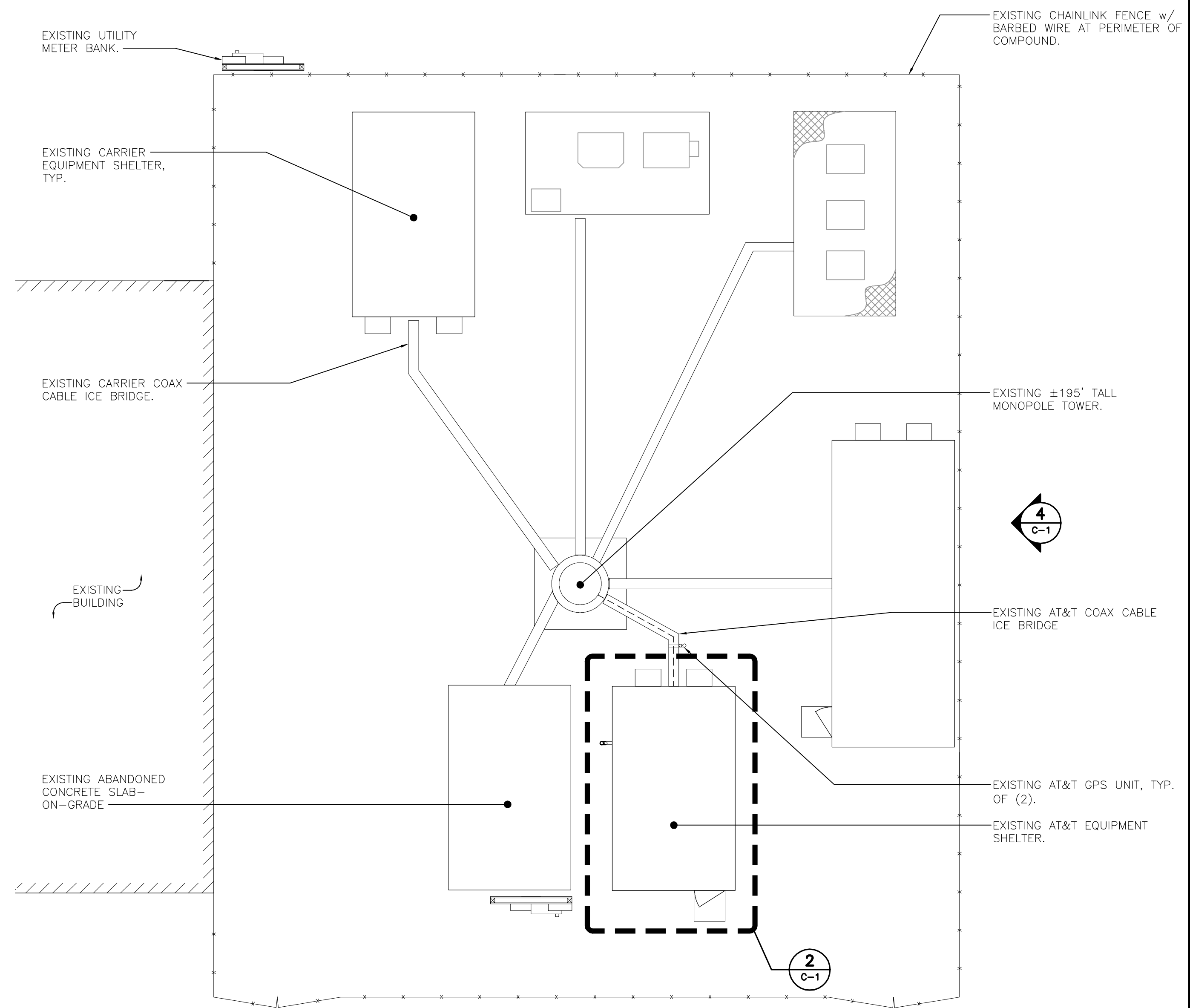
TOWER STRUCTURAL NOTES:

- REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CROWN CASTLE, INC., PROJ. NO. XXXXX.XX, DATED XXXXXX XX, XXXX FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE, INC. AND FINAL AT&T RF DATA SHEET.

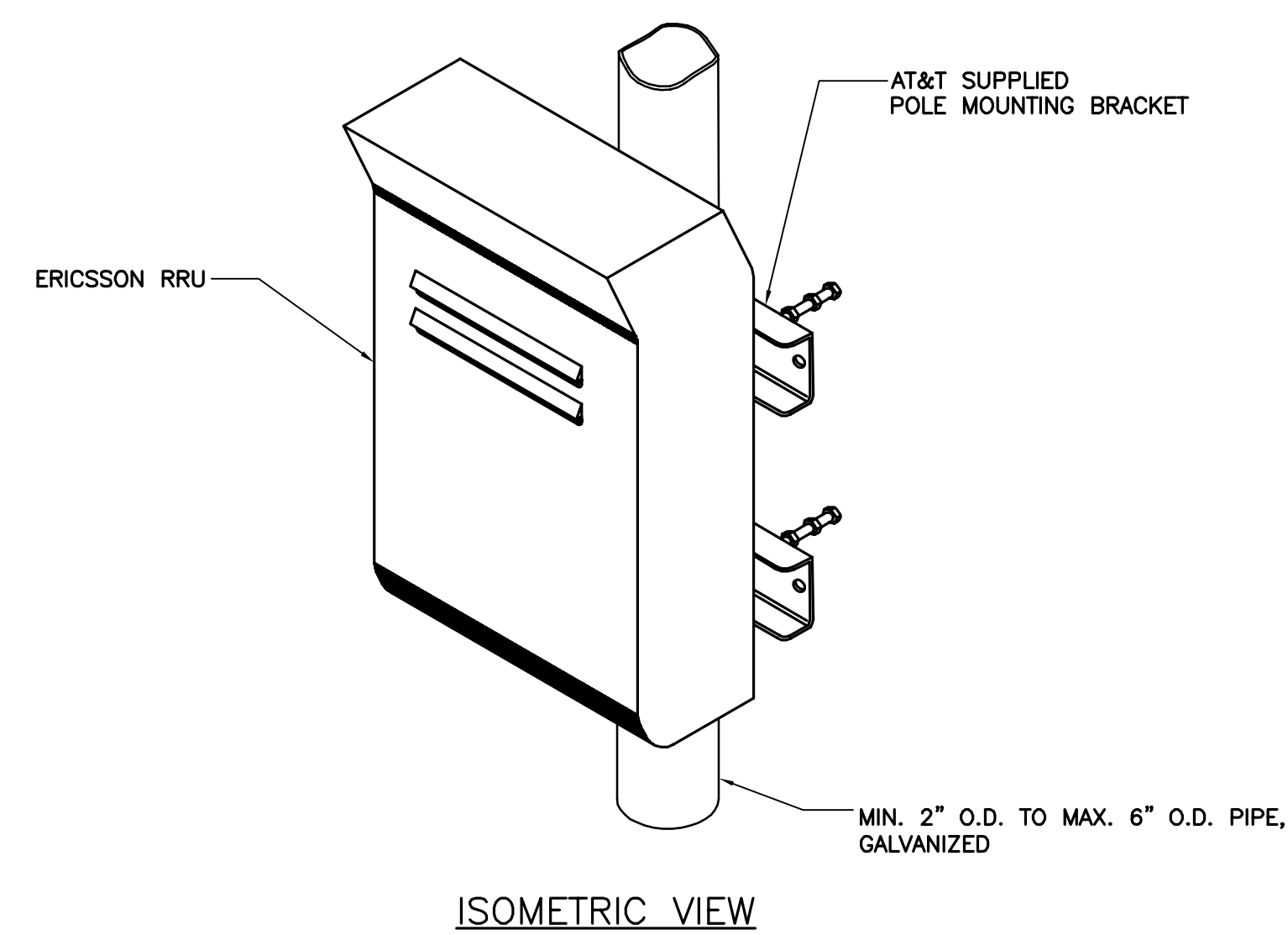
NOTES:

- ATB = ABOVE TOWER BASE R.
- EXISTING CARRIER EQUIPMENT NOT SHOWN FOR CLARITY.

4 PARTIAL EAST ELEVATION
SCALE: 3/32" = 1'-0"



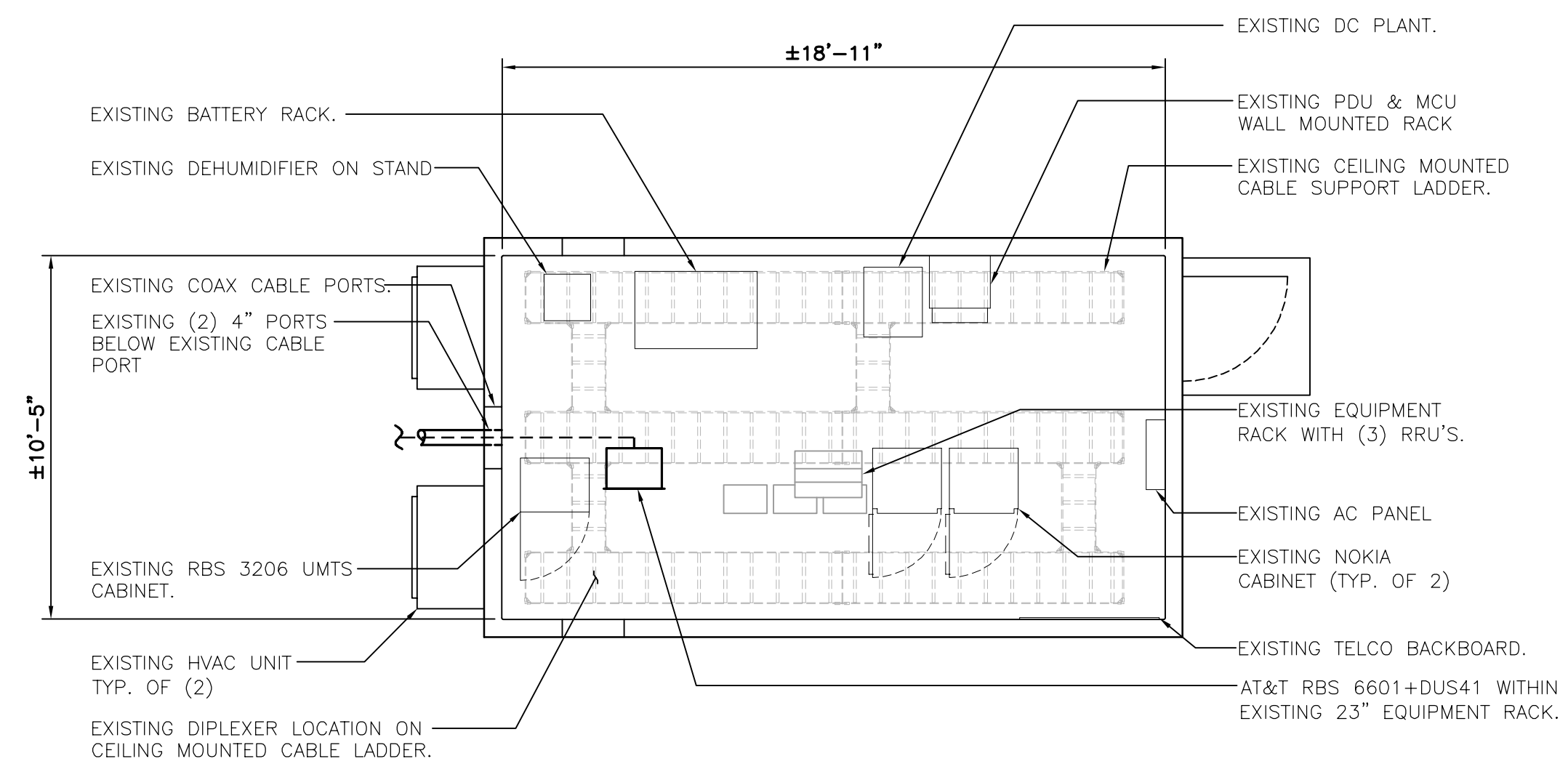
1 COMPOUND PLAN
SCALE: 1/8" = 1'-0"



NOTES:

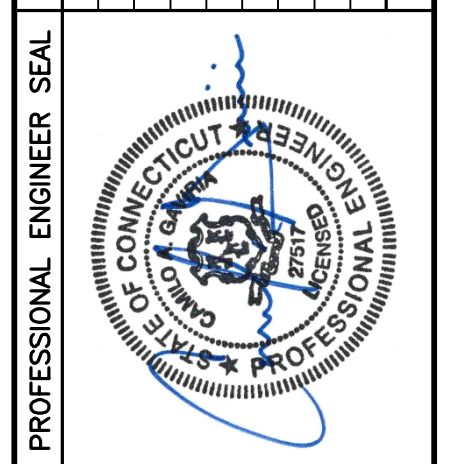
- AT&T SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
- NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

3 TYPICAL RRU MOUNTING DETAILS
SCALE: NTS



2 EQUIPMENT SHELTER PLAN
SCALE: 1/4" = 1'-0"

REV.	DATE	BY	CHKD	DESCRIPTION
1	6/15/16	CAS	KAW	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
0	05/05/16	CAS	KAW	CONSTRUCTION DOCUMENTS - ISSUED FOR CLIENT REVIEW



CENTEK engineering
Centered on Solutions™
(203) 498-0390
(203) 498-3397 Fax
632 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
TRUMBULL - INDIAN LEDGE
CT2093 - LTE 2C
495 INDIAN LEDGE PARK
TRUMBULL, CT 06611

DATE: 05/11/16
SCALE: AS NOTED
JOB NO. 16071.07

PLANS, ELEVATION AND DETAILS

C-1
Sheet No. 3 of 7

Date: May 18, 2016

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

JACOBS
Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
(770) 701-2500

Subject: Structural Analysis Report

Carrier Designation: AT&T Mobility Co-Locate
Carrier Site Number: CTL02093
Carrier Site Name: TRUMBULL INDIAN LEDGE

Crown Castle Designation: Crown Castle BU Number: 881535
Crown Castle Site Name: TRUMBULL TOWER
Crown Castle JDE Job Number: 377805
Crown Castle Work Order Number: 1237425
Crown Castle Application Number: 344101 Rev. 1

Engineering Firm Designation: Jacobs Engineering Group, Inc. Project Number: 1237425

Site Data: 425 Indian Ledge Park Rd, Trumbull, Fairfield County, CT
Latitude 41° 16' 23.81", Longitude -73° 12' 47.18"
195 Foot - Monopole Tower

Dear Charles McGuirt,

Jacobs Engineering Group, Inc. 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 903727, in accordance with application 344101, 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.

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

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

Structural analysis prepared by:

Kristi Holder, E.I.
Tower Structural Engineer

Reviewed by:



Matthew E. Watkins, P.E.
Engineering Project Manager

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tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 195 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in July of 2001. 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/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
185.0	187.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	-	-	-
		3	ericsson	RRUS12/RRUS A2			

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
185.0	187.0	3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe	-	-	3
		6	powerwave technologies	7770.00 w/ Mount Pipe	12 1 2	1-1/4 3/8 5/8	1
	6	ericsson	RRUS-11				
	12	powerwave technologies	LGP21401				
	1	raycap	DC6-48-60-18-8F				
		185.0	1	tower mounts	Platform Mount [LP 601-1]		
174.0	174.0	1	tower mounts	Platform Mount [LP 601-1]	-	-	5
164.0	166.0	1	dragonwave	A-ANT-23G-2-C	3 6 2	1-1/4 5/16 7983A	1
		3	argus technologies	LLPX310R w/ Mount Pipe			
		3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
	3	alcatel lucent	1900MHz RRH (65MHz)				
	3	alcatel lucent	800 EXTERNAL NOTCH FILTER				
	3	alcatel lucent	800MHZ RRH				
	9	rfs celwave	ACU-A20-N				
	3	samsung telecommunications	FDD_R6_RRH				
	164.0	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
154.0	155.0	3	alcatel lucent	RRH2x40-AWS	19	1-5/8	1
		3	antel	BXA-70063/6CF w/ Mount Pipe			
		2	antel	LPA-4016 w/ Mount Pipe			
		4	decibel	DB844G65ZAXY w/ Mount Pipe			
		3	kathrein	742 213 w/ Mount Pipe			
		1	rfs celwave	DB-B1-6C-8AB-0Z			
	3	rymsa wireless	MG D3-800TV w/ Mount Pipe				
	154.0	1	tower mounts	Platform Mount [LP 601-1]			
144.0	145.0	3	commscope	SBNH-1D65C-SR w/ Mount Pipe	1	1-1/4	2
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		3	ericsson	RRUS 11 B12			
	3	ericsson	RRUS 11 B2				
	144.0	1	tower mounts	Platform Mount [LP 601-1]	12	1-5/8	1
134.0	135.0	12	decibel	DB844H90E-XY w/ Mount Pipe	9	1-1/4	4
	134.0	1	tower mounts	Platform Mount [LP 303-1]	6	1-5/8	

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment To Be Removed; Not Considered In This Analysis
- 4) Abandoned Equipment; Considered In This Analysis
- 5) Empty Mount; Considered In This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
195	195	2	Generic	Omni Whip Antenna	-	-
185	185	12	Allgon	7120.16	-	-
175	175	12	Allgon	7120.16	-	-
165	165	12	Allgon	7120.16	-	-
155	155	12	Allgon	7120.16	-	-
145	145	12	Allgon	7120.16	-	-
135	135	12	Allgon	7120.16	-	-
125	125	12	Allgon	7120.16	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc., Inc.	1406210	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors Inc.	1405798	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Inc.	1405789	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group, Inc. 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	195 - 157.648	Pole	TP33.875x25x0.25	1	-7.39	1340.68	28.4	Pass
L2	157.648 - 117.083	Pole	TP42.9063x32.2501x0.3125	2	-19.16	2125.19	77.1	Pass
L3	117.083 - 81.0937	Pole	TP50.75x40.9017x0.375	3	-29.17	3017.43	91.1	Pass
L4	81.0937 - 40.0391	Pole	TP59.6563x48.3897x0.5	4	-45.23	4726.30	81.0	Pass
L5	40.0391 - 0	Pole	TP68x56.7861x0.5	5	-67.99	5568.98	88.5	Pass
							Summary	
						Pole (L3)	91.1	Pass
						RATING =	91.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	89.1	Pass
1	Base Plate	0	84.0	Pass
1	Base Foundation Structural	0	96.5	Pass
1	Base Foundation Soil Interaction	0	84.2	Pass

Structure Rating (max from all components) =	96.5%
-----------------------------------------------------	--------------

Notes:

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

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	4	5
Length (ft)	37.35	45.30	41.85	47.90	47.99
Number of Slats	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.5000	0.5000
Socket Length (ft)	4.73	5.86	6.84	7.95	7.95
Top Dia (in)	25.0000	32.2501	40.9017	48.3897	56.7861
Bot Dia (in)	33.8750	42.9063	50.7500	59.6563	68.0000
Grade			A572-65		
Weight (K)	2.9	5.7	7.7	13.8	16.0

195.0 ft

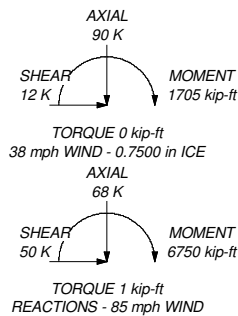
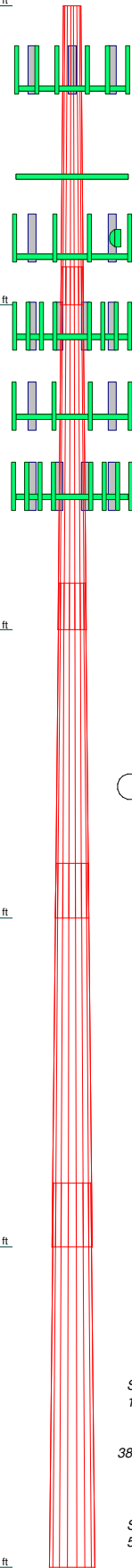
157.6 ft

117.1 ft

81.1 ft

40.0 ft

0.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) 7770.00 w/ Mount Pipe	185	Platform Mount [LP 601-1]	164
(2) 7770.00 w/ Mount Pipe	185	8' x 2" Mount Pipe	164
(2) 7770.00 w/ Mount Pipe	185	(2) 8' x 2" Mount Pipe	164
(2) RRUS-11	185	8' x 2" Mount Pipe	164
(2) RRUS-11	185	A-ANT-23G-2-C	164
(2) RRUS-11	185	742 213 w/ Mount Pipe	154
(4) LGP21401	185	742 213 w/ Mount Pipe	154
(4) LGP21401	185	MG D3-800TV w/ Mount Pipe	154
(4) LGP21401	185	MG D3-800TV w/ Mount Pipe	154
DC6-46-60-18-8F	185	MG D3-800TV w/ Mount Pipe	154
HPA-65R-BUU-H6 w/ Mount Pipe	185	BXA-70063/6CF w/ Mount Pipe	154
HPA-65R-BUU-H6 w/ Mount Pipe	185	BXA-70063/6CF w/ Mount Pipe	154
HPA-65R-BUU-H6 w/ Mount Pipe	185	(2) DB844G65ZAXY w/ Mount Pipe	154
RRUS12/RRUS A2	185	(2) DB844G65ZAXY w/ Mount Pipe	154
RRUS12/RRUS A2	185	(2) LPA-4016 w/ Mount Pipe	154
RRUS12/RRUS A2	185	RRH2x40-AWS	154
Platform Mount [LP 601-1]	185	RRH2x40-AWS	154
6' Climbing Ladder (Flat)	183	RRH2x40-AWS	154
Platform Mount [LP 601-1]	174	RRH2x40-AWS	154
(4) 8' x 2" Mount Pipe	174	DB-B1-6C-8AB-0Z	154
(4) 8' x 2" Mount Pipe	174	Platform Mount [LP 601-1]	154
(4) 8' x 2" Mount Pipe	174	742 213 w/ Mount Pipe	154
6' Climbing Ladder (Flat)	172	6' Climbing Ladder (Flat)	152
LLPX310R w/ Mount Pipe	164	SBNH-1D65C-SR w/ Mount Pipe	144
LLPX310R w/ Mount Pipe	164	SBNH-1D65C-SR w/ Mount Pipe	144
LLPX310R w/ Mount Pipe	164	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	144
APXVSP18-C-A20 w/ Mount Pipe	164	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	144
APXVSP18-C-A20 w/ Mount Pipe	164	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	144
APXVSP18-C-A20 w/ Mount Pipe	164	RRUS 11 B2	144
(3) ACU-A20-N	164	RRUS 11 B2	144
(3) ACU-A20-N	164	RRUS 11 B2	144
(3) ACU-A20-N	164	RRUS 11 B12	144
800MHZ RRH	164	RRUS 11 B12	144
800MHZ RRH	164	RRUS 11 B12	144
800MHZ RRH	164	KRY 112 144/1	144
FDD_R6_RRH	164	KRY 112 144/1	144
FDD_R6_RRH	164	KRY 112 144/1	144
FDD_R6_RRH	164	Platform Mount [LP 601-1]	144
1900MHz RRH (65MHz)	164	SBNH-1D65C-SR w/ Mount Pipe	144
1900MHz RRH (65MHz)	164	6' Climbing Ladder (Flat)	142
1900MHz RRH (65MHz)	164	(4) DB844H90E-XY w/ Mount Pipe	134
800 EXTERNAL NOTCH FILTER	164	(4) DB844H90E-XY w/ Mount Pipe	134
800 EXTERNAL NOTCH FILTER	164	Platform Mount [LP 303-1]	134
800 EXTERNAL NOTCH FILTER	164	(4) DB844H90E-XY w/ Mount Pipe	134

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 91.1%

JACOBS 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Jacobs Engineering Group, Inc. Job: TRUMBULL TOWER
	Project: BU 881535 WO 1237425 Client: Crown Castle Code: TIA/EIA-222-F Path: \\RALF\03\Telcom\881535 TRUMBULL TOWER\1237425\Analysis\Model\20160222_APP233698_881535.dwg
Drawn by: holderkg Date: 05/18/16	App'd: Scale: NTS Dwg No: E-1

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	TRUMBULL TOWER	Page	1 of 17
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	Client	Crown Castle	Designed by	holderkg

Tower Input Data

There is a pole section.

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

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 38 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	195.00-157.65	37.35	4.73	18	25.0000	33.8750	0.2500	1.0000	A572-65 (65 ksi)
L2	157.65-117.08	45.30	5.86	18	32.2501	42.9063	0.3125	1.2500	A572-65 (65 ksi)
L3	117.08-81.09	41.85	6.84	18	40.9017	50.7500	0.3750	1.5000	A572-65 (65 ksi)
L4	81.09-40.04	47.90	7.95	18	48.3897	59.6563	0.5000	2.0000	A572-65 (65 ksi)
L5	40.04-0.00	47.99		18	56.7861	68.0000	0.5000	2.0000	A572-65

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	Client Crown Castle	Designed by holderkg

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	(65 ksi)

Tapered Pole Properties

Section	Tip Dia.	Area	I	r	C	I/C	J	It/Q	w	w/t
	in	in ²	in ⁴	in	in	in ³	in ⁴	in ²	in	
L1	25.3857	19.6391	1519.8824	8.7863	12.7000	119.6758	3041.7647	9.8214	3.9600	15.84
	34.3976	26.6814	3811.2835	11.9369	17.2085	221.4768	7627.5821	13.3433	5.5220	22.088
L2	33.8785	31.6781	4082.2569	11.3378	16.3830	249.1758	8169.8853	15.8421	5.1260	16.403
	43.5681	42.2477	9683.4926	15.1208	21.7964	444.2708	19379.7271	21.1279	7.0015	22.405
L3	42.9339	48.2369	10009.1822	14.3870	20.7781	481.7190	20031.5347	24.1230	6.5387	17.437
	51.5329	59.9588	19222.9846	17.8831	25.7810	745.6260	38471.2633	29.9851	8.2720	22.059
L4	50.7708	76.0009	22021.1305	17.0008	24.5819	895.8253	44071.2370	38.0077	7.6366	15.273
	60.5765	93.8810	41506.5163	21.0005	30.3054	1369.6091	83067.6479	46.9494	9.6195	19.239
L5	59.5486	89.3261	35753.5214	19.9816	28.8474	1239.4036	71554.0883	44.6715	9.1144	18.229
	69.0490	107.1225	61663.1484	23.9625	34.5440	1785.0610	123407.434	53.5714	11.0880	22.176

8

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	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				1	1	1			
195.00-157.65				1	1	1			
L2				1	1	1			
157.65-117.08				1	1	1			
L3				1	1	1			
117.08-81.09				1	1	1			
L4				1	1	1			
81.09-40.04				1	1	1			
L5				1	1	1			
40.04-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C _A A _A	Weight
				ft		ft ² /ft	plf
LDF6-50A(1-1/4")	C	No	Inside Pole	185.00 - 0.00	12	0.00	0.66
						0.00	0.66
						0.00	0.66
						0.00	0.66
						0.00	0.66

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A		Weight plf
							ft ² /ft		
FB-L98B-002-75000(3/8")	C	No	Inside Pole	185.00 - 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	
						4" Ice	0.00	0.06	
WR-VG82ST-BRDA(5/8)	C	No	Inside Pole	185.00 - 0.00	2	No Ice	0.00	0.31	
						1/2" Ice	0.00	0.31	
						1" Ice	0.00	0.31	
						2" Ice	0.00	0.31	
						4" Ice	0.00	0.31	
2" Rigid Conduit	C	No	Inside Pole	185.00 - 0.00	1	No Ice	0.00	2.80	
						1/2" Ice	0.00	2.80	
						1" Ice	0.00	2.80	
						2" Ice	0.00	2.80	
						4" Ice	0.00	2.80	

HB114-1-0813U4-M5J(1-1/4")	B	No	Inside Pole	164.00 - 0.00	3	No Ice	0.00	1.20	
						1/2" Ice	0.00	1.20	
						1" Ice	0.00	1.20	
						2" Ice	0.00	1.20	
						4" Ice	0.00	1.20	
9207(5/16")	B	No	Inside Pole	164.00 - 0.00	6	No Ice	0.00	0.60	
						1/2" Ice	0.00	0.60	
						1" Ice	0.00	0.60	
						2" Ice	0.00	0.60	
						4" Ice	0.00	0.60	
2" Rigid Conduit	B	No	Inside Pole	164.00 - 0.00	2	No Ice	0.00	2.80	
						1/2" Ice	0.00	2.80	
						1" Ice	0.00	2.80	
						2" Ice	0.00	2.80	
						4" Ice	0.00	2.80	
FSJ4-50B(1/2")	B	No	Inside Pole	164.00 - 0.00	2	No Ice	0.00	0.14	
						1/2" Ice	0.00	0.14	
						1" Ice	0.00	0.14	
						2" Ice	0.00	0.14	
						4" Ice	0.00	0.14	

AL7-50(1-5/8")	B	No	Inside Pole	154.00 - 0.00	3	No Ice	0.00	0.52	
						1/2" Ice	0.00	0.52	
						1" Ice	0.00	0.52	
						2" Ice	0.00	0.52	
						4" Ice	0.00	0.52	
HB158-1-08U8-S8J18(1-5/8")	B	No	Inside Pole	154.00 - 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	
						4" Ice	0.00	1.30	
HJ7-50A(1-5/8")	B	No	Inside Pole	154.00 - 0.00	8	No Ice	0.00	1.04	
						1/2" Ice	0.00	1.04	
						1" Ice	0.00	1.04	
						2" Ice	0.00	1.04	
						4" Ice	0.00	1.04	
HJ7-50A(1-5/8")	B	No	CaAa (Out Of Face)	154.00 - 0.00	2	No Ice	0.20	1.04	
						1/2" Ice	0.30	2.55	
						1" Ice	0.40	4.68	
						2" Ice	0.60	10.76	
						4" Ice	1.00	30.26	
HJ7-50A(1-5/8")	B	No	CaAa (Out Of Face)	154.00 - 0.00	5	No Ice	0.00	1.04	
						1/2" Ice	0.00	0.00	
						1" Ice	0.00	0.00	
						2" Ice	0.00	0.00	

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA}	Weight
						ft ² /ft	plf
***						4" Ice	0.00
LDF7-50A(1-5/8")	A	No	Inside Pole	144.00 - 0.00	12	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
MLE Hybrid	A	No	Inside Pole	144.00 - 0.00	1	No Ice	0.00
3Power/6Fiber RL						1/2" Ice	0.00
2(1-1/4")						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
LDF6-50A(1-1/4")	A	No	Inside Pole	134.00 - 0.00	9	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
LDF7-50A(1-5/8")	A	No	Inside Pole	134.00 - 0.00	6	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	195.00-157.65	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.08
		C	0.000	0.000	0.000	0.000	0.31
L2	157.65-117.08	A	0.000	0.000	0.000	0.000	0.47
		B	0.000	0.000	0.000	14.619	1.21
		C	0.000	0.000	0.000	0.000	0.46
L3	117.08-81.09	A	0.000	0.000	0.000	0.000	0.77
		B	0.000	0.000	0.000	14.252	1.14
		C	0.000	0.000	0.000	0.000	0.41
L4	81.09-40.04	A	0.000	0.000	0.000	0.000	0.88
		B	0.000	0.000	0.000	16.258	1.29
		C	0.000	0.000	0.000	0.000	0.47
L5	40.04-0.00	A	0.000	0.000	0.000	0.000	0.86
		B	0.000	0.000	0.000	15.855	1.26
		C	0.000	0.000	0.000	0.000	0.46

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	195.00-157.65	A	0.917	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.08
		C		0.000	0.000	0.000	0.000	0.31
L2	157.65-117.08	A	0.889	0.000	0.000	0.000	0.000	0.47
		B		0.000	0.000	0.000	28.154	1.26

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L3	117.08-81.09	C	0.855	0.000	0.000	0.000	0.000	0.46
		A		0.000	0.000	0.000	0.000	0.77
		B		0.000	0.000	0.000	27.057	1.18
L4	81.09-40.04	C	0.807	0.000	0.000	0.000	0.000	0.41
		A		0.000	0.000	0.000	0.000	0.88
		B		0.000	0.000	0.000	30.306	1.33
L5	40.04-0.00	C	0.750	0.000	0.000	0.000	0.000	0.47
		A		0.000	0.000	0.000	0.000	0.86
		B		0.000	0.000	0.000	28.773	1.28
		C		0.000	0.000	0.000	0.000	0.46

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	195.00-157.65	0.0000	0.0000	0.0000	0.0000
L2	157.65-117.08	0.4252	0.2455	0.7199	0.4156
L3	117.08-81.09	0.4667	0.2695	0.7926	0.4576
L4	81.09-40.04	0.4734	0.2733	0.8040	0.4642
L5	40.04-0.00	0.4785	0.2763	0.8036	0.4640

Discrete Tower Loads

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	
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	185.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			2.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	185.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			2.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	185.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			2.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) RRUS-11	A	From Leg	4.00	0.0000	185.00	No Ice	2.94	1.25	0.06
			0.00			1/2" Ice	3.17	1.41	0.07
			0.00			1" Ice	3.41	1.59	0.10
						2" Ice	3.91	1.96	0.15
(2) RRUS-11	B	From Leg		0.0000	185.00	4" Ice	5.02	2.82	0.30
						No Ice	2.94	1.25	0.06

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	TRUMBULL TOWER	Page	6 of 17
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	Client	Crown Castle	Designed by	holderkg

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
(2) RRUS-11	C	From Leg	4.00	0.0000	185.00	No Ice	2.94	1.25	0.06
			0.00			1/2" Ice	3.17	1.41	0.07
			0.00			1" Ice	3.41	1.59	0.10
						2" Ice	3.91	1.96	0.15
						4" Ice	5.02	2.82	0.30
						No Ice	2.94	1.25	0.06
						1/2" Ice	3.17	1.41	0.07
						1" Ice	3.41	1.59	0.10
						2" Ice	3.91	1.96	0.15
						4" Ice	5.02	2.82	0.30
(4) LGP21401	A	From Leg	4.00	0.0000	185.00	No Ice	1.29	0.23	0.01
			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
(4) LGP21401	B	From Leg	4.00	0.0000	185.00	No Ice	1.29	0.23	0.01
			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
(4) LGP21401	C	From Leg	4.00	0.0000	185.00	No Ice	1.29	0.23	0.01
			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	185.00	No Ice	1.47	1.47	0.03
			0.00			1/2" Ice	1.67	1.67	0.05
			0.00			1" Ice	1.88	1.88	0.07
						2" Ice	2.33	2.33	0.12
						4" Ice	3.38	3.38	0.25
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00	0.0000	185.00	No Ice	10.60	8.11	0.08
			0.00			1/2" Ice	11.27	9.30	0.16
			2.00			1" Ice	11.91	10.21	0.25
						2" Ice	13.21	12.17	0.46
						4" Ice	15.93	16.35	1.02
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.0000	185.00	No Ice	10.60	8.11	0.08
			0.00			1/2" Ice	11.27	9.30	0.16
			2.00			1" Ice	11.91	10.21	0.25
						2" Ice	13.21	12.17	0.46
						4" Ice	15.93	16.35	1.02
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00	0.0000	185.00	No Ice	10.60	8.11	0.08
			0.00			1/2" Ice	11.27	9.30	0.16
			2.00			1" Ice	11.91	10.21	0.25
						2" Ice	13.21	12.17	0.46
						4" Ice	15.93	16.35	1.02
RRUS12/RRUS A2	A	From Leg	4.00	0.0000	185.00	No Ice	3.67	2.14	0.07
			0.00			1/2" Ice	3.92	2.35	0.10
			2.00			1" Ice	4.19	2.56	0.13
						2" Ice	4.74	3.02	0.20
						4" Ice	5.96	4.03	0.40
RRUS12/RRUS A2	B	From Leg	4.00	0.0000	185.00	No Ice	3.67	2.14	0.07
			0.00			1/2" Ice	3.92	2.35	0.10
			2.00			1" Ice	4.19	2.56	0.13
						2" Ice	4.74	3.02	0.20
						4" Ice	5.96	4.03	0.40
RRUS12/RRUS A2	C	From Leg	4.00	0.0000	185.00	No Ice	3.67	2.14	0.07
			0.00			1/2" Ice	3.92	2.35	0.10
			2.00			1" Ice	4.19	2.56	0.13

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight		
			Horz	Lateral						°	ft
Platform Mount [LP 601-1]	C	None			0.0000	185.00	2" Ice	4.74	3.02	0.20	
							4" Ice	5.96	4.03	0.40	
							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	
4" Ice	69.43	69.43	4.26								

6' Climbing Ladder (Flat)	C	From Leg	2.00	0.00	0.0000	183.00	No Ice	5.84	5.84	0.05	
							1/2" Ice	10.30	10.30	0.07	
							1" Ice	14.76	14.76	0.09	
							2" Ice	23.67	23.67	0.14	
							4" Ice	41.49	41.49	0.23	
							0.00				

Platform Mount [LP 601-1]	C	None			0.0000	174.00	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	
							4" Ice	69.43	69.43	4.26	
(4) 8' x 2" Mount Pipe	A	From Leg	4.00	0.00	0.0000	174.00	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	
							4" Ice	6.50	6.50	0.30	
							1.00				
(4) 8' x 2" Mount Pipe	B	From Leg	4.00	0.00	0.0000	174.00	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	
							4" Ice	6.50	6.50	0.30	
							1.00				
(4) 8' x 2" Mount Pipe	C	From Leg	4.00	0.00	0.0000	174.00	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	
							4" Ice	6.50	6.50	0.30	
							1.00				

6' Climbing Ladder (Flat)	C	From Leg	2.00	0.00	0.0000	172.00	No Ice	5.84	5.84	0.05	
							1/2" Ice	10.30	10.30	0.07	
							1" Ice	14.76	14.76	0.09	
							2" Ice	23.67	23.67	0.14	
							4" Ice	41.49	41.49	0.23	
							0.00				

LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	164.00	No Ice	5.07	2.98	0.05	
							1/2" Ice	5.48	3.53	0.08	
							1" Ice	5.91	4.09	0.13	
							2" Ice	6.79	5.31	0.23	
							4" Ice	8.70	8.13	0.54	
							2.00				
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	164.00	No Ice	5.07	2.98	0.05	
							1/2" Ice	5.48	3.53	0.08	
							1" Ice	5.91	4.09	0.13	
							2" Ice	6.79	5.31	0.23	
							4" Ice	8.70	8.13	0.54	
							2.00				
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	164.00	No Ice	5.07	2.98	0.05	
							1/2" Ice	5.48	3.53	0.08	
							1" Ice	5.91	4.09	0.13	
							2" Ice	6.79	5.31	0.23	
							4" Ice	8.70	8.13	0.54	
							2.00				
APXVSPP18-C-A20 w/	A	From Leg	4.00		0.0000	164.00	No Ice	8.50	6.95	0.08	

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Crown Castle						holderkg		

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz Lateral	Vert						°
Mount Pipe			0.00			1/2" Ice	9.15	8.13	0.15	
			2.00			1" Ice	9.77	9.02	0.23	
						2" Ice	11.03	10.84	0.41	
						4" Ice	13.68	14.85	0.91	
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00		0.0000	164.00	No Ice	8.50	6.95	0.08
			0.00				1/2" Ice	9.15	8.13	0.15
			2.00				1" Ice	9.77	9.02	0.23
							2" Ice	11.03	10.84	0.41
							4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00		0.0000	164.00	No Ice	8.50	6.95	0.08
			0.00				1/2" Ice	9.15	8.13	0.15
			2.00				1" Ice	9.77	9.02	0.23
							2" Ice	11.03	10.84	0.41
							4" Ice	13.68	14.85	0.91
(3) ACU-A20-N	A	From Leg	4.00		0.0000	164.00	No Ice	0.08	0.14	0.00
			0.00				1/2" Ice	0.12	0.19	0.00
			0.00				1" Ice	0.17	0.25	0.00
							2" Ice	0.30	0.40	0.01
							4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	B	From Leg	4.00		0.0000	164.00	No Ice	0.08	0.14	0.00
			0.00				1/2" Ice	0.12	0.19	0.00
			0.00				1" Ice	0.17	0.25	0.00
							2" Ice	0.30	0.40	0.01
							4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	C	From Leg	4.00		0.0000	164.00	No Ice	0.08	0.14	0.00
			0.00				1/2" Ice	0.12	0.19	0.00
			0.00				1" Ice	0.17	0.25	0.00
							2" Ice	0.30	0.40	0.01
							4" Ice	0.67	0.80	0.04
800MHZ RRH	A	From Leg	4.00		0.0000	164.00	No Ice	2.49	2.07	0.05
			0.00				1/2" Ice	2.71	2.27	0.07
			0.00				1" Ice	2.93	2.48	0.10
							2" Ice	3.41	2.93	0.16
							4" Ice	4.46	3.93	0.32
800MHZ RRH	B	From Leg	4.00		0.0000	164.00	No Ice	2.49	2.07	0.05
			0.00				1/2" Ice	2.71	2.27	0.07
			0.00				1" Ice	2.93	2.48	0.10
							2" Ice	3.41	2.93	0.16
							4" Ice	4.46	3.93	0.32
800MHZ RRH	C	From Leg	4.00		0.0000	164.00	No Ice	2.49	2.07	0.05
			0.00				1/2" Ice	2.71	2.27	0.07
			0.00				1" Ice	2.93	2.48	0.10
							2" Ice	3.41	2.93	0.16
							4" Ice	4.46	3.93	0.32
FDD_R6_RRH	A	From Leg	4.00		0.0000	164.00	No Ice	1.79	0.78	0.03
			0.00				1/2" Ice	1.97	0.92	0.04
			0.00				1" Ice	2.16	1.07	0.06
							2" Ice	2.57	1.39	0.09
							4" Ice	3.49	2.14	0.20
FDD_R6_RRH	B	From Leg	4.00		0.0000	164.00	No Ice	1.79	0.78	0.03
			0.00				1/2" Ice	1.97	0.92	0.04
			0.00				1" Ice	2.16	1.07	0.06
							2" Ice	2.57	1.39	0.09
							4" Ice	3.49	2.14	0.20
FDD_R6_RRH	C	From Leg	4.00		0.0000	164.00	No Ice	1.79	0.78	0.03
			0.00				1/2" Ice	1.97	0.92	0.04
			0.00				1" Ice	2.16	1.07	0.06

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
1900MHz RRH (65MHz)	A	From Leg	4.00	0.0000	164.00	2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
						No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						1" Ice	3.18	3.26	0.11
1900MHz RRH (65MHz)	B	From Leg	4.00	0.0000	164.00	2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
						No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						1" Ice	3.18	3.26	0.11
1900MHz RRH (65MHz)	C	From Leg	4.00	0.0000	164.00	2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
						No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						1" Ice	3.18	3.26	0.11
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00	0.0000	164.00	2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
						No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						1" Ice	1.02	0.56	0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.0000	164.00	2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
						No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						1" Ice	1.02	0.56	0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.0000	164.00	2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
						No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						1" Ice	1.02	0.56	0.02
Platform Mount [LP 601-1]	C	None	0.0000	164.00	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	
					4" Ice	69.43	69.43	4.26	
8' x 2" Mount Pipe	A	From Leg	4.00	0.0000	164.00	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
						4" Ice	6.50	6.50	0.30
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.0000	164.00	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
						4" Ice	6.50	6.50	0.30
8' x 2" Mount Pipe	C	From Leg	4.00	0.0000	164.00	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
						4" Ice	6.50	6.50	0.30

742 213 w/ Mount Pipe	A	From Leg	4.00	0.0000	154.00	No Ice	5.37	4.62	0.05
						1/2" Ice	5.95	6.00	0.09
						1" Ice	6.50	6.98	0.15
						2" Ice	7.61	8.85	0.28

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	Client	Crown Castle	Designed by	holderkg

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
742 213 w/ Mount Pipe	B	From Leg	4.00	0.0000	154.00	4" Ice	9.93	12.79	0.68
			0.00	No Ice		5.37	4.62	0.05	
			1.00	1/2" Ice		5.95	6.00	0.09	
				1" Ice		6.50	6.98	0.15	
				2" Ice		7.61	8.85	0.28	
742 213 w/ Mount Pipe	C	From Leg	4.00	0.0000	154.00	4" Ice	9.93	12.79	0.68
			0.00	No Ice		5.37	4.62	0.05	
			1.00	1/2" Ice		5.95	6.00	0.09	
				1" Ice		6.50	6.98	0.15	
				2" Ice		7.61	8.85	0.28	
MG D3-800TV w/ Mount Pipe	A	From Leg	4.00	0.0000	154.00	4" Ice	9.93	12.79	0.68
			0.00	No Ice		3.57	3.42	0.04	
			1.00	1/2" Ice		3.98	4.12	0.07	
				1" Ice		4.39	4.78	0.11	
				2" Ice		5.33	6.16	0.21	
MG D3-800TV w/ Mount Pipe	B	From Leg	4.00	0.0000	154.00	4" Ice	7.34	9.18	0.52
			0.00	No Ice		3.57	3.42	0.04	
			1.00	1/2" Ice		3.98	4.12	0.07	
				1" Ice		4.39	4.78	0.11	
				2" Ice		5.33	6.16	0.21	
MG D3-800TV w/ Mount Pipe	C	From Leg	4.00	0.0000	154.00	4" Ice	7.34	9.18	0.52
			0.00	No Ice		3.57	3.42	0.04	
			1.00	1/2" Ice		3.98	4.12	0.07	
				1" Ice		4.39	4.78	0.11	
				2" Ice		5.33	6.16	0.21	
BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.00	0.0000	154.00	4" Ice	7.34	9.18	0.52
			0.00	No Ice		7.98	5.41	0.04	
			1.00	1/2" Ice		8.62	6.56	0.10	
				1" Ice		9.23	7.42	0.17	
				2" Ice		10.47	9.20	0.33	
BXA-70063/6CF w/ Mount Pipe	B	From Leg	4.00	0.0000	154.00	4" Ice	13.08	12.95	0.79
			0.00	No Ice		7.98	5.41	0.04	
			1.00	1/2" Ice		8.62	6.56	0.10	
				1" Ice		9.23	7.42	0.17	
				2" Ice		10.47	9.20	0.33	
BXA-70063/6CF w/ Mount Pipe	C	From Leg	4.00	0.0000	154.00	4" Ice	13.08	12.95	0.79
			0.00	No Ice		7.98	5.41	0.04	
			1.00	1/2" Ice		8.62	6.56	0.10	
				1" Ice		9.23	7.42	0.17	
				2" Ice		10.47	9.20	0.33	
(2) DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.00	0.0000	154.00	4" Ice	13.08	12.95	0.79
			0.00	No Ice		4.90	4.92	0.03	
			1.00	1/2" Ice		5.35	5.60	0.08	
				1" Ice		5.80	6.28	0.13	
				2" Ice		6.73	7.71	0.26	
(2) DB844G65ZAXY w/ Mount Pipe	C	From Leg	4.00	0.0000	154.00	4" Ice	8.73	10.83	0.62
			0.00	No Ice		4.90	4.92	0.03	
			1.00	1/2" Ice		5.35	5.60	0.08	
				1" Ice		5.80	6.28	0.13	
				2" Ice		6.73	7.71	0.26	
(2) LPA-4016 w/ Mount Pipe	B	From Leg	4.00	0.0000	154.00	4" Ice	8.73	10.83	0.62
			0.00	No Ice		10.01	7.46	0.04	
			1.00	1/2" Ice		10.52	8.15	0.12	
				1" Ice		11.04	8.87	0.21	
				2" Ice		12.11	10.35	0.40	
RRH2x40-AWS	A	From Leg	4.00	0.0000	154.00	4" Ice	14.39	13.59	0.91
				No Ice		2.52	1.59	0.04	

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
				0.00					0.06
				1.00		1/2" Ice	2.75	1.80	0.08
						1" Ice	2.99	2.01	0.13
						2" Ice	3.50	2.46	0.28
						4" Ice	4.61	3.48	0.04
RRH2x40-AWS	B	From Leg	4.00	0.0000	154.00	No Ice	2.52	1.59	0.06
			0.00			1/2" Ice	2.75	1.80	0.08
			1.00			1" Ice	2.99	2.01	0.13
						2" Ice	3.50	2.46	0.28
						4" Ice	4.61	3.48	0.04
RRH2x40-AWS	C	From Leg	4.00	0.0000	154.00	No Ice	2.52	1.59	0.06
			0.00			1/2" Ice	2.75	1.80	0.08
			1.00			1" Ice	2.99	2.01	0.13
						2" Ice	3.50	2.46	0.28
						4" Ice	4.61	3.48	0.04
DB-B1-6C-8AB-0Z	C	From Leg	4.00	0.0000	154.00	No Ice	5.60	2.33	0.08
			0.00			1/2" Ice	5.92	2.56	0.12
			1.00			1" Ice	6.24	2.79	0.21
						2" Ice	6.91	3.28	0.45
						4" Ice	8.37	4.37	1.12
Platform Mount [LP 601-1]	C	None		0.0000	154.00	No Ice	28.47	28.47	1.51
						1/2" Ice	33.59	33.59	1.91
						1" Ice	38.71	38.71	2.69
						2" Ice	48.95	48.95	4.26
						4" Ice	69.43	69.43	0.05
***									0.07
6' Climbing Ladder (Flat)	A	From Leg	2.00	0.0000	152.00	No Ice	5.84	5.84	0.09
			0.00			1/2" Ice	10.30	10.30	0.14
			0.00			1" Ice	14.76	14.76	0.23
						2" Ice	23.67	23.67	1.15
						4" Ice	41.49	41.49	0.08
***									0.17
SBNH-1D65C-SR w/ Mount Pipe	A	From Leg	4.00	0.0000	144.00	No Ice	11.68	9.84	0.27
			0.00			1/2" Ice	12.40	11.37	0.51
			1.00			1" Ice	13.14	12.91	1.15
						2" Ice	14.60	15.27	1.15
						4" Ice	17.87	20.14	0.08
SBNH-1D65C-SR w/ Mount Pipe	B	From Leg	4.00	0.0000	144.00	No Ice	11.68	9.84	0.17
			0.00			1/2" Ice	12.40	11.37	0.27
			1.00			1" Ice	13.14	12.91	0.51
						2" Ice	14.60	15.27	1.15
						4" Ice	17.87	20.14	0.08
SBNH-1D65C-SR w/ Mount Pipe	C	From Leg	4.00	0.0000	144.00	No Ice	11.68	9.84	0.17
			0.00			1/2" Ice	12.40	11.37	0.27
			1.00			1" Ice	13.14	12.91	0.51
						2" Ice	14.60	15.27	1.15
						4" Ice	17.87	20.14	0.11
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00	0.0000	144.00	No Ice	6.83	5.64	0.17
			0.00			1/2" Ice	7.35	6.48	0.23
			1.00			1" Ice	7.86	7.26	0.38
						2" Ice	8.93	8.86	0.81
						4" Ice	11.18	12.29	0.11
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00	0.0000	144.00	No Ice	6.83	5.64	0.17
			0.00			1/2" Ice	7.35	6.48	0.23
			1.00			1" Ice	7.86	7.26	0.38
						2" Ice	8.93	8.86	0.81
						4" Ice	11.18	12.29	0.11
ERICSSON AIR 21 B4A	C	From Leg	4.00	0.0000	144.00	No Ice	6.83	5.64	0.11

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						°
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17	
			1.00			1" Ice	7.86	7.26	0.23	
						2" Ice	8.93	8.86	0.38	
						4" Ice	11.18	12.29	0.81	
RRUS 11 B2	A	From Leg	4.00		0.0000	144.00	No Ice	3.31	1.36	0.05
			0.00				1/2" Ice	3.55	1.54	0.07
			1.00				1" Ice	3.80	1.73	0.10
							2" Ice	4.33	2.13	0.15
							4" Ice	5.50	3.04	0.31
RRUS 11 B2	B	From Leg	4.00		0.0000	144.00	No Ice	3.31	1.36	0.05
			0.00				1/2" Ice	3.55	1.54	0.07
			1.00				1" Ice	3.80	1.73	0.10
							2" Ice	4.33	2.13	0.15
							4" Ice	5.50	3.04	0.31
RRUS 11 B2	C	From Leg	4.00		0.0000	144.00	No Ice	3.31	1.36	0.05
			0.00				1/2" Ice	3.55	1.54	0.07
			1.00				1" Ice	3.80	1.73	0.10
							2" Ice	4.33	2.13	0.15
							4" Ice	5.50	3.04	0.31
RRUS 11 B12	A	From Leg	4.00		0.0000	144.00	No Ice	3.31	1.36	0.05
			0.00				1/2" Ice	3.55	1.54	0.07
			1.00				1" Ice	3.80	1.73	0.10
							2" Ice	4.33	2.13	0.15
							4" Ice	5.50	3.04	0.31
RRUS 11 B12	B	From Leg	4.00		0.0000	144.00	No Ice	3.31	1.36	0.05
			0.00				1/2" Ice	3.55	1.54	0.07
			1.00				1" Ice	3.80	1.73	0.10
							2" Ice	4.33	2.13	0.15
							4" Ice	5.50	3.04	0.31
RRUS 11 B12	C	From Leg	4.00		0.0000	144.00	No Ice	3.31	1.36	0.05
			0.00				1/2" Ice	3.55	1.54	0.07
			1.00				1" Ice	3.80	1.73	0.10
							2" Ice	4.33	2.13	0.15
							4" Ice	5.50	3.04	0.31
KRY 112 144/1	A	From Leg	4.00		0.0000	144.00	No Ice	0.41	0.19	0.01
			0.00				1/2" Ice	0.50	0.26	0.01
			1.00				1" Ice	0.60	0.33	0.02
							2" Ice	0.82	0.51	0.03
							4" Ice	1.36	0.97	0.08
KRY 112 144/1	B	From Leg	4.00		0.0000	144.00	No Ice	0.41	0.19	0.01
			0.00				1/2" Ice	0.50	0.26	0.01
			1.00				1" Ice	0.60	0.33	0.02
							2" Ice	0.82	0.51	0.03
							4" Ice	1.36	0.97	0.08
KRY 112 144/1	C	From Leg	4.00		0.0000	144.00	No Ice	0.41	0.19	0.01
			0.00				1/2" Ice	0.50	0.26	0.01
			1.00				1" Ice	0.60	0.33	0.02
							2" Ice	0.82	0.51	0.03
							4" Ice	1.36	0.97	0.08
Platform Mount [LP 601-1]	C	None			0.0000	144.00	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
							4" Ice	69.43	69.43	4.26

6' Climbing Ladder (Flat)	A	From Leg	2.00		0.0000	142.00	No Ice	5.84	5.84	0.05
			0.00				1/2" Ice	10.30	10.30	0.07

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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" Ice	14.76	14.76	0.09	
						2" Ice	23.67	23.67	0.14	
						4" Ice	41.49	41.49	0.23	

(4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.00		0.0000	134.00	No Ice	3.30	4.92	0.03
			0.00				1/2" Ice	3.69	5.60	0.07
			1.00				1" Ice	4.12	6.28	0.12
							2" Ice	5.01	7.71	0.23
							4" Ice	6.92	10.83	0.56
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.00		0.0000	134.00	No Ice	3.30	4.92	0.03
			0.00				1/2" Ice	3.69	5.60	0.07
			1.00				1" Ice	4.12	6.28	0.12
							2" Ice	5.01	7.71	0.23
							4" Ice	6.92	10.83	0.56
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.00		0.0000	134.00	No Ice	3.30	4.92	0.03
			0.00				1/2" Ice	3.69	5.60	0.07
			1.00				1" Ice	4.12	6.28	0.12
							2" Ice	5.01	7.71	0.23
							4" Ice	6.92	10.83	0.56
Platform Mount [LP 303-1]	C	None			0.0000	134.00	No Ice	14.66	14.66	1.25
							1/2" Ice	18.87	18.87	1.48
							1" Ice	23.08	23.08	1.71
							2" Ice	31.50	31.50	2.18
							4" Ice	48.34	48.34	3.10

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz	Lateral							
				ft	ft	°	°	ft	ft	ft ²	K	
A-ANT-23G-2-C	B	Paraboloid w/Shroud (HP)	From Leg	4.00		40.0000		164.00	2.17	No Ice	3.72	0.01
				0.00						1/2" Ice	4.01	0.03
				2.00						1" Ice	4.30	0.05
										2" Ice	4.88	0.09
										4" Ice	6.04	0.18

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice

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<i>Comb. No.</i>	<i>Description</i>
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

<i>Section No.</i>	<i>Elevation</i>	<i>Horz. Deflection</i>	<i>Gov. Load</i>	<i>Tilt</i>	<i>Twist</i>
	<i>ft</i>	<i>in</i>	<i>Comb.</i>	<i>°</i>	<i>°</i>
L1	195 - 157.648	44.686	31	1.9388	0.0010
L2	162.383 - 117.083	31.599	31	1.8513	0.0009
L3	122.948 - 81.0937	17.742	31	1.4284	0.0004
L4	87.9375 - 40.0391	8.876	31	0.9480	0.0002
L5	47.9896 - 0	2.686	31	0.5048	0.0001

Critical Deflections and Radius of Curvature - Service Wind

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>		<i>Comb.</i>	<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
185.00	(2) 7770.00 w/ Mount Pipe	31	40.612	1.9275	0.0009	31445
183.00	6' Climbing Ladder (Flat)	31	39.801	1.9244	0.0009	26204
174.00	Platform Mount [LP 601-1]	31	36.177	1.9035	0.0010	14973
172.00	6' Climbing Ladder (Flat)	31	35.380	1.8969	0.0010	13671

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
166.00	A-ANT-23G-2-C	31	33.010	1.8714	0.0010	10840
164.00	LLPX310R w/ Mount Pipe	31	32.228	1.8608	0.0010	10126
154.00	742 213 w/ Mount Pipe	31	28.397	1.7895	0.0009	7377
152.00	6' Climbing Ladder (Flat)	31	27.649	1.7718	0.0009	6986
144.00	SBNH-1D65C-SR w/ Mount Pipe	31	24.729	1.6918	0.0008	5763
142.00	6' Climbing Ladder (Flat)	31	24.019	1.6696	0.0007	5521
134.00	(4) DB844H90E-XY w/ Mount Pipe	31	21.269	1.5741	0.0006	4728

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	195 - 157.648	128.683	12	5.5908	0.0028
L2	162.383 - 117.083	91.032	12	5.3385	0.0027
L3	122.948 - 81.0937	51.145	12	4.1196	0.0012
L4	87.9375 - 40.0391	25.597	12	2.7345	0.0007
L5	47.9896 - 0	7.749	12	1.4564	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	(2) 7770.00 w/ Mount Pipe	12	116.965	5.5584	0.0025	11121
183.00	6' Climbing Ladder (Flat)	12	114.630	5.5494	0.0025	9267
174.00	Platform Mount [LP 601-1]	12	104.204	5.4893	0.0028	5293
172.00	6' Climbing Ladder (Flat)	12	101.910	5.4702	0.0028	4832
166.00	A-ANT-23G-2-C	12	95.090	5.3966	0.0028	3831
164.00	LLPX310R w/ Mount Pipe	12	92.841	5.3659	0.0028	3578
154.00	742 213 w/ Mount Pipe	12	81.818	5.1602	0.0026	2603
152.00	6' Climbing Ladder (Flat)	12	79.665	5.1093	0.0026	2464
144.00	SBNH-1D65C-SR w/ Mount Pipe	12	71.260	4.8786	0.0023	2030
142.00	6' Climbing Ladder (Flat)	12	69.216	4.8148	0.0022	1944
134.00	(4) DB844H90E-XY w/ Mount Pipe	12	61.300	4.5394	0.0018	1662

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
L1	195 - 157.648 (1)	TP33.875x25x0.25	37.35	0.00	0.0	39.000	25.7888	-7.39	1005.76	0.007
L2	157.648 -	TP42.9063x32.2501x0.3125	45.30	0.00	0.0	39.000	40.8793	-19.16	1594.29	0.012

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Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L3	117.083 (2) 117.083 - 81.0937 (3)	TP50.75x40.9017x0.375	41.85	0.00	0.0	39.000	58.0421	-29.17	2263.64	0.013
L4	81.0937 - 40.0391 (4)	TP59.6563x48.3897x0.5	47.90	0.00	0.0	39.000	90.9131	-45.23	3545.61	0.013
L5	40.0391 - 0 (5)	TP68x56.7861x0.5	47.99	0.00	0.0	39.000	107.1220	-67.99	4177.78	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	195 - 157.648 (1)	TP33.875x25x0.25	249.04	14.448	39.000	0.370	0.00	0.000	39.000	0.000
L2	157.648 - 117.083 (2)	TP42.9063x32.2501x0.3125	1371.68	39.581	39.000	1.015	0.00	0.000	39.000	0.000
L3	117.083 - 81.0937 (3)	TP50.75x40.9017x0.375	2725.29	46.816	39.000	1.200	0.00	0.000	39.000	0.000
L4	81.0937 - 40.0391 (4)	TP59.6563x48.3897x0.5	4451.54	41.602	39.000	1.067	0.00	0.000	39.000	0.000
L5	40.0391 - 0 (5)	TP68x56.7861x0.5	6749.96	45.376	39.000	1.163	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	195 - 157.648 (1)	TP33.875x25x0.25	17.47	0.677	26.000	0.052	0.97	0.027	26.000	0.001
L2	157.648 - 117.083 (2)	TP42.9063x32.2501x0.3125	36.50	0.893	26.000	0.069	0.39	0.005	26.000	0.000
L3	117.083 - 81.0937 (3)	TP50.75x40.9017x0.375	40.78	0.703	26.000	0.054	0.38	0.003	26.000	0.000
L4	81.0937 - 40.0391 (4)	TP59.6563x48.3897x0.5	45.51	0.501	26.000	0.038	0.38	0.002	26.000	0.000
L5	40.0391 - 0 (5)	TP68x56.7861x0.5	50.15	0.468	26.000	0.036	0.38	0.001	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	195 - 157.648 (1)	0.007	0.370	0.000	0.052	0.001	0.379	1.333	H1-3+VT ✓
L2	157.648 - 117.083 (2)	0.012	1.015	0.000	0.069	0.000	1.028	1.333	H1-3+VT ✓

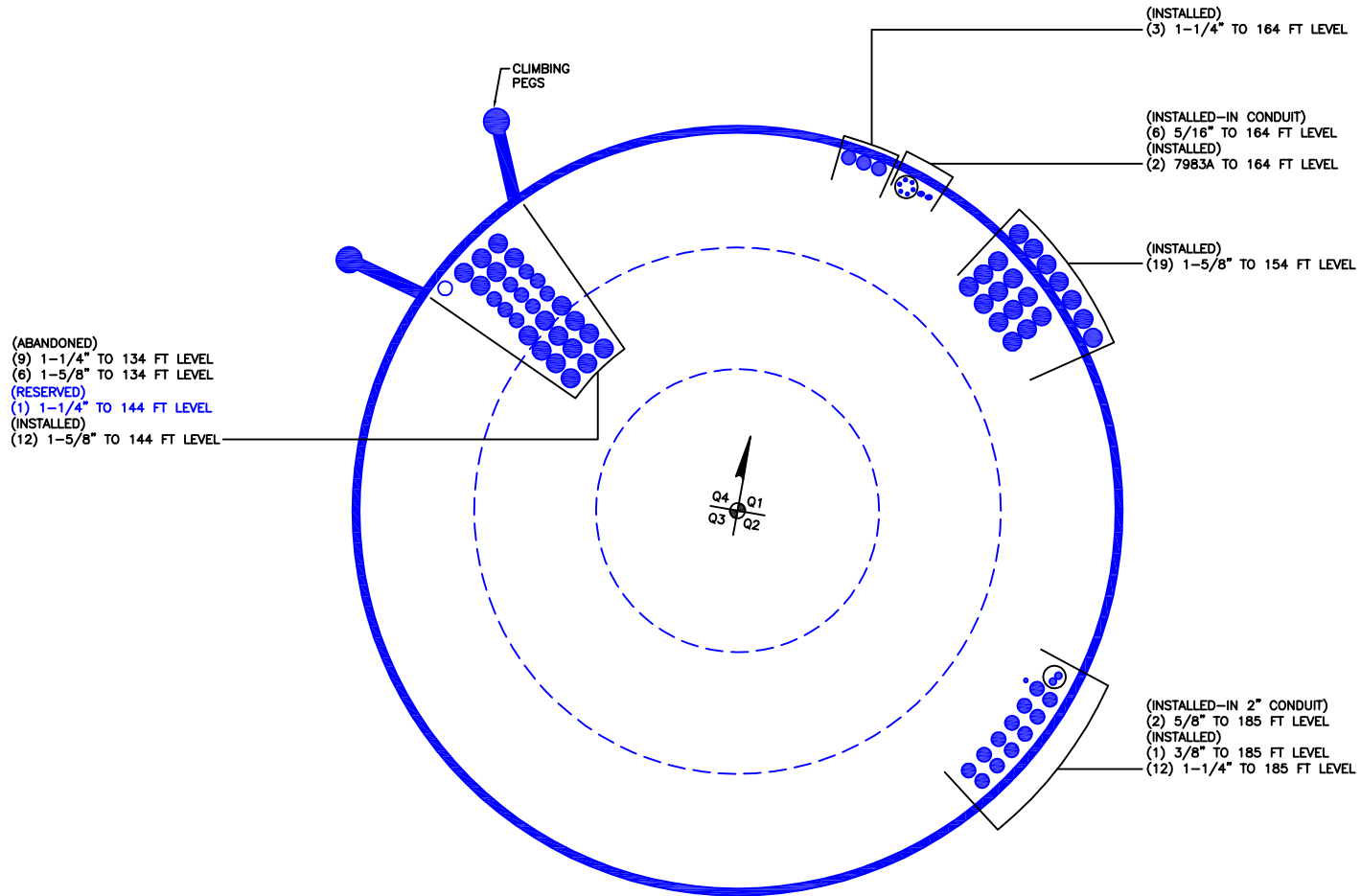
tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Road Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501	Job	TRUMBULL TOWER	Page	17 of 17
	Project	BU 881535 WO 1237425	Date	15:03:51 05/18/16
	Client	Crown Castle	Designed by	holderkg

Section No.	Elevation ft	Ratio P	Ratio f_{bx}	Ratio f_{by}	Ratio f_v	Ratio f_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_a	F_{bx}	F_{by}	F_v	F_{vt}			
L3	117.083 - 81.0937 (3)	0.013	1.200	0.000	0.054	0.000	1.214	1.333	H1-3+VT ✓
L4	81.0937 - 40.0391 (4)	0.013	1.067	0.000	0.038	0.000	1.080	1.333	H1-3+VT ✓
L5	40.0391 - 0 (5)	0.016	1.163	0.000	0.036	0.000	1.180	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L1	195 - 157.648	Pole	TP33.875x25x0.25	1	-7.39	1340.68	28.4	Pass	
L2	157.648 - 117.083	Pole	TP42.9063x32.2501x0.3125	2	-19.16	2125.19	77.1	Pass	
L3	117.083 - 81.0937	Pole	TP50.75x40.9017x0.375	3	-29.17	3017.43	91.1	Pass	
L4	81.0937 - 40.0391	Pole	TP59.6563x48.3897x0.5	4	-45.23	4726.30	81.0	Pass	
L5	40.0391 - 0	Pole	TP68x56.7861x0.5	5	-67.99	5568.98	88.5	Pass	
							Summary		
							Pole (L3)	91.1	Pass
							RATING =	91.1	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: 881535
Site Name: TRUMBULL TOWER
App #: 344101 Rev. 1
Pole Manufacturer: Other

Reactions

Moment:	6750	ft-kips
Axial:	68	kips
Shear:	50	kips

Anchor Rod Data

Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	76.5	in

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

Anchor Rod Results

Maximum Rod Tension:	173.6 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	89.1% Pass

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	82.5	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	8.99	in

Base Plate Results

Base Plate Stress:	50.4 ksi	Flexural Check
Allowable Plate Stress:	60.0 ksi	
Base Plate Stress Ratio:	84.0% Pass	

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
35.05

Stiffener Data (Welding at both sides)

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

n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

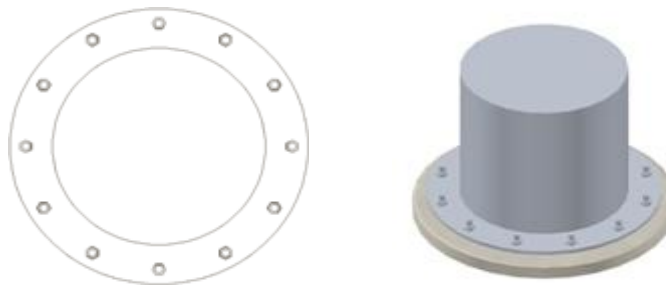
Pole Punching Shear Check:	n/a
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Pole Data

Diam:	68	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
-------	-------



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: 881535
Site Name: TRUMBULL TOWER
App #: 344101 Rev. 1

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	68	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	50	kips
Unfactored WL Moment, M:	6750	ft-kips

Load Factor	Shaft Factored Loads	
1.20	1.2D+1.6W, Pu:	81.6 kips
0.90	0.9D+1.6W, Pu:	61.2 kips
1.35	Vu:	67.5 kips
	Mu:	9112.5 ft-kips

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	12	in
Pad Bearing Depth, D:	7	ft
Pad Thickness, T:	3	ft
Pad Width=Length, L:	29	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	9	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	81.00	ft^2
Pier Height:	5.00	ft
Soil (above pad) Height:	4.00	ft

1.2D+1.6W Load Combination, Bearing Results:

(No Soil Wedges) [Reaction+Conc+Soil]	1064.64	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	9577.33	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 = 9.00 ft
 Orthogonal qu= 3.33 ksf
 qu/φ*qn Ratio= **37.05% Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 = 6.36 ft
 Diagonal qu= 4.02 ksf
 qu/φ*qn Ratio= **44.63% Pass**

<-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(w/ Soil Wedges) [Reaction+Conc+Soil]	844.65	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	9176.44	ft-kips

Orthogonal ecc3 = M2/P2 = 10.86 ft
 Ortho Non Bearing Length,NBL= **21.73 ft**
 Orthogonal qu= 4.01 ksf
 Diagonal qu= 4.54 ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating

Actual M:	6750.00		
M Orthogonal:	8019.69	84.17%	Pass
M Diagonal:	8019.69	84.17%	Pass

Soil Parameters		
Unit Weight, γ:	125.0	pcf
Ultimate Bearing Capacity, qn:	12.00	ksf
Strength Reduct. factor, φ:	0.75	
Angle of Friction, Φ:	34.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: φ*qn:	9.00	ksf
Passive Pres. Coeff., Kp	3.54	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	67.5	kips
Pad Force Location Above D:	1.36	ft
φ(Passive Pressure Moment):	92.05	ft-kips
Factored O.T. M(WL), "1.6W":	9669.4	ft-kips
Factored OT (MW-Msoil), M1	9577.33	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	2.70	ft
Sum of Soil Wedges Wt:	51.30	kips
Soil Wedges ecc, K1:	8.68	ft
Ftg+Soil above Pad wt:	819.2	kips
Unfactored (Total ftg-soil Wt):	870.50	kips
1.2D. No Soil Wedges.	1064.64	kips
0.9D. With Soil Wedges	844.65	kips

Resistance due to Cohesion (Vertical)		
φ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Project Name:	TRUMBULL TOWER
Project Number:	BU 881535
Job Number:	WO 1237425
Date:	5/18/2016



Created On:	6/3/2014
Checked By:	DW
Revised On:	3/4/2015
Revision No.:	1.6

Monopole Pad & Pier Foundation

Foundation Parameters

Load	
Code	F
Axial	68 kips
Shear	50 kips
Moment	6750 k-ft
Soil Unit Weight	125 pcf
Friction Angle	34
Cohesion	0 psf

Material	
Concrete Strength (F'c)	4000 psi
Concrete Density	150 pcf
Rebar Tensile (Fy)	60 ksi
Clear Cover	3 in

Pad	
Thickness	3 ft
Bearing Depth	7 ft
Width	29 ft
Rebar Size	8
Rebar Quantity	55

Pier	
Pier type	Square
Width	9 ft
Height above Grade	1 ft
Rebar Size	8
Rebar Quantity	54
Tie Size	4
Tie C/C Spacing	6 in

Structural Checks

Pad Beam Shear Capacity	1039.9 kips
Pad Beam Shear	565.5 kips
Pad Beam Shear Check	54.4% Pass

Pad Bending Moment Capacity	5943.6 k-ft
Pad Bending Moment	4029.7 k-ft
Pad Bending Moment Check	67.8% Pass

Punching Shear Capacity	3335.0 kips
Punching Shear	510.8 kips
Punching Shear Check	15.3% Pass

Pad-Pier Bearing Capacity	51554.9 kips
Pad-Pier Bearing	1064.6 kips
Pad-Pier Bearing Check	2.1% Pass

Pier Beam Shear Capacity	1273.6 kips
Pier Beam Shear	67.5 kips
Pier Beam Shear Check	5.3% Pass

Pier Bending Moment Capacity	9775.5 k-ft
Pier Bending Moment	9436.5 k-ft
Pier Bending Moment Check	96.5% Pass



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

AT&T Existing Facility

Site ID: CT2093

Trumbull - Indian Ledge
425 Indian Ledge Park Rd
Trumbull, CT 06611

June 14, 2016

EBI Project Number: 6216002808

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	11.54 %



June 14, 2016

AT&T Mobility – New England
Attn: Cameron Syme, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT2093 – Trumbull - Indian Ledge**

EBI Consulting was directed to analyze the proposed AT&T facility located at **425 Indian Ledge Park Rd, Trumbull, CT**, for the purpose of determining whether the emissions from the Proposed AT&T 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 public 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 public 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.

Public 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 limits for the 700 and 850 MHz Bands are approximately $467 \mu\text{W}/\text{cm}^2$ and $567 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) 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 AT&T Wireless antenna facility located at **425 Indian Ledge Park Rd, Trumbull, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel 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 UMTS channels (850 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 (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (700 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 (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.



- 6) 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.
- 7) 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.
- 8) The antennas used in this modeling are the **Powerwave 7770** and the **CCI HPA-65R-BUU-H6** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. 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.
- 9) The antenna mounting height centerlines of the proposed antennas are **187 feet** above ground level (AGL) for **Sector A**, **187 feet** above ground level (AGL) for **Sector B** and **187 feet** above ground level (AGL) for Sector C.
- 10) 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.

All calculations were done with respect to uncontrolled / general public threshold limits.



AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	187 feet	Height (AGL):	187 feet	Height (AGL):	187 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	0.30 %	Antenna B1 MPE%	0.30 %	Antenna C1 MPE%	0.30 %
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	187 feet	Height (AGL):	187 feet	Height (AGL):	187 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	5,462.56	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A2 MPE%	0.83 %	Antenna B2 MPE%	0.83 %	Antenna C2 MPE%	0.83 %
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 dBd	Gain:	11.4 dBd	Gain:	11.4 dBd
Height (AGL):	187 feet	Height (AGL):	187 feet	Height (AGL):	187 feet
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts
ERP (W):	828.23	ERP (W):	828.23	ERP (W):	828.23
Antenna A3 MPE%	0.16 %	Antenna B3 MPE%	0.16 %	Antenna C3 MPE%	0.16 %

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	1.29 %
Town Antennas	4.80 %
Sprint	0.82 %
Clearwire	0.07 %
Verizon Wireless	2.66 %
T-Mobile	1.90 %
Site Total MPE %:	11.54 %

AT&T Sector A Total:	1.29 %
AT&T Sector B Total:	1.29 %
AT&T Sector C Total:	1.29 %
Site Total:	11.55 %

AT&T_ Max Values Per Sector	# 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
AT&T 850 MHz UMTS	2	828.23	187	0.91	850 MHz	567	0.16 %
AT&T 1900 MHz (PCS) UMTS	2	1,312.66	187	1.44	1900 MHz (PCS)	1000	0.14 %
AT&T 700 MHz LTE	2	1,880.10	187	2.06	700 MHz	467	0.44 %
AT&T 1900 MHz (PCS) LTE	2	3,582.46	187	3.93	1900 MHz (PCS)	1000	0.39 %
AT&T 850 MHz GSM	2	828.23	187	0.91	850 MHz	567	0.16 %
						Total:	1.29 %



Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	1.29 %
Sector B:	1.29 %
Sector C:	1.29 %
AT&T Maximum Total (per sector):	1.29 %
Site Total:	11.54 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **11.54 %** of the allowable FCC established general public 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.