



Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

HAND DELIVERED

December 7, 2017

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Notice of Exempt Modification: Existing Telecommunications Facility at 170 Ingham Hill Road, Old Saybrook

Dear Ms. Bachman:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) and/or Long Term Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, copies of this letter are being sent to the chief elected official and the Planning & Zoning Department of the municipality in which the affected cell site is located, the property owner of record, and the tower owner or operator.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile (“GSM”) communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T’s operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

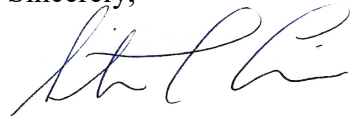
The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical and environmental characteristics of the site will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not increase.
2. The proposed changes will not extend the site boundaries.
3. The proposed changes will not increase the noise level at the site boundary by six decibels or more, or to levels that exceed state and local criteria.
4. The changes will not add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996, as amended, and the State Department of Energy and Environmental Protection, pursuant to Section 22a-162 of the Connecticut General Statutes.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. With recommended modifications to the tower structure, the proposed equipment changes will not impair the structural integrity of the facility, as determined in a certification provided by a professional engineer licensed in Connecticut.

For the foregoing reasons, AT&T respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 830-0380 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Steven L. Levine
Real Estate Consultant

cc: Honorable Carl P. Fortuna, 1st Selectman, Town of Old Saybrook
Christine Nelson, Town Planner, Town of Old Saybrook
Property Owner of Record – Carol J. and Robert A. Lorenz
Tower Owner / Operator – William Gates, Crown Castle International

Attachments

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

170 Ingham Hill Road, Old Saybrook, CT
Geographic Coordinates: N 41-18-35 W 72-23-51
Site Number 2019
Prior Decisions: Docket 51.2;
Ex. Mods 7/98, 7/02, 7/07, 5/11, and 5/16

Tower Owner/Manager: Crown Castle

Land Owner of Record: Carol J. and Robert A. Lorenz
Please see the attached property cards and map. The Lorenz's own two contiguous parcels in the area, one that is known as 170 Ingham Hill Road, and the other denoted simply as Ingham Hill Road. The tower facility is actually located on the latter un-numbered parcel.

Original Permitting: The Council approved the Ingham Hill Road 150 ft monopole structure on September 26, 1985 in Docket 51. An excerpt from the Decision and Order is attached hereto. In EM-SCLP-106-980709, the Council approved a T-Mobile canister mount extending to approximately 165 feet a.g.l. No condition of approval will be violated by the proposed equipment modifications.

Lease Area: The attached site plan exhibit from Docket 51 shows that the Council approved a fenced equipment compound within a 100 ft x 100 ft lease area in 1985. All proposed equipment modifications will occur either on the existing tower structure or within AT&T's existing equipment shelter. Accordingly, the proposed modifications will not extend either AT&T's lease area or the existing overall site boundaries.

Equipment configuration: 150-ft. Guyed Monopole + Pole-Mounted Canister to Approx. 165 ft

Current and/or approved: Platform Mount @ 149 ft a.g.l.
Side Arm Mount @ 148 ft a.g.l.
Three PowerWave 7770 antennas @ 154 ft c.l.
Three KMW AM-X-CD-14-65-00 antennas @ 154 ft c.l.
Three Andrew SBNHH-1D65A antennas @ 154 ft c.l.
Six PowerWave TMA's @ 154 ft
Two Raycap DC6-48-60-18-8F surge arrestors @ 154 ft
Six Ericsson RRUS-11 remote radio heads @ 154 ft
Three RRUS-32-B30 remote radio heads @ 154 ft
Twelve runs 1¼ inch coax
Two fiber cable and four DC control cables
One Andrew dish antenna @ 156 ft c.l.
Equipment Shelter

Planned Modifications:

Remove the Andrew dish antenna.
 Lower the existing Andrew and Powerwave antennas to 149 ft c.l.
 Remove the three existing KMW antennas.
 Install two Quintel QS46512-2 antennas @ 149 ft c.l.
 Install one Kathrein 800-10799 antenna @ 149 ft c.l.
 Lower existing remote radio heads, TMA's, and surge arrestors to 149 ft.
 Remove three RRUS-11 remote radio heads.
 Install three RRUS-32 remote radio heads at 149 ft.

Power Density:

Worst-case calculations with 10 dB reduction for existing wireless operations at the site indicate a radio frequency electromagnetic radiation power density, measured at six feet above ground level beside the tower, of approximately 8.3 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 8.5 % of the standard.

Existing

Company	Frequency (MHz)	Antenna (Total for all sectors)	Centerline Ht (feet)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	Percent of Limit
Other Users *								6.52
AT&T LTE *	740	KMW 3 antennas	154	2	793	0.0260	0.4933	0.53
AT&T LTE *	1900	KMW 3 antennas	154	2	1734	0.0569	1.0000	0.57
AT&T LTE *	2300	Andrew 3 antennas	154	2	1094	0.0359	1.0000	0.36
AT&T UMTS *	880	PowerWave 3 antennas	154	2	352	0.0116	0.5867	0.20
AT&T UMTS *	1900	PowerWave 3 antennas	154	1	423	0.0069	1.0000	0.07
AT&T GSM *	880	Andrew 3 antennas	154	1	352	0.0058	0.5867	0.10
Total								8.34%

* Per CSC records

Proposed

Company	Frequency (MHz)	Antenna (Total for all sectors)	Centerline Ht (feet)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	Percent of Limit
Other Users *								6.52
AT&T LTE	740	Quintel 2 antennas Kathrein 1 antenna	149	2	793	0.0279	0.4933	0.57
AT&T LTE	1900	Quintel 2 antennas Kathrein 1 antenna	149	2	1734	0.0610	1.0000	0.61
AT&T LTE	2300	Andrew 3 antennas	149	2	1094	0.0385	1.0000	0.38
AT&T UMTS	880	PowerWave 3 antennas	149	2	352	0.0124	0.5867	0.21
AT&T UMTS	1900	PowerWave 3 antennas	149	1	423	0.0074	1.0000	0.07
AT&T GSM	880	Andrew 3 antennas	149	1	352	0.0062	0.5867	0.11
Total								8.47%

* Per CSC records

Structural information:

The attached structural analysis (B + T Group, 11/30/17) demonstrates that the tower and foundation have adequate structural capacity to accommodate the proposed equipment modifications. The attached mount analysis (Hudson Design Group, 2/27/17) demonstrates that the existing antenna platform mount has adequate structural capacity to accommodate the proposed equipment modifications.

INGHAM HILL RD

Location INGHAM HILL RD

MBLU 052/ 04T/ //

Acct# 00568700

Owner LORENZ CAROL J & ROBERT
A

Assessment \$442,500

Appraisal \$632,000

PID 3259

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$159,500	\$472,500	\$632,000
Assessment			
Valuation Year	Improvements	Land	Total
2016	\$111,700	\$330,800	\$442,500

Owner of Record

Owner LORENZ CAROL J & ROBERT A
Co-Owner
Address P O BOX 351
CENTER OSSIPEE, NH 03814

Sale Price \$0
Certificate
Book & Page 0211/0890
Sale Date

Ownership History

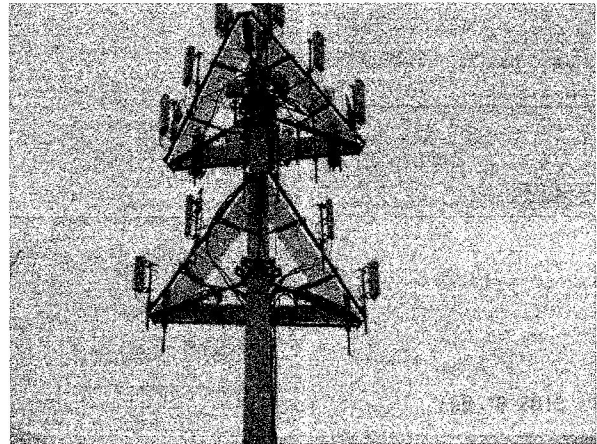
Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
LORENZ CAROL J & ROBERT A	\$0		0211/0890	

Building Information

Building 1 : Section 1

Year Built: 1990
Living Area: 880

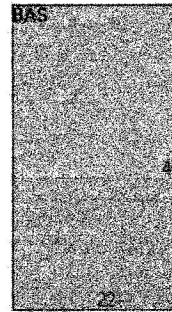
Building Photo



(<http://images.vgsi.com/photos/OldSaybrookCTPhotos//\00\01\27\84.jpg>)

Building Attributes	
Field	Description
STYLE	Light Indust
MODEL	Commercial
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Forced Air-Duc
AC Type	Central
Bldg Use	TEL REL TW
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	4310
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	NONE
Ceiling/Wall	SUSP-CEIL ONLY
Rooms/Prtns	LIGHT
Wall Height	10
% Comn Wall	0

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	880	880
		880	880

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 4310
Description TEL REL TW
Zone AA-1

Land Line Valuation

Size (Acres) 0.23
Depth 0
Assessed Value \$330,800
Appraised Value \$472,500

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN9	W/O TOP RL-8'			272 L.F.	\$1,800	1
CELL	CELL TOWER			125 UNITS	\$46,900	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$159,500	\$472,500	\$632,000
2015	\$112,600	\$472,500	\$585,100
2014	\$112,600	\$472,500	\$585,100

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$111,700	\$330,800	\$442,500
2015	\$78,900	\$330,800	\$409,700
2014	\$78,900	\$330,800	\$409,700

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170 INGHAM HILL RD

Location 170 INGHAM HILL RD

MBLU 051/ 033/ //

Acct# 00559800

Owner LORENZ CAROL J & ROBERT
A

Assessment \$165,300

Appraisal \$287,000

PID 3322

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$147,200	\$139,800	\$287,000

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$103,000	\$62,300	\$165,300

Owner of Record

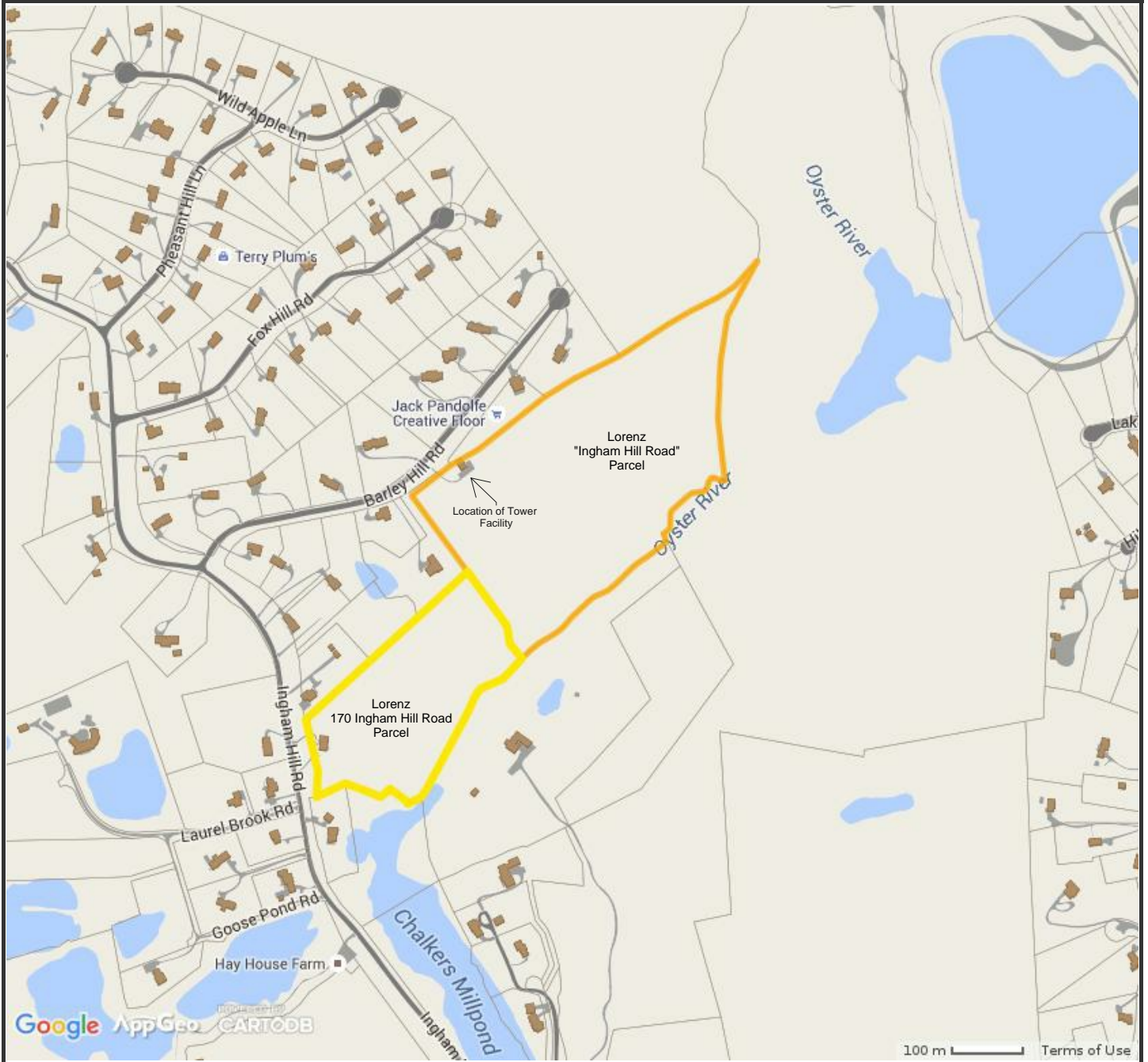
Owner LORENZ CAROL J & ROBERT A
Co-Owner
Address P O BOX 351
 CENTER OSSIPEE N H, NH 03814-0351

Sale Price \$0
Certificate
Book & Page 0211/0890
Sale Date 03/15/1984

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
LORENZ CAROL J & ROBERT A	\$0		0211/0890	03/15/1984

Building Information



Property Information

Property ID 051/033-0000
Location 170 INGHAM HILL RD
Owner LORENZ CAROL J & ROBERT A



**MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT**

Town of Old Saybrook, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

AN APPLICATION SUBMITTED BY THE SOUTHERN : CONNECTICUT SITING
NEW ENGLAND TELEPHONE COMPANY FOR A :
CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY : COUNCIL
AND PUBLIC NEED FOR THE CONSTRUCTION, :
MAINTENANCE, AND OPERATION OF FACILITIES :
TO PROVIDE CELLULAR SERVICE IN HARTFORD :
AND MIDDLESEX COUNTIES. : September 26, 1985

D E C I S I O N A N D O R D E R

Pursuant to the foregoing opinion, the Council hereby directs that a certificate of environmental compatibility and public need as required by section 16-50k of the General Statutes of Connecticut be issued to Southern New England Telephone Company (SNET) for the construction, operation, and maintenance of a telecommunications tower and associated equipment building to provide cellular service at sites in Old Saybrook and Enfield, Connecticut.

The facilities shall be constructed, operated, and maintained as specified in this matter, and subject to the following conditions:

1. The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed
 - a) 150' at the Old Saybrook site; and
 - b) 150' at the Enfield site;
2. A fence not lower than eight feet shall surround each tower and its associated equipment building;
3. The applicant or its successor shall notify the Council if and when directional antennas or any other equipment is added to any of these facilities;
4. The applicant or its successor shall permit, in accordance with representations made by it during the proceeding, public or private entities to share space on the facilities, for due

consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing;

5. The facilities shall be constructed in accordance with all applicable federal, state, and municipal laws and regulations;
6. The applicant shall submit a development and management plan (D&M) for the Old Saybrook site pursuant to sections 16-50j-75 through 16-50j-77 of the regulations of state agencies, except that irrelevant items in section 16-50j-76 need only be identified as such. The D&M plan shall include erosion control measures, reseeding plans, and tree removal plans. The applicant shall comply with the reporting requirements of section 16-50j-77 for both sites;
7. Construction activities shall take place during daylight working hours;
8. This decision and order shall be void and the towers and associated equipment approved herein shall be dismantled and removed, or reapplication for any new use shall be made to the Connecticut Siting Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction;
9. This decision and order shall be void if all construction authorized is not completed within three years of the issuance of this decision.

Pursuant to section 16-50p of the General Statutes, we hereby direct that a copy of the opinion and decision and order be served on each person listed below. A notice of the issuance shall be published in the

Hartford Courant, the Middletown Press, and the Old Saybrook Pictorial.

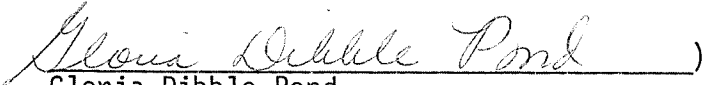
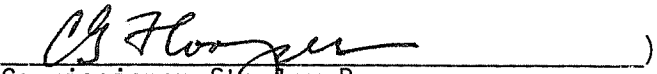


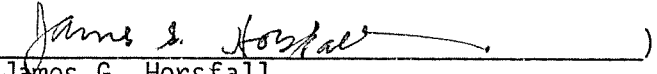
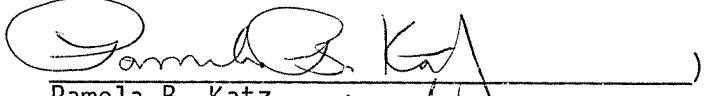
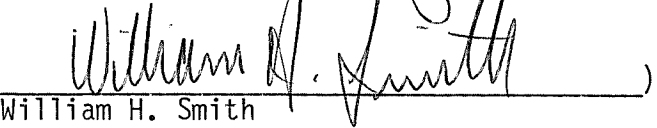
The parties to this proceeding are

Southern New England Telephone Company (Applicant)
227 Church Street
New Haven, Connecticut 06506
Attn: Peter J. Tyrrell
Senior Attorney
Room 314

C E R T I F I C A T I O N

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:


Dated at New Britain, Connecticut, this 26th day of September, 1985.

<u>Council Members</u>	<u>Vote Cast</u>
 Gloria Dibble Pond Chairperson	Yes
_____ Commissioner John Downey Designee: Commissioner Peter G. Boucher	Absent
 Commissioner Stanley Pac Designee: Christopher Cooper	Yes
 Owen L. Clark	Yes
 Mortimer A. Gelston	Yes
 James G. Horsfall	Yes
 Pamela B. Katz	Yes
 William H. Smith	Yes
_____ Colin C. Tait	Absent

STATE OF CONNECTICUT)
 :
COUNTY OF HARTFORD) ss. New Britain, September 26, 1985

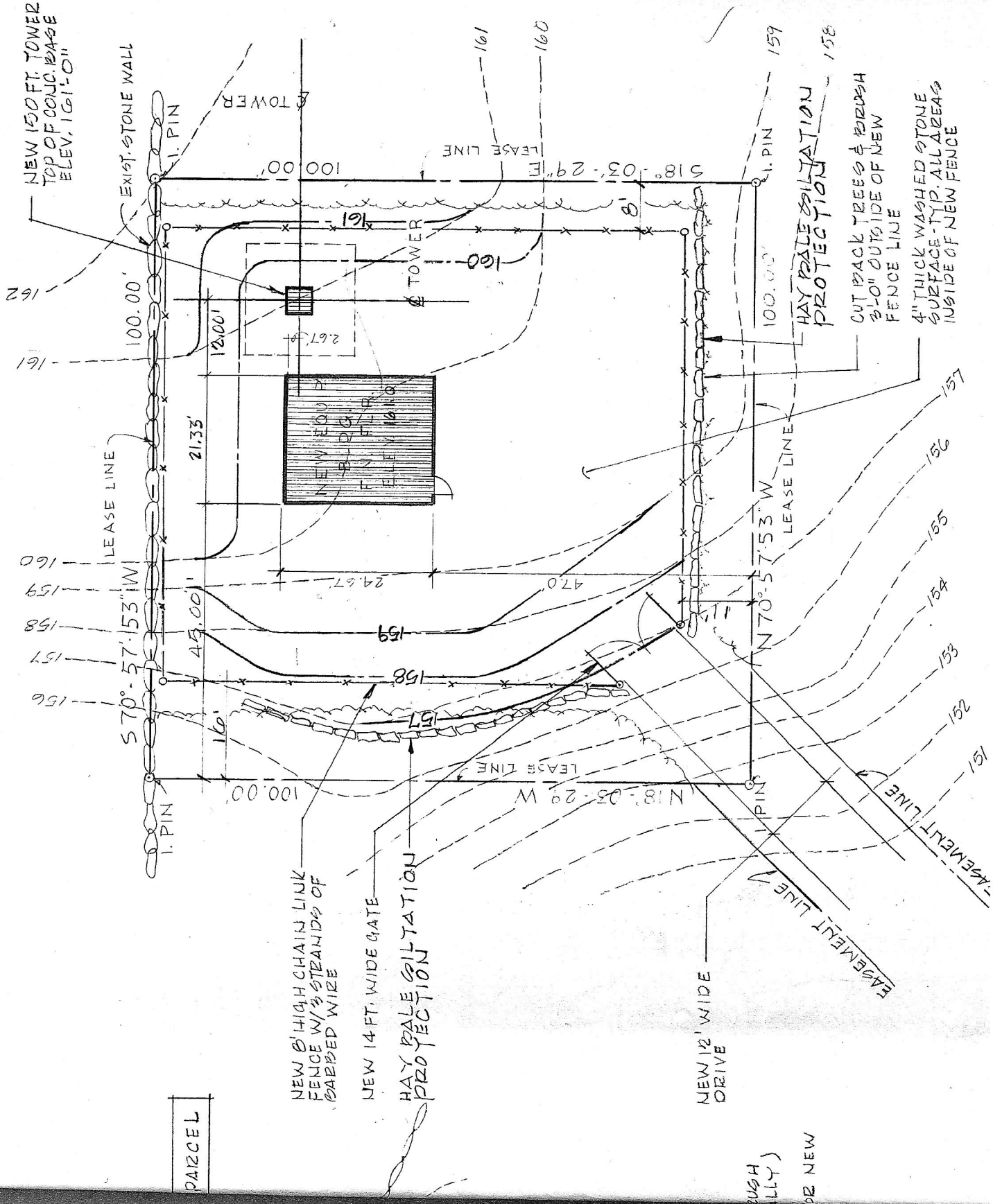
I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:



Christopher S. Wood, Executive Director
Connecticut Siting Council

Site Plan Excerpt from the D&M Plan



PARCEL

USH
LLY)
OR NEW

PROJECT INFORMATION

SCOPE OF WORK: TELECOMMUNICATIONS FACILITY UPGRADE (LTE BWE 2017 UPGRADE):

SITE ADDRESS: 170 INGHAM HILL ROAD
OLD SAYBROOK, CT 06475

LATITUDE: 41.309881° N 41° 18' 35.57" N

LONGITUDE: 72.397526° W 72° 23' 51.09" W

TYPE OF SITE: MONOPOLE / INDOOR EQUIPMENT

TOWER HEIGHT: 150'±

RAD CENTER: 149'±

JURISDICTION: NATIONAL, STATE & LOCAL CODES OR ORDINANCES

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY



at&t

SITE NUMBER: CT2019

SITE NAME: OLD SAYBROOK

PROJECT: LTE BWE 2017 UPGRADE

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
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A-2	ANTENNA LAYOUTS & ELEVATION	1
A-3	DETAILS	1
RF-1	RF-PLUMBING DIAGRAM	1
G-1	GROUNDING DETAILS	1

CROWN SITE NAME: OLD SAYBROOK
CROWN SITE #: 841289

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI. TURN LEFT ONTO CAPITOL BLVD. 0.3 MI. TURN LEFT ONTO WEST ST. 0.3 MI. MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 1.4 MI. MERGE ONTO CT-9 S VIA EXIT 22S ON THE LEFT TOWARD MIDDLETOWN/OLD SAYBROOK. 29.3 MI. MERGE ONTO I-95 S / GOVERNOR JOHN DAVIS LODGE TURNPIKE TOWARD NEW HAVEN/N.Y. CITY. 2.1 MI. TAKE THE ELM ST. EXIT, EXIT 67. 0.2 MI. TURN RIGHT ONTO ELM ST. 0.0 MI. ELM ST BECOMES INGHAM HILL RD. 0.6 MI. 170 INGHAM HILL RD IS ON THE RIGHT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS



CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT



27 NORTHWESTERN DR.
SALEM, NH 03079



45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SITE NUMBER: CT2019
SITE NAME: OLD SAYBROOK
CROWN SITE #: 841289
170 INGHAM HILL ROAD
OLD SAYBROOK, CT 06475
MIDDLESEX COUNTY



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	BY	REVISIONS	CHK APP'D	DESIGNED BY:	DRAWN BY:
1	11/09/17	SG	ISSUED FOR CONSTRUCTION		AT	LL
0	04/24/17	SG	ISSUED FOR CONSTRUCTION		AT	LL
A	01/12/17	LL	ISSUED FOR REVIEW		AT	LL

SITE NUMBER	DRAWING NUMBER	REV
CT2019	T-1	1

AT&T

TITLE SHEET
LTE BWE 2017 UPGRADE

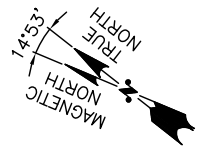
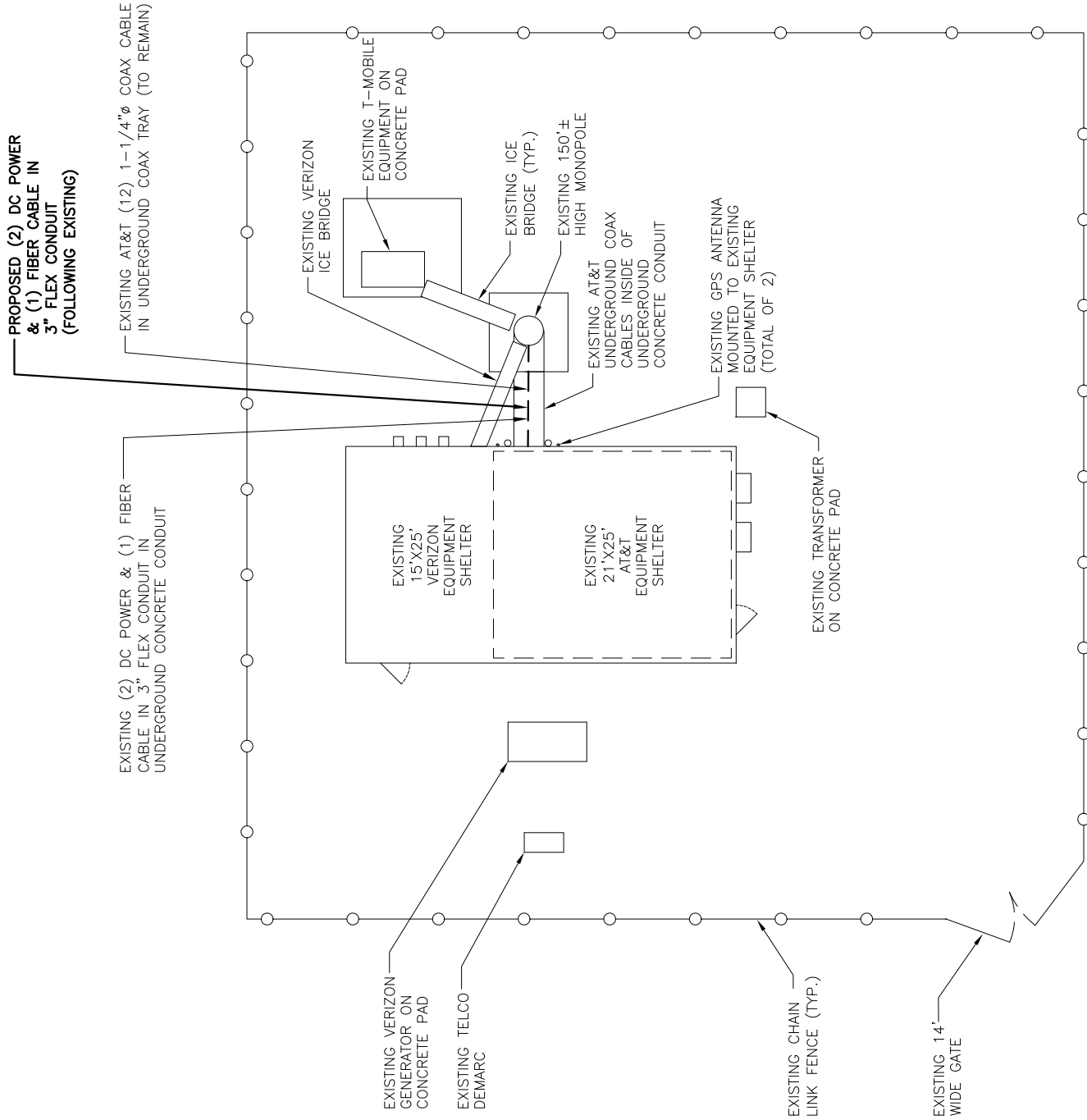


DESIGNED BY: AT
DRAWN BY: LL

NOTE:
REFER TO STRUCTURAL ANALYSIS BY: B+T GRP., DATED: OCTOBER 30, 2017, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: FEBRUARY 27, 2017 (REV. 1)

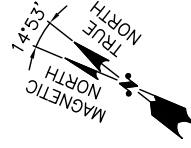
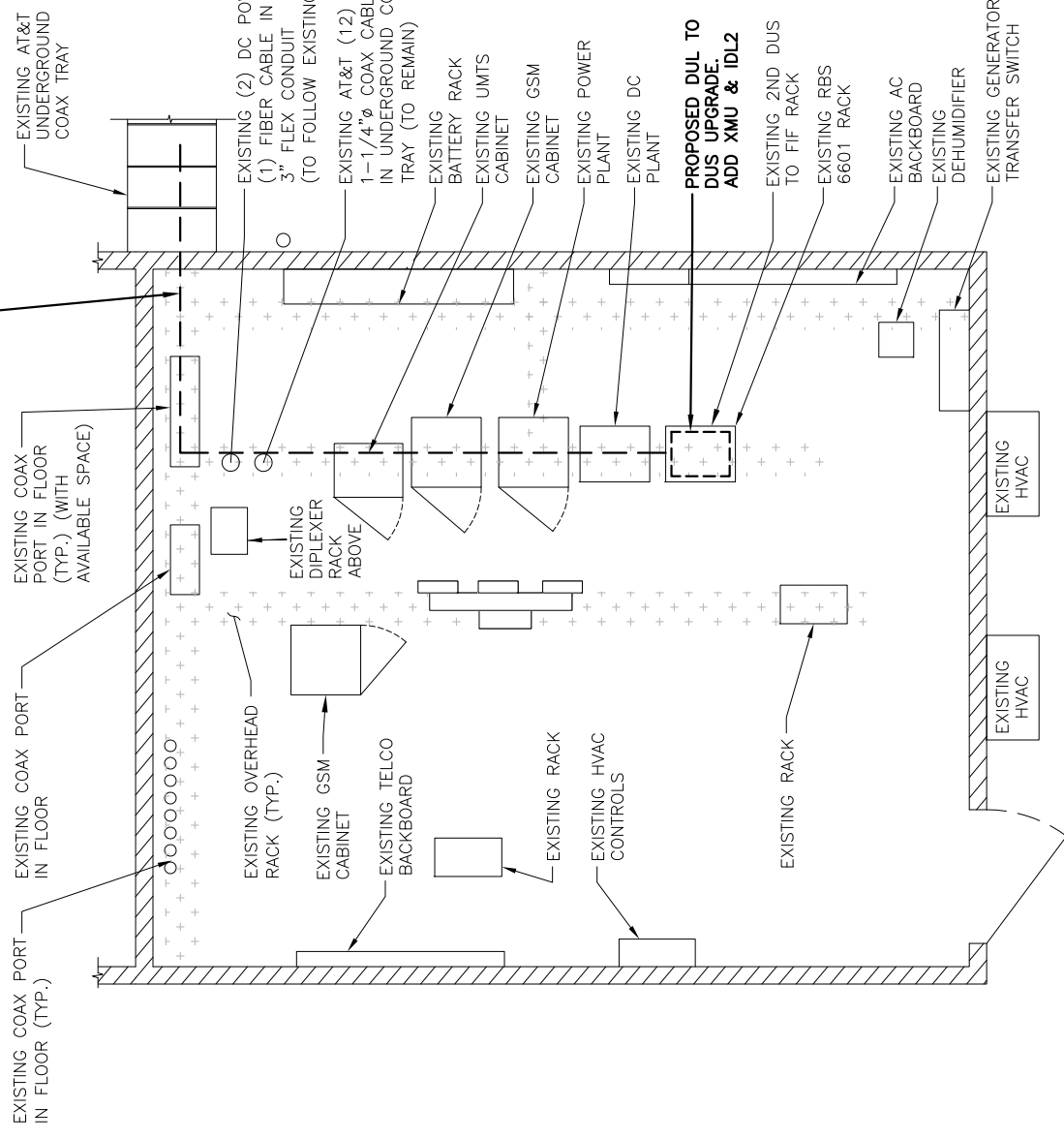
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



COMPOUND PLAN
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"

PROPOSED (2) DC POWER & (1) FIBER CABLE IN 3" FLEX CONDUIT (FOLLOWING EXISTING)



EQUIPMENT PLAN
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"



45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT2019
SITE NAME: OLD SAYBROOK
CROWN SITE#: 841289
170 INGHAM HILL ROAD
OLD SAYBROOK, CT 06475
MIDDLESEX COUNTY

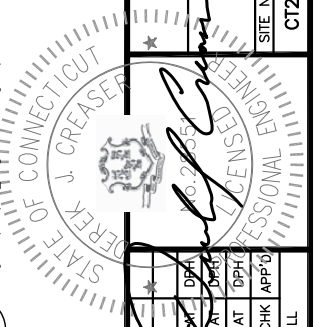


550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK APP'D	SCALE	AS SHOWN	DESIGNED BY:	AT	DRAWN BY:	LL
1	11/09/17	ISSUED FOR CONSTRUCTION	SG	AT	DPH					
0	04/24/17	ISSUED FOR CONSTRUCTION	SG	AT	DPH					
A	01/12/17	ISSUED FOR REVIEW	LL	AT	DPH					

REV	SITE NUMBER	DRAWING NUMBER
1	CT2019	A-1

AT&T
COMPOUND & EQUIPMENT PLAN
LTE BWE 2017 UPGRADE





November 30th, 2017

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6607

B+T Group
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Subject: **Structural Analysis Report**

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: CT2019
Carrier Site Name: Old Saybrook

Crown Castle Designation: **Crown Castle BU Number:** 841289
Crown Castle Site Name: OLD SAYBROOK
Crown Castle JDE Job Number: 433341
Crown Castle Work Order Number: 1494707
Crown Castle Application Number: 386401 Rev. 15

Engineering Firm Designation: **B+T Group Project Number:** 93496.014.01

Site Data: **170 Ingham Hill Road, Old Saybrook, Middlesex County, CT**
Latitude 41° 18' 35.55", Longitude -72° 23' 51.13"
150 Foot - Monopole Tower

Dear Charles McGuirt,

B+T Group 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 1112107, in accordance with application 386401, revision 15.

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 1 and Table 2 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 135 mph converted to a nominal 3-second gust wind speed of 105 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

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

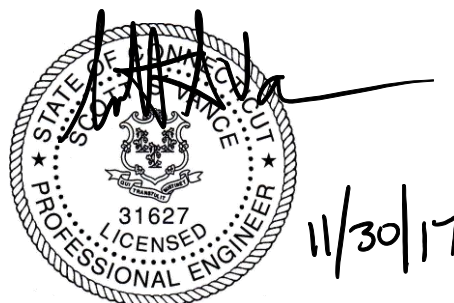
We at B+T Group appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Tharun Cheriyan, E.I.T.

Respectfully submitted by: B&T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2018

Scott S. Vance, P.E.

tnxTower Report - version 7.0.5.1



1) INTRODUCTION

This tower is a 150-ft. monopole designed by Engineered Endeavors Inc., in June of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E. The tower has been modified multiple times and those modifications were incorporated into this analysis.

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 105 mph with no ice, 50 mph with 0.75-inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

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
149.0	150.0	3	Andrew	SBNHH-1D65A	4 2	3/4 3/8	--
		3	Ericsson	RRUS 32			
		3	Ericsson	WCS RRUS-32-B30			
		1	Kathrein	80010799			
		2	Quintel Tech.	QS46512-2			
		1	Raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note	
160.0	163.0	1	Andrew	CSHAX-6516-R2	--	--	4	
	160.0	1	--	Pipe Mount [PM 701-1]	6	1-1/4	3	
	--	--	--	--				
149.0	156.0	1	Andrew	KP4F-23A	--	--	1	
	152.0	3	Andrew	SBNHH-1D65A	--	--	4	
		3	Ericsson	WCS RRUS-32-B30				
		3	Kmw Comm.	AM-X-CD-14-65-00T-RET				
	150.0	150.0	3	Ericsson	RRUS 11	12 1	1-1/4 7/8	1
			3	Powerwave Tech.	7770.00			
			6	Powerwave Tech.	TT19-08BP111-001			
1			Raycap	DC6-48-60-18-8F				
149.0	1	--	Platform Mount [LP 403-1]					
148.0	150.0	3	Ericsson	RRUS 11	2 1	5/8 3/8	4	
	148.0	1	--	Side Arm Mount [SO 102-3]	--	--	1	
140.0	142.0	3	Commscope	TMAT7LA-11A	1 1	1-1/4 1-5/8	1	
	141.0	3	Andrew	LNx-6515DS-A1M				
		3	Ericsson	RRUS 11 B12				
140.0	140.0	3	Ericsson	AIR 21 B2A/B4P				
		3	Ericsson	AIR 21 B4A/B2P				

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	--	Miscellaneous [NA 507-1]			
		1	--	Platform Mount [LP 303-1]			
130.0	133.0	3	Alcatel Lucent	B13 RRH 4X30	1	1-5/8	2
		3	Alcatel Lucent	B25 RRH4X30			
		3	Alcatel Lucent	B66A RRH4X45			
		6	Commscope	SBNHH-1D65B			
		1	Rfs Celwave	DB-B1-6C-12AB-0Z			
		3	Antel	BXA-80080/4CF			
	1	Rfs Celwave	DB-B1-6C-12AB-0Z	6	1-1/4	1	
	130.0	1	--	Platform Mount [LP 403-1]	1	1-5/8	
71.0	72.0	1	Kathrein	FMO	1	1/2	1
	71.0	1	--	Side Arm Mount [SO 301-1]			
22.0	22.0	1	Maxrad	MYA-43012N	1	5/16	1
		1	--	Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment to Be Relocated to 140'.
- 4) **Equipment to Be Removed; Not Considered in This Analysis**

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
158	158	1	Ems Wireless	TRR90-17	--	--
150	150	12	Allgon	7120.16	--	--
140	140	12	Allgon	7120.16	--	--
130	130	12	Allgon	7184.05	--	--
120	120	12	Allgon	7184.05	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Locate Rev#15	386401	CCI Sites
Tower Manufacturer Drawing	EI, Job No. 3503	4287398	CCI Sites
Tower Mapping	ReliaPOLE, Project No. 14-0703NEd	5204147	CCI Sites
Tower Modification Drawing	GPD, Date: 10/02/2008	4489382	CCI Sites
Post Modification Inspection	GPD, Date:03/04/2009	4489415	CCI Sites
Tower Modification Drawing	GPD, Date:12/15/2011	4478711	CCI Sites
Post Modification Inspection	HDG, Date: 03/19/2012	4468635	CCI Sites
Tower Modification Drawing	B+T Group, Date: 08/20/2015	5293057	CCI Sites
Post Modification Inspection	SGS, Date: 09/01/2015	5874000	CCI Sites
Tower Modification Drawing	B+T Group, Date: 05/06/2016	6254746	CCI Sites

Document	Remarks	Reference	Source
Post Modification Inspection	SGS, Date: 09/07/2016	6444911	CCI Sites
Foundation Mapping	FDH, Project No. 08-04159E N1	4591935	CCI Sites
Geotech Report	FDH, Project No. 08-04159E G1	4468634	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 11/27/2017	CCI Sites

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) Mount areas and weights are assumed based on photographs provided.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 145	Pole	TP16.31x15.53x0.25	1	-3.178	-	11.2	Pass
L2	145 - 140	Pole	TP17.09x16.31x0.25	2	-3.468	-	20.6	Pass
L3	140 - 135	Pole	TP17.87x17.09x0.25	3	-6.288	-	35.3	Pass
L4	135 - 130	Pole	TP18.65x17.87x0.25	4	-6.705	-	47.4	Pass
L5	130 - 125	Pole	TP19.43x18.65x0.25	5	-9.704	-	65.9	Pass
L6	125 - 123.75	Pole	TP19.625x19.43x0.25	6	-9.834	-	69.5	Pass
L7	123.75 - 123.5	Pole	TP19.664x19.625x0.513	7	-9.891	-	61.3	Pass
L8	123.5 - 118.5	Pole + Reinf.	TP20.444x19.664x0.5	8	-10.631	-	74.4	Pass
L9	118.5 - 113.5	Pole + Reinf.	TP21.224x20.444x0.488	9	-11.431	-	86.4	Pass
L10	113.5 - 110	Pole + Reinf.	TP21.77x21.224x0.488	10	-12.011	-	94.3	Pass
L11	110 - 109.75	Pole + Reinf.	TP21.81x21.77x0.763	11	-12.080	-	56.0	Pass
L12	109.75 - 104.75	Pole + Reinf.	TP22.619x21.81x0.75	12	-13.186	-	62.3	Pass
L13	104.75 - 99.75	Pole + Reinf.	TP23.427x22.619x0.725	13	-14.329	-	68.2	Pass
L14	99.75 - 94.75	Pole + Reinf.	TP24.235x23.427x0.713	14	-15.500	-	73.6	Pass
L15	94.75 - 89.75	Pole + Reinf.	TP25.043x24.235x0.688	15	-263.328	-	77.0	Pass
L16	89.75 - 84.75	Pole + Reinf.	TP25.852x25.043x0.675	16	-264.507	-	82.0	Pass
L17	84.75 - 83	Pole + Reinf.	TP26.134x25.852x0.675	17	-264.917	-	82.7	Pass
L18	83 - 82.75	Pole + Reinf.	TP26.175x26.134x0.563	18	-264.983	-	97.1	Pass
L19	82.75 - 77.75	Pole + Reinf.	TP26.983x26.175x0.563	19	-265.842	-	98.8	Pass
L20	77.75 - 72.75	Pole + Reinf.	TP27.791x26.983x0.55	20	-266.078	-	99.8	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L21	72.75 - 67.5	Pole + Reinf.	TP28.64x27.791x0.55	21	-267.180	-	100.0	Pass
L22	67.5 - 66	Pole + Reinf.	TP28.266x27.449x0.613	22	-269.154	-	93.1	Pass
L23	66 - 61	Pole + Reinf.	TP29.084x28.266x0.6	23	-269.517	-	93.0	Pass
L24	61 - 56	Pole	TP29.901x29.084x0.375	24	-270.751	-	94.8	Pass
L25	56 - 51	Pole	TP30.718x29.901x0.375	25	-271.664	-	92.7	Pass
L26	51 - 49.9	Pole	TP30.898x30.718x0.375	26	-272.585	-	92.1	Pass
L27	49.9 - 49.65	Pole + Reinf.	TP30.939x30.898x0.663	27	-272.783	-	79.6	Pass
L28	49.65 - 44.65	Pole + Reinf.	TP31.756x30.939x0.663	28	-272.856	-	78.4	Pass
L29	44.65 - 39.65	Pole + Reinf.	TP32.573x31.756x0.65	29	-274.259	-	77.0	Pass
L30	39.65 - 33	Pole	TP33.66x32.573x0.65	30	-275.682	-	76.3	Pass
L31	33 - 32.65	Pole	TP32.966x32.256x0.713	31	-278.736	-	70.8	Pass
L32	32.65 - 32.4	Pole	TP33.006x32.966x0.438	32	-278.847	-	75.3	Pass
L33	32.4 - 27.4	Pole	TP33.822x33.006x0.438	33	-278.904	-	73.0	Pass
L34	27.4 - 22.4	Pole	TP34.637x33.822x0.438	34	-280.008	-	70.6	Pass
L35	22.4 - 17.4	Pole	TP35.452x34.637x0.438	35	-281.131	-	68.2	Pass
L36	17.4 - 12.4	Pole	TP36.268x35.452x0.438	36	-282.391	-	65.8	Pass
L37	12.4 - 7.4	Pole	TP37.083x36.268x0.438	37	-283.554	-	63.4	Pass
L38	7.4 - 2.4	Pole	TP37.899x37.083x0.438	38	-284.739	-	61.0	Pass
L39	2.4 - 0	Pole	TP38.29x37.899x0.438	39	-285.947	-	59.9	Pass
L15	94.75 - 89.75	Guy A@90.75	1 5/8	42	179.005	194.400	92.1	Pass
L15	94.75 - 89.75	Guy B@90.75	1 3/8	41	94.593	139.200	68.0	Pass
L15	94.75 - 89.75	Guy C@90.75	1 3/8	40	106.620	139.200	76.6	Pass
							Summary	
						Pole (L21)	100.0	Pass
						Guy A (L15)	92.1	Pass
						Guy B (L15)	68.0	Pass
						Guy C (L15)	76.6	Pass
						Rating =	100.0	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation	% Capacity	Pass / Fail	
1	Flange Connection	110'	60.1	Pass	
1	Anchor Rods	Base	97.9	Pass	
1	Base Plate	Base	61.0	Pass	
1	Base Foundation	Structure	Base	41.2	Pass
		Soil	Base	72.9	Pass
1	Inner Guy Anchor Foundation	Anchor Rod	Base	92.9	Pass
		Structure	Base	76.3	Pass
		Soil	Base	55.1	Pass
1	Outer Guy Anchor Foundation	Anchor Rod	Base	48.8	Pass
		Structure	Base	30.2	Pass
		Soil	Base	54.3	Pass

Structure Rating (max from all components) =	100.0%
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Notes:

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

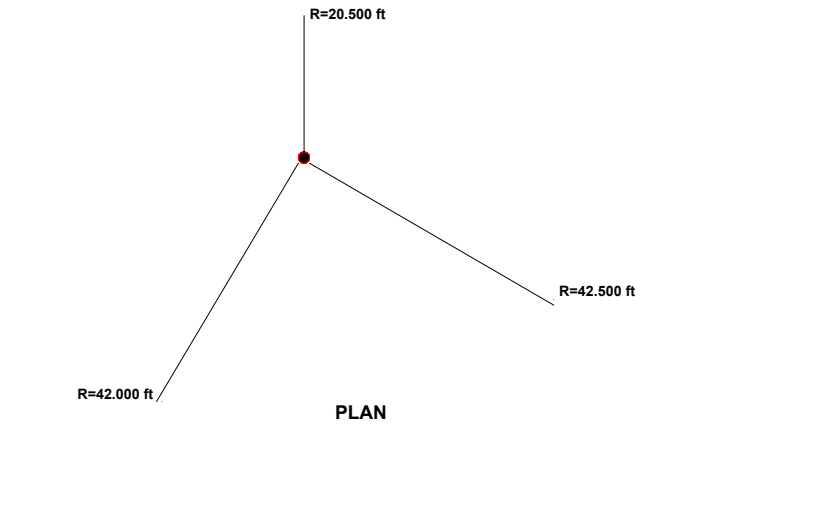
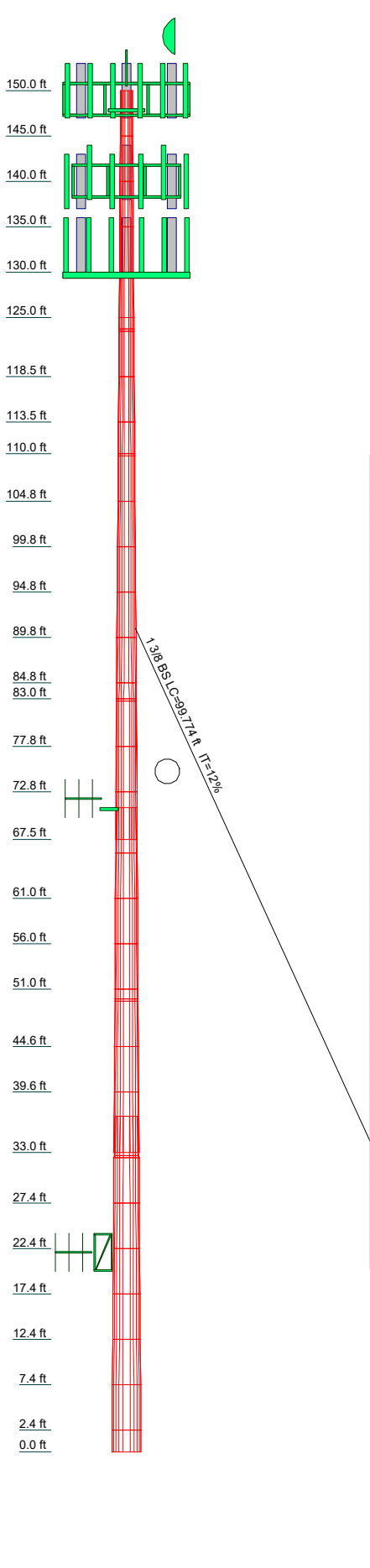
4.1) Recommendations

The tower and its foundations have sufficient capacity to carry the final load configuration. Modifications will not be required.

Table 7 – Existing Loading Tilt-Sway Results for 60 mph Service Wind – LC7

<i>Elevation (ft)</i>	<i>Dish Model</i>	<i>Diameter (ft)</i>	<i>Tilt (°)</i>	<i>Twist (°)</i>
149.0	KP4F-23A	4.0	1.131	0.010

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.000	12	0.250	3.500	15.530	16.310	0.2	0.2
2	5.000	12	0.250	3.500	16.310	17.090	0.2	0.2
3	5.000	12	0.250	3.500	17.090	17.870	0.2	0.2
4	5.000	12	0.250	3.500	17.870	18.650	0.2	0.2
5	5.000	12	0.250	3.500	18.650	19.430	0.2	0.2
6	5.000	12	0.250	3.500	19.430	20.210	0.2	0.2
7	5.000	12	0.250	3.500	20.210	20.990	0.2	0.2
8	5.000	12	0.250	3.500	20.990	21.770	0.2	0.2
9	5.000	12	0.250	3.500	21.770	22.550	0.2	0.2
10	5.000	12	0.250	3.500	22.550	23.330	0.2	0.2
11	5.000	12	0.250	3.500	23.330	24.110	0.2	0.2
12	5.000	12	0.250	3.500	24.110	24.890	0.2	0.2
13	5.000	12	0.250	3.500	24.890	25.670	0.2	0.2
14	5.000	12	0.250	3.500	25.670	26.450	0.2	0.2
15	5.000	12	0.250	3.500	26.450	27.230	0.2	0.2
16	5.000	12	0.250	3.500	27.230	28.010	0.2	0.2
17	5.000	12	0.250	3.500	28.010	28.790	0.2	0.2
18	5.000	12	0.250	3.500	28.790	29.570	0.2	0.2
19	5.000	12	0.250	3.500	29.570	30.350	0.2	0.2
20	5.000	12	0.250	3.500	30.350	31.130	0.2	0.2
21	5.000	12	0.250	3.500	31.130	31.910	0.2	0.2
22	5.000	12	0.250	3.500	31.910	32.690	0.2	0.2
23	5.000	12	0.250	3.500	32.690	33.470	0.2	0.2
24	5.000	12	0.250	3.500	33.470	34.250	0.2	0.2
25	5.000	12	0.250	3.500	34.250	35.030	0.2	0.2
26	5.000	12	0.250	3.500	35.030	35.810	0.2	0.2
27	5.000	12	0.250	3.500	35.810	36.590	0.2	0.2
28	5.000	12	0.250	3.500	36.590	37.370	0.2	0.2
29	5.000	12	0.250	3.500	37.370	38.150	0.2	0.2
30	5.000	12	0.250	3.500	38.150	38.930	0.2	0.2
31	5.000	12	0.250	3.500	38.930	39.710	0.2	0.2
32	5.000	12	0.250	3.500	39.710	40.490	0.2	0.2
33	5.000	12	0.250	3.500	40.490	41.270	0.2	0.2
34	5.000	12	0.250	3.500	41.270	42.050	0.2	0.2
35	5.000	12	0.250	3.500	42.050	42.830	0.2	0.2
36	5.000	12	0.250	3.500	42.830	43.610	0.2	0.2
37	5.000	12	0.250	3.500	43.610	44.390	0.2	0.2
38	5.000	12	0.250	3.500	44.390	45.170	0.2	0.2
39	5.000	12	0.250	3.500	45.170	45.950	0.2	0.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8" x 5' (E)	152.5	TMAT7LA-11A (E/front shielded per photo)	140
7770.00 w/ Mount Pipe (E)	149	7770.00 w/ Mount Pipe (E)	149
7770.00 w/ Mount Pipe (E)	149	7770.00 w/ Mount Pipe (E)	149
DC6-48-60-18-8F (E-Relocated From 148' level)	149	TMAT7LA-11A (E/front shielded per photo)	140
RRUS 11 (E-Relocated From 148' level)	149	RRUS 11 B12 (E/front shielded per photo)	140
RRUS 11 (E-Relocated From 148' level)	149	RRUS 11 B12 (E/front shielded per photo)	140
RRUS 11 (E-Relocated From 148' level)	149	RRUS 11 B12 (E/front shielded per photo)	140
RRUS 11 (E-Relocated From 148' level)	149	RRUS 11 B12 (E/front shielded per photo)	140
(2) TT19-08BP111-001 (E-Shielded per photo)	149	Platform Mount [LP 303-1] (E)	140
(2) TT19-08BP111-001 (E)	149	Miscellaneous [NA 507-1] (E)	140
(2) TT19-08BP111-001 (E)	149	AIR 21 B2A/B4P w/ Mount Pipe (E)	140
(2) TT19-08BP111-001 (E)	149	GPS (3"x7") (E-Per Photo)	134
SBNHH-1D65A w/ Mount Pipe (P)	149	BXA-80080/4CF w/ Mount Pipe (E)	130
SBNHH-1D65A w/ Mount Pipe (P)	149	DB-B1-6C-12AB-0Z (E)	130
SBNHH-1D65A w/ Mount Pipe (P)	149	(2) SBNHH-1D65B w/ Mount Pipe (R)	130
QS46512-2 w/ Mount Pipe (P)	149	(2) SBNHH-1D65B w/ Mount Pipe (R)	130
80010799 w/ Mount Pipe (P)	149	(2) SBNHH-1D65B w/ Mount Pipe (R)	130
QS46512-2 w/ Mount Pipe (P)	149	B13 RRH 4X30 (R)	130
DC6-48-60-18-8F (P)	149	B13 RRH 4X30 (R)	130
WCS RRUS-32-B30 (P)	149	B25 RRH4X30 (R)	130
WCS RRUS-32-B30 (P)	149	B25 RRH4X30 (R)	130
WCS RRUS-32-B30 (P)	149	B25 RRH4X30 (R)	130
RRUS 32 (P-Relocated from 148')	149	B25 RRH4X30 (R)	130
RRUS 32 (P-Relocated from 148')	149	DB-B1-6C-12AB-0Z (R)	130
RRUS 32 (P-Relocated from 148')	149	B66A RRH4X45 (R)	130
6' x 2" Mount Pipe (E-Empty/Photo)	149	B66A RRH4X45 (R)	130
6' x 2" Mount Pipe (E-Empty/Photo)	149	B66A RRH4X45 (R)	130
6' x 2" Mount Pipe (E-Empty/Photo)	149	5' x 2" Pipe Mount (E-TBR Antenna)	130
Platform Mount [LP 403-1] (E)	149	5' x 2" Pipe Mount (E-TBR Antenna)	130
KP4F-23A (E)	149	5' x 2" Pipe Mount (E-TBR Antenna)	130
5' x 2" Pipe Mount (E)	148	Platform Mount [LP 403-1] (E)	130
5' x 2" Pipe Mount (E)	148	BXA-80080/4CF w/ Mount Pipe (E)	130
Side Arm Mount [SO 102-3] (E)	148	BXA-80080/4CF w/ Mount Pipe (E)	130
5' x 2" Pipe Mount (E)	148	Reflector (E-Per Photo)	71
AIR 21 B2A/B4P w/ Mount Pipe (E)	140	3' x 2" Pipe Mount (E-Per Photo)	71
AIR 21 B2A/B4P w/ Mount Pipe (E)	140	Side Arm Mount [SO 701-1] (E)	71
AIR 21 B4A/B2P w/ Mount Pipe (E)	140	FMO (E)	71
AIR 21 B4A/B2P w/ Mount Pipe (E)	140	Side Arm Mount [SO 301-1] (E)	71
AIR 21 B4A/B2P w/ Mount Pipe (E)	140	Side Arm Mount [SO 701-1] (E)	22
LNX-6515DS-A1M w/ Mount Pipe (E)	140	MYA-43012N (E)	22
LNX-6515DS-A1M w/ Mount Pipe (E)	140	4' x 2" Pipe Mount (E-For Yagi/Photo)	22
LNX-6515DS-A1M w/ Mount Pipe (E)	140		

B+T Group
 1717 S. Boulder Ave. Suite 300
 Tulsa, OK 74119
 Phone: (918) 587-4630
 FAX: (918) 295-0265

Job: 93496.014.01 - OLD SAYBROOK, CT (BU # 84128)		
Project:		
Client: Crown Castle	Drawn by: T. Cheriyan	App'd:
Code: TIA-222-G	Date: 11/30/17	Scale: NTS
Path:		Dwg No. E-1

February 27, 2017 (Rev. 1)



SAI Communications
27 Northwestern Drive
Salem NH, 03079

RE: Site Number: CT2019
 Site Name: Old Saybrook
 Site Address: 170 Ingham Hill Road
 Old Saybrook, CT 06475

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by SAI to perform a mount analysis on the existing AT&T antenna mount to determine its capability of supporting the following equipment loading:

- (3) 7770 Antennas (55"x11"x5" – Wt. = 35 lbs/each)
- (3) SBNHH-1D65A Antennas (55"x11.9"x7.1" – Wt. = 41 lbs/each)
- (3) RRUS-11 RRH's (19.7"x17.0"x7.2" – Wt. = 51 lbs/each) (Separate ring mount)
- (3) RRUS-32 RRH's (27.2"x12.1"x7" – Wt. = 60 lbs/each) (Separate ring mount)
- (6) TT19-08BP111-001 TMA's (9.9"x6.7"x5.4" – Wt. = 16 lbs/each)
- (2) Raycap DC6-48-60-18-8F squid (24"x9.7"Ø – Wt. = 33 lbs) (Separate ring mount)
- **(2) QS46512-2 Antennas (52"x12"x10.8" – Wt. = 75 lbs/each)**
- **(1) 800-10799 Antenna (106"x14.8"x6.7" – Wt. = 108 lbs)**
- **(3) RRUS-32 RRH's (27.2"x12.1"x7" – Wt. = 60 lbs/each)**

**Proposed Loading Shown in Bold.*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing AT&T antenna mounts on March 3, 2016.

Based on our analysis, we have determined that the existing antenna mounts **ARE CAPABLE** of supporting the proposed installation with the following modifications:

- **Vertically center the new and existing antennas on the existing platform (typ. of nine).**

This analysis was conducted in accordance with EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the International Building Code 2012 with 2016 CTSCB Amendments. (See the attached analysis).

Reference Documents:

- Mount mapping data prepared by ProVertic LLC dated March 3, 2016.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC



Michael Cabral
Structural Dept. Head



Daniel P. Hamm, PE
Principal



Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

December 7, 2017

Honorable Carl P. Fortuna
1st Selectman, Town of Old Saybrook
Town Hall, 302 Main Street
Old Saybrook ,CT 06475

Re: Existing Telecommunications Facility – 170 Ingham Hill Road, Old Saybrook

Dear Mr. Fortuna:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) and LongTerm Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (“R.C.S.A.”) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T’s proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The enclosed Notice fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council’s procedures, please contact the undersigned at 860-830-0380 or Ms. Melanie Bachman, Acting Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

A handwritten signature in black ink, appearing to read "S. L. Levine".

Steven L. Levine
Real Estate Consultant

Enclosure



Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

December 7, 2017

Christine Nelson, Town Planner
Town of Old Saybrook
Town Hall, 302 Main Street
Old Saybrook ,CT 06475

Re: Existing Telecommunications Facility – 170 Ingham Hill Road, Old Saybrook

Dear Ms. Nelson:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) and LongTerm Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) will be changing its equipment configuration at certain cell sites.

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Steven L. Levine
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3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

December 7, 2017

William Gates, Project Engineer
Crown Castle Inc.
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

Re: Existing Telecommunications Facility – 170 Ingham Hill Road, Old Saybrook

Dear Mr. Gates:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) and LongTerm Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) will be changing its equipment configuration at certain cell sites.

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Enclosure



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3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

December 7, 2017

Carol J. and Robert A. Lorenz
Box 351
Ossipee Center, NH 03814

Re: Existing Telecommunications Facility – 170 Ingham Hill Road, Old Saybrook

Dear Mr. and Mrs. Lorenz:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) and LongTerm Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) will be changing its equipment configuration at certain cell sites.

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Steven L. Levine
Real Estate Consultant

Enclosure

February 27, 2017 (Rev. 1)



SAI Communications
27 Northwestern Drive
Salem NH, 03079

RE: Site Number: CT2019
 Site Name: Old Saybrook
 Site Address: 170 Ingham Hill Road
 Old Saybrook, CT 06475

To Whom It May Concern:

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- (3) RRUS-11 RRH's (19.7"x17.0"x7.2" – Wt. = 51 lbs/each) (Separate ring mount)
- (3) RRUS-32 RRH's (27.2"x12.1"x7" – Wt. = 60 lbs/each) (Separate ring mount)
- (6) TT19-08BP111-001 TMA's (9.9"x6.7"x5.4" – Wt. = 16 lbs/each)
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This determination was based on the following limitations and assumptions:

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Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC



Michael Cabral
Structural Dept. Head



Daniel P. Hamm, PE
Principal

FIELD PHOTOS:





Wind & Ice Calculations

Date: 02-27-2017

Project Name: Old Saybrook

Project Number: CT2019

Designed By: GH Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

$$K_z = 2.01 (z/z_g)^{2/\alpha}$$

z= 156 (ft)

z_g= 1200 (ft)

α= 7

K_z= 1.122

$$K_{zmin} \leq K_z \leq 2.01$$

Table 2-4

Exposure	Z _g	α	K _{zmin}	K _e
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.4 Topographic Factor:

Table 2-5

Topo. Category	K _t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$$K_{zt} = [1 + (K_e K_t / K_h)]^2$$

$$K_h = e^{(f \cdot z / H)}$$

K_{zt}= #DIV/0!

K_h= #DIV/0!

K_e= 0 (from Table 2-4)

K_t= 0 (from Table 2-5)

f= 0 (from Table 2-5)

z= 156

H= 0 (Ht. of the crest above surrounding terrain)

K_{zt}= 1.00

(If Category 1 then K_{zt}=1.0)

Category= 1

Date: 02-27-2017

Project Name: Old Saybrook

Project Number: CT2019

Designed By: GH Checked By: MSC



2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

Gh = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h= 155 Gh= 0.85

2.6.7.2 Guyed Masts Gh= 0.85

2.6.7.3 Pole Structures Gh= 1.1

2.6.9 Appurtenances Gh= 1.0

2.6.7.4 Structures Supported on Other Structures
(Cantilevered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

Gh= 1.35 Gh= 1.00

Date: 02-27-2017

Project Name: Old Saybrook

Project Number: CT2019

Designed By: GH Checked By: MSC



2.6.9.2 Design Wind Force on Appurtenances

$$F = qz * Gh * (EPA)_A$$

$$qz = 0.00256 * K_z * K_{zt} * K_d * V_{max}^2 * I$$

$$K_z = 1.122$$

$$K_{zt} = 1.0$$

$$K_d = 0.95$$

$$V_{max} = 120$$

$$I = 1.0$$

$$q_z = 39.30$$

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95

Determine Cf:

If lattice Structure See Manual

If Tubular Pole Structure, Use Corrected Value from Table 2.7 Below

C mph.ft	Round	18 Sided	16 Sided	12 Sided	8 Sided
< 32 (Subcritical)	1.2	1.2	1.2	1.2	1.2
32 to 64 (Transitional)	$38.4/C^{1.0}$	$25.8/C^{0.885}$	$12.6/C^{0.678}$	$2.99/C^{0.263}$	1.2
> 64 (Supercritical)	0.6	0.65	0.75	1	1.2

$$C = (I * K_{zt} * K_z)^{0.5} * V * D$$

D = Outside diameter for rounds: 0.25 feet

$$C = 31.78$$

$$C_f = 1.2$$

Date: 02-27-2017
 Project Name: Old Saybrook
 Project Number: CT2019
 Designed By: GH Checked By: MSC



Determine Ca:

Table 2-8

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Round	C < 32 (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{1.0})$
	C > 64 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
 (Aspect ratio is independent of the spacing between support points of a linear appurtenance, and the section length considered to have uniform wind load).

Note: Linear interpolation may be used for aspect ratios other than those shown.

<u>Appurtenances</u>	<u>Height</u>	<u>Width</u>	<u>Depth</u>	<u>Flat Area</u>	<u>Aspect Ratio</u>	<u>Ca</u>	<u>Force (lbs) (normal)</u>	<u>Force (lbs) (angle)</u>
7770	55.0	11.0	5.0	4.20	5.00	1.31	216	140
SBNHH-1D65A	55.0	11.9	7.1	4.55	4.62	1.29	231	172
QS46512-2	52.0	12.0	10.8	4.33	4.33	1.28	218	204
800-10799	106.0	14.8	6.7	10.89	7.16	1.41	602	397
RRUS-32 (shielded)	27.2	2.0	7.0	0.38	13.60	1.62	24	

ICE WEIGHT CALCULATIONS

Project: CT2019 - Old Saybrook

Thickness of ice: 0.75 in.
Density of ice: 56 pcf

7770 Antenna

Weight of ice based on total radial SF area:
Depth (in): 5
height (in): 55
Width (in): 11
Total weight of ice on object: 51 lbs
Weight of object: 35 lbs
Combined weight of ice and object: 86 lbs

SBNHH-1D65A Antenna

Weight of ice based on total radial SF area:
Depth (in): 7.1
height (in): 55
Width (in): 11.85
Total weight of ice on object: 60 lbs
Weight of object: 41 lbs
Combined weight of ice and object: 101 lbs

QS46512-2 Antenna

Weight of ice based on total radial SF area:
Depth (in): 10.8
height (in): 52
Width (in): 12
Total weight of ice on object: 69 lbs
Weight of object: 75 lbs
Combined weight of ice and object: 144 lbs

800-10799 Antenna

Weight of ice based on total radial SF area:
Depth (in): 6.7
height (in): 106
Width (in): 14.8
Total weight of ice on object: 125 lbs
Weight of object: 108 lbs
Combined weight of ice and object: 233 lbs

2-3/8" Pipe

Per foot weight of ice:
diameter (in): 2.38
Per foot weight of ice on object: 2 plf

3-1/2" Pipe

Per foot weight of ice:
diameter (in): 3.5
Per foot weight of ice on object: 3 plf

RRUS-11 RRH

Weight of ice based on total radial SF area:
Depth (in): 7.2
height (in): 19.7
Width (in): 17
Total weight of ice on object: 32 lbs
Weight of object: 51 lbs
Combined weight of ice and object: 83 lbs

RRUS-32 RRH

Weight of ice based on total radial SF area:
Depth (in): 7
height (in): 27.2
Width (in): 12.1
Total weight of ice on object: 33 lbs
Weight of object: 60 lbs
Combined weight of ice and object: 93 lbs

TT19-08BP111-001 TMA

Weight of ice based on total radial SF area:
Depth (in): 5.4
height (in): 9.9
Width (in): 6.7
Total weight of ice on object: 9 lbs
Weight of object: 16 lbs
Combined weight of ice and object: 25 lbs

Squid

Per foot weight of ice:
diameter (in): 9.7
height (in): 24
Per foot weight of ice on object: 9 plf
Total weight of ice on object: 18 lbs

2-1/2x1-1/2x1/4 Angle

Weight of ice based on total radial SF area:
Depth (in): 0.25
height (in): 12
Width (in): 4
Per foot weight of ice on object: 2 plf

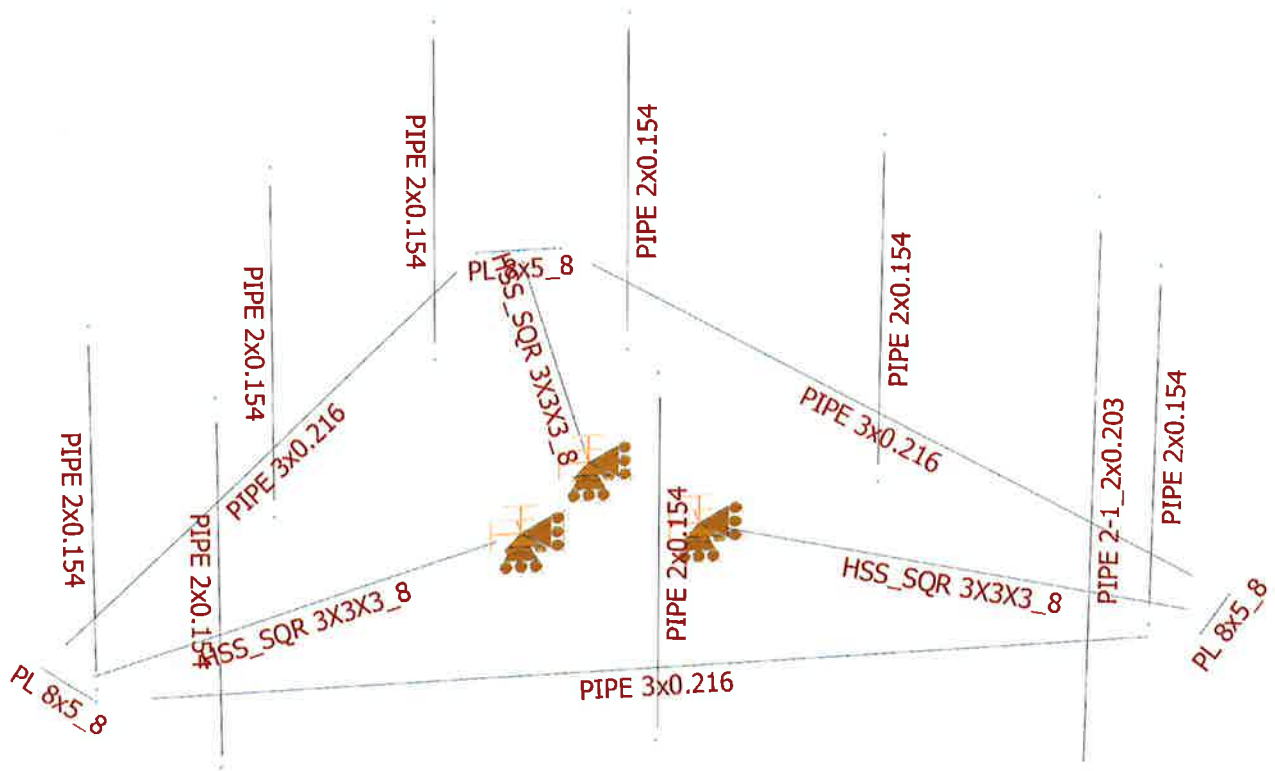
3x3 HSS

Weight of ice based on total radial SF area:
Depth (in): 3
height (in): 12
Width (in): 3
Per foot weight of ice on object: 4 plf



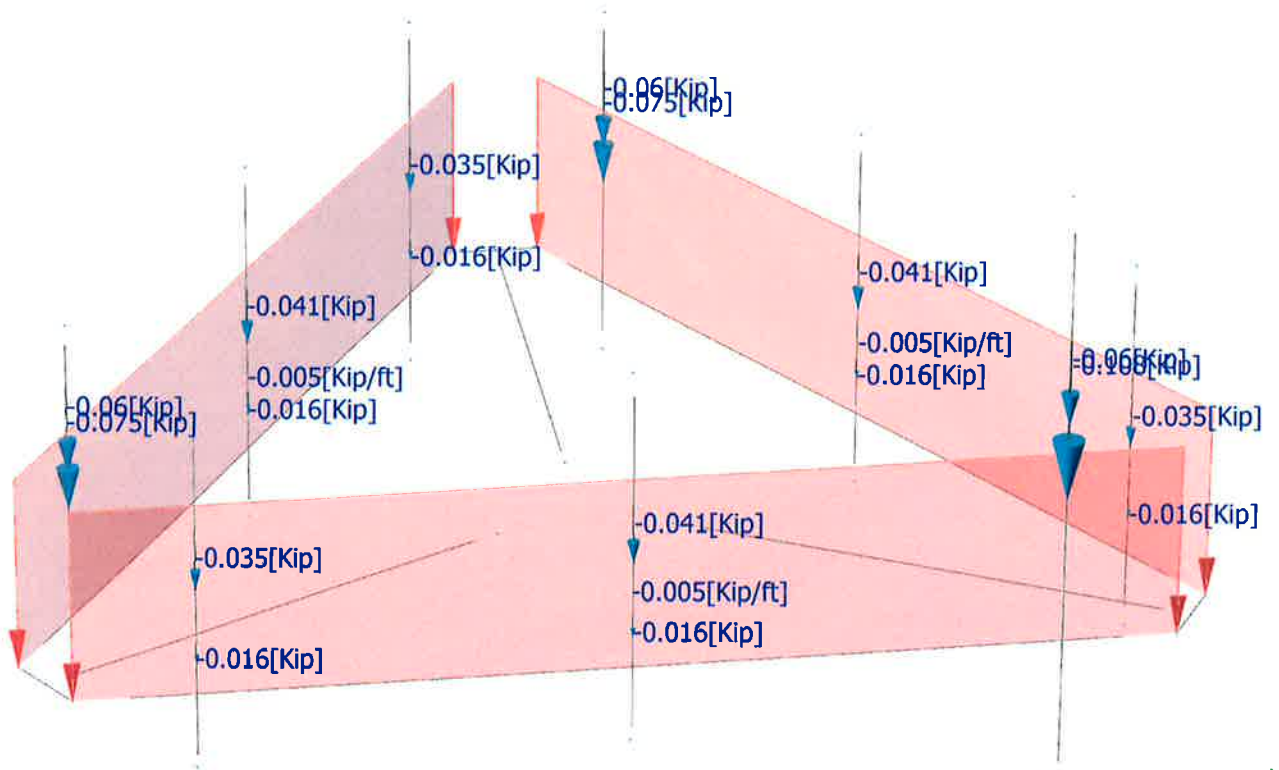
**Mount Calculations
(EXISTING CONDITIONS)**





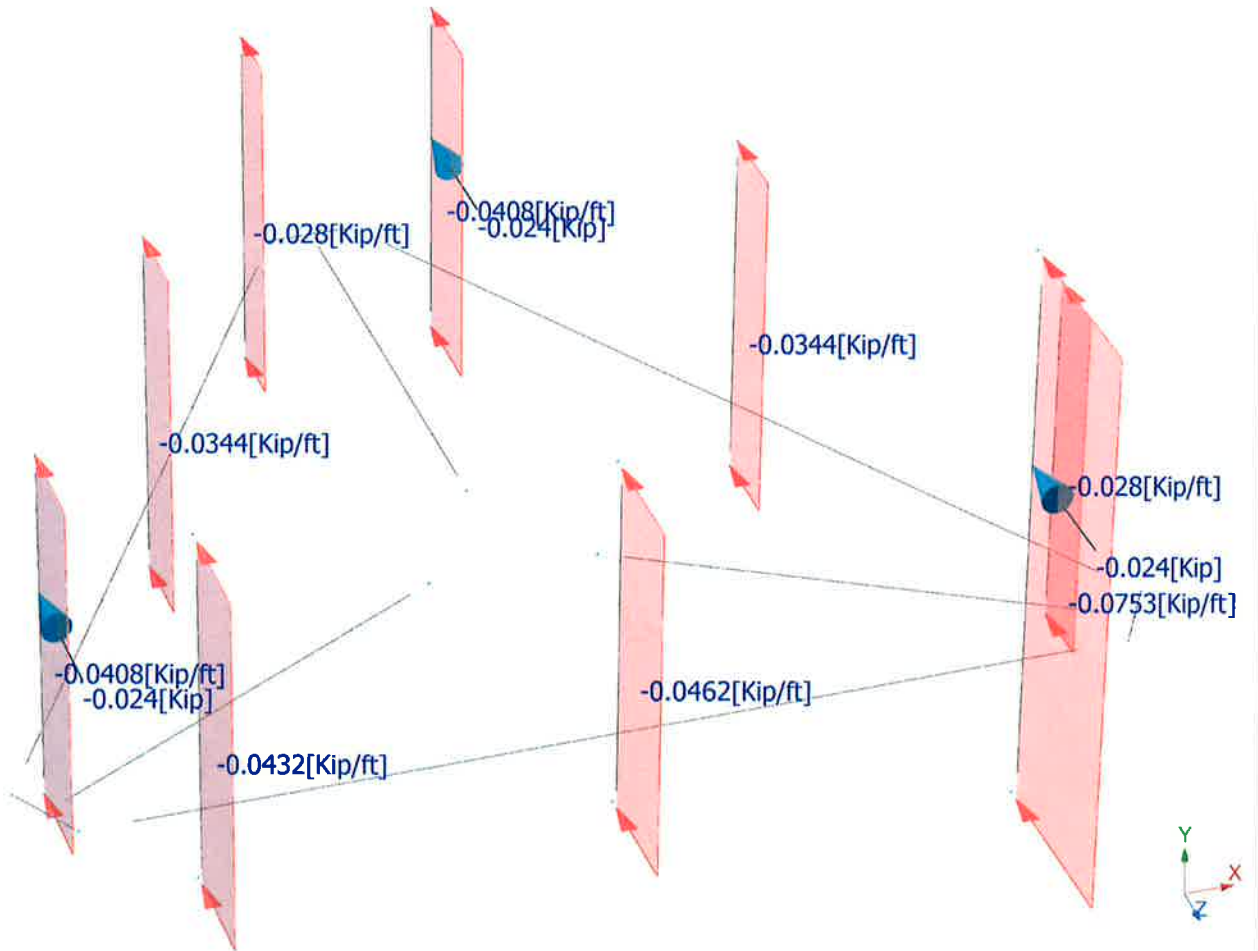
Loads

- Global distributed - Members
- Local distributed - Members
- Concentrated - Members



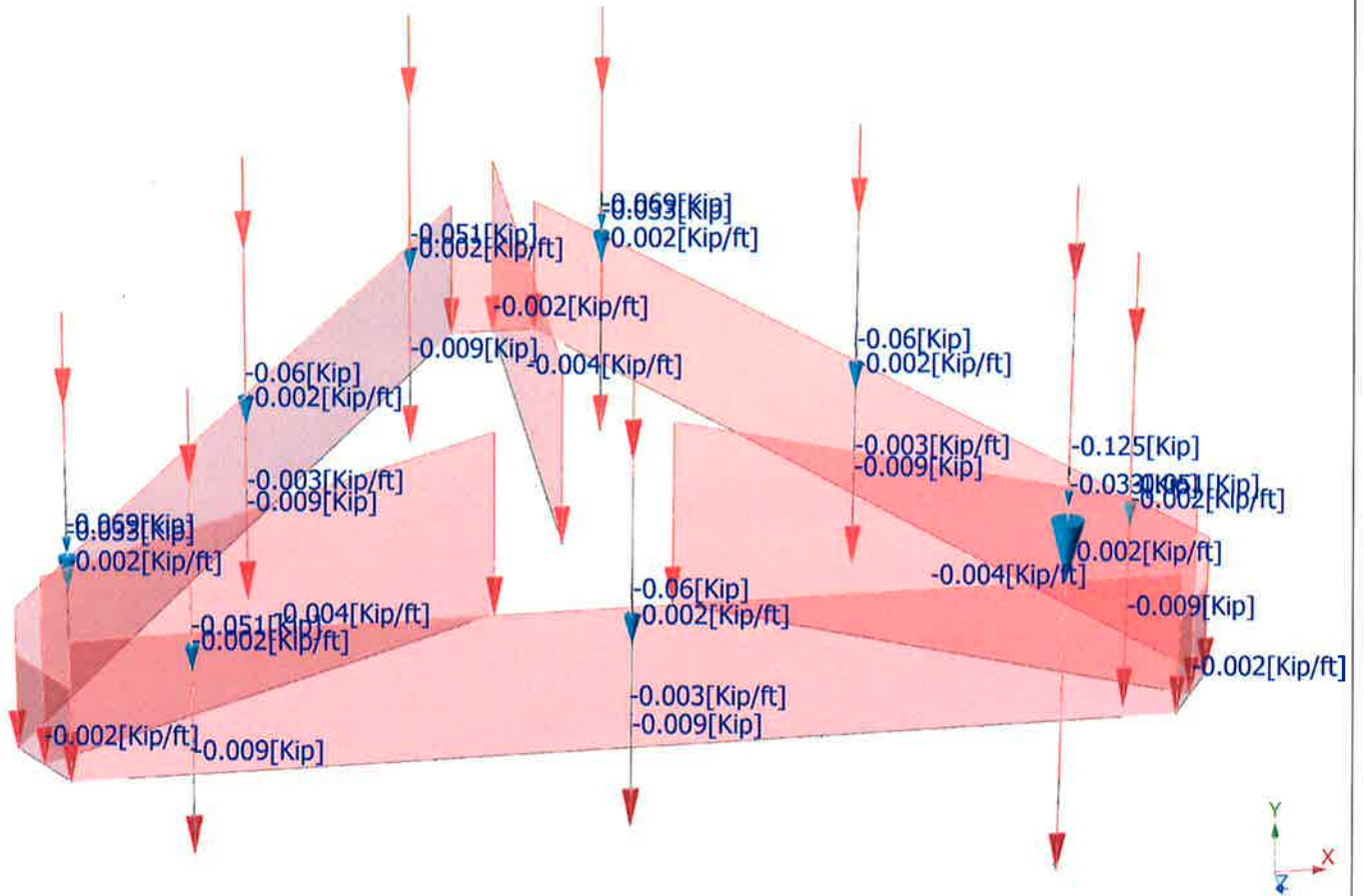
Loads

- Global distributed - Members
- Local distributed - Members
- Concentrated - Members







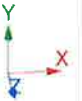
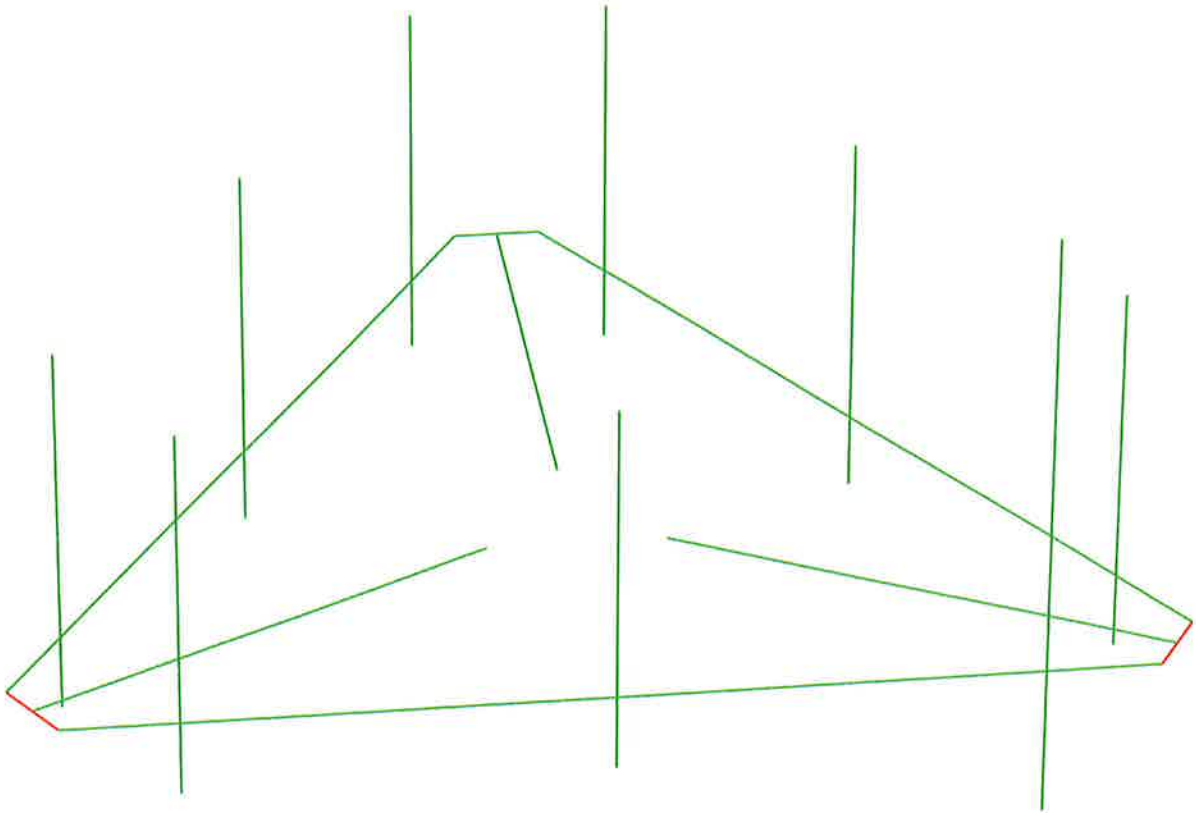
Loads

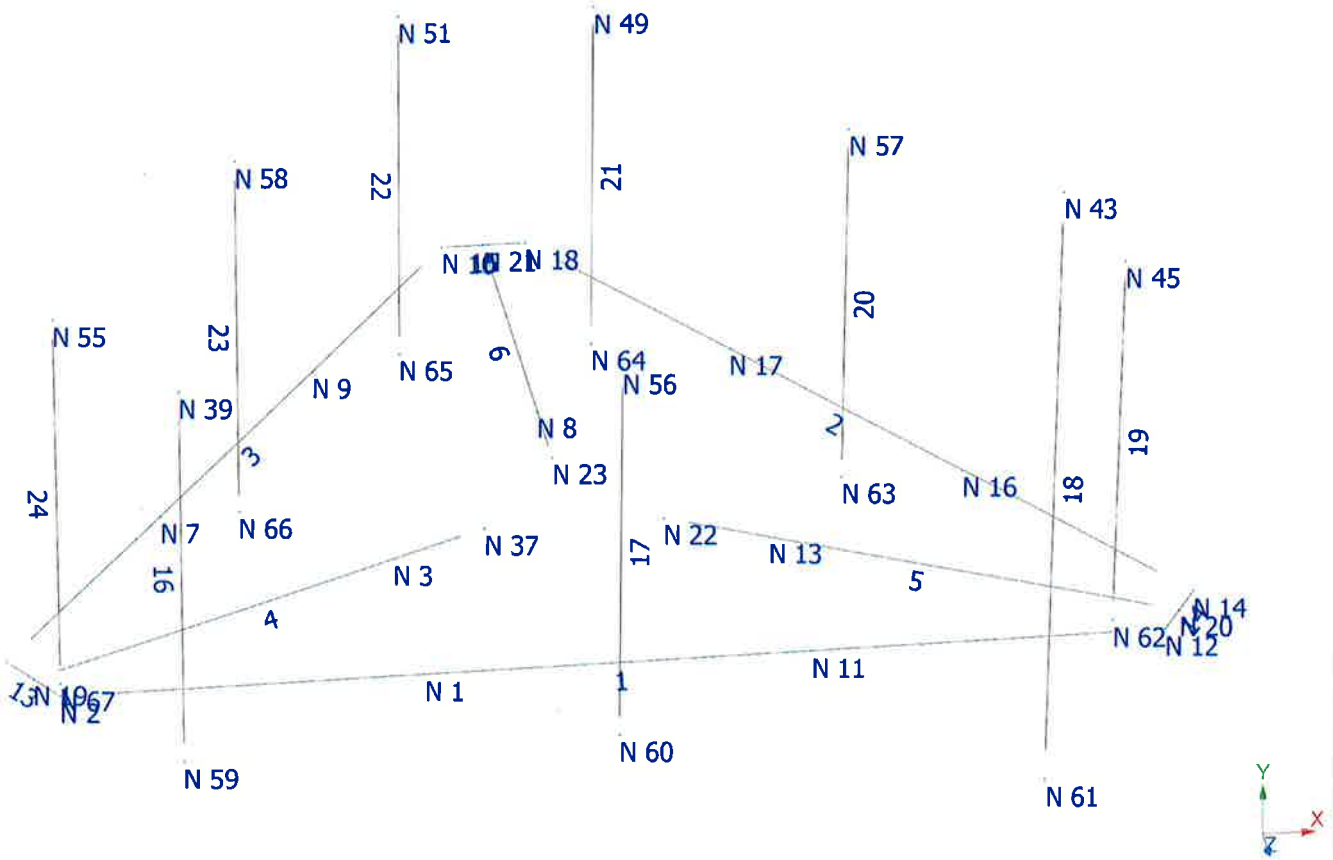
- Global distributed - Members
- Local distributed - Members
- Concentrated - Members



Design status

-  Not designed
-  Error on design
-  Design O.K.
-  With warnings





Steel Code Check

Report: Summary - For all selected load conditions

Load conditions to be included in design :

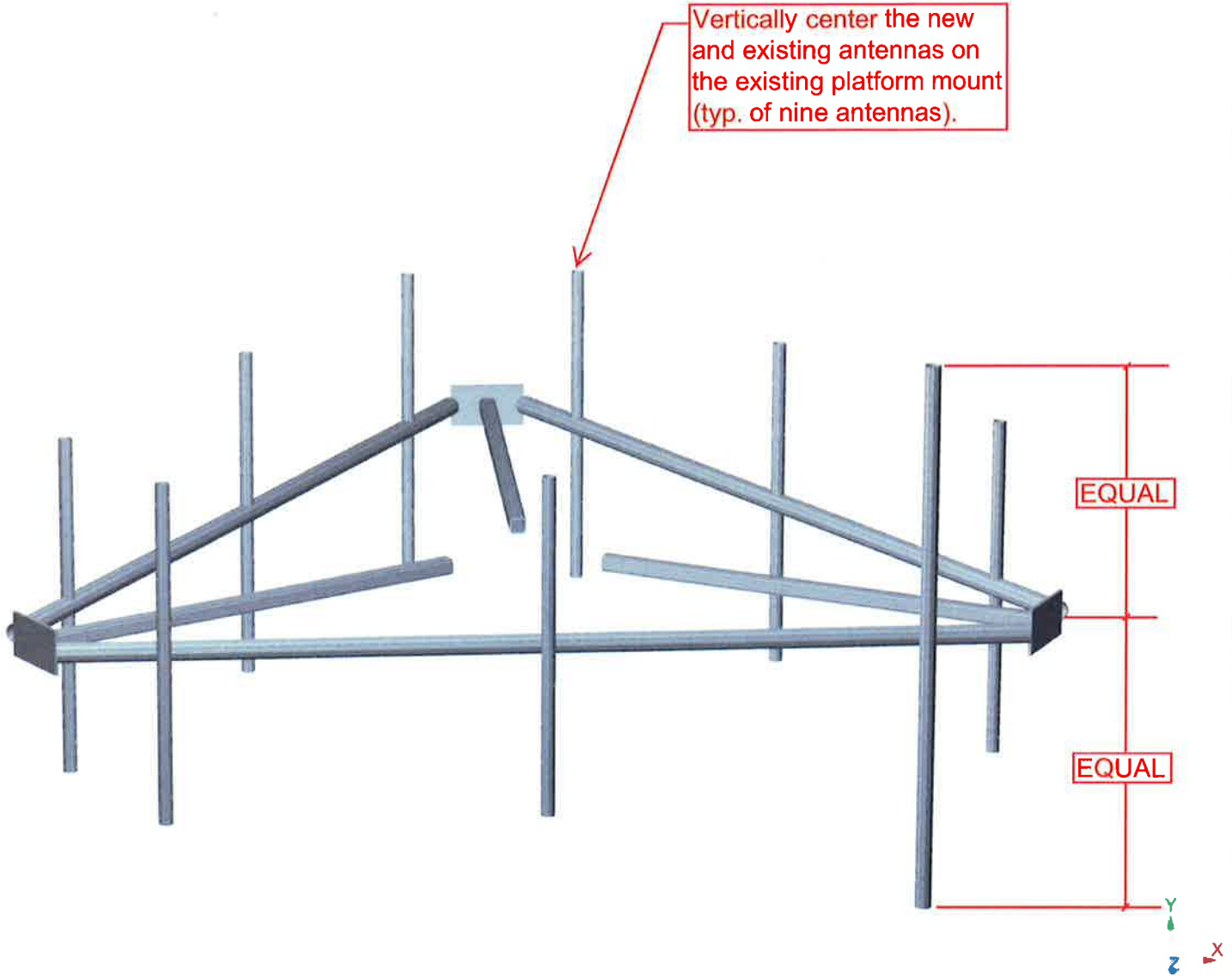
- LC1=1.2DL+1.6W
- LC2=0.9DL+1.6W
- LC3=1.2DL+W+I
- LC4=1.2DL
- LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 3X3X3_8	4	LC1 at 100.00%	0.33	OK	Eq. H1-1b
			LC2 at 0.00%	0.27	OK	Eq. H1-1b
			LC3 at 100.00%	0.56	OK	Eq. H1-1b
			LC4 at 100.00%	0.42	OK	Eq. H1-1b
			LC5 at 100.00%	0.32	OK	Eq. H1-1b
		5	LC1 at 0.00%	0.55	OK	Eq. H1-1b
			LC2 at 0.00%	0.43	OK	Eq. H1-1b
			LC3 at 0.00%	0.75	OK	Eq. H1-1b
			LC4 at 0.00%	0.47	OK	Eq. H1-1b
			LC5 at 0.00%	0.35	OK	Eq. H1-1b
		6	LC1 at 100.00%	0.78	OK	Eq. H1-1b
			LC2 at 100.00%	0.68	OK	Eq. H1-1b
			LC3 at 100.00%	0.83	OK	Eq. H1-1b
			LC4 at 100.00%	0.41	OK	Eq. H1-1b
			LC5 at 100.00%	0.31	OK	Eq. H1-1b
	PIPE 2-1_2x0.203	18	LC1 at 71.88%	0.88	OK	Eq. H1-1b
			LC2 at 71.88%	0.88	OK	Eq. H1-1b
			LC3 at 71.88%	0.56	OK	Eq. H1-1b
			LC4 at 71.88%	0.01	OK	Sec. E1
			LC5 at 71.88%	0.01	OK	Sec. E1
	PIPE 2x0.154	16	LC1 at 78.13%	0.43	OK	Eq. H1-1b
			LC2 at 78.13%	0.43	OK	Eq. H1-1b
			LC3 at 78.13%	0.27	OK	Eq. H1-1b
			LC4 at 78.13%	0.00	OK	Sec. E1
			LC5 at 78.13%	0.00	OK	Sec. E1
		17	LC1 at 78.13%	0.46	OK	Eq. H1-1b
			LC2 at 78.13%	0.45	OK	Eq. H1-1b
			LC3 at 78.13%	0.29	OK	Eq. H1-1b
			LC4 at 78.13%	0.01	OK	Sec. E1
			LC5 at 78.13%	0.00	OK	Sec. E1
		19	LC1 at 78.13%	0.28	OK	Eq. H1-1b
			LC2 at 78.13%	0.28	OK	Eq. H1-1b
			LC3 at 78.13%	0.18	OK	Eq. H1-1b
			LC4 at 78.13%	0.00	OK	Sec. E1
			LC5 at 78.13%	0.00	OK	Sec. E1
		20	LC1 at 78.13%	0.34	OK	Eq. H1-1b
			LC2 at 78.13%	0.34	OK	Eq. H1-1b





		LC3 at 78.13%	0.22	OK	Eq. H1-1b	
		LC4 at 78.13%	0.01	OK	Sec. E1	
		LC5 at 78.13%	0.00	OK	Sec. E1	
		<hr/>				
	21	LC1 at 78.13%	0.46	OK	Eq. H1-1b	
		LC2 at 78.13%	0.46	OK	Eq. H1-1b	
		LC3 at 78.13%	0.30	OK	Eq. H1-1b	
		LC4 at 78.13%	0.01	OK	Sec. E1	
		LC5 at 78.13%	0.01	OK	Sec. E1	
		<hr/>				
	22	LC1 at 78.13%	0.28	OK	Eq. H1-1b	
		LC2 at 78.13%	0.28	OK	Eq. H1-1b	
		LC3 at 78.13%	0.18	OK	Eq. H1-1b	
		LC4 at 78.13%	0.00	OK	Sec. E1	
		LC5 at 78.13%	0.00	OK	Sec. E1	
		<hr/>				
	23	LC1 at 78.13%	0.34	OK	Eq. H1-1b	
		LC2 at 78.13%	0.34	OK	Eq. H1-1b	
		LC3 at 78.13%	0.22	OK	Eq. H1-1b	
		LC4 at 78.13%	0.01	OK	Sec. E1	
		LC5 at 78.13%	0.00	OK	Sec. E1	
		<hr/>				
	24	LC1 at 78.13%	0.46	OK	Eq. H1-1b	
		LC2 at 78.13%	0.46	OK	Eq. H1-1b	
		LC3 at 78.13%	0.30	OK	Eq. H1-1b	
		LC4 at 78.13%	0.01	OK	Sec. E1	
		LC5 at 78.13%	0.01	OK	Sec. E1	
		<hr/>				
		PIPE 3x0.216				
	1	LC1 at 50.00%	0.61	OK	Eq. H1-1b	
		LC2 at 50.00%	0.59	OK	Eq. H1-1b	
		LC3 at 50.00%	0.42	OK	Eq. H1-1b	
		LC4 at 100.00%	0.19	OK	Eq. H1-1b	
		LC5 at 100.00%	0.14	OK	Eq. H1-1b	
		<hr/>				
	2	LC1 at 88.54%	0.39	OK	Eq. H1-1b	
		LC2 at 88.54%	0.38	OK	Eq. H1-1b	
		LC3 at 100.00%	0.38	OK	Eq. H1-1b	
		LC4 at 0.00%	0.19	OK	Eq. H1-1b	
		LC5 at 0.00%	0.15	OK	Eq. H1-1b	
		<hr/>				
	3	LC1 at 0.00%	0.36	OK	Eq. H1-1b	
		LC2 at 0.00%	0.32	OK	Eq. H1-1b	
		LC3 at 0.00%	0.38	OK	Eq. H1-1b	
		LC4 at 100.00%	0.18	OK	Eq. H1-1b	
		LC5 at 100.00%	0.14	OK	Eq. H1-1b	
		<hr/>				
		PL 8x5_8				
	13	LC1 at 100.00%	0.96	OK	Eq. H3-6	
		LC2 at 50.00%	0.81	OK		
		LC3 at 50.00%	1.18	N.G.	Eq. H3-6	
		LC4 at 0.00%	0.57	OK		
		LC5 at 0.00%	0.43	OK		
		<hr/>				
	14	LC1 at 0.00%	1.73	N.G.	Eq. H3-6	
		LC2 at 0.00%	1.38	N.G.	Eq. H3-6	
		LC3 at 0.00%	1.79	N.G.	Eq. H3-6	
		LC4 at 0.00%	0.59	OK		
		LC5 at 0.00%	0.45	OK		
		<hr/>				
	15	LC1 at 50.00%	0.71	OK		
		LC2 at 50.00%	0.58	OK	Eq. H1-1b	
		LC3 at 50.00%	0.92	OK	Eq. H3-6	
		LC4 at 0.00%	0.56	OK		
		LC5 at 0.00%	0.42	OK		

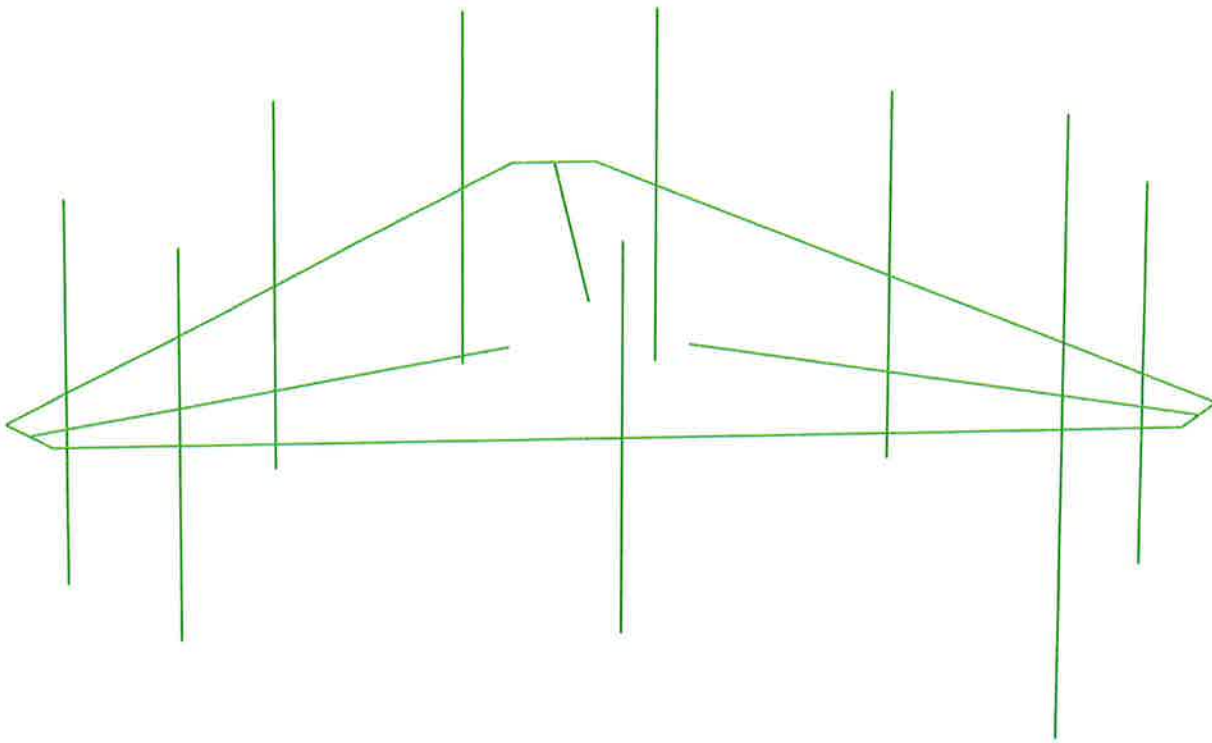


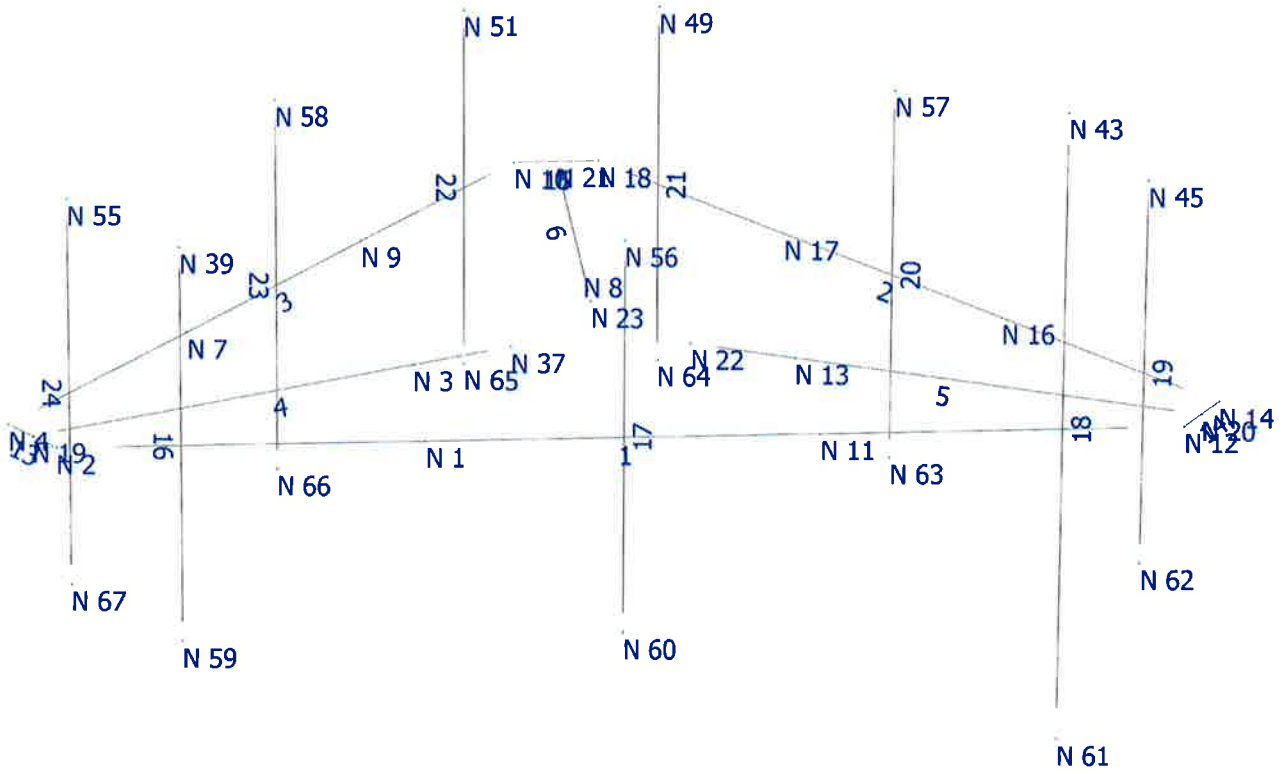
**Mount Calculations
(WITH MODIFICATIONS)**



Design status

-  Not designed
-  Error on design
-  Design O.K.
-  With warnings





Steel Code Check

Report: Summary - For all selected load conditions

Load conditions to be included in design :

- LC1=1.2DL+1.6W
- LC2=0.9DL+1.6W
- LC3=1.2DL+W+I
- LC4=1.2DL
- LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference	
	<i>HSS_SQR 3X3X3_8</i>	4	LC1 at 100.00%	0.46	OK	Eq. H1-1b	
			LC2 at 100.00%	0.35	OK	Eq. H1-1b	
			LC3 at 100.00%	0.64	OK	Eq. H1-1b	
			LC4 at 100.00%	0.42	OK	Eq. H1-1b	
			LC5 at 100.00%	0.32	OK	Eq. H1-1b	
		5	LC1 at 0.00%	0.72	OK	Eq. H1-1b	
			LC2 at 0.00%	0.60	OK	Eq. H1-1b	
			LC3 at 0.00%	0.86	OK	Eq. H1-1b	
			LC4 at 0.00%	0.47	OK	Eq. H1-1b	
			LC5 at 0.00%	0.35	OK	Eq. H1-1b	
		6	LC1 at 100.00%	0.52	OK	Eq. H1-1b	
			LC2 at 100.00%	0.41	OK	Eq. H1-1b	
			LC3 at 100.00%	0.67	OK	Eq. H1-1b	
			LC4 at 100.00%	0.41	OK	Eq. H1-1b	
			LC5 at 100.00%	0.31	OK	Eq. H1-1b	
		<i>PIPE 2-1_2x0.203</i>	18	LC1 at 50.00%	0.40	OK	Eq. H1-1b
				LC2 at 50.00%	0.40	OK	Eq. H1-1b
				LC3 at 50.00%	0.25	OK	Eq. H1-1b
				LC4 at 46.88%	0.00	OK	Sec. E1
				LC5 at 46.88%	0.00	OK	Sec. E1
<i>PIPE 2x0.154</i>	16	LC1 at 50.00%	0.17	OK	Eq. H1-1b		
		LC2 at 50.00%	0.17	OK	Eq. H1-1b		
		LC3 at 50.00%	0.11	OK	Eq. H1-1b		
		LC4 at 50.00%	0.00	OK	Eq. Sec. D2		
		LC5 at 50.00%	0.00	OK	Eq. Sec. D2		
	17	LC1 at 50.00%	0.19	OK	Eq. H1-1b		
		LC2 at 50.00%	0.19	OK	Eq. H1-1b		
		LC3 at 50.00%	0.12	OK	Eq. H1-1b		
		LC4 at 50.00%	0.00	OK	Eq. Sec. D2		
		LC5 at 50.00%	0.00	OK	Eq. Sec. D2		
	19	LC1 at 50.00%	0.11	OK	Eq. H1-1b		
		LC2 at 50.00%	0.11	OK	Eq. H1-1b		
		LC3 at 50.00%	0.07	OK	Eq. H1-1b		
		LC4 at 50.00%	0.00	OK	Eq. Sec. D2		
		LC5 at 50.00%	0.00	OK	Eq. Sec. D2		
	20	LC1 at 50.00%	0.14	OK	Eq. H1-1b		
		LC2 at 50.00%	0.14	OK	Eq. H1-1b		

	LC3 at 50.00%	0.09	OK	Eq. H1-1b
	LC4 at 50.00%	0.00	OK	Eq. Sec. D2
	LC5 at 50.00%	0.00	OK	Eq. Sec. D2
21	LC1 at 50.00%	0.16	OK	Eq. H1-1b
	LC2 at 50.00%	0.16	OK	Eq. H1-1b
	LC3 at 50.00%	0.10	OK	Eq. H1-1b
	LC4 at 46.88%	0.01	OK	Sec. E1
	LC5 at 46.88%	0.00	OK	Sec. E1
22	LC1 at 50.00%	0.11	OK	Eq. H1-1b
	LC2 at 50.00%	0.11	OK	Eq. H1-1b
	LC3 at 50.00%	0.07	OK	Eq. H1-1b
	LC4 at 50.00%	0.00	OK	Eq. Sec. D2
	LC5 at 50.00%	0.00	OK	Eq. Sec. D2
23	LC1 at 50.00%	0.14	OK	Eq. H1-1b
	LC2 at 50.00%	0.14	OK	Eq. H1-1b
	LC3 at 50.00%	0.09	OK	Eq. H1-1b
	LC4 at 50.00%	0.00	OK	Eq. Sec. D2
	LC5 at 50.00%	0.00	OK	Eq. Sec. D2
24	LC1 at 50.00%	0.16	OK	Eq. H1-1b
	LC2 at 50.00%	0.16	OK	Eq. H1-1b
	LC3 at 50.00%	0.10	OK	Eq. H1-1b
	LC4 at 46.88%	0.01	OK	Sec. E1
	LC5 at 46.88%	0.00	OK	Sec. E1
PIPE 3x0.216				
1	LC1 at 50.00%	0.54	OK	Eq. H1-1b
	LC2 at 50.00%	0.53	OK	Eq. H1-1b
	LC3 at 50.00%	0.38	OK	Eq. H1-1b
	LC4 at 100.00%	0.19	OK	Eq. H1-1b
	LC5 at 100.00%	0.14	OK	Eq. H1-1b
2	LC1 at 50.00%	0.26	OK	Eq. H1-1b
	LC2 at 50.00%	0.26	OK	Eq. H1-1b
	LC3 at 100.00%	0.31	OK	Eq. H1-1b
	LC4 at 0.00%	0.19	OK	Eq. H1-1b
	LC5 at 0.00%	0.15	OK	Eq. H1-1b
3	LC1 at 48.96%	0.25	OK	Eq. H1-1b
	LC2 at 48.96%	0.24	OK	Eq. H1-1b
	LC3 at 0.00%	0.29	OK	Eq. H1-1b
	LC4 at 100.00%	0.18	OK	Eq. H1-1b
	LC5 at 100.00%	0.14	OK	Eq. H1-1b
PL 8x5_8				
13	LC1 at 50.00%	0.62	OK	Eq. H1-1b
	LC2 at 50.00%	0.61	OK	Eq. H1-1b
	LC3 at 0.00%	0.84	OK	
	LC4 at 0.00%	0.57	OK	
	LC5 at 0.00%	0.43	OK	
14	LC1 at 46.88%	0.82	OK	Eq. H1-1b
	LC2 at 46.88%	0.81	OK	Eq. H1-1b
	LC3 at 0.00%	0.90	OK	
	LC4 at 0.00%	0.59	OK	
	LC5 at 0.00%	0.45	OK	
15	LC1 at 0.00%	0.56	OK	
	LC2 at 50.00%	0.54	OK	Eq. H1-1b
	LC3 at 0.00%	0.83	OK	
	LC4 at 0.00%	0.56	OK	
	LC5 at 0.00%	0.42	OK	



November 30th, 2017

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(918) 587-4630
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Subject: **Structural Analysis Report**

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: CT2019
Carrier Site Name: Old Saybrook

Crown Castle Designation: **Crown Castle BU Number:** 841289
Crown Castle Site Name: OLD SAYBROOK
Crown Castle JDE Job Number: 433341
Crown Castle Work Order Number: 1494707
Crown Castle Application Number: 386401 Rev. 15

Engineering Firm Designation: **B+T Group Project Number:** 93496.014.01

Site Data: **170 Ingham Hill Road, Old Saybrook, Middlesex County, CT**
Latitude 41° 18' 35.55", Longitude -72° 23' 51.13"
150 Foot - Monopole Tower

Dear Charles McGuirt,

B+T Group 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 1112107, in accordance with application 386401, revision 15.

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 1 and Table 2 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 135 mph converted to a nominal 3-second gust wind speed of 105 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

All 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 B+T Group 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: Tharun Cheriyan, E.I.T.

Respectfully submitted by: B&T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2018

Scott S. Vance, P.E.

tnxTower Report - version 7.0.5.1

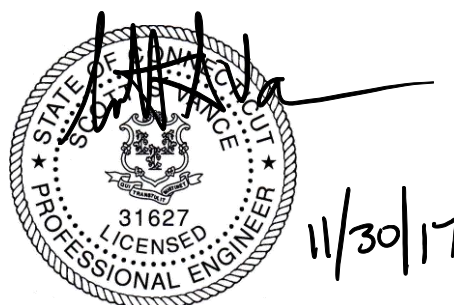


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1) INTRODUCTION

This tower is a 150-ft. monopole designed by Engineered Endeavors Inc., in June of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E. The tower has been modified multiple times and those modifications were incorporated into this analysis.

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 105 mph with no ice, 50 mph with 0.75-inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

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
149.0	150.0	3	Andrew	SBNHH-1D65A	4 2	3/4 3/8	--
		3	Ericsson	RRUS 32			
		3	Ericsson	WCS RRUS-32-B30			
		1	Kathrein	80010799			
		2	Quintel Tech.	QS46512-2			
		1	Raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note	
160.0	163.0	1	Andrew	CSHAX-6516-R2	--	--	4	
	160.0	1	--	Pipe Mount [PM 701-1]	6	1-1/4	3	
	--	--	--	--				
149.0	156.0	1	Andrew	KP4F-23A	--	--	1	
	152.0	3	Andrew	SBNHH-1D65A	--	--	4	
		3	Ericsson	WCS RRUS-32-B30				
		3	Kmw Comm.	AM-X-CD-14-65-00T-RET				
	150.0	150.0	3	Ericsson	RRUS 11	12 1	1-1/4 7/8	1
			3	Powerwave Tech.	7770.00			
			6	Powerwave Tech.	TT19-08BP111-001			
1			Raycap	DC6-48-60-18-8F				
149.0	1	--	Platform Mount [LP 403-1]					
148.0	150.0	3	Ericsson	RRUS 11	2 1	5/8 3/8	4	
	148.0	1	--	Side Arm Mount [SO 102-3]	--	--	1	
140.0	142.0	3	Commscope	TMAT7LA-11A	1 1	1-1/4 1-5/8	1	
	141.0	3	Andrew	LNx-6515DS-A1M				
		3	Ericsson	RRUS 11 B12				
140.0	140.0	3	Ericsson	AIR 21 B2A/B4P				
		3	Ericsson	AIR 21 B4A/B2P				

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	--	Miscellaneous [NA 507-1]			
		1	--	Platform Mount [LP 303-1]			
130.0	133.0	3	Alcatel Lucent	B13 RRH 4X30	1	1-5/8	2
		3	Alcatel Lucent	B25 RRH4X30			
		3	Alcatel Lucent	B66A RRH4X45			
		6	Commscope	SBNHH-1D65B			
		1	Rfs Celwave	DB-B1-6C-12AB-0Z			
	3	Antel	BXA-80080/4CF	6	1-1/4 1-5/8	1	
	1	Rfs Celwave	DB-B1-6C-12AB-0Z				
	130.0	1	--	Platform Mount [LP 403-1]			
71.0	72.0	1	Kathrein	FMO	1	1/2	1
	71.0	1	--	Side Arm Mount [SO 301-1]			
22.0	22.0	1	Maxrad	MYA-43012N	1	5/16	1
		1	--	Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment to Be Relocated to 140'.
- 4) **Equipment to Be Removed; Not Considered in This Analysis**

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
158	158	1	Ems Wireless	TRR90-17	--	--
150	150	12	Allgon	7120.16	--	--
140	140	12	Allgon	7120.16	--	--
130	130	12	Allgon	7184.05	--	--
120	120	12	Allgon	7184.05	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Locate Rev#15	386401	CCI Sites
Tower Manufacturer Drawing	EEL, Job No. 3503	4287398	CCI Sites
Tower Mapping	ReliaPOLE, Project No. 14-0703NEd	5204147	CCI Sites
Tower Modification Drawing	GPD, Date: 10/02/2008	4489382	CCI Sites
Post Modification Inspection	GPD, Date:03/04/2009	4489415	CCI Sites
Tower Modification Drawing	GPD, Date:12/15/2011	4478711	CCI Sites
Post Modification Inspection	HDG, Date: 03/19/2012	4468635	CCI Sites
Tower Modification Drawing	B+T Group, Date: 08/20/2015	5293057	CCI Sites
Post Modification Inspection	SGS, Date: 09/01/2015	5874000	CCI Sites
Tower Modification Drawing	B+T Group, Date: 05/06/2016	6254746	CCI Sites

Document	Remarks	Reference	Source
Post Modification Inspection	SGS, Date: 09/07/2016	6444911	CCI Sites
Foundation Mapping	FDH, Project No. 08-04159E N1	4591935	CCI Sites
Geotech Report	FDH, Project No. 08-04159E G1	4468634	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 11/27/2017	CCI Sites

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) Mount areas and weights are assumed based on photographs provided.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 145	Pole	TP16.31x15.53x0.25	1	-3.178	-	11.2	Pass
L2	145 - 140	Pole	TP17.09x16.31x0.25	2	-3.468	-	20.6	Pass
L3	140 - 135	Pole	TP17.87x17.09x0.25	3	-6.288	-	35.3	Pass
L4	135 - 130	Pole	TP18.65x17.87x0.25	4	-6.705	-	47.4	Pass
L5	130 - 125	Pole	TP19.43x18.65x0.25	5	-9.704	-	65.9	Pass
L6	125 - 123.75	Pole	TP19.625x19.43x0.25	6	-9.834	-	69.5	Pass
L7	123.75 - 123.5	Pole	TP19.664x19.625x0.513	7	-9.891	-	61.3	Pass
L8	123.5 - 118.5	Pole + Reinf.	TP20.444x19.664x0.5	8	-10.631	-	74.4	Pass
L9	118.5 - 113.5	Pole + Reinf.	TP21.224x20.444x0.488	9	-11.431	-	86.4	Pass
L10	113.5 - 110	Pole + Reinf.	TP21.77x21.224x0.488	10	-12.011	-	94.3	Pass
L11	110 - 109.75	Pole + Reinf.	TP21.81x21.77x0.763	11	-12.080	-	56.0	Pass
L12	109.75 - 104.75	Pole + Reinf.	TP22.619x21.81x0.75	12	-13.186	-	62.3	Pass
L13	104.75 - 99.75	Pole + Reinf.	TP23.427x22.619x0.725	13	-14.329	-	68.2	Pass
L14	99.75 - 94.75	Pole + Reinf.	TP24.235x23.427x0.713	14	-15.500	-	73.6	Pass
L15	94.75 - 89.75	Pole + Reinf.	TP25.043x24.235x0.688	15	-263.328	-	77.0	Pass
L16	89.75 - 84.75	Pole + Reinf.	TP25.852x25.043x0.675	16	-264.507	-	82.0	Pass
L17	84.75 - 83	Pole + Reinf.	TP26.134x25.852x0.675	17	-264.917	-	82.7	Pass
L18	83 - 82.75	Pole + Reinf.	TP26.175x26.134x0.563	18	-264.983	-	97.1	Pass
L19	82.75 - 77.75	Pole + Reinf.	TP26.983x26.175x0.563	19	-265.842	-	98.8	Pass
L20	77.75 - 72.75	Pole + Reinf.	TP27.791x26.983x0.55	20	-266.078	-	99.8	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L21	72.75 - 67.5	Pole + Reinf.	TP28.64x27.791x0.55	21	-267.180	-	100.0	Pass
L22	67.5 - 66	Pole + Reinf.	TP28.266x27.449x0.613	22	-269.154	-	93.1	Pass
L23	66 - 61	Pole + Reinf.	TP29.084x28.266x0.6	23	-269.517	-	93.0	Pass
L24	61 - 56	Pole	TP29.901x29.084x0.375	24	-270.751	-	94.8	Pass
L25	56 - 51	Pole	TP30.718x29.901x0.375	25	-271.664	-	92.7	Pass
L26	51 - 49.9	Pole	TP30.898x30.718x0.375	26	-272.585	-	92.1	Pass
L27	49.9 - 49.65	Pole + Reinf.	TP30.939x30.898x0.663	27	-272.783	-	79.6	Pass
L28	49.65 - 44.65	Pole + Reinf.	TP31.756x30.939x0.663	28	-272.856	-	78.4	Pass
L29	44.65 - 39.65	Pole + Reinf.	TP32.573x31.756x0.65	29	-274.259	-	77.0	Pass
L30	39.65 - 33	Pole	TP33.66x32.573x0.65	30	-275.682	-	76.3	Pass
L31	33 - 32.65	Pole	TP32.966x32.256x0.713	31	-278.736	-	70.8	Pass
L32	32.65 - 32.4	Pole	TP33.006x32.966x0.438	32	-278.847	-	75.3	Pass
L33	32.4 - 27.4	Pole	TP33.822x33.006x0.438	33	-278.904	-	73.0	Pass
L34	27.4 - 22.4	Pole	TP34.637x33.822x0.438	34	-280.008	-	70.6	Pass
L35	22.4 - 17.4	Pole	TP35.452x34.637x0.438	35	-281.131	-	68.2	Pass
L36	17.4 - 12.4	Pole	TP36.268x35.452x0.438	36	-282.391	-	65.8	Pass
L37	12.4 - 7.4	Pole	TP37.083x36.268x0.438	37	-283.554	-	63.4	Pass
L38	7.4 - 2.4	Pole	TP37.899x37.083x0.438	38	-284.739	-	61.0	Pass
L39	2.4 - 0	Pole	TP38.29x37.899x0.438	39	-285.947	-	59.9	Pass
L15	94.75 - 89.75	Guy A@90.75	1 5/8	42	179.005	194.400	92.1	Pass
L15	94.75 - 89.75	Guy B@90.75	1 3/8	41	94.593	139.200	68.0	Pass
L15	94.75 - 89.75	Guy C@90.75	1 3/8	40	106.620	139.200	76.6	Pass
							Summary	
						Pole (L21)	100.0	Pass
						Guy A (L15)	92.1	Pass
						Guy B (L15)	68.0	Pass
						Guy C (L15)	76.6	Pass
						Rating =	100.0	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation	% Capacity	Pass / Fail	
1	Flange Connection	110'	60.1	Pass	
1	Anchor Rods	Base	97.9	Pass	
1	Base Plate	Base	61.0	Pass	
1	Base Foundation	Structure	Base	41.2	Pass
		Soil	Base	72.9	Pass
1	Inner Guy Anchor Foundation	Anchor Rod	Base	92.9	Pass
		Structure	Base	76.3	Pass
		Soil	Base	55.1	Pass
1	Outer Guy Anchor Foundation	Anchor Rod	Base	48.8	Pass
		Structure	Base	30.2	Pass
		Soil	Base	54.3	Pass

Structure Rating (max from all components) =	100.0%
---	---------------

Notes:

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

4.1) Recommendations

The tower and its foundations have sufficient capacity to carry the final load configuration. Modifications will not be required.

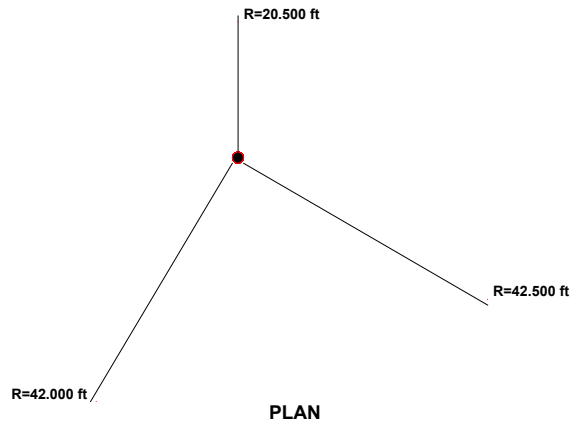
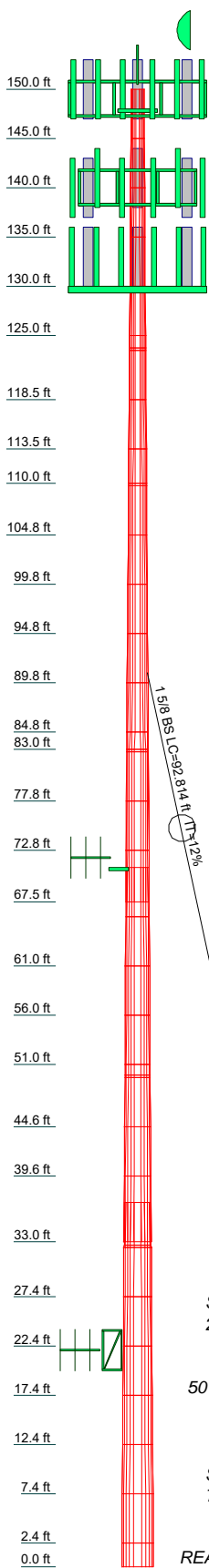
Table 7 – Existing Loading Tilt-Sway Results for 60 mph Service Wind – LC7

<i>Elevation (ft)</i>	<i>Dish Model</i>	<i>Diameter (ft)</i>	<i>Tilt (°)</i>	<i>Twist (°)</i>
149.0	KP4F-23A	4.0	1.131	0.010

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1								0.2
2								0.2
3								0.2
4								0.2
5								0.250
6								0.250
7								0.250
8								0.500
9								0.487
10								0.487
11								0.487
12								0.487
13								0.725
14								0.713
15								0.688
16								0.688
17								0.688
18								0.688
19								0.550
20								0.550
21								0.550
22								0.550
23								0.600
24								0.375
25								0.375
26								0.660
27								0.650
28								1.1
29								1.4
30								0.8
31								0.8
32								0.8
33								0.8
34								0.8
35								0.8
36								0.8
37								0.9
38								0.9
39								0.4

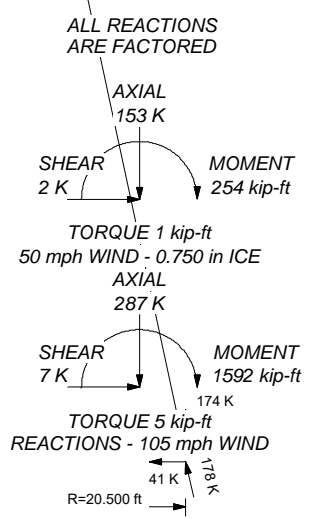


MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 100.0%

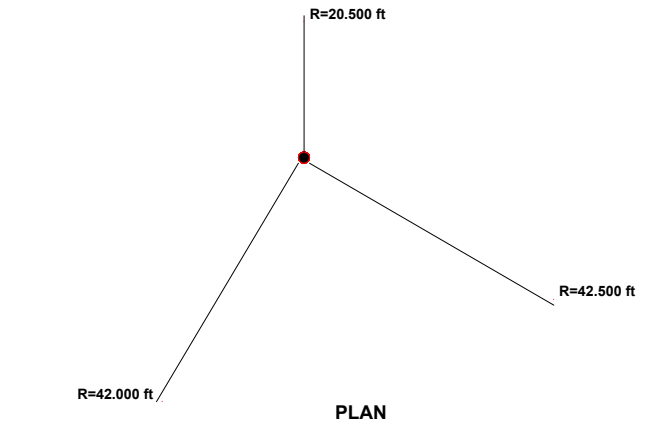
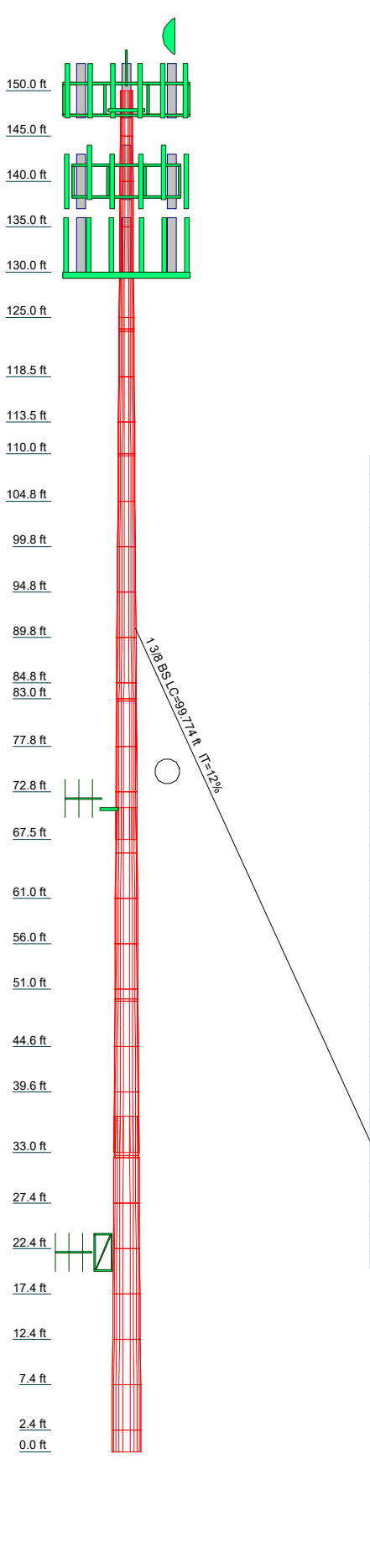


ALL REACTIONS ARE FACTORED

B+T Group
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 Tulsa, OK 74119
 Phone: (918) 587-4630
 FAX: (918) 295-0265

Job: 93496.014.01 - OLD SAYBROOK, CT (BU # 84128)		
Project:	Client: Crown Castle	Drawn by: T. Cheriyan
Code: TIA-222-G	Date: 11/30/17	App'd:
Path:	Scale: NTS	Dwg No. E-1

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39						
Length (ft)	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000				
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12			
Thickness (in)	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250				
Socket Length (ft)																																													
Top Dia (in)	15.530	16.310	17.090	17.870	18.650	19.430	20.210	20.990	21.770	22.550	23.330	24.110	24.890	25.670	26.450	27.230	28.010	28.790	29.570	30.350	31.130	31.910	32.690	33.470	34.250	35.030	35.810	36.590	37.370	38.150	38.930	39.710	40.490	41.270	42.050	42.830	43.610	44.390	45.170	45.950	46.730	47.510	48.290		
Bot Dia (in)	16.310	17.090	17.870	18.650	19.430	20.210	20.990	21.770	22.550	23.330	24.110	24.890	25.670	26.450	27.230	28.010	28.790	29.570	30.350	31.130	31.910	32.690	33.470	34.250	35.030	35.810	36.590	37.370	38.150	38.930	39.710	40.490	41.270	42.050	42.830	43.610	44.390	45.170	45.950	46.730	47.510	48.290			
Grade																																													
Weight (K)	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.8	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.7	5.0	5.3	5.6	5.9	6.2	6.5	6.8	7.1	7.4	7.7	8.0	8.3	8.6	8.9	9.2	9.5	9.8	10.1	10.4	10.7	11.0	11.3	11.6	11.9



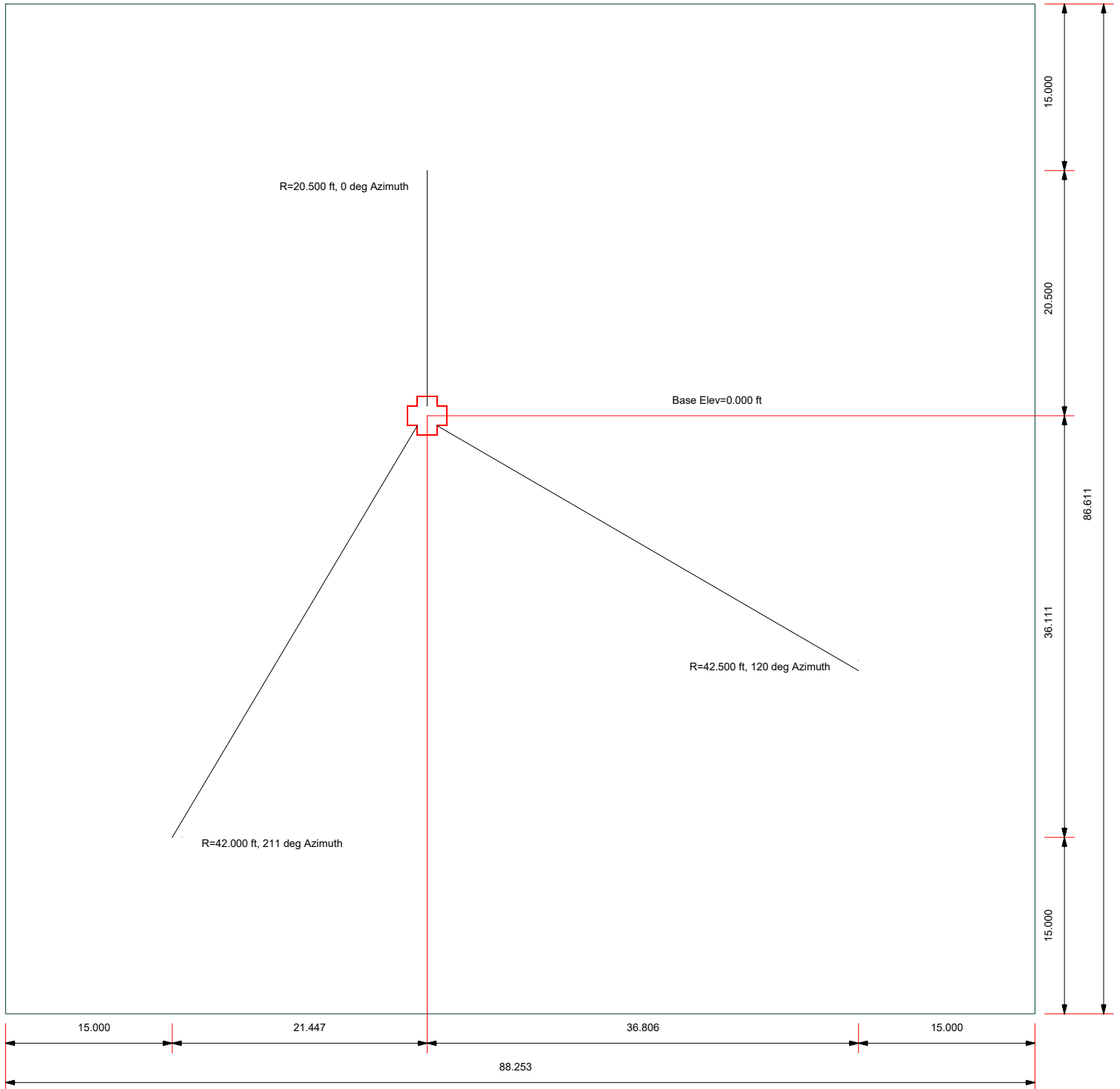
DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8" x 5' (E)	152.5	TMAT7LA-11A (E/front shielded per photo)	140
7770.00 w/ Mount Pipe (E)	149	7770.00 w/ Mount Pipe (E)	149
7770.00 w/ Mount Pipe (E)	149	7770.00 w/ Mount Pipe (E)	149
DC6-48-60-18-8F (E-Relocated From 148' level)	149	TMAT7LA-11A (E/front shielded per photo)	140
RRUS 11 (E-Relocated From 148' level)	149	RRUS 11 B12 (E/front shielded per photos)	140
RRUS 11 (E-Relocated From 148' level)	149	RRUS 11 B12 (E/front shielded per photos)	140
RRUS 11 (E-Relocated From 148' level)	149	RRUS 11 B12 (E/front shielded per photos)	140
(2) TT19-08BP111-001 (E-Shielded per photos)	149	Platform Mount [LP 303-1] (E)	140
(2) TT19-08BP111-001 (E)	149	Miscellaneous [NA 507-1] (E)	140
(2) TT19-08BP111-001 (E)	149	AIR 21 B2A/B4P w/ Mount Pipe (E)	140
SBNHH-1D65A w/ Mount Pipe (P)	149	GPS (3"x7") (E-Per Photo)	134
SBNHH-1D65A w/ Mount Pipe (P)	149	BXA-80080/4CF w/ Mount Pipe (E)	130
QS46512-2 w/ Mount Pipe (P)	149	DB-B1-6C-12AB-0Z (E)	130
80010799 w/ Mount Pipe (P)	149	(2) SBNHH-1D65B w/ Mount Pipe (R)	130
QS46512-2 w/ Mount Pipe (P)	149	(2) SBNHH-1D65B w/ Mount Pipe (R)	130
DC6-48-60-18-8F (P)	149	(2) SBNHH-1D65B w/ Mount Pipe (R)	130
WCS RRUS-32-B30 (P)	149	B13 RRH 4X30 (R)	130
WCS RRUS-32-B30 (P)	149	B13 RRH 4X30 (R)	130
WCS RRUS-32-B30 (P)	149	B25 RRH4X30 (R)	130
RRUS 32 (P-Relocated from 148')	149	B25 RRH4X30 (R)	130
RRUS 32 (P-Relocated from 148')	149	DB-B1-6C-12AB-0Z (R)	130
RRUS 32 (P-Relocated from 148')	149	B66A RRH4X45 (R)	130
6' x 2" Mount Pipe (E-Empty/Photo)	149	B66A RRH4X45 (R)	130
6' x 2" Mount Pipe (E-Empty/Photo)	149	B66A RRH4X45 (R)	130
6' x 2" Mount Pipe (E-Empty/Photo)	149	5' x 2" Pipe Mount (E-TBR Antenna)	130
Platform Mount [LP 403-1] (E)	149	5' x 2" Pipe Mount (E-TBR Antenna)	130
KP4F-23A (E)	149	Platform Mount [LP 403-1] (E)	130
5' x 2" Pipe Mount (E)	148	BXA-80080/4CF w/ Mount Pipe (E)	130
5' x 2" Pipe Mount (E)	148	BXA-80080/4CF w/ Mount Pipe (E)	130
Side Arm Mount [SO 102-3] (E)	148	Reflector (E-Per Photo)	71
5' x 2" Pipe Mount (E)	148	3' x 2" Pipe Mount (E-Per Photo)	71
AIR 21 B2A/B4P w/ Mount Pipe (E)	140	Side Arm Mount [SO 701-1] (E)	71
AIR 21 B2A/B4P w/ Mount Pipe (E)	140	FMO (E)	71
AIR 21 B4A/B2P w/ Mount Pipe (E)	140	Side Arm Mount [SO 301-1] (E)	71
AIR 21 B4A/B2P w/ Mount Pipe (E)	140	Side Arm Mount [SO 701-1] (E)	22
LNX-6515DS-A1M w/ Mount Pipe (E)	140	MYA-43012N (E)	22
LNX-6515DS-A1M w/ Mount Pipe (E)	140	LNX-6515DS-A1M w/ Mount Pipe (E)	22
LNX-6515DS-A1M w/ Mount Pipe (E)	140	LNX-6515DS-A1M w/ Mount Pipe (E)	22

B+T Group
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Job:	93496.014.01 - OLD SAYBROOK, CT (BU # 84128)			
Project:				
Client:	Crown Castle	Drawn by:	T. Cheriyan	
Code:	TIA-222-G	Date:	11/30/17	
Path:			Scale:	NTS
			Dwg No. E-1	

Plot Plan
Total Area - 0.18 Acres



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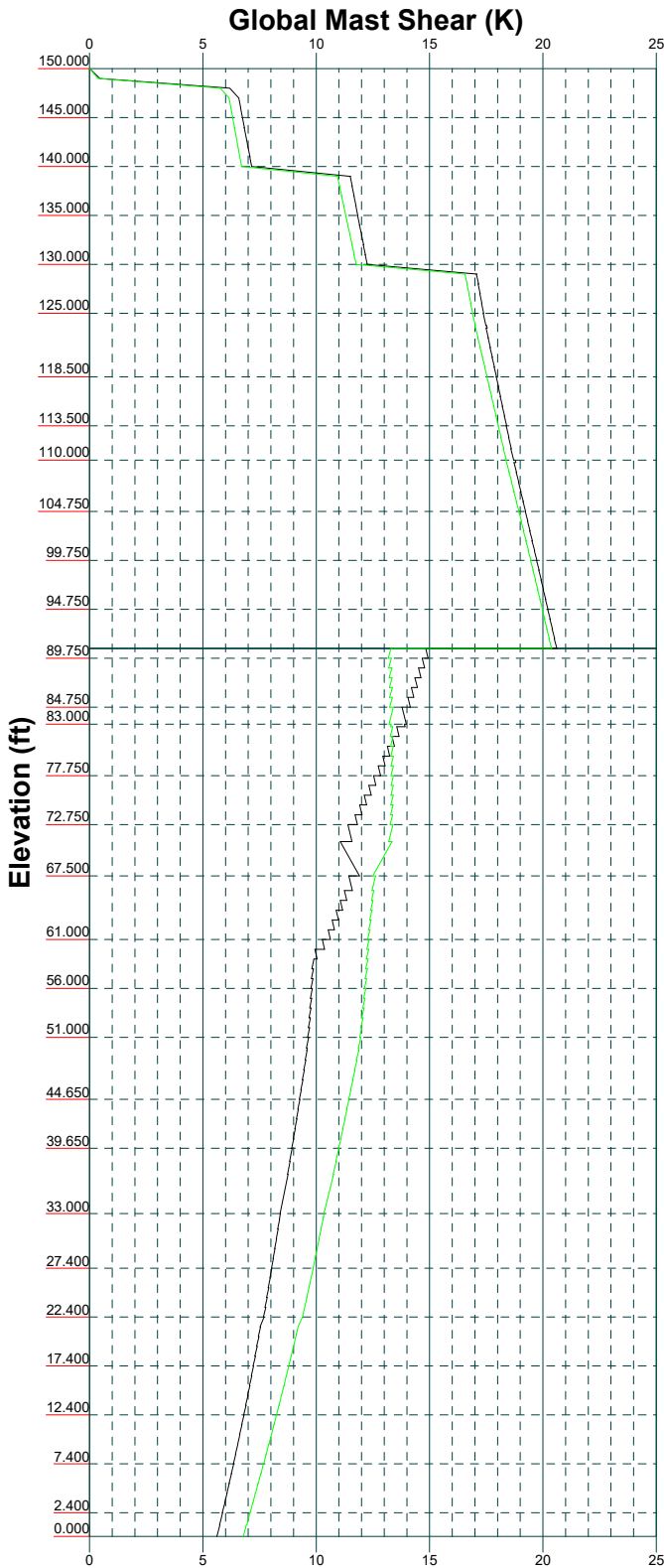
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Project:		
Client: Crown Castle	Drawn by: T. Cheriyan	App'd:
Code: TIA-222-G	Date: 11/30/17	Scale: NTS
Path:		Dwg No. E-2

Vx

Vz

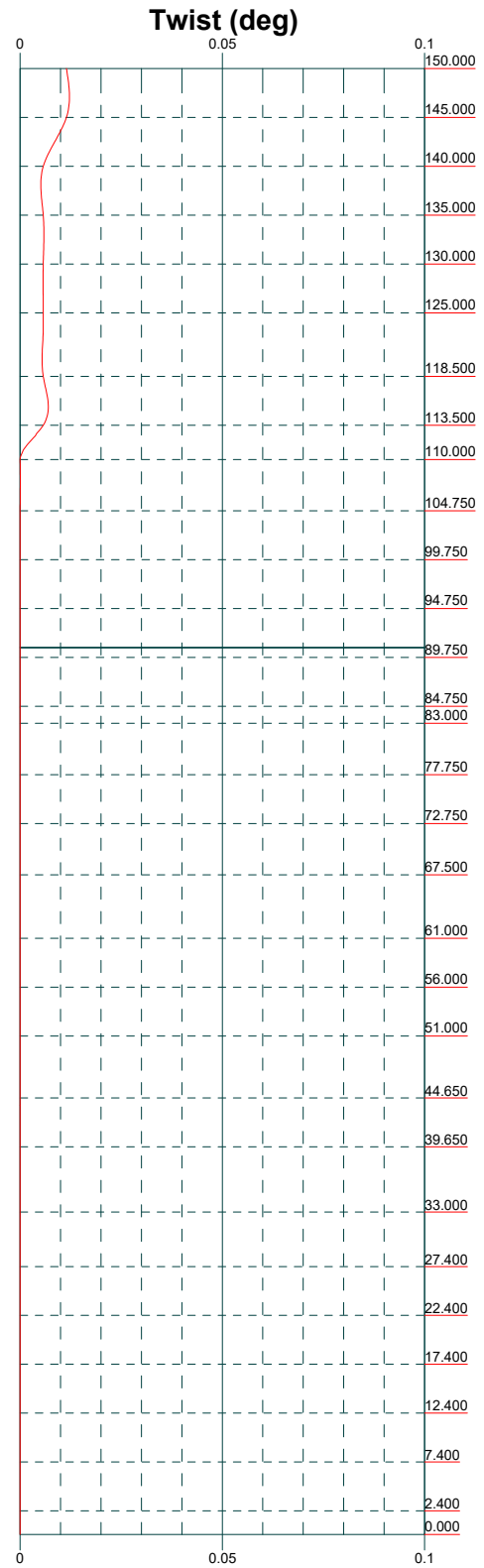
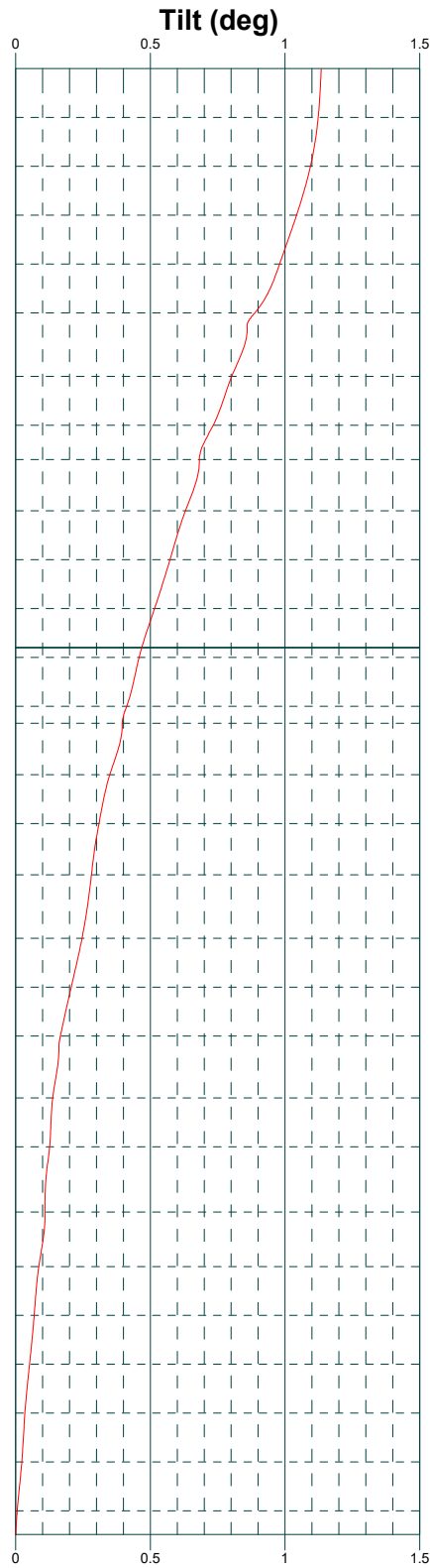
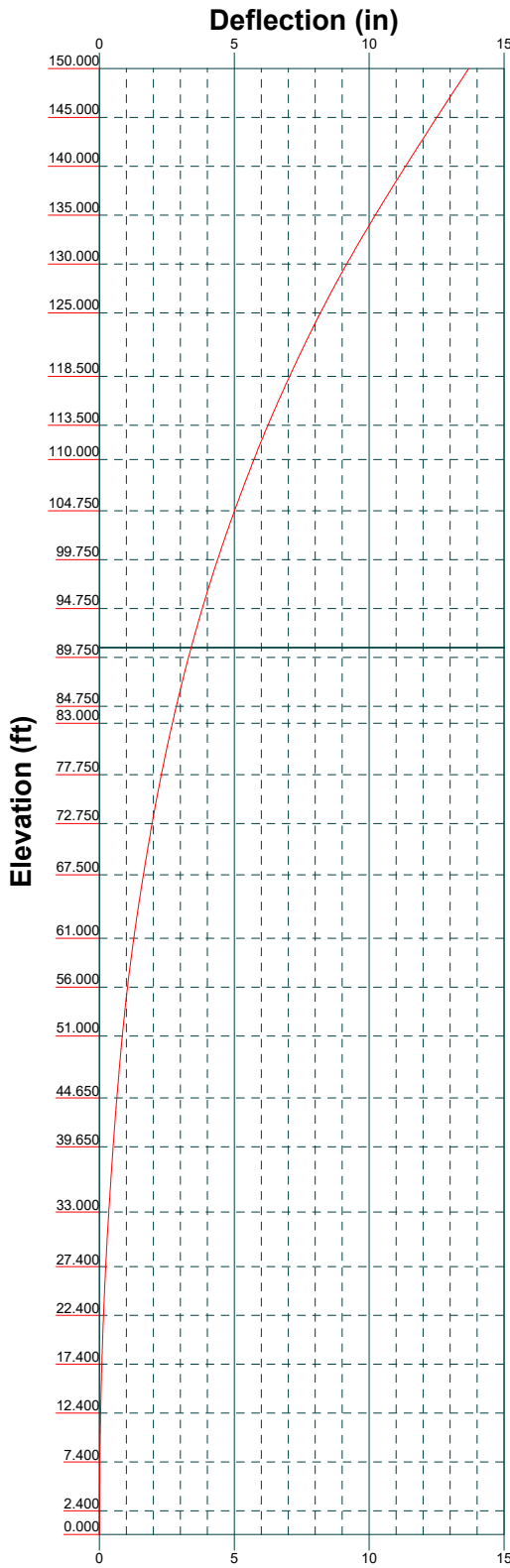
Mx

Mz



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Project:		
Client: Crown Castle	Drawn by: T. Cheriyan	App'd:
Code: TIA-222-G	Date: 11/30/17	Scale: NTS
Path:		Dwg No. E-4

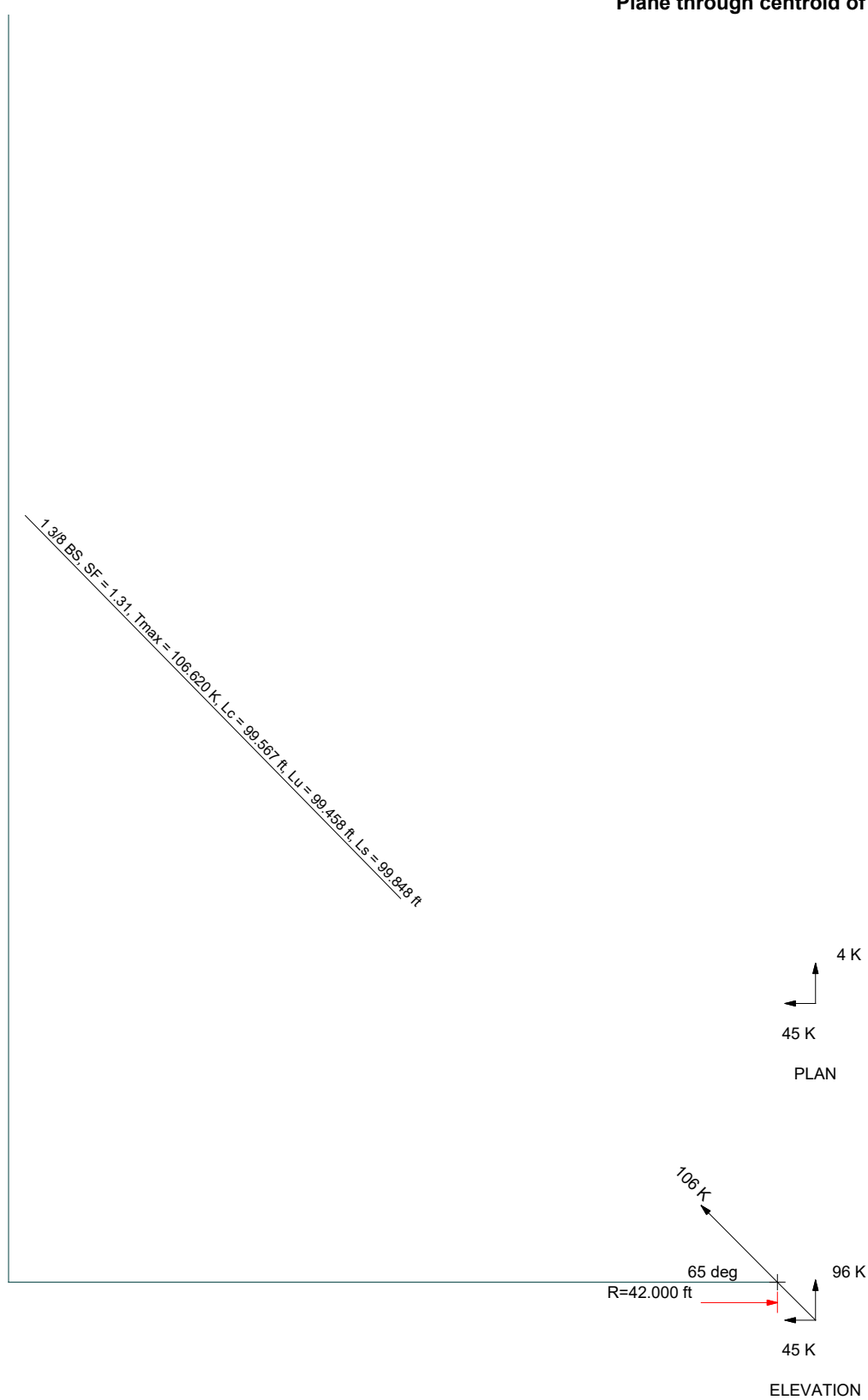
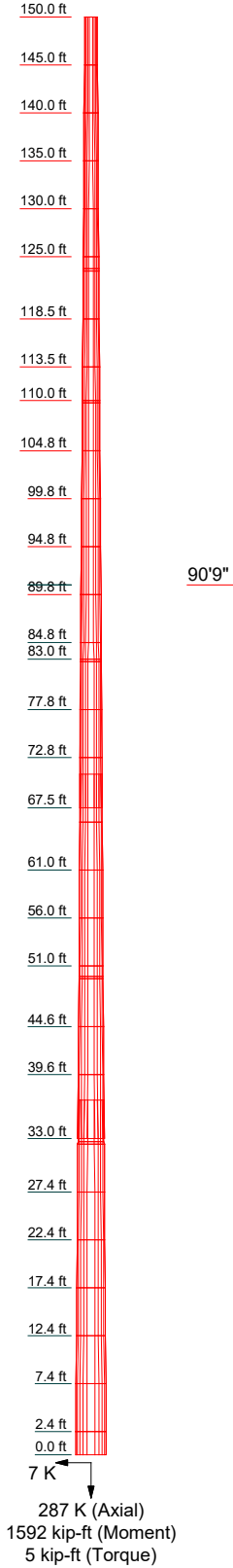



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Job: 93496.014.01 - OLD SAYBROOK, CT (BU # 84128)		
Project:		
Client: Crown Castle	Drawn by: T. Cheriyan	App'd:
Code: TIA-222-G	Date: 11/30/17	Scale: NTS
Path:		Dwg No. E-5

Guy Tensions and Tower Reactions
TIA-222-G - 105 mph/50 mph 0.750 in Ice Exposure B

Maximum Values
Anchor 'C'@42 ft Azimuth 211 deg Elev 0 ft
Plane through centroid of tower



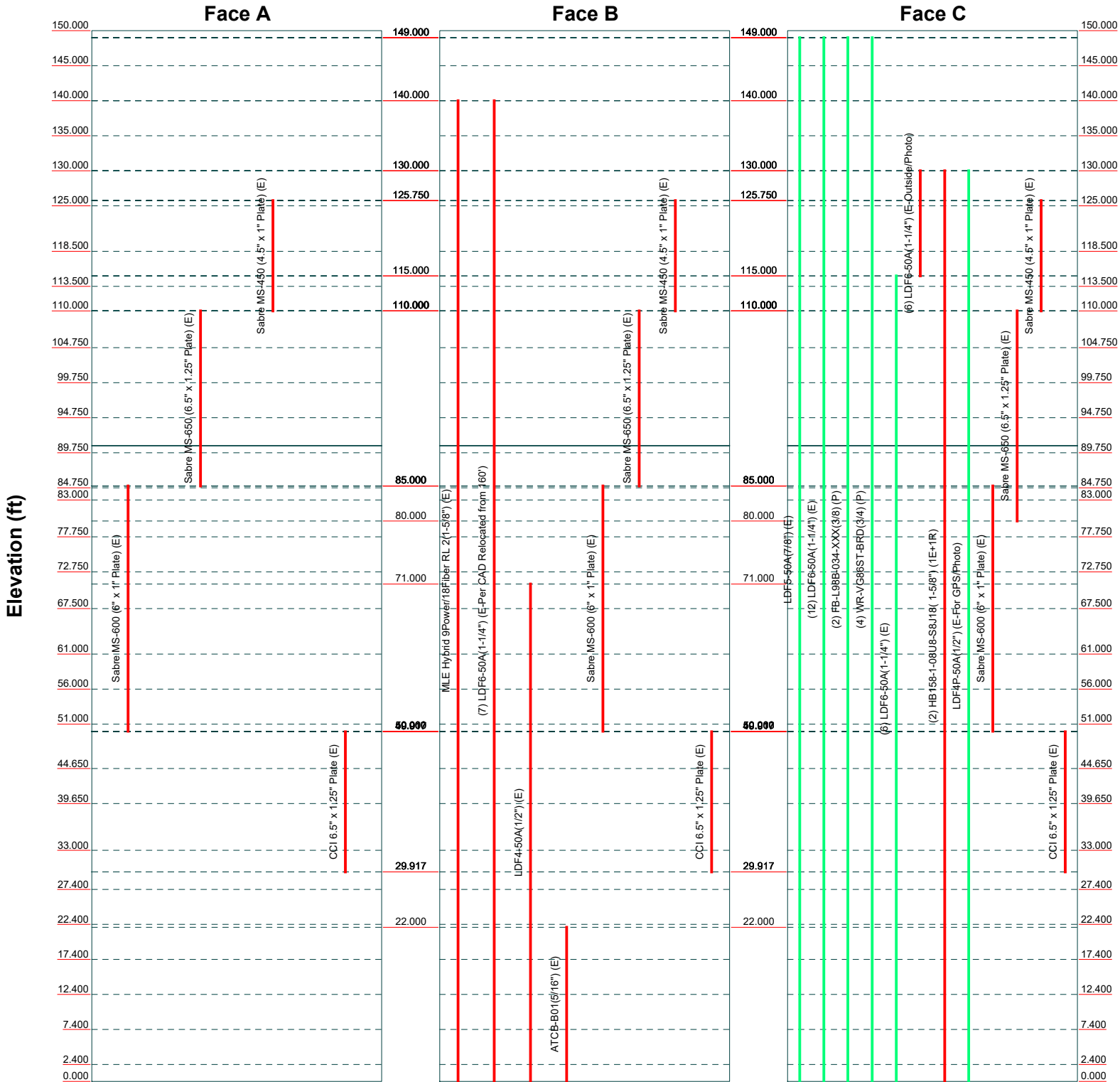
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Job: 93496.014.01 - OLD SAYBROOK, CT (BU # 84128)		
Project:		
Client: Crown Castle	Drawn by: T. Cheriyan	App'd:
Code: TIA-222-G	Date: 11/30/17	Scale: NTS
Path:		Dwg No. E-6

Feed Line Distribution Chart

0' - 150'

— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss Leg




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Job: 93496.014.01 - OLD SAYBROOK, CT (BU # 84128)		
Project:		
Client: Crown Castle	Drawn by: T. Cheriyan	App'd:
Code: TIA-222-G	Date: 11/30/17	Scale: NTS
Path:		Dwg No. E-7

tnxTower B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 93496.014.01 - OLD SAYBROOK, CT (BU # 841289)	Page 1 of 43
	Project	Date 09:18:36 11/30/17
	Client Crown Castle	Designed by T. Cheriyan

Tower Input Data

There is a pole section.

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

The following design criteria apply:

Tower is located in Middlesex County, Connecticut.

Basic wind speed of 105 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.000 ft.

Nominal ice thickness of 0.750 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 60 mph.

TOWER RATING: 100.0%.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Safety factor used in guy design is 1.

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="background-color: #e0e0e0;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|--|

Tapered Pole Section Geometry

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	
L1	150.000-145.000	5.000	0.000	12	15.530	16.310	0.250	1.000	A572-65 (65 ksi)
L2	145.000-140.000	5.000	0.000	12	16.310	17.090	0.250	1.000	A572-65 (65 ksi)
L3	140.000-135.000	5.000	0.000	12	17.090	17.870	0.250	1.000	A572-65 (65 ksi)

tnxTower

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Job
93496.014.01 - OLD SAYBROOK, CT (BU # 841289)

Page
2 of 43

Project
Date
09:18:36 11/30/17

Client
Crown Castle
Designed by
T. Cheriyan

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
L4	135.000-130.000	5.000	0.000	12	17.870	18.650	0.250	1.000	A572-65 (65 ksi)
L5	130.000-125.000	5.000	0.000	12	18.650	19.430	0.250	1.000	A572-65 (65 ksi)
L6	125.000-123.750	1.250	0.000	12	19.430	19.625	0.250	1.000	A572-65 (65 ksi)
L7	123.750-123.500	0.250	0.000	12	19.625	19.664	0.512	2.050	A572-65 (65 ksi)
L8	123.500-118.500	5.000	0.000	12	19.664	20.444	0.500	2.000	A572-65 (65 ksi)
L9	118.500-113.500	5.000	0.000	12	20.444	21.224	0.487	1.950	A572-65 (65 ksi)
L10	113.500-110.000	3.500	0.000	12	21.224	21.770	0.487	1.950	A572-65 (65 ksi)
L11	110.000-109.750	0.250	0.000	12	21.770	21.810	0.762	3.050	A572-65 (65 ksi)
L12	109.750-104.750	5.000	0.000	12	21.810	22.619	0.750	3.000	A572-65 (65 ksi)
L13	104.750-99.750	5.000	0.000	12	22.619	23.427	0.725	2.900	A572-65 (65 ksi)
L14	99.750-94.750	5.000	0.000	12	23.427	24.235	0.713	2.850	A572-65 (65 ksi)
L15	94.750-89.750	5.000	0.000	12	24.235	25.043	0.688	2.750	A572-65 (65 ksi)
L16	89.750-84.750	5.000	0.000	12	25.043	25.852	0.675	2.700	A572-65 (65 ksi)
L17	84.750-83.000	1.750	0.000	12	25.852	26.134	0.675	2.700	A572-65 (65 ksi)
L18	83.000-82.750	0.250	0.000	12	26.134	26.175	0.563	2.250	A572-65 (65 ksi)
L19	82.750-77.750	5.000	0.000	12	26.175	26.983	0.563	2.250	A572-65 (65 ksi)
L20	77.750-72.750	5.000	0.000	12	26.983	27.791	0.550	2.200	A572-65 (65 ksi)
L21	72.750-67.500	5.250	3.500	12	27.791	28.640	0.550	2.200	A572-65 (65 ksi)
L22	67.500-66.000	5.000	0.000	12	27.449	28.266	0.613	2.450	A572-65 (65 ksi)
L23	66.000-61.000	5.000	0.000	12	28.266	29.084	0.600	2.400	A572-65 (65 ksi)
L24	61.000-56.000	5.000	0.000	12	29.084	29.901	0.375	1.500	A572-65 (65 ksi)
L25	56.000-51.000	5.000	0.000	12	29.901	30.718	0.375	1.500	A572-65 (65 ksi)
L26	51.000-49.900	1.100	0.000	12	30.718	30.898	0.375	1.500	A572-65 (65 ksi)
L27	49.900-49.650	0.250	0.000	12	30.898	30.939	0.662	2.650	A572-65 (65 ksi)
L28	49.650-44.650	5.000	0.000	12	30.939	31.756	0.662	2.650	A572-65 (65 ksi)
L29	44.650-39.650	5.000	0.000	12	31.756	32.573	0.650	2.600	A572-65 (65 ksi)
L30	39.650-33.000	6.650	4.000	12	32.573	33.660	0.650	2.600	A572-65 (65 ksi)
L31	33.000-32.650	4.350	0.000	12	32.256	32.966	0.713	2.850	A572-65 (65 ksi)
L32	32.650-32.400	0.250	0.000	12	32.966	33.006	0.438	1.750	A572-65 (65 ksi)
L33	32.400-27.400	5.000	0.000	12	33.006	33.822	0.438	1.750	A572-65 (65 ksi)
L34	27.400-22.400	5.000	0.000	12	33.822	34.637	0.438	1.750	A572-65

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p>Job</p> <p style="text-align: center;">93496.014.01 - OLD SAYBROOK, CT (BU # 841289)</p>	<p>Page</p> <p style="text-align: center;">3 of 43</p>
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	<p>Client</p> <p style="text-align: center;">Crown Castle</p>	<p>Designed by</p> <p style="text-align: center;">T. Cheriyan</p>

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
L35	22.400-17.400	5.000	0.000	12	34.637	35.453	0.438	1.750	(65 ksi) A572-65
L36	17.400-12.400	5.000	0.000	12	35.453	36.268	0.438	1.750	(65 ksi) A572-65
L37	12.400-7.400	5.000	0.000	12	36.268	37.083	0.438	1.750	(65 ksi) A572-65
L38	7.400-2.400	5.000	0.000	12	37.083	37.899	0.438	1.750	(65 ksi) A572-65
L39	2.400-0.000	2.400		12	37.899	38.290	0.438	1.750	(65 ksi) A572-65

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	Iv/Q in ²	w in	w/t
L1	16.078	12.300	366.566	5.470	8.045	45.567	742.762	6.054	3.492	13.968
	16.885	12.928	425.616	5.749	8.449	50.377	862.414	6.363	3.701	14.804
L2	16.885	12.928	425.616	5.749	8.449	50.377	862.414	6.363	3.701	14.804
	17.693	13.556	490.691	6.029	8.853	55.429	994.273	6.672	3.910	15.64
L3	17.693	13.556	490.691	6.029	8.853	55.429	994.273	6.672	3.910	15.64
	18.500	14.184	562.082	6.308	9.257	60.722	1138.930	6.981	4.119	16.477
L4	18.500	14.184	562.082	6.308	9.257	60.722	1138.930	6.981	4.119	16.477
	19.308	14.812	640.082	6.587	9.661	66.256	1296.979	7.290	4.328	17.313
L5	19.308	14.812	640.082	6.587	9.661	66.256	1296.979	7.290	4.328	17.313
	20.115	15.440	724.983	6.866	10.065	72.032	1469.011	7.599	4.537	18.149
L6	20.115	15.440	724.983	6.866	10.065	72.032	1469.011	7.599	4.537	18.149
	20.317	15.597	747.321	6.936	10.166	73.514	1514.274	7.676	4.590	18.358
L7	20.317	15.540	1470.578	6.842	10.166	144.660	2979.791	15.523	3.886	7.582
	20.358	31.605	1479.599	6.856	10.186	145.259	2998.069	15.555	3.896	7.603
L8	20.358	30.854	1446.340	6.861	10.186	141.994	2930.676	15.185	3.930	7.86
	21.165	32.110	1630.229	7.140	10.590	153.941	3303.286	15.803	4.139	8.278
L9	21.165	31.327	1592.464	7.144	10.590	150.374	3226.763	15.418	4.172	8.559
	21.973	32.551	1786.581	7.424	10.994	162.505	3620.098	16.021	4.382	8.988
L10	21.973	32.551	1786.581	7.424	10.994	162.505	3620.098	16.021	4.382	8.988
	22.538	33.408	1931.454	7.619	11.277	171.276	3913.649	16.443	4.528	9.288
L11	22.538	51.579	2905.392	7.521	11.277	257.642	5887.113	25.385	3.791	4.972
	22.580	51.678	2922.192	7.535	11.298	258.652	5921.153	25.434	3.802	4.986
L12	22.580	50.861	2879.411	7.540	11.298	254.865	5834.468	25.032	3.835	5.114
	23.417	52.813	3223.805	7.829	11.716	275.152	6532.304	25.993	4.052	5.402
L13	23.417	51.111	3127.045	7.838	11.716	266.893	6336.241	25.155	4.119	5.681
	24.253	52.998	3486.305	8.127	12.135	287.290	7064.200	26.084	4.335	5.98
L14	24.253	52.112	3431.859	8.132	12.135	282.804	6953.877	25.648	4.369	6.132
	25.090	53.967	3811.392	8.421	12.554	303.605	7722.914	26.561	4.586	6.436
L15	25.090	52.129	3689.398	8.430	12.554	293.887	7475.720	25.656	4.653	6.767
	25.927	53.918	4082.485	8.719	12.972	314.704	8272.221	26.537	4.869	7.082
L16	25.927	52.965	4014.432	8.724	12.972	309.458	8134.328	26.068	4.903	7.263
	26.764	54.721	4427.272	9.013	13.391	330.612	8970.854	26.932	5.119	7.584
L17	26.764	54.721	4427.272	9.013	13.391	330.612	8970.854	26.932	5.119	7.584
	27.056	55.336	4578.189	9.114	13.538	338.182	9276.652	27.235	5.195	7.696
L18	27.056	46.317	3865.956	9.155	13.538	285.571	7833.476	22.796	5.497	9.772
	27.098	46.390	3884.313	9.169	13.559	286.484	7870.672	22.832	5.507	9.791
L19	27.098	46.390	3884.313	9.169	13.559	286.484	7870.672	22.832	5.507	9.791
	27.935	47.854	4263.765	9.459	13.977	305.050	8639.544	23.552	5.724	10.176
L20	27.935	46.813	4174.935	9.463	13.977	298.695	8459.550	23.040	5.757	10.468
	28.772	48.244	4569.730	9.752	14.396	317.432	9259.512	23.744	5.974	10.862

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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 in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
50									
L7				1	1	0.922254			
123.750-123.500									
L8				1	1	0.927302			
123.500-118.500									
L9				1	1	0.934021			
118.500-113.500									
L10				1	1	0.923215			
113.500-110.000									
L11				1	1	0.890946			
110.000-109.750									
L12				1	1	0.8872			
109.750-104.750									
L13				1	1	0.899453			
104.750-99.750									
L14				1	1	0.898369			
99.750-94.750									
L15				1	1	0.914269			
94.750-89.750									
L16				1	1	0.915706			
89.750-84.750									
L17				1	1	0.910676			
84.750-83.000									
L18				1	1	0.949546			
83.000-82.750									
L19				1	1	0.937493			
82.750-77.750									
L20				1	1	0.94677			
77.750-72.750									
L21				1	1	0.942879			
72.750-67.500									
L22				1	1	0.948006			
67.500-66.000									
L23				1	1	0.957498			
66.000-61.000									
L24				1	1	1			
61.000-56.000									
L25				1	1	1			
56.000-51.000									
L26				1	1	1			
51.000-49.900									
L27				1	1	0.949353			
49.900-49.650									
L28				1	1	0.939279			
49.650-44.650									
L29				1	1	0.947229			
44.650-39.650									
L30				1	1	0.942272			
39.650-33.000									
L31				1	1	0.949149			
33.000-32.650									
L32				1	1	1			

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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
32.650-32.400									
L33				1	1	1			
32.400-27.400									
L34				1	1	1			
27.400-22.400									
L35				1	1	1			
22.400-17.400									
L36				1	1	1			
17.400-12.400									
L37				1	1	1			
12.400-7.400									
L38				1	1	1			
7.400-2.400									
L39				1	1	1			
2.400-0.000									

Guy Data

Guy Elevation	Guy Grade	Guy Size	Initial Tension	%	Guy Modulus	Guy Weight	L_u	Anchor Radius	Anchor Azimuth Adj.	Anchor Elevation	End Fitting Efficiency	
ft			K		ksi	plf	ft	ft	°	ft	%	
90.75	BS	A	1 5/8	38.880	12%	24000.000	5.550	92.719	20.500	0.000	0.000	100%
		B	1 3/8	27.840	12%	24000.000	3.970	99.671	42.500	0.000	0.000	100%
		C	1 3/8	27.840	12%	24000.000	3.970	99.464	42.000	-30.000	0.000	100%

Guy Data(cont'd)

Guy Elevation	Mount Type	Torque-Arm Spread	Torque-Arm Leg Angle	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
ft		ft	°				
90.75	Corner						

Guy Data (cont'd)

Guy Elevation	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
ft								
90.750	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	

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Guy Data (cont'd)

Guy Elevation	Cable Weight	Cable Weight	Cable Weight	Cable Weight	Tower Intercept	Tower Intercept	Tower Intercept	Tower Intercept
ft	A	B	C	D	A	B	C	D
	K	K	K	K	ft	ft	ft	ft
90.75	0.515	0.396	0.395		0.610	0.704	0.702	
					1.3 sec/pulse	1.4 sec/pulse	1.4 sec/pulse	

Guy Data (cont'd)

Guy Elevation	Calc K	Calc K	Torque Arm		Pull Off		Diagonal	
			K _x	K _y	K _x	K _y	K _x	K _y
ft	Single Angles	Solid Rounds						
90.75	No	No			1	1	1	1

Guy Data (cont'd)

Guy Elevation	Torque-Arm				Pull Off				Diagonal			
	Bolt Size	Number	Net Width	U	Bolt Size	Number	Net Width	U	Bolt Size	Number	Net Width	U
ft	in		Deduct		in		Deduct		in		Deduct	
90.75	0.625	0	0.000	0.75	0.625	0	0.000	0.75	0.625	0	0.000	0.75
	A325N				A325N				A325N			

Guy Pressures

Guy Elevation	Guy Location	z	q _z	q _z	Ice Thickness
ft		ft	ksf	ksf	in
90.75	A	45.375	0.021	0.005	1.549
	B	45.375	0.021	0.005	1.549
	C	45.375	0.021	0.005	1.549

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension	F _x	F _y	F _z	M _x	M _y	M _z
ft		°	Top Bottom K	K	K	K	kip-ft	kip-ft	kip-ft
90.75	A	77.895	39.383 38.880	0.000	38.519	-8.206	-39.934	0.000	0.000
	B	65.445	28.200 27.840	10.084	25.684	5.822	13.314	0.000	-23.060
	C	65.706	28.200 27.840	-5.887	25.736	9.911	22.941	0.000	13.625

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Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F _x	F _y	F _z	M _x	M _y	M _z
ft		°	K	K	K	kip-ft	kip-ft	kip-ft	
			Sum:	4.198	89.939	7.528	-3.680	0.000	-9.435

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F _x	F _y	F _z	M _x	M _y	M _z
ft		°	K	K	K	kip-ft	kip-ft	kip-ft	
90.75	A	77.895	52.095 51.047	0.000	50.960	-10.814	-52.832	0.000	0.000
	B	65.445	37.367 36.506	13.293	34.069	7.674	17.660	0.000	-30.589
	C	65.706	37.365 36.503	-7.759	34.136	13.064	30.428	0.000	18.072
			Sum:	5.533	119.165	9.924	-4.744	0.000	-12.517

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F _x	F _y	F _z	M _x	M _y	M _z
ft		°	K	K	K	kip-ft	kip-ft	kip-ft	
90.75	A	77.895	39.383 38.880	0.000	38.519	-8.206	-39.934	0.000	0.000
	B	65.445	28.200 27.840	10.084	25.684	5.822	13.314	0.000	-23.060
	C	65.706	28.200 27.840	-5.887	25.736	9.911	22.941	0.000	13.625
			Sum:	4.198	89.939	7.528	-3.680	0.000	-9.435

Guy-Tensioning Information

Temperature At Time Of Tensioning																	
Guy Elevation	H	V	0 F		20 F		40 F		60 F		80 F		100 F		120 F		
			Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	
ft	ft	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft	
90.75	A	19.46	90.75	39.535	0.60	39.317	0.60	39.098	0.61	38.880	0.61	38.662	0.61	38.444	0.62	38.226	0.62
	B	41.46	90.75	29.665	0.66	29.056	0.68	28.448	0.69	27.840	0.70	27.232	0.72	26.625	0.74	26.018	0.75
	C	40.96	90.75	29.629	0.66	29.032	0.67	28.436	0.69	27.840	0.70	27.244	0.72	26.649	0.73	26.054	0.75

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Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
S									
M									
MLE Hybrid 9Power/18Fiber RL 2(1-5/8") (E)	B	Surface Ar (CaAa)	140.000 - 0.000	1	1	0.350 0.400	1.625		0.001
LDF6-50A(1-1/4") (E-Per CAD Relocated from 160')	B	Surface Ar (CaAa)	140.000 - 0.000	7	7	0.050 0.350	1.550		0.001
LDF6-50A(1-1/4") (E-Outside/Photo)	C	Surface Ar (CaAa)	130.000 - 115.000	6	6	0.000 0.150	1.550		0.001
HB158-1-08U8-S8J18(1-5/8") (1E+1R)	C	Surface Ar (CaAa)	130.000 - 0.000	2	2	0.250 0.300	1.980		0.001
M									
LDF4-50A(1/2") (E)	B	Surface Ar (CaAa)	71.000 - 0.000	1	1	-0.460 -0.450	0.630		0.000
M									
ATCB-B01(5/16") (E)	B	Surface Ar (CaAa)	22.000 - 0.000	1	1	-0.480 -0.470	0.315		0.000
M									
M									
2014 Mod									
Sabre MS-600 (6" x 1" Plate) (E)	A	Surface Af (CaAa)	85.000 - 50.000	1	1	0.000 0.100	6.000	14.000	0.000
Sabre MS-600 (6" x 1" Plate) (E)	B	Surface Af (CaAa)	85.000 - 50.000	1	1	0.000 0.100	6.000	14.000	0.000
Sabre MS-600 (6" x 1" Plate) (E)	C	Surface Af (CaAa)	85.000 - 50.000	1	1	0.000 0.100	6.000	14.000	0.000
M									
Sabre MS-650 (6.5" x 1.25" Plate) (E)	A	Surface Af (CaAa)	110.000 - 85.000	1	1	0.120 0.140	6.500	15.500	0.000
Sabre MS-650 (6.5" x 1.25" Plate) (E)	B	Surface Af (CaAa)	110.000 - 85.000	1	1	0.120 0.140	6.500	15.500	0.000
Sabre MS-650 (6.5" x 1.25" Plate) (E)	C	Surface Af (CaAa)	110.000 - 80.000	1	1	0.120 0.140	6.500	15.500	0.000
M									
Sabre MS-450 (4.5" x 1" Plate) (E)	A	Surface Af (CaAa)	125.750 - 110.000	1	1	0.200 0.240	4.500	11.000	0.000
Sabre MS-450 (4.5" x 1" Plate) (E)	B	Surface Af (CaAa)	125.750 - 110.000	1	1	0.200 0.240	4.500	11.000	0.000
Sabre MS-450 (4.5" x 1" Plate) (E)	C	Surface Af (CaAa)	125.750 - 110.000	1	1	0.200 0.240	4.500	11.000	0.000
M									
2016 Mod									
CCI 6.5" x 1.25" Plate (E)	A	Surface Af (CaAa)	49.917 - 29.917	1	1	-0.240 -0.200	6.500	15.500	0.000
CCI 6.5" x 1.25" Plate (E)	B	Surface Af (CaAa)	49.917 - 29.917	1	1	-0.240 -0.200	6.500	15.500	0.000
CCI 6.5" x 1.25" Plate (E)	C	Surface Af (CaAa)	49.917 - 29.917	1	1	-0.240 -0.200	6.500	15.500	0.000
M									

Feed Line/Linear Appurtenances - Entered As Area

tnxTower B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 93496.014.01 - OLD SAYBROOK, CT (BU # 841289)	Page 10 of 43
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	Client Crown Castle	Designed by T. Cheriyan

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf
M								
LDF5-50A(7/8") (E)	C	No	Inside Pole	149.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
LDF6-50A(1-1/4") (E)	C	No	Inside Pole	149.000 - 0.000	12	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
FB-L98B-034-XXX(3/8) (P)	C	No	Inside Pole	149.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
WR-VG86ST-BRD(3/4) (P)	C	No	Inside Pole	149.000 - 0.000	4	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
M								
M								
LDF6-50A(1-1/4") (E)	C	No	Inside Pole	115.000 - 0.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
M								
LDF4P-50A(1/2") (E-For GPS/Photo)	C	No	Inside Pole	130.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
M								
M								
M								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	150.000-145.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.043
L2	145.000-140.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.053
L3	140.000-135.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.237	0.000	0.028
		C	0.000	0.000	0.000	0.000	0.053
L4	135.000-130.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.237	0.000	0.028
		C	0.000	0.000	0.000	0.000	0.053
L5	130.000-125.000	A	0.000	0.000	0.563	0.000	0.000
		B	0.000	0.000	6.800	0.000	0.028
		C	0.000	0.000	7.192	0.000	0.087
L6	125.000-123.750	A	0.000	0.000	0.938	0.000	0.000
		B	0.000	0.000	2.497	0.000	0.007
		C	0.000	0.000	2.595	0.000	0.022
L7	123.750-123.500	A	0.000	0.000	0.188	0.000	0.000
		B	0.000	0.000	0.499	0.000	0.001
		C	0.000	0.000	0.519	0.000	0.004
L8	123.500-118.500	A	0.000	0.000	3.750	0.000	0.000
		B	0.000	0.000	9.988	0.000	0.028
		C	0.000	0.000	10.380	0.000	0.087
L9	118.500-113.500	A	0.000	0.000	3.750	0.000	0.000
		B	0.000	0.000	9.988	0.000	0.028

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
L10	113.500-110.000	C	0.000	0.000	8.985	0.000	0.087
		A	0.000	0.000	2.625	0.000	0.000
		B	0.000	0.000	6.991	0.000	0.020
L11	110.000-109.750	C	0.000	0.000	4.011	0.000	0.061
		A	0.000	0.000	0.271	0.000	0.000
		B	0.000	0.000	0.583	0.000	0.001
L12	109.750-104.750	C	0.000	0.000	0.370	0.000	0.004
		A	0.000	0.000	5.417	0.000	0.000
		B	0.000	0.000	11.654	0.000	0.028
L13	104.750-99.750	C	0.000	0.000	7.397	0.000	0.087
		A	0.000	0.000	5.417	0.000	0.000
		B	0.000	0.000	11.654	0.000	0.028
L14	99.750-94.750	C	0.000	0.000	7.397	0.000	0.087
		A	0.000	0.000	5.417	0.000	0.000
		B	0.000	0.000	11.654	0.000	0.028
L15	94.750-89.750	C	0.000	0.000	7.397	0.000	0.087
		A	0.000	0.000	5.417	0.000	0.000
		B	0.000	0.000	11.654	0.000	0.028
L16	89.750-84.750	C	0.000	0.000	7.397	0.000	0.087
		A	0.000	0.000	5.396	0.000	0.000
		B	0.000	0.000	11.633	0.000	0.028
L17	84.750-83.000	C	0.000	0.000	7.647	0.000	0.087
		A	0.000	0.000	1.750	0.000	0.000
		B	0.000	0.000	3.933	0.000	0.010
L18	83.000-82.750	C	0.000	0.000	4.339	0.000	0.030
		A	0.000	0.000	0.250	0.000	0.000
		B	0.000	0.000	0.562	0.000	0.001
L19	82.750-77.750	C	0.000	0.000	0.620	0.000	0.004
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.238	0.000	0.028
L20	77.750-72.750	C	0.000	0.000	9.959	0.000	0.087
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.238	0.000	0.028
L21	72.750-67.500	C	0.000	0.000	6.980	0.000	0.087
		A	0.000	0.000	5.250	0.000	0.000
		B	0.000	0.000	12.020	0.000	0.030
L22	67.500-66.000	C	0.000	0.000	7.329	0.000	0.091
		A	0.000	0.000	1.500	0.000	0.000
		B	0.000	0.000	3.466	0.000	0.009
L23	66.000-61.000	C	0.000	0.000	2.094	0.000	0.026
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.553	0.000	0.029
L24	61.000-56.000	C	0.000	0.000	6.980	0.000	0.087
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.553	0.000	0.029
L25	56.000-51.000	C	0.000	0.000	6.980	0.000	0.087
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.553	0.000	0.029
L26	51.000-49.900	C	0.000	0.000	6.980	0.000	0.087
		A	0.000	0.000	1.018	0.000	0.000
		B	0.000	0.000	2.460	0.000	0.006
L27	49.900-49.650	C	0.000	0.000	1.454	0.000	0.019
		A	0.000	0.000	0.271	0.000	0.000
		B	0.000	0.000	0.598	0.000	0.001
L28	49.650-44.650	C	0.000	0.000	0.370	0.000	0.004
		A	0.000	0.000	5.417	0.000	0.000
		B	0.000	0.000	11.969	0.000	0.029
L29	44.650-39.650	C	0.000	0.000	7.397	0.000	0.087
		A	0.000	0.000	5.417	0.000	0.000
		B	0.000	0.000	11.969	0.000	0.029
		C	0.000	0.000	7.397	0.000	0.087

<p>tnxTower</p> <p>B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p>Job 93496.014.01 - OLD SAYBROOK, CT (BU # 841289)</p>	<p>Page 12 of 43</p>
	<p>Project</p>	<p>Date 09:18:36 11/30/17</p>
	<p>Client Crown Castle</p>	<p>Designed by T. Cheriyan</p>

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
L30	39.650-33.000	A	0.000	0.000	7.204	0.000	0.000
		B	0.000	0.000	15.919	0.000	0.039
		C	0.000	0.000	9.838	0.000	0.116
L31	33.000-32.650	A	0.000	0.000	0.379	0.000	0.000
		B	0.000	0.000	0.838	0.000	0.002
		C	0.000	0.000	0.518	0.000	0.006
L32	32.650-32.400	A	0.000	0.000	0.271	0.000	0.000
		B	0.000	0.000	0.598	0.000	0.001
		C	0.000	0.000	0.370	0.000	0.004
L33	32.400-27.400	A	0.000	0.000	2.690	0.000	0.000
		B	0.000	0.000	9.242	0.000	0.029
		C	0.000	0.000	4.670	0.000	0.087
L34	27.400-22.400	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.553	0.000	0.029
		C	0.000	0.000	1.980	0.000	0.087
L35	22.400-17.400	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.697	0.000	0.030
		C	0.000	0.000	1.980	0.000	0.087
L36	17.400-12.400	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.710	0.000	0.030
		C	0.000	0.000	1.980	0.000	0.087
L37	12.400-7.400	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.710	0.000	0.030
		C	0.000	0.000	1.980	0.000	0.087
L38	7.400-2.400	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.710	0.000	0.030
		C	0.000	0.000	1.980	0.000	0.087
L39	2.400-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.221	0.000	0.014
		C	0.000	0.000	0.950	0.000	0.042

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	150.000-145.000	A	1.742	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.043
L2	145.000-140.000	A	1.736	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.053
L3	140.000-135.000	A	1.730	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	11.486	0.000	0.167
		C		0.000	0.000	0.000	0.000	0.053
L4	135.000-130.000	A	1.724	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	11.472	0.000	0.167
		C		0.000	0.000	0.000	0.000	0.053
L5	130.000-125.000	A	1.717	0.000	0.000	0.817	0.000	0.009
		B		0.000	0.000	12.274	0.000	0.175
		C		0.000	0.000	13.397	0.000	0.240
L6	125.000-123.750	A	1.713	0.000	0.000	1.360	0.000	0.015
		B		0.000	0.000	4.222	0.000	0.056
		C		0.000	0.000	4.502	0.000	0.072
L7	123.750-123.500	A	1.712	0.000	0.000	0.272	0.000	0.003
		B		0.000	0.000	0.844	0.000	0.011
		C		0.000	0.000	0.900	0.000	0.014
L8	123.500-118.500	A	1.708	0.000	0.000	5.436	0.000	0.058

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
		B		0.000	0.000	16.873	0.000	0.223
		C		0.000	0.000	17.994	0.000	0.289
L9	118.500-113.500	A	1.701	0.000	0.000	5.430	0.000	0.058
		B		0.000	0.000	16.851	0.000	0.222
		C		0.000	0.000	15.589	0.000	0.261
L10	113.500-110.000	A	1.695	0.000	0.000	3.798	0.000	0.040
		B		0.000	0.000	11.782	0.000	0.155
		C		0.000	0.000	7.013	0.000	0.138
L11	110.000-109.750	A	1.692	0.000	0.000	0.355	0.000	0.004
		B		0.000	0.000	0.925	0.000	0.012
		C		0.000	0.000	0.585	0.000	0.011
L12	109.750-104.750	A	1.688	0.000	0.000	7.104	0.000	0.072
		B		0.000	0.000	18.495	0.000	0.235
		C		0.000	0.000	11.689	0.000	0.211
L13	104.750-99.750	A	1.680	0.000	0.000	7.096	0.000	0.071
		B		0.000	0.000	18.469	0.000	0.234
		C		0.000	0.000	11.671	0.000	0.211
L14	99.750-94.750	A	1.671	0.000	0.000	7.088	0.000	0.071
		B		0.000	0.000	18.442	0.000	0.232
		C		0.000	0.000	11.652	0.000	0.210
L15	94.750-89.750	A	1.662	0.000	0.000	7.079	0.000	0.070
		B		0.000	0.000	18.413	0.000	0.231
		C		0.000	0.000	11.632	0.000	0.209
L16	89.750-84.750	A	1.653	0.000	0.000	7.049	0.000	0.070
		B		0.000	0.000	18.362	0.000	0.229
		C		0.000	0.000	11.944	0.000	0.211
L17	84.750-83.000	A	1.647	0.000	0.000	2.326	0.000	0.023
		B		0.000	0.000	6.281	0.000	0.078
		C		0.000	0.000	6.385	0.000	0.095
L18	83.000-82.750	A	1.645	0.000	0.000	0.332	0.000	0.003
		B		0.000	0.000	0.897	0.000	0.011
		C		0.000	0.000	0.912	0.000	0.014
L19	82.750-77.750	A	1.639	0.000	0.000	6.639	0.000	0.064
		B		0.000	0.000	17.922	0.000	0.223
		C		0.000	0.000	15.044	0.000	0.240
L20	77.750-72.750	A	1.629	0.000	0.000	6.629	0.000	0.064
		B		0.000	0.000	17.888	0.000	0.221
		C		0.000	0.000	11.140	0.000	0.201
L21	72.750-67.500	A	1.617	0.000	0.000	6.948	0.000	0.066
		B		0.000	0.000	20.096	0.000	0.247
		C		0.000	0.000	11.670	0.000	0.210
L22	67.500-66.000	A	1.609	0.000	0.000	1.985	0.000	0.019
		B		0.000	0.000	5.935	0.000	0.073
		C		0.000	0.000	3.334	0.000	0.060
L23	66.000-61.000	A	1.601	0.000	0.000	6.601	0.000	0.062
		B		0.000	0.000	19.715	0.000	0.240
		C		0.000	0.000	11.078	0.000	0.199
L24	61.000-56.000	A	1.588	0.000	0.000	6.588	0.000	0.062
		B		0.000	0.000	19.659	0.000	0.238
		C		0.000	0.000	11.049	0.000	0.197
L25	56.000-51.000	A	1.574	0.000	0.000	6.574	0.000	0.061
		B		0.000	0.000	19.599	0.000	0.235
		C		0.000	0.000	11.017	0.000	0.196
L26	51.000-49.900	A	1.565	0.000	0.000	1.337	0.000	0.012
		B		0.000	0.000	4.196	0.000	0.050
		C		0.000	0.000	2.312	0.000	0.042
L27	49.900-49.650	A	1.563	0.000	0.000	0.349	0.000	0.003
		B		0.000	0.000	0.998	0.000	0.012
		C		0.000	0.000	0.570	0.000	0.010
L28	49.650-44.650	A	1.554	0.000	0.000	6.971	0.000	0.065
		B		0.000	0.000	19.932	0.000	0.236

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	<p>Project</p>	<p>Date 09:18:36 11/30/17</p>
	<p>Client Crown Castle</p>	<p>Designed by T. Cheriyan</p>

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
L29	44.650-39.650	C		0.000	0.000	11.389	0.000	0.199
		A	1.537	0.000	0.000	6.954	0.000	0.064
		B		0.000	0.000	19.858	0.000	0.234
		C		0.000	0.000	11.350	0.000	0.197
L30	39.650-33.000	A	1.514	0.000	0.000	9.218	0.000	0.083
		B		0.000	0.000	26.283	0.000	0.306
		C		0.000	0.000	15.028	0.000	0.260
L31	33.000-32.650	A	1.499	0.000	0.000	0.485	0.000	0.004
		B		0.000	0.000	1.383	0.000	0.016
		C		0.000	0.000	0.791	0.000	0.014
L32	32.650-32.400	A	1.498	0.000	0.000	0.346	0.000	0.003
		B		0.000	0.000	0.985	0.000	0.011
		C		0.000	0.000	0.563	0.000	0.010
L33	32.400-27.400	A	1.485	0.000	0.000	3.427	0.000	0.030
		B		0.000	0.000	16.163	0.000	0.194
		C		0.000	0.000	7.759	0.000	0.162
L34	27.400-22.400	A	1.458	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	12.648	0.000	0.161
		C		0.000	0.000	4.298	0.000	0.131
L35	22.400-17.400	A	1.426	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	14.000	0.000	0.171
		C		0.000	0.000	4.257	0.000	0.129
L36	17.400-12.400	A	1.385	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	13.954	0.000	0.167
		C		0.000	0.000	4.207	0.000	0.128
L37	12.400-7.400	A	1.330	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	13.718	0.000	0.160
		C		0.000	0.000	4.137	0.000	0.126
L38	7.400-2.400	A	1.239	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	13.333	0.000	0.149
		C		0.000	0.000	4.024	0.000	0.123
L39	2.400-0.000	A	1.077	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	6.068	0.000	0.062
		C		0.000	0.000	1.834	0.000	0.056

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	150.000-145.000	0.000	0.000	0.000	0.000
L2	145.000-140.000	0.000	0.000	0.000	0.000
L3	140.000-135.000	1.068	-0.061	1.145	-0.028
L4	135.000-130.000	1.085	-0.062	1.175	-0.028
L5	130.000-125.000	0.492	0.671	0.423	0.649
L6	125.000-123.750	0.353	0.480	0.331	0.508
L7	123.750-123.500	0.354	0.482	0.333	0.510
L8	123.500-118.500	0.359	0.489	0.338	0.519
L9	118.500-113.500	0.404	0.400	0.387	0.448
L10	113.500-110.000	0.510	0.134	0.509	0.213
L11	110.000-109.750	0.438	0.115	0.467	0.195
L12	109.750-104.750	0.444	0.116	0.474	0.197
L13	104.750-99.750	0.454	0.119	0.487	0.202
L14	99.750-94.750	0.464	0.122	0.500	0.207
L15	94.750-89.750	0.474	0.124	0.512	0.212
L16	89.750-84.750	0.468	0.149	0.511	0.235
L17	84.750-83.000	0.204	0.530	0.285	0.549

tnxTower B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 93496.014.01 - OLD SAYBROOK, CT (BU # 841289)	Page 15 of 43
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	Client Crown Castle	Designed by T. Cheriyan

Section	Elevation	CP _x	CP _z	CP _x	CP _z
		in	in	Ice in	Ice in
L18	83.000-82.750	0.205	0.532	0.287	0.551
L19	82.750-77.750	0.336	0.369	0.402	0.418
L20	77.750-72.750	0.525	0.137	0.567	0.233
L21	72.750-67.500	0.534	0.118	0.574	0.150
L22	67.500-66.000	0.532	0.107	0.570	0.108
L23	66.000-61.000	0.538	0.108	0.578	0.110
L24	61.000-56.000	0.548	0.109	0.591	0.112
L25	56.000-51.000	0.557	0.111	0.603	0.114
L26	51.000-49.900	0.580	0.116	0.626	0.118
L27	49.900-49.650	0.545	0.109	0.598	0.113
L28	49.650-44.650	0.549	0.110	0.604	0.114
L29	44.650-39.650	0.558	0.111	0.616	0.116
L30	39.650-33.000	0.568	0.113	0.629	0.119
L31	33.000-32.650	0.566	0.113	0.626	0.118
L32	32.650-32.400	0.566	0.113	0.627	0.119
L33	32.400-27.400	0.721	0.144	0.768	0.145
L34	27.400-22.400	0.983	0.196	0.986	0.187
L35	22.400-17.400	0.986	0.169	0.972	0.023
L36	17.400-12.400	0.993	0.167	0.984	0.012
L37	12.400-7.400	1.000	0.169	0.998	0.017
L38	7.400-2.400	1.007	0.170	1.012	0.026
L39	2.400-0.000	1.012	0.170	1.024	0.043

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L3	18	MLE Hybrid 9Power/18Fiber	135.00 -	1.0000	1.0000
		RL 2(1-5/8")	140.00		
L3	19	LDF6-50A(1-1/4")	135.00 -	1.0000	1.0000
			140.00		
L4	18	MLE Hybrid 9Power/18Fiber	130.00 -	1.0000	1.0000
		RL 2(1-5/8")	135.00		
L4	19	LDF6-50A(1-1/4")	130.00 -	1.0000	1.0000
			135.00		
L5	18	MLE Hybrid 9Power/18Fiber	125.00 -	1.0000	1.0000
		RL 2(1-5/8")	130.00		
L5	19	LDF6-50A(1-1/4")	125.00 -	1.0000	1.0000
			130.00		
L5	26	LDF6-50A(1-1/4")	125.00 -	1.0000	1.0000
			130.00		
L5	27	HB158-1-08U8-S8J18(125.00 -	1.0000	1.0000
		1-5/8")	130.00		
L5	46	Sabre MS-450 (4.5" x 1"	125.00 -	1.0000	1.0000
		Plate)	125.75		
L5	47	Sabre MS-450 (4.5" x 1"	125.00 -	1.0000	1.0000
		Plate)	125.75		
L5	48	Sabre MS-450 (4.5" x 1"	125.00 -	1.0000	1.0000
		Plate)	125.75		
L6	18	MLE Hybrid 9Power/18Fiber	123.75 -	1.0000	1.0000
		RL 2(1-5/8")	125.00		
L6	19	LDF6-50A(1-1/4")	123.75 -	1.0000	1.0000
			125.00		
L6	26	LDF6-50A(1-1/4")	123.75 -	1.0000	1.0000
			125.00		

tnxTower

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Date
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Client
Crown Castle
Designed by
T. Cheriyan

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L6	27	HB158-1-08U8-S8J18(1-5/8")	123.75 - 125.00	1.0000	1.0000
L6	46	Sabre MS-450 (4.5" x 1" Plate)	123.75 - 125.00	1.0000	1.0000
L6	47	Sabre MS-450 (4.5" x 1" Plate)	123.75 - 125.00	1.0000	1.0000
L6	48	Sabre MS-450 (4.5" x 1" Plate)	123.75 - 125.00	1.0000	1.0000
L7	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	123.50 - 123.75	1.0000	1.0000
L7	19	LDF6-50A(1-1/4")	123.50 - 123.75	1.0000	1.0000
L7	26	LDF6-50A(1-1/4")	123.50 - 123.75	1.0000	1.0000
L7	27	HB158-1-08U8-S8J18(1-5/8")	123.50 - 123.75	1.0000	1.0000
L7	46	Sabre MS-450 (4.5" x 1" Plate)	123.50 - 123.75	1.0000	1.0000
L7	47	Sabre MS-450 (4.5" x 1" Plate)	123.50 - 123.75	1.0000	1.0000
L7	48	Sabre MS-450 (4.5" x 1" Plate)	123.50 - 123.75	1.0000	1.0000
L8	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	118.50 - 123.50	1.0000	1.0000
L8	19	LDF6-50A(1-1/4")	118.50 - 123.50	1.0000	1.0000
L8	26	LDF6-50A(1-1/4")	118.50 - 123.50	1.0000	1.0000
L8	27	HB158-1-08U8-S8J18(1-5/8")	118.50 - 123.50	1.0000	1.0000
L8	46	Sabre MS-450 (4.5" x 1" Plate)	118.50 - 123.50	1.0000	1.0000
L8	47	Sabre MS-450 (4.5" x 1" Plate)	118.50 - 123.50	1.0000	1.0000
L8	48	Sabre MS-450 (4.5" x 1" Plate)	118.50 - 123.50	1.0000	1.0000
L9	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	113.50 - 118.50	1.0000	1.0000
L9	19	LDF6-50A(1-1/4")	113.50 - 118.50	1.0000	1.0000
L9	26	LDF6-50A(1-1/4")	115.00 - 118.50	1.0000	1.0000
L9	27	HB158-1-08U8-S8J18(1-5/8")	113.50 - 118.50	1.0000	1.0000
L9	46	Sabre MS-450 (4.5" x 1" Plate)	113.50 - 118.50	1.0000	1.0000
L9	47	Sabre MS-450 (4.5" x 1" Plate)	113.50 - 118.50	1.0000	1.0000
L9	48	Sabre MS-450 (4.5" x 1" Plate)	113.50 - 118.50	1.0000	1.0000
L10	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	110.00 - 113.50	1.0000	1.0000
L10	19	LDF6-50A(1-1/4")	110.00 - 113.50	1.0000	1.0000
L10	27	HB158-1-08U8-S8J18(1-5/8")	110.00 - 113.50	1.0000	1.0000
L10	46	Sabre MS-450 (4.5" x 1" Plate)	110.00 - 113.50	1.0000	1.0000
L10	47	Sabre MS-450 (4.5" x 1" Plate)	110.00 - 113.50	1.0000	1.0000
L10	48	Sabre MS-450 (4.5" x 1" Plate)	110.00 - 113.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L11	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	109.75 - 110.00	1.0000	1.0000
L11	19	LDF6-50A(1-1/4")	109.75 - 110.00	1.0000	1.0000
L11	27	HB158-1-08U8-S8J18(1-5/8")	109.75 - 110.00	1.0000	1.0000
L11	42	Sabre MS-650 (6.5" x 1.25" Plate)	109.75 - 110.00	1.0000	1.0000
L11	43	Sabre MS-650 (6.5" x 1.25" Plate)	109.75 - 110.00	1.0000	1.0000
L11	44	Sabre MS-650 (6.5" x 1.25" Plate)	109.75 - 110.00	1.0000	1.0000
L12	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	104.75 - 109.75	1.0000	1.0000
L12	19	LDF6-50A(1-1/4")	104.75 - 109.75	1.0000	1.0000
L12	27	HB158-1-08U8-S8J18(1-5/8")	104.75 - 109.75	1.0000	1.0000
L12	42	Sabre MS-650 (6.5" x 1.25" Plate)	104.75 - 109.75	1.0000	1.0000
L12	43	Sabre MS-650 (6.5" x 1.25" Plate)	104.75 - 109.75	1.0000	1.0000
L12	44	Sabre MS-650 (6.5" x 1.25" Plate)	104.75 - 109.75	1.0000	1.0000
L13	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	99.75 - 104.75	1.0000	1.0000
L13	19	LDF6-50A(1-1/4")	99.75 - 104.75	1.0000	1.0000
L13	27	HB158-1-08U8-S8J18(1-5/8")	99.75 - 104.75	1.0000	1.0000
L13	42	Sabre MS-650 (6.5" x 1.25" Plate)	99.75 - 104.75	1.0000	1.0000
L13	43	Sabre MS-650 (6.5" x 1.25" Plate)	99.75 - 104.75	1.0000	1.0000
L13	44	Sabre MS-650 (6.5" x 1.25" Plate)	99.75 - 104.75	1.0000	1.0000
L14	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	94.75 - 99.75	1.0000	1.0000
L14	19	LDF6-50A(1-1/4")	94.75 - 99.75	1.0000	1.0000
L14	27	HB158-1-08U8-S8J18(1-5/8")	94.75 - 99.75	1.0000	1.0000
L14	42	Sabre MS-650 (6.5" x 1.25" Plate)	94.75 - 99.75	1.0000	1.0000
L14	43	Sabre MS-650 (6.5" x 1.25" Plate)	94.75 - 99.75	1.0000	1.0000
L14	44	Sabre MS-650 (6.5" x 1.25" Plate)	94.75 - 99.75	1.0000	1.0000
L15	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	89.75 - 94.75	1.0000	1.0000
L15	19	LDF6-50A(1-1/4")	89.75 - 94.75	1.0000	1.0000
L15	27	HB158-1-08U8-S8J18(1-5/8")	89.75 - 94.75	1.0000	1.0000
L15	42	Sabre MS-650 (6.5" x 1.25" Plate)	89.75 - 94.75	1.0000	1.0000
L15	43	Sabre MS-650 (6.5" x 1.25" Plate)	89.75 - 94.75	1.0000	1.0000
L15	44	Sabre MS-650 (6.5" x 1.25" Plate)	89.75 - 94.75	1.0000	1.0000
L16	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	84.75 - 89.75	1.0000	1.0000
L16	19	LDF6-50A(1-1/4")	84.75 - 89.75	1.0000	1.0000
L16	27	HB158-1-08U8-S8J18(1-5/8")	84.75 - 89.75	1.0000	1.0000

tnxTower

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Job 93496.014.01 - OLD SAYBROOK, CT (BU # 841289)	Page 18 of 43
Project	Date 09:18:36 11/30/17
Client Crown Castle	Designed by T. Cheriyan

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L16	38	Sabre MS-600 (6" x 1" Plate)	84.75 - 85.00	1.0000	1.0000
L16	39	Sabre MS-600 (6" x 1" Plate)	84.75 - 85.00	1.0000	1.0000
L16	40	Sabre MS-600 (6" x 1" Plate)	84.75 - 85.00	1.0000	1.0000
L16	42	Sabre MS-650 (6.5" x 1.25" Plate)	85.00 - 89.75	1.0000	1.0000
L16	43	Sabre MS-650 (6.5" x 1.25" Plate)	85.00 - 89.75	1.0000	1.0000
L16	44	Sabre MS-650 (6.5" x 1.25" Plate)	84.75 - 89.75	1.0000	1.0000
L17	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	83.00 - 84.75	1.0000	1.0000
L17	19	LDF6-50A(1-1/4")	83.00 - 84.75	1.0000	1.0000
L17	27	HB158-1-08U8-S8J18(1-5/8")	83.00 - 84.75	1.0000	1.0000
L17	38	Sabre MS-600 (6" x 1" Plate)	83.00 - 84.75	1.0000	1.0000
L17	39	Sabre MS-600 (6" x 1" Plate)	83.00 - 84.75	1.0000	1.0000
L17	40	Sabre MS-600 (6" x 1" Plate)	83.00 - 84.75	1.0000	1.0000
L17	44	Sabre MS-650 (6.5" x 1.25" Plate)	83.00 - 84.75	1.0000	1.0000
L18	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	82.75 - 83.00	1.0000	1.0000
L18	19	LDF6-50A(1-1/4")	82.75 - 83.00	1.0000	1.0000
L18	27	HB158-1-08U8-S8J18(1-5/8")	82.75 - 83.00	1.0000	1.0000
L18	38	Sabre MS-600 (6" x 1" Plate)	82.75 - 83.00	1.0000	1.0000
L18	39	Sabre MS-600 (6" x 1" Plate)	82.75 - 83.00	1.0000	1.0000
L18	40	Sabre MS-600 (6" x 1" Plate)	82.75 - 83.00	1.0000	1.0000
L18	44	Sabre MS-650 (6.5" x 1.25" Plate)	82.75 - 83.00	1.0000	1.0000
L19	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	77.75 - 82.75	1.0000	1.0000
L19	19	LDF6-50A(1-1/4")	77.75 - 82.75	1.0000	1.0000
L19	27	HB158-1-08U8-S8J18(1-5/8")	77.75 - 82.75	1.0000	1.0000
L19	38	Sabre MS-600 (6" x 1" Plate)	77.75 - 82.75	1.0000	1.0000
L19	39	Sabre MS-600 (6" x 1" Plate)	77.75 - 82.75	1.0000	1.0000
L19	40	Sabre MS-600 (6" x 1" Plate)	77.75 - 82.75	1.0000	1.0000
L19	44	Sabre MS-650 (6.5" x 1.25" Plate)	80.00 - 82.75	1.0000	1.0000
L20	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	72.75 - 77.75	1.0000	1.0000
L20	19	LDF6-50A(1-1/4")	72.75 - 77.75	1.0000	1.0000
L20	27	HB158-1-08U8-S8J18(1-5/8")	72.75 - 77.75	1.0000	1.0000
L20	38	Sabre MS-600 (6" x 1" Plate)	72.75 - 77.75	1.0000	1.0000
L20	39	Sabre MS-600 (6" x 1" Plate)	72.75 - 77.75	1.0000	1.0000
L20	40	Sabre MS-600 (6" x 1" Plate)	72.75 - 77.75	1.0000	1.0000
L21	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	67.50 - 72.75	1.0000	1.0000
L21	19	LDF6-50A(1-1/4")	67.50 - 72.75	1.0000	1.0000
L21	27	HB158-1-08U8-S8J18(1-5/8")	67.50 - 72.75	1.0000	1.0000
L21	29	LDF4-50A(1/2")	67.50 - 71.00	1.0000	1.0000
L21	38	Sabre MS-600 (6" x 1" Plate)	67.50 - 72.75	1.0000	1.0000
L21	39	Sabre MS-600 (6" x 1" Plate)	67.50 - 72.75	1.0000	1.0000
L21	40	Sabre MS-600 (6" x 1" Plate)	67.50 - 72.75	1.0000	1.0000
L23	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	61.00 - 66.00	1.0000	1.0000
L23	19	LDF6-50A(1-1/4")	61.00 - 66.00	1.0000	1.0000
L23	27	HB158-1-08U8-S8J18(1-5/8")	61.00 - 66.00	1.0000	1.0000
L23	29	LDF4-50A(1/2")	61.00 - 66.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L23	38	Sabre MS-600 (6" x 1" Plate)	61.00 - 66.00	1.0000	1.0000
L23	39	Sabre MS-600 (6" x 1" Plate)	61.00 - 66.00	1.0000	1.0000
L23	40	Sabre MS-600 (6" x 1" Plate)	61.00 - 66.00	1.0000	1.0000
L24	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	56.00 - 61.00	1.0000	1.0000
L24	19	LDF6-50A(1-1/4")	56.00 - 61.00	1.0000	1.0000
L24	27	HB158-1-08U8-S8J18(1-5/8")	56.00 - 61.00	1.0000	1.0000
L24	29	LDF4-50A(1/2")	56.00 - 61.00	1.0000	1.0000
L24	38	Sabre MS-600 (6" x 1" Plate)	56.00 - 61.00	1.0000	1.0000
L24	39	Sabre MS-600 (6" x 1" Plate)	56.00 - 61.00	1.0000	1.0000
L24	40	Sabre MS-600 (6" x 1" Plate)	56.00 - 61.00	1.0000	1.0000
L25	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	51.00 - 56.00	1.0000	1.0000
L25	19	LDF6-50A(1-1/4")	51.00 - 56.00	1.0000	1.0000
L25	27	HB158-1-08U8-S8J18(1-5/8")	51.00 - 56.00	1.0000	1.0000
L25	29	LDF4-50A(1/2")	51.00 - 56.00	1.0000	1.0000
L25	38	Sabre MS-600 (6" x 1" Plate)	51.00 - 56.00	1.0000	1.0000
L25	39	Sabre MS-600 (6" x 1" Plate)	51.00 - 56.00	1.0000	1.0000
L25	40	Sabre MS-600 (6" x 1" Plate)	51.00 - 56.00	1.0000	1.0000
L26	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	49.90 - 51.00	1.0000	1.0000
L26	19	LDF6-50A(1-1/4")	49.90 - 51.00	1.0000	1.0000
L26	27	HB158-1-08U8-S8J18(1-5/8")	49.90 - 51.00	1.0000	1.0000
L26	29	LDF4-50A(1/2")	49.90 - 51.00	1.0000	1.0000
L26	38	Sabre MS-600 (6" x 1" Plate)	50.00 - 51.00	1.0000	1.0000
L26	39	Sabre MS-600 (6" x 1" Plate)	50.00 - 51.00	1.0000	1.0000
L26	40	Sabre MS-600 (6" x 1" Plate)	50.00 - 51.00	1.0000	1.0000
L26	51	CCI 6.5" x 1.25" Plate	49.90 - 49.92	1.0000	1.0000
L26	52	CCI 6.5" x 1.25" Plate	49.90 - 49.92	1.0000	1.0000
L26	53	CCI 6.5" x 1.25" Plate	49.90 - 49.92	1.0000	1.0000
L27	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	49.65 - 49.90	1.0000	1.0000
L27	19	LDF6-50A(1-1/4")	49.65 - 49.90	1.0000	1.0000
L27	27	HB158-1-08U8-S8J18(1-5/8")	49.65 - 49.90	1.0000	1.0000
L27	29	LDF4-50A(1/2")	49.65 - 49.90	1.0000	1.0000
L27	51	CCI 6.5" x 1.25" Plate	49.65 - 49.90	1.0000	1.0000
L27	52	CCI 6.5" x 1.25" Plate	49.65 - 49.90	1.0000	1.0000
L27	53	CCI 6.5" x 1.25" Plate	49.65 - 49.90	1.0000	1.0000
L28	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	44.65 - 49.65	1.0000	1.0000
L28	19	LDF6-50A(1-1/4")	44.65 - 49.65	1.0000	1.0000
L28	27	HB158-1-08U8-S8J18(1-5/8")	44.65 - 49.65	1.0000	1.0000
L28	29	LDF4-50A(1/2")	44.65 - 49.65	1.0000	1.0000
L28	51	CCI 6.5" x 1.25" Plate	44.65 - 49.65	1.0000	1.0000
L28	52	CCI 6.5" x 1.25" Plate	44.65 - 49.65	1.0000	1.0000
L28	53	CCI 6.5" x 1.25" Plate	44.65 - 49.65	1.0000	1.0000
L29	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	39.65 - 44.65	1.0000	1.0000
L29	19	LDF6-50A(1-1/4")	39.65 - 44.65	1.0000	1.0000
L29	27	HB158-1-08U8-S8J18(1-5/8")	39.65 - 44.65	1.0000	1.0000
L29	29	LDF4-50A(1/2")	39.65 - 44.65	1.0000	1.0000
L29	51	CCI 6.5" x 1.25" Plate	39.65 - 44.65	1.0000	1.0000
L29	52	CCI 6.5" x 1.25" Plate	39.65 - 44.65	1.0000	1.0000
L29	53	CCI 6.5" x 1.25" Plate	39.65 - 44.65	1.0000	1.0000
L30	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	33.00 - 39.65	1.0000	1.0000

tnxTower

B+T Group
 1717 S. Boulder Ave. Suite 300
 Tulsa, OK 74119
 Phone: (918) 587-4630
 FAX: (918) 295-0265

Job

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Project**Date**

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Client

Crown Castle

Designed by

T. Cheriyan

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L30	19	LDF6-50A(1-1/4")	33.00 - 39.65	1.0000	1.0000
L30	27	HB158-1-08U8-S8J18(1-5/8")	33.00 - 39.65	1.0000	1.0000
L30	29	LDF4-50A(1/2")	33.00 - 39.65	1.0000	1.0000
L30	51	CCI 6.5" x 1.25" Plate	33.00 - 39.65	1.0000	1.0000
L30	52	CCI 6.5" x 1.25" Plate	33.00 - 39.65	1.0000	1.0000
L30	53	CCI 6.5" x 1.25" Plate	33.00 - 39.65	1.0000	1.0000
L32	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	32.40 - 32.65	1.0000	1.0000
L32	19	LDF6-50A(1-1/4")	32.40 - 32.65	1.0000	1.0000
L32	27	HB158-1-08U8-S8J18(1-5/8")	32.40 - 32.65	1.0000	1.0000
L32	29	LDF4-50A(1/2")	32.40 - 32.65	1.0000	1.0000
L32	51	CCI 6.5" x 1.25" Plate	32.40 - 32.65	1.0000	1.0000
L32	52	CCI 6.5" x 1.25" Plate	32.40 - 32.65	1.0000	1.0000
L32	53	CCI 6.5" x 1.25" Plate	32.40 - 32.65	1.0000	1.0000
L33	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	27.40 - 32.40	1.0000	1.0000
L33	19	LDF6-50A(1-1/4")	27.40 - 32.40	1.0000	1.0000
L33	27	HB158-1-08U8-S8J18(1-5/8")	27.40 - 32.40	1.0000	1.0000
L33	29	LDF4-50A(1/2")	27.40 - 32.40	1.0000	1.0000
L33	51	CCI 6.5" x 1.25" Plate	29.92 - 32.40	1.0000	1.0000
L33	52	CCI 6.5" x 1.25" Plate	29.92 - 32.40	1.0000	1.0000
L33	53	CCI 6.5" x 1.25" Plate	29.92 - 32.40	1.0000	1.0000
L34	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	22.40 - 27.40	1.0000	1.0000
L34	19	LDF6-50A(1-1/4")	22.40 - 27.40	1.0000	1.0000
L34	27	HB158-1-08U8-S8J18(1-5/8")	22.40 - 27.40	1.0000	1.0000
L34	29	LDF4-50A(1/2")	22.40 - 27.40	1.0000	1.0000
L35	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	17.40 - 22.40	1.0000	1.0000
L35	19	LDF6-50A(1-1/4")	17.40 - 22.40	1.0000	1.0000
L35	27	HB158-1-08U8-S8J18(1-5/8")	17.40 - 22.40	1.0000	1.0000
L35	29	LDF4-50A(1/2")	17.40 - 22.40	1.0000	1.0000
L35	31	ATCB-B01(5/16")	17.40 - 22.00	1.0000	1.0000
L36	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	12.40 - 17.40	1.0000	1.0000
L36	19	LDF6-50A(1-1/4")	12.40 - 17.40	1.0000	1.0000
L36	27	HB158-1-08U8-S8J18(1-5/8")	12.40 - 17.40	1.0000	1.0000
L36	29	LDF4-50A(1/2")	12.40 - 17.40	1.0000	1.0000
L36	31	ATCB-B01(5/16")	12.40 - 17.40	1.0000	1.0000
L37	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	7.40 - 12.40	1.0000	1.0000
L37	19	LDF6-50A(1-1/4")	7.40 - 12.40	1.0000	1.0000
L37	27	HB158-1-08U8-S8J18(1-5/8")	7.40 - 12.40	1.0000	1.0000
L37	29	LDF4-50A(1/2")	7.40 - 12.40	1.0000	1.0000
L37	31	ATCB-B01(5/16")	7.40 - 12.40	1.0000	1.0000
L38	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	2.40 - 7.40	1.0000	1.0000
L38	19	LDF6-50A(1-1/4")	2.40 - 7.40	1.0000	1.0000
L38	27	HB158-1-08U8-S8J18(1-5/8")	2.40 - 7.40	1.0000	1.0000
L38	29	LDF4-50A(1/2")	2.40 - 7.40	1.0000	1.0000
L38	31	ATCB-B01(5/16")	2.40 - 7.40	1.0000	1.0000
L39	18	MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	0.00 - 2.40	1.0000	1.0000
L39	19	LDF6-50A(1-1/4")	0.00 - 2.40	1.0000	1.0000

tnxTower B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 93496.014.01 - OLD SAYBROOK, CT (BU # 841289)	Page 21 of 43
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	Client Crown Castle	Designed by T. Cheriyan

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L39	27	HB158-1-08U8-S8J18(1-5/8")	0.00 - 2.40	1.0000	1.0000
L39	29	LDF4-50A(1/2")	0.00 - 2.40	1.0000	1.0000
L39	31	ATCB-B01(5/16")	0.00 - 2.40	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			Lateral		°	ft	ft ²	ft ²	K	
Lightning Rod 5/8" x 5' (E)	C	None			0.000	152.500	No Ice	0.313	0.313	0.031
							1/2" Ice	0.826	0.826	0.035
							1" Ice	1.322	1.322	0.041
s										
7770.00 w/ Mount Pipe (E)	A	From Leg	4.000	0.000	0.000	149.000	No Ice	5.746	4.254	0.055
			0.000				1/2" Ice	6.179	5.014	0.103
			1.000				1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe (E)	B	From Leg	4.000	0.000	0.000	149.000	No Ice	5.746	4.254	0.055
			0.000				1/2" Ice	6.179	5.014	0.103
			1.000				1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe (E)	C	From Leg	4.000	0.000	0.000	149.000	No Ice	5.746	4.254	0.055
			0.000				1/2" Ice	6.179	5.014	0.103
			1.000				1" Ice	6.607	5.711	0.157
DC6-48-60-18-8F (E-Relocated From 148' level)	A	From Leg	4.000	0.000	0.000	149.000	No Ice	1.212	1.212	0.033
			0.000				1/2" Ice	1.892	1.892	0.055
			1.000				1" Ice	2.105	2.105	0.080
RRUS 11 (E-Relocated From 148' level)	A	From Leg	4.000	0.000	0.000	149.000	No Ice	2.784	1.187	0.048
			0.000				1/2" Ice	2.992	1.334	0.068
			1.000				1" Ice	3.207	1.490	0.092
RRUS 11 (E-Relocated From 148' level)	B	From Leg	4.000	0.000	0.000	149.000	No Ice	2.784	1.187	0.048
			0.000				1/2" Ice	2.992	1.334	0.068
			1.000				1" Ice	3.207	1.490	0.092
RRUS 11 (E-Relocated From 148' level)	C	From Leg	4.000	0.000	0.000	149.000	No Ice	2.784	1.187	0.048
			0.000				1/2" Ice	2.992	1.334	0.068
			1.000				1" Ice	3.207	1.490	0.092
(2) TT19-08BP111-001 (E-Shielded per photos)	A	From Leg	4.000	0.000	0.000	149.000	No Ice	0.000	0.442	0.016
			0.000				1/2" Ice	0.000	0.530	0.022
			1.000				1" Ice	0.000	0.626	0.029
(2) TT19-08BP111-001 (E)	B	From Leg	4.000	0.000	0.000	149.000	No Ice	0.545	0.442	0.016
			0.000				1/2" Ice	0.641	0.530	0.022
			1.000				1" Ice	0.743	0.626	0.029
(2) TT19-08BP111-001 (E)	C	From Leg	4.000	0.000	0.000	149.000	No Ice	0.545	0.442	0.016
			0.000				1/2" Ice	0.641	0.530	0.022
			1.000				1" Ice	0.743	0.626	0.029
SBNHH-1D65A w/ Mount Pipe (P)	A	From Leg	4.000	0.000	0.000	149.000	No Ice	5.954	5.190	0.061
			0.000				1/2" Ice	6.390	5.961	0.114
			1.000				1" Ice	6.820	6.658	0.174
SBNHH-1D65A w/ Mount Pipe (P)	B	From Leg	4.000	0.000	0.000	149.000	No Ice	5.954	5.190	0.061
			0.000				1/2" Ice	6.390	5.961	0.114
			1.000				1" Ice	6.820	6.658	0.174

tnxTower B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job		93496.014.01 - OLD SAYBROOK, CT (BU # 841289)		Page		22 of 43	
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	Client		Crown Castle		Designed by		T. Cheriyan	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Lateral Vert						°
SBNHH-1D65A w/ Mount Pipe (P)	C	From Leg	4.000	0.000	0.000	149.000	No Ice	5.954	5.190	0.061
			0.000				1/2" Ice	6.390	5.961	0.114
			1.000				1" Ice	6.820	6.658	0.174
QS46512-2 w/ Mount Pipe (P)	A	From Leg	4.000	0.000	0.000	149.000	No Ice	5.791	5.876	0.123
			0.000				1/2" Ice	6.207	6.579	0.180
			1.000				1" Ice	6.623	7.252	0.243
80010799 w/ Mount Pipe (P)	B	From Leg	4.000	0.000	0.000	149.000	No Ice	15.549	10.690	0.144
			0.000				1/2" Ice	16.327	12.347	0.251
			1.000				1" Ice	17.095	14.028	0.369
QS46512-2 w/ Mount Pipe (P)	C	From Leg	4.000	0.000	0.000	149.000	No Ice	5.791	5.876	0.123
			0.000				1/2" Ice	6.207	6.579	0.180
			1.000				1" Ice	6.623	7.252	0.243
DC6-48-60-18-8F (P)	A	From Leg	4.000	0.000	0.000	149.000	No Ice	1.212	1.212	0.033
			0.000				1/2" Ice	1.892	1.892	0.055
			1.000				1" Ice	2.105	2.105	0.080
WCS RRUS-32-B30 (P)	A	From Leg	4.000	0.000	0.000	149.000	No Ice	3.314	2.424	0.077
			0.000				1/2" Ice	3.558	2.638	0.105
			1.000				1" Ice	3.809	2.860	0.136
WCS RRUS-32-B30 (P)	B	From Leg	4.000	0.000	0.000	149.000	No Ice	3.314	2.424	0.077
			0.000				1/2" Ice	3.558	2.638	0.105
			1.000				1" Ice	3.809	2.860	0.136
WCS RRUS-32-B30 (P)	C	From Leg	4.000	0.000	0.000	149.000	No Ice	3.314	2.424	0.077
			0.000				1/2" Ice	3.558	2.638	0.105
			1.000				1" Ice	3.809	2.860	0.136
RRUS 32 (P-Relocated from 148')	A	From Leg	4.000	0.000	0.000	149.000	No Ice	2.857	1.777	0.055
			0.000				1/2" Ice	3.083	1.968	0.077
			1.000				1" Ice	3.316	2.166	0.103
RRUS 32 (P-Relocated from 148')	B	From Leg	4.000	0.000	0.000	149.000	No Ice	2.857	1.777	0.055
			0.000				1/2" Ice	3.083	1.968	0.077
			1.000				1" Ice	3.316	2.166	0.103
RRUS 32 (P-Relocated from 148')	C	From Leg	4.000	0.000	0.000	149.000	No Ice	2.857	1.777	0.055
			0.000				1/2" Ice	3.083	1.968	0.077
			1.000				1" Ice	3.316	2.166	0.103
6' x 2" Mount Pipe (E-Empty/Photo)	A	From Leg	4.000	0.000	0.000	149.000	No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe (E-Empty/Photo)	B	From Leg	4.000	0.000	0.000	149.000	No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe (E-Empty/Photo)	C	From Leg	4.000	0.000	0.000	149.000	No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
Platform Mount [LP 403-1] (E)	C	None			0.000	149.000	No Ice	18.850	18.850	1.500
							1/2" Ice	24.300	24.300	1.797
							1" Ice	29.750	29.750	2.093
M										
5' x 2" Pipe Mount (E)	A	From Leg	2.000	0.000	0.000	148.000	No Ice	1.000	1.000	0.029
			0.000				1/2" Ice	1.393	1.393	0.037
			0.000				1" Ice	1.703	1.703	0.048
5' x 2" Pipe Mount (E)	B	From Leg	2.000	0.000	0.000	148.000	No Ice	1.000	1.000	0.029
			0.000				1/2" Ice	1.393	1.393	0.037
			0.000				1" Ice	1.703	1.703	0.048
5' x 2" Pipe Mount (E)	C	From Leg	2.000	0.000	0.000	148.000	No Ice	1.000	1.000	0.029
			0.000				1/2" Ice	1.393	1.393	0.037
			0.000				1" Ice	1.703	1.703	0.048
Side Arm Mount [SO 102-3] (E)	C	None			0.000	148.000	No Ice	3.000	3.000	0.081
							1/2" Ice	3.480	3.480	0.111

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	Client		Crown Castle		Designed by		T. Cheriyan	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral Vert					
						1" Ice	3.960	3.960	0.141
M									
AIR 21 B2A/B4P w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
AIR 21 B2A/B4P w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
AIR 21 B2A/B4P w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
AIR 21 B4A/B2P w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
AIR 21 B4A/B2P w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
AIR 21 B4A/B2P w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	6.162 6.600 7.033	5.545 6.303 6.998	0.103 0.159 0.222
LNX-6515DS-A1M w/ Mount Pipe (E)	A	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	11.647 12.368 13.099	9.844 11.368 12.917	0.083 0.173 0.272
LNX-6515DS-A1M w/ Mount Pipe (E)	B	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	11.647 12.368 13.099	9.844 11.368 12.917	0.083 0.173 0.272
LNX-6515DS-A1M w/ Mount Pipe (E)	C	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	11.647 12.368 13.099	9.844 11.368 12.917	0.083 0.173 0.272
TMAT7LA-11A (E/front shielded per phtoso)	A	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.347 0.423 0.506	0.022 0.029 0.037
TMAT7LA-11A (E/front shielded per phtoso)	B	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.347 0.423 0.506	0.022 0.029 0.037
TMAT7LA-11A (E/front shielded per phtoso)	C	From Leg	4.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.347 0.423 0.506	0.022 0.029 0.037
RRUS 11 B12 (E/front shielded per photos)	A	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	1.182 1.330 1.485	0.051 0.072 0.095
RRUS 11 B12 (E/front shielded per photos)	B	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	1.182 1.330 1.485	0.051 0.072 0.095
RRUS 11 B12 (E/front shielded per photos)	C	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	1.182 1.330 1.485	0.051 0.072 0.095
Platform Mount [LP 303-1] (E)	C	None		0.000	140.000	No Ice 1/2" Ice 1" Ice	14.660 18.870 23.080	14.660 18.870 23.080	1.250 1.481 1.713
Miscellaneous [NA 507-1] (E)	C	None		0.000	140.000	No Ice 1/2" Ice 1" Ice	4.800 6.700 8.600	4.800 6.700 8.600	0.245 0.294 0.343
M									
BXA-80080/4CF w/ Mount Pipe (E)	A	From Leg	4.000 0.000 3.000	0.000	130.000	No Ice 1/2" Ice 1" Ice	5.037 5.421 5.813	4.033 4.655 5.281	0.033 0.077 0.127

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	Project				Date		09:18:36 11/30/17	
	Client		Crown Castle		Designed by		T. Cheriyan	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
BXA-80080/4CF w/ Mount Pipe (E)	B	From Leg	4.000	0.000	0.000	130.000	No Ice	5.037	4.033	0.033
			0.000				1/2" Ice	5.421	4.655	0.077
			3.000				1" Ice	5.813	5.281	0.127
BXA-80080/4CF w/ Mount Pipe (E)	C	From Leg	4.000	0.000	0.000	130.000	No Ice	5.037	4.033	0.033
			0.000				1/2" Ice	5.421	4.655	0.077
			3.000				1" Ice	5.813	5.281	0.127
DB-B1-6C-12AB-0Z (E)	A	From Leg	4.000	0.000	0.000	130.000	No Ice	3.364	2.192	0.021
			0.000				1/2" Ice	3.597	2.395	0.050
			3.000				1" Ice	3.838	2.606	0.082
(2) SBNHH-1D65B w/ Mount Pipe (R)	A	From Leg	4.000	0.000	0.000	130.000	No Ice	8.397	7.071	0.066
			0.000				1/2" Ice	8.960	8.260	0.135
			3.000				1" Ice	9.490	9.170	0.212
(2) SBNHH-1D65B w/ Mount Pipe (R)	B	From Leg	4.000	0.000	0.000	130.000	No Ice	8.397	7.071	0.066
			0.000				1/2" Ice	8.960	8.260	0.135
			3.000				1" Ice	9.490	9.170	0.212
(2) SBNHH-1D65B w/ Mount Pipe (R)	C	From Leg	4.000	0.000	0.000	130.000	No Ice	8.397	7.071	0.066
			0.000				1/2" Ice	8.960	8.260	0.135
			3.000				1" Ice	9.490	9.170	0.212
B13 RRH 4X30 (R)	A	From Leg	4.000	0.000	0.000	130.000	No Ice	2.055	1.320	0.056
			0.000				1/2" Ice	2.241	1.475	0.073
			3.000				1" Ice	2.433	1.638	0.093
B13 RRH 4X30 (R)	B	From Leg	4.000	0.000	0.000	130.000	No Ice	2.055	1.320	0.056
			0.000				1/2" Ice	2.241	1.475	0.073
			3.000				1" Ice	2.433	1.638	0.093
B13 RRH 4X30 (R)	C	From Leg	4.000	0.000	0.000	130.000	No Ice	2.055	1.320	0.056
			0.000				1/2" Ice	2.241	1.475	0.073
			3.000				1" Ice	2.433	1.638	0.093
B25 RRH4X30 (R)	A	From Leg	4.000	0.000	0.000	130.000	No Ice	2.200	1.742	0.055
			0.000				1/2" Ice	2.393	1.920	0.075
			3.000				1" Ice	2.593	2.106	0.099
B25 RRH4X30 (R)	B	From Leg	4.000	0.000	0.000	130.000	No Ice	2.200	1.742	0.055
			0.000				1/2" Ice	2.393	1.920	0.075
			3.000				1" Ice	2.593	2.106	0.099
B25 RRH4X30 (R)	C	From Leg	4.000	0.000	0.000	130.000	No Ice	2.200	1.742	0.055
			0.000				1/2" Ice	2.393	1.920	0.075
			3.000				1" Ice	2.593	2.106	0.099
DB-B1-6C-12AB-0Z (R)	A	From Leg	4.000	0.000	0.000	130.000	No Ice	3.364	2.192	0.021
			0.000				1/2" Ice	3.597	2.395	0.050
			3.000				1" Ice	3.838	2.606	0.082
B66A RRH4X45 (R)	A	From Leg	4.000	0.000	0.000	130.000	No Ice	2.537	1.610	0.057
			0.000				1/2" Ice	2.750	1.791	0.077
			3.000				1" Ice	2.970	1.978	0.100
B66A RRH4X45 (R)	B	From Leg	4.000	0.000	0.000	130.000	No Ice	2.537	1.610	0.057
			0.000				1/2" Ice	2.750	1.791	0.077
			3.000				1" Ice	2.970	1.978	0.100
B66A RRH4X45 (R)	C	From Leg	4.000	0.000	0.000	130.000	No Ice	2.537	1.610	0.057
			0.000				1/2" Ice	2.750	1.791	0.077
			3.000				1" Ice	2.970	1.978	0.100
5' x 2" Pipe Mount (E-TBR Antenna)	A	From Leg	4.000	0.000	0.000	130.000	No Ice	1.000	1.000	0.029
			0.000				1/2" Ice	1.393	1.393	0.037
			0.000				1" Ice	1.703	1.703	0.048
5' x 2" Pipe Mount (E-TBR Antenna)	B	From Leg	4.000	0.000	0.000	130.000	No Ice	1.000	1.000	0.029
			0.000				1/2" Ice	1.393	1.393	0.037
			0.000				1" Ice	1.703	1.703	0.048
5' x 2" Pipe Mount (E-TBR Antenna)	C	From Leg	4.000	0.000	0.000	130.000	No Ice	1.000	1.000	0.029
			0.000				1/2" Ice	1.393	1.393	0.037
			0.000				1" Ice	1.703	1.703	0.048

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight K
Platform Mount [LP 403-1] (E)	C	None		0.000	130.000	No Ice 18.850 1/2" Ice 24.300 1" Ice 29.750	18.850 24.300 29.750	1.500 1.797 2.093
M FMO (E)	C	From Leg	2.000 0.000 1.000	0.000	71.000	No Ice 8.400 1/2" Ice 8.815 1" Ice 9.237	8.400 8.815 9.237	0.010 0.181 0.361
Side Arm Mount [SO 301-1] (E)	C	From Leg	1.000 0.000 0.000	0.000	71.000	No Ice 1.000 1/2" Ice 1.390 1" Ice 1.780	0.900 1.420 1.940	0.023 0.033 0.042
Reflector (E-Per Photo)	A	From Leg	3.000 0.000 0.000	0.000	71.000	No Ice 0.163 1/2" Ice 0.218 1" Ice 0.279	0.117 0.165 0.221	0.010 0.012 0.015
3' x 2" Pipe Mount (E-Per Photo)	A	From Leg	3.000 0.000 0.000	0.000	71.000	No Ice 0.583 1/2" Ice 0.770 1" Ice 0.967	0.583 0.770 0.967	0.011 0.017 0.024
Side Arm Mount [SO 701-1] (E)	A	From Leg	1.500 0.000 0.000	0.000	71.000	No Ice 0.850 1/2" Ice 1.140 1" Ice 1.430	1.670 2.340 3.010	0.065 0.079 0.093
M MYA-43012N (E)	C	From Leg	3.000 0.000 0.000	0.000	22.000	No Ice 0.620 1/2" Ice 1.116 1" Ice 1.612	0.620 1.116 1.612	0.005 0.006 0.008
4' x 2" Pipe Mount (E-For Yagi/Photo)	C	From Leg	3.000 0.000 0.000	0.000	22.000	No Ice 0.785 1/2" Ice 1.028 1" Ice 1.281	0.785 1.028 1.281	0.029 0.035 0.044
Side Arm Mount [SO 701-1] (E)	C	From Leg	1.500 0.000 0.000	0.000	22.000	No Ice 0.850 1/2" Ice 1.140 1" Ice 1.430	1.670 2.340 3.010	0.065 0.079 0.093
M GPS (3"x7") (E-Per Photo)	C	From Leg	4.000 0.000 4.000	0.000	134.000	No Ice 0.175 1/2" Ice 0.234 1" Ice 0.301	0.175 0.234 0.301	0.008 0.010 0.013
M								

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
KP4F-23A (E)	B	Grid	From Leg	4.000 0.000 7.000	0.000		149.000	4.000	No Ice 12.570 1/2" Ice 13.090 1" Ice 16.130	0.070 0.140 0.200
S										

Load Combinations

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p>Job</p> <p style="text-align: center;">93496.014.01 - OLD SAYBROOK, CT (BU # 841289)</p>	<p>Page</p> <p style="text-align: center;">26 of 43</p>
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	<p>Client</p> <p style="text-align: center;">Crown Castle</p>	<p>Designed by</p> <p style="text-align: center;">T. Cheriyan</p>

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov.	Axial	Major Axis	Minor Axis
				Load	K	Moment	Moment
				Comb.		kip-ft	kip-ft
L1	150 - 145	Pole	Max Tension	4	0.000	-0.002	-0.001
			Max. Compression	14	-9.517	-2.265	-0.097
			Max. Mx	5	-3.276	-32.967	-1.156
			Max. My	8	-3.634	-1.516	-29.883
			Max. Vy	5	6.746	-32.967	-1.156
			Max. Vx	8	6.315	-1.516	-29.883
			Max. Torque	8			1.966
			Max Tension	1	0.000	0.000	0.000
L2	145 - 140	Pole	Max. Compression	14	-10.052	-2.369	-0.159
			Max. Mx	5	-3.570	-67.705	-2.392
			Max. My	8	-3.946	-2.439	-62.436
			Max. Vy	5	7.154	-67.705	-2.392
			Max. Vx	8	6.709	-2.439	-62.436
			Max. Torque	8			1.966

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	140 - 135	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-17.648	-2.678	-0.264
			Max. Mx	5	-6.448	-127.298	-4.033
			Max. My	8	-7.040	-3.467	-119.263
			Max. Vy	5	11.833	-127.298	-4.033
			Max. Vx	8	11.308	-3.467	-119.263
			Max. Torque	8			1.965
L4	135 - 130	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-18.418	-2.898	-0.427
			Max. Mx	5	-6.868	-187.517	-5.721
			Max. My	8	-7.469	-4.455	-176.997
			Max. Vy	5	12.250	-187.517	-5.721
			Max. Vx	8	11.765	-4.455	-176.997
			Max. Torque	8			1.958
L5	130 - 125	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-26.864	-3.229	0.607
			Max. Mx	5	-9.942	-283.355	-7.719
			Max. My	8	-10.767	-5.541	-270.433
			Max. Vy	5	17.387	-283.355	-7.719
			Max. Vx	8	16.910	-5.541	-270.433
			Max. Torque	13			-2.044
L6	125 - 123.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-27.149	-3.312	0.527
			Max. Mx	5	-10.080	-305.138	-8.247
			Max. My	8	-10.906	-5.809	-291.634
			Max. Vy	5	17.483	-305.138	-8.247
			Max. Vx	8	17.022	-5.809	-291.634
			Max. Torque	13			-2.042
L7	123.75 - 123.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-27.220	-3.329	0.511
			Max. Mx	5	-10.137	-309.514	-8.383
			Max. My	8	-10.963	-5.864	-295.890
			Max. Vy	5	17.539	-309.514	-8.383
			Max. Vx	8	17.025	-5.864	-295.890
			Max. Torque	13			-2.042
L8	123.5 - 118.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-28.642	-3.662	0.182
			Max. Mx	5	-10.908	-398.116	-10.520
			Max. My	8	-11.746	-6.940	-382.344
			Max. Vy	5	17.952	-398.116	-10.520
			Max. Vx	8	17.541	-6.940	-382.344
			Max. Torque	13			-2.042
L9	118.5 - 113.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-30.054	-4.008	-0.129
			Max. Mx	5	-11.718	-488.965	-12.743
			Max. My	8	-12.567	-8.023	-471.286
			Max. Vy	5	18.399	-488.965	-12.743
			Max. Vx	8	18.039	-8.023	-471.286
			Max. Torque	13			-2.041
L10	113.5 - 110	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-31.011	-4.261	-0.302
			Max. Mx	5	-12.301	-553.882	-14.326
			Max. My	8	-13.158	-8.784	-535.010
			Max. Vy	5	18.710	-553.882	-14.326
			Max. Vx	8	18.388	-8.784	-535.010
			Max. Torque	13			-2.040
L11	110 - 109.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-31.097	-4.281	-0.315
			Max. Mx	5	-12.370	-558.569	-14.486
			Max. My	8	-13.227	-8.840	-539.607
			Max. Vy	5	18.806	-558.569	-14.486

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	Crown Castle	T. Cheriyan	

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft					
L12	109.75 - 104.75	Pole	Max. Vx	8	18.394	-8.840	-539.607					
			Max. Torque	13			-2.039					
			Max Tension	1	0.000	0.000	0.000					
			Max. Compression	14	-32.830	-4.651	-0.572					
			Max. Mx	5	-13.481	-653.448	-16.799					
			Max. My	8	-14.355	-9.936	-632.976					
			Max. Vy	5	19.235	-653.448	-16.799					
			Max. Vx	8	18.945	-9.936	-632.976					
			Max. Torque	13			-2.039					
			Max Tension	1	0.000	0.000	0.000					
L13	104.75 - 99.75	Pole	Max. Compression	14	-34.584	-5.032	-0.840					
			Max. Mx	5	-14.626	-750.828	-19.257					
			Max. My	8	-15.517	-11.044	-728.991					
			Max. Vy	5	19.733	-750.828	-19.257					
			Max. Vx	8	19.470	-11.044	-728.991					
			Max. Torque	13			-2.038					
			Max Tension	1	0.000	0.000	0.000					
			Max. Compression	14	-36.360	-5.424	-1.121					
			Max. Mx	5	-15.798	-850.680	-21.819					
			Max. My	8	-16.707	-12.162	-827.598					
L14	99.75 - 94.75	Pole	Max. Vy	5	20.226	-850.680	-21.819					
			Max. Vx	8	19.984	-12.162	-827.598					
			Max. Torque	13			-2.038					
			Max Tension	1	0.000	0.000	0.000					
			Max. Compression	6	-263.328	-814.540	-361.608					
			Max. Mx	5	-16.754	-932.324	-23.941					
			Max. My	8	-17.678	-13.064	-908.309					
			Max. Vy	5	20.616	-932.324	-23.941					
			Max. Vx	8	20.384	-13.064	-908.309					
			Max. Torque	6			5.821					
L15	94.75 - 89.75	Pole	Bottom Tension	6	178.528							
			Top Tension	6	179.005							
			Top Cable Vert	6	174.244							
			Top Cable Norm	6	40.401							
			Top Cable Tan	6	7.038							
			Bot Cable Vert	6	-173.672							
			Bot Cable Norm	6	40.667							
			Bot Cable Tan	6	7.521							
			Bottom Tension	11	94.238							
			Top Tension	11	94.593							
		Guy A		Guy B	Top Cable Vert	11	85.954					
					Top Cable Norm	11	39.489					
					Top Cable Tan	11	0.708					
					Bot Cable Vert	11	-85.403					
					Bot Cable Norm	11	39.829					
					Bot Cable Tan	11	0.945					
					Guy B		Guy C	Bottom Tension	4	106.269		
								Top Tension	4	106.620		
								Top Cable Vert	4	96.996		
								Top Cable Norm	4	44.215		
Top Cable Tan	4	2.169										
Bot Cable Vert	4	-96.446										
Bot Cable Norm	4	44.559										
Bot Cable Tan	4	2.401										
L16	89.75 - 84.75	Pole	Max Tension	1				0.000	0.000	0.000		
			Max. Compression	6				-264.507	-886.549	-390.558		
			Max. Mx	5	-251.695	-944.193	-24.017					
			Max. My	2	-138.468	5.809	804.257					
			Max. Vy	6	14.779	-829.258	-367.515					
			Max. Vx	2	13.359	3.420	751.122					

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L17	84.75 - 83	Pole	Max. Torque	6			5.819
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-264.917	-910.838	-400.352
			Max. Mx	5	-252.101	-961.157	-40.988
			Max. My	2	-139.538	2.821	737.818
			Max. Vy	6	13.976	-910.838	-400.352
			Max. Vx	2	13.398	2.821	737.818
L18	83 - 82.75	Pole	Max. Torque	6			5.814
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-264.983	-914.287	-401.771
			Max. Mx	5	-252.161	-963.557	-43.442
			Max. My	2	-139.930	1.770	714.529
			Max. Vy	6	13.916	-914.287	-401.771
			Max. Vx	2	13.307	1.770	714.529
L19	82.75 - 77.75	Pole	Max. Torque	6			5.812
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-266.061	-980.201	-428.432
			Max. Mx	5	-253.216	-1008.760	-91.707
			Max. My	2	-139.974	1.618	711.203
			Max. Vy	6	13.653	-927.866	-407.235
			Max. Vx	2	13.407	-0.793	657.840
L20	77.75 - 72.75	Pole	Max. Torque	6			5.812
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-267.158	-1041.038	-453.195
			Max. Mx	5	-254.291	-1049.349	-139.451
			Max. My	8	-174.830	-25.128	-667.859
			Max. Vy	6	12.632	-992.777	-433.538
			Max. Vx	2	13.405	-1.397	644.484
L21	72.75 - 67.5	Pole	Max. Torque	6			5.806
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-267.541	-1061.145	-461.415
			Max. Mx	5	-254.668	-1062.508	-155.976
			Max. My	8	-175.847	-29.207	-633.685
			Max. Vy	6	11.578	-1061.145	-461.415
			Max. Vx	2	13.385	-4.416	577.769
L22	67.5 - 66	Pole	Max. Torque	6			5.800
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-269.500	-1119.647	-485.544
			Max. Mx	6	-269.500	-1119.647	-485.544
			Max. My	8	-177.814	-33.315	-599.593
			Max. Vy	6	11.596	-1119.647	-485.544
			Max. Vx	2	12.615	-7.516	510.702
L23	66 - 61	Pole	Max. Torque	6			5.031
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-270.735	-1174.302	-508.567
			Max. Mx	6	-270.735	-1174.302	-508.567
			Max. My	8	-178.164	-34.492	-590.274
			Max. Vy	6	11.347	-1130.941	-490.283
			Max. Vx	2	12.541	-8.424	491.893
L24	61 - 56	Pole	Max. Torque	6			5.030
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-271.648	-1222.608	-529.153
			Max. Mx	6	-271.648	-1222.608	-529.153
			Max. My	7	-221.769	-761.626	-574.701
			Max. Vy	6	10.367	-1184.621	-512.942
			Max. Vx	2	12.332	-11.434	429.848
L25	56 - 51	Pole	Max. Torque	6			5.025
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-272.572	-1262.950	-546.609
			Max. Mx	6	-272.572	-1262.950	-546.609
			Max. My	7	-222.640	-803.443	-562.791

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L26	51 - 49.9	Pole	Max. Vy	12	9.829	360.673	173.001
			Max. Vx	2	12.189	-14.404	368.675
			Max. Torque	6			5.020
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-272.776	-1270.803	-550.049
			Max. Mx	6	-272.776	-1270.803	-550.049
			Max. My	6	-272.776	-1270.803	-550.049
			Max. Vy	12	9.670	312.010	138.946
L27	49.9 - 49.65	Pole	Max. Vx	2	11.971	-17.315	308.377
			Max. Torque	6			5.015
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-272.851	-1272.550	-550.823
			Max. Mx	6	-272.851	-1272.550	-550.823
			Max. My	6	-272.851	-1272.550	-550.823
			Max. Vy	12	9.603	301.419	131.542
			Max. Vx	2	11.890	-17.947	295.268
L28	49.65 - 44.65	Pole	Max. Torque	6			5.015
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-274.253	-1305.699	-565.558
			Max. Mx	6	-274.253	-1305.699	-565.558
			Max. My	6	-274.253	-1305.699	-565.558
			Max. Vy	12	9.598	299.019	129.864
			Max. Vx	2	11.879	-18.090	292.299
			Max. Torque	6			5.014
L29	44.65 - 39.65	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-275.676	-1335.833	-579.309
			Max. Mx	6	-275.676	-1335.833	-579.309
			Max. My	6	-275.676	-1335.833	-579.309
			Max. Vy	12	9.278	251.839	96.829
			Max. Vx	2	11.450	-20.934	234.002
			Max. Torque	6			5.012
			Max Tension	1	0.000	0.000	0.000
L30	39.65 - 33	Pole	Max. Compression	6	-276.439	-1350.636	-586.216
			Max. Mx	6	-276.439	-1350.636	-586.216
			Max. My	6	-276.439	-1350.636	-586.216
			Max. Vy	12	8.938	206.304	64.838
			Max. Vx	2	11.001	-23.737	177.890
			Max. Torque	6			5.010
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-278.845	-1374.334	-597.483
L31	33 - 32.65	Pole	Max. Mx	6	-278.845	-1374.334	-597.483
			Max. My	6	-278.845	-1374.334	-597.483
			Max. Vy	12	8.420	148.519	24.028
			Max. Vx	2	10.354	-27.407	106.849
			Max. Torque	6			5.009
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-278.900	-1375.683	-598.131
			Max. Mx	6	-278.900	-1375.683	-598.131
L32	32.65 - 32.4	Pole	Max. My	6	-278.900	-1375.683	-598.131
			Max. Vy	12	8.395	145.574	21.938
			Max. Vx	2	10.324	-27.599	103.232
			Max. Torque	6			5.009
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-280.003	-1399.852	-610.043
			Max. Mx	6	-280.003	-1399.852	-610.043
			Max. My	6	-280.003	-1399.852	-610.043
L33	32.4 - 27.4	Pole	Max. Vy	12	8.385	143.476	20.449
			Max. Vx	2	10.301	-27.736	100.654
			Max. Torque	6			5.009
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-281.127	-1418.972	-620.049
			Max. Mx	6	-281.127	-1418.972	-620.049
			Max. My	6	-281.127	-1418.972	-620.049
			Max. Vy	12	8.385	143.476	20.449
L34	27.4 - 22.4	Pole	Max. Vx	2	10.301	-27.736	100.654
			Max. Torque	6			5.009
			Max Tension	1	0.000	0.000	0.000

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L35	22.4 - 17.4	Pole	Max. Mx	6	-281.127	-1418.972	-620.049
			Max. My	6	-281.127	-1418.972	-620.049
			Max. Vy	12	8.041	102.395	-8.732
			Max. Vx	2	9.867	-30.434	50.223
			Max. Torque	6			5.007
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-282.388	-1433.458	-628.794
			Max. Mx	6	-282.388	-1433.458	-628.794
			Max. My	6	-282.388	-1433.458	-628.794
			Max. Vy	11	7.701	200.650	-214.974
L36	17.4 - 12.4	Pole	Max. Vx	2	9.393	-33.050	2.049
			Max. Torque	6			5.005
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-283.552	-1444.091	-635.806
			Max. Mx	6	-283.552	-1444.091	-635.806
			Max. My	6	-283.552	-1444.091	-635.806
			Max. Vy	11	7.238	163.833	-230.208
			Max. Vx	2	8.787	-35.171	-43.441
			Max. Torque	6			4.688
			Max Tension	1	0.000	0.000	0.000
L37	12.4 - 7.4	Pole	Max. Compression	6	-284.738	-1450.874	-641.428
			Max. Mx	6	-284.738	-1450.874	-641.428
			Max. My	6	-284.738	-1450.874	-641.428
			Max. Vy	11	6.816	128.687	-244.495
			Max. Vx	2	8.243	-37.558	-86.061
			Max. Torque	6			4.687
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-285.946	-1454.184	-645.824
			Max. Mx	6	-285.946	-1454.184	-645.824
			Max. My	5	-272.997	-1282.857	-647.040
L38	7.4 - 2.4	Pole	Max. Vy	11	6.357	95.730	-258.043
			Max. Vx	2	7.671	-39.859	-125.899
			Max. Torque	6			4.686
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-286.534	-1454.646	-647.545
			Max. Mx	6	-286.534	-1454.646	-647.545
			Max. My	5	-273.586	-1281.266	-656.992
			Max. Vy	11	5.867	65.139	-270.854
			Max. Vx	2	7.072	-42.073	-162.820
			Max. Torque	6			4.686
L39	2.4 - 0	Pole	Max. Compression	6	-286.534	-1454.646	-647.545
			Max. Mx	6	-286.534	-1454.646	-647.545
			Max. My	5	-273.586	-1281.266	-656.992
			Max. Vy	11	5.867	65.139	-270.854
			Max. Vx	2	7.072	-42.073	-162.820
			Max. Torque	6			4.686

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	6	286.534	-0.040	-0.663
	Max. H _x	3	136.752	2.147	-5.792
	Max. H _z	8	194.820	-0.334	2.972
	Max. M _x	21	-40.246	-0.324	0.710
	Max. M _z	6	1454.645	-0.040	-0.663
	Max. Torsion	6	4.686	-0.040	-0.663
	Min. Vert	32	110.583	0.126	-0.043
	Min. H _x	11	207.342	-5.617	-2.415
	Min. H _z	2	160.987	-0.417	-6.786
	Min. M _x	5	-656.992	0.757	-4.032
	Min. M _z	9	-245.338	-1.582	1.992

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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Guy C @ 42 ft Elev 0 ft Azimuth 211 deg	Min. Torsion	10	-1.082	-4.386	-0.071
	Max. Vert	9	-0.535	-0.053	0.085
Guy B @ 42.5 ft Elev 0 ft Azimuth 120 deg	Max. H _x	10	-0.683	0.001	0.217
	Max. H _z	4	-96.446	-24.819	37.085
	Min. Vert	4	-96.446	-24.819	37.085
	Min. H _x	5	-93.517	-25.491	35.106
	Min. H _z	9	-0.535	-0.053	0.085
	Max. Vert	6	-0.285	-0.009	-0.003
Guy A @ 20.5 ft Elev 0 ft Azimuth 0 deg	Max. H _x	11	-85.403	34.966	19.096
	Max. H _z	12	-84.427	34.169	19.571
	Min. Vert	11	-85.403	34.966	19.096
	Min. H _x	5	-0.381	-0.010	0.121
	Min. H _z	7	-0.428	0.117	-0.056
	Max. Vert	2	-4.060	-0.003	-0.636
Guy A @ 20.5 ft Elev 0 ft Azimuth 0 deg	Max. H _x	10	-131.981	1.844	-30.055
	Max. H _z	2	-4.060	-0.003	-0.636
	Min. Vert	6	-173.672	-7.521	-40.667
	Min. H _x	6	-173.672	-7.521	-40.667
	Min. H _z	6	-173.672	-7.521	-40.667

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	116.157	0.345	0.908	70.520	-42.122	-0.016
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	160.987	0.417	6.786	179.458	-43.102	0.630
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	136.752	-2.147	5.792	180.059	-48.508	0.462
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	214.036	-0.563	6.293	479.415	-746.741	-0.038
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	273.587	-0.757	4.032	656.992	-1281.266	-2.474
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	286.534	0.040	0.663	647.545	-1454.645	-4.686
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	237.455	2.869	-1.678	428.724	-1103.049	-3.989
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	194.820	0.334	-2.972	255.438	-71.393	-0.831
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	235.302	1.582	-1.992	351.632	245.338	1.032
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	245.086	4.386	0.071	375.734	189.790	1.082
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	207.342	5.617	2.415	276.722	51.338	0.365
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	157.838	5.544	4.056	143.463	-84.681	0.204
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	161.957	3.319	6.052	175.732	-68.868	0.617
1.2 Dead+1.0 Ice+1.0	133.473	0.215	0.680	57.822	-34.160	-0.013

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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
Temp+Guy						
1.2 Dead+1.0 Wind 0 deg+1.0	138.702	0.416	2.254	89.541	-37.127	0.089
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 30 deg+1.0	135.599	-0.476	2.027	87.650	-34.414	0.242
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 60 deg+1.0	139.655	-0.648	1.695	103.598	-83.433	0.248
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 90 deg+1.0	150.342	-0.216	1.281	131.398	-181.269	0.068
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 120	153.191	0.204	0.545	128.079	-219.341	-0.325
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 150	143.489	0.387	-0.220	85.973	-155.064	-0.566
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 180	132.033	0.324	-0.710	40.246	-51.311	-0.446
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 210	135.663	0.865	-0.540	43.012	-29.267	-0.226
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 240	138.827	1.637	0.107	52.268	-42.679	0.077
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 270	140.420	1.863	0.835	64.160	-48.128	0.237
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 300	141.406	1.696	1.576	77.683	-47.270	0.117
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 330	140.846	1.117	2.051	85.767	-41.358	-0.008
deg+1.0 Ice+1.0 Temp+1.0 Guy						
Dead+Wind 0 deg -	120.356	0.363	1.935	92.299	-42.487	0.112
Service+Guy						
Dead+Wind 30 deg -	117.350	-0.122	1.762	88.921	-39.191	0.028
Service+Guy						
Dead+Wind 60 deg -	114.296	-0.470	1.399	81.635	-37.638	0.014
Service+Guy						
Dead+Wind 90 deg -	112.851	-0.537	0.935	74.812	-45.458	-0.043
Service+Guy						
Dead+Wind 120 deg -	112.860	-0.353	0.460	68.744	-57.513	-0.146
Service+Guy						
Dead+Wind 150 deg -	110.583	-0.126	0.043	52.969	-41.508	-0.189
Service+Guy						
Dead+Wind 180 deg -	111.909	0.328	-0.107	49.253	-42.136	-0.144
Service+Guy						
Dead+Wind 210 deg -	114.873	0.803	0.051	52.113	-45.120	-0.040
Service+Guy						
Dead+Wind 240 deg -	118.118	1.177	0.417	59.894	-48.254	-0.027
Service+Guy						
Dead+Wind 270 deg -	120.822	1.329	0.919	70.856	-49.708	-0.009
Service+Guy						
Dead+Wind 300 deg -	122.392	1.237	1.450	82.333	-49.047	0.078
Service+Guy						
Dead+Wind 330 deg -	122.066	0.849	1.802	89.979	-46.026	0.147
Service+Guy						

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	0.000	-35.946	0.000	0.000	35.946	0.000	0.002%
2	-0.150	-43.010	-31.081	0.150	43.010	31.081	0.000%
3	15.105	-42.950	-26.105	-15.105	42.950	26.105	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
4	26.142	-42.878	-14.903	-26.143	42.878	14.903	0.000%
5	30.313	-42.814	0.154	-30.313	42.814	-0.154	0.000%
6	26.885	-42.759	15.528	-26.885	42.759	-15.528	0.000%
7	15.373	-42.725	26.330	-15.373	42.725	-26.330	0.000%
8	0.170	-42.739	31.089	-0.170	42.739	-31.089	0.000%
9	-15.047	-42.798	26.139	15.047	42.798	-26.139	0.000%
10	-26.126	-42.871	14.916	26.126	42.871	-14.916	0.000%
11	-30.313	-42.935	-0.133	30.313	42.935	0.133	0.000%
12	-26.851	-42.990	-15.508	26.851	42.990	15.508	0.000%
13	-15.355	-43.024	-26.341	15.355	43.024	26.341	0.000%
14	0.000	-76.418	0.000	0.000	76.418	0.000	0.000%
15	-0.217	-76.485	-7.286	0.217	76.485	7.286	0.000%
16	3.514	-76.458	-6.076	-3.514	76.458	6.076	0.000%
17	5.686	-76.423	-3.234	-5.686	76.423	3.234	0.000%
18	6.694	-76.390	0.022	-6.694	76.390	-0.022	0.000%
19	6.013	-76.362	3.468	-6.013	76.362	-3.468	0.000%
20	3.557	-76.344	6.110	-3.557	76.344	-6.110	0.000%
21	0.039	-76.350	7.219	-0.039	76.350	-7.219	0.000%
22	-3.511	-76.378	6.078	3.511	76.378	-6.078	0.000%
23	-5.829	-76.413	3.112	5.829	76.413	-3.112	0.000%
24	-6.766	-76.446	-0.140	6.766	76.446	0.140	0.000%
25	-6.080	-76.474	-3.507	6.080	76.474	3.507	0.000%
26	-3.695	-76.492	-6.114	3.695	76.492	6.114	0.000%
27	-0.027	-35.971	-5.675	0.027	35.971	5.675	0.000%
28	2.758	-35.960	-4.767	-2.758	35.960	4.767	0.000%
29	4.774	-35.947	-2.721	-4.774	35.947	2.721	0.000%
30	5.535	-35.935	0.028	-5.535	35.935	-0.028	0.000%
31	4.909	-35.925	2.835	-4.909	35.925	-2.835	0.000%
32	2.807	-35.919	4.808	-2.807	35.919	-4.808	0.000%
33	0.031	-35.922	5.677	-0.031	35.922	-5.677	0.000%
34	-2.747	-35.932	4.773	2.747	35.932	-4.773	0.000%
35	-4.771	-35.946	2.724	4.771	35.946	-2.724	0.000%
36	-5.535	-35.957	-0.024	5.535	35.957	0.024	0.000%
37	-4.903	-35.967	-2.832	4.903	35.967	2.832	0.000%
38	-2.804	-35.973	-4.810	2.804	35.973	4.810	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	5	0.0000001	0.00036598
2	Yes	6	0.0000001	0.00057930
3	Yes	7	0.0000001	0.00023531
4	Yes	9	0.0000001	0.00083802
5	Yes	12	0.0000001	0.00062029
6	Yes	13	0.0000001	0.00055328
7	Yes	11	0.0000001	0.00042637
8	Yes	8	0.0000001	0.00016472
9	Yes	9	0.0000001	0.00032940
10	Yes	9	0.0000001	0.00036425
11	Yes	8	0.0000001	0.00020983
12	Yes	7	0.0000001	0.00008830
13	Yes	7	0.0000001	0.00009895
14	Yes	6	0.0000001	0.00017534
15	Yes	6	0.0000001	0.00042639
16	Yes	6	0.0000001	0.00085952

<p>tnxTower</p> <p>B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p>Job 93496.014.01 - OLD SAYBROOK, CT (BU # 841289)</p>	<p>Page 35 of 43</p>
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17	Yes	8	0.00000001	0.00057474
18	Yes	9	0.00000001	0.00040320
19	Yes	9	0.00000001	0.00048729
20	Yes	9	0.00000001	0.00026857
21	Yes	7	0.00000001	0.00049659
22	Yes	7	0.00000001	0.00029360
23	Yes	7	0.00000001	0.00019434
24	Yes	6	0.00000001	0.00068610
25	Yes	6	0.00000001	0.00054452
26	Yes	6	0.00000001	0.00047466
27	Yes	5	0.00000001	0.00017178
28	Yes	5	0.00000001	0.00020674
29	Yes	5	0.00000001	0.00023959
30	Yes	6	0.00000001	0.00039473
31	Yes	7	0.00000001	0.00014781
32	Yes	5	0.00000001	0.00075753
33	Yes	5	0.00000001	0.00026367
34	Yes	5	0.00000001	0.00016061
35	Yes	5	0.00000001	0.00020738
36	Yes	5	0.00000001	0.00014427
37	Yes	5	0.00000001	0.00015794
38	Yes	5	0.00000001	0.00013733

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	13.687	31	1.133	0.010
L2	145 - 140	12.506	31	1.121	0.009
L3	140 - 135	11.346	31	1.093	0.008
L4	135 - 130	10.226	31	1.044	0.006
L5	130 - 125	9.167	31	0.977	0.005
L6	125 - 123.75	8.190	31	0.887	0.004
L7	123.75 - 123.5	7.961	31	0.862	0.004
L8	123.5 - 118.5	7.916	31	0.859	0.004
L9	118.5 - 113.5	7.048	31	0.800	0.003
L10	113.5 - 110	6.246	31	0.733	0.003
L11	110 - 109.75	5.728	31	0.682	0.003
L12	109.75 - 104.75	5.693	31	0.680	0.003
L13	104.75 - 99.75	5.009	31	0.629	0.002
L14	99.75 - 94.75	4.381	31	0.574	0.002
L15	94.75 - 89.75	3.812	31	0.517	0.002
L16	89.75 - 84.75	3.304	31	0.459	0.002
L17	84.75 - 83	2.851	31	0.412	0.001
L18	83 - 82.75	2.704	31	0.398	0.001
L19	82.75 - 77.75	2.683	31	0.395	0.001
L20	77.75 - 72.75	2.296	31	0.349	0.001
L21	72.75 - 67.5	1.953	31	0.309	0.001
L22	71 - 66	1.843	31	0.296	0.001
L23	66 - 61	1.544	31	0.274	0.001
L24	61 - 56	1.274	31	0.245	0.001
L25	56 - 51	1.041	31	0.203	0.001
L26	51 - 49.9	0.848	31	0.167	0.000
L27	49.9 - 49.65	0.810	31	0.160	0.000
L28	49.65 - 44.65	0.802	31	0.159	0.000
L29	44.65 - 39.65	0.646	31	0.140	0.000
L30	39.65 - 33	0.508	31	0.123	0.000
L31	37 - 32.65	0.442	31	0.115	0.000
L32	32.65 - 32.4	0.340	31	0.109	0.000

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	Crown Castle	T. Cheriyan	

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L33	32.4 - 27.4	0.334	31	0.108	0.000
L34	27.4 - 22.4	0.233	31	0.087	0.000
L35	22.4 - 17.4	0.152	31	0.068	0.000
L36	17.4 - 12.4	0.089	27	0.051	0.000
L37	12.4 - 7.4	0.046	27	0.035	0.000
L38	7.4 - 2.4	0.017	27	0.021	0.000
L39	2.4 - 0	0.002	27	0.007	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.000	KP4F-23A	31	13.687	1.133	0.010	11947
152.500	Lightning Rod 5/8" x 5'	31	13.687	1.133	0.010	11947
149.000	7770.00 w/ Mount Pipe	31	13.450	1.131	0.010	11947
148.000	5' x 2" Pipe Mount	31	13.213	1.129	0.010	11947
140.000	AIR 21 B2A/B4P w/ Mount Pipe	31	11.346	1.093	0.008	7046
134.000	GPS (3"x7")	31	10.008	1.032	0.006	4403
130.000	BXA-80080/4CF w/ Mount Pipe	31	9.167	0.977	0.005	3525
90.750	Guy	31	3.401	0.470	0.002	4368
71.000	FMO	31	1.843	0.296	0.001	10213
22.000	MYA-43012N	31	0.146	0.067	0.000	16069

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	143.306	6	9.279	0.150
L2	145 - 140	133.681	6	9.220	0.144
L3	140 - 135	124.169	6	9.061	0.135
L4	135 - 130	114.874	6	8.793	0.124
L5	130 - 125	105.913	6	8.415	0.111
L6	125 - 123.75	97.404	6	7.908	0.098
L7	123.75 - 123.5	95.363	6	7.766	0.094
L8	123.5 - 118.5	94.958	6	7.751	0.094
L9	118.5 - 113.5	87.050	6	7.419	0.085
L10	113.5 - 110	79.509	6	7.040	0.075
L11	110 - 109.75	74.472	6	6.755	0.068
L12	109.75 - 104.75	74.120	6	6.741	0.067
L13	104.75 - 99.75	67.235	6	6.452	0.060
L14	99.75 - 94.75	60.661	6	6.143	0.052
L15	94.75 - 89.75	54.414	6	5.820	0.044
L16	89.75 - 84.75	48.510	6	5.488	0.035
L17	84.75 - 83	42.941	6	5.174	0.028
L18	83 - 82.75	41.069	6	5.067	0.026
L19	82.75 - 77.75	40.804	6	5.049	0.026
L20	77.75 - 72.75	35.718	6	4.687	0.019
L21	72.75 - 67.5	31.006	6	4.328	0.014
L22	71 - 66	29.445	6	4.205	0.013
L23	66 - 61	25.143	6	3.988	0.011

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L24	61 - 56	21.144	6	3.662	0.008
L25	56 - 51	17.571	6	3.174	0.005
L26	51 - 49.9	14.496	6	2.707	0.003
L27	49.9 - 49.65	13.884	6	2.609	0.003
L28	49.65 - 44.65	13.748	6	2.596	0.003
L29	44.65 - 39.65	11.166	6	2.342	0.002
L30	39.65 - 33	8.844	6	2.097	0.002
L31	37 - 32.65	7.715	6	1.972	0.002
L32	32.65 - 32.4	5.964	6	1.867	0.001
L33	32.4 - 27.4	5.867	6	1.850	0.001
L34	27.4 - 22.4	4.107	6	1.516	0.001
L35	22.4 - 17.4	2.686	6	1.201	0.001
L36	17.4 - 12.4	1.586	6	0.903	0.001
L37	12.4 - 7.4	0.789	6	0.623	0.001
L38	7.4 - 2.4	0.275	6	0.360	0.000
L39	2.4 - 0	0.028	6	0.113	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.000	KP4F-23A	6	143.306	9.279	0.187	2539
152.500	Lightning Rod 5/8" x 5'	6	143.306	9.279	0.187	2539
149.000	7770.00 w/ Mount Pipe	6	141.378	9.271	0.185	2539
148.000	5' x 2" Pipe Mount	6	139.450	9.262	0.184	2539
140.000	AIR 21 B2A/B4P w/ Mount Pipe	6	124.169	9.061	0.170	1428
134.000	GPS (3"x7")	6	113.051	8.725	0.156	868
130.000	BXA-80080/4CF w/ Mount Pipe	6	105.913	8.415	0.144	684
90.750	Guy	6	49.664	5.554	0.053	900
71.000	FMO	6	29.445	4.205	0.026	1085
22.000	MYA-43012N	6	2.587	1.176	0.004	941

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
L15	90.750 (A) (42)	1 5/8 BS	38.880	324.001	179.005	194.400	1.000	1.086 ✓
	90.750 (B) (41)	1 3/8 BS	27.840	232.000	94.593	139.200	1.000	1.472 ✓
	90.750 (C) (40)	1 3/8 BS	27.840	232.000	106.620	139.200	1.000	1.306 ✓

Compression Checks

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Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 145 (1)	TP16.31x15.53x0.25	5.000	0.000	0.0	12.928	-3.178	952.945	0.003
L2	145 - 140 (2)	TP17.09x16.31x0.25	5.000	0.000	0.0	13.556	-3.468	999.228	0.003
L3	140 - 135 (3)	TP17.87x17.09x0.25	5.000	0.000	0.0	14.184	-6.288	1045.510	0.006
L4	135 - 130 (4)	TP18.65x17.87x0.25	5.000	0.000	0.0	14.812	-6.705	1091.790	0.006
L5	130 - 125 (5)	TP19.43x18.65x0.25	5.000	0.000	0.0	15.440	-9.704	1138.080	0.009
L6	125 - 123.75 (6)	TP19.625x19.43x0.25	1.250	0.000	0.0	15.597	-9.834	1149.650	0.009
L7	123.75 - 123.5 (7)	TP19.664x19.625x0.513	0.250	0.000	0.0	31.605	-9.891	2329.590	0.004
L8	123.5 - 118.5 (8)	TP20.444x19.664x0.5	5.000	0.000	0.0	32.110	-10.631	2366.820	0.004
L9	118.5 - 113.5 (9)	TP21.224x20.444x0.488	5.000	0.000	0.0	32.551	-11.431	2399.340	0.005
L10	113.5 - 110 (10)	TP21.77x21.224x0.488	3.500	0.000	0.0	33.408	-12.011	2462.520	0.005
L11	110 - 109.75 (11)	TP21.81x21.77x0.763	0.250	0.000	0.0	51.678	-12.080	3809.180	0.003
L12	109.75 - 104.75 (12)	TP22.619x21.81x0.75	5.000	0.000	0.0	52.813	-13.186	3892.830	0.003
L13	104.75 - 99.75 (13)	TP23.427x22.619x0.725	5.000	0.000	0.0	52.998	-14.329	3906.450	0.004
L14	99.75 - 94.75 (14)	TP24.235x23.427x0.713	5.000	0.000	0.0	53.967	-15.500	3977.890	0.004
L15	94.75 - 89.75 (15)	TP25.043x24.235x0.688	5.000	0.000	0.0	53.918	-263.328	3974.280	0.066
L16	89.75 - 84.75 (16)	TP25.852x25.043x0.675	5.000	0.000	0.0	54.721	-264.507	4033.510	0.066
L17	84.75 - 83 (17)	TP26.134x25.852x0.675	1.750	0.000	0.0	55.336	-264.917	4078.830	0.065
L18	83 - 82.75 (18)	TP26.175x26.134x0.563	0.250	0.000	0.0	46.390	-264.983	3419.440	0.077
L19	82.75 - 77.75 (19)	TP26.983x26.175x0.563	5.000	0.000	0.0	47.562	-265.842	3505.760	0.076
L20	77.75 - 72.75 (20)	TP27.791x26.983x0.55	5.000	0.000	0.0	46.813	-266.078	3450.590	0.077
L21	72.75 - 67.5 (21)	TP28.64x27.791x0.55	5.250	0.000	0.0	48.244	-267.180	3556.100	0.075
L22	67.5 - 66 (22)	TP28.266x27.449x0.613	5.000	0.000	0.0	54.057	-269.154	3984.540	0.068
L23	66 - 61 (23)	TP29.084x28.266x0.6	5.000	0.000	0.0	53.452	-269.517	3939.910	0.068
L24	61 - 56 (24)	TP29.901x29.084x0.375	5.000	0.000	0.0	34.666	-270.751	2555.210	0.106
L25	56 - 51 (25)	TP30.718x29.901x0.375	5.000	0.000	0.0	35.653	-271.664	2627.940	0.103
L26	51 - 49.9 (26)	TP30.898x30.718x0.375	1.100	0.000	0.0	36.639	-272.585	2700.680	0.101
L27	49.9 - 49.65 (27)	TP30.939x30.898x0.663	0.250	0.000	0.0	64.499	-272.783	4754.260	0.057
L28	49.65 - 44.65 (28)	TP31.756x30.939x0.663	5.000	0.000	0.0	64.587	-272.856	4760.690	0.057
L29	44.65 - 39.65 (29)	TP32.573x31.756x0.65	5.000	0.000	0.0	65.105	-274.259	4798.870	0.057
L30	39.65 - 33 (30)	TP33.66x32.573x0.65	6.650	0.000	0.0	66.815	-275.682	4924.940	0.056
L31	33 - 32.65 (31)	TP32.966x32.256x0.713	4.350	0.000	0.0	73.866	-278.736	5444.640	0.051
L32	32.65 - 32.4 (32)	TP33.006x32.966x0.438	0.250	0.000	0.0	45.824	-278.847	3377.690	0.083
L33	32.4 - 27.4 (33)	TP33.822x33.006x0.438	5.000	0.000	0.0	45.881	-278.904	3381.920	0.082
L34	27.4 - 22.4 (34)	TP34.637x33.822x0.438	5.000	0.000	0.0	47.030	-280.008	3466.590	0.081
L35	22.4 - 17.4 (35)	TP35.453x34.637x0.438	5.000	0.000	0.0	48.179	-281.131	3551.250	0.079
L36	17.4 - 12.4 (36)	TP36.268x35.453x0.438	5.000	0.000	0.0	49.327	-282.391	3635.920	0.078
L37	12.4 - 7.4 (37)	TP37.083x36.268x0.438	5.000	0.000	0.0	50.476	-283.554	3720.590	0.076
L38	7.4 - 2.4 (38)	TP37.899x37.083x0.438	5.000	0.000	0.0	51.625	-284.739	3805.260	0.075
L39	2.4 - 0 (39)	TP38.29x37.899x0.438	2.400	0.000	0.0	52.773	-285.947	3889.920	0.074

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
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Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	150 - 145 (1)	TP16.31x15.53x0.25	33.813	309.443	0.109	0.000	309.443	0.000
L2	145 - 140 (2)	TP17.09x16.31x0.25	69.256	340.472	0.203	0.000	340.472	0.000
L3	140 - 135 (3)	TP17.87x17.09x0.25	129.730	372.984	0.348	0.000	372.984	0.000
L4	135 - 130 (4)	TP18.65x17.87x0.25	190.867	406.979	0.469	0.000	406.979	0.000
L5	130 - 125 (5)	TP19.43x18.65x0.25	288.104	442.456	0.651	0.000	442.456	0.000
L6	125 - 123.75 (6)	TP19.625x19.43x0.25	310.330	451.558	0.687	0.000	451.558	0.000
L7	123.75 - 123.5 (7)	TP19.664x19.625x0.513	314.832	892.250	0.353	0.000	892.250	0.000
L8	123.5 - 118.5 (8)	TP20.444x19.664x0.5	405.935	945.583	0.429	0.000	945.583	0.000
L9	118.5 - 113.5 (9)	TP21.224x20.444x0.488	500.106	998.183	0.501	0.000	998.183	0.000
L10	113.5 - 110 (10)	TP21.77x21.224x0.488	567.575	1052.058	0.539	0.000	1052.058	0.000
L11	110 - 109.75 (11)	TP21.81x21.77x0.763	572.486	1588.767	0.360	0.000	1588.767	0.000
L12	109.75 - 104.75 (12)	TP22.619x21.81x0.75	671.202	1690.117	0.397	0.000	1690.117	0.000
L13	104.75 - 99.75 (13)	TP23.427x22.619x0.725	772.668	1764.683	0.438	0.000	1764.683	0.000
L14	99.75 - 94.75 (14)	TP24.235x23.427x0.713	876.800	1864.892	0.470	0.000	1864.892	0.000
L15	94.75 - 89.75 (15)	TP25.043x24.235x0.688	891.200	1933.067	0.461	0.000	1933.067	0.000
L16	89.75 - 84.75 (16)	TP25.852x25.043x0.675	968.767	2030.783	0.477	0.000	2030.783	0.000
L17	84.75 - 83 (17)	TP26.134x25.852x0.675	994.942	2077.283	0.479	0.000	2077.283	0.000
L18	83 - 82.75 (18)	TP26.175x26.134x0.563	998.667	1759.725	0.568	0.000	1759.725	0.000
L19	82.75 - 77.75 (19)	TP26.983x26.175x0.563	1055.958	1850.675	0.571	0.000	1850.675	0.000
L20	77.75 - 72.75 (20)	TP27.791x26.983x0.55	1069.725	1834.733	0.583	0.000	1834.733	0.000
L21	72.75 - 67.5 (21)	TP28.64x27.791x0.55	1135.392	1949.825	0.582	0.000	1949.825	0.000
L22	67.5 - 66 (22)	TP28.266x27.449x0.613	1201.658	2193.533	0.548	0.000	2193.533	0.000
L23	66 - 61 (23)	TP29.084x28.266x0.6	1220.383	2190.775	0.557	0.000	2190.775	0.000
L24	61 - 56 (24)	TP29.901x29.084x0.375	1279.692	1486.883	0.861	0.000	1486.883	0.000
L25	56 - 51 (25)	TP30.718x29.901x0.375	1332.200	1573.300	0.847	0.000	1573.300	0.000
L26	51 - 49.9 (26)	TP30.898x30.718x0.375	1376.158	1662.158	0.828	0.000	1662.158	0.000
L27	49.9 - 49.65 (27)	TP30.939x30.898x0.663	1384.725	2888.417	0.479	0.000	2888.417	0.000
L28	49.65 - 44.65 (28)	TP31.756x30.939x0.663	1386.633	2896.308	0.479	0.000	2896.308	0.000
L29	44.65 - 39.65 (29)	TP32.573x31.756x0.65	1422.917	3002.442	0.474	0.000	3002.442	0.000
L30	39.65 - 33 (30)	TP33.66x32.573x0.65	1456.033	3163.933	0.460	0.000	3163.933	0.000
L31	33 - 32.65 (31)	TP32.966x32.256x0.713	1496.475	3521.608	0.425	0.000	3521.608	0.000
L32	32.65 - 32.4 (32)	TP33.006x32.966x0.438	1498.583	2226.133	0.673	0.000	2226.133	0.000

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Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L33	32.4 - 27.4 (33)	TP33.822x33.006x0.438	1500.083	2231.750	0.672	0.000	2231.750	0.000
L34	27.4 - 22.4 (34)	TP34.637x33.822x0.438	1527.000	2345.658	0.651	0.000	2345.658	0.000
L35	22.4 - 17.4 (35)	TP35.453x34.637x0.438	1548.525	2462.392	0.629	0.000	2462.392	0.000
L36	17.4 - 12.4 (36)	TP36.268x35.453x0.438	1565.308	2581.967	0.606	0.000	2581.967	0.000
L37	12.4 - 7.4 (37)	TP37.083x36.268x0.438	1577.858	2704.375	0.583	0.000	2704.375	0.000
L38	7.4 - 2.4 (38)	TP37.899x37.083x0.438	1586.333	2829.625	0.561	0.000	2829.625	0.000
L39	2.4 - 0 (39)	TP38.29x37.899x0.438	1591.142	2957.700	0.538	0.000	2957.700	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	150 - 145 (1)	TP16.31x15.53x0.25	6.892	476.473	0.014	0.434	627.452	0.001
L2	145 - 140 (2)	TP17.09x16.31x0.25	7.305	499.614	0.015	0.433	690.371	0.001
L3	140 - 135 (3)	TP17.87x17.09x0.25	12.020	522.755	0.023	0.416	756.296	0.001
L4	135 - 130 (4)	TP18.65x17.87x0.25	12.442	545.896	0.023	0.370	825.226	0.000
L5	130 - 125 (5)	TP19.43x18.65x0.25	17.720	569.038	0.031	0.994	897.167	0.001
L6	125 - 123.75 (6)	TP19.625x19.43x0.25	17.868	574.823	0.031	0.992	915.617	0.001
L7	123.75 - 123.5 (7)	TP19.664x19.625x0.513	18.179	1164.790	0.016	0.988	1809.208	0.001
L8	123.5 - 118.5 (8)	TP20.444x19.664x0.5	18.583	1183.410	0.016	0.970	1917.342	0.001
L9	118.5 - 113.5 (9)	TP21.224x20.444x0.488	19.125	1199.670	0.016	0.960	2024.008	0.000
L10	113.5 - 110 (10)	TP21.77x21.224x0.488	19.469	1231.260	0.016	0.954	2133.250	0.000
L11	110 - 109.75 (11)	TP21.81x21.77x0.763	19.898	1904.590	0.010	0.953	3221.525	0.000
L12	109.75 - 104.75 (12)	TP22.619x21.81x0.75	20.052	1946.420	0.010	0.947	3427.033	0.000
L13	104.75 - 99.75 (13)	TP23.427x22.619x0.725	20.590	1953.220	0.011	0.939	3578.225	0.000
L14	99.75 - 94.75 (14)	TP24.235x23.427x0.713	21.117	1988.950	0.011	0.931	3781.417	0.000
L15	94.75 - 89.75 (15)	TP25.043x24.235x0.688	16.102	1987.140	0.008	5.821	3919.658	0.001
L16	89.75 - 84.75 (16)	TP25.852x25.043x0.675	15.264	2016.750	0.008	5.815	4117.800	0.001
L17	84.75 - 83 (17)	TP26.134x25.852x0.675	15.077	2039.410	0.007	5.814	4212.075	0.001
L18	83 - 82.75 (18)	TP26.175x26.134x0.563	15.099	1709.720	0.009	5.812	3568.175	0.002
L19	82.75 - 77.75 (19)	TP26.983x26.175x0.563	14.076	1752.880	0.008	5.808	3752.592	0.002
L20	77.75 - 72.75 (20)	TP27.791x26.983x0.55	13.641	1735.850	0.008	5.806	3720.267	0.002
L21	72.75 - 67.5 (21)	TP28.64x27.791x0.55	12.514	1796.510	0.007	5.800	3953.642	0.001
L22	67.5 - 66 (22)	TP28.266x27.449x0.613	12.575	2010.090	0.006	5.031	4447.800	0.001
L23	66 - 61 (23)	TP29.084x28.266x0.6	12.310	1981.600	0.006	5.030	4442.200	0.001
L24	61 - 56 (24)	TP29.901x29.084x0.375	11.265	1284.880	0.009	5.025	3014.942	0.002
L25	56 - 51 (25)	TP30.718x29.901x0.375	9.515	1321.250	0.007	5.020	3190.167	0.002
L26	51 - 49.9 (26)	TP30.898x30.718x0.375	7.851	1358.340	0.006	5.015	3370.342	0.001
L27	49.9 - 49.65 (27)	TP30.939x30.898x0.663	7.706	2380.340	0.003	5.015	5856.808	0.001
L28	49.65 - 44.65	TP31.756x30.939x0.663	7.574	2393.190	0.003	5.014	5872.817	0.001

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Client	Crown Castle	Designed by	T. Cheriyan

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 $\frac{T_u}{\phi T_n}$
L29	44.65 - 39.65 (28)	TP32.573x31.756x0.65	6.927	2412.040	0.003	5.012	6088.017	0.001
L30	39.65 - 33 (30) (29)	TP33.66x32.573x0.65	6.308	2479.170	0.003	5.010	6415.467	0.001
L31	33 - 32.65 (31)	TP32.966x32.256x0.713	6.071	2727.150	0.002	5.009	7140.717	0.001
L32	32.65 - 32.4 (32)	TP33.006x32.966x0.438	6.029	1690.960	0.004	5.009	4513.900	0.001
L33	32.4 - 27.4 (33)	TP33.822x33.006x0.438	5.886	1699.430	0.003	5.009	4525.292	0.001
L34	27.4 - 22.4 (34)	TP34.637x33.822x0.438	4.775	1741.760	0.003	5.007	4756.258	0.001
L35	22.4 - 17.4 (35)	TP35.453x34.637x0.438	3.854	1784.090	0.002	5.005	4992.967	0.001
L36	17.4 - 12.4 (36)	TP36.268x35.453x0.438	2.931	1826.430	0.002	4.688	5235.425	0.001
L37	12.4 - 7.4 (37)	TP37.083x36.268x0.438	2.104	1868.760	0.001	4.687	5483.633	0.001
L38	7.4 - 2.4 (38)	TP37.899x37.083x0.438	1.387	1911.090	0.001	4.686	5737.591	0.001
L39	2.4 - 0 (39)	TP38.29x37.899x0.438	0.831	1955.120	0.000	4.686	5997.291	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 145 (1)	0.003	0.109	0.000	0.014	0.001	0.113	1.000	4.8.2 ✓
L2	145 - 140 (2)	0.003	0.203	0.000	0.015	0.001	0.207	1.000	4.8.2 ✓
L3	140 - 135 (3)	0.006	0.348	0.000	0.023	0.001	0.354	1.000	4.8.2 ✓
L4	135 - 130 (4)	0.006	0.469	0.000	0.023	0.000	0.476	1.000	4.8.2 ✓
L5	130 - 125 (5)	0.009	0.651	0.000	0.031	0.001	0.661	1.000	4.8.2 ✓
L6	125 - 123.75 (6)	0.009	0.687	0.000	0.031	0.001	0.697	1.000	4.8.2 ✓
L7	123.75 - 123.5 (7)	0.004	0.353	0.000	0.016	0.001	0.357	1.000	4.8.2 ✓
L8	123.5 - 118.5 (8)	0.004	0.429	0.000	0.016	0.001	0.434	1.000	4.8.2 ✓
L9	118.5 - 113.5 (9)	0.005	0.501	0.000	0.016	0.000	0.506	1.000	4.8.2 ✓
L10	113.5 - 110 (10)	0.005	0.539	0.000	0.016	0.000	0.545	1.000	4.8.2 ✓
L11	110 - 109.75 (11)	0.003	0.360	0.000	0.010	0.000	0.364	1.000	4.8.2 ✓
L12	109.75 - 104.75 (12)	0.003	0.397	0.000	0.010	0.000	0.401	1.000	4.8.2 ✓
L13	104.75 - 99.75 (13)	0.004	0.438	0.000	0.011	0.000	0.442	1.000	4.8.2 ✓
L14	99.75 - 94.75 (14)	0.004	0.470	0.000	0.011	0.000	0.474	1.000	4.8.2 ✓
L15	94.75 - 89.75 (15)	0.066	0.461	0.000	0.008	0.001	0.527	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
L16	89.75 - 84.75 (16)	0.066	0.477	0.000	0.008	0.001	0.543	1.000	4.8.2 ✓
L17	84.75 - 83 (17)	0.065	0.479	0.000	0.007	0.001	0.544	1.000	4.8.2 ✓
L18	83 - 82.75 (18)	0.077	0.568	0.000	0.009	0.002	0.645	1.000	4.8.2 ✓
L19	82.75 - 77.75 (19)	0.076	0.571	0.000	0.008	0.002	0.647	1.000	4.8.2 ✓
L20	77.75 - 72.75 (20)	0.077	0.583	0.000	0.008	0.002	0.660	1.000	4.8.2 ✓
L21	72.75 - 67.5 (21)	0.075	0.582	0.000	0.007	0.001	0.658	1.000	4.8.2 ✓
L22	67.5 - 66 (22)	0.068	0.548	0.000	0.006	0.001	0.615	1.000	4.8.2 ✓
L23	66 - 61 (23)	0.068	0.557	0.000	0.006	0.001	0.626	1.000	4.8.2 ✓
L24	61 - 56 (24)	0.106	0.861	0.000	0.009	0.002	0.967	1.000	4.8.2 ✓
L25	56 - 51 (25)	0.103	0.847	0.000	0.007	0.002	0.950	1.000	4.8.2 ✓
L26	51 - 49.9 (26)	0.101	0.828	0.000	0.006	0.001	0.929	1.000	4.8.2 ✓
L27	49.9 - 49.65 (27)	0.057	0.479	0.000	0.003	0.001	0.537	1.000	4.8.2 ✓
L28	49.65 - 44.65 (28)	0.057	0.479	0.000	0.003	0.001	0.536	1.000	4.8.2 ✓
L29	44.65 - 39.65 (29)	0.057	0.474	0.000	0.003	0.001	0.531	1.000	4.8.2 ✓
L30	39.65 - 33 (30)	0.056	0.460	0.000	0.003	0.001	0.516	1.000	4.8.2 ✓
L31	33 - 32.65 (31)	0.051	0.425	0.000	0.002	0.001	0.476	1.000	4.8.2 ✓
L32	32.65 - 32.4 (32)	0.083	0.673	0.000	0.004	0.001	0.756	1.000	4.8.2 ✓
L33	32.4 - 27.4 (33)	0.082	0.672	0.000	0.003	0.001	0.755	1.000	4.8.2 ✓
L34	27.4 - 22.4 (34)	0.081	0.651	0.000	0.003	0.001	0.732	1.000	4.8.2 ✓
L35	22.4 - 17.4 (35)	0.079	0.629	0.000	0.002	0.001	0.708	1.000	4.8.2 ✓
L36	17.4 - 12.4 (36)	0.078	0.606	0.000	0.002	0.001	0.684	1.000	4.8.2 ✓
L37	12.4 - 7.4 (37)	0.076	0.583	0.000	0.001	0.001	0.660	1.000	4.8.2 ✓
L38	7.4 - 2.4 (38)	0.075	0.561	0.000	0.001	0.001	0.635	1.000	4.8.2 ✓
L39	2.4 - 0 (39)	0.074	0.538	0.000	0.000	0.001	0.611	1.000	4.8.2 ✓

tnxTower B+T Group 1717 S. Boulder Ave. Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 93496.014.01 - OLD SAYBROOK, CT (BU # 841289)	Page 43 of 43
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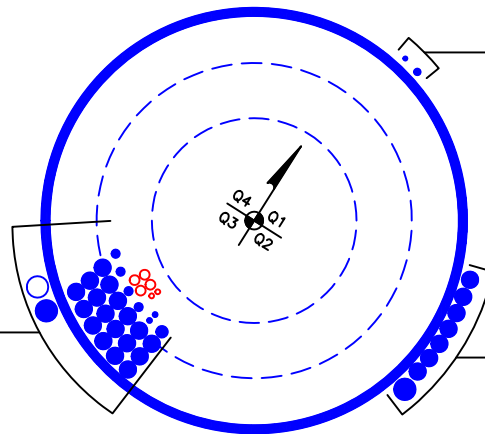
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 145	Pole	TP16.31x15.53x0.25	1	-3.178	952.945	*	*
L2	145 - 140	Pole	TP17.09x16.31x0.25	2	-3.468	999.228	*	*
L3	140 - 135	Pole	TP17.87x17.09x0.25	3	-6.288	1045.510	*	*
L4	135 - 130	Pole	TP18.65x17.87x0.25	4	-6.705	1091.790	*	*
L5	130 - 125	Pole	TP19.43x18.65x0.25	5	-9.704	1138.080	*	*
L6	125 - 123.75	Pole	TP19.625x19.43x0.25	6	-9.834	1149.650	*	*
L7	123.75 - 123.5	Pole	TP19.664x19.625x0.513	7	-9.891	2329.590	*	*
L8	123.5 - 118.5	Pole	TP20.444x19.664x0.5	8	-10.631	2366.820	*	*
L9	118.5 - 113.5	Pole	TP21.224x20.444x0.488	9	-11.431	2399.340	*	*
L10	113.5 - 110	Pole	TP21.77x21.224x0.488	10	-12.011	2462.520	*	*
L11	110 - 109.75	Pole	TP21.81x21.77x0.763	11	-12.080	3809.180	*	*
L12	109.75 - 104.75	Pole	TP22.619x21.81x0.75	12	-13.186	3892.830	*	*
L13	104.75 - 99.75	Pole	TP23.427x22.619x0.725	13	-14.329	3906.450	*	*
L14	99.75 - 94.75	Pole	TP24.235x23.427x0.713	14	-15.500	3977.890	*	*
L15	94.75 - 89.75	Pole	TP25.043x24.235x0.688	15	-263.328	3974.280	*	*
L16	89.75 - 84.75	Pole	TP25.852x25.043x0.675	16	-264.507	4033.510	*	*
L17	84.75 - 83	Pole	TP26.134x25.852x0.675	17	-264.917	4078.830	*	*
L18	83 - 82.75	Pole	TP26.175x26.134x0.563	18	-264.983	3419.440	*	*
L19	82.75 - 77.75	Pole	TP26.983x26.175x0.563	19	-265.842	3505.760	*	*
L20	77.75 - 72.75	Pole	TP27.791x26.983x0.55	20	-266.078	3450.590	*	*
L21	72.75 - 67.5	Pole	TP28.64x27.791x0.55	21	-267.180	3556.100	*	*
L22	67.5 - 66	Pole	TP28.266x27.449x0.613	22	-269.154	3984.540	*	*
L23	66 - 61	Pole	TP29.084x28.266x0.6	23	-269.517	3939.910	*	*
L24	61 - 56	Pole	TP29.901x29.084x0.375	24	-270.751	2555.210	*	*
L25	56 - 51	Pole	TP30.718x29.901x0.375	25	-271.664	2627.940	*	*
L26	51 - 49.9	Pole	TP30.898x30.718x0.375	26	-272.585	2700.680	*	*
L27	49.9 - 49.65	Pole	TP30.939x30.898x0.663	27	-272.783	4754.260	*	*
L28	49.65 - 44.65	Pole	TP31.756x30.939x0.663	28	-272.856	4760.690	*	*
L29	44.65 - 39.65	Pole	TP32.573x31.756x0.65	29	-274.259	4798.870	*	*
L30	39.65 - 33	Pole	TP33.66x32.573x0.65	30	-275.682	4924.940	*	*
L31	33 - 32.65	Pole	TP32.966x32.256x0.713	31	-278.736	5444.640	*	*
L32	32.65 - 32.4	Pole	TP33.006x32.966x0.438	32	-278.847	3377.690	*	*
L33	32.4 - 27.4	Pole	TP33.822x33.006x0.438	33	-278.904	3381.920	*	*
L34	27.4 - 22.4	Pole	TP34.637x33.822x0.438	34	-280.008	3466.590	*	*
L35	22.4 - 17.4	Pole	TP35.453x34.637x0.438	35	-281.131	3551.250	*	*
L36	17.4 - 12.4	Pole	TP36.268x35.453x0.438	36	-282.391	3635.920	*	*
L37	12.4 - 7.4	Pole	TP37.083x36.268x0.438	37	-283.554	3720.590	*	*
L38	7.4 - 2.4	Pole	TP37.899x37.083x0.438	38	-284.739	3805.260	*	*
L39	2.4 - 0	Pole	TP38.29x37.899x0.438	39	-285.947	3889.920	*	*
L15	94.75 - 89.75	Guy A@90.75	1 5/8	42	179.005	194.400	92.1	Pass
L15	94.75 - 89.75	Guy B@90.75	1 3/8	41	94.593	139.200	68.0	Pass
L15	94.75 - 89.75	Guy C@90.75	1 3/8	40	106.620	139.200	76.6	Pass
Summary								
Guy A (L15)							92.1	Pass
Guy B (L15)							68.0	Pass
Guy C (L15)							76.6	Pass
RATING =							*	*

*Please refer to Appendix C for ratings and additional calculations.

APPENDIX B
BASE LEVEL DRAWING

- (RESERVED)
- (1) 1-5/8" TO 130 FT LEVEL
- (INSTALLED)
- (6) 1-1/4" TO 130 FT LEVEL
- (1) 1-5/8" TO 130 FT LEVEL
- (PROPOSED)
- (2) 3/8" TO 149 FT LEVEL
- (4) 3/4" TO 149 FT LEVEL
- (INSTALLED--TO BE REMOVED)
- (1) 3/8" TO 149 FT LEVEL
- (2) 5/8" TO 149 FT LEVEL
- (INSTALLED)
- (1) 7/8" TO 149 FT LEVEL
- (12) 1-1/4" TO 149 FT LEVEL



- (INSTALLED)
- (1) 5/16" TO 22 FT LEVEL
- (1) 1/2" TO 71 FT LEVEL

- (INSTALLED--TO BE RELOCATED TO 140 FT LEVEL)
- (6) 1-1/4" TO 160 FT LEVEL
- (INSTALLED)
- (1) 1-1/4" TO 140 FT LEVEL
- (1) 1-5/8" TO 140 FT LEVEL

BUSINESS UNIT: 841289

APPENDIX C
ADDITIONAL CALCULATIONS

Site BU: 841289
Work Order: 1494707



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Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	150	40	0	12	15.53	21.77	0.25	1	A572-65
2	110	42.5	3.5	12	21.77	28.64	0.3125	1.25	A572-65
3	71	38	4	12	27.45	33.66	0.375	1.5	A572-65
4	37	37	0	12	32.26	38.29	0.4375	1.75	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number												
						1	2	3	4	5	6	7	8	9	10	11	12
1	49.9	83	plate	CCI-SFP-060100	3		1				1				1		
2	83	110	plate	CCI-SFP-065125	3		1				1				1		
3	110	123.75	plate	CCI-SFP-045100	3		1				1				1		
4	32.65	49.9	plate	CCI-SFP-065125	3				1				1				1
5																	
6																	
7																	
8																	
9																	
10																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L _v (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
2	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
3	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
4	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	150 - 145	5		12	15.530	16.310	0.25	A572-65	1.000
2	145 - 140	5		12	16.310	17.090	0.25	A572-65	1.000
3	140 - 135	5		12	17.090	17.870	0.25	A572-65	1.000
4	135 - 130	5		12	17.870	18.650	0.25	A572-65	1.000
5	130 - 125	5		12	18.650	19.430	0.25	A572-65	1.000
6	125 - 123.75	1.25		12	19.430	19.625	0.25	A572-65	1.000
7	123.75 - 123.5	0.25		12	19.625	19.664	0.5125	A572-65	0.922
8	123.5 - 118.5	5		12	19.664	20.444	0.5	A572-65	0.927
9	118.5 - 113.5	5		12	20.444	21.224	0.4875	A572-65	0.934
10	113.5 - 110	3.5	0	12	21.224	21.770	0.4875	A572-65	0.923
11	110 - 109.75	0.25		12	21.770	21.810	0.7625	A572-65	0.891
12	109.75 - 104.75	5		12	21.810	22.619	0.75	A572-65	0.887
13	104.75 - 99.75	5		12	22.619	23.427	0.725	A572-65	0.899
14	99.75 - 94.75	5		12	23.427	24.235	0.7125	A572-65	0.898
15	94.75 - 89.75	5		12	24.235	25.043	0.6875	A572-65	0.914
16	89.75 - 84.75	5		12	25.043	25.852	0.675	A572-65	0.916
17	84.75 - 83	1.75		12	25.852	26.134	0.675	A572-65	0.911
18	83 - 82.75	0.25		12	26.134	26.175	0.5625	A572-65	0.950
19	82.75 - 77.75	5		12	26.175	26.983	0.5625	A572-65	0.937
20	77.75 - 72.75	5		12	26.983	27.791	0.55	A572-65	0.947
21	72.75 - 71	5.25	3.5	12	27.791	28.640	0.55	A572-65	0.943
22	71 - 66	5		12	27.449	28.266	0.6125	A572-65	0.948
23	66 - 61	5		12	28.266	29.084	0.6	A572-65	0.957
24	61 - 56	5		12	29.084	29.901	0.375	A572-65	1.000
25	56 - 51	5		12	29.901	30.718	0.375	A572-65	1.000
26	51 - 49.9	1.1		12	30.718	30.898	0.375	A572-65	1.000
27	49.9 - 49.65	0.25		12	30.898	30.939	0.6625	A572-65	0.949
28	49.65 - 44.65	5		12	30.939	31.756	0.6625	A572-65	0.939
29	44.65 - 39.65	5		12	31.756	32.573	0.65	A572-65	0.947
30	39.65 - 37	6.65	4	12	32.573	33.660	0.65	A572-65	0.942
31	37 - 32.65	4.35		12	32.256	32.966	0.7125	A572-65	0.949
32	32.65 - 32.4	0.25		12	32.966	33.006	0.4375	A572-65	1.000
33	32.4 - 27.4	5		12	33.006	33.822	0.4375	A572-65	1.000
34	27.4 - 22.4	5		12	33.822	34.637	0.4375	A572-65	1.000
35	22.4 - 17.4	5		12	34.637	35.452	0.4375	A572-65	1.000
36	17.4 - 12.4	5		12	35.452	36.268	0.4375	A572-65	1.000
37	12.4 - 7.4	5		12	36.268	37.083	0.4375	A572-65	1.000
38	7.4 - 2.4	5		12	37.083	37.899	0.4375	A572-65	1.000
39	2.4 - 0	2.4		12	37.899	38.290	0.4375	A572-65	1.000

TNX Section Forces

Increment (ft):		5	TNX Output		
	Section Height (ft)	P _u (K)	M _{ux} (kip-ft)	V _u (K)	
1	150 - 145	3.1778	33.813	6.8924	
2	145 - 140	3.4676	69.256	7.3047	
3	140 - 135	6.2878	129.73	12.02	
4	135 - 130	6.7048	190.87	12.442	
5	130 - 125	9.7035	288.1	17.72	
6	125 - 123.75	9.8338	310.33	17.868	
7	123.75 - 123.5	9.8908	314.83	18.179	
8	123.5 - 118.5	10.631	405.94	18.583	
9	118.5 - 113.5	11.431	500.11	19.124	
10	113.5 - 110	12.011	567.57	19.469	
11	110 - 109.75	12.08	572.49	19.898	
12	109.75 - 104.75	13.186	671.2	20.053	
13	104.75 - 99.75	14.329	772.67	20.59	
14	99.75 - 94.75	15.5	876.8	21.117	
15	94.75 - 89.75	16.456	961.98	21.529	
16	89.75 - 84.75	264.51	968.76	15.264	
17	84.75 - 83	264.92	994.94	15.077	
18	83 - 82.75	264.98	998.67	15.099	
19	82.75 - 77.75	266.06	1069.7	13.86	
20	77.75 - 72.75	267.16	1135.4	12.772	
21	72.75 - 71	267.54	1157.1	12.514	
22	71 - 66	269.5	1220.4	12.575	
23	66 - 61	270.73	1279.7	11.545	
24	61 - 56	271.65	1332.2	9.8586	
25	56 - 51	272.57	1376.2	8.1832	
26	51 - 49.9	272.78	1384.7	7.8508	
27	49.9 - 49.65	272.85	1386.6	7.706	
28	49.65 - 44.65	274.25	1422.9	7.0553	
29	44.65 - 39.65	275.68	1456	6.4327	
30	39.65 - 37	276.44	1472.4	6.1525	
31	37 - 32.65	278.84	1498.6	6.0706	
32	32.65 - 32.4	278.9	1500.1	6.0294	
33	32.4 - 27.4	280	1527	4.9899	
34	27.4 - 22.4	281.13	1548.5	3.9535	
35	22.4 - 17.4	282.39	1565.3	3.1081	
36	17.4 - 12.4	283.55	1577.9	2.2616	
37	12.4 - 7.4	284.74	1586.3	1.5206	
38	7.4 - 2.4	285.95	1591.1	0.9233	
39	2.4 - 0	286.5	1592.3	0.7	

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP16.31x15.53x0.25	Pole	11.2%	Pass
145 - 140	Pole	TP17.09x16.31x0.25	Pole	20.6%	Pass
140 - 135	Pole	TP17.87x17.09x0.25	Pole	35.3%	Pass
135 - 130	Pole	TP18.65x17.87x0.25	Pole	47.4%	Pass
130 - 125	Pole	TP19.43x18.65x0.25	Pole	65.9%	Pass
125 - 123.75	Pole	TP19.625x19.43x0.25	Pole	69.5%	Pass
123.75 - 123.5	Pole + Reinf.	TP19.664x19.625x0.5125	Reinf. 3 Tension Rupture	61.3%	Pass
123.5 - 118.5	Pole + Reinf.	TP20.444x19.664x0.5	Reinf. 3 Tension Rupture	74.4%	Pass
118.5 - 113.5	Pole + Reinf.	TP21.224x20.444x0.4875	Reinf. 3 Tension Rupture	86.4%	Pass
113.5 - 110	Pole + Reinf.	TP21.77x21.224x0.4875	Reinf. 3 Tension Rupture	94.3%	Pass
110 - 109.75	Pole + Reinf.	TP21.81x21.77x0.7625	Reinf. 2 Tension Rupture	56.0%	Pass
109.75 - 104.75	Pole + Reinf.	TP22.619x21.81x0.75	Reinf. 2 Tension Rupture	62.3%	Pass
104.75 - 99.75	Pole + Reinf.	TP23.427x22.619x0.725	Reinf. 2 Tension Rupture	68.2%	Pass
99.75 - 94.75	Pole + Reinf.	TP24.235x23.427x0.7125	Reinf. 2 Tension Rupture	73.6%	Pass
94.75 - 89.75	Pole + Reinf.	TP25.043x24.235x0.6875	Reinf. 2 Tension Rupture	77.0%	Pass
89.75 - 84.75	Pole + Reinf.	TP25.852x25.043x0.675	Reinf. 2 Tension Rupture	82.0%	Pass
84.75 - 83	Pole + Reinf.	TP26.134x25.852x0.675	Reinf. 2 Tension Rupture	82.7%	Pass
83 - 82.75	Pole + Reinf.	TP26.175x26.134x0.5625	Reinf. 1 Tension Rupture	97.1%	Pass
82.75 - 77.75	Pole + Reinf.	TP26.983x26.175x0.5625	Reinf. 1 Tension Rupture	98.8%	Pass
77.75 - 72.75	Pole + Reinf.	TP27.791x26.983x0.55	Reinf. 1 Tension Rupture	99.8%	Pass
72.75 - 71	Pole + Reinf.	TP28.64x27.791x0.55	Reinf. 1 Tension Rupture	100.0%	Pass
71 - 66	Pole + Reinf.	TP28.266x27.449x0.6125	Reinf. 1 Tension Rupture	93.1%	Pass
66 - 61	Pole + Reinf.	TP29.084x28.266x0.6	Reinf. 1 Tension Rupture	93.0%	Pass
61 - 56	Pole	TP29.901x29.084x0.375	Pole	94.8%	Pass
56 - 51	Pole	TP30.718x29.901x0.375	Pole	92.7%	Pass
51 - 49.9	Pole	TP30.898x30.718x0.375	Pole	92.1%	Pass
49.9 - 49.65	Pole + Reinf.	TP30.939x30.898x0.6625	Reinf. 4 Tension Rupture	79.6%	Pass
49.65 - 44.65	Pole + Reinf.	TP31.756x30.939x0.6625	Reinf. 4 Tension Rupture	78.4%	Pass
44.65 - 39.65	Pole + Reinf.	TP32.573x31.756x0.65	Reinf. 4 Tension Rupture	77.0%	Pass
39.65 - 37	Pole + Reinf.	TP33.66x32.573x0.65	Reinf. 4 Tension Rupture	76.3%	Pass
37 - 32.65	Pole + Reinf.	TP32.966x32.256x0.7125	Reinf. 4 Tension Rupture	70.8%	Pass
32.65 - 32.4	Pole	TP33.006x32.966x0.4375	Pole	75.3%	Pass
32.4 - 27.4	Pole	TP33.822x33.006x0.4375	Pole	73.0%	Pass
27.4 - 22.4	Pole	TP34.637x33.822x0.4375	Pole	70.6%	Pass
22.4 - 17.4	Pole	TP35.452x34.637x0.4375	Pole	68.2%	Pass
17.4 - 12.4	Pole	TP36.268x35.452x0.4375	Pole	65.8%	Pass
12.4 - 7.4	Pole	TP37.083x36.268x0.4375	Pole	63.4%	Pass
7.4 - 2.4	Pole	TP37.899x37.083x0.4375	Pole	61.0%	Pass
2.4 - 0	Pole	TP38.29x37.899x0.4375	Pole	59.9%	Pass
			Pole	94.8%	Pass
			Reinforcement	100.0%	Pass
			Overall	100.0%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity				
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4
150 - 145	426	n/a	426	12.91	n/a	12.91	11.2%				
145 - 140	491	n/a	491	13.54	n/a	13.54	20.6%				
140 - 135	563	n/a	563	14.16	n/a	14.16	35.3%				
135 - 130	641	n/a	641	14.79	n/a	14.79	47.4%				
130 - 125	726	n/a	726	15.42	n/a	15.42	65.9%				
125 - 123.75	748	n/a	748	15.57	n/a	15.57	69.5%				
123.75 - 123.5	753	739	1492	15.61	13.50	29.11	35.0%			61.3%	
123.5 - 118.5	847	795	1642	16.23	13.50	29.73	42.6%			74.4%	
118.5 - 113.5	949	852	1802	16.86	13.50	30.36	49.5%			86.4%	
113.5 - 110	1025	894	1919	17.30	13.50	30.80	54.1%			94.3%	
110 - 109.75	1278	1677	2955	21.60	24.38	45.98	35.5%		56.0%		
109.75 - 104.75	1427	1793	3220	22.41	24.38	46.79	39.6%		62.3%		
104.75 - 99.75	1588	1912	3500	23.23	24.38	47.60	43.4%		68.2%		
99.75 - 94.75	1761	2036	3796	24.04	24.38	48.41	47.0%		73.6%		
94.75 - 89.75	1945	2163	4108	24.85	24.38	49.22	49.2%		77.0%		
89.75 - 84.75	2142	2295	4437	25.66	24.38	50.04	55.4%		82.0%		
84.75 - 83	2214	2342	4556	25.95	24.38	50.32	55.9%		82.7%		
83 - 82.75	2225	1698	3923	25.99	18.00	43.99	64.8%	97.1%			
82.75 - 77.75	2440	1799	4239	26.80	18.00	44.80	65.9%	98.8%			
77.75 - 72.75	2669	1902	4570	27.61	18.00	45.61	66.7%	99.8%			
72.75 - 71	2752	1939	4691	27.90	18.00	45.90	67.0%	100.0%			
71 - 66	3349	1964	5313	33.63	18.00	51.63	61.9%	93.1%			
66 - 61	3652	2073	5725	34.62	18.00	52.62	61.8%	93.0%			
61 - 56	3973	n/a	3973	35.60	n/a	35.60	94.8%				
56 - 51	4312	n/a	4312	36.59	n/a	36.59	92.7%				
51 - 49.9	4389	n/a	4389	36.80	n/a	36.80	92.1%				
49.9 - 49.65	4406	3214	7620	36.85	24.38	61.23	53.7%				79.6%
49.65 - 44.65	4769	3376	8145	37.84	24.38	62.21	52.9%				78.4%
44.65 - 39.65	5152	3542	8694	38.82	24.38	63.20	52.0%				77.0%
39.65 - 37	5362	3632	8995	39.35	24.38	63.72	51.6%				76.3%
37 - 32.65	6197	3624	9821	45.76	24.38	70.13	47.8%				70.8%
32.65 - 32.4	6221	n/a	6221	45.82	n/a	45.82	75.3%				
32.4 - 27.4	6699	n/a	6699	46.96	n/a	46.96	73.0%				
27.4 - 22.4	7202	n/a	7202	48.11	n/a	48.11	70.6%				
22.4 - 17.4	7730	n/a	7730	49.26	n/a	49.26	68.2%				
17.4 - 12.4	8283	n/a	8283	50.40	n/a	50.40	65.8%				
12.4 - 7.4	8861	n/a	8861	51.55	n/a	51.55	63.4%				
7.4 - 2.4	9466	n/a	9466	52.70	n/a	52.70	61.0%				
2.4 - 0	9766	n/a	9766	53.25	n/a	53.25	59.9%				

PROJECT	93496.014.01 - OLD SAYBROOK, CT		
SUBJECT	Bridge Stiffeners @ 110'		
DATE	11/30/17	PAGE	1 OF 1



0

Determine Load to Bridge Stiffener:

M =	567.4 k-ft	From Risa Model	Stiffener Width	6.500 in
I =	3417.9 in^4	From AutoCAD Sketch	Stiffener Thickness	1.250 in
ybar =	14.630 in		Stiffener Height	166.000 in
S =	233.63 in^3	I/y	Fy	65 ksi
fc =	29.14 ksi	M/S	Fu	80 ksi
Ag =	8.125 in^2		Step Width	3.00 in
Pu =	236.80 k	fc x Ag	Bolt Circle	25.50 in
			Number of Bolts	12
			Bolt Size	1
			Gap @ Flange	6.00 in

Determine ΦP_n (Allowable Axial Load):

Pn = Fcr x Ag		Eqn E3-1, AISC 13th Edition, Section E3.		
K =	0.99			
I =	16.000 in	Unsupported Length		
Iy =	1.058 in^4	Local Weak Axis Moment of Intertia		
Ag =	8.125 in^2	Stiffener Cross Sectional Area		
ry =	.361 in	Radius of Gyration (Weak Axis)		
kl/r =	43.90			
4.71 x $\sqrt{E/Fy}$ =	99.49	Limit State Equation for Flexural Buckling - AISC 13th Edition, Section E3.		
Fe =	148.53 ksi	Eqn E3-4 - AISC 13th Edition, Section E3.		
		Elastic Critical Buckling Stress		
Fcr =	54.12 ksi	Eqn E3-2, AISC 13th Edition, Section E3		
		Critical Buckling Stress		
Pn =	439.73 k	Nominal Compressive Strength		
ΦP_n =	395.76 k	Allowable Compressive Strength	Unity% =	59.8 %

Tension Rupture Check:

AISC 13th Edition, Chapter J4.1

Hole Size	1.25			
U =	1	Shear Lag Factor - Table D3.1 and TIA222-G		
Ag =	8.125 in^2	Gross Area		
An =	6.563 in^2	Net Area		
Ae =	6.563 in^2	Effective Area		
ΦR_n =	475.31 k	Tension Yielding: Eqn J4-1		
ΦR_n =	393.75 k	Tension Rupture: Eqn J4-2		
ΦR_n(Equiv)	393.75 ksi		Unity%	60.14 %

Moment to Existing Bolt Group:

S_{BG} =	268.07 in^3	# Bolts Acting	3
ft =	25.40 ksi		
Ab =	.785 in^2		
T =	59.85 k		
Arm =	25.50 ksi		
M_{EQ} =	127.2 k-ft	<-----Insert into Flange Spreadsheet	

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

Site Data

BU#: 841289
 Site Name: OLD SAYBROOK, CT
 App #: 386401 Revision # 15

Reactions		
Mu	127.2	ft-kips
Axial, Pu:	11.954	kips
Shear, Vu:	19.461	kips
Elevation:	110	feet

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

Pole Manufacturer:	Other
--------------------	-------

Bolt Data		
Qty:	12	
Diameter (in.):	1	Bolt Fu: 120
Bolt Material:	A325	Bolt Fy: 92
N/A:	75	<-- Disregard
N/A:	55	<-- Disregard
Circle (in.):	25.5	

Plate Data		
Diam:	28	in
Thick, t:	1	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	5.83	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	21.77	in
Thick:	0.22	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

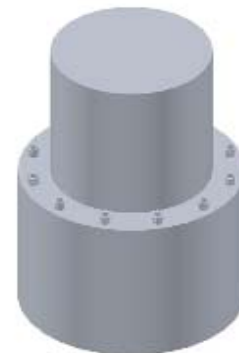
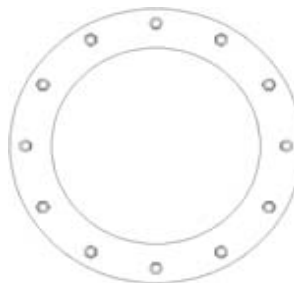
If No stiffeners, Criteria: TIA G <-Only Applicable to Unstiffened Cases

Flange Bolt Results		Rigid
Bolt Tension Capacity, $\phi^* T_n, B1$:	54.54 kips	$\phi^* T_n$
Adjusted $\phi^* T_n$ (due to $V_u = V_u / Q_t$), B:	54.49 kips	$\phi T_n [(1 - (V_u / \phi V_n)^2)^{1/2}]$
Max Bolt directly applied T_u :	18.96 Kips	
Min. PL "tc" for B cap. w/o Pry:	1.000 in	
Min PL "treq" for actual T w/ Pry:	0.438 in	
Min PL "t1" for actual T w/o Pry:	0.590 in	
T allowable w/o Prying:	54.54 kips	$\alpha < 0$ case
Prying Force, q:	0.00 kips	
Total Bolt Tension = $T_u + q$:	18.96 kips	
Non-Prying Bolt Stress Ratio, T_u / B :	34.8% Pass	

Exterior Flange Plate Results		Flexural Check	Rigid
Compression Side Plate Stress:	17.5 ksi		TIA G
Allowable Plate Stress:	32.4 ksi		$\phi^* F_y$
Compression Plate Stress Ratio:	53.9% Pass		Comp. Y.L. Length:
			13.28
No Prying			
Tension Side Stress Ratio, $(treq/t)^2$:	19.2% Pass		

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

Pole Results
 Pole Punching Shear Check: n/a



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

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

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

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

Site Data

BU#: 841289
 Site Name: OLD SAYBROOK
 App #: 386401 Revision # 15

Anchor Rod Data

Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	8	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	44	in
Anchor Spacing:	6	in

Plate Data

W=Side:	49	in
Thick:	2.5	in
Grade:	50	ksi
Clip Distance:	6	in

Stiffener Data (Welding at both sides)

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

Pole Data

Diam:	38.29	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Base Reactions

TIA Revision:	G	
Factored Moment, Mu:	1592	ft-kips
Factored Axial, Pu:	286	kips
Factored Shear, Vu:	7	kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/ η): 254.6 Kips
 Axial Design Strength, $\Phi \cdot F_u \cdot A_{net}$: 260.0 Kips
 Anchor Rod Stress Ratio: 97.9% **Pass**

Base Plate Results

Base Plate Stress: 27.4 ksi
 PL Design Bending Strength, $\Phi \cdot F_y$: 45.0 ksi
 Base Plate Stress Ratio: 61.0% **Pass**

Flexural Check

PL Ref. Data

Yield Line (in):	31.00
Max PL Length:	31.01

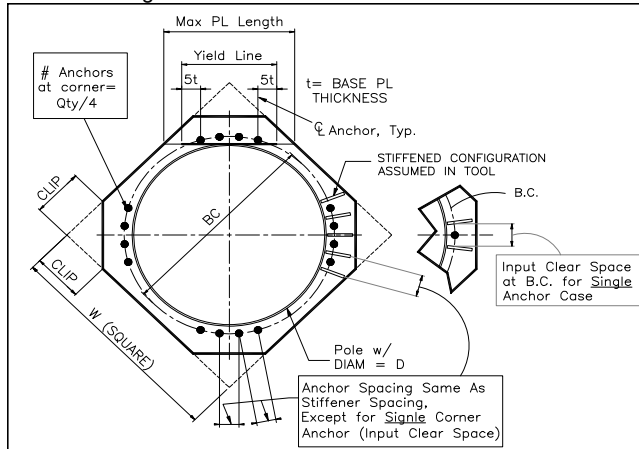
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.



BU#:	841289
Site Name:	OLD SAYBROOK, CT
App Number:	386401 Revision # 15
Location:	INNER

TIA-222 Revision:	G
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Design Reactions		
Shear, S:	41.00	kips
Uplift, Ua:	174.00	kips
Resultant Force, Rf:	178.8	kips
Tower Height, H:	150.00	ft
Guy Anchor Radius, R:	20.50	ft
Resultant Angle to Horizontal, θ:	76.7	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, Da:	11.0	ft
Anchor Width, Wa:	5.0	ft
Anchor Thickness, Ta:	2.0	ft
Anchor Length, La:	37.0	ft
Concrete Volume, Vc:	13.7	yd ³
Toe Width, toe:	0	ft
Guyed Anchor Top Rebar Size, Sat:	9	
No. of Bars in Top of Block:	13	
Guyed Anchor Front Rebar Size, Saf:	9	
No. of Bars in Front of Block:	4	
Stirrup Size:	4	
Anchor Shaft Diameter, ds:	1.75	in
Anchor Shaft Quantity, n:	2	
Anchor Shaft Area Override:		in ²
Shear Lag Factor, u:	1	

Material Properties		
Rebar Grade, Fy:	60000	psi
Concrete Strength, F'c:	4000	psi
Wt. Avg. Concrete Density, δx:	0.088	kcf
Clear Cover, cc:	3	in
Anchor Shaft Grade, Fy':	50	ksi
Anchor Shaft Ultimate Strength, Fu':	65	ksi

Design Checks				
	Capacity/Availability	Demand/Limits	%	Check
Lateral Capacity (kips):	262.73	41.00	15.6%	OK
Uplift Capacity (kips):	315.59	174.00	55.1%	OK
Lateral Flexural Capacity (ft*kips):	980.38	189.63	19.3%	OK
Uplift Flexural Capacity (ft*kips):	1054.42	804.75	76.3%	OK
Anchor Shaft (kips):	192.42	178.77	92.9%	OK

Frost Depth, Fd:	3.33	ft
Groundwater Level, gw:	2.7	ft

Soil Properties:	No. of Soil Layers?					
Layer	φ, deg	cu, ksf	δ, kcf	d, ft	Ultimate fs (ksf)	N (blows/ft)
1	0	0.000	0.120	3.00		
2	0	0.000	0.110	5.70		
3	0	0.000	0.048	6.33		
4	31	0.000	0.048	7.00		
5	42	0.000	0.073	11.00		

*key: φ = Internal Angle of Friction

cu = Cohesion / Undrained Shear Strength

δ = Buoyant Soil Unit Weight

d = Depth to Bottom of Layer

Ultimate fs = Geotechnical Report-provided skin friction / adhesion

N = SPT Blow Count

Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.



BU#:	841289
Site Name:	OLD SAYBROOK, CT
App Number:	386401 Revision # 15
Location:	Outer

TIA-222 Revision: G

Design Reactions		
Shear, S:	40.00	kips
Uplift, Ua:	85.00	kips
Resultant Force, Rf:	93.9	kips
Tower Height, H:	150.00	ft
Guy Anchor Radius, R:	42.00	ft
Resultant Angle to Horizontal, θ:	64.8	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, Da:	8.0	ft
Anchor Width, Wa:	5.0	ft
Anchor Thickness, Ta:	2.0	ft
Anchor Length, La:	30.0	ft
Concrete Volume, Vc:	11.1	yd ³
Toe Width, toe:	0	ft
Guyed Anchor Top Rebar Size, Sat:	9	
No. of Bars in Top of Block:	13	
Guyed Anchor Front Rebar Size, Saf:	9	
No. of Bars in Front of Block:	4	
Stirrup Size:	4	
Anchor Shaft Diameter, ds:	1.75	in
Anchor Shaft Quantity, n:	2	
Anchor Shaft Area Override:		in ²
Shear Lag Factor, u:	1	

Material Properties		
Rebar Grade, Fy:	60000	psi
Concrete Strength, F'c:	4000	psi
Wt. Avg. Concrete Density, δx:	0.088	kcf
Clear Cover, cc:	3	in
Anchor Shaft Grade, Fy':	50	ksi
Anchor Shaft Ultimate Strength, Fu':	65	ksi

Design Checks				
	Capacity/Availability	Demand/Limits	%	Check
Lateral Capacity (kips):	131.30	40.00	30.5%	OK
Uplift Capacity (kips):	156.40	85.00	54.3%	OK
Lateral Flexural Capacity (ft*kips):	980.38	150.00	15.3%	OK
Uplift Flexural Capacity (ft*kips):	1054.42	318.75	30.2%	OK
Anchor Shaft (kips):	192.42	93.94	48.8%	OK

Frost Depth, Fd:	3.33	ft
Groundwater Level, gw:	2.7	ft

Soil Properties:	No. of Soil Layers?			4		
Layer	φ, deg	cu, ksf	δ, kcf	d, ft	Ultimate fs (ksf)	N (blows/ft)
1	0	0.000	0.110	2.70		
2	0	0.000	0.048	3.33		
3	31	0.000	0.048	4.00		
4	42	0.000	0.073	8.00		

*key: φ = Internal Angle of Friction

cu = Cohesion / Undrained Shear Strength

δ = Buoyant Soil Unit Weight

d = Depth to Bottom of Layer

Ultimate fs = Geotechnical Report-provided skin friction / adhesion

N = SPT Blow Count

Pier and Pad Foundation



BU # : 841289
Site Name: OLD SAYBROOK,CT
App. Number: 386401 Revision # 15

TIA-222 Revision: G
Tower Type: Monopole

Block Foundation?:

Superstructure Analysis Reactions		
Compression, P_{comp} :	286	kips
Base Shear, V_{u_comp} :	7	kips
Moment, M_u :	1592	ft-kips
Tower Height, H :	150	ft
BP Dist. Above Fdn, bp_{dist} :	6	in

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
<i>Lateral (Sliding) (kips)</i>	189.64	7.00	3.7%	Pass
<i>Bearing Pressure (ksf)</i>	22.50	8.98	39.9%	Pass
<i>Overturning (kip*ft)</i>	2273.97	1658.50	72.9%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	12439.45	1637.50	13.2%	Pass
<i>Pier Compression (kip)</i>	22913.28	344.11	1.5%	Pass
<i>Pad Flexure (kip*ft)</i>	887.56	365.95	41.2%	Pass
<i>Pad Shear - 1-way (kips)</i>	299.41	0.00	0.0%	Pass
<i>Pad Shear - 2-way (ksi)</i>	0.16	0.00	0.0%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	8.0	ft
Ext. Above Grade, E :	0.3	ft
Pier Rebar Size, S_c :	11	
Pier Rebar Quantity, mc :	44	
Pier Tie/Spiral Size, S_t :	4	
Pier Tie/Spiral Quantity, mt :	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Soil Rating:	72.9%
Structural Rating:	41.2%

Pad Properties		
Depth, D :	8.7	ft
Pad Width, W :	12.0	ft
Pad Thickness, T :	2.5	ft
Pad Rebar Size, S_p :	9	
Pad Rebar Quantity, mp :	8	
Pad Clear Cover, cc_{pad} :	3	in

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

Soil Properties		
Total Soil Unit Weight, γ :	110	pcf
Ultimate Gross Bearing, Q_{ult} :	30.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	42	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :	0.4	
Neglected Depth, N :	3.3	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	2.7	ft

<--Toggle between Gross and Net