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

May 13, 2016

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 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.

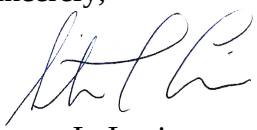
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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
Property Owner of Record – Carol J. and Robert A. Lorenz
Tower Owner / Operator – Crown Castle International (by email)

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, and 5/11

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 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.
Three PowerWave 7770 antennas @ 154 ft c.l.
Six KMW AM-X-CD-14-65-00 antennas @ 154 ft c.l.
Six PowerWave TMA's @ 154 ft
One Raycap DC6-48-60-18-8F surge arrestor @ 154 ft
Six Ericsson RRUS-11 remote radio heads @ 154 ft
Twelve runs 1¼ inch coax
One fiber cable and two DC control cables
Equipment Shelter

Planned Modifications:
Remove three KMW AM-X-CD-14-65-00 antennas.
Install three Andrew SBNHH-1D65A antennas @ 154 ft c.l.
Install three RRUS-32 remote radio heads @ 154 ft.
Install one Raycap DC6-48-60-18-8F @ 154 ft.
Install one fiber cable and two DC control cables.

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 4.2 % 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 4.4 % of the standard.

Existing

Company	Frequency (MHz)	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 *							2.57
AT&T LTE *	740	154	1	500	0.0082	0.4933	0.17
AT&T UMTS *	880	154	1	500	0.0082	0.5867	0.14
AT&T UMTS *	1900	154	1	500	0.0082	1.0000	0.08
AT&T GSM *	880	154	8	296	0.0389	0.5867	0.66
AT&T GSM *	1900	154	8	427	0.0561	1.0000	0.56
Total							**4.18%**

***** Per CSC records.

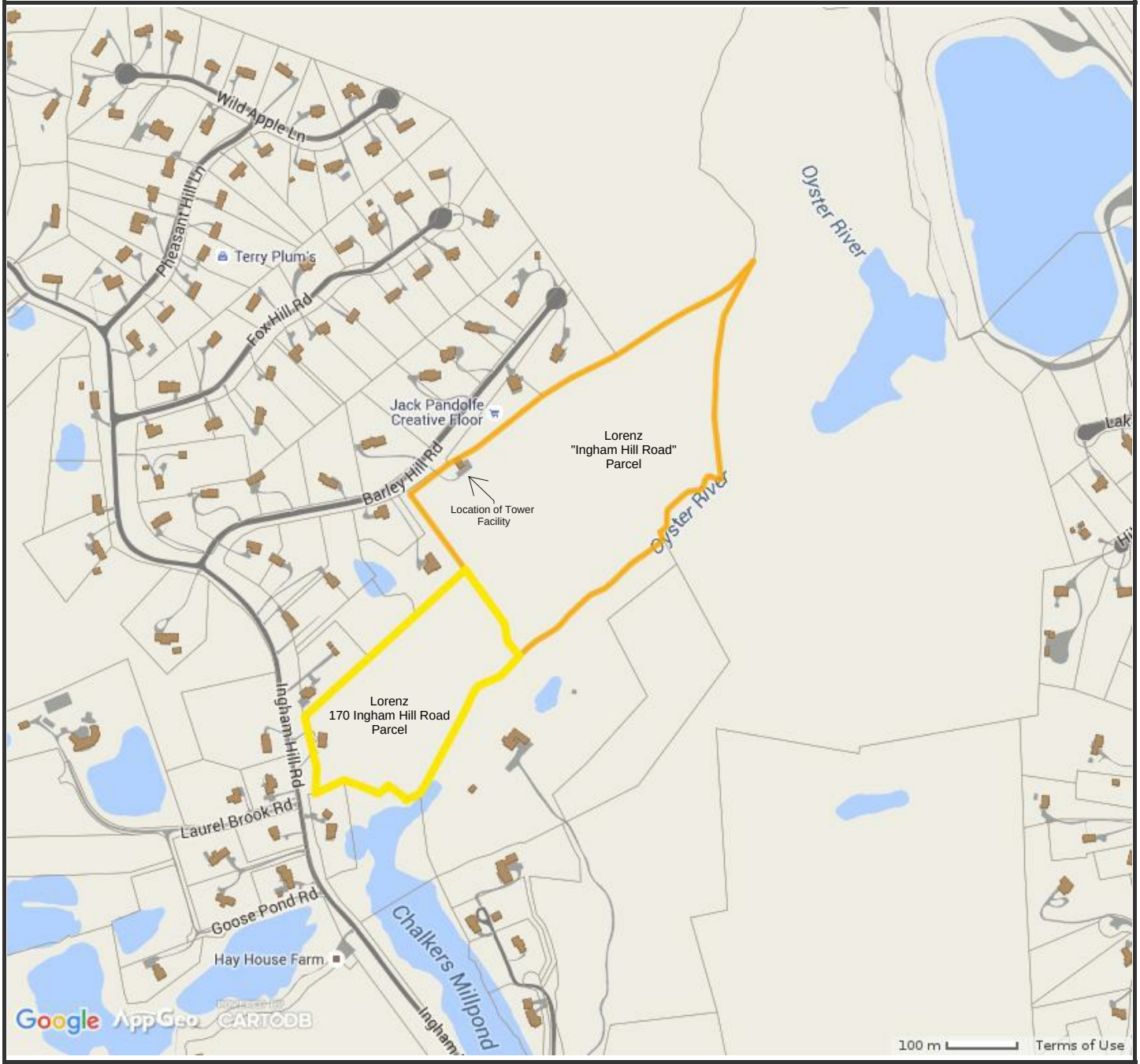
Proposed

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 *								2.57
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								**4.39%**

***** Per CSC records

Structural information:

The attached structural analysis (B + T Group, 5/6/16) demonstrates that the tower and foundation will have adequate structural capacity to accommodate the proposed equipment modifications upon completion of the recommended structural modifications.



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.

170 INGHAM HILL RD

Location	170 INGHAM HILL RD	**MBLU**	051/ 033/ / /
Acct#	00559800	**Owner**	LORENZ CAROL J & ROBERT A
Assessment	$164,300	**Appraisal**	$285,500
PID	3322	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$145,700	$139,800	$285,500
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$102,000	$62,300	$164,300

Owner of Record

Owner	LORENZ CAROL J & ROBERT A	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	P O BOX 351 CENTER OSSIPEE N H, NH 03814-0351	**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

INGHAM HILL RD

Location	INGHAM HILL RD	**MBLU**	052/ 004/ / /
Acct#	00563600	**Owner**	LORENZ CAROL J & ROBERT A
Assessment	$9,900	**Appraisal**	$202,200
PID	3258	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$0	$202,200	$202,200

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$0	$9,900	$9,900

Owner of Record

Owner	LORENZ CAROL J & ROBERT A	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	P O BOX 351 CENTER OSSIPEE, NH 03814-0351	**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

DOCKET NO. 51

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

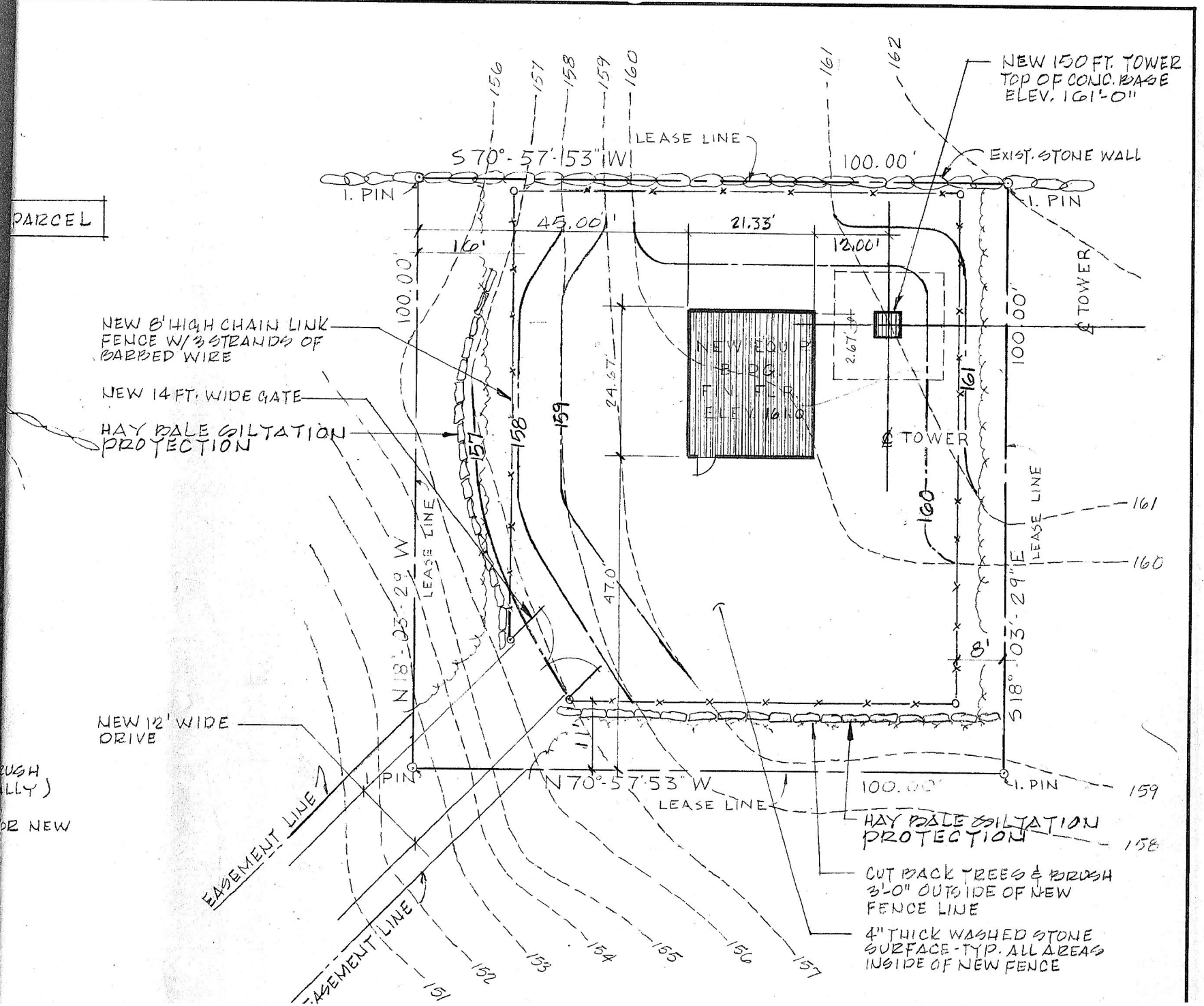
Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner John Downey Designee: Commissioner Peter G. Boucher	Absent
Commissioner Stanley Pac Designee: Christopher Cooper	Yes
Owen L. Clark	Yes
Mortimer A. Gelston	Yes
James G. Horsfall	Yes
Pamela B. Katz	Yes
William H. Smith	Yes
Colin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

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

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


PARCEL
NEW 150 FT. TOWER
TOP OF CONC. BASE
ELEV. 161'-0"
LEASE LINE
S 70°-57'-53" W
100.00'
EXIST. STONE WALL
I. PIN
I. PIN
45.00'
21.33'
12.00'
16'
100.00'
TOWER
NEW 8' HIGH CHAIN LINK
FENCE W/ 3 STRANDS OF
BARBED WIRE
NEW 14 FT. WIDE GATE
HAY BALE SILTATION
PROTECTION
NEW EQUIP. FLOOR
ELEV. 161.0
2.67'
24.67'
47.0'
TOWER
100.00'
LEASE LINE
N 18°-03'-29" W
LEASE LINE
S 18°-03'-29" E
8'
NEW 12' WIDE
DRIVE
I. PIN
N 70°-57'-53" W
LEASE LINE
100.00'
I. PIN
HAY BALE SILTATION
PROTECTION
EASEMENT LINE
EASEMENT LINE
CUT BACK TREES & BRUSH
3'-0" OUTSIDE OF NEW
FENCE LINE
4" THICK WASHED STONE
SURFACE - TYP. ALL AREAS
INSIDE OF NEW FENCE
156
157
158
159
160
161
162
151
152
153
154
155
156
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158
159
160
161

PROJECT INFORMATION

SCOPE OF WORK:	TELECOMMUNICATIONS FACILITY UPGRADE (LTE 3C 2016 UPGRADE):
SITE ADDRESS:	170 INGHAM HILL ROAD OLD SAYBROOK, CT 06475
LATITUDE:	41.30988° N 41° 18' 35.57" N
LONGITUDE:	72.39752° W 72° 23' 51.09" W
TYPE OF SITE:	MONOPOLE / INDOOR EQUIPMENT
TOWER HEIGHT:	150'±
RAD CENTER:	154'±
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	800-638-2822

SITE NUMBER: CT2019

SITE NAME: OLD SAYBROOK

PROJECT: LTE 3C 2016 UPGRADE

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	2
GN-1	GENERAL NOTES	2
A-1	COMPOUND & EQUIPMENT PLANS	2
A-2	ANTENNA LAYOUTS & ELEVATION	2
A-3	DETAILS	2
RF-1	RF-PLUMBING DIAGRAM	2
G-1	GROUNDING DETAILS	2

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.

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-888-DIG-SAFE
OR CALL 811

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

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

550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	04/08/16	ISSUED FOR CONSTRUCTION	RB	AT	DPH
1	03/23/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
A	03/18/16	ISSUED FOR REVIEW	EB	AT	DPH

SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: EB

AT&T

TITLE SHEET
(LTE 3C)

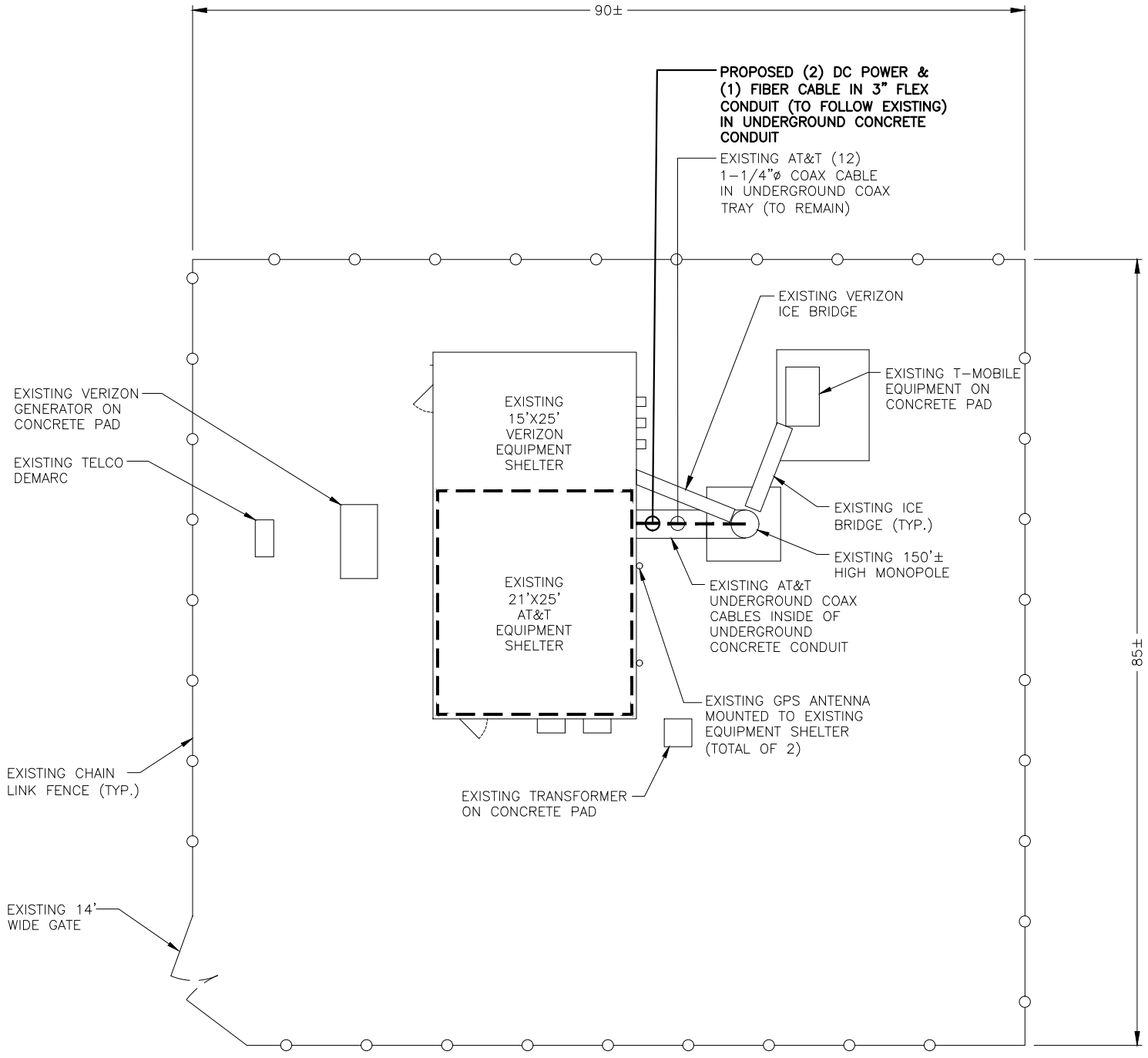
SITE NUMBER	DRAWING NUMBER	REV
2019.02	T-1	2

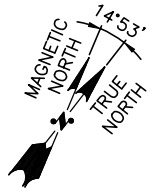
NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA CONFIGURATION.

NOTE:

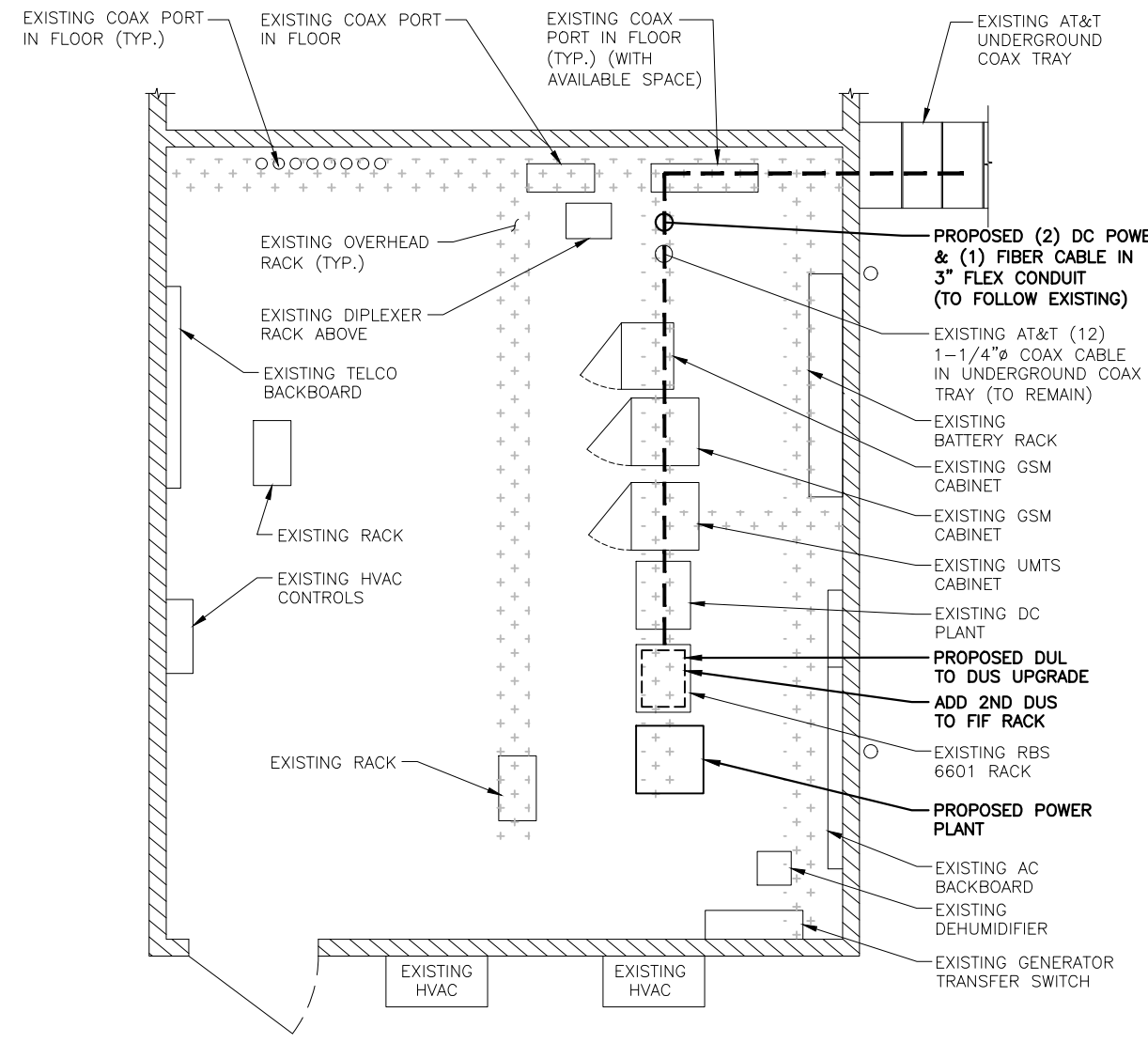
REFER TO MOUNT ANALYSIS BY: HUDSON DESIGN GROUP, LLC, DATED: MARCH 09, 2016, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

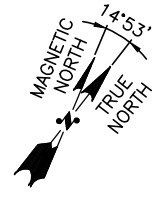




COMPOUND PLAN (1 / A-1)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

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





EQUIPMENT PLAN (2 / A-1)
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

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

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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SITE NAME: OLD SAYBROOK

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at&t
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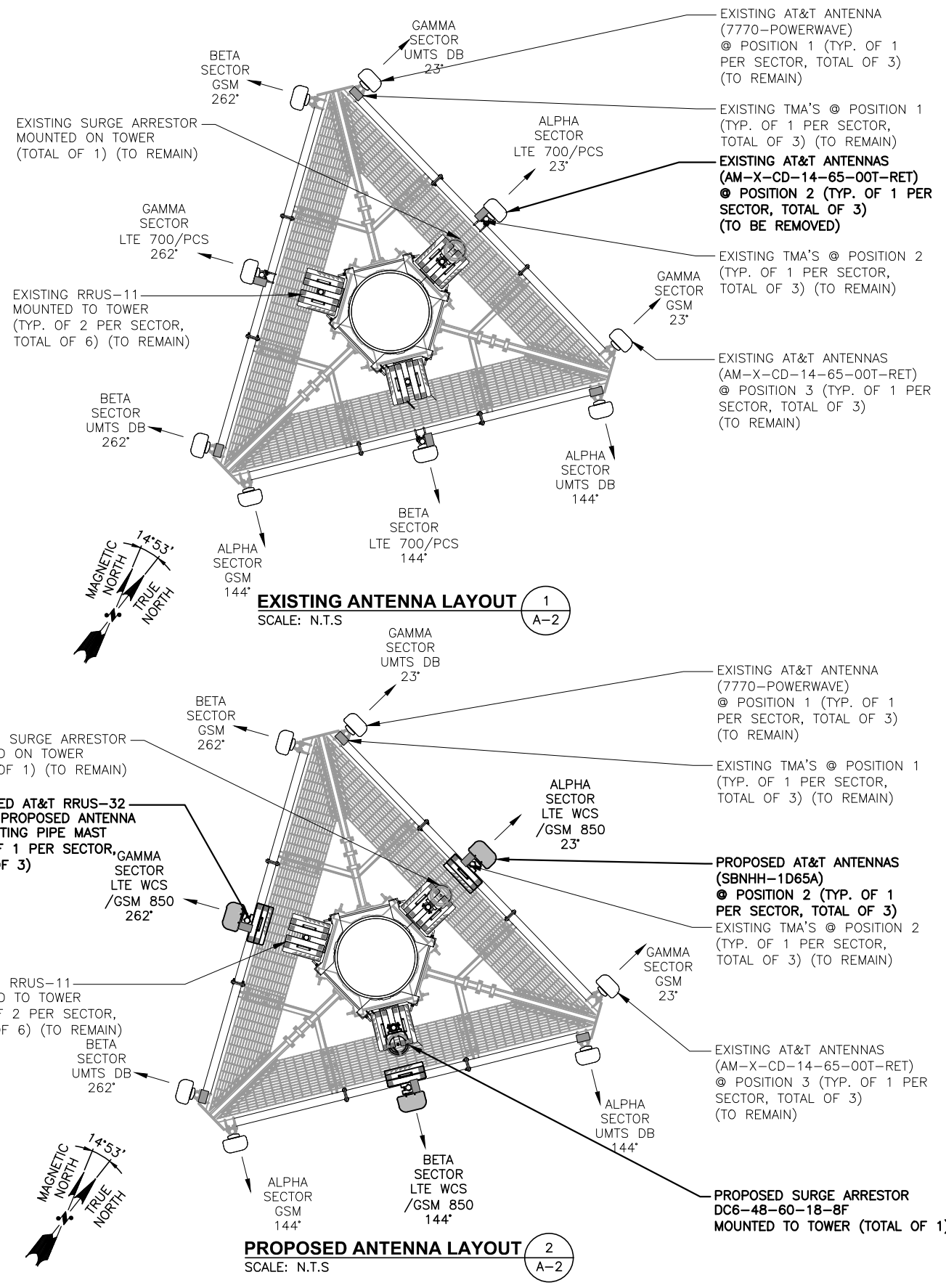
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

AT&T

COMPOUND & EQUIPMENT PLANS
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
2019.02	A-1	2



EXISTING ANTENNA LAYOUT (1 / A-2)

SCALE: N.T.S

NOTE:

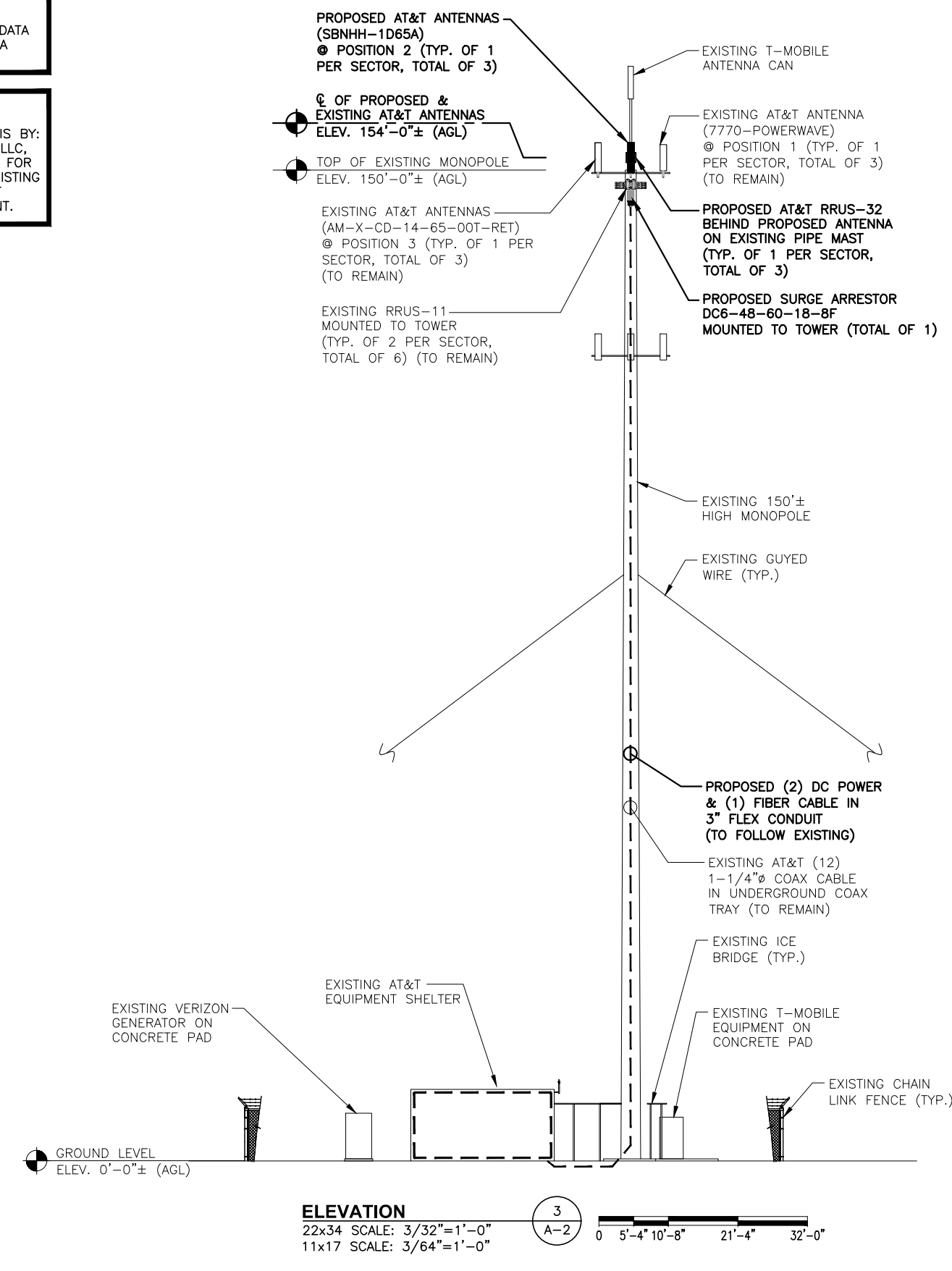
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

REFER TO MOUNT ANALYSIS BY: HUDSON DESIGN GROUP, LLC, DATED: MARCH 09, 2016, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

PROPOSED ANTENNA LAYOUT (2 / A-2)

SCALE: N.T.S



ELEVATION (3 / A-2)

22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

AT&T

ANTENNA LAYOUTS & ELEVATION
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
2019.02	A-2	2

May 6, 2016

Mr. Timothy Howell
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(980) 209-8242

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
ModDwgs@btgrp.com

Subject:	**Structural Modification Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2019
	Carrier Site Name:	Old Saybroook
Crown Castle Designation:	**Crown Castle BU Number:**	841289
	Crown Castle Site Name:	Old Saybrook
	Crown Castle JDE Job Number:	357650
	Crown Castle Work Order Number:	1228779
	Crown Castle Application Number:	322613 Rev. 4
Engineering Firm Designation:	**B+T Group Project Number:**	93496.005.01
Site Data:	**170 Ingham Hill Road, Old Saybrook, CT, Middlesex County** **Latitude *41° 18' 35.55"*, Longitude *-72° 23' 51.13"*** **150 Foot - Monopole**	

Dear Mr. Howell,

B+T Group is pleased to submit this **"Structural Modification 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 897120, in accordance with application 322613, revision 4.

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:

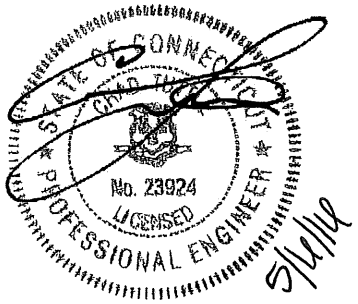
LC4.5: TSA specified load case with proposed modifications **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and IBC 2006 based upon a wind speed of 85 mph fastest mile.

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

We at *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.

Respectfully submitted by:
B+T Engineering, Inc.
PEC.0001564; Exp.: 02/10/17



Ashkan Ghaeezadeh, E.I.T.
Project Engineer

Chad E. Tuttle, P.E.
Engineer of Record

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 in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
149.0	152.0	3	Andrew	SBNHH-1D65A	2 1	5/8 3/8	--
		3	Ericsson	WCS RRUS-32-B30			
		1	Raycap	DC6-48-60-18-8F			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	163.0	1	Andrew	CSHAX-6516-R2	6	1-1/4	1
	160.0	1	--	Pipe Mount [PM 701-1]			
149.0	156.0	1	Andrew	KP4F-23A	--	--	1
	152.0	**1**	**KMW Com.**	**AM-X-CD-14-65-00T-RET**	**--**	**--**	**2**
		2	**KMW Com.**	**AM-X-CW-14-65-00T-RET**			
		3	KMW Com.	AM-X-CD-14-65-00T-RET	12 1	1-1/4 7/8	1
		3	Powerwave Tech.	7770.00			
		6	Powerwave Tech.	TT19-08BP111-001			
	149.0	1	--	Platform Mount [LP 403-1]			
148.0	150.0	6	Ericsson	RRUS 11	2 1	5/8 3/8	1
	148.0	1	--	Side Arm Mount [SO 102-3]			
	147.0	1	Raycap	DC6-48-60-18-8F			
130.0	133.0	3	Alcatel Lucent	RRH2X60-AWS	12 1	1-1/4 1-5/8	1
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Antel	BXA-171085-8BF-EDIN-0			
		3	Antel	BXA-80080/4CF			
		3	Commscope	HBXX-6517DS-A2M			
		3	Commscope	LNX-6514DS-A1M			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		6	RFS Celwave	FD9R6004/2C-3L			
	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

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) 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 Re# 4	322613	CCIsites
Tower Manufacturer Drawings	EEI, Job No. 3503	4287398	CCIsites
Tower Mapping	ReliaPOLE, Project No. 14-0703NEd	5204147	CCIsites
Tower Modification Drawings	GPD, Date: 09/30/2008	4489382	CCIsites
Post Modification Inspection	GPD, Date:03/04/2009	4489415	CCIsites
Tower Modification Drawings	GPD, Date:12/15/2011	4478711	CCIsites
Post Modification Inspection	HDG, Date: 03/19/2012	4468635	CCIsites
Tower Modification Drawings	B+T Group, Date: 08/26/2015	5293057	CCIsites
Post Modification Inspection	SGS, Date: 09/01/2015	5874000	CCIsites
Foundation Drawings	FDH Project No. 08-04159E N1	4591935	CCIsites
Geotech Report	FDH Project No. 08-04159E G1	4468634	CCIsites
Antenna Configuration	Crown CAD Package	Date: 03/24/2016	CCIsites

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) 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) – LC4.5

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.75	Pole	TP19.625x15.53x0.25	1	-6.060	810.835	86.8	Pass
L2	123.75 - 110	Pole	TP21.77x19.625x0.482	2	-7.816	1262.228	90.6	Pass
L3	110 - 83	Pole	TP26.134x21.77x0.668	3	-213.900	2205.982	81.2	Pass
		Guy A@91.1	1 5/8	11	152.528	162.000	94.2	Pass
		Guy B@91.1	1 3/8	10	84.990	116.000	73.3	Pass
		Guy C@91.1	1 3/8	9	94.805	116.000	81.7	Pass
L4	83 - 67.5	Pole	TP28.64x26.134x0.545	4	-222.378	1898.272	96.8	Pass
L5	67.5 - 49.917	Pole	TP30.895x26.984x0.585	5	-225.806	2159.806	95.0	Pass
L6	49.917 - 33	Pole	TP33.66x30.895x0.644	6	-229.368	2688.581	79.6	Pass
L7	33 - 32.5	Pole	TP32.963x31.746x0.71	7	-234.257	3146.600	71.7	Pass
L8	32.5 - 0	Pole	TP38.29x32.963x0.438	8	-234.395	2382.044	93.2	Pass
				Summary				
						Pole (L4)	96.8	Pass
						Guy A (L3)	94.2	Pass
						Guy B (L3)	73.3	Pass
						Guy C (L3)	81.7	Pass
						RATING =	**96.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC4.5

Notes	Component	Elevation	% Capacity	Pass / Fail
1	Flange Connections	110’	61.5	Pass
1	Anchor Rods	Base	90.9	Pass
1	Base Plate	Base	77.3	Pass
1	Base Foundation (Structure)	Base	22.5	Pass
1	Base Foundation (Soil)	Base	98.5	Pass
1	Inner Guy Anchor Foundation (Anchor Rod)	Base	79.0	Pass
1	Inner Guy Anchor Foundation (Soil)	Base	92.4	Pass
1	Outer Guy Anchor Foundation (Anchor Rod)	Base	47.8	Pass
1	Outer Guy Anchor Foundation (Soil)	Base	90.8	Pass

Structure Rating (max from all components) =	**98.5%**

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

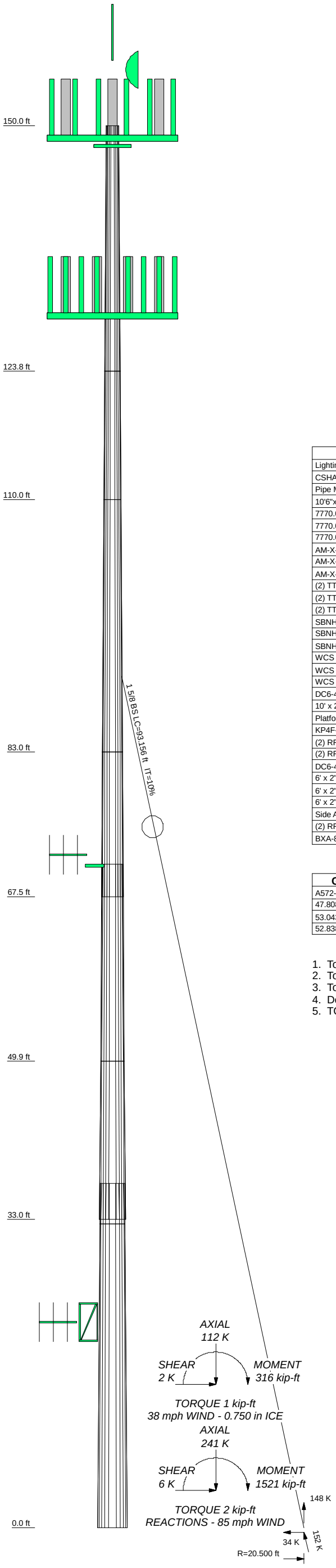
4.1) Recommendations

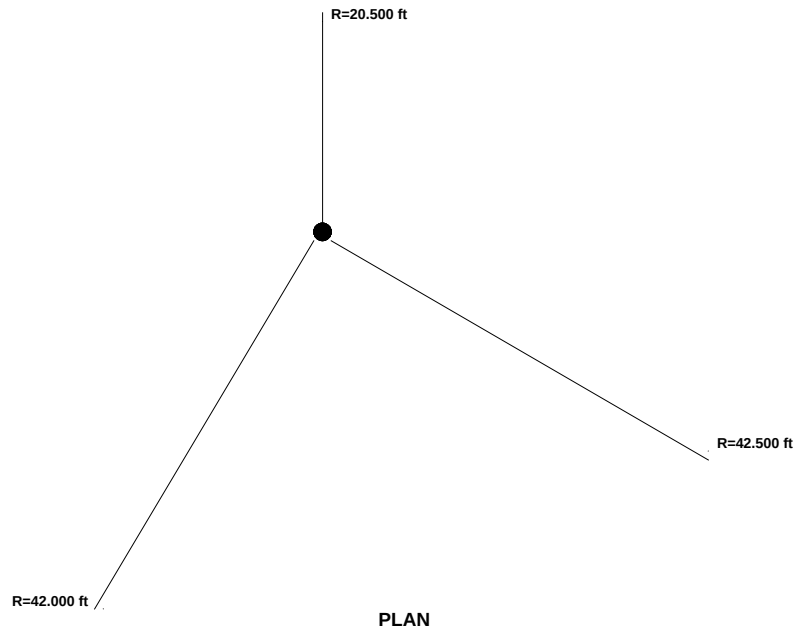
1) All modifications proposed in this report shall be installed in accordance with the attached drawings (Appendix D) for the determined available structural capacity to be effective.

Table 7 –Existing Loading Tilt-Sway Results for 50 mph Service Wind – LC4.5

Elevation (ft)	*Dish Model*	*Diameter (ft)*	*Tilt (°)*	*Twist (°)*
156.0	KP4F-23A	4.000	2.412	0.010

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	26.250	12	0.250		15.530	19.625	A572-65	1.2
2	13.750	12	0.482		19.625	21.770	A572-65	1.4
3	27.000	12	0.668		21.770	26.134	47.808044ksi	4.2
4	15.500	12	0.545	3.500	26.134	28.640	53.04341ksi	2.4
5	21.083	12	0.585		26.984	30.895	52.838993ksi	3.7
6	16.917	12	0.644	3.833	30.895	33.660	53.028176ksi	3.6
7	4.333	12	0.710		31.746	32.963	53.604437ksi	1.0
8	32.500	12	0.438		32.963	38.290	A572-65	5.5
							53.607744ksi	22.9





PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 5/8" x 5' (E)	168	BXA-80080/4CF w/ Mount Pipe (E)	130
CSHAX-6516-R2 (E)	160	HBXX-6517DS-A2M w/ Mount Pipe (E)	130
Pipe Mount [PM 701-1] (E)	160	HBXX-6517DS-A2M w/ Mount Pipe (E)	130
10'6"x4" Pipe Mount (E)	155.5	HBXX-6517DS-A2M w/ Mount Pipe (E)	130
7770.00 w/ Mount Pipe (E)	149	BXA-171085-8BF-EDIN-0 w/ Mount Pipe (E)	130
7770.00 w/ Mount Pipe (E)	149	BXA-171085-8BF-EDIN-0 w/ Mount Pipe (E)	130
7770.00 w/ Mount Pipe (E)	149	BXA-171085-8BF-EDIN-0 w/ Mount Pipe (E)	130
AM-X-CW-14-65-00T-RET w/ Mount Pipe (E)	149	LNX-6514DS-A1M w/ Mount Pipe (E)	130
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	149	LNX-6514DS-A1M w/ Mount Pipe (E)	130
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	149	LNX-6514DS-A1M w/ Mount Pipe (E)	130
(2) TT19-08BP111-001 (E)	149	RRH2X60-PCS (E)	130
(2) TT19-08BP111-001 (E)	149	RRH2X60-PCS (E)	130
(2) TT19-08BP111-001 (E)	149	RRH2X60-PCS (E)	130
SBNHH-1D65A w/ Mount Pipe (P)	149	RRH2X60-AWS (E)	130
SBNHH-1D65A w/ Mount Pipe (P)	149	RRH2X60-AWS (E)	130
SBNHH-1D65A w/ Mount Pipe (P)	149	RRH2X60-AWS (E)	130
WCS RRUS-32-B30 (P)	149	(2) FD9R6004/2C-3L (E)	130
WCS RRUS-32-B30 (P)	149	(2) FD9R6004/2C-3L (E)	130
WCS RRUS-32-B30 (P)	149	(2) FD9R6004/2C-3L (E)	130
DC6-48-60-18-8F (P)	149	DB-T1-6Z-8AB-0Z (E)	130
10' x 2" Mount Pipe (E)	149	Platform Mount [LP 403-1] (E)	130
Platform Mount [LP 403-1] (E)	149	GPS (3"x7") (E-Per Photo)	130
KP4F-23A (E)	149	3' x 2" Pipe Mount (E-Per Photo)	130
(2) RRUS 11 (E)	148	BXA-80080/4CF w/ Mount Pipe (E)	130
(2) RRUS 11 (E)	148	Yagi (E-Per Photo)	71
DC6-48-60-18-8F (E)	148	5' x 2" Pipe Mount (E-For Yagi Per photo)	71
6' x 2" Mount Pipe (E-)	148	Side Arm Mount [SO 701-1] (E)	71
6' x 2" Mount Pipe (E)	148	FMO (E)	71
6' x 2" Mount Pipe (E)	148	Side Arm Mount [SO 301-1] (E)	71
Side Arm Mount [SO 102-3] (E)	148	Side Arm Mount [SO 701-1] (E)	22
(2) RRUS 11 (E)	148	5' x 2" Pipe Mount (E-For Yagi Per photo)	22
BXA-80080/4CF w/ Mount Pipe (E)	130	MYA-43012N (E)	22

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	53.028176ksi	53 ksi	68 ksi
47.808044ksi	48 ksi	63 ksi	53.604437ksi	54 ksi	69 ksi
53.04341ksi	53 ksi	68 ksi	53.607744ksi	54 ksi	69 ksi
52.838993ksi	53 ksi	68 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.8%

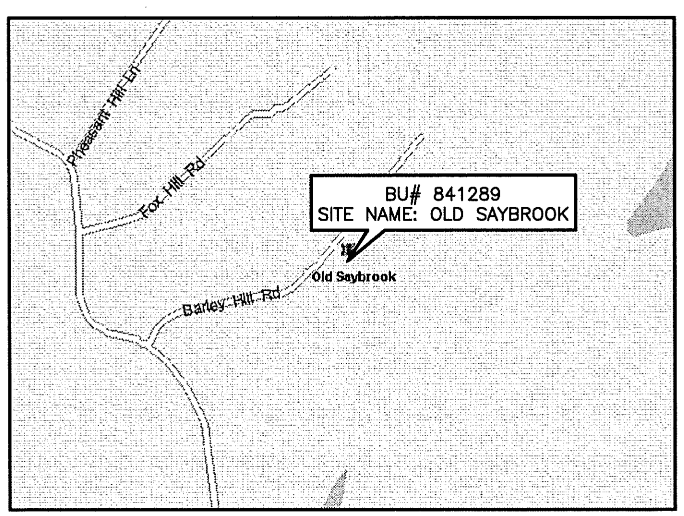
B+T Group
1717 S Boulder Ave, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 93496.005.01 - OLD SAYBROOK, CT (BU # 84128			
Project:			
Client: Crown Castle	Drawn by: aghaeezadeh	App'd:	
Code: TIA/EIA-222-F	Date: 05/05/16	Scale: NTS	
Path:		Dwg No. E-1	

TOWER MODIFICATION DRAWINGS
PREPARED FOR: CROWN CASTLE

SITE NAME: OLD SAYBROOK
BU NUMBER: 841289

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



MAP

DIRECTIONS

UPDATED 2 07 CT 2019 OLD SAYBROOK I 95 SOUTH TO EXIT 67. RIGHT ON ELM STREET. APPROX. .8 MILES. GO PAST 170 INGHAM HILL ROAD MAILBOX TO BARLEY HILL ROAD. TURN RIGHT ONTO BARLEY HILL ROAD.CONTINUE UP HILL, ACCESS ROAD AND GATE IS ON THE RIGHT, CLOSE TO TOP OF STREET. ACCESS 24/7 COMBO:0043

PROJECT CONTACTS:

1. CROWN PROJECT MANAGER
   DAN VADNEY
   (518) 373-3510
   DAN.VADNEY@CROWNCASTLE.COM

2. CROWN CONSTRUCTION MANAGER
   JASON D'AMICO
   (860) 209-0104
   JASON.D'AMICO@CROWNCASTLE.COM

3. B+T GROUP RFI CONTACT
   ASHKAN GHAEEZADEH
   (918) 587-4630
   AGHAEEZADEH@BTGRP.COM
   MODDWGS@BTGRP.COM
   1717 S BOULDER AVENUE, SUITE 300
   TULSA, OK 74119

TOWER INFORMATION

TOWER MANUFACTURER / JOB #:	ENGINEERED ENDEAVORS, INC. / 3503
TOWER HEIGHT / TYPE:	150' MONOPOLE
TOWER LOCATION:	LAT. 41° 18' 35.55"
DATUM: (NAD 1983)	LONG. -72° 23' 51.13"
	ELEV. 175 FT AMSL
STRUCTURAL DESIGN DRAWING REPORT:	B+T GROUP / WO. # 1228779
STRUCTURAL ANALYSIS REPORT:	B+T GROUP / WO. # 1211010
STRUCTURAL ANALYSIS DATE:	03/28/16
APPLICATION ID / REVISION #:	322613 / 4
CCISITES DOCUMENT ID:	6179805

CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS PERFORMED IN ACCORDANCE WITH THE TIA/EIA-222-F STANDARD AND IBC 2006 BASED UPON A WIND SPEED OF 85 MPH FASTEST MILE.

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, NG2 BOLT NOTES AND DETAILS
S4	FORGBOLT NOTES AND DETAILS
S5	AJAX ONESIDE™ BOLT SPECIFICATIONS AND TIGHTENING PROCEDURE
S6	TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.
S7	TOWER SECTION (29.9'–49.9')
S8	IN–LINE SPLICE DETAIL
D1	PART DETAILS

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800–788–7011.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO:	93496.005.01
PROJECT ENG:	ASHKAN GHAEEZADEH
DRAWN BY:	TEL
CHECKED BY:	BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

OLD SAYBROOK
841289
170 INGHAM HILL ROAD
OLD SAYBROOK, CT
EXISTING 150' MONOPOLE

SHEET TITLE
TITLE SHEET

SHEET NUMBER: S1
REVISION: 0

MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVAL	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS AS NECESSARY FOR NON-STANDARD PARTS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION BY A CWI OF A PORTION OF WELDING ON THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING (PER ENG-STD-10069) ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION (PERFORMED BY CONTRACTOR)
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS.
N/A	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH CROWN ENG-PRC-10012 FOR INCLUSION IN THE MI REPORT.
N/A	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. CWI SHALL FOLLOW ALL THE PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS ENG-SOW-10066, ENG-STD-10069 AND SRV-STD-10159. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. FULL PENETRATION WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
N/A	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH ENG-BUL-10149.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE AS PART OF PLUMB AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD.
		POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH ENG-PRC-10119 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		
NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT AND N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT		

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

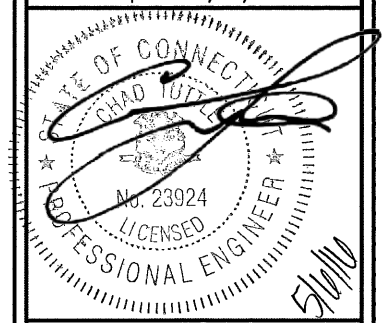
CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO:	93496.005.01
PROJECT ENG:	ASHKAN GHAEEZADEH
DRAWN BY:	TEL
CHECKED BY:	BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17



OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE

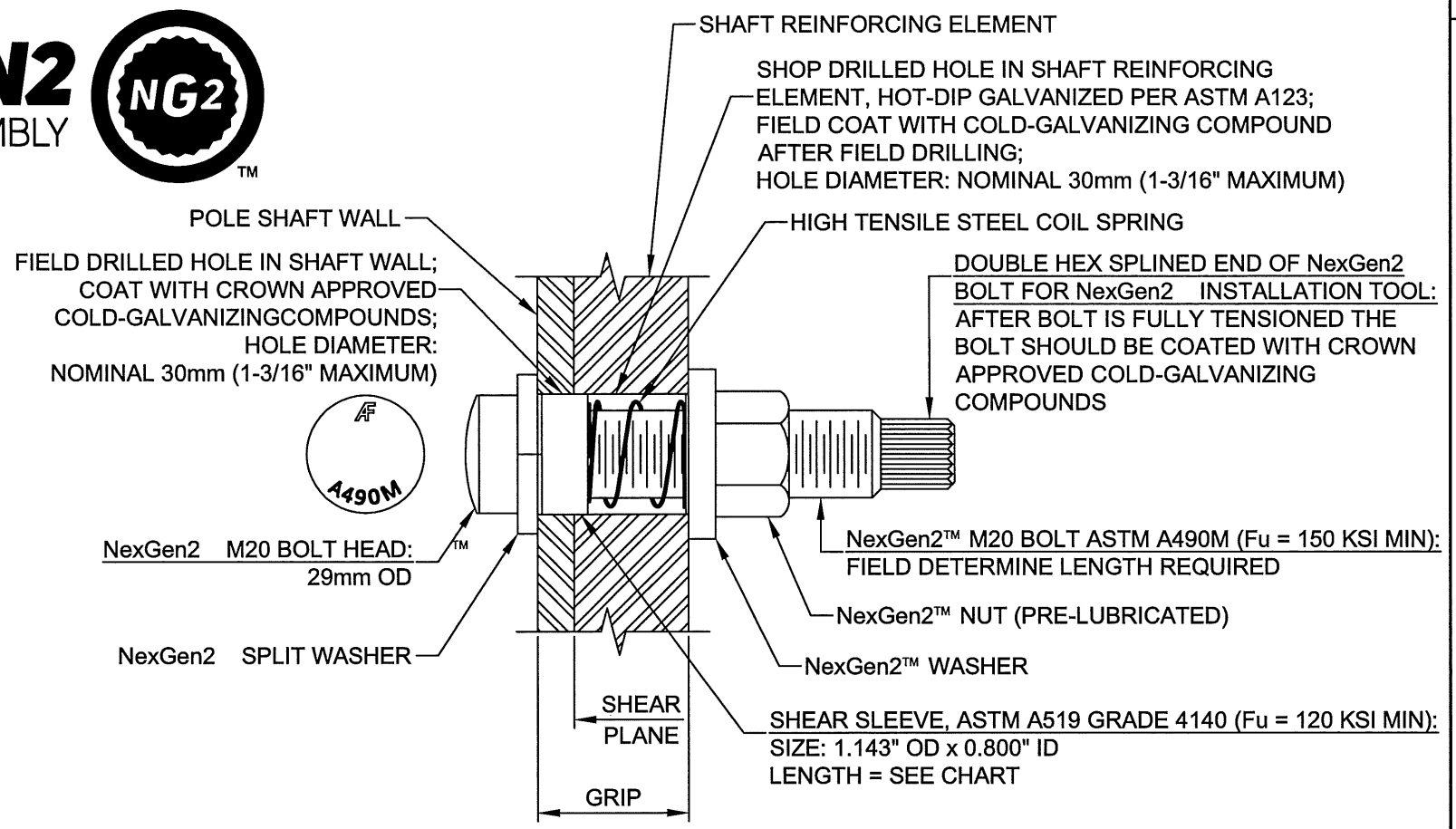
MODIFICATION INSPECTION NOTES AND CHECKLIST

SHEET NUMBER:	REVISION:
S2	0

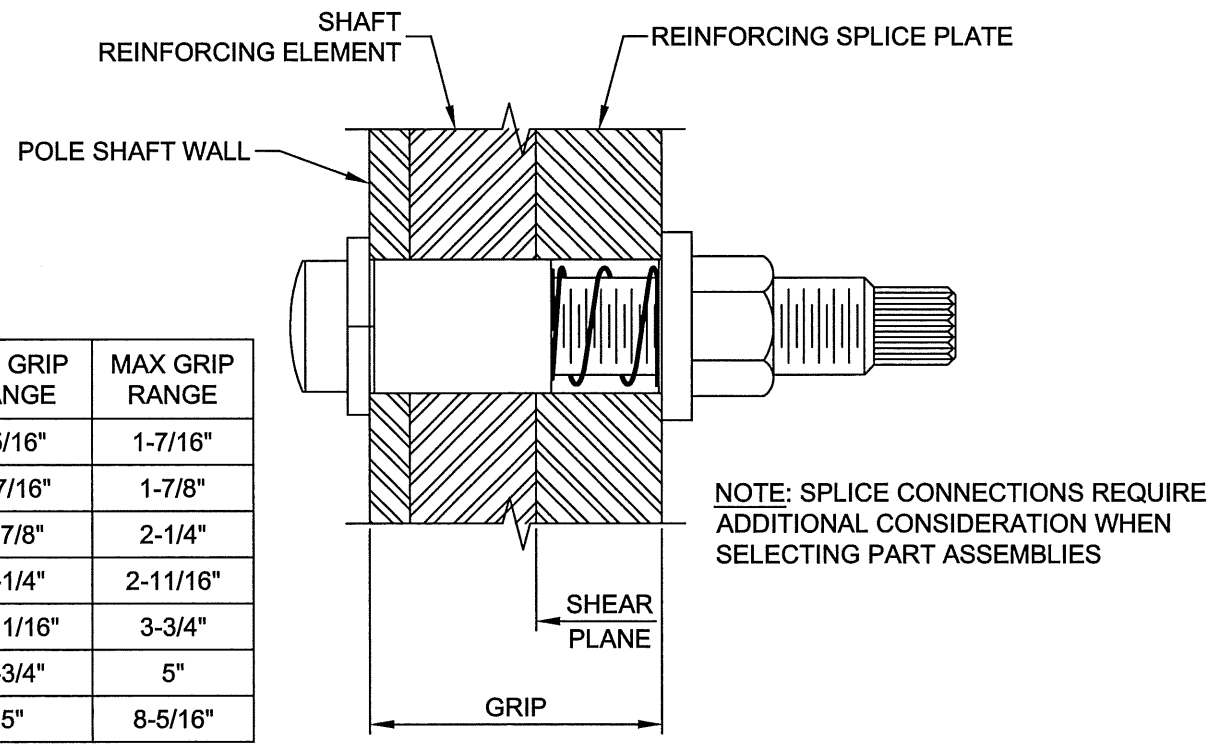
INTERIOR OF POLE SHAFT	EXTERIOR OF POLE SHAFT

NEXGEN2 BLIND BOLT ASSEMBLY

- PATENT PENDING -



TYPICAL NG2™ BOLT DETAIL



NOTE: SPLICE CONNECTIONS REQUIRE ADDITIONAL CONSIDERATION WHEN SELECTING PART ASSEMBLIES

PART NUMBER	BOLT LENGTH	SLEEVE LENGTH	MIN GRIP RANGE	MAX GRIP RANGE
M20x36	M20x95	11/16"	15/16"	1-7/16"
M20x48	M20x95	1-3/16"	1-7/16"	1-7/8"
M20x57	M20x95	1-5/8"	1-7/8"	2-1/4"
M20x68	M20x135	2"	2-1/4"	2-11/16"
M20x96	M20x135	2-7/16"	2-11/16"	3-3/4"
M20x127	M20x165	3"	3-3/4"	5"
M20x212	M20x250	4"	5"	8-5/16"

GENERAL NOTES

1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-222-F STANDARD AS WELL AS ANY OTHER GOVERNING BUILDING CODES.
1.2 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.
1.3 A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.
1.4 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.
1.5 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.
1.6 ALL CONSTRUCTION MEANS AND METHODS: INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

FABRICATION

2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

	YIELD	ASTM SPECS
A. STEEL SHAPES AND PLATES, U.N.O.	65ksi	A572

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E80 SERIES.
2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B+T GROUP 5 DAYS PRIOR TO FABRICATION.

KEY NOTES

(#) TOWER MODIFICATION I.D.

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRE-TENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
3. ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30mm DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1 3/16".
4. NexGen2™ COMPLETE ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AS APPROPRIATE.
5. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

MANUFACTURER:

ALLFASTENERS
15401 COMMERCE PARK DRIVE
BROOKPARK, OH 444142
PHONE: 440-232-6060
WEBSITE: WWW.ALLFASTENERS.COM

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO:	93496.005.01
PROJECT ENG:	ASHKAN GHAEEZADEH
DRAWN BY:	TEL
CHECKED BY:	BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17

STATE OF CONNECTICUT CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER

OLD SAYBROOK
841289

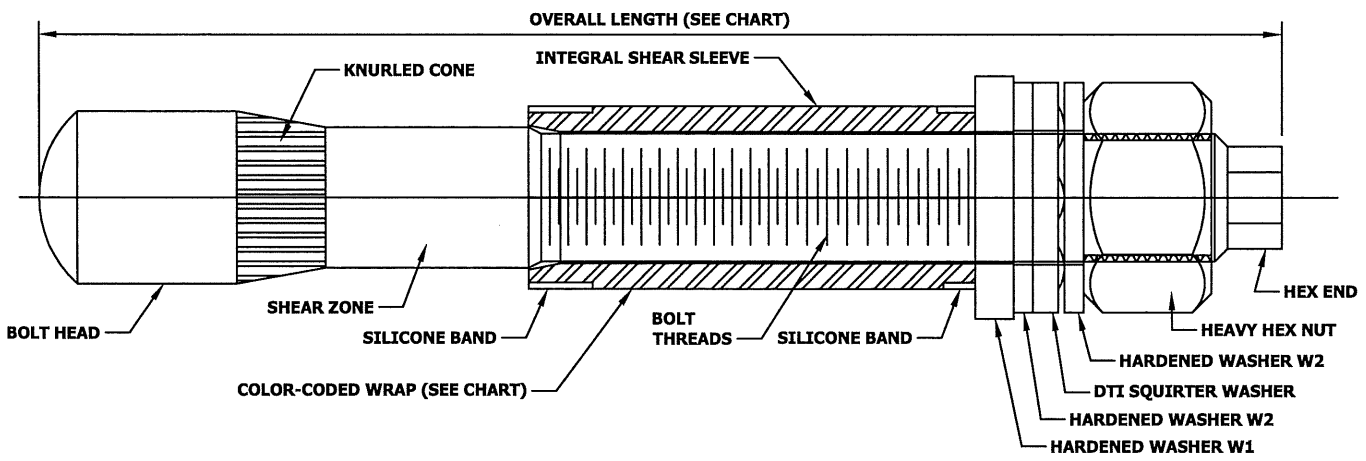
170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

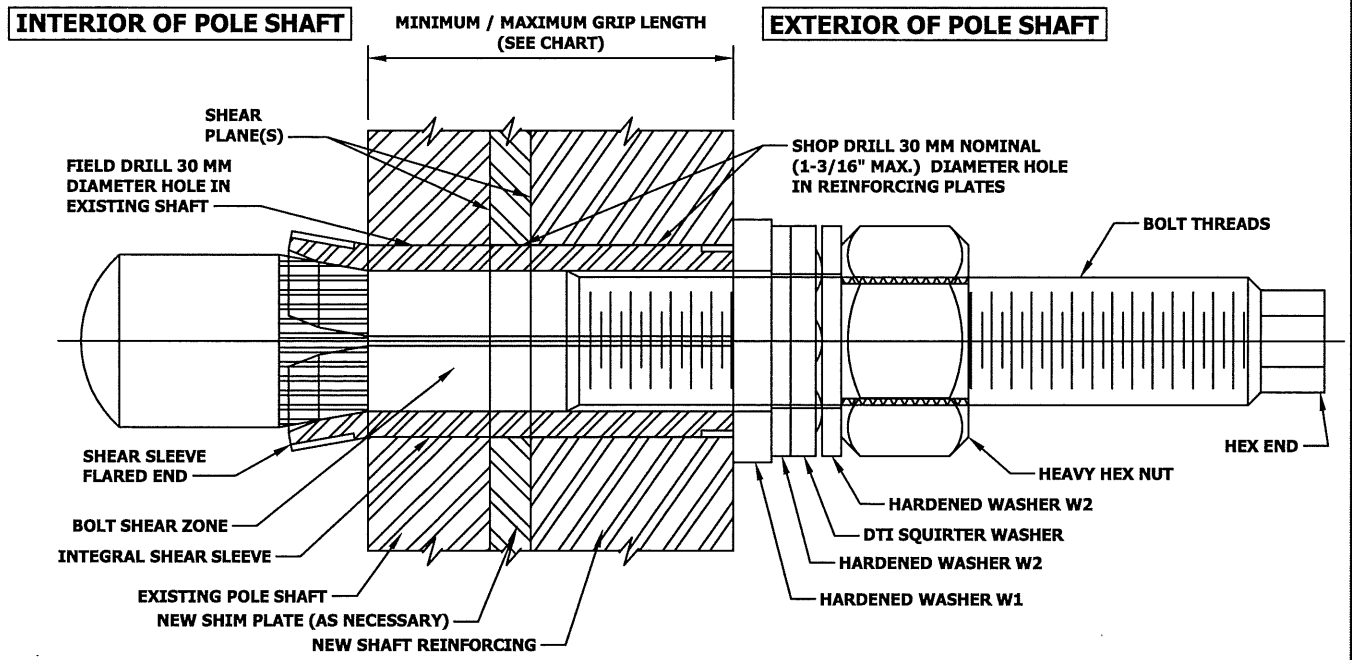
SHEET TITLE
GENERAL NOTES, NG2 BOLT NOTES AND DETAILS

SHEET NUMBER:	REVISION:
S3	0

NOTES:
1. **ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.**
2. **ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.**



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2

BOLT HOLE NOTES:

1. **ALL SHOP-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM SHOP-DRILLED HOLE DIAMETER PERMITTED IS 1-3/16".**
2. **ALL FIELD-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM FIELD-DRILLED HOLE DIAMETER PERMITTED IS 30 MM.**

DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
PHONE: **888-926-4857**
EMAIL: info@precisiontowerproducts.com
WEB: www.precisiontowerproducts.com

CONTAINS PROPRIETARY INFORMATION
PATENT PENDING

FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)				
GROUP A	FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8 1	**135**	5.31	1.3	3/8" to 1"	--	**RED**
2	**160**	6.30	1.6	3/4" to 1-1/2"	--	**GREEN**
3	**195**	7.68	1.9	1-1/4" to 2-1/4"	--	**BLUE**
4	**260**	10.24	2.6	2" to 3-1/2"	Splice Bolt	**YELLOW**
5	**365**	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	**ORANGE**
6	**440**	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	**BLACK**
DTI Note	Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FORGBolt™ Installation

Follow all Manufacturer/Distributer Recommendations for Installation, Tightening, and Inspection.

1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

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CROWN CASTLE

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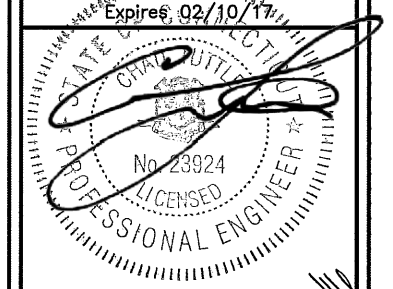


OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
FORGBOLT NOTES AND DETAILS

SHEET NUMBER:	REVISION:
S4	0

INTERIOR OF POLE SHAFT | EXTERIOR OF POLE SHAFT

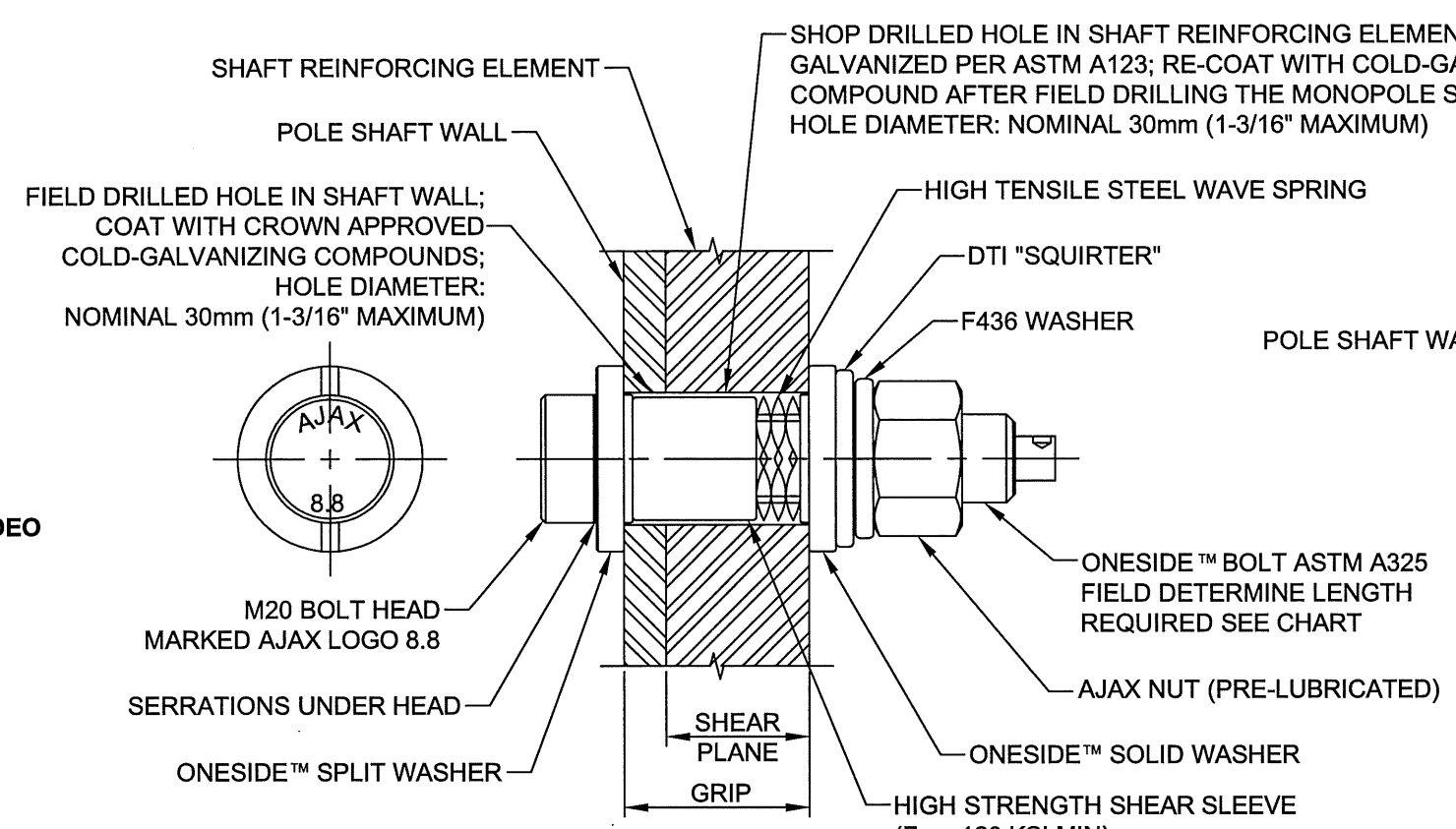
AJAX FASTENERS

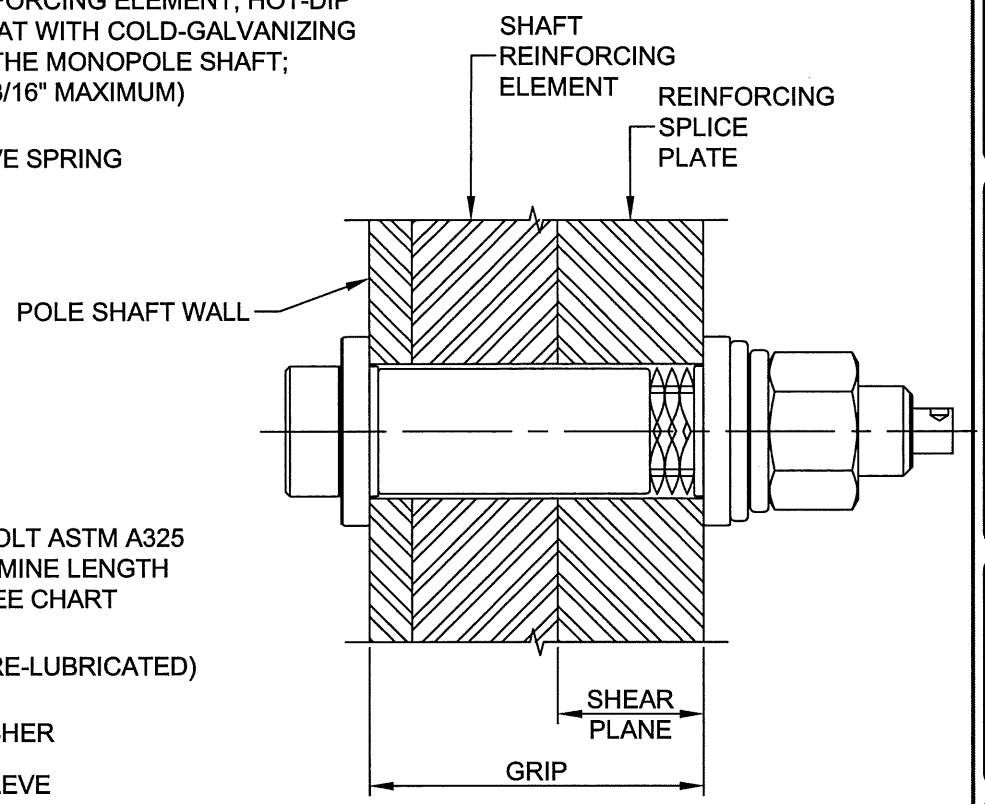
ONESIDE™

PATENT US 7,373,709B2

MANUFACTURER INSTALLATION VIDEO

https://www.youtube.com/watch?v=ZGBS0eLrZsw&feature=em-share_video_user





NOTE:
SPLICE CONNECTIONS REQUIRE ADDITIONAL CONSIDERATION WHEN SELECTING PART ASSEMBLIES

AJAX ONESIDE BOLT DETAIL

CODE	SIZE	COLOR	SLEEVE LENGTH	GRIP	GRIP IMP
OSBA20.65-6	M20 x 65	ORANGE	6.0 (0.236")	12.5 / 20.0	0.500" / 0.787"
OSBA20.95-14	M20 x 95	BLACK	14.0 (0.551")	20.0 / 32.0	0.787" / 1.259"
OSBA20.95-22	M20 x 95	GREEN	22.0 (0.866")	30.0 / 50.0	1.181" / 1.968"
OSBA20.95-30	M20 x 95	YELLOW	30.0 (1.181")	40.5 / 50.0	1.595" / 1.968"
OSBA20.135-39	M20 x 135	BLUE	39.0 (1.535")	49.0 / 77.0	1.929" / 3.031"
OSBA20.135-48	M20 x 135	BROWN	48.0 (1.889")	60.5 / 77.0	2.375" / 3.031"
OSBA20.135-57	M20 x 135	PURPLE	57.0 (2.244")	67.0 / 90.0	2.637" / 3.543"
OSBA20.165-76	M20 x 165	RED	76.0 (3.000")	87.0 / 120.0	3.425" / 4.724"
OSBA20.250	M20 x 250	SILVER	MTO	121.0 / 211.0	4.724" / 8.310"

MANUFACTURER
AJAX FASTENERS
SALES + TECH: ONESIDE@AJAXFAST.COM.AU

DISTRIBUTOR
IRA SVENSGAARD AND ASSOCIATES
PETER SVENDSGAARD - PETERS@IRASVENS.COM
JOHN KILLAM - JOHN@IRASVENS.COM
PHONE (530) 647-8225
FAX (530) 647-8229

BOLT ASSEMBLY AND INSTALLATION:
1. BOLT MUST BE PURCHASED PRE-ASSEMBLED.
2. FOLLOW BOLT AND DTI MANUFACTURERS INSTRUCTIONS FOR INSTALLATION.

INSPECTION:
1. A MINIMUM OF 4 OUT OF 5 SQUIRTER® DTI PROTRUSIONS SHALL BE ENGAGED IN ANY AJAX/DTI BOLT ASSEMBLY IN THE REINFORCING MEMBERS. A FEELER GAGE MAY BE USED TO VERIFY PROTRUSION COMPRESSION.
2. INSPECTIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS AND CROWN DOCUMENT ENG-SOW-10007: *MODIFICATION INSPECTION SOW*.

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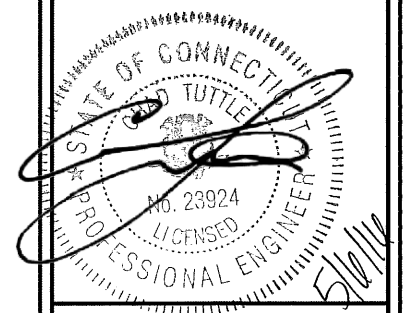


OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
AJAX ONESIDE™ BOLT SPECIFICATIONS AND TIGHTENING PROCEDURE

SHEET NUMBER:	REVISION:
S5	0

CCI: FLAT PLATE-BILL OF MATERIALS (65KSI)

BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	FLAT # OR AZIMUTH	BOLTS PER PLATE	TOTAL BOLT QTY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	TOTAL STEEL WEIGHT	
29'-11"	49'-11"	*CCI-CFP-06512520	20'-0"	3	2, 6 & 10	32	96	11	11	19"	1658	LBS.
							96				1658	LBS.

* UNIQUE PART. SEE PART DETAIL SHEET D1

ALL BOLTS SHALL BE PRE-APPROVED BLIND M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED

REFERENCE DRAWINGS BY:	DATE
GPD	09/30/08
GPD	12/15/11
B+T GROUP	08/26/15

EXISTING MEMBER SCHEDULE

SECTION	NUMBER OF SIDES	THICKNESS	Fy (ksi)	BOTTOM DIAMETER	TOP DIAMETER	LAP SPLICE
1	12	0.4375"	65	38.290"	32.256"	48"
2	12	0.3750"	65	33.660"	27.449"	42"
3	12	0.3125"	65	28.640"	21.770"	---
4	12	0.1875"	65	21.770"	15.530"	---
EXISTING BASE PLATE GRADE = 60 ksi						

NOTES:
1. ALL THE PARTS STARTING WITH "CCI-" DESIGNATION – REFER TO "CROWN CASTLE APPROVED REINFORCEMENT COMPONENTS CATALOGUE EDITION 1" FOR PART DETAILS.
2. BLIND BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH SPECIFIED STEEL GRADE.
3. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATOR IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS. 1-800-831-3275 FOR PRODUCT INFORMATION.
4. ALL SHIMS SHALL BE ASTM A36.
5. HOLES FOR BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
6. SHOP WELDS ARE ASSUMED E80XX OR GREATER, PER STANDARD SPLICE DETAIL.
7. IF SCOPE OF MODIFICATION REQUIRES REMOVAL OF TOWER ID TAG, IT MUST BE REPLACED.
8. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD OR TOWER OWNER.
9. WHERE POSSIBLE, CLIMBING HARDWARE SHOULD REMAIN IN-LINE ALONG THE POLE. IF AN OBSTRUCTION CAUSES A LATERAL OFFSET OF 2'-0" OR MORE, CLIMBING ANCHORS SHALL BE PROVIDED AT EACH CHANGE IN ALIGNMENT. IF NEW REINFORCEMENT REQUIRES STEP BOLT BRACKETS, INSTALL PRIOR TO GALVANIZATION OF STEEL.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER FITTING OF REINFORCEMENT ON MONOPOLES. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.
11. TOLERANCES FOR INSTALLED PLATE HEIGHTS PER FLAT PLATE BILL OF MATERIALS ARE AS FOLLOWS:
+/- 1" FOR PLATES BEGINNING IN BOTTOM 1'-0" OF POLE.
+/- 3" FOR ALL OTHER HEIGHT.
EXCEPTIONS MAY BE NOTED ABOVE.

TOWER MODIFICATIONS:

(1) INSTALL NEW REINFORCING ELEMENTS RE: SHEET S7.

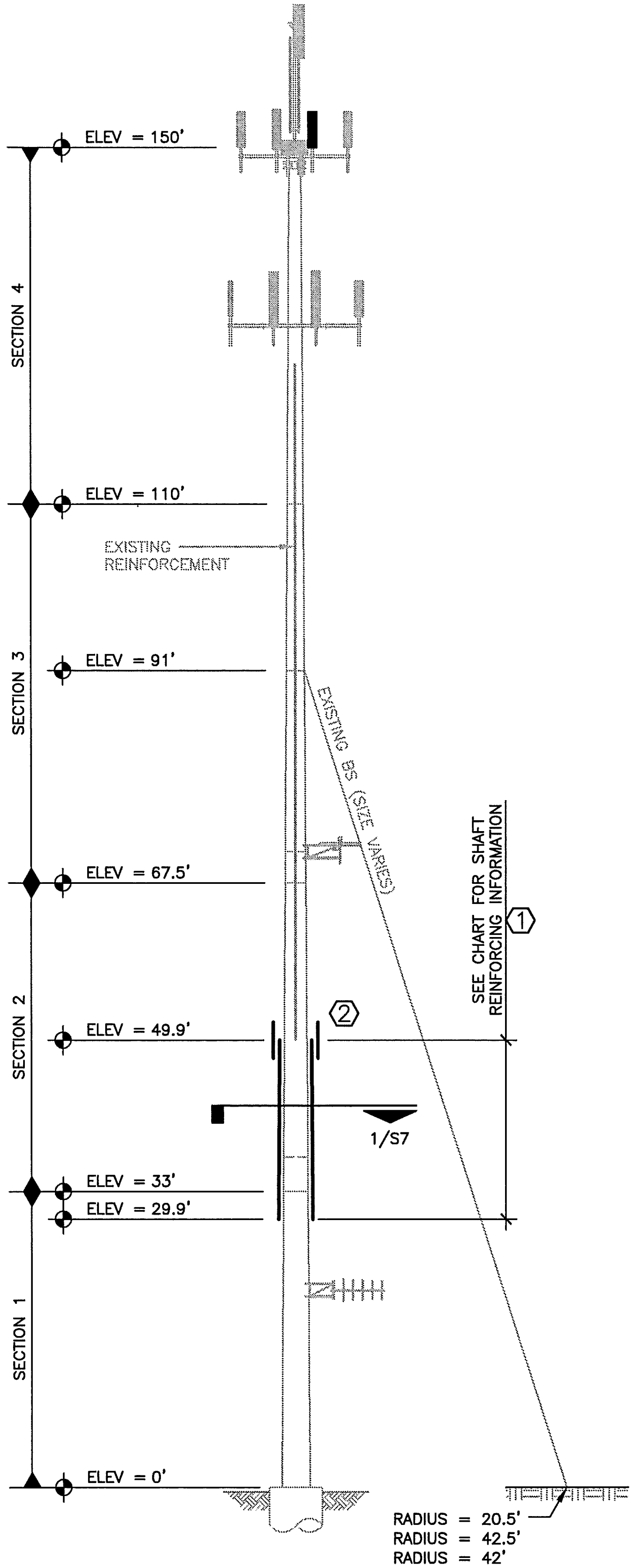
(2) INSTALL NEW IN-LINE SPLICES RE: SHEET S8.

* CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.

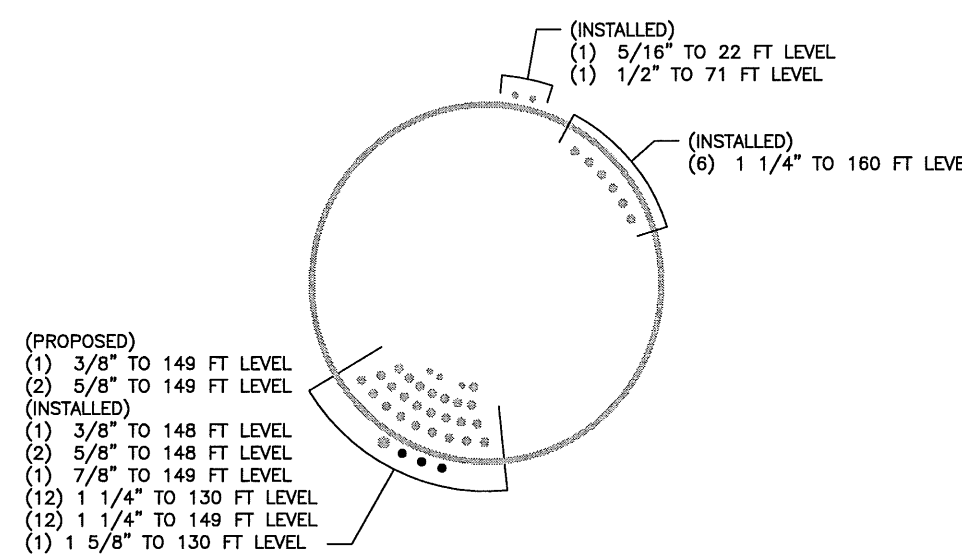
** THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S6.

*** CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.

**** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.



(1) TOWER ELEVATION
SCALE: N.T.S.



(2) TX LINE DISTRIBUTION DIAGRAM
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO: 93496.005.01
PROJECT ENG: ASHKAN GHAEEZADEH
DRAWN BY: TEL
CHECKED BY: BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

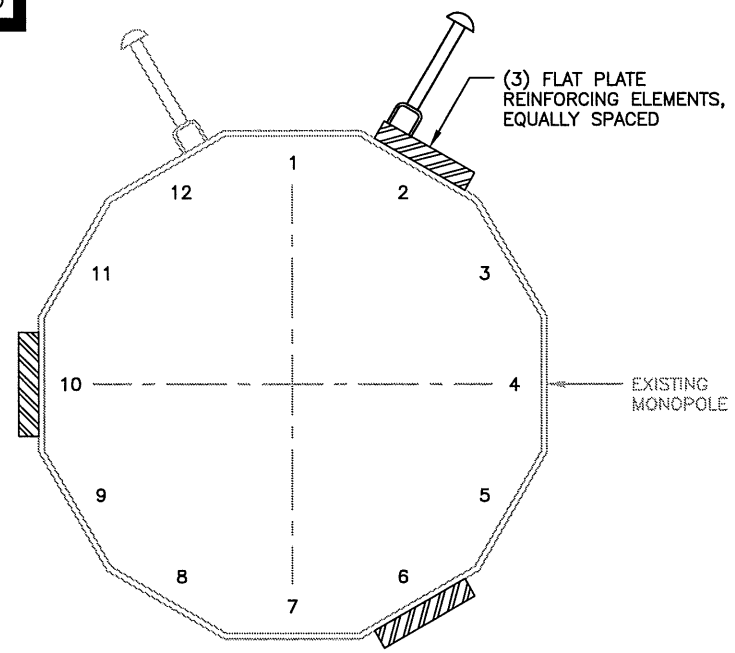
EXISTING 150' MONOPOLE

SHEET TITLE
TOWER ELEV., SCHEDULES, AND TX LINE DIST. DIAGRAM

SHEET NUMBER: S6
REVISION: 0

\\tower-two\BT Telecom Services\Projects\Crown Castle\93000\93496_841289_Old Saybrook\TOW MOD\005\93496.005.01_Old Saybrook-841289-TowMod.dwg – Sheet:S6 – User: Tlonon – May 6, 2016 – 8:41 AM

CONTRACTOR TO INCLUDE PROVISION FOR RELOCATION / REPLACEMENT OF EXISTING CLIMBING PEGS AS REQUIRED



1 TOWER SECTION (29.9'-49.9')
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO:	93496.005.01
PROJECT ENG:	ASHKAN GHAEEZADEH
DRAWN BY:	TEL
CHECKED BY:	BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

OLD SAYBROOK
841289

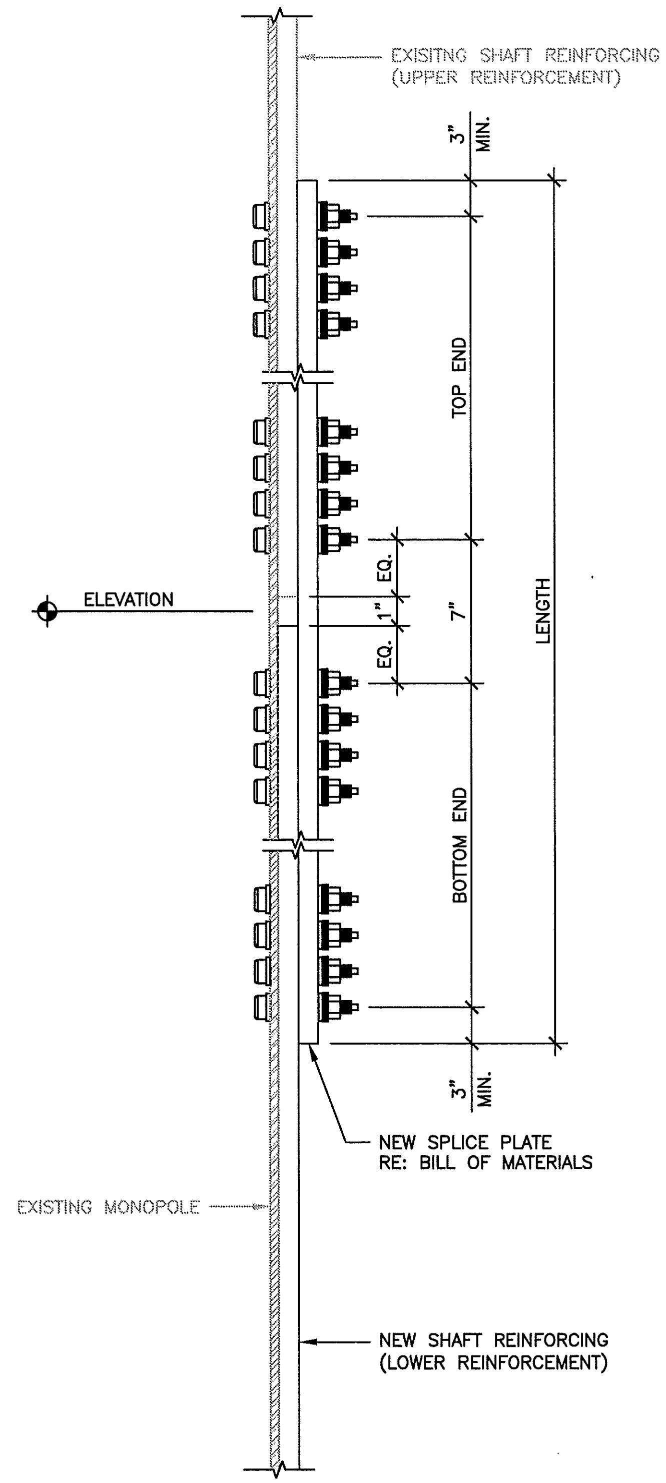
170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
TOWER SECTION
29.9'-49.9'

SHEET NUMBER: S7

REVISION: 0



1 FLAT PLATE IN-LINE SPLICE DETAIL
SCALE: N.T.S.

SPLICE PLATE-BILL OF MATERIALS (65KSI)

ELEVATION	WIDTH	THICKNESS	LENGTH	QTY	QTY OF BOLTS (TOP END)	QTY OF BOLTS (BOTTOM END)	BOLTS PER SPLICE	TOTAL BOLTS	TOTAL STEEL WEIGHT	
49'-11 1/2"	6 1/2"	1 1/4"	5'-4"	3	8	11	19	57	442	LBS.
							TOTAL:	57	442	LBS.

* O.C. DISTANCE ON TERMINATION BOLTS TO BE 3 IN. U.N.O.
** USE SHIM PLATES AS REQUIRED.
*** BOLT QTY INCLUDED IN S5 BILL OF MATERIALS
**** STEEL WEIGHT NOT INCLUDED IN S5 BILL OF MATERIALS.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO: 93496.005.01
PROJECT ENG: ASHKAN GHAEEZADEH
DRAWN BY: TEL
CHECKED BY: BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires: 02/10/17

STATE OF CONNECTICUT
CHAD TUTTLE
No. 2
LICENSED
PROFESSIONAL ENGINEER

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OLD SAYBROOK
841289

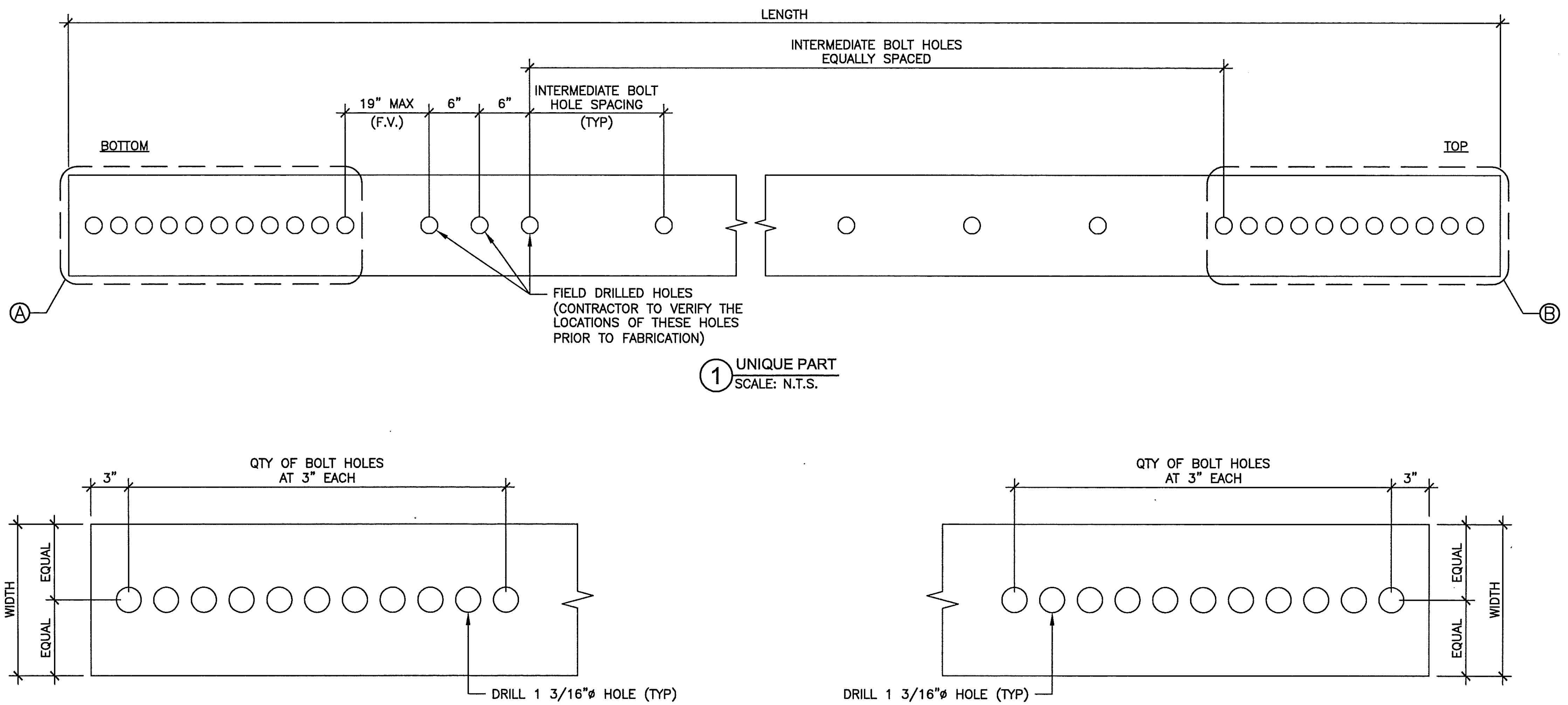
170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
IN-LINE SPLICE DETAIL

SHEET NUMBER: S8
REVISION: 0

\\tower-two\BT Telecom Services\Projects\Crown Castle\93000\93496_841289_Old Saybrook\TOW MOD\005\93496.005.01_Old Saybrook-841289-TowMod.dwg -- Sheet:S8 -- User: Tlonon -- May 6, 2016 -- 8:41 AM



1 UNIQUE PART
SCALE: N.T.S.

2 DETAIL A (BOTTOM)
SCALE: N.T.S.

3 DETAIL B (TOP)
SCALE: N.T.S.

FLAT PLATE DESIGNATION	BLACK WEIGHT (LBS)	WIDTH	THICKNESS	LENGTH	TOTAL QTY OF 1 3/16"Ø BOLT HOLES	QTY OF BOLT HOLES (BOTTOM END)	QTY OF BOLT HOLES (TOP END)	INTERMEDIATE BOLT HOLE SPACING
CCI-CFP-06512520	553	6 1/2"	1 1/4"	20'-0"	32	11	11	1'-7"

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO:	93496.005.01
PROJECT ENG: ASHKAN GHAEEZADEH	
DRAWN BY:	TEL
CHECKED BY:	BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17

STATE OF CONNECTICUT ★ CHAD TUTTLE ★ No. 23924 LICENSED PROFESSIONAL ENGINEER

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OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
PART DETAILS

SHEET NUMBER: D1
REVISION: 0

\\tower-two\BT Telecom Services\Projects\Crown Castle\93000\93496_841289_Old Saybrook\TOW MOD\005\93496.005.01_Old Saybrook-841289-TowMod.dwg - Sheet:D1 - User: Tlonon - May 6, 2016 - 8:41 AM

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

May 13, 2016

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 Long Term 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,

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

May 13, 2016

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 Long Term 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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Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

May 6, 2016

Mr. Timothy Howell
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(980) 209-8242

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
ModDwgs@btgrp.com

Subject:	**Structural Modification Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2019
	Carrier Site Name:	Old Saybroook
Crown Castle Designation:	**Crown Castle BU Number:**	841289
	Crown Castle Site Name:	Old Saybrook
	Crown Castle JDE Job Number:	357650
	Crown Castle Work Order Number:	1228779
	Crown Castle Application Number:	322613 Rev. 4
Engineering Firm Designation:	**B+T Group Project Number:**	93496.005.01
Site Data:	**170 Ingham Hill Road, Old Saybrook, CT, Middlesex County** **Latitude *41° 18' 35.55"*, Longitude *-72° 23' 51.13"*** **150 Foot - Monopole**	

Dear Mr. Howell,

B+T Group is pleased to submit this **"Structural Modification 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 897120, in accordance with application 322613, revision 4.

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:

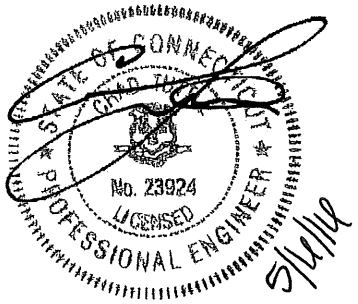
LC4.5: TSA specified load case with proposed modifications **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and IBC 2006 based upon a wind speed of 85 mph fastest mile.

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

We at *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.

Respectfully submitted by:
B+T Engineering, Inc.
PEC.0001564; Exp.: 02/10/17



Ashkan Ghaeezadeh, E.I.T.
Project Engineer

Chad E. Tuttle, P.E.
Engineer of Record

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

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 in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
149.0	152.0	3	Andrew	SBNHH-1D65A	2 1	5/8 3/8	--
		3	Ericsson	WCS RRUS-32-B30			
		1	Raycap	DC6-48-60-18-8F			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	163.0	1	Andrew	CSHAX-6516-R2	6	1-1/4	1
	160.0	1	--	Pipe Mount [PM 701-1]			
149.0	156.0	1	Andrew	KP4F-23A	--	--	1
	152.0	**1**	**KMW Com.**	**AM-X-CD-14-65-00T-RET**	**--**	**--**	**2**
		2	**KMW Com.**	**AM-X-CW-14-65-00T-RET**			
		3	KMW Com.	AM-X-CD-14-65-00T-RET	12 1	1-1/4 7/8	1
		3	Powerwave Tech.	7770.00			
		6	Powerwave Tech.	TT19-08BP111-001			
	149.0	1	--	Platform Mount [LP 403-1]			
148.0	150.0	6	Ericsson	RRUS 11	2 1	5/8 3/8	1
	148.0	1	--	Side Arm Mount [SO 102-3]			
	147.0	1	Raycap	DC6-48-60-18-8F			
130.0	133.0	3	Alcatel Lucent	RRH2X60-AWS	12 1	1-1/4 1-5/8	1
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Antel	BXA-171085-8BF-EDIN-0			
		3	Antel	BXA-80080/4CF			
		3	Commscope	HBXX-6517DS-A2M			
		3	Commscope	LNX-6514DS-A1M			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		6	RFS Celwave	FD9R6004/2C-3L			
	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

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) 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 Re# 4	322613	CCIsites
Tower Manufacturer Drawings	EEI, Job No. 3503	4287398	CCIsites
Tower Mapping	ReliaPOLE, Project No. 14-0703NEd	5204147	CCIsites
Tower Modification Drawings	GPD, Date: 09/30/2008	4489382	CCIsites
Post Modification Inspection	GPD, Date:03/04/2009	4489415	CCIsites
Tower Modification Drawings	GPD, Date:12/15/2011	4478711	CCIsites
Post Modification Inspection	HDG, Date: 03/19/2012	4468635	CCIsites
Tower Modification Drawings	B+T Group, Date: 08/26/2015	5293057	CCIsites
Post Modification Inspection	SGS, Date: 09/01/2015	5874000	CCIsites
Foundation Drawings	FDH Project No. 08-04159E N1	4591935	CCIsites
Geotech Report	FDH Project No. 08-04159E G1	4468634	CCIsites
Antenna Configuration	Crown CAD Package	Date: 03/24/2016	CCIsites

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) 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) – LC4.5

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.75	Pole	TP19.625x15.53x0.25	1	-6.060	810.835	86.8	Pass
L2	123.75 - 110	Pole	TP21.77x19.625x0.482	2	-7.816	1262.228	90.6	Pass
L3	110 - 83	Pole	TP26.134x21.77x0.668	3	-213.900	2205.982	81.2	Pass
		Guy A@91.1	1 5/8	11	152.528	162.000	94.2	Pass
		Guy B@91.1	1 3/8	10	84.990	116.000	73.3	Pass
		Guy C@91.1	1 3/8	9	94.805	116.000	81.7	Pass
L4	83 - 67.5	Pole	TP28.64x26.134x0.545	4	-222.378	1898.272	96.8	Pass
L5	67.5 - 49.917	Pole	TP30.895x26.984x0.585	5	-225.806	2159.806	95.0	Pass
L6	49.917 - 33	Pole	TP33.66x30.895x0.644	6	-229.368	2688.581	79.6	Pass
L7	33 - 32.5	Pole	TP32.963x31.746x0.71	7	-234.257	3146.600	71.7	Pass
L8	32.5 - 0	Pole	TP38.29x32.963x0.438	8	-234.395	2382.044	93.2	Pass
				Summary				
						Pole (L4)	96.8	Pass
						Guy A (L3)	94.2	Pass
						Guy B (L3)	73.3	Pass
						Guy C (L3)	81.7	Pass
						RATING =	**96.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC4.5

Notes	Component	Elevation	% Capacity	Pass / Fail
1	Flange Connections	110’	61.5	Pass
1	Anchor Rods	Base	90.9	Pass
1	Base Plate	Base	77.3	Pass
1	Base Foundation (Structure)	Base	22.5	Pass
1	Base Foundation (Soil)	Base	98.5	Pass
1	Inner Guy Anchor Foundation (Anchor Rod)	Base	79.0	Pass
1	Inner Guy Anchor Foundation (Soil)	Base	92.4	Pass
1	Outer Guy Anchor Foundation (Anchor Rod)	Base	47.8	Pass
1	Outer Guy Anchor Foundation (Soil)	Base	90.8	Pass

Structure Rating (max from all components) =	**98.5%**

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

4.1) Recommendations

1) All modifications proposed in this report shall be installed in accordance with the attached drawings (Appendix D) for the determined available structural capacity to be effective.

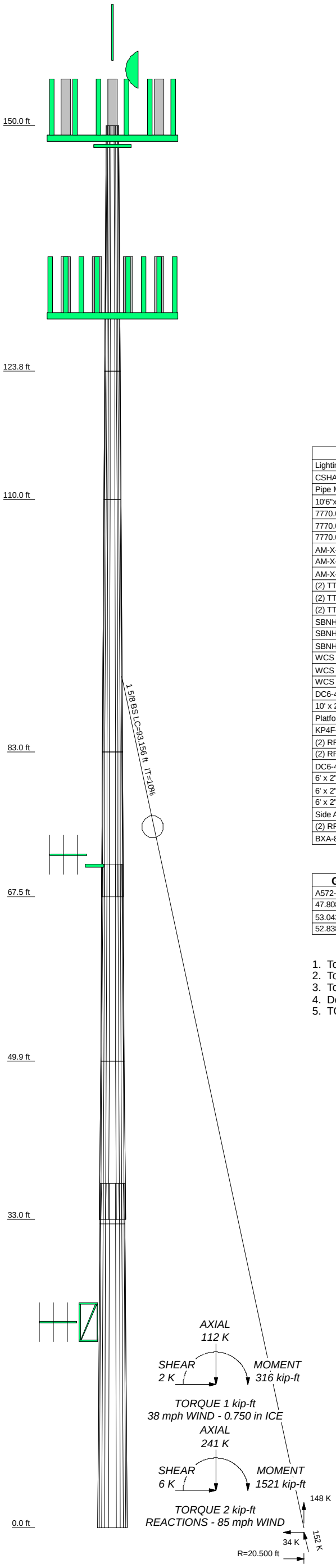
Table 7 –Existing Loading Tilt-Sway Results for 50 mph Service Wind – LC4.5

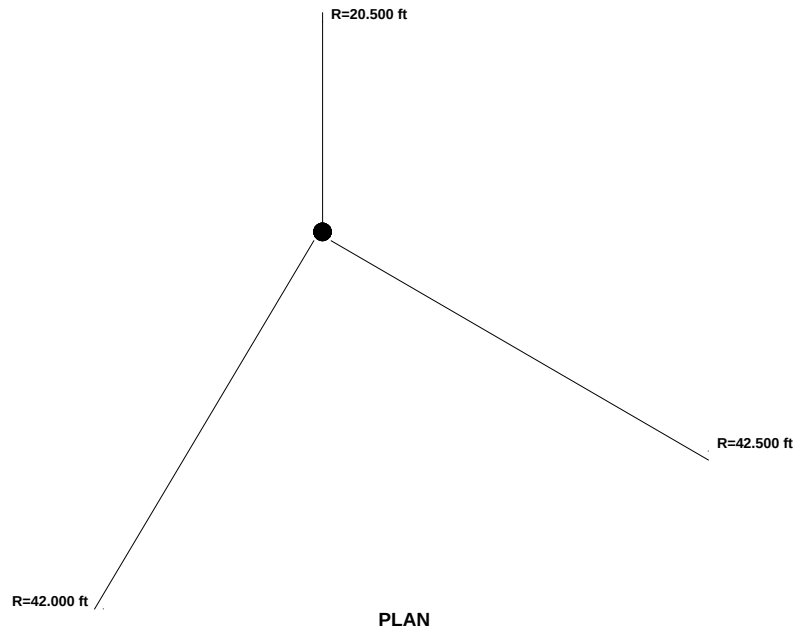
Elevation (ft)	*Dish Model*	*Diameter (ft)*	*Tilt (°)*	*Twist (°)*
156.0	KP4F-23A	4.000	2.412	0.010

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	26.250	12	0.250		15.530	19.625	A572-65	1.2
2	13.750	12	0.482		19.625	21.770	A572-65	1.4
3	27.000	12	0.668		21.770	26.134	47.808044ksi	4.2
4	15.500	12	0.545	3.500	26.134	28.640	53.04341ksi	2.4
5	21.083	12	0.585		26.984	30.895	52.838993ksi	3.7
6	16.917	12	0.644	3.833	30.895	33.660	53.028176ksi	3.6
7	4.333	12	0.710		31.746	32.963	53.604437ksi	1.0
8	32.500	12	0.438		32.963	38.290	A572-65	5.5
							53.607744ksi	22.9





PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 5/8" x 5' (E)	168	BXA-80080/4CF w/ Mount Pipe (E)	130
CSHAX-6516-R2 (E)	160	HBXX-6517DS-A2M w/ Mount Pipe (E)	130
Pipe Mount [PM 701-1] (E)	160	HBXX-6517DS-A2M w/ Mount Pipe (E)	130
10'6"x4" Pipe Mount (E)	155.5	HBXX-6517DS-A2M w/ Mount Pipe (E)	130
7770.00 w/ Mount Pipe (E)	149	BXA-171085-8BF-EDIN-0 w/ Mount Pipe (E)	130
7770.00 w/ Mount Pipe (E)	149	BXA-171085-8BF-EDIN-0 w/ Mount Pipe (E)	130
7770.00 w/ Mount Pipe (E)	149	BXA-171085-8BF-EDIN-0 w/ Mount Pipe (E)	130
AM-X-CW-14-65-00T-RET w/ Mount Pipe (E)	149	LNX-6514DS-A1M w/ Mount Pipe (E)	130
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	149	LNX-6514DS-A1M w/ Mount Pipe (E)	130
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	149	LNX-6514DS-A1M w/ Mount Pipe (E)	130
(2) TT19-08BP111-001 (E)	149	RRH2X60-PCS (E)	130
(2) TT19-08BP111-001 (E)	149	RRH2X60-PCS (E)	130
(2) TT19-08BP111-001 (E)	149	RRH2X60-PCS (E)	130
SBNHH-1D65A w/ Mount Pipe (P)	149	RRH2X60-AWS (E)	130
SBNHH-1D65A w/ Mount Pipe (P)	149	RRH2X60-AWS (E)	130
SBNHH-1D65A w/ Mount Pipe (P)	149	RRH2X60-AWS (E)	130
WCS RRUS-32-B30 (P)	149	(2) FD9R6004/2C-3L (E)	130
WCS RRUS-32-B30 (P)	149	(2) FD9R6004/2C-3L (E)	130
WCS RRUS-32-B30 (P)	149	(2) FD9R6004/2C-3L (E)	130
DC6-48-60-18-8F (P)	149	DB-T1-6Z-8AB-0Z (E)	130
10' x 2" Mount Pipe (E)	149	Platform Mount [LP 403-1] (E)	130
Platform Mount [LP 403-1] (E)	149	GPS (3"x7") (E-Per Photo)	130
KP4F-23A (E)	149	3' x 2" Pipe Mount (E-Per Photo)	130
(2) RRUS 11 (E)	148	BXA-80080/4CF w/ Mount Pipe (E)	130
(2) RRUS 11 (E)	148	Yagi (E-Per Photo)	71
DC6-48-60-18-8F (E)	148	5' x 2" Pipe Mount (E-For Yagi Per photo)	71
6' x 2" Mount Pipe (E-)	148	Side Arm Mount [SO 701-1] (E)	71
6' x 2" Mount Pipe (E)	148	FMO (E)	71
6' x 2" Mount Pipe (E)	148	Side Arm Mount [SO 301-1] (E)	71
Side Arm Mount [SO 102-3] (E)	148	Side Arm Mount [SO 701-1] (E)	22
(2) RRUS 11 (E)	148	5' x 2" Pipe Mount (E-For Yagi Per photo)	22
BXA-80080/4CF w/ Mount Pipe (E)	130	MYA-43012N (E)	22

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	53.028176ksi	53 ksi	68 ksi
47.808044ksi	48 ksi	63 ksi	53.604437ksi	54 ksi	69 ksi
53.04341ksi	53 ksi	68 ksi	53.607744ksi	54 ksi	69 ksi
52.838993ksi	53 ksi	68 ksi			

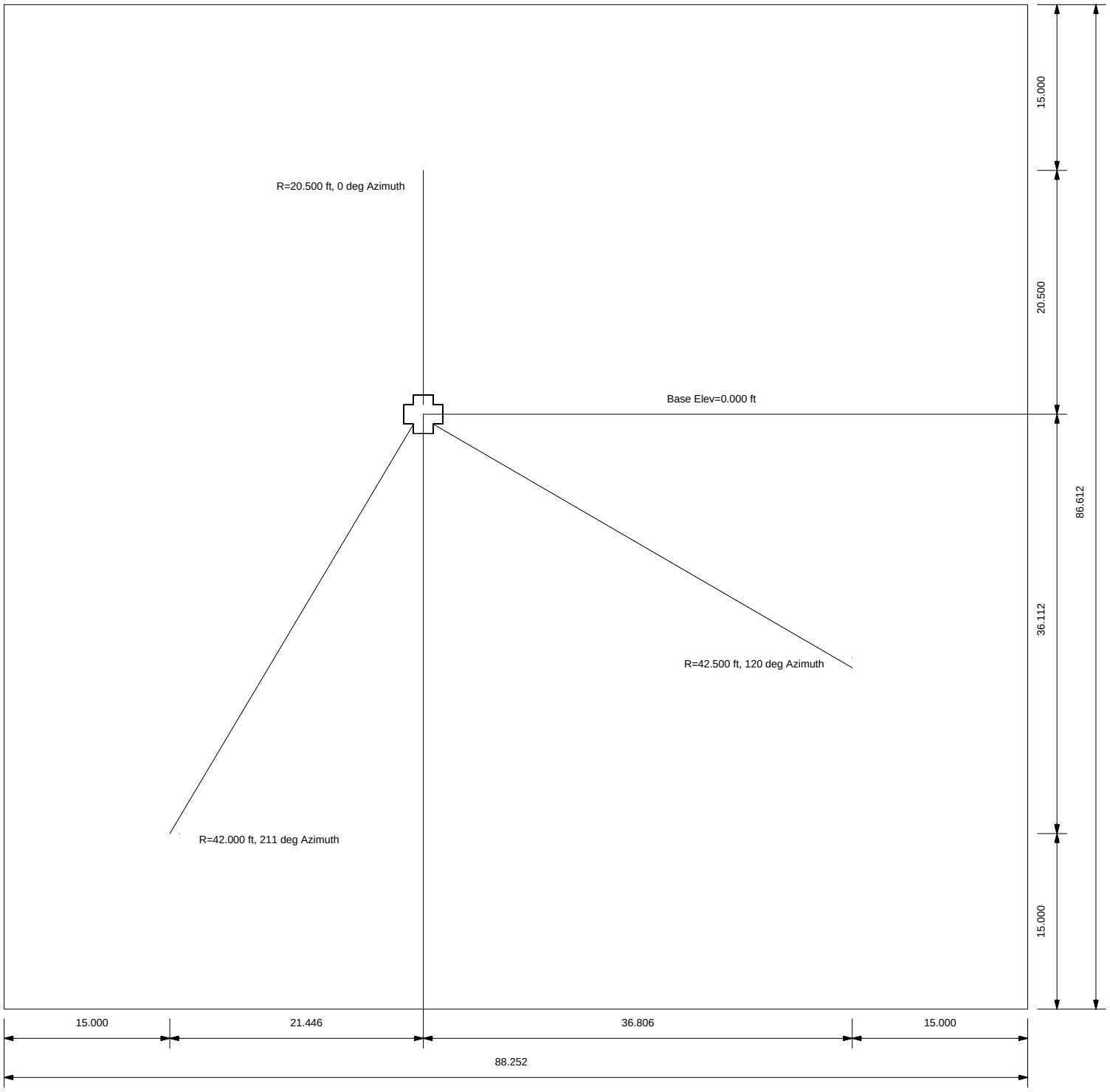
TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.8%

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

Job: 93496.005.01 - OLD SAYBROOK, CT (BU # 84128			
Project:			
Client: Crown Castle	Drawn by: aghaeezadeh	App'd:	
Code: TIA/EIA-222-F	Date: 05/05/16	Scale: NTS	
Path:		Dwg No. E-1	

Plot Plan
Total Area - 0.18 Acres



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Job: ***93496.005.01 - OLD SAYBROOK, CT (BU # 84128***$			
Project:			
Client: Crown Castle	Drawn by: aghaeezadeh	App'd:	
Code: TIA/EIA-222-F	Date: 05/05/16	Scale: NTS	
Path:		Dwg No. E-2	

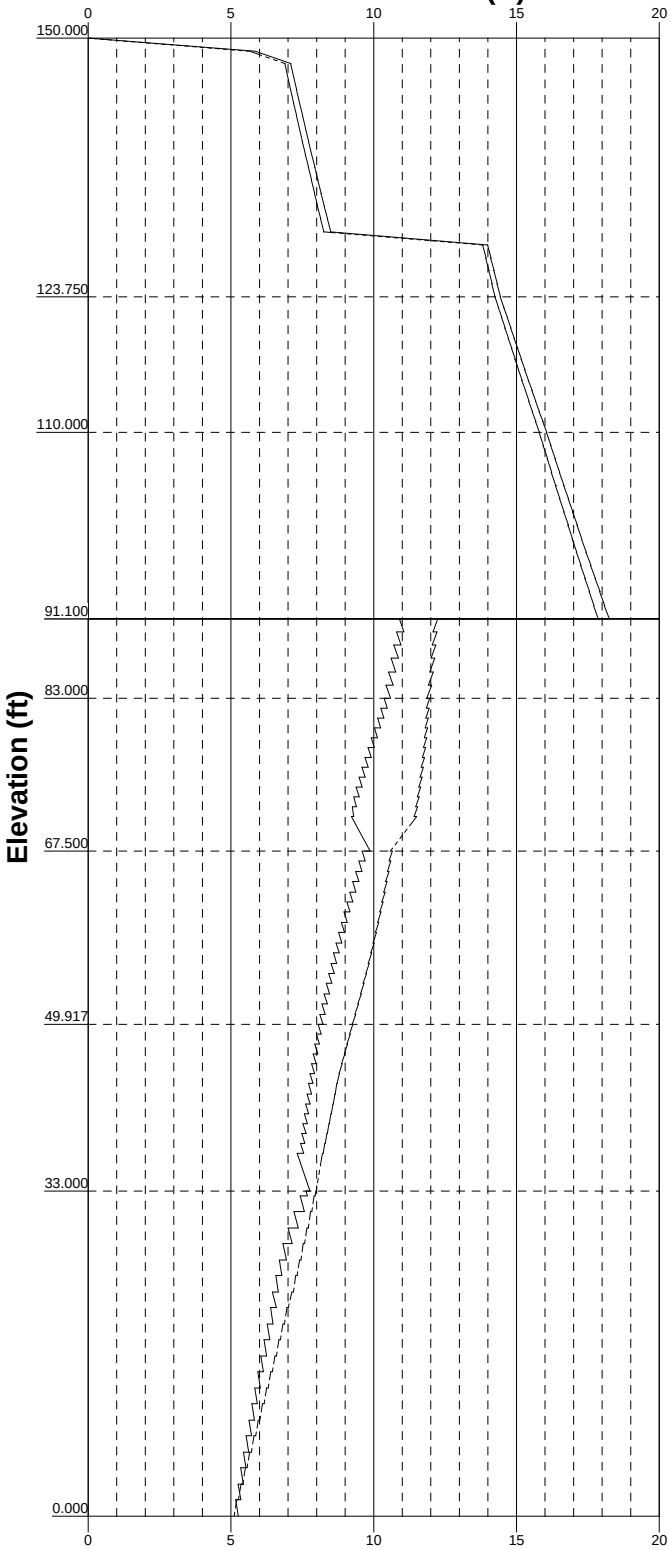
TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Vx Vz

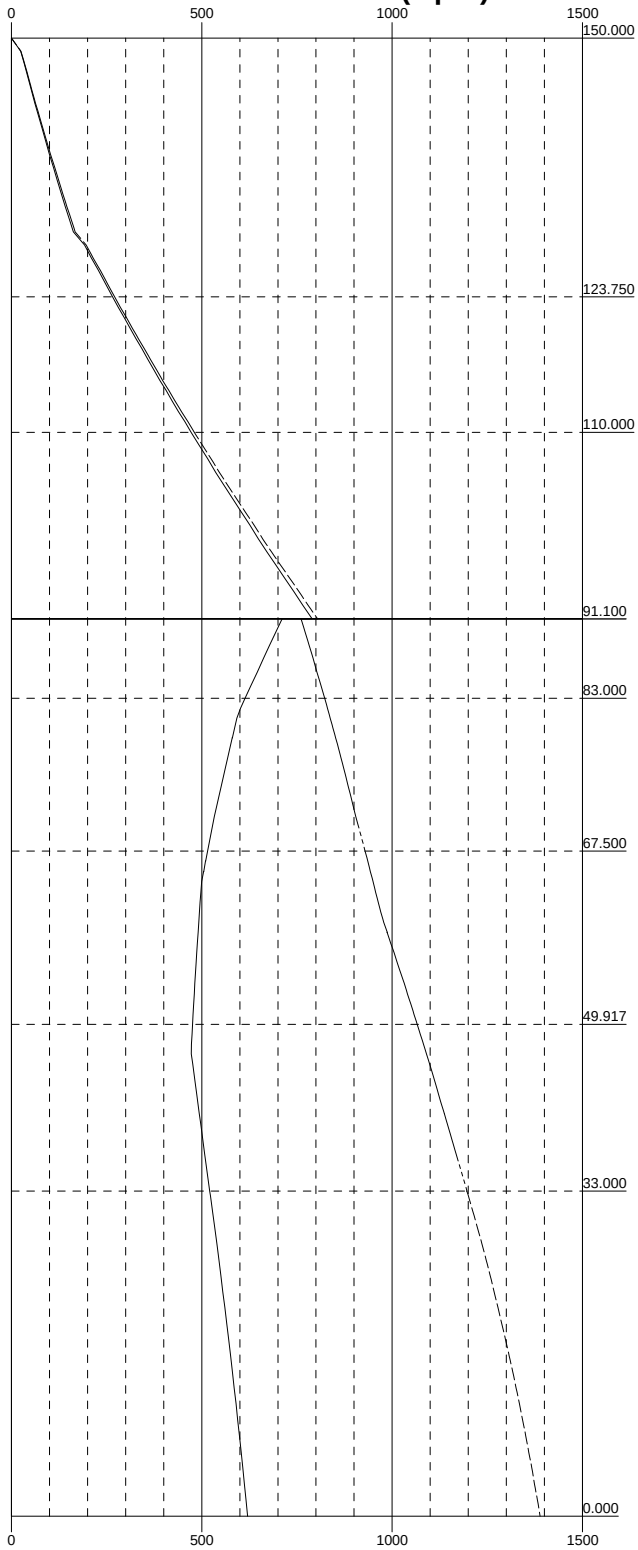
Maximum Values

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



B+T GRP

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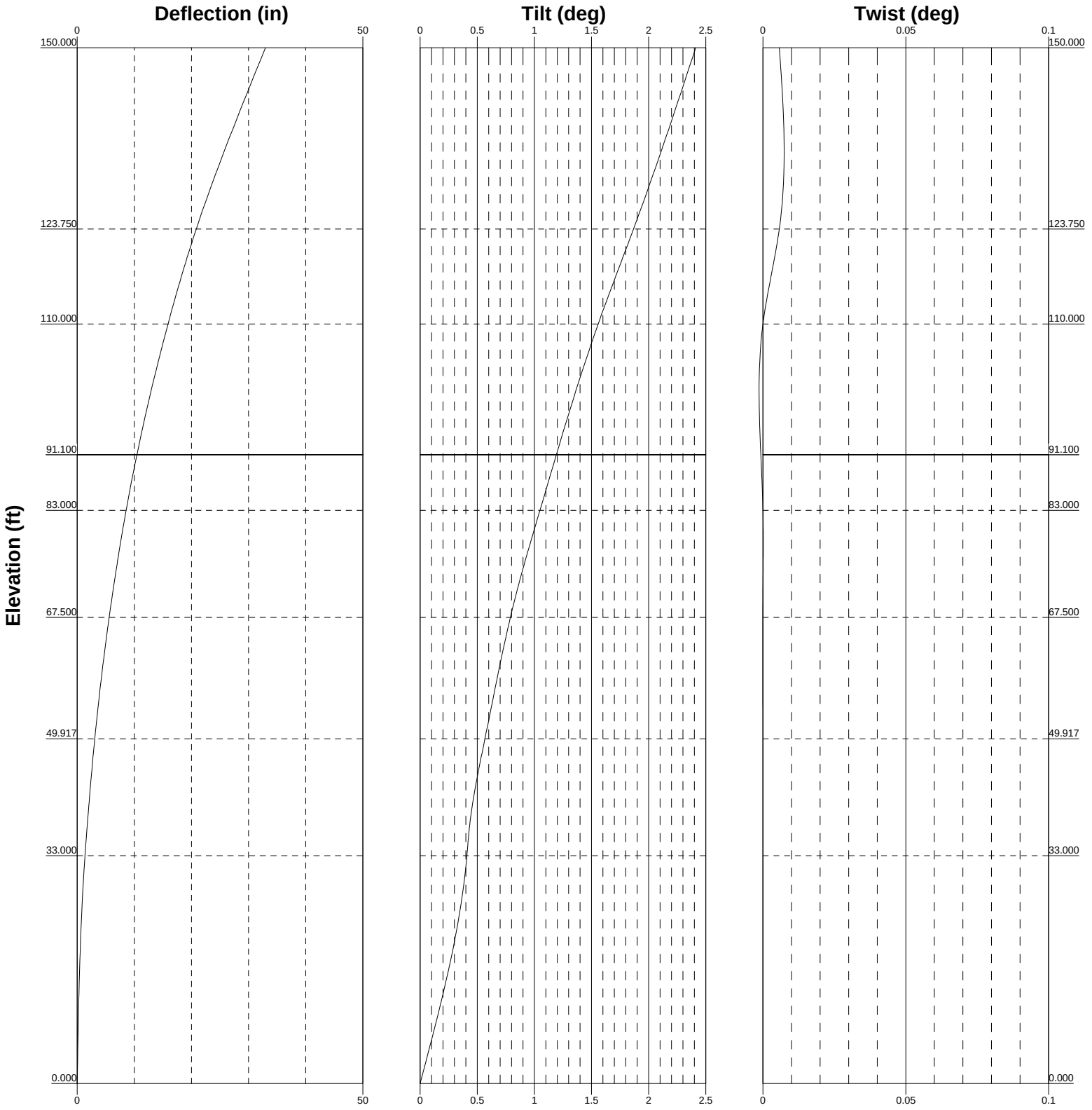
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job:	***93496.005.01 - OLD SAYBROOK, CT (BU # 84128*****		
Project:			
Client: Crown Castle	Drawn by: aghaeezadeh	App'd:	
Code: TIA/EIA-222-F	Date: 05/05/16	Scale: NTS	
Path:		Dwg No. E-4	

TIA/EIA-222-F - Service - 50 mph

Maximum Values



B+T GRP

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Phone: (918) 587-4630
FAX: (918) 295-0265

Job: ***93496.005.01 - OLD SAYBROOK, CT (BU # 84128***			
Project:			
Client: Crown Castle	Drawn by: aghaeezadeh	App'd:	
Code: TIA/EIA-222-F	Date: 05/05/16	Scale: NTS	
Path:		Dwg No. E-5	

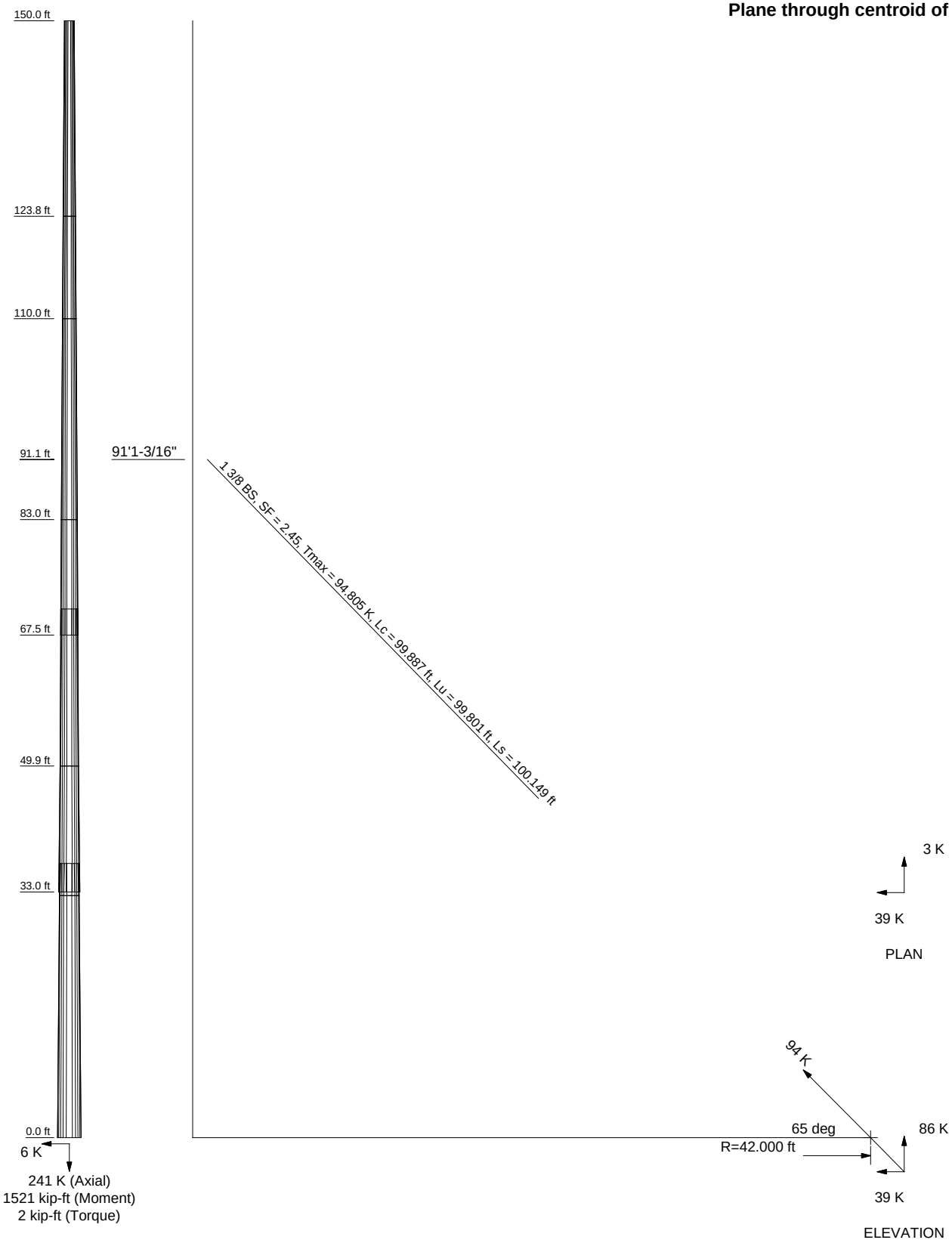
Guy Tensions and Tower Reactions

TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Maximum Values

Anchor 'C'@42 ft Azimuth 211 deg Elev 0 ft

Plane through centroid of tower



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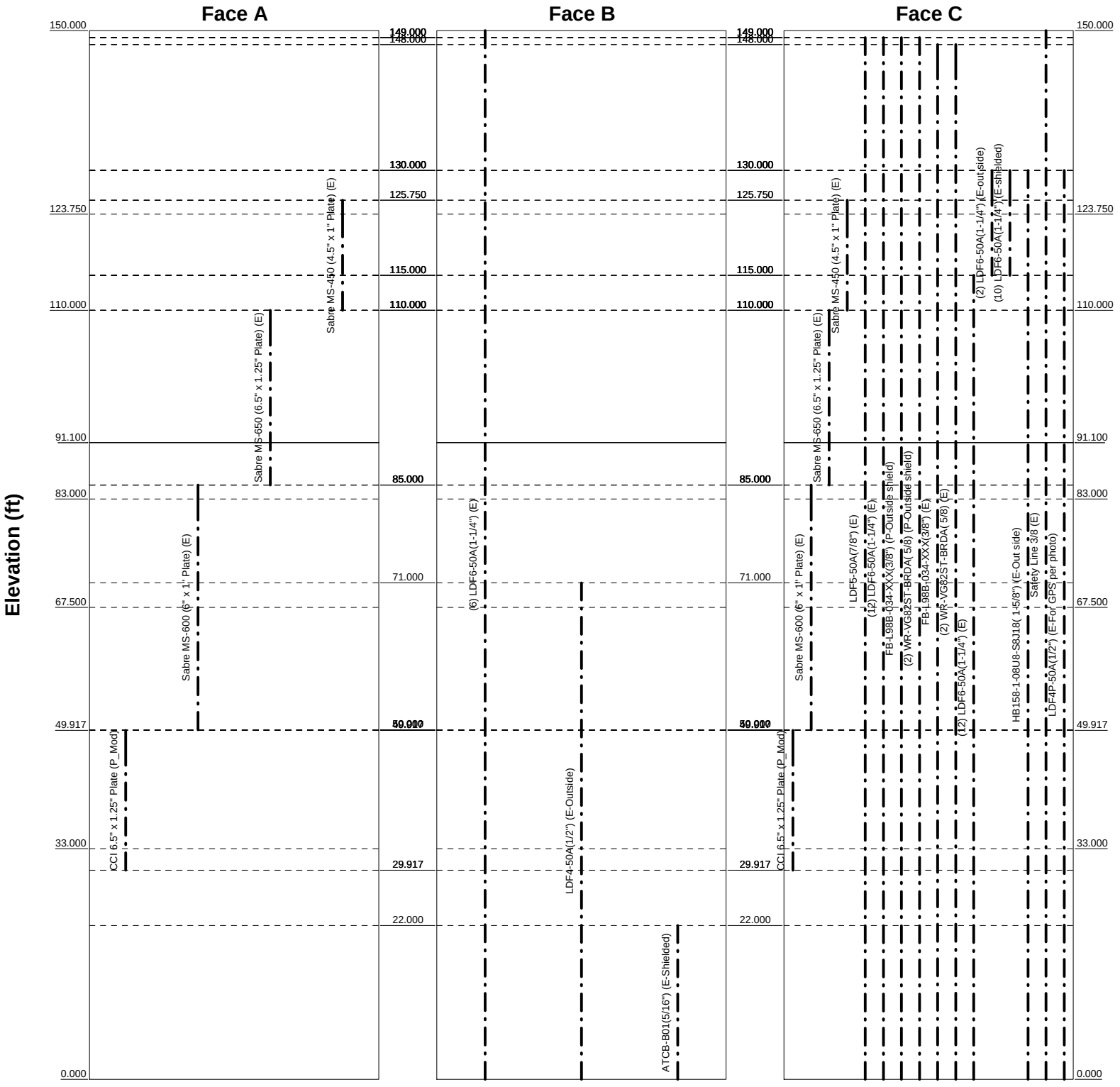
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 93496.005.01 - OLD SAYBROOK, CT (BU # 84128			
Project:			
Client: Crown Castle	Drawn by: aghaeezadeh	App'd:	
Code: TIA/EIA-222-F	Date: 05/05/16	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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Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 93496.005.01 - OLD SAYBROOK, CT (BU # 841289			
Project:			
Client: Crown Castle	Drawn by: aghaeezadeh	App'd:	
Code: TIA/EIA-222-F	Date: 05/05/16	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

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

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 85 mph.
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 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Safety factor used in guy design is 2.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
√ Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	150.000-123.750	26.250	0.000	12	15.530	19.625	0.250	1.000	A572-65 (65 ksi)
L2	123.750-110.000	13.750	0.000	12	19.625	21.770	0.482	1.926	47.808044ksi (48 ksi)
L3	110.000-83.000	27.000	0.000	12	21.770	26.134	0.668	2.674	53.04341ksi (53 ksi)
L4	83.000-67.500	15.500	3.500	12	26.134	28.640	0.545	2.181	52.838993ksi (53 ksi)
L5	67.500-49.917	21.083	0.000	12	26.984	30.895	0.585	2.339	53.028176ksi

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
L6	49.917-33.000	16.917	3.833	12	30.895	33.660	0.644	2.575	(53 ksi) 53.604437ksi
L7	33.000-32.500	4.333	0.000	12	31.746	32.963	0.710	2.839	(54 ksi) 53.607744ksi
L8	32.500-0.000	32.500		12	32.963	38.290	0.438	1.750	(54 ksi) A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/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
	20.317	15.597	747.321	6.936	10.166	73.514	1514.274	7.676	4.590	18.358
L2	20.317	29.685	1388.536	6.853	10.166	136.590	2813.551	14.610	3.969	8.242
	22.538	33.011	1909.540	7.621	11.277	169.333	3869.246	16.247	4.544	9.435
L3	22.538	45.422	2581.534	7.554	11.277	228.923	5230.889	22.355	4.043	6.048
	27.056	54.817	4537.520	9.117	13.538	335.178	9194.246	26.979	5.212	7.797
L4	27.056	44.918	3754.287	9.161	13.538	277.322	7607.202	22.107	5.543	10.168
	29.650	49.316	4968.568	10.058	14.836	334.910	10067.666	24.272	6.215	11.4
L5	28.608	49.702	4421.228	9.451	13.978	316.306	8958.606	24.462	5.665	9.688
	31.985	57.065	6691.776	10.851	16.004	418.141	13559.353	28.086	6.713	11.481
L6	31.985	62.711	7325.117	10.830	16.004	457.716	14842.673	30.864	6.555	10.181
	34.847	68.442	9522.811	11.820	17.436	546.162	19295.797	33.685	7.296	11.332
L7	33.980	70.929	8720.622	11.111	16.444	530.309	17670.345	34.909	6.606	9.307
	34.126	73.710	9787.131	11.547	17.075	573.193	19831.381	36.278	6.932	9.767
L8	34.126	45.820	6187.074	11.644	17.075	362.352	12536.690	22.551	7.662	17.512
	39.641	53.325	9752.222	13.551	19.834	491.687	19760.646	26.245	9.089	20.775

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	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
L1 150.000-123.750				1	1	1			
L2 123.750-110.000				1	1	0.931736			
L3 110.000-83.000				1	1	0.916808			
L4 83.000-67.500				1	1	0.948412			
L5 67.500-49.917				1	1	0.958669			
L6 49.917-33.000				1	1	0.94843			
L7 33.000-32.500				1	1	0.949699			
L8 32.500-0.000				1	1	1			

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
91.1	BS	A	1 5/8	32.400	10%	24000.000	5.550	93.077	20.500	0.000	0.000	100%
		B	1 3/8	23.200	10%	24000.000	3.970	100.007	42.500	0.000	0.000	100%
		C	1 3/8	23.200	10%	24000.000	3.970	99.801	42.000	-30.000	0.000	100%

Guy Data*(cont'd)*

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

Guy Data *(cont'd)*

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

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
91.1	0.517	0.397	0.396		0.737 1.5 sec/pulse	0.850 1.6 sec/pulse	0.846 1.6 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
91.1	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
91.1	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z ksf	q_z Ice ksf	Ice Thickness in
91.1	A	45.550	0.020	0.004	0.780
	B	45.550	0.020	0.004	0.780
	C	45.550	0.020	0.004	0.780

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom K	F_x K	F_y K	F_z K	M_x kip-ft	M_y kip-ft	M_z kip-ft
91.1	A	77.939	32.905 32.400	0.000	32.190	-6.823	-33.297	0.000	0.000
	B	65.527	23.561 23.200	8.388	21.478	4.843	11.108	0.000	-19.240
	C	65.788	23.561 23.200	-4.896	21.522	8.244	19.141	0.000	11.368
			Sum:	**3.492**	75.190	**6.264**	**-3.047**	0.000	**-7.873**

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom K	F_x K	F_y K	F_z K	M_x kip-ft	M_y kip-ft	M_z kip-ft
91.1	A	77.939	45.429 44.715	0.000	44.442	-9.418	-45.970	0.000	0.000
	B	65.527	32.492 31.944	11.558	29.624	6.673	15.321	0.000	-26.537
	C	65.788	32.492 31.943	-6.747	29.684	11.360	26.400	0.000	15.678
			Sum:	**4.812**	103.750	**8.616**	**-4.249**	0.000	**-10.859**

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
91.1	A	77.939	32.905 32.400	0.000	32.190	-6.823	-33.297	0.000	0.000
	B	65.527	23.561 23.200	8.388	21.478	4.843	11.108	0.000	-19.240
	C	65.788	23.561 23.200	-4.896	21.522	8.244	19.141	0.000	11.368
			Sum:	**3.492**	75.190	**6.264**	**-3.047**	0.000	**-7.873**

Guy-Tensioning Information

				Temperature At Time Of Tensioning											
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation		H	V	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
91.1	A	19.47	91.10	33.050	0.72	32.833	0.73	32.617	0.73	32.400	0.74	32.183	0.74	31.967	0.75	31.751	0.75
	B	41.47	91.10	25.010	0.79	24.406	0.81	23.803	0.83	23.200	0.85	22.597	0.87	21.995	0.90	21.394	0.92
	C	40.97	91.10	24.974	0.79	24.382	0.81	23.791	0.83	23.200	0.85	22.609	0.87	22.019	0.89	21.430	0.92

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C_AA_A	Weight
				ft			ft^2/ft	klf
CCI 6.5" x 1.25" Plate (P_Mod)	A	No	CaAa (Out Of Face)	49.917 - 29.917	1	No Ice	0.208	0.000
						1/2" Ice	0.292	0.000
						1" Ice	0.375	0.000
						2" Ice	0.542	0.000
						4" Ice	0.875	0.000
CCI 6.5" x 1.25" Plate (P_Mod)	C	No	CaAa (Out Of Face)	49.917 - 29.917	1	No Ice	0.208	0.000
						1/2" Ice	0.292	0.000
						1" Ice	0.375	0.000
						2" Ice	0.542	0.000
						4" Ice	0.875	0.000
*								
Sabre MS-600 (6" x 1" Plate) (E)	A	No	CaAa (Out Of Face)	85.000 - 50.000	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000
Sabre MS-600 (6" x 1" Plate) (E)	C	No	CaAa (Out Of Face)	85.000 - 50.000	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
*								
Sabre MS-650 (6.5" x 1.25" Plate) (E)	A	No	CaAa (Out Of Face)	110.000 - 85.000	1	No Ice	0.208	0.000
						1/2" Ice	0.292	0.000
						1" Ice	0.375	0.000
						2" Ice	0.542	0.000
						4" Ice	0.875	0.000
Sabre MS-650 (6.5" x 1.25" Plate) (E)	C	No	CaAa (Out Of Face)	110.000 - 85.000	1	No Ice	0.208	0.000
						1/2" Ice	0.292	0.000
						1" Ice	0.375	0.000
						2" Ice	0.542	0.000
						4" Ice	0.875	0.000
*								
Sabre MS-450 (4.5" x 1" Plate) (E)	A	No	CaAa (Out Of Face)	125.750 - 110.000	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000
Sabre MS-450 (4.5" x 1" Plate) (E)	C	No	CaAa (Out Of Face)	125.750 - 110.000	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000
M								
LDF6-50A(1-1/4") (E)	B	No	Inside Pole	150.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
M								
LDF5-50A(7/8") (E)	C	No	Inside Pole	149.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF6-50A(1-1/4") (E)	C	No	Inside Pole	149.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
FB-L98B-034-XXX(3/8") (P-Outside shield)	C	No	CaAa (Out Of Face)	149.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.022
WR-VG82ST-BRDA(5/8) (P-Outside shield)	C	No	CaAa (Out Of Face)	149.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.007
						4" Ice	0.000	0.023
M								
FB-L98B-034-XXX(3/8") (E)	C	No	Inside Pole	148.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG82ST-BRDA(5/8) (E)	C	No	Inside Pole	148.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
M								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF6-50A(1-1/4") (E)	C	No	Inside Pole	115.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
LDF6-50A(1-1/4") (E-out side)	C	No	CaAa (Out Of Face)	130.000 - 115.000	2	No Ice	0.155	0.001
						1/2" Ice	0.255	0.002
						1" Ice	0.355	0.004
						2" Ice	0.555	0.009
						4" Ice	0.955	0.028
LDF6-50A(1-1/4") (E-shielded)	C	No	CaAa (Out Of Face)	130.000 - 115.000	10	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.009
						4" Ice	0.000	0.028
HB158-1-08U8-S8J18(1-5/8") (E-Out side)	C	No	CaAa (Out Of Face)	130.000 - 0.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.003
						1" Ice	0.398	0.005
						2" Ice	0.598	0.011
						4" Ice	0.998	0.031
M LDF4-50A(1/2") (E-Outside)	B	No	CaAa (Out Of Face)	71.000 - 0.000	1	No Ice	0.063	0.000
						1/2" Ice	0.163	0.001
						1" Ice	0.263	0.002
						2" Ice	0.463	0.007
						4" Ice	0.863	0.023
M ATCB-B01(5/16") (E-Shielded)	B	No	CaAa (Out Of Face)	22.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.021
M Safety Line 3/8 (E)	C	No	CaAa (Out Of Face)	150.000 - 0.000	1	No Ice	0.037	0.000
						1/2" Ice	0.137	0.001
						1" Ice	0.238	0.001
						2" Ice	0.437	0.002
						4" Ice	0.838	0.004
M LDF4P-50A(1/2") (E-For GPS per photo)	C	No	Inside Pole	130.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-123.750	A	0.000	0.000	0.000	0.333	0.000
		B	0.000	0.000	0.000	0.000	0.104
		C	0.000	0.000	0.000	4.493	0.306
L2	123.750-110.000	A	0.000	0.000	0.000	2.292	0.000
		B	0.000	0.000	0.000	0.000	0.054
		C	0.000	0.000	0.000	8.242	0.264
L3	110.000-83.000	A	0.000	0.000	0.000	5.542	0.000
		B	0.000	0.000	0.000	0.000	0.107

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	11.900	0.518
L4	83.000-67.500	A	0.000	0.000	0.000	2.583	0.000
		B	0.000	0.000	0.000	0.221	0.062
		C	0.000	0.000	0.000	6.234	0.297
L5	67.500-49.917	A	0.000	0.000	0.000	2.917	0.000
		B	0.000	0.000	0.000	1.108	0.072
		C	0.000	0.000	0.000	7.057	0.337
L6	49.917-33.000	A	0.000	0.000	0.000	3.524	0.000
		B	0.000	0.000	0.000	1.066	0.070
		C	0.000	0.000	0.000	7.508	0.325
L7	33.000-32.500	A	0.000	0.000	0.000	0.104	0.000
		B	0.000	0.000	0.000	0.032	0.002
		C	0.000	0.000	0.000	0.222	0.010
L8	32.500-0.000	A	0.000	0.000	0.000	0.538	0.000
		B	0.000	0.000	0.000	2.047	0.135
		C	0.000	0.000	0.000	8.192	0.623

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_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-123.750	A	0.889	0.000	0.000	0.000	0.630	0.000
		B		0.000	0.000	0.000	0.000	0.104
		C		0.000	0.000	0.000	12.792	0.676
L2	123.750-110.000	A	0.873	0.000	0.000	0.000	4.292	0.000
		B		0.000	0.000	0.000	0.000	0.054
		C		0.000	0.000	0.000	18.098	0.662
L3	110.000-83.000	A	0.853	0.000	0.000	0.000	9.379	0.000
		B		0.000	0.000	0.000	0.000	0.107
		C		0.000	0.000	0.000	24.945	0.748
L4	83.000-67.500	A	0.828	0.000	0.000	0.000	4.722	0.000
		B		0.000	0.000	0.000	0.800	0.067
		C		0.000	0.000	0.000	13.505	0.425
L5	67.500-49.917	A	0.803	0.000	0.000	0.000	5.331	0.000
		B		0.000	0.000	0.000	4.019	0.099
		C		0.000	0.000	0.000	15.294	0.482
L6	49.917-33.000	A	0.771	0.000	0.000	0.000	5.697	0.000
		B		0.000	0.000	0.000	3.673	0.093
		C		0.000	0.000	0.000	14.895	0.451
L7	33.000-32.500	A	0.750	0.000	0.000	0.000	0.168	0.000
		B		0.000	0.000	0.000	0.109	0.003
		C		0.000	0.000	0.000	0.440	0.013
L8	32.500-0.000	A	0.750	0.000	0.000	0.000	0.861	0.000
		B		0.000	0.000	0.000	6.923	0.202
		C		0.000	0.000	0.000	18.265	0.858

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.000-123.750	-0.212	0.103	-0.459	0.237
L2	123.750-110.000	-0.536	0.136	-0.838	0.253
L3	110.000-83.000	-0.432	0.017	-0.702	0.101
L4	83.000-67.500	-0.401	0.050	-0.665	0.148
L5	67.500-49.917	-0.349	0.079	-0.511	0.226
L6	49.917-33.000	-0.391	0.053	-0.545	0.201
L7	33.000-32.500	-0.392	0.054	-0.549	0.203
L8	32.500-0.000	-0.220	0.191	-0.344	0.414

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lighting Rod 5/8" x 5'	C	None		0.000	168.000	No Ice	0.313	0.313	0.031
(E)						1/2" Ice	0.826	0.826	0.035
						1" Ice	1.322	1.322	0.041
						2" Ice	1.957	1.957	0.065
						4" Ice	3.338	3.338	0.159
M									
CSHAX-6516-R2	C	From Leg	0.000	0.000	160.000	No Ice	5.818	5.818	0.184
(E)			0.000			1/2" Ice	6.300	6.300	0.245
			3.000			1" Ice	6.793	6.793	0.312
						2" Ice	7.813	7.813	0.462
						4" Ice	9.985	9.985	0.832
10'6"x4" Pipe Mount	C	From Leg	0.000	0.000	155.500	No Ice	4.725	4.725	0.114
(E)			0.000			1/2" Ice	5.615	5.615	0.147
			0.000			1" Ice	6.252	6.252	0.187
						2" Ice	7.553	7.553	0.288
						4" Ice	10.267	10.267	0.582
Pipe Mount [PM 701-1]	C	None		0.000	160.000	No Ice	10.610	10.610	0.278
(E)						1/2" Ice	12.540	12.540	0.370
						1" Ice	14.470	14.470	0.462
						2" Ice	18.330	18.330	0.646
						4" Ice	26.050	26.050	1.014
M									
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	149.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			3.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	149.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			3.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	149.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			3.000			1" Ice	7.128	5.711	0.157

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
AM-X-CW-14-65-00T-RET w/ Mount Pipe (E)	A	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	5.744	4.015	0.049
						1/2" Ice	6.198	4.633	0.094
						1" Ice	6.661	5.276	0.145
						2" Ice	7.618	6.678	0.268
						4" Ice	9.668	9.744	0.624
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	B	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	5.744	4.015	0.035
						1/2" Ice	6.198	4.633	0.080
						1" Ice	6.661	5.276	0.131
						2" Ice	7.618	6.678	0.254
						4" Ice	9.668	9.744	0.610
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	C	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	5.744	4.015	0.035
						1/2" Ice	6.198	4.633	0.080
						1" Ice	6.661	5.276	0.131
						2" Ice	7.618	6.678	0.254
						4" Ice	9.668	9.744	0.610
(2) TT19-08BP111-001 (E)	A	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	0.636	0.516	0.016
						1/2" Ice	0.747	0.619	0.022
						1" Ice	0.867	0.730	0.029
						2" Ice	1.133	0.980	0.049
						4" Ice	1.768	1.582	0.118
(2) TT19-08BP111-001 (E)	B	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	0.636	0.516	0.016
						1/2" Ice	0.747	0.619	0.022
						1" Ice	0.867	0.730	0.029
						2" Ice	1.133	0.980	0.049
						4" Ice	1.768	1.582	0.118
(2) TT19-08BP111-001 (E)	C	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	0.636	0.516	0.016
						1/2" Ice	0.747	0.619	0.022
						1" Ice	0.867	0.730	0.029
						2" Ice	1.133	0.980	0.049
						4" Ice	1.768	1.582	0.118
SBNHH-1D65A w/ Mount Pipe (P)	A	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	6.387	5.190	0.061
						1/2" Ice	6.896	5.961	0.114
						1" Ice	7.402	6.705	0.174
						2" Ice	8.445	8.279	0.316
						4" Ice	10.653	11.643	0.720
SBNHH-1D65A w/ Mount Pipe (P)	B	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	6.387	5.190	0.061
						1/2" Ice	6.896	5.961	0.114
						1" Ice	7.402	6.705	0.174
						2" Ice	8.445	8.279	0.316
						4" Ice	10.653	11.643	0.720
SBNHH-1D65A w/ Mount Pipe (P)	C	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	6.387	5.190	0.061
						1/2" Ice	6.896	5.961	0.114
						1" Ice	7.402	6.705	0.174
						2" Ice	8.445	8.279	0.316
						4" Ice	10.653	11.643	0.720
WCS RRUS-32-B30 (P)	A	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	3.866	2.762	0.077
						1/2" Ice	4.151	3.021	0.105
						1" Ice	4.444	3.290	0.136
						2" Ice	5.055	3.852	0.211
						4" Ice	6.383	5.081	0.412
WCS RRUS-32-B30 (P)	B	From Leg	4.000 0.000 3.000	0.000	149.000	No Ice	3.866	2.762	0.077
						1/2" Ice	4.151	3.021	0.105
						1" Ice	4.444	3.290	0.136
						2" Ice	5.055	3.852	0.211
						4" Ice	6.383	5.081	0.412

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
WCS RRUS-32-B30	C	From Leg	4.000	0.000	149.000	No Ice	3.866	2.762	0.077
(P)			0.000			1/2" Ice	4.151	3.021	0.105
			3.000			1" Ice	4.444	3.290	0.136
						2" Ice	5.055	3.852	0.211
						4" Ice	6.383	5.081	0.412
DC6-48-60-18-8F	A	From Leg	4.000	0.000	149.000	No Ice	1.467	1.467	0.019
(P)			0.000			1/2" Ice	1.667	1.667	0.037
			3.000			1" Ice	1.878	1.878	0.057
						2" Ice	2.333	2.333	0.105
						4" Ice	3.378	3.378	0.239
10' x 2" Mount Pipe	B	From Leg	4.000	0.000	149.000	No Ice	2.000	2.000	0.080
(E)			0.000			1/2" Ice	3.025	3.025	0.096
			0.000			1" Ice	4.067	4.067	0.117
						2" Ice	5.702	5.702	0.181
						4" Ice	8.257	8.257	0.394
Platform Mount [LP 403-1]	C	None		0.000	149.000	No Ice	18.850	18.850	1.500
(E)						1/2" Ice	24.300	24.300	1.797
						1" Ice	29.750	29.750	2.093
						2" Ice	40.650	40.650	2.686
						4" Ice	62.450	62.450	3.872
M									
(2) RRUS 11	A	From Leg	2.000	0.000	148.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) RRUS 11	B	From Leg	2.000	0.000	148.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) RRUS 11	C	From Leg	2.000	0.000	148.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			2.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
DC6-48-60-18-8F	A	From Leg	2.000	0.000	148.000	No Ice	1.467	1.467	0.019
(E)			0.000			1/2" Ice	1.667	1.667	0.037
			-1.000			1" Ice	1.878	1.878	0.057
						2" Ice	2.333	2.333	0.105
						4" Ice	3.378	3.378	0.239
6' x 2" Mount Pipe	A	From Leg	2.000	0.000	148.000	No Ice	1.425	1.425	0.022
(E-)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	B	From Leg	2.000	0.000	148.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	C	From Leg	2.000	0.000	148.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
Side Arm Mount [SO 102-3]	C	None		0.000	148.000	No Ice	3.000	3.000	0.081

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
M									
BXA-80080/4CF w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	5.486 5.937	4.033 4.655	0.033 0.077
(E)			3.000			1" Ice	6.398	5.298	0.127
						2" Ice	7.349	6.704	0.248
						4" Ice	9.389	9.778	0.600
BXA-80080/4CF w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	5.486 5.937	4.033 4.655	0.033 0.077
(E)			3.000			1" Ice	6.398	5.298	0.127
						2" Ice	7.349	6.704	0.248
						4" Ice	9.389	9.778	0.600
BXA-80080/4CF w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	5.486 5.937	4.033 4.655	0.033 0.077
(E)			3.000			1" Ice	6.398	5.298	0.127
						2" Ice	7.349	6.704	0.248
						4" Ice	9.389	9.778	0.600
HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	8.976 9.647	6.963 8.182	0.067 0.137
(E)			3.000			1" Ice	10.291	9.144	0.215
						2" Ice	11.595	11.022	0.398
						4" Ice	14.321	15.027	0.914
HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	8.976 9.647	6.963 8.182	0.067 0.137
(E)			3.000			1" Ice	10.291	9.144	0.215
						2" Ice	11.595	11.022	0.398
						4" Ice	14.321	15.027	0.914
HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	8.976 9.647	6.963 8.182	0.067 0.137
(E)			3.000			1" Ice	10.291	9.144	0.215
						2" Ice	11.595	11.022	0.398
						4" Ice	14.321	15.027	0.914
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	3.179 3.555	3.353 3.971	0.029 0.061
(E)			3.000			1" Ice	3.964	4.595	0.099
						2" Ice	4.853	5.893	0.193
						4" Ice	6.767	8.885	0.488
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	3.179 3.555	3.353 3.971	0.029 0.061
(E)			3.000			1" Ice	3.964	4.595	0.099
						2" Ice	4.853	5.893	0.193
						4" Ice	6.767	8.885	0.488
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	3.179 3.555	3.353 3.971	0.029 0.061
(E)			3.000			1" Ice	3.964	4.595	0.099
						2" Ice	4.853	5.893	0.193
						4" Ice	6.767	8.885	0.488
LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	8.648 9.305	7.082 8.273	0.065 0.134
(E)			3.000			1" Ice	9.930	9.185	0.211
						2" Ice	11.204	11.023	0.393
						4" Ice	13.872	15.063	0.902
LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	8.648 9.305	7.082 8.273	0.065 0.134

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			3.000			1" Ice	9.930	9.185	0.211
						2" Ice	11.204	11.023	0.393
						4" Ice	13.872	15.063	0.902
LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	130.000	No Ice 1/2" Ice	8.648 9.305	7.082 8.273	0.065 0.134
(E)			3.000			1" Ice	9.930	9.185	0.211
						2" Ice	11.204	11.023	0.393
						4" Ice	13.872	15.063	0.902
RRH2X60-PCS	A	From Leg	4.000	0.000	130.000	No Ice	2.567	2.011	0.055
(E)			0.000 3.000			1/2" Ice 1" Ice	2.791 3.025	2.218 2.435	0.075 0.099
						2" Ice	3.517	2.894	0.155
						4" Ice	4.606	3.915	0.313
RRH2X60-PCS	B	From Leg	4.000	0.000	130.000	No Ice	2.567	2.011	0.055
(E)			0.000 3.000			1/2" Ice 1" Ice	2.791 3.025	2.218 2.435	0.075 0.099
						2" Ice	3.517	2.894	0.155
						4" Ice	4.606	3.915	0.313
RRH2X60-PCS	C	From Leg	4.000	0.000	130.000	No Ice	2.567	2.011	0.055
(E)			0.000 3.000			1/2" Ice 1" Ice	2.791 3.025	2.218 2.435	0.075 0.099
						2" Ice	3.517	2.894	0.155
						4" Ice	4.606	3.915	0.313
RRH2X60-AWS	A	From Leg	4.000	0.000	130.000	No Ice	3.957	1.816	0.060
(E)			0.000 3.000			1/2" Ice 1" Ice	4.272 4.596	2.075 2.360	0.083 0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
RRH2X60-AWS	B	From Leg	4.000	0.000	130.000	No Ice	3.957	1.816	0.060
(E)			0.000 3.000			1/2" Ice 1" Ice	4.272 4.596	2.075 2.360	0.083 0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
RRH2X60-AWS	C	From Leg	4.000	0.000	130.000	No Ice	3.957	1.816	0.060
(E)			0.000 3.000			1/2" Ice 1" Ice	4.272 4.596	2.075 2.360	0.083 0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
(2) FD9R6004/2C-3L	A	From Leg	4.000	0.000	130.000	No Ice	0.367	0.085	0.003
(E)			0.000 3.000			1/2" Ice 1" Ice	0.451 0.543	0.136 0.196	0.005 0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L	B	From Leg	4.000	0.000	130.000	No Ice	0.367	0.085	0.003
(E)			0.000 3.000			1/2" Ice 1" Ice	0.451 0.543	0.136 0.196	0.005 0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L	C	From Leg	4.000	0.000	130.000	No Ice	0.367	0.085	0.003
(E)			0.000 3.000			1/2" Ice 1" Ice	0.451 0.543	0.136 0.196	0.005 0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
DB-T1-6Z-8AB-0Z	A	From Leg	4.000	0.000	130.000	No Ice	5.600	2.333	0.044
(E)			0.000 3.000			1/2" Ice 1" Ice	5.915 6.240	2.558 2.791	0.080 0.120
						2" Ice	6.914	3.284	0.213

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	8.365	4.373	0.455
Platform Mount [LP 403-1]	C	None		0.000	130.000	No Ice	18.850	18.850	1.500
(E)						1/2" Ice	24.300	24.300	1.797
						1" Ice	29.750	29.750	2.093
						2" Ice	40.650	40.650	2.686
						4" Ice	62.450	62.450	3.872
M									
FMO	C	From Leg	2.000	0.000	71.000	No Ice	9.800	9.800	0.010
(E)			0.000			1/2" Ice	10.284	10.284	0.181
			1.000			1" Ice	10.777	10.777	0.361
						2" Ice	11.788	11.788	0.747
						4" Ice	13.914	13.914	1.632
Side Arm Mount [SO 301-1]	C	From Leg	1.000	0.000	71.000	No Ice	1.000	0.900	0.023
(E)			0.000			1/2" Ice	1.390	1.420	0.033
			0.000			1" Ice	1.780	1.940	0.042
						2" Ice	2.560	2.980	0.061
						4" Ice	4.120	5.060	0.100
M									
MYA-43012N	C	From Leg	3.000	0.000	22.000	No Ice	0.620	0.620	0.005
(E)			0.000			1/2" Ice	1.116	1.116	0.006
			0.000			1" Ice	1.612	1.612	0.008
						2" Ice	2.604	2.604	0.011
						4" Ice	4.588	4.588	0.017
5' x 2" Pipe Mount	C	From Leg	3.000	0.000	22.000	No Ice	1.000	1.000	0.029
(E-For Yagi Per photo)			0.000			1/2" Ice	1.393	1.393	0.037
			0.000			1" Ice	1.703	1.703	0.048
						2" Ice	2.351	2.351	0.082
						4" Ice	3.778	3.778	0.196
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	22.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
M									
Yagi	A	From Leg	3.000	0.000	71.000	No Ice	0.058	0.058	0.010
(E-Per Photo)			0.000			1/2" Ice	0.095	0.095	0.011
			0.000			1" Ice	0.140	0.140	0.013
						2" Ice	0.257	0.257	0.019
						4" Ice	0.594	0.594	0.049
5' x 2" Pipe Mount	A	From Leg	3.000	0.000	71.000	No Ice	1.000	1.000	0.029
(E-For Yagi Per photo)			0.000			1/2" Ice	1.393	1.393	0.037
			0.000			1" Ice	1.703	1.703	0.048
						2" Ice	2.351	2.351	0.082
						4" Ice	3.778	3.778	0.196
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	71.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
M									
GPS (3"x7")	C	From Leg	4.000	0.000	130.000	No Ice	0.204	0.204	0.008
(E-Per Photo)			0.000			1/2" Ice	0.273	0.273	0.010
			4.000			1" Ice	0.351	0.351	0.013
						2" Ice	0.533	0.533	0.023
						4" Ice	0.999	0.999	0.065
3' x 2" Pipe Mount	C	From Leg	4.000	0.000	130.000	No Ice	0.583	0.583	0.011
(E-Per Photo)			0.000			1/2" Ice	0.770	0.770	0.017

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	0.967	0.967	0.024
						2" Ice	1.417	1.417	0.047
						4" Ice	2.536	2.536	0.126
M									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert 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	1.000 / 0.000 / 7.000	0.000		149.000	4.000	No Ice	12.570	0.070
									1/2" Ice	13.090	0.140
									1" Ice	16.130	0.200
									2" Ice	22.210	0.340
									4" Ice	34.360	0.610
M											

Load Combinations

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

Comb. No.	Description
26	Dead+Wind 330 deg+Ice+Temp+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. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 123.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-13.211	-0.196	-0.045
			Max. Mx	5	-6.175	-271.050	-3.680
			Max. My	8	-6.732	-2.185	-265.608
			Max. Vy	5	14.440	-271.050	-3.680
			Max. Vx	8	14.253	-2.185	-265.608
			Max. Torque	9			0.513
L2	123.75 - 110	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-15.618	0.004	-0.433
			Max. Mx	5	-7.939	-480.419	-6.402
			Max. My	8	-8.555	-3.116	-472.058
			Max. Vy	5	16.058	-480.419	-6.402
			Max. Vx	8	15.804	-3.116	-472.058
			Max. Torque	13			-0.499
L3	110 - 83	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-222.365	-759.091	-336.679
			Max. Mx	5	-215.295	-822.783	-30.930
			Max. My	8	-12.078	-4.519	-789.780
			Max. Vy	5	18.249	-804.123	-10.875
			Max. Vx	8	17.864	-4.519	-789.780
			Max. Torque	6			3.523
		Guy A	Bottom Tension	6	152.044		
			Top Tension	6	152.528		
			Top Cable Vert	6	148.627		
			Top Cable Norm	6	33.903		
			Top Cable Tan	6	5.033		
			Bot Cable Vert	6	-148.058		
			Bot Cable Norm	6	34.149		
			Bot Cable Tan	6	5.479		
		Guy B	Bottom Tension	11	84.633		
			Top Tension	11	84.990		
			Top Cable Vert	11	77.291		
			Top Cable Norm	11	35.341		
			Top Cable Tan	11	0.607		
			Bot Cable Vert	11	-76.751		
			Bot Cable Norm	11	35.656		
			Bot Cable Tan	11	0.827		
		Guy C	Bottom Tension	4	94.451		
			Top Tension	4	94.805		
			Top Cable Vert	4	86.333		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Cable Norm	4	39.137		
			Top Cable Tan	4	1.708		
			Bot Cable Vert	4	-85.793		
			Bot Cable Norm	4	39.455		
			Bot Cable Tan	4	1.923		
L4	83 - 67.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-224.490	-876.453	-382.697
			Max. Mx	5	-217.389	-904.438	-131.188
			Max. My	2	-120.031	-1.807	613.570
			Max. Vy	6	10.473	-769.476	-340.709
			Max. Vx	2	11.958	-1.807	613.570
			Max. Torque	6			3.500
L5	67.5 - 49.917	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-229.360	-1065.868	-461.844
			Max. Mx	6	-229.360	-1065.868	-461.844
			Max. My	8	-153.446	-19.465	-515.191
			Max. Vy	6	9.702	-920.462	-400.394
			Max. Vx	2	10.655	-8.293	435.736
			Max. Torque	6			2.654
L6	49.917 - 33	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-232.435	-1167.462	-507.444
			Max. Mx	6	-232.435	-1167.462	-507.444
			Max. My	6	-232.435	-1167.462	-507.444
			Max. Vy	6	8.158	-1074.008	-465.407
			Max. Vx	2	9.268	-15.523	259.755
			Max. Torque	6			2.609
L7	33 - 32.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-234.386	-1200.175	-522.694
			Max. Mx	6	-234.386	-1200.175	-522.694
			Max. My	6	-234.386	-1200.175	-522.694
			Max. Vy	6	7.679	-1200.175	-522.694
			Max. Vx	4	7.977	-710.165	-188.732
			Max. Torque	6			2.567
L8	32.5 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-240.870	-1388.583	-620.489
			Max. Mx	6	-240.870	-1388.583	-620.489
			Max. My	6	-240.870	-1388.583	-620.489
			Max. Vy	6	7.572	-1212.344	-528.431
			Max. Vx	4	7.913	-711.179	-192.711
			Max. Torque	6			2.566

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	6	240.873	-4.334	-2.564
	Max. H_x	3	116.565	0.834	-3.532
	Max. H_z	33	92.358	-0.398	0.248
	Max. M_x	14	-43.076	-0.265	-0.534
	Max. M_z	6	1388.583	-4.334	-2.564
	Max. Torsion	6	2.159	-4.334	-2.564
	Min. Vert	14	86.885	-0.265	-0.534
	Min. H_x	7	201.089	-5.167	-0.786
	Min. H_z	4	181.971	-2.371	-5.080
	Min. M_x	6	-620.489	-4.334	-2.564
	Min. M_z	9	-298.662	0.103	-0.454

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Torsion	9	-2.348	0.103	-0.454
Guy C @ 42 ft Elev 0 ft Azimuth 211 deg	Max. Vert	34	-0.125	-0.035	0.057
	Max. H_x	10	-0.612	0.002	0.198
	Max. H_z	4	-85.793	-21.800	32.942
	Min. Vert	4	-85.793	-21.800	32.942
	Min. H_x	5	-82.055	-21.912	30.837
	Min. H_z	34	-0.125	-0.035	0.057
Guy B @ 42.5 ft Elev 0 ft Azimuth 120 deg	Max. Vert	31	-0.012	0.011	0.007
	Max. H_x	11	-76.751	31.293	17.112
	Max. H_z	11	-76.751	31.293	17.112
	Min. Vert	11	-76.751	31.293	17.112
	Min. H_x	6	-0.263	-0.001	0.001
	Min. H_z	7	-0.401	0.117	-0.046
Guy A @ 20.5 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-3.220	-0.002	-0.479
	Max. H_x	10	-118.641	1.594	-26.848
	Max. H_z	2	-3.220	-0.002	-0.479
	Min. Vert	6	-148.058	-5.479	-34.149
	Min. H_x	6	-148.058	-5.479	-34.149
	Min. H_z	6	-148.058	-5.479	-34.149

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	97.016	0.306	0.736	56.009	-33.754	-0.008
Dead+Wind 0 deg - No Ice+Guy	138.101	0.297	3.969	74.864	-32.917	-1.457
Dead+Wind 30 deg - No Ice+Guy	116.565	-0.834	3.532	92.619	-85.480	-1.098
Dead+Wind 60 deg - No Ice+Guy	181.971	2.371	5.080	405.889	-779.390	-0.558
Dead+Wind 90 deg - No Ice+Guy	233.724	3.456	4.390	603.606	-1276.979	-1.418
Dead+Wind 120 deg - No Ice+Guy	240.873	4.334	2.564	620.489	-1388.583	-2.159
Dead+Wind 150 deg - No Ice+Guy	201.089	5.167	0.786	461.846	-1070.458	-1.297
Dead+Wind 180 deg - No Ice+Guy	168.175	0.341	-0.217	328.014	-50.607	1.343
Dead+Wind 210 deg - No Ice+Guy	205.906	-0.103	0.454	416.281	298.662	2.348
Dead+Wind 240 deg - No Ice+Guy	215.308	1.569	1.531	410.681	281.924	1.649
Dead+Wind 270 deg - No Ice+Guy	180.931	2.527	2.430	273.472	159.848	0.142
Dead+Wind 300 deg - No Ice+Guy	130.522	2.840	2.482	85.430	3.472	-0.997
Dead+Wind 330 deg - No Ice+Guy	139.653	1.826	3.632	80.039	-16.402	-1.396
Dead+Ice+Temp+Guy	86.885	0.265	0.534	43.076	-26.077	-0.003

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+Wind 0 deg+Ice+Temp+Guy	92.177	0.427	1.509	55.737	-28.078	-0.486
Dead+Wind 30 deg+Ice+Temp+Guy	89.388	-0.046	1.330	55.816	-39.290	-0.197
Dead+Wind 60 deg+Ice+Temp+Guy	98.402	0.485	1.442	96.381	-141.339	0.024
Dead+Wind 90 deg+Ice+Temp+Guy	110.002	1.271	1.452	141.447	-255.700	0.149
Dead+Wind 120 deg+Ice+Temp+Guy	111.564	1.579	1.054	146.118	-280.508	0.143
Dead+Wind 150 deg+Ice+Temp+Guy	101.728	1.309	0.418	107.666	-200.432	0.159
Dead+Wind 180 deg+Ice+Temp+Guy	89.096	0.440	-0.129	57.503	-47.536	0.255
Dead+Wind 210 deg+Ice+Temp+Guy	96.305	0.362	0.139	73.043	11.213	0.246
Dead+Wind 240 deg+Ice+Temp+Guy	100.236	0.824	0.548	77.644	11.613	0.232
Dead+Wind 270 deg+Ice+Temp+Guy	96.483	1.056	0.753	57.496	-5.976	-0.012
Dead+Wind 300 deg+Ice+Temp+Guy	95.245	1.033	1.065	51.377	-15.942	-0.312
Dead+Wind 330 deg+Ice+Temp+Guy	94.456	0.784	1.355	53.377	-21.539	-0.509
Dead+Wind 0 deg - Service+Guy	104.163	0.309	1.836	70.303	-33.718	-0.502
Dead+Wind 30 deg - Service+Guy	99.391	-0.140	1.667	68.459	-42.934	-0.441
Dead+Wind 60 deg - Service+Guy	106.344	0.304	1.687	106.038	-141.906	-0.232
Dead+Wind 90 deg - Service+Guy	122.658	1.384	1.765	169.675	-300.659	-0.101
Dead+Wind 120 deg - Service+Guy	124.756	1.783	1.317	177.370	-333.948	0.000
Dead+Wind 150 deg - Service+Guy	111.500	1.399	0.534	126.759	-227.703	0.211
Dead+Wind 180 deg - Service+Guy	92.358	0.398	-0.248	51.783	-45.074	0.474
Dead+Wind 210 deg - Service+Guy	102.288	0.565	0.058	71.524	-4.999	0.503
Dead+Wind 240 deg - Service+Guy	107.042	0.961	0.411	73.103	-2.570	0.282
Dead+Wind 270 deg - Service+Guy	105.785	1.252	0.755	58.573	-17.758	-0.038
Dead+Wind 300 deg - Service+Guy	107.660	1.144	1.299	63.702	-21.591	-0.292
Dead+Wind 330 deg - Service+Guy	107.269	0.788	1.712	68.998	-26.690	-0.443

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.000	-33.802	0.000	-0.000	33.802	0.000	0.000%
2	-0.046	-33.926	-29.613	0.046	33.926	29.613	0.000%
3	14.736	-33.872	-25.567	-14.736	33.872	25.567	0.000%
4	25.585	-33.805	-14.759	-25.585	33.805	14.759	0.000%
5	29.606	-33.746	0.049	-29.606	33.746	-0.049	0.000%
6	25.686	-33.695	14.891	-25.686	33.695	-14.891	0.000%
7	14.842	-33.664	25.714	-14.842	33.664	-25.714	0.000%
8	0.064	-33.677	29.621	-0.064	33.677	-29.621	0.002%
9	-14.682	-33.731	25.598	14.682	33.731	-25.598	0.000%
10	-25.570	-33.798	14.771	25.570	33.798	-14.771	0.000%
11	-29.606	-33.857	-0.030	29.606	33.857	0.030	0.000%
12	-25.655	-33.908	-14.873	25.655	33.908	14.873	0.000%
13	-14.825	-33.939	-25.724	14.825	33.939	25.724	0.000%
14	0.000	-45.632	0.000	0.000	45.632	0.000	0.000%
15	-0.197	-45.688	-7.663	0.197	45.688	7.663	0.000%
16	3.771	-45.664	-6.546	-3.771	45.664	6.546	0.000%
17	6.581	-45.635	-3.778	-6.581	45.635	3.778	0.000%
18	7.624	-45.609	0.012	-7.624	45.609	-0.012	0.000%
19	6.629	-45.586	3.838	-6.629	45.586	-3.838	0.000%
20	3.821	-45.571	6.613	-3.821	45.571	-6.613	0.000%
21	0.028	-45.576	7.602	-0.028	45.576	-7.602	0.000%
22	-3.768	-45.600	6.548	3.768	45.600	-6.548	0.000%
23	-6.718	-45.629	3.662	6.718	45.629	-3.662	0.000%
24	-7.693	-45.655	-0.124	7.693	45.655	0.124	0.000%
25	-6.693	-45.679	-3.875	6.693	45.679	3.875	0.000%
26	-3.952	-45.693	-6.617	3.952	45.693	6.617	0.000%
27	-0.016	-33.845	-10.247	0.016	33.845	10.247	0.000%
28	5.099	-33.826	-8.847	-5.099	33.826	8.847	0.000%
29	8.853	-33.803	-5.107	-8.853	33.803	5.107	0.001%
30	10.244	-33.782	0.017	-10.244	33.782	-0.017	0.000%
31	8.888	-33.765	5.152	-8.888	33.765	-5.152	0.000%
32	5.136	-33.754	8.898	-5.136	33.754	-8.898	0.000%
33	0.022	-33.758	10.249	-0.022	33.758	-10.249	0.001%
34	-5.080	-33.777	8.857	5.080	33.777	-8.857	0.000%
35	-8.848	-33.800	5.111	8.848	33.800	-5.111	0.000%
36	-10.244	-33.821	-0.010	10.244	33.821	0.010	0.000%
37	-8.877	-33.838	-5.146	8.877	33.838	5.146	0.000%
38	-5.130	-33.849	-8.901	5.130	33.849	8.901	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00021705
2	Yes	5	0.00000001	0.00041133
3	Yes	6	0.00000001	0.00038320
4	Yes	8	0.00000001	0.00026898
5	Yes	10	0.00000001	0.00028432
6	Yes	10	0.00000001	0.00055290
7	Yes	9	0.00000001	0.00030625
8	Yes	6	0.00004719	0.00081089
9	Yes	7	0.00000001	0.00098852
10	Yes	8	0.00000001	0.00014367

11	Yes	7	0.00000001	0.00014700
12	Yes	6	0.00000001	0.00005878
13	Yes	6	0.00000001	0.00011236
14	Yes	5	0.00000001	0.00023000
15	Yes	5	0.00000001	0.00035571
16	Yes	6	0.00000001	0.00010711
17	Yes	7	0.00000001	0.00070432
18	Yes	8	0.00000001	0.00014855
19	Yes	8	0.00000001	0.00013883
20	Yes	7	0.00000001	0.00080578
21	Yes	7	0.00000001	0.00013051
22	Yes	6	0.00000001	0.00092833
23	Yes	7	0.00000001	0.00006906
24	Yes	6	0.00000001	0.00027553
25	Yes	5	0.00000001	0.00047305
26	Yes	5	0.00000001	0.00040608
27	Yes	5	0.00000001	0.00002911
28	Yes	5	0.00000001	0.00008299
29	Yes	6	0.00013283	0.00093650
30	Yes	7	0.00000001	0.00025396
31	Yes	7	0.00000001	0.00026525
32	Yes	7	0.00000001	0.00016109
33	Yes	5	0.00000001	0.00077090
34	Yes	6	0.00000001	0.00010856
35	Yes	6	0.00000001	0.00014567
36	Yes	5	0.00000001	0.00007970
37	Yes	5	0.00000001	0.00005965
38	Yes	5	0.00000001	0.00005785

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.75	32.957	31	2.412	0.008
L2	123.75 - 110	20.848	31	1.866	0.004
L3	110 - 83	15.903	31	1.557	0.003
L4	83 - 67.5	8.567	31	1.049	0.001
L5	71 - 49.917	6.202	31	0.840	0.001
L6	49.917 - 33	3.077	31	0.568	0.001
L7	36.833 - 32.5	1.712	31	0.432	0.001
L8	32.5 - 0	1.329	31	0.409	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.000	Lighting Rod 5/8" x 5'	31	32.957	2.412	0.010	9114
160.000	CSHAX-6516-R2	31	32.957	2.412	0.010	9114
156.000	KP4F-23A	31	32.957	2.412	0.010	9114
155.500	10'6"x4" Pipe Mount	31	32.957	2.412	0.010	9114
149.000	7770.00 w/ Mount Pipe	31	32.466	2.392	0.010	9114
148.000	(2) RRUS 11	31	31.974	2.372	0.010	9114
130.000	BXA-80080/4CF w/ Mount Pipe	31	23.477	2.002	0.007	2277
91.100	Guy	31	10.465	1.194	0.002	2439
71.000	FMO	31	6.202	0.840	0.001	4114
22.000	MYA-43012N	31	0.656	0.319	0.001	4688

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.75	120.963	6	8.097	0.105
L2	123.75 - 110	79.935	6	6.526	0.069
L3	110 - 83	62.428	6	5.635	0.049
L4	83 - 67.5	34.901	6	4.129	0.016
L5	71 - 49.917	25.461	6	3.401	0.008
L6	49.917 - 33	12.681	6	2.344	0.005
L7	36.833 - 32.5	7.040	6	1.786	0.004
L8	32.5 - 0	5.460	6	1.690	0.003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.000	Lighting Rod 5/8" x 5'	6	120.963	8.097	0.123	3271
160.000	CSHAX-6516-R2	6	120.963	8.097	0.123	3271
156.000	KP4F-23A	6	120.963	8.097	0.123	3271
155.500	10'6"x4" Pipe Mount	6	120.963	8.097	0.123	3271
149.000	7770.00 w/ Mount Pipe	6	119.314	8.039	0.121	3271
148.000	(2) RRUS 11	6	117.665	7.982	0.120	3271
130.000	BXA-80080/4CF w/ Mount Pipe	6	88.977	6.921	0.092	814
91.100	Guy	6	42.249	4.586	0.032	1005
71.000	FMO	6	25.461	3.401	0.012	1125
22.000	MYA-43012N	6	2.681	1.318	0.003	1129

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T K	Allowable T_a K	Required S.F.	Actual S.F.
L3	91.100 (A) (11)	1 5/8 BS	32.400	324.001	152.528	162.000	2.000	2.124 ✔
	91.100 (B) (10)	1 3/8 BS	23.200	232.000	84.990	116.000	2.000	2.730 ✔
	91.100 (C) (9)	1 3/8 BS	23.200	232.000	94.805	116.000	2.000	2.447 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 123.75 (1)	TP19.625x15.53x0.25	26.250	0.000	0.0	39.000	15.597	-6.060	608.278	0.010
L2	123.75 - 110 (2)	TP21.77x19.625x0.482	13.750	0.000	0.0	28.685	33.011	-7.816	946.908	0.008
L3	110 - 83 (3)	TP26.134x21.77x0.668	27.000	0.000	0.0	31.826	51.998	-213.900	1654.900	0.129
L4	83 - 67.5 (4)	TP28.64x26.134x0.545	15.500	0.000	0.0	31.703	44.918	-222.378	1424.060	0.156
L5	67.5 - 49.917 (5)	TP30.895x26.984x0.585	21.083	0.000	0.0	31.817	50.924	-225.806	1620.260	0.139
L6	49.917 - 33 (6)	TP33.66x30.895x0.644	16.917	0.000	0.0	32.163	62.711	-229.368	2016.940	0.114
L7	33 - 32.5 (7)	TP32.963x31.746x0.71	4.333	0.000	0.0	32.165	73.389	-234.257	2360.540	0.099
L8	32.5 - 0 (8)	TP38.29x32.963x0.438	32.500	0.000	0.0	39.000	45.820	-234.395	1786.980	0.131

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 123.75 (1)	TP19.625x15.53x0.25	273.682	44.675	39.000	1.145	0.000	0.000	39.000	0.000
L2	123.75 - 110 (2)	TP21.77x19.625x0.482	484.990	34.370	28.685	1.198	0.000	0.000	28.685	0.000
L3	110 - 83 (3)	TP26.134x21.77x0.668	761.535	30.342	31.826	0.953	0.000	0.000	31.826	0.000
L4	83 - 67.5 (4)	TP28.64x26.134x0.545	830.353	35.930	31.703	1.133	0.000	0.000	31.703	0.000
L5	67.5 - 49.917 (5)	TP30.895x26.984x0.585	992.983	35.866	31.817	1.127	0.000	0.000	31.817	0.000
L6	49.917 - 33 (6)	TP33.66x30.895x0.644	1161.600	30.454	32.163	0.947	0.000	0.000	32.163	0.000
L7	33 - 32.5 (7)	TP32.963x31.746x0.71	1304.825	27.559	32.165	0.857	0.000	0.000	32.165	0.000
L8	32.5 - 0 (8)	TP38.29x32.963x0.438	1309.042	43.351	39.000	1.112	0.000	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 123.75 (1)	TP19.625x15.53x0.25	14.588	0.935	26.000	0.073	0.300	0.023	26.000	0.001
L2	123.75 - 110 (2)	TP21.77x19.625x0.482	16.246	0.492	19.123	0.052	0.243	0.008	19.123	0.000
L3	110 - 83 (3)	TP26.134x21.77x0.668	11.627	0.224	21.217	0.021	1.950	0.036	21.217	0.002
L4	83 - 67.5 (4)	TP28.64x26.134x0.545	11.252	0.250	21.136	0.024	3.500	0.071	21.136	0.003
L5	67.5 - 49.917 (5)	TP30.895x26.984x0.585	10.501	0.206	21.211	0.020	2.654	0.045	21.211	0.002
L6	49.917 - 33 (6)	TP33.66x30.895x0.644	8.913	0.142	21.442	0.013	2.609	0.032	21.442	0.001
L7	33 - 32.5 (7)	TP32.963x31.746x0.71	8.494	0.116	21.443	0.011	2.567	0.025	21.443	0.001
L8	32.5 - 0 (8)	TP38.29x32.963x0.438	8.375	0.183	26.000	0.014	2.566	0.040	26.000	0.002

Pole Interaction Design Data

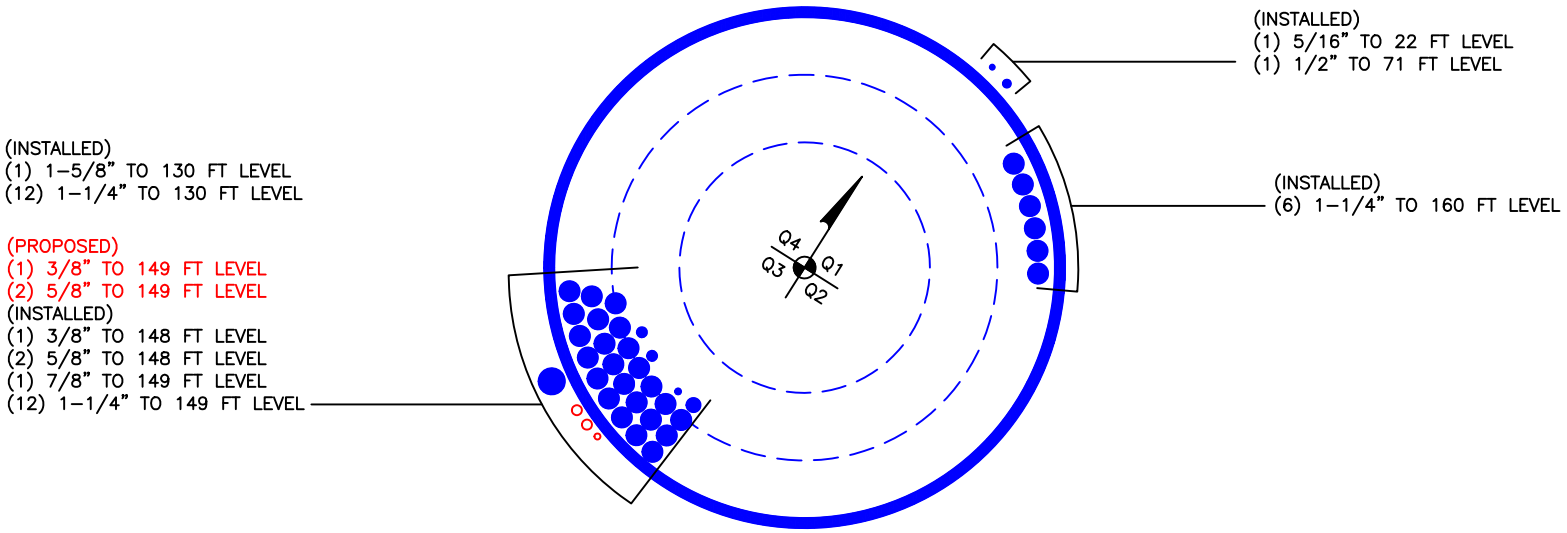
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 123.75 (1)	0.010	1.145	0.000	0.073	0.001	1.157 ✔	1.333	H1-3+VT ✔
L2	123.75 - 110 (2)	0.008	1.198	0.000	0.052	0.000	1.207 ✔	1.333	H1-3+VT ✔
L3	110 - 83 (3)	0.129	0.953	0.000	0.021	0.002	1.083 ✔	1.333	H1-3+VT ✔
L4	83 - 67.5 (4)	0.156	1.133	0.000	0.024	0.003	1.290 ✔	1.333	H1-3+VT ✔
L5	67.5 - 49.917 (5)	0.139	1.127	0.000	0.020	0.002	1.267 ✔	1.333	H1-3+VT ✔
L6	49.917 - 33 (6)	0.114	0.947	0.000	0.013	0.001	1.061 ✔	1.333	H1-3+VT ✔
L7	33 - 32.5 (7)	0.099	0.857	0.000	0.011	0.001	0.956 ✔	1.333	H1-3+VT ✔
L8	32.5 - 0 (8)	0.131	1.112	0.000	0.014	0.002	1.243 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 123.75	Pole	TP19.625x15.53x0.25	1	-6.060	810.835	86.8	Pass
L2	123.75 - 110	Pole	TP21.77x19.625x0.482	2	-7.816	1262.228	90.6	Pass
L3	110 - 83	Pole	TP26.134x21.77x0.668	3	-213.900	2205.982	81.2	Pass
		Guy A@91.1	1 5/8	11	152.528	162.000	94.2	Pass
		Guy B@91.1	1 3/8	10	84.990	116.000	73.3	Pass
		Guy C@91.1	1 3/8	9	94.805	116.000	81.7	Pass
L4	83 - 67.5	Pole	TP28.64x26.134x0.545	4	-222.378	1898.272	96.8	Pass
L5	67.5 - 49.917	Pole	TP30.895x26.984x0.585	5	-225.806	2159.806	95.0	Pass
L6	49.917 - 33	Pole	TP33.66x30.895x0.644	6	-229.368	2688.581	79.6	Pass
L7	33 - 32.5	Pole	TP32.963x31.746x0.71	7	-234.257	3146.600	71.7	Pass
L8	32.5 - 0	Pole	TP38.29x32.963x0.438	8	-234.395	2382.044	93.2	Pass
							Summary	
						Pole (L4)	96.8	Pass
						Guy A (L3)	94.2	Pass
						Guy B (L3)	73.3	Pass
						Guy C (L3)	81.7	Pass
						RATING =	**96.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 841289

APPENDIX C

ADDITIONAL CALCULATIONS

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

Site Data

BU#: *841289*
Site Name: *OLD SAYBROOK,CT*
App #: *225459 Revision # 11*

Pole Manufacturer:	Other

Reactions		
Moment:	108.7	ft-kips
Axial:	7.816	kips
Shear:	16.246	kips
Elevation:	110	feet

B+T: Total moment minus moment going to the bridge stiffener

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

Bolt Data			
Qty:	12		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty:
N/A:	55	<-- Disregard	44.00
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:		
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:	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

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results | Rigid

Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	16.40 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.356 in	
Min PL "treq" for actual **T w/ Pry**:	0.601 in	
Min PL "t1" for actual **T w/o Pry**:	0.809 in	
T allowable with Prying:	36.85 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	16.40 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	35.6% **Pass**	

Exterior Flange Plate Results Flexural Check | Rigid

Compression Side Plate Stress:	22.1 ksi	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	61.5% **Pass**	Comp. Y.L. Length:
No Prying		13.28
Tension Side Stress Ratio, (treq/t)^2:	36.1% **Pass**	

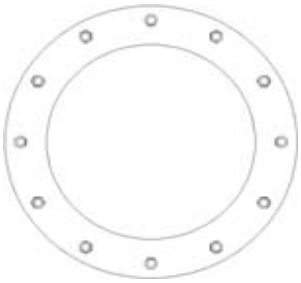
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



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

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

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

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

Site Data

BU#: *841289*
Site Name: *OLD SAYBROOK*
App #: *322613 Revision # 4*

Anchor Rod Data		
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

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	1521	ft-kips
Unfactored Axial, P:	241	kips
Unfactored Shear, V:	6	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	177.3 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	90.9% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	38.7 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	77.3% **Pass**

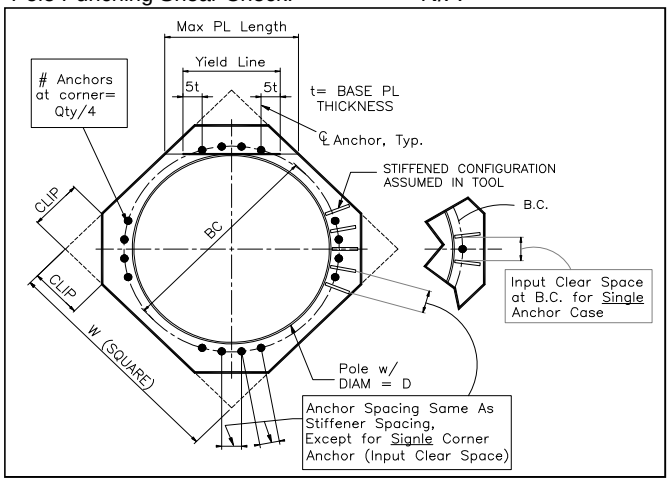
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

PROJECT	**841289 - OLD SAYBROOK,CT**				
SUBJECT	**Foundation Analysis**				
DATE	**05/05/16**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Monopole Pad & Pier Foundation Analysis

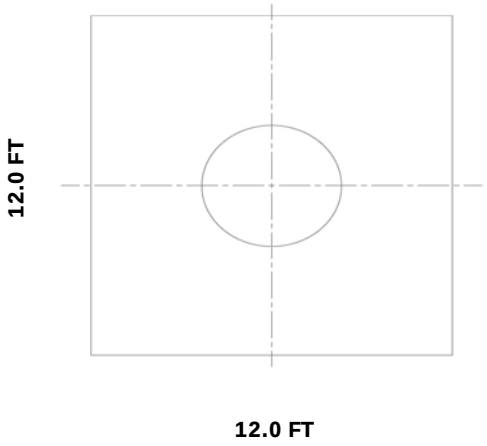
Rev. Type: F

Design Loads:

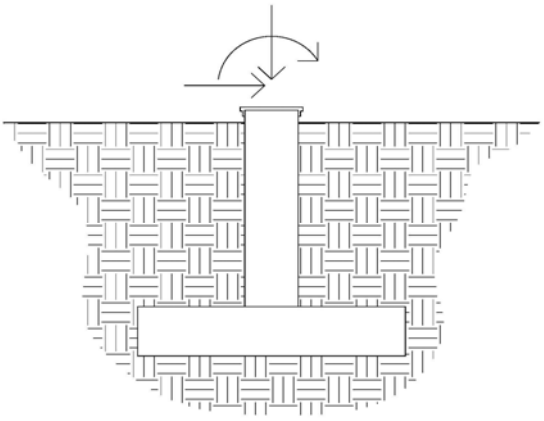
	Input unfactored loads	
Shear:	6.0	kips
Moment:	1,521.0	ft-kips
Tower Height:	150.0	ft
Tower Weight:	241.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	38.29	in
Bearing Depth:	8.7	ft
Pad Width:	12.0	ft
Neglected Depth:	3.3	ft
Thickness:	2.5	ft
Pier Diameter:	8.0	ft
Pier Height Above Grade:	0.3	ft
BP Dist. Above Pier:	0.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	11	
Pier Rebar Quanity:	44	
Pier Tie Size:	4	
Tie Quanity:	7	
Rebar Yield Strength:	60000	psi
Concrete Strength:	3000	psi
Concrete Unit Weight:	0.1084	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.073	kcf
Ult. Bearing Capacity:	30.000	ksf
Angle of Friction:	42.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.400	

** Notes:

Pad steel has not been analyzed.

Summary of Results

Req'd Pier Diam.	OK
Overturning	98.5%
Shear Capacity	6.9%
Bearing	75.5%
Pad Shear - 2-way	22.5%
Pier Moment Capacity	16.0%

PROJECT	**841289 - OLD SAYBROOK,CT**
SUBJECT	**Guy Anchor Analysis**
DATE	**05/05/16**

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Inner Deadman Guy Anchor Analysis Rev F

Design Loads:

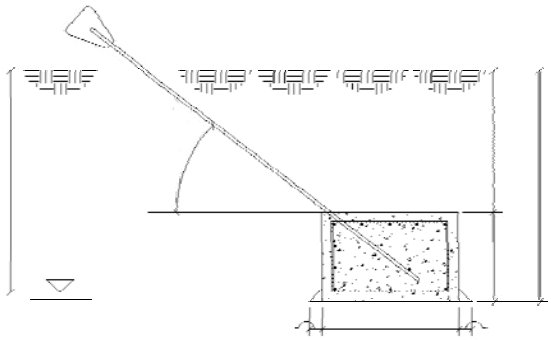
Uplift (Pv)	=	148.00	k
Shear (Ph)	=	34.15	k

Saftey Factors:

Uplift S.F. (Conc. Wt.)	=	1.25
Uplift S.F. (Soil Wt.)	=	2.00
Shear S.F.	=	2.00

Anchor Dims / Properties:

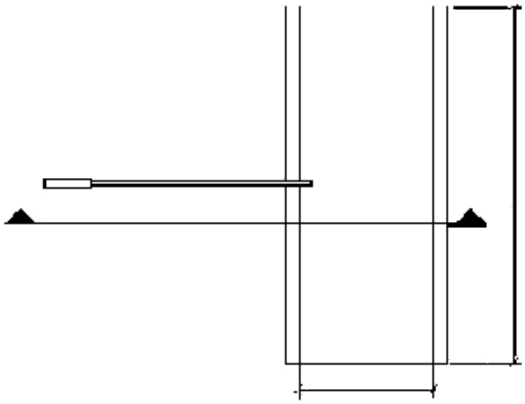
Anchor Radius	=	20.50	ft
Deadman Block Width (W)	=	5.00	ft
Deadman Block Thickness (H)	=	2.00	ft
Deadman Block Length (L)	=	37.00	ft
Depth to BOC (D)	=	8.00	ft
Concrete Density	=	0.09	kcf
Concrete Strength	=	4000	psi



Soil Data:

Frost Depth	=	3.33	ft
Allowable Soil Friction		0.00	ksf

	Unit Wt. (pcf)	Angle (deg)	Cohesion (kcf)
Berm: 3'	0.12	0.00	0.00
Layer 1: 2.7'	0.11	0.00	0.00
Layer 2: 3.33'	0.05	0.00	0.00
Layer 3: 4'	0.05	31.00	0.00
Layer 4: 8'	0.07	42.00	0.00



Steel Reinforcement:

Bar Size	=	9	
No. of Bars in Top of Block	=	13	
No. of Bars in Front of Block	=	4	
Rebar Tensile Strength	=	60000	psi
Clear Cover	=	3.00	in
Strength Reduction Factor	=	0.90	

Anchor Shaft:

Shaft Diameter	=	1.75	in
Shaft Grade	=	50	ksi

Summary of Results

Uplift	92.4%
Lateral	30.2%
Anchor Rod	79.0%
Rebar	Acceptable

PROJECT	**841289 - OLD SAYBROOK,CT**
SUBJECT	**Guy Anchor Analysis**
DATE	**05/05/16**

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Outer A Deadman Guy Anchor Analysis Rev F

Design Loads:

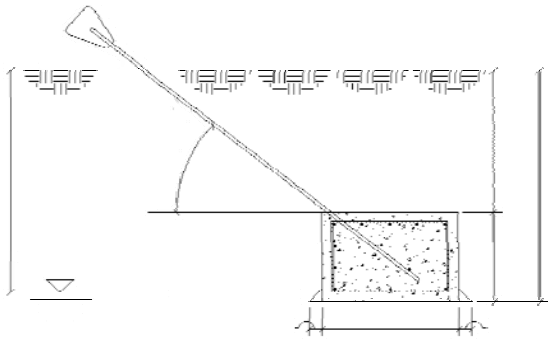
Uplift (Pv)	=	85.80	k
Shear (Ph)	=	32.94	k

Saftey Factors:

Uplift S.F. (Conc. Wt.)	=	1.25
Uplift S.F. (Soil Wt.)	=	2.00
Shear S.F.	=	2.00

Anchor Dims / Properties:

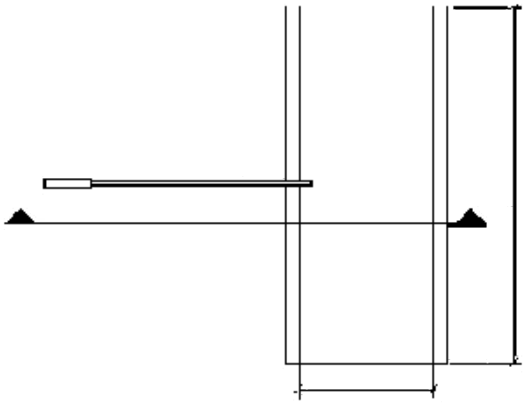
Anchor Radius	=	42.00	ft
Deadman Block Width (W)	=	5.00	ft
Deadman Block Thickness (H)	=	2.00	ft
Deadman Block Length (L)	=	30.00	ft
Depth to BOC (D)	=	8.00	ft
Concrete Density	=	0.09	kcf
Concrete Strength	=	4000	psi



Soil Data:

Frost Depth	=	3.33	ft
Allowable Soil Friction		0.00	ksf

	Unit Wt. (pcf)	Angle (deg)	Cohesion (kcf)
Layer 1: 2.7'	0.11	0.00	0.00
Layer 2: 3.33'	0.05	0.00	0.00
Layer 3: 4'	0.05	31.00	0.00
Layer 4: 8'	0.07	42.00	0.00



Steel Reinforcement:

Bar Size	=	9	
No. of Bars in Top of Block	=	13	
No. of Bars in Front of Block	=	4	
Rebar Tensile Strength	=	60000	psi
Clear Cover	=	3.00	in
Strength Reduction Factor	=	0.90	

Anchor Shaft:

Shaft Diameter	=	1.75	in
Shaft Grade	=	50	ksi

Summary of Results

Uplift	90.8%
Lateral	37.7%
Anchor Rod	47.8%
Rebar	50.4%

APPENDIX D

TOWER MODIFICATION DRAWINGS

TOWER MODIFICATION DRAWINGS
PREPARED FOR: CROWN CASTLE

PROJECT CONTACTS:

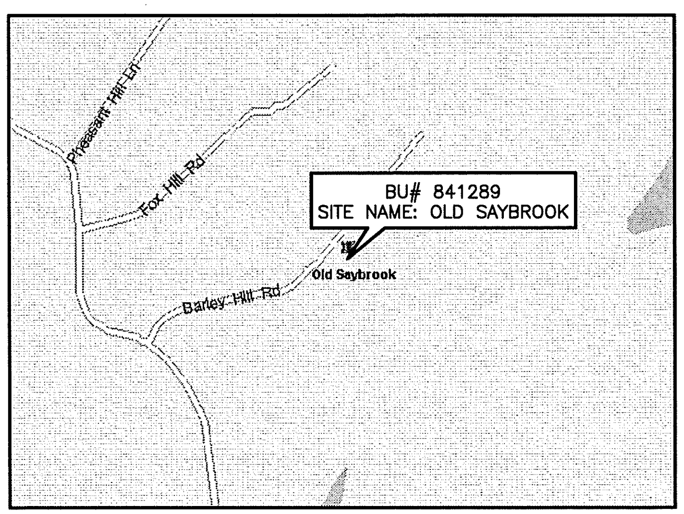
1. CROWN PROJECT MANAGER
   DAN VADNEY
   (518) 373-3510
   DAN.VADNEY@CROWNCASTLE.COM

2. CROWN CONSTRUCTION MANAGER
   JASON D'AMICO
   (860) 209-0104
   JASON.D'AMICO@CROWNCASTLE.COM

3. B+T GROUP RFI CONTACT
   ASHKAN GHAEEZADEH
   (918) 587-4630
   AGHAEEZADEH@BTGRP.COM
   MODDWGS@BTGRP.COM
   1717 S BOULDER AVENUE, SUITE 300
   TULSA, OK 74119

SITE NAME: OLD SAYBROOK
BU NUMBER: 841289

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



MAP

DIRECTIONS

UPDATED 2 07 CT 2019 OLD SAYBROOK I 95 SOUTH TO EXIT 67. RIGHT ON ELM STREET. APPROX. .8 MILES. GO PAST 170 INGHAM HILL ROAD MAILBOX TO BARLEY HILL ROAD. TURN RIGHT ONTO BARLEY HILL ROAD.CONTINUE UP HILL, ACCESS ROAD AND GATE IS ON THE RIGHT, CLOSE TO TOP OF STREET. ACCESS 24/7 COMBO:0043

TOWER INFORMATION

TOWER MANUFACTURER / JOB #:	ENGINEERED ENDEAVORS, INC. / 3503
TOWER HEIGHT / TYPE:	150' MONOPOLE
TOWER LOCATION: DATUM: (NAD 1983)	LAT. 41° 18' 35.55" LONG. -72° 23' 51.13" ELEV. 175 FT AMSL
STRUCTURAL DESIGN DRAWING REPORT:	B+T GROUP / WO. # 1228779
STRUCTURAL ANALYSIS REPORT:	B+T GROUP / WO. # 1211010
STRUCTURAL ANALYSIS DATE:	03/28/16
APPLICATION ID / REVISION #:	322613 / 4
CCISITES DOCUMENT ID:	6179805

CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS PERFORMED IN ACCORDANCE WITH THE TIA/EIA-222-F STANDARD AND IBC 2006 BASED UPON A WIND SPEED OF 85 MPH FASTEST MILE.

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, NG2 BOLT NOTES AND DETAILS
S4	FORGBOLT NOTES AND DETAILS
S5	AJAX ONESIDE™ BOLT SPECIFICATIONS AND TIGHTENING PROCEDURE
S6	TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.
S7	TOWER SECTION (29.9'–49.9')
S8	IN-LINE SPLICE DETAIL
D1	PART DETAILS

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800–788–7011.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO:	93496.005.01
PROJECT ENG:	ASHKAN GHAEEZADEH
DRAWN BY:	TEL
CHECKED BY:	BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
TITLE SHEET

SHEET NUMBER: S1
REVISION: 0

MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVAL	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS AS NECESSARY FOR NON-STANDARD PARTS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION BY A CWI OF A PORTION OF WELDING ON THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING (PER ENG-STD-10069) ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION (PERFORMED BY CONTRACTOR)
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS.
N/A	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH CROWN ENG-PRC-10012 FOR INCLUSION IN THE MI REPORT.
N/A	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. CWI SHALL FOLLOW ALL THE PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS ENG-SOW-10066, ENG-STD-10069 AND SRV-STD-10159. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. FULL PENETRATION WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
N/A	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH ENG-BUL-10149.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE AS PART OF PLUMB AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD.
		POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH ENG-PRC-10119 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		
NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT AND N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT		

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

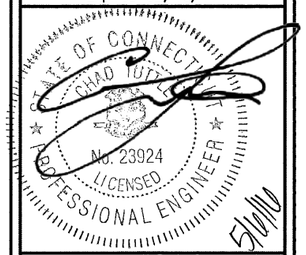
CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO:	93496.005.01
PROJECT ENG:	ASHKAN GHAEEZADEH
DRAWN BY:	TEL
CHECKED BY:	BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17



OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE

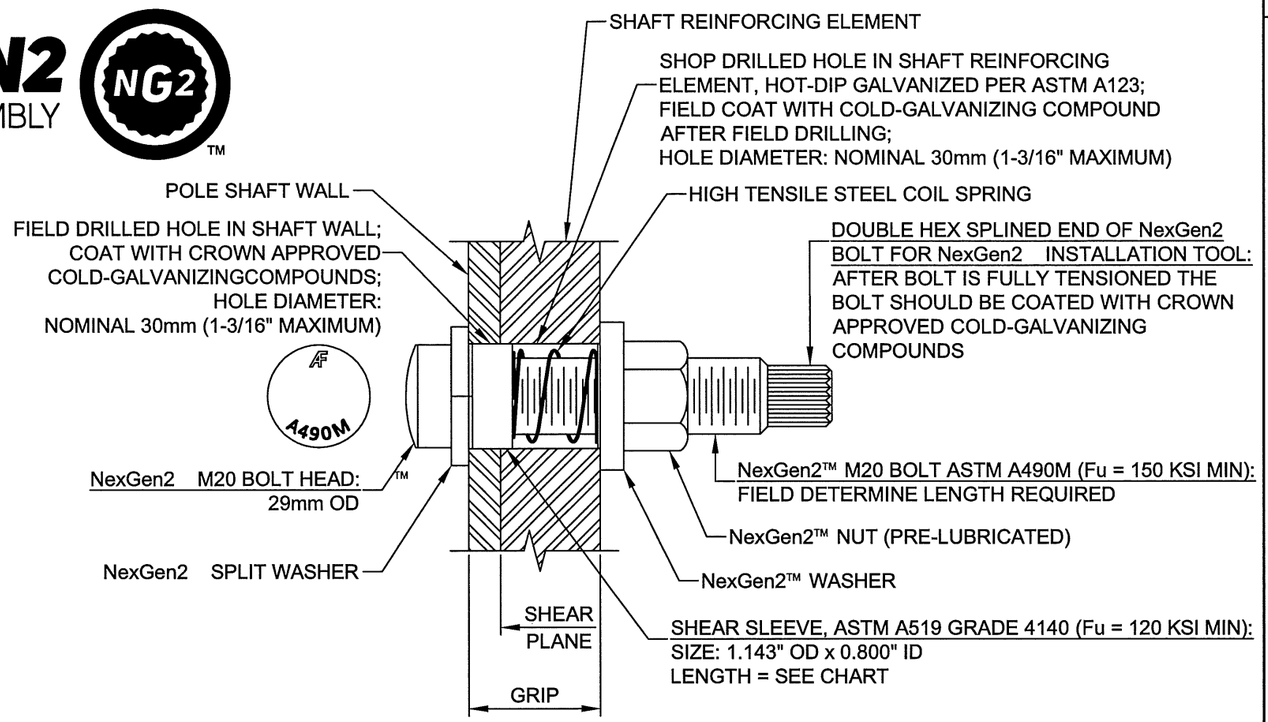
MODIFICATION INSPECTION NOTES AND CHECKLIST

SHEET NUMBER:	REVISION:
S2	0

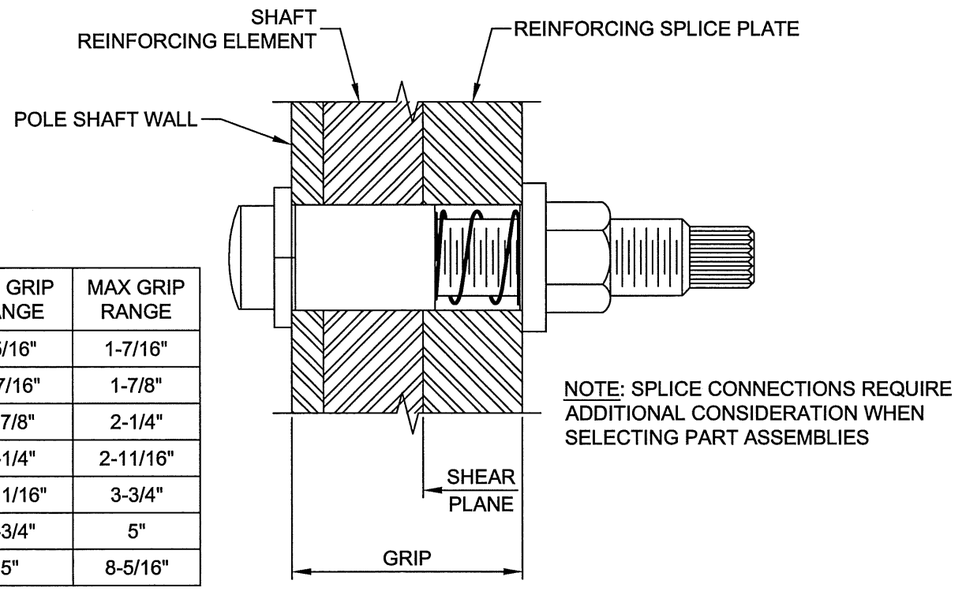
INTERIOR OF POLE SHAFT	EXTERIOR OF POLE SHAFT

NEXGEN2 BLIND BOLT ASSEMBLY

- PATENT PENDING -



TYPICAL NG2™ BOLT DETAIL



NOTE: SPLICE CONNECTIONS REQUIRE ADDITIONAL CONSIDERATION WHEN SELECTING PART ASSEMBLIES

PART NUMBER	BOLT LENGTH	SLEEVE LENGTH	MIN GRIP RANGE	MAX GRIP RANGE
M20x36	M20x95	11/16"	15/16"	1-7/16"
M20x48	M20x95	1-3/16"	1-7/16"	1-7/8"
M20x57	M20x95	1-5/8"	1-7/8"	2-1/4"
M20x68	M20x135	2"	2-1/4"	2-11/16"
M20x96	M20x135	2-7/16"	2-11/16"	3-3/4"
M20x127	M20x165	3"	3-3/4"	5"
M20x212	M20x250	4"	5"	8-5/16"

GENERAL NOTES

1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-222-F STANDARD AS WELL AS ANY OTHER GOVERNING BUILDING CODES.
1.2 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.
1.3 A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.
1.4 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.
1.5 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.
1.6 ALL CONSTRUCTION MEANS AND METHODS: INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

FABRICATION

2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

	YIELD	ASTM SPECS
A. STEEL SHAPES AND PLATES, U.N.O.	65ksi	A572

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E80 SERIES.
2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B+T GROUP 5 DAYS PRIOR TO FABRICATION.

KEY NOTES

(#) TOWER MODIFICATION I.D.

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRE-TENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
3. ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30mm DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1 3/16".
4. NexGen2™ COMPLETE ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AS APPROPRIATE.
5. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

MANUFACTURER:

ALLFASTENERS
15401 COMMERCE PARK DRIVE
BROOKPARK, OH 444142
PHONE: 440-232-6060
WEBSITE: WWW.ALLFASTENERS.COM

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO:	93496.005.01
PROJECT ENG:	ASHKAN GHAEEZADEH
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CHECKED BY:	BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17

STATE OF CONNECTICUT CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER

OLD SAYBROOK
841289

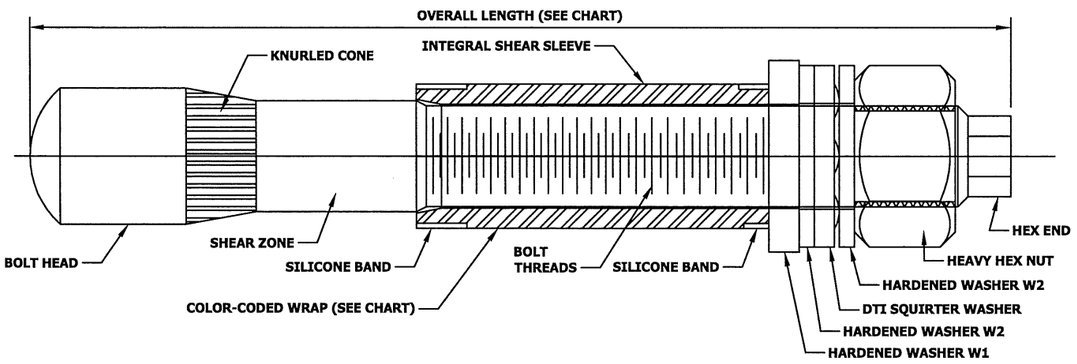
170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

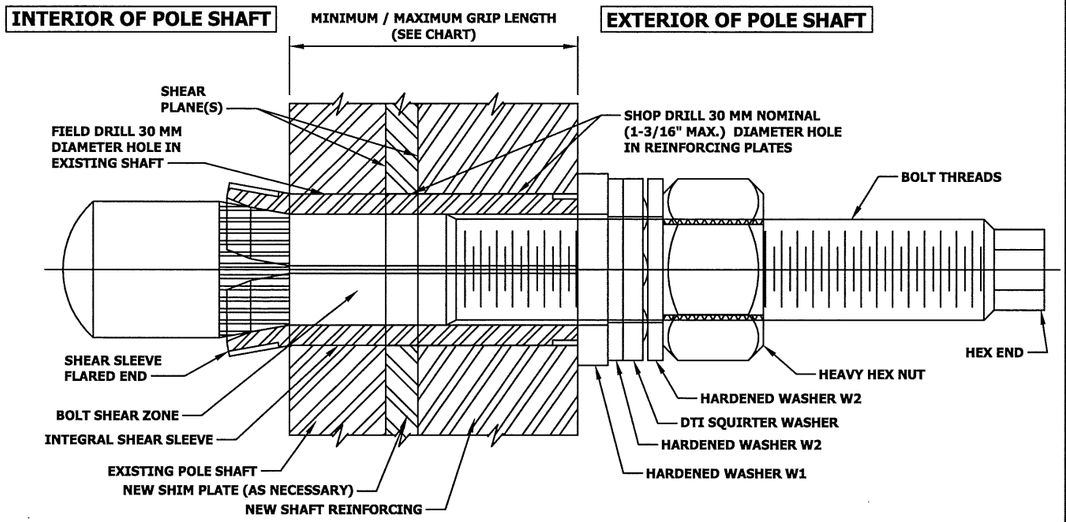
SHEET TITLE
GENERAL NOTES, NG2 BOLT NOTES AND DETAILS

SHEET NUMBER:	REVISION:
S3	0

NOTES:
1. **ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.**
2. **ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.**



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2

BOLT HOLE NOTES:

1. **ALL SHOP-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM SHOP-DRILLED HOLE DIAMETER PERMITTED IS 1-3/16".**
2. **ALL FIELD-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM FIELD-DRILLED HOLE DIAMETER PERMITTED IS 30 MM.**

DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
PHONE: **888-926-4857**
EMAIL: info@precisiontowerproducts.com
WEB: www.precisiontowerproducts.com

CONTAINS PROPRIETARY INFORMATION
PATENT PENDING

FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)				
GROUP A	FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8 1	**135**	5.31	1.3	3/8" to 1"	--	**RED**
2	**160**	6.30	1.6	3/4" to 1-1/2"	--	**GREEN**
3	**195**	7.68	1.9	1-1/4" to 2-1/4"	--	**BLUE**
4	**260**	10.24	2.6	2" to 3-1/2"	Splice Bolt	**YELLOW**
5	**365**	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	**ORANGE**
6	**440**	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	**BLACK**
DTI Note	Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FORGBolt™ Installation

Follow all Manufacturer/Distributer Recommendations for Installation, Tightening, and Inspection.

1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
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www.btgrp.com

CROWN CASTLE

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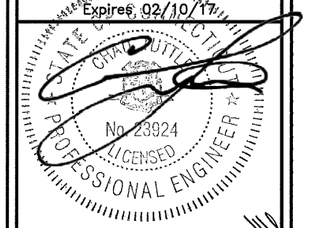


OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
FORGBOLT NOTES AND DETAILS

SHEET NUMBER:	REVISION:
S4	0

INTERIOR OF POLE SHAFT | EXTERIOR OF POLE SHAFT

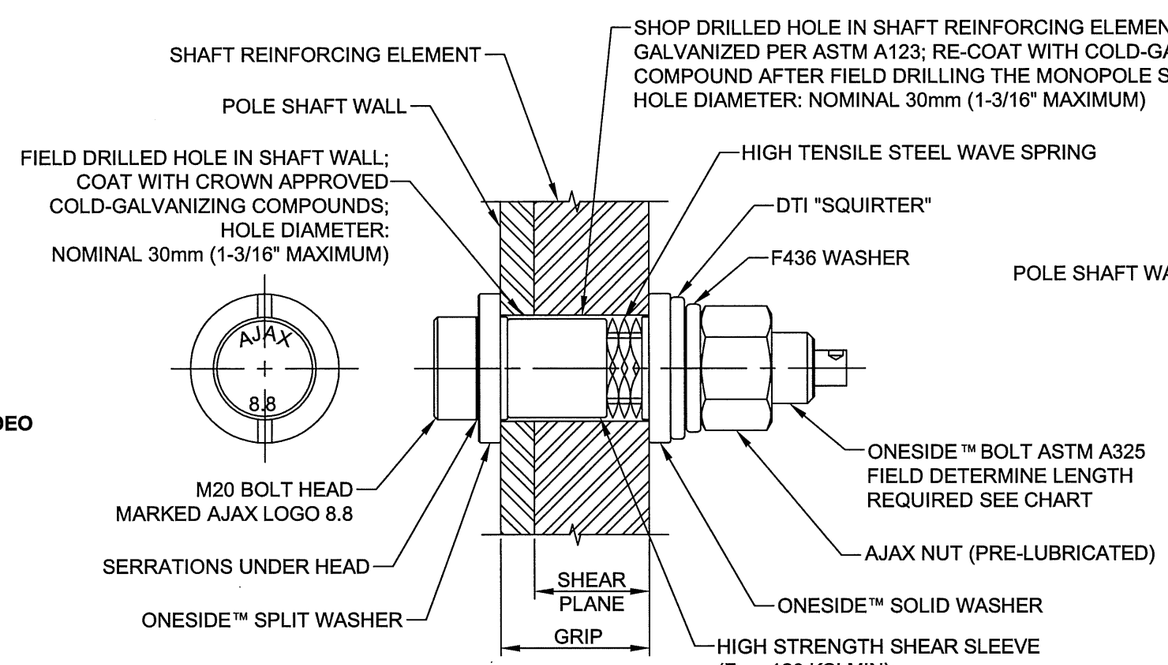
AJAX FASTENERS

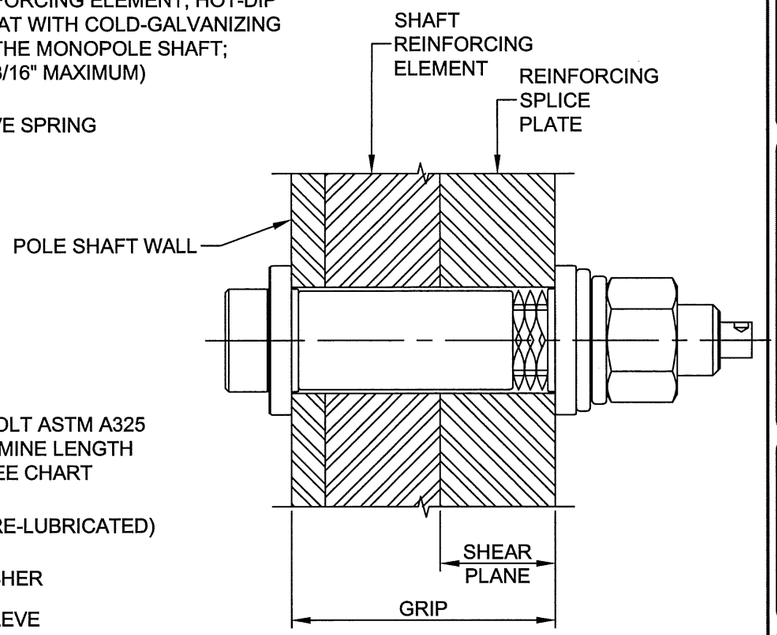
ONESIDE™

PATENT US 7,373,709B2

MANUFACTURER INSTALLATION VIDEO

https://www.youtube.com/watch?v=ZGBS0eLrZsw&feature=em-share_video_user





NOTE:
SPLICE CONNECTIONS REQUIRE ADDITIONAL CONSIDERATION WHEN SELECTING PART ASSEMBLIES

AJAX ONESIDE BOLT DETAIL

CODE	SIZE	COLOR	SLEEVE LENGTH	GRIP	GRIP IMP
OSBA20.65-6	M20 x 65	ORANGE	6.0 (0.236")	12.5 / 20.0	0.500" / 0.787"
OSBA20.95-14	M20 x 95	BLACK	14.0 (0.551")	20.0 / 32.0	0.787" / 1.259"
OSBA20.95-22	M20 x 95	GREEN	22.0 (0.866")	30.0 / 50.0	1.181" / 1.968"
OSBA20.95-30	M20 x 95	YELLOW	30.0 (1.181")	40.5 / 50.0	1.595" / 1.968"
OSBA20.135-39	M20 x 135	BLUE	39.0 (1.535")	49.0 / 77.0	1.929" / 3.031"
OSBA20.135-48	M20 x 135	BROWN	48.0 (1.889")	60.5 / 77.0	2.375" / 3.031"
OSBA20.135-57	M20 x 135	PURPLE	57.0 (2.244")	67.0 / 90.0	2.637" / 3.543"
OSBA20.165-76	M20 x 165	RED	76.0 (3.000")	87.0 / 120.0	3.425" / 4.724"
OSBA20.250	M20 x 250	SILVER	MTO	121.0 / 211.0	4.724" / 8.310"

MANUFACTURER
AJAX FASTENERS
SALES + TECH: ONESIDE@AJAXFAST.COM.AU

DISTRIBUTOR
IRA SVENSGAARD AND ASSOCIATES
PETER SVENDSGAARD - PETERS@IRASVENS.COM
JOHN KILLAM - JOHN@IRASVENS.COM
PHONE (530) 647-8225
FAX (530) 647-8229

BOLT ASSEMBLY AND INSTALLATION:
1. BOLT MUST BE PURCHASED PRE-ASSEMBLED.
2. FOLLOW BOLT AND DTI MANUFACTURERS INSTRUCTIONS FOR INSTALLATION.

INSPECTION:
1. A MINIMUM OF 4 OUT OF 5 SQUIRTER® DTI PROTRUSIONS SHALL BE ENGAGED IN ANY AJAX/DTI BOLT ASSEMBLY IN THE REINFORCING MEMBERS. A FEELER GAGE MAY BE USED TO VERIFY PROTRUSION COMPRESSION.
2. INSPECTIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS AND CROWN DOCUMENT ENG-SOW-10007: *MODIFICATION INSPECTION SOW*.

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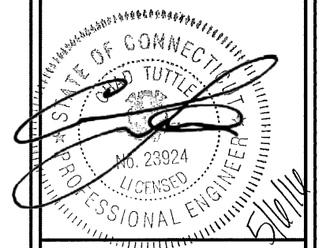

OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
AJAX ONESIDE™ BOLT SPECIFICATIONS AND TIGHTENING PROCEDURE

SHEET NUMBER:	REVISION:
S5	0

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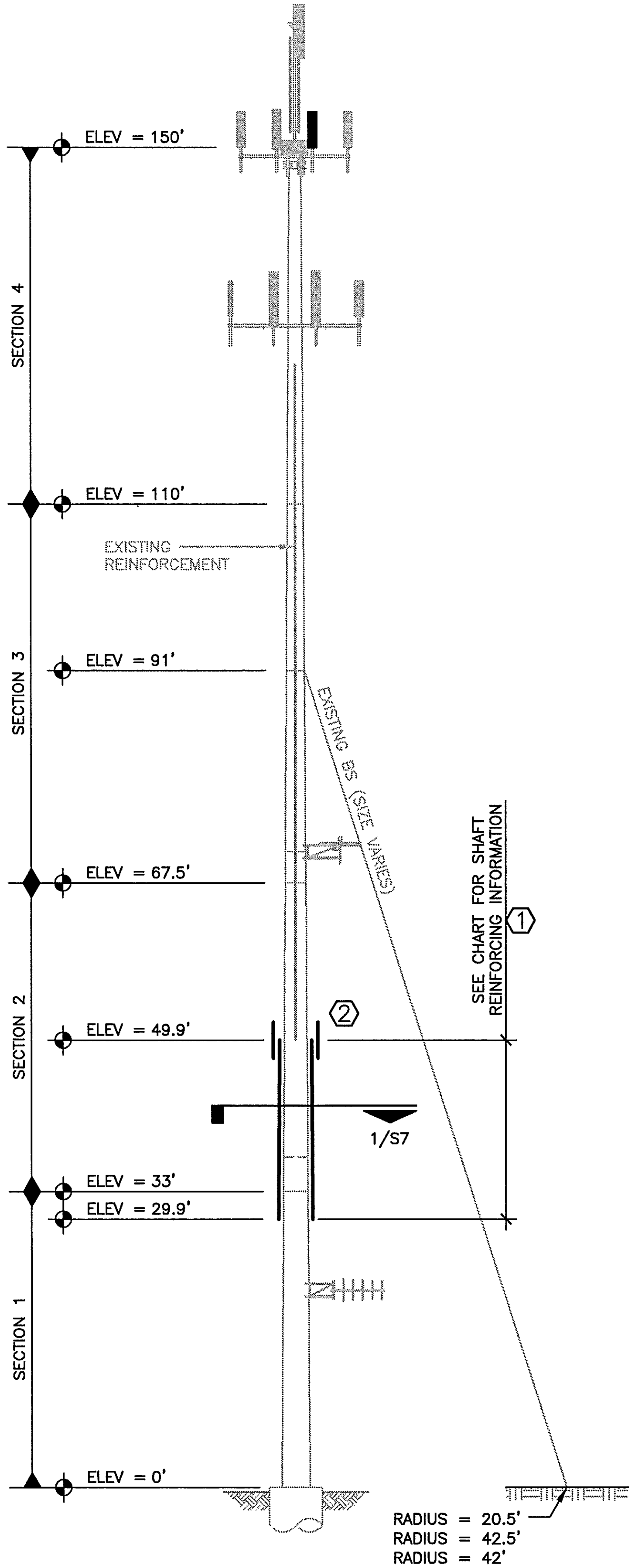
CCI: FLAT PLATE-BILL OF MATERIALS (65KSI)												
BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	FLAT # OR AZIMUTH	BOLTS PER PLATE	TOTAL BOLT QTY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	TOTAL STEEL WEIGHT	
29'-11"	49'-11"	*CCI-CFP-06512520	20'-0"	3	2, 6 & 10	32	96	11	11	19"	1658	LBS.
* UNIQUE PART. SEE PART DETAIL SHEET D1							96				1658	LBS.

ALL BOLTS SHALL BE PRE-APPROVED BLIND M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED	
REFERENCE DRAWINGS BY:	DATE
GPD	09/30/08
GPD	12/15/11
B+T GROUP	08/26/15

EXISTING MEMBER SCHEDULE						
SECTION	NUMBER OF SIDES	THICKNESS	Fy (ksi)	BOTTOM DIAMETER	TOP DIAMETER	LAP SPLICE
1	12	0.4375"	65	38.290"	32.256"	48"
2	12	0.3750"	65	33.660"	27.449"	42"
3	12	0.3125"	65	28.640"	21.770"	---
4	12	0.1875"	65	21.770"	15.530"	---
EXISTING BASE PLATE GRADE = 60 ksi						



1 TOWER ELEVATION
SCALE: N.T.S.

TOWER MODIFICATIONS:

(1) INSTALL NEW REINFORCING ELEMENTS RE: SHEET S7.

(2) INSTALL NEW IN-LINE SPLICES RE: SHEET S8.

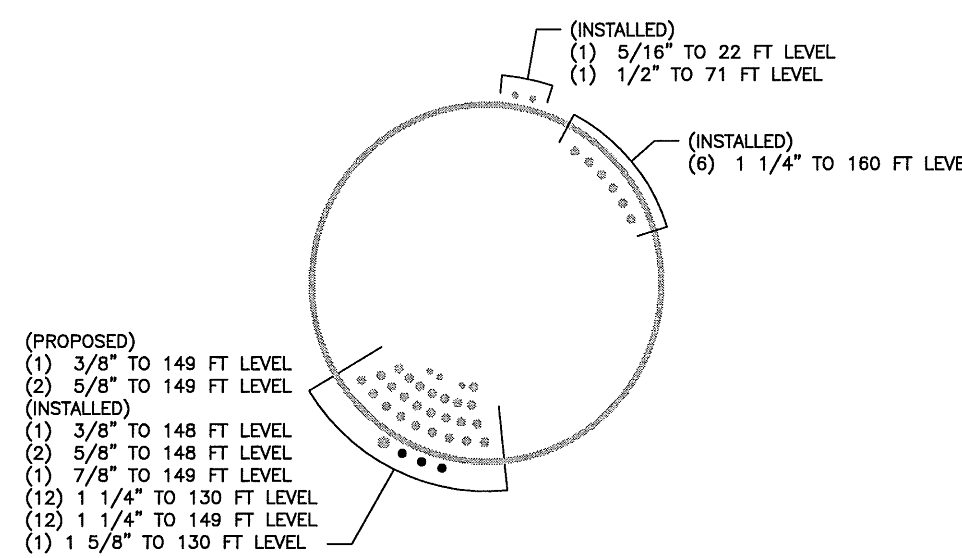
* CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.

** THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S6.

*** CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.

**** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

NOTES:
1. ALL THE PARTS STARTING WITH "CCI-" DESIGNATION - REFER TO "CROWN CASTLE APPROVED REINFORCEMENT COMPONENTS CATALOGUE EDITION 1" FOR PART DETAILS.
2. BLIND BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH SPECIFIED STEEL GRADE.
3. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATOR IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS. 1-800-831-3275 FOR PRODUCT INFORMATION.
4. ALL SHIMS SHALL BE ASTM A36.
5. HOLES FOR BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
6. SHOP WELDS ARE ASSUMED E80XX OR GREATER, PER STANDARD SPLICE DETAIL.
7. IF SCOPE OF MODIFICATION REQUIRES REMOVAL OF TOWER ID TAG, IT MUST BE REPLACED.
8. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD OR TOWER OWNER.
9. WHERE POSSIBLE, CLIMBING HARDWARE SHOULD REMAIN IN-LINE ALONG THE POLE. IF AN OBSTRUCTION CAUSES A LATERAL OFFSET OF 2'-0" OR MORE, CLIMBING ANCHORS SHALL BE PROVIDED AT EACH CHANGE IN ALIGNMENT. IF NEW REINFORCEMENT REQUIRES STEP BOLT BRACKETS, INSTALL PRIOR TO GALVANIZATION OF STEEL.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER FITTING OF REINFORCEMENT ON MONOPOLES. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.
11. TOLERANCES FOR INSTALLED PLATE HEIGHTS PER FLAT PLATE BILL OF MATERIALS ARE AS FOLLOWS:
   +/- 1" FOR PLATES BEGINNING IN BOTTOM 1'-0" OF POLE.
   +/- 3" FOR ALL OTHER HEIGHT.
   EXCEPTIONS MAY BE NOTED ABOVE.



2 TX LINE DISTRIBUTION DIAGRAM
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:		
REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO: 93496.005.01
PROJECT ENG: ASHKAN GHAEEZADEH
DRAWN BY: TEL
CHECKED BY: BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17

STATE OF CONNECTICUT ... No. 23924 LICENSED PROFESSIONAL ENGINEER

OLD SAYBROOK
841289

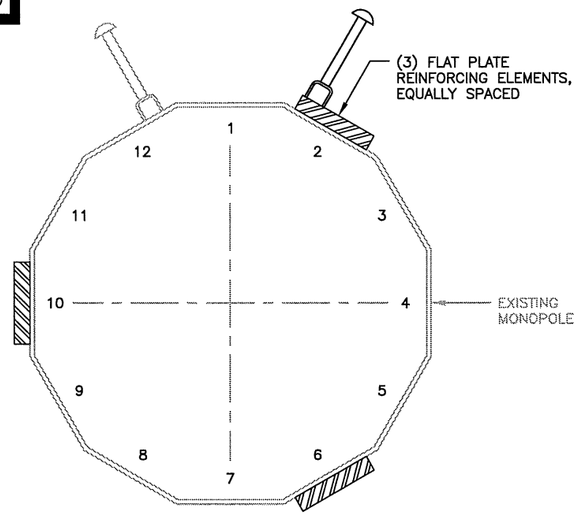
170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
TOWER ELEV., SCHEDULES, AND TX LINE DIST. DIAGRAM

SHEET NUMBER: S6
REVISION: 0

CONTRACTOR TO INCLUDE PROVISION FOR RELOCATION / REPLACEMENT OF EXISTING CLIMBING PEGS AS REQUIRED



1 TOWER SECTION (29.9'-49.9')
SCALE: N.T.S.

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1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/16	ISSUED FOR CONSTRUCTION

PROJECT NO:	93496.005.01
PROJECT ENG:	ASHKAN GHAEEZADEH
DRAWN BY:	TEL
CHECKED BY:	BMT

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/17

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

OLD SAYBROOK
841289

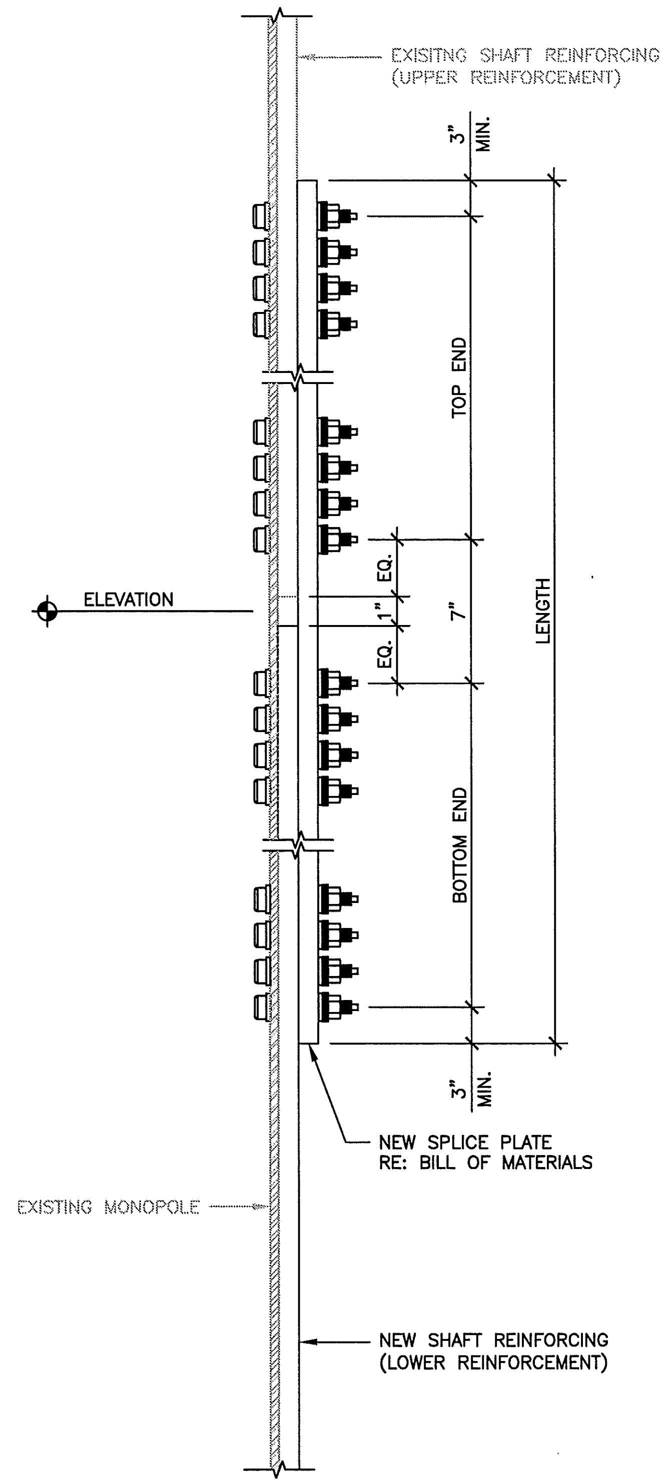
170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE
TOWER SECTION
29.9'-49.9'

SHEET NUMBER: S7

REVISION: 0



1 FLAT PLATE IN-LINE SPLICE DETAIL
SCALE: N.T.S.

SPLICE PLATE-BILL OF MATERIALS (65KSI)										
ELEVATION	WIDTH	THICKNESS	LENGTH	QTY	QTY OF BOLTS (TOP END)	QTY OF BOLTS (BOTTOM END)	BOLTS PER SPLICE	TOTAL BOLTS	TOTAL STEEL WEIGHT	
49'-11 1/2"	6 1/2"	1 1/4"	5'-4"	3	8	11	19	57	442	LBS.
							TOTAL:	57	442	LBS.

* O.C. DISTANCE ON TERMINATION BOLTS TO BE 3 IN. U.N.O.
** USE SHIM PLATES AS REQUIRED.
*** BOLT QTY INCLUDED IN S5 BILL OF MATERIALS
**** STEEL WEIGHT NOT <u>INCLUDED</u> IN S5 BILL OF MATERIALS.

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STATE OF CONNECTICUT
CHAD TUTTLE
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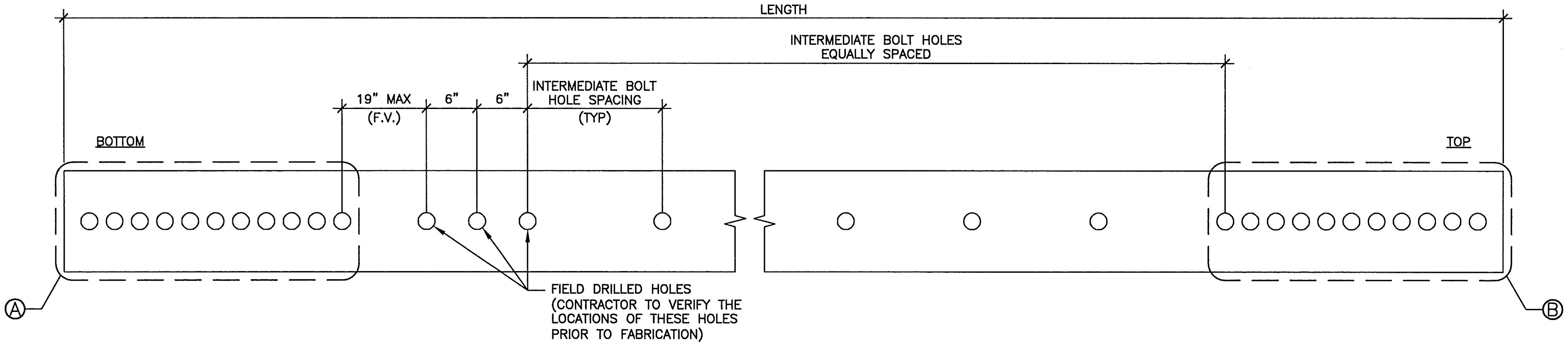
OLD SAYBROOK
841289

170 INGHAM HILL ROAD
OLD SAYBROOK, CT

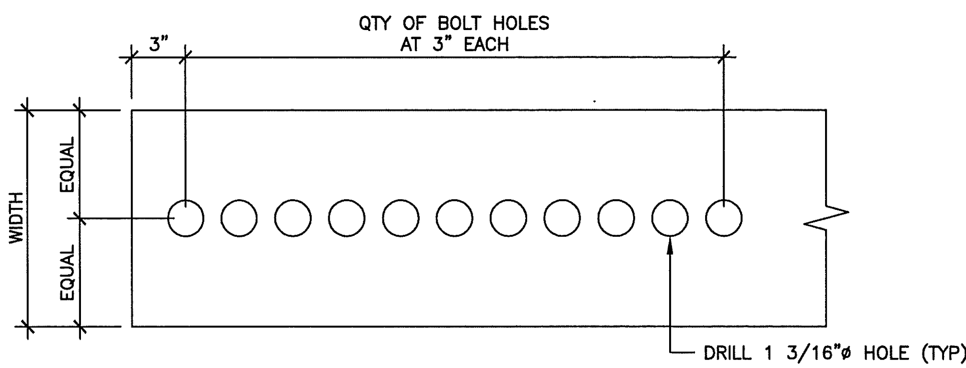
EXISTING 150' MONOPOLE

SHEET TITLE
IN-LINE SPLICE DETAIL

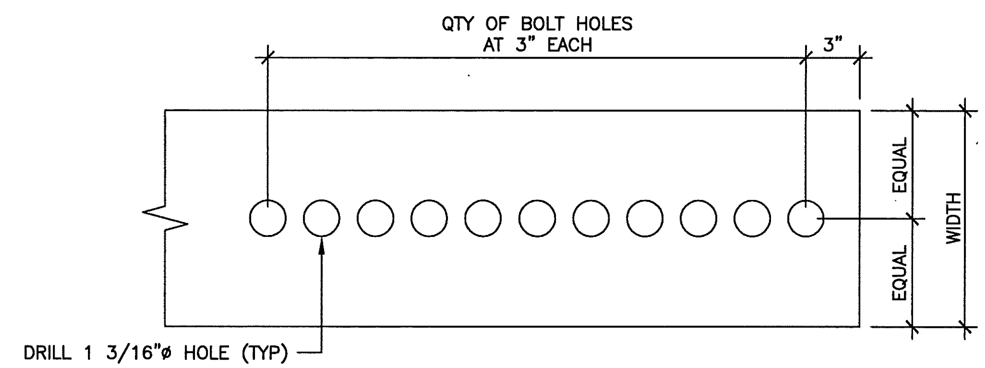
SHEET NUMBER: S8
REVISION: 0



1 UNIQUE PART
SCALE: N.T.S.



2 DETAIL A (BOTTOM)
SCALE: N.T.S.



3 DETAIL B (TOP)
SCALE: N.T.S.

FLAT PLATE DESIGNATION	BLACK WEIGHT (LBS)	WIDTH	THICKNESS	LENGTH	TOTAL QTY OF 1 3/16"Ø BOLT HOLES	QTY OF BOLT HOLES (BOTTOM END)	QTY OF BOLT HOLES (TOP END)	INTERMEDIATE BOLT HOLE SPACING
CCI-CFP-06512520	553	6 1/2"	1 1/4"	20'-0"	32	11	11	1'-7"

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CROWN CASTLE

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PROJECT NO:	93496.005.01
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170 INGHAM HILL ROAD
OLD SAYBROOK, CT

EXISTING 150' MONOPOLE

SHEET TITLE

PART DETAILS

SHEET NUMBER: D1

REVISION: 0