COHEN and WOLF P.C.
ATTORNEYS AT LAW

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport
WRITER'S DIRECT DIAL: (203) 337-4157
E-Mail Address: jkohler@cohenandwolf.com

March 26, 2015

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

Re: Notice of Exempt Modification
Town of Windsor/ T-Mobile equipment upgrade
Site ID CT11063B
340 Bloomfield Avenue, Windsor CT

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, the Town of Windsor owns the existing monopole telecommunications tower and related facility at 340 Bloomfield Avenue, Windsor, Connecticut (Latitude: 41.852597, Longitude: -72.660566). T-Mobile intends to add three (3) antennas and related equipment at this existing telecommunications facility in Windsor ("Windsor Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mayor Donald S. Trinks. The Town of Windsor is also the property owner.

The existing Windsor Facility consists of a 150 foot monopole tower.[1] T-Mobile plans to add three (3) new antennas and add three (3) remote radio units (RRUs) at a centerline of 142 feet. T-Mobile will also install an equipment cabinet mounted to an H-frame. (See the plans revised to July 25, 2014 attached hereto as Exhibit A). Assuming the modifications in the structural report are implemented, the existing Windsor Facility is structurally capable of supporting T-Mobile's proposed modifications. See the structural analysis dated October 8,

[1] The online CSC database does not include the Windsor Facility as having been approved via a Docket or Petition. This Facility has been the subject of several notice of intent however, the most recent being EM-VER-164-141223, EM-SPRINT-164-140619B and EM-T-MOBILE-164-140523.

2014 attached hereto as Exhibit B.[2]

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

1. The proposed modification will not increase the height of the tower. T-Mobile's additional antennas and equipment will be installed at a centerline of 142 feet, merely adding to existing antennas located at the same elevation. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension of the site boundaries or lease area, as depicted on Sheet 2 of Exhibit A. T-Mobile's equipment will be located entirely within the existing compound area.

3. The proposed modification to the Windsor Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the additional antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated March 12, 2015, T-Mobile's operations would add 6.43% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 43.02% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

For the foregoing reasons, T-Mobile respectfully submits that the proposed antennas and equipment at the Windsor Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence construction approximately sixty days from the date of the Council's notice of acknowledgement.

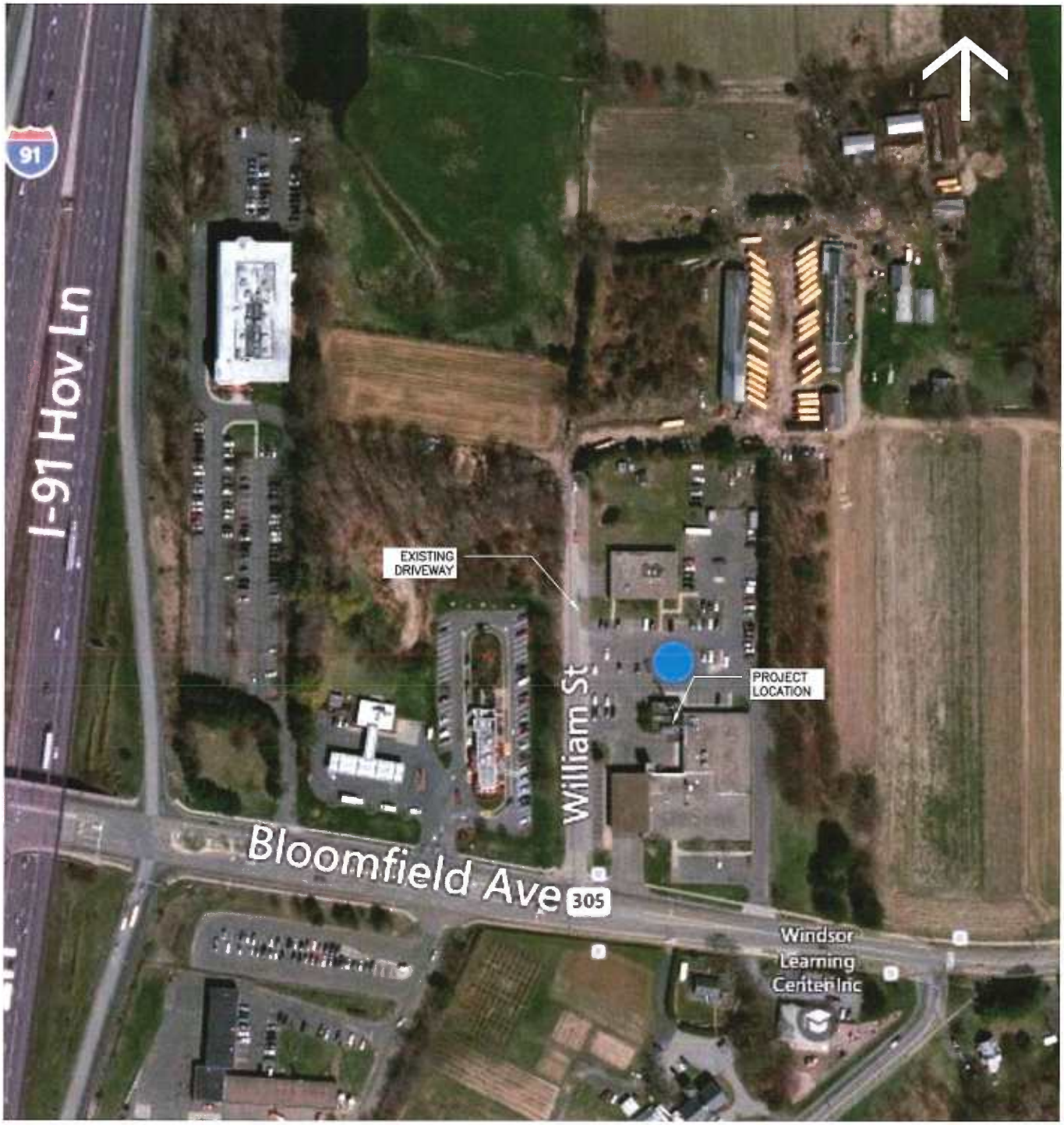
Sincerely,

Julie D. Kohler, Esq.

cc: Town of Windsor, Mayor Donald S. Trinks
Crown Castle
Sheldon Freincle, NSS

[2] T-Mobile will implement the required modifications prior to the installation of its antennas.

EXHIBIT A



KEY PLAN

N.T.S.

CONFIGURATION

702CU

SUBMITTALS	
LE REV A	07.25.14

ATLANTIS GROUP
1340 Centre Street
Suite 212
Newton, MA 02459
Office: 617-965-0789
Fax: 617-213-5056

LEASE EXHIBIT

SITE NUMBER:
CT11063B

SITE NAME:
WINDSOR FIRE DEPARTMENT_1

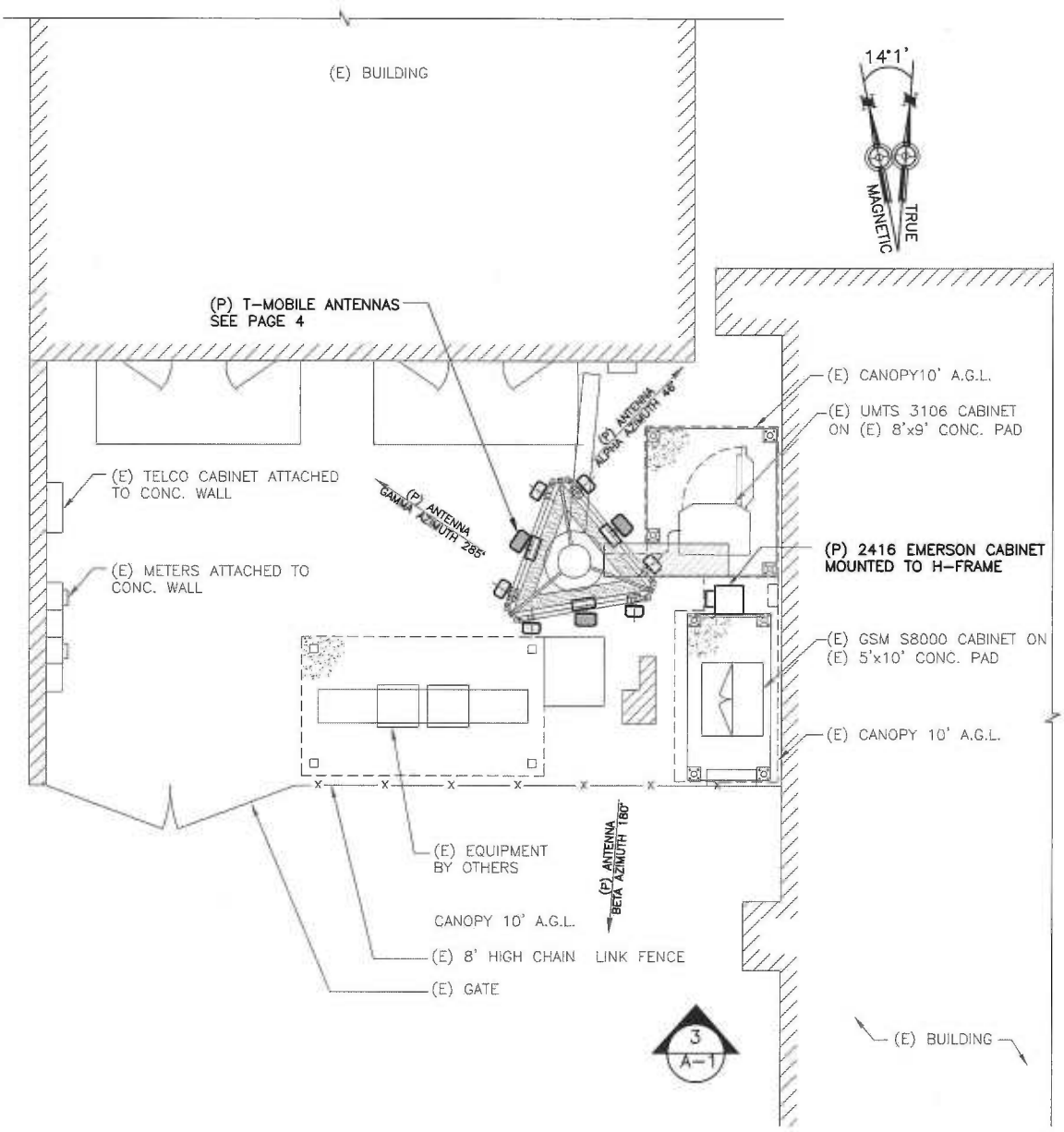
SITE ADDRESS:
340 BLOOMFIELD AVENUE
WINDSOR, CT 06095

NORTHEAST SITE SOLUTIONS
54 MAIN STREET, UNIT 3
STURBRIDGE, MA 01566
(508) 434-5237

FOR

T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX: (860) 692-7159

DRAWN BY: EB | CHECKED BY:SM



ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

SITE PLAN

SCALE: N.T.S.

1
LE-2

CONFIGURATION

702CU

SUBMITTALS	
LE REV A	07.25.14

ATLANTIS GROUP
1340 Centre Street
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LEASE EXHIBIT

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SITE NAME:
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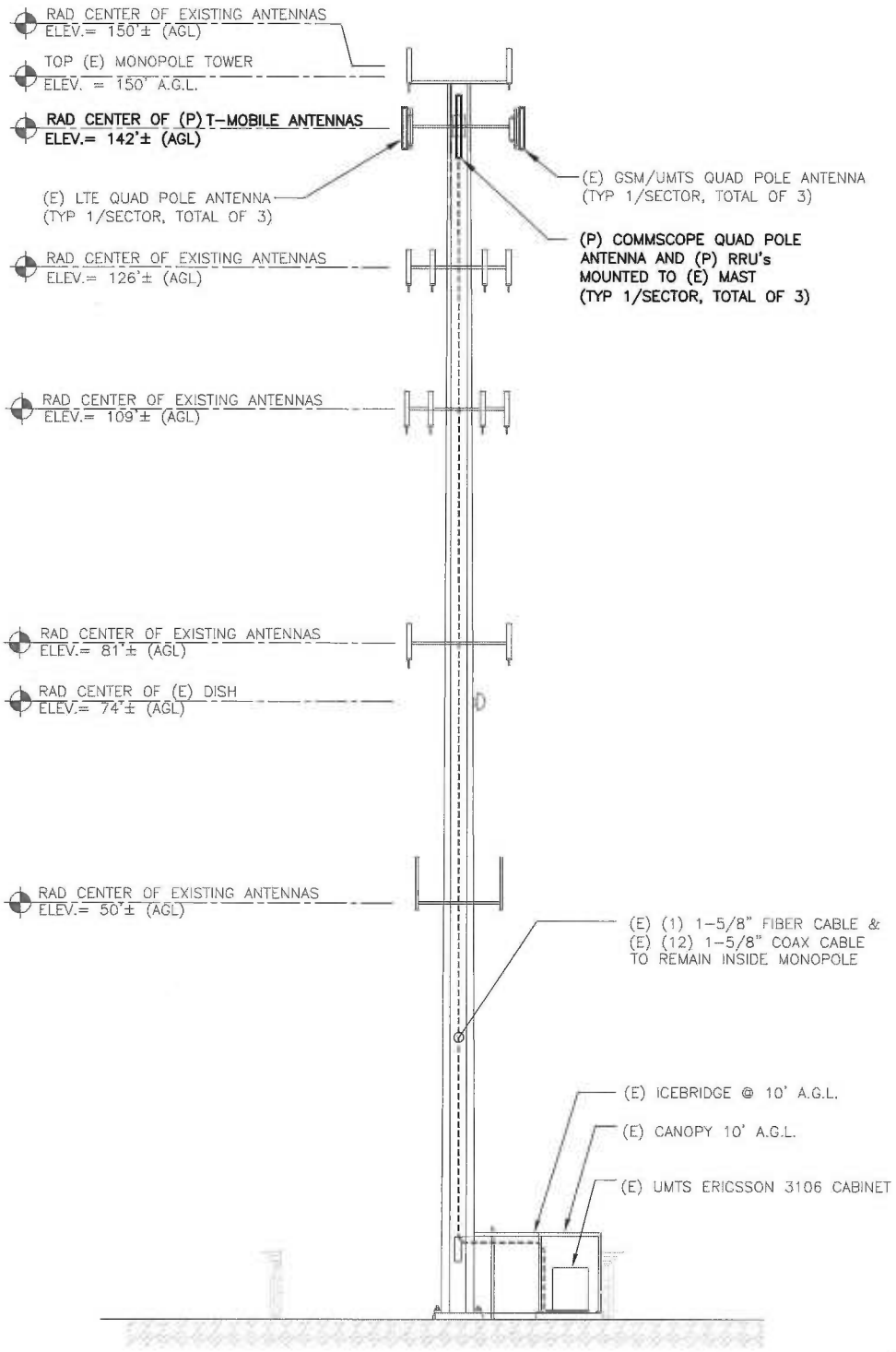
DRAWN BY: EB | CHECKED BY:SM



ELEVATION

N.T.S.

1
LE-3

CONFIGURATION

702CU

SUBMITTALS	
LE REV A	07.25.14

ATLANTIS GROUP
1340 Centre Street
Suite 212
Newton, MA 02459
Office: 617-965-0789
Fax: 617-213-5056

LEASE EXHIBIT

SITE NUMBER:
CT11063B

SITE NAME:
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NORTHEAST SITE SOLUTIONS
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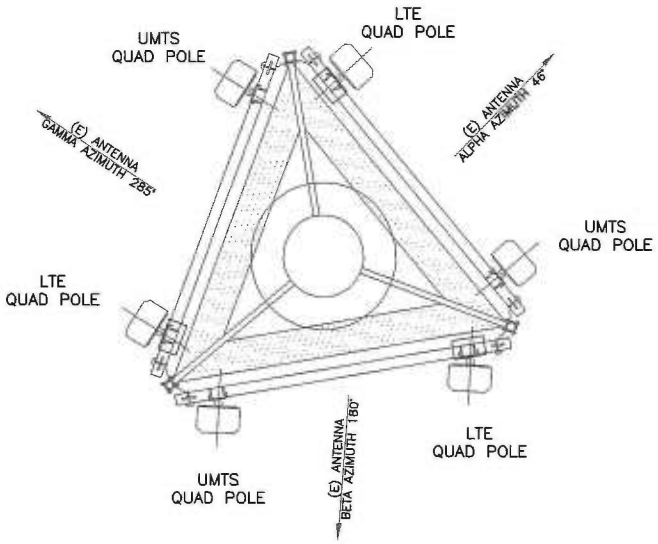
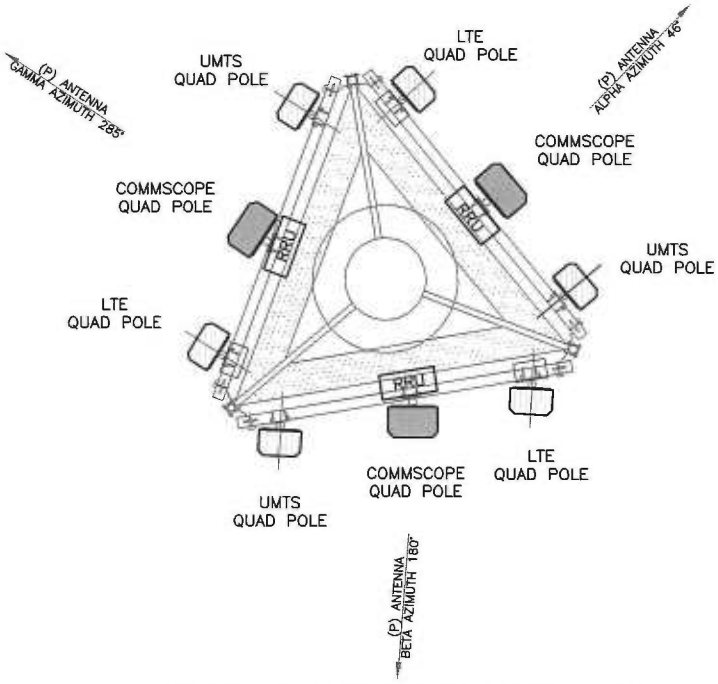
DRAWN BY: EB | CHECKED BY: SM



EXISTING ANTENNA CONFIGURATION



PROPOSED ANTENNA CONFIGURATION

CONFIGURATION

702CU

SUBMITTALS	
LE REV A	07.25.14

ATLANTIS GROUP
1340 Centre Street
Suite 212
Newton, MA 02459
Office: 617-965-0789
Fax: 617-213-5056

LEASE EXHIBIT

SITE NUMBER:
CT11063B

SITE NAME:
WINDSOR FIRE DEPARTMENT_1

SITE ADDRESS:
340 BLOOMFIELD AVENUE
WINDSOR, CT 06095

NORTHEAST SITE SOLUTIONS
54 MAIN STREET, UNIT 3
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(508) 434-5237

FOR

T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX: (860) 692-7159

DRAWN BY: EB | CHECKED BY:SM

EXHIBIT B

October 8, 2014

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:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11063B
	Carrier Site Name:	Windsor Fire Department_1
Crown Castle Designation:	**Crown Castle BU Number:**	855662
	Crown Castle Site Name:	Windsorcentral
	Crown Castle JDE Job Number:	301918
	Crown Castle Work Order Number:	936346
	Crown Castle Application Number:	260649 Rev. 3
Engineering Firm Designation:	**B+T Group Project Number:**	91728.004.01
Site Data:	**340 Bloomfield Avenue, Windsor, CT, Hartford County**	
	Latitude *41° 51' 9.3"*, Longitude *-72° 39' 37.8"*	
	148 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 709781, in accordance with application 260649, revision 3.

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:

LC4.7: TSA specified load case with proposed modifications **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 80 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.

STATE OF CONNECTICUT * CHAD TUTTLE * No. 23924 LICENSED PROFESSIONAL ENGINEER
10/8/14

Robert M. Frazier E.I.
Project Engineer

Chad E. Tuttle, P.E.
President

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 148 ft. Monopole designed by Summit Manufacturing Inc. in November of 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 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
142.0	143.0	3	Commscope	LNX-6515DS-VTM	1	1 5/8	--
		3	Ericsson	ERICSSON AIR 21 B2A B4P			
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
	142.0	3	Ericsson	RRUS 11 B12			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
147.0	152.0	1	RFS Celwave	PD320-2	12 3 1	1 5/8 1 1/4 7/8	1
	149.0	3	Ericsson	RRUS-11			
		1	Raycap	DC6-48-60-18-8F			
	147.0	1	--	Platform Mount [LP 1201-1]			
	145.0	6	Kathrein	800 10121			
		12	Kathrein	860 10025			
		2	KMW	AM-X-CD-16-65-00T-RET			
		12	Powerwave	LGP 13519			
		1	Powerwave	P65-15-XLH-RR			
142.0	142.0	**3**	**EMS Wireless**	**RR90-17-02DP**	--	--	**3**
		6	**Remec**	**G20045A1**			
		3	**RFS Celwave**	**APX16DWV-16DWVS-C**			
		3	Ericsson	KRY 112 144/1	12	1 5/8	1
		1	--	Platform Mount [LP 1201-1]			
125.0	127.0	3	Alcatel Lucent	RRH2x40-AWS	1	1 5/8	2
		3	Andrew	HBX-6516DS-VTM			
		3	Andrew	HBX-6517DS-VTM			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		1	Antel	BXA-70080-6CF-4	12	1 5/8	1
		6	Decibel	DB844G65ZAXY			
		2	Powerwave	P65-16-XL-R			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		6	RFS Celwave	FD9R6004/2C-3L			
	125.0	1	--	Platform Mount [LP 403-1]			
111.0	113.0	3	Alcatel Lucent	TME-800MHz 2X50W RRH W/FILTER	--	--	1
	111.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz			
		1	--	Pipe Mount [PM 601-3]			
109.0	118.0	1	Decibel	DB205-L	--	--	1
		1	Sinclair	SD212-SF3P2SNM			
	113.0	1	Sinclair	SRL-227			
	110.0	3	Alcatel Lucent	TD-RRH8x20-25	3	5/16	2
		3	RFS Celwave	APXVTM14-C-120	1	5/8	
		4	RFS Celwave	APXVSPP18-C-A20	3	1 1/4	1
	109.0	1	--	Platform Mount [LP 1201-1]	3	7/8	
	107.0	1	--	Miscellaneous [NA 509-3]	--	--	2
81.0	83.0	1	Sinclair	SRL-227	2	7/8	1
	81.0	1	--	Side Arm Mount [SO 702-3]			
	76.0	1	Sinclair	SD212			
74.0	75.0	1	Radiowaves	HP2-23	1	1/4	1
	74.0	1	--	Pipe Mount [PM 601-1]			
50.0	51.0	1	Pctel	GPS-TMG-HR-26N	1	1/2	1
	50.0	1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be Removed

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)
148	148	12	Allgon	7184.12 Sector	--	--
		1	Generic	14' Low Profile Platform		
143	143	1	Generic	14' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		
128	128	1	Generic	14' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		
113	113	1	Generic	14' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		
98	98	1	Generic	14' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		
83	83	1	Generic	14' Low Profile Platform	--	--
		12	Swedcom	ALP-9212-N		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	T-Mobile Co-Locate, Rev. 3	260649	CCIsites
Tower Manufacturer Drawing	Summit Manufacturing, LLC, Job No. 11986	4864315	CCIsites
Tower Mapping	BTE Management Group, Job No. 15085	4840493	CCIsites
Foundation Drawing	Summit Manufacturing, LLC, Job No. 11986	4864324	CCIsites
Geotech Report	PJF, Project No. A00007-T144	4857883	CCIsites
Antenna Configuration	Previous failing SA by AeroSolutions, LLC, Project No. 003-14-0835	5233690	CCIsites

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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) - LC4.7

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	148 - 116	Pole	TP30.241x24x0.219	1	-9.992	--	44.9	Pass[1]
L2	116 - 93.5	Pole	TP34.191x29.072x0.25	2	-17.390	--	83.8	Pass[1]
L3	93.5 - 74.75	Pole	TP37.847x34.191x0.421	3	-20.431	--	75.4	Pass[1]
L4	74.75 - 57.75	Pole	TP40.663x36.421x0.467	4	-26.445	--	83.7	Pass[1]
L5	57.75 - 39.5	Pole	TP44.222x40.663x0.511	5	-30.232	--	81.1	Pass[1]
L6	39.5 - 31.75	Pole	TP45.108x42.524x0.565	6	-35.568	--	79.7	Pass[1]
L7	31.75 - 0	Pole	TP51.3x45.108x0.522	7	-46.963	--	83.0	Pass[1]
							Summary	
						Pole (L2)	83.8	Pass[1]
						Rating =	83.8	Pass[1]

Table 6 - Tower Component Stresses vs. Capacity - LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	89.6	Pass
1	Base Plate	Base	89.6	Pass
1	Base Foundation (Soil Interaction)	Base	99.7	Pass

Structure Rating (max from all components) =	99.7%

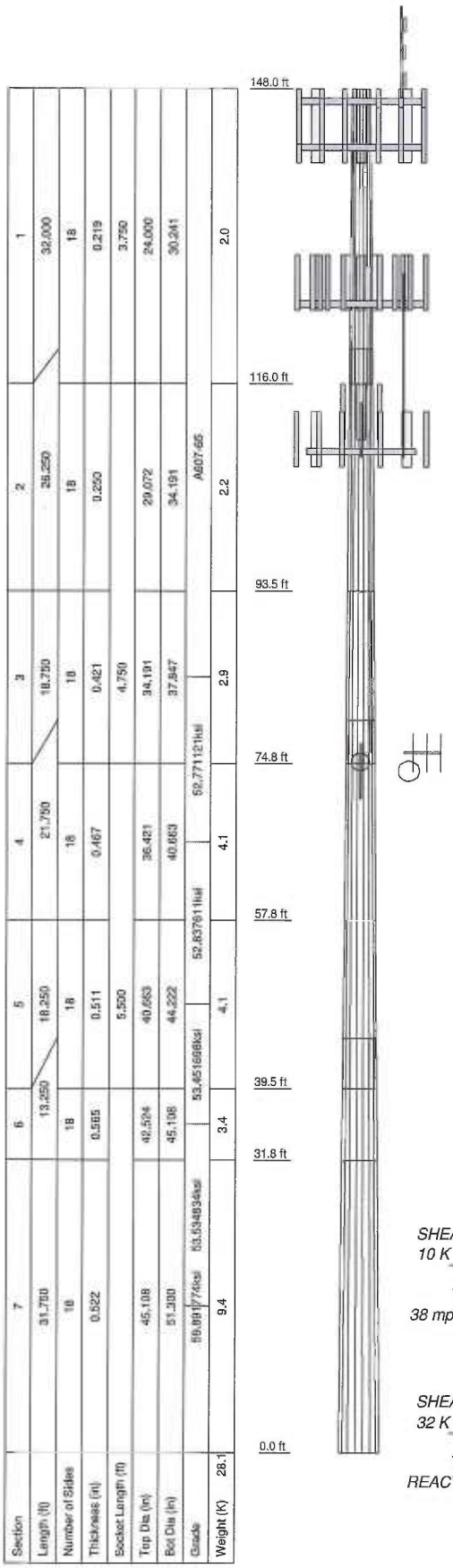
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

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.

APPENDIX A

tnxTOWER OUTPUT



Section	1	2	3	4	5	6	7
Length (ft)	32.000	28.250	18.750	21.750	18.250	13.250	31.750
Number of Sides	18	18	18	18	18	18	18
Thickness (in)	0.219	0.250	0.421	0.467	0.511	0.565	0.522
Socket Length (ft)	3.750	4.750	5.500				
Top Dia (in)	24.000	29.072	34.191	36.421	40.663	42.524	45.108
Bot Dia (in)	30.241	34.191	37.847	40.663	44.222	45.108	51.300
Grade	A607-65			52.771121ksi	53.451698ksi	53.534834ksi	59.891774ksi
Weight (K)	2.0	2.2	2.9	4.1	4.1	3.4	9.4

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION
(2) 800 10121 w/ Mount Pipe (E)	147
(2) 800 10121 w/ Mount Pipe (E)	147
(2) 800 10121 w/ Mount Pipe (E)	147
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	147
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	147
P65-15-XLH-RR w/ Mount Pipe (E)	147
(4) LGP 13519 (E)	147
(4) LGP 13519 (E)	147
(4) LGP 13519 (E)	147
RRUS-11 (E)	147
RRUS-11 (E)	147
RRUS-11 (E)	147
(4) 860 10025 (E)	147
(4) 860 10025 (E)	147
(4) 860 10025 (E)	147
DC6-48-60-18-8F (E)	147
PD320-2 (E)	147
Platform Mount [LP 1201-1] (E)	147
Detuner Mount (E)	147
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (P)	142
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (P)	142
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	142
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	142
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	142
LNX-6515DS-VTM w/ Mount Pipe (P)	142
LNX-6515DS-VTM w/ Mount Pipe (P)	142
LNX-6515DS-VTM w/ Mount Pipe (P)	142
RRUS 11 B12 (P)	142
RRUS 11 B12 (P)	142
RRUS 11 B12 (P)	142
KRY 112 144/1 (E)	142
KRY 112 144/1 (E)	142
KRY 112 144/1 (E)	142
6' x 2" Mount Pipe (E)	142
6' x 2" Mount Pipe (E)	142
6' x 2" Mount Pipe (E)	142
Platform Mount [LP 1201-1] (E)	142
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (P)	142
(2) DB844G65ZAXY w/Mount Pipe (E)	125
(2) DB844G65ZAXY w/Mount Pipe (E)	125
P65-16-XL-R w/ Mount Pipe (E)	125
P65-16-XL-R w/ Mount Pipe (E)	125
BXA-70080-6CF-4 w/ Mount Pipe (E)	125
(2) FD9R6004/2C-3L (E)	125
(2) FD9R6004/2C-3L (E)	125
(2) FD9R6004/2C-3L (E)	125
HBX-6516DS-VTM w/ Mount Pipe (R)	125
HBX-6516DS-VTM w/ Mount Pipe (R)	125

TYPE	ELEVATION
HBX-6516DS-VTM w/ Mount Pipe (R)	125
HBX-6517DS-VTM w/ Mount Pipe (R)	125
HBX-6517DS-VTM w/ Mount Pipe (R)	125
HBX-6517DS-VTM w/ Mount Pipe (R)	125
DB-T1-6Z-8AB-0Z (R)	125
RRH2x40-AWS (R)	125
RRH2x40-AWS (R)	125
RRH2x40-AWS (R)	125
Platform Mount [LP 403-1] (E)	125
(2) DB844G65ZAXY w/Mount Pipe (E)	125
TME-800MHz 2X50W RRH W/FILTER (E)	111
TME-800MHz 2X50W RRH W/FILTER (E)	111
PCS 1900MHz 4x45W-65MHz (E)	111
PCS 1900MHz 4x45W-65MHz (E)	111
PCS 1900MHz 4x45W-65MHz (E)	111
Pipe Mount [PM 601-3] (E)	111
TME-800MHz 2X50W RRH W/FILTER (E)	111
APXVTM14-C-120 w/ Mount Pipe (R)	109
APXVTM14-C-120 w/ Mount Pipe (R)	109
TD-RRH8x20-25 (R)	109
TD-RRH8x20-25 (R)	109
TD-RRH8x20-25 (R)	109
APXVSPP18-C-A20 w/ Mount Pipe (E)	109
APXVSPP18-C-A20 w/ Mount Pipe (E)	109
(2) APXVSPP18-C-A20 w/ Mount Pipe (E)	109
SRL-227 (E)	109
DB205-L (E)	109
SD212-SF3P2SNM (E)	109
6' x 2" Mount Pipe (E)	109
(2) 6' x 2" Mount Pipe (E)	109
(2) 6' x 2" Mount Pipe (E)	109
Platform Mount [LP 1201-1] (E)	109
APXVTM14-C-120 w/ Mount Pipe (R)	109
Miscellaneous [NA 509-3] (R)	107
Detuner Mount (E)	95
5' x 2" Pipe Mount (E)	81
5' x 2" Pipe Mount (E)	81
5' x 2" Pipe Mount (E)	81
Side Arm Mount [SO 702-3] (E)	81
SRL-227 (E)	81
SD212 (E)	81
Pipe Mount [PM 601-1] (E)	74
HP2-23 (E)	74
4' x 2" Pipe Mount (E)	50
GPS-TMG-HR-26N (E)	50
Detuner Mount (E)	50
Side Arm Mount [SO 701-1] (E)	50
Detuner Mount (E)	15

MATERIAL STRENGTH

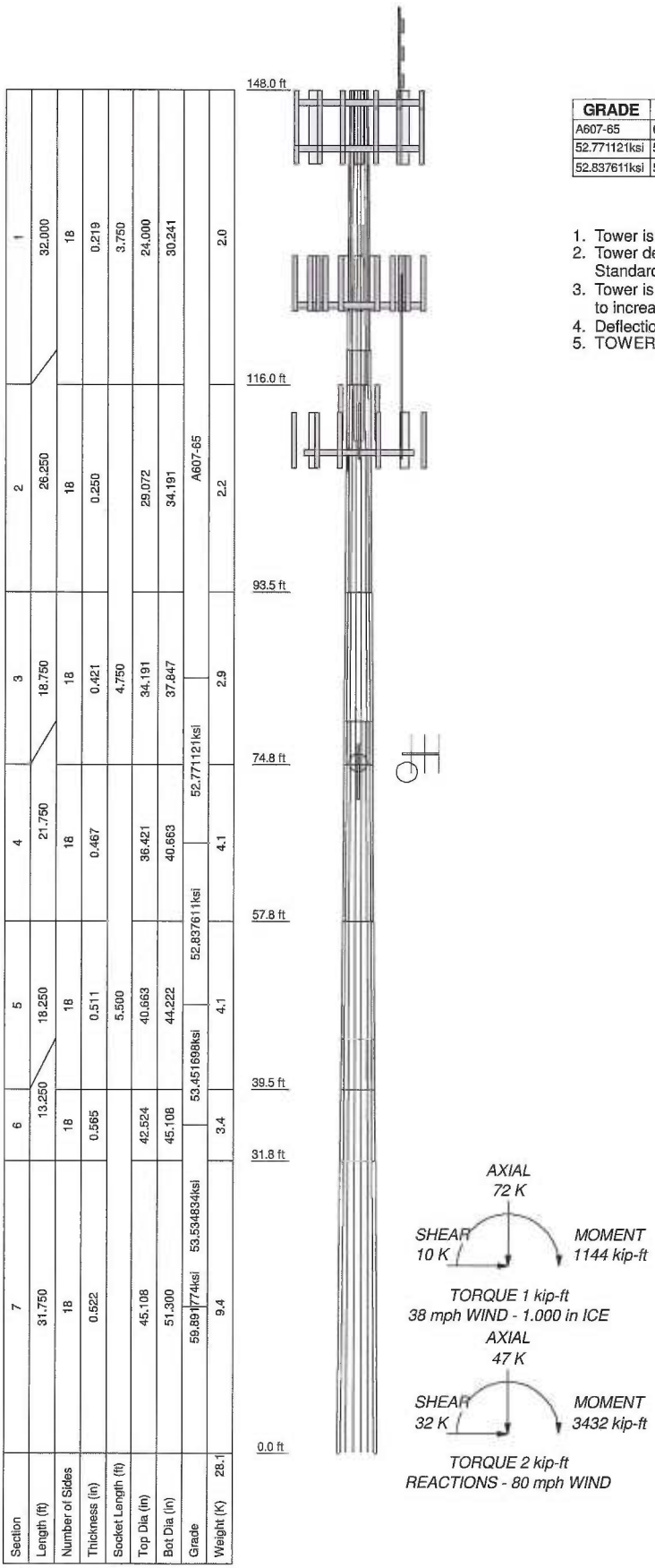
GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi	53.451698ksi	53 ksi	68 ksi
52.771121ksi	53 ksi	68 ksi	53.534834ksi	54 ksi	69 ksi
52.837611ksi	53 ksi	68 ksi	59.891774ksi	60 ksi	75 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 83.8%

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

Job: 91728.004.01 - Windsor Central, CT (BU# 855662)			
Project:			
Client: Crown Castle	Drawn by: Anil S. Poojary		App'd:
Code: TIA/EIA-222-F	Date: 10/07/14		Scale: NTS
Path:			Dwg No. E-1



Section	1	2	3	4	5	6	7
Length (ft)	32.000	26.250	18.750	21.750	18.250	13.250	31.750
Number of Sides	18	18	18	18	18	18	18
Thickness (in)	0.219	0.250	0.421	0.467	0.511	0.565	0.522
Socket Length (ft)	3.750		4.750		5.500		
Top Dia (in)	24.000	29.072	34.191	36.421	40.663	42.524	45.108
Bot Dia (in)	30.241	34.191	37.847	40.663	44.222	45.108	51.300
Grade	A607-65			52.771121ksi	52.837611ksi	53.451698ksi	53.534834ksi / 59.891774ksi
Weight (K)	2.0	2.2	2.9	4.1	4.1	3.4	9.4

Total Weight (K) 28.1

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi	53.451698ksi	53 ksi	68 ksi
52.771121ksi	53 ksi	68 ksi	53.534834ksi	54 ksi	69 ksi
52.837611ksi	53 ksi	68 ksi	59.891774ksi	60 ksi	75 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
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5. TOWER RATING: 83.8%

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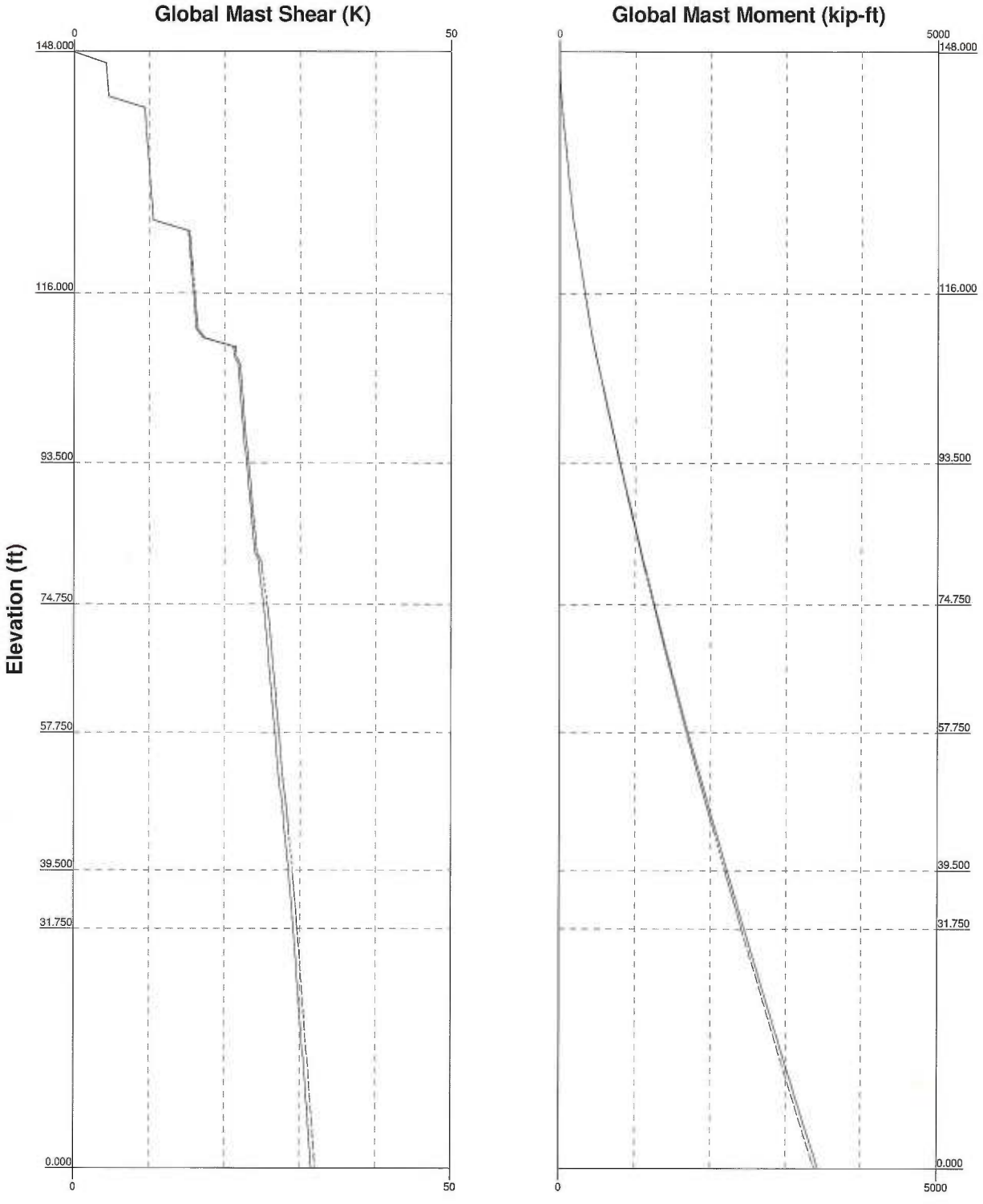
Job: 91728.004.01 - Windsor Central, CT (BU# 855662)			
Project:			
Client: Crown Castle	Drawn by: Anil S. Poojary		App'd:
Code: TIA/EIA-222-F	Date: 10/07/14		Scale: NTS
Path:			Dwg No. E-1

TIA/EIA-222-F - 80 mph/38 mph 1.000 in Ice

Vx Vz

Maximum Values

Mx Mz



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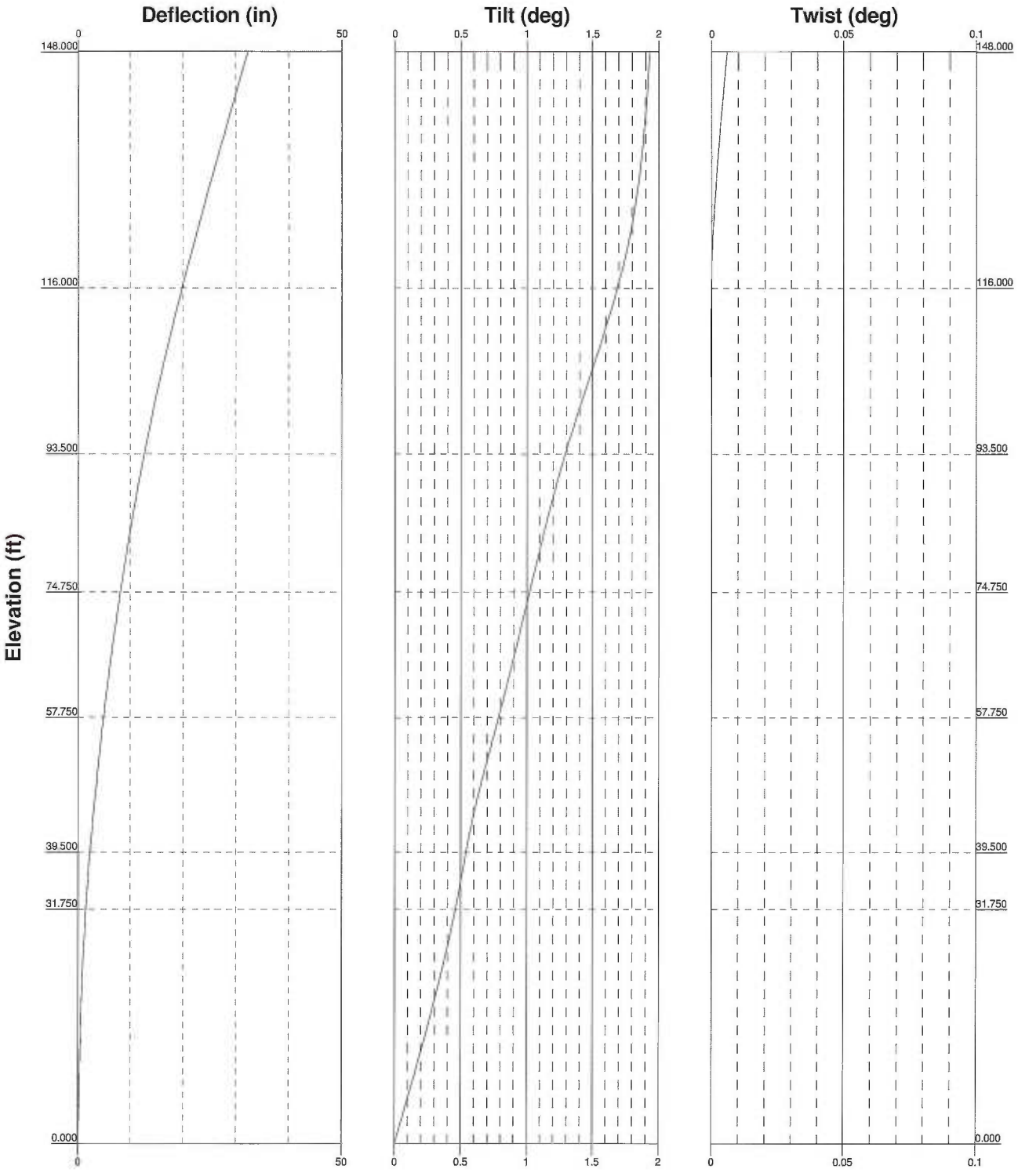
Job: 91728.004.01 - Windsor Central, CT (BU# 855662)		
Project:		
Client: Crown Castle	Drawn by: Anil S. Poojary	App'd:
Code: TIA/EIA-222-F	Date: 10/07/14	Scale: NTS
Path:		Dwg No. E-4

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

Maximum Values



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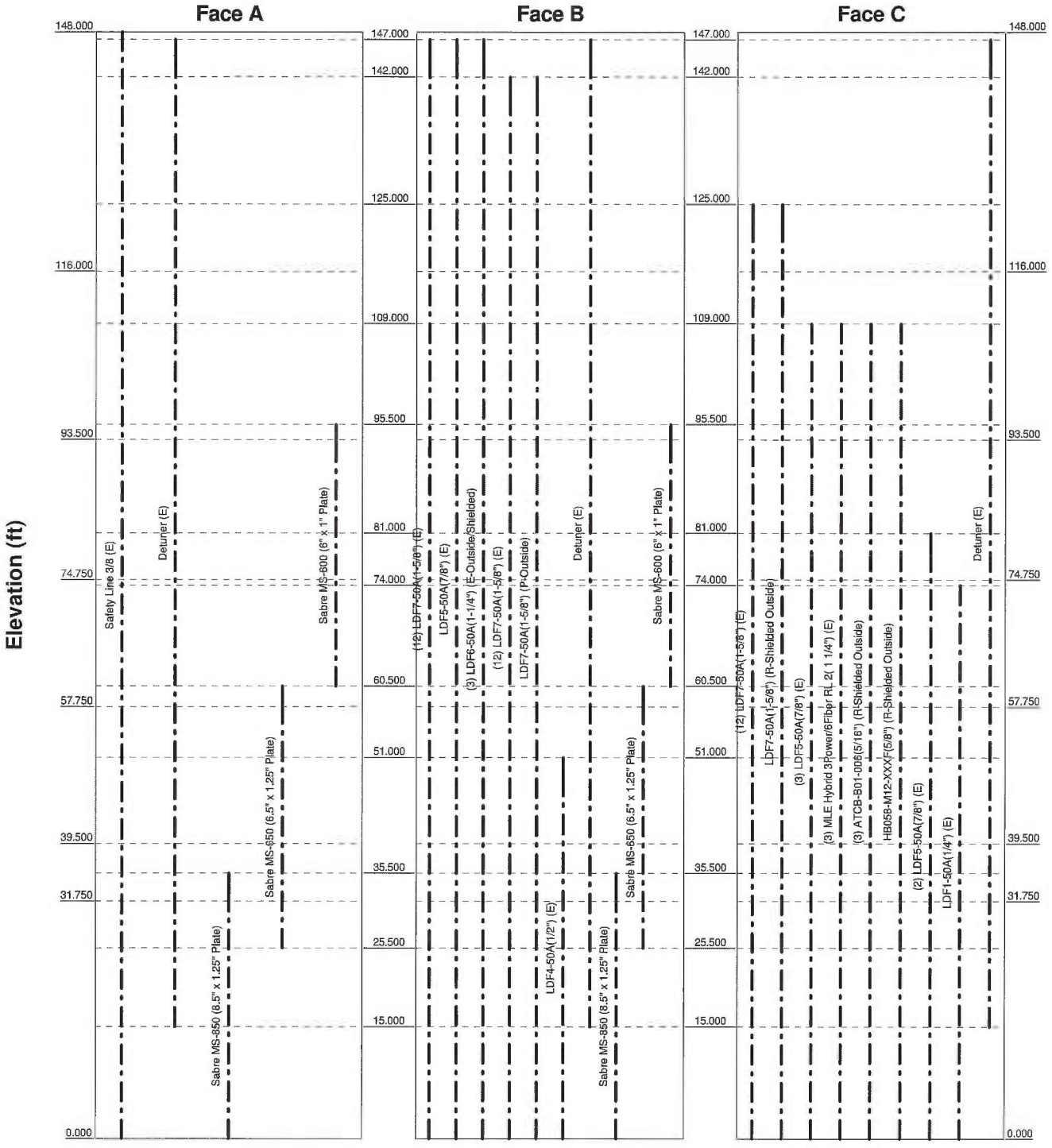
Job: 91728.004.01 - Windsor Central, CT (BU# 855662)		
Project:		
Client: Crown Castle	Drawn by: Anil S. Poojary	App'd:
Code: TIA/EIA-222-F	Date: 10/07/14	Scale: NTS
Path:		Dwg No. E-5

Feed Line Distribution Chart
0' - 148'

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



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Job: 91728.004.01 - Windsor Central, CT (BU# 855662)			
Project:			
Client: Crown Castle	Drawn by: Anil S. Poojary	App'd:	
Code: TIA/EIA-222-F	Date: 10/07/14	Scale: NTS	
Path:		Dwg No. E-7	

tnxTower	Job	Page
B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	91728.004.01 - Windsor Central, CT (BU# 855662)	1 of 38
	Project	Date 13:13:41 10/07/14
	Client Crown Castle	Designed by Anil S. Poojary

Tower Input Data

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

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 80 mph.
3) Nominal ice thickness of 1.000 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.000 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50.000 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) TOWER RATING: 83.8%.
10) A non-linear (P-delta) analysis was used.
11) Pressures are calculated at each section.
12) Stress ratio used in pole design is 1.333.
13) 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		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios		Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
√	Escalate Ice	√	Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends	√	Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice Capacity Exemption		

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	148.000-116.000	32.000	3.750	18	24.000	30.241	0.219	0.875	A607-65 (65 ksi)
L2	116.000-93.500	26.250	0.000	18	29.072	34.191	0.250	1.000	A607-65 (65 ksi)
L3	93.500-74.750	18.750	4.750	18	34.191	37.847	0.421	1.682	52.771121ksi (53 ksi)
L4	74.750-57.750	21.750	0.000	18	36.421	40.663	0.467	1.867	52.837611ksi (53 ksi)
L5	57.750-39.500	18.250	5.500	18	40.663	44.222	0.511	2.045	53.451698ksi (53 ksi)
L6	39.500-31.750	13.250	0.000	18	42.524	45.108	0.565	2.262	53.534834ksi (54 ksi)
L7	31.750-0.000	31.750		18	45.108	51.300	0.522	2.086	59.891774ksi (60 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	24.370	16.512	1179.768	8.442	12.192	96.766	2361.088	8.257	3.839	17.55
	30.708	20.845	2373.680	10.658	15.362	154.512	4750.483	10.424	4.937	22.571
L2	30.263	22.870	2400.285	10.232	14.769	162.526	4803.728	11.437	4.677	18.707
	34.718	26.932	3919.682	12.049	17.369	225.672	7844.521	13.469	5.578	22.31
L3	34.718	45.084	6495.710	11.988	17.369	373.985	12999.968	22.546	5.277	12.547
	38.431	49.965	8842.189	13.286	19.226	459.901	17696.012	24.987	5.921	14.077
L4	37.923	53.270	8699.854	12.764	18.502	470.218	17411.156	26.640	5.588	11.972
	41.290	59.555	12156.721	14.270	20.657	588.514	24329.438	29.783	6.335	13.571
L5	41.290	65.150	13269.407	14.254	20.657	642.380	26556.275	32.581	6.257	12.239
	44.904	70.925	17120.363	15.517	22.465	762.098	34263.253	35.469	6.883	13.465
L6	44.269	75.301	16748.886	14.895	21.602	775.327	33519.810	37.658	6.489	11.477
	45.804	79.938	20037.684	15.813	22.915	874.435	40101.735	39.977	6.944	12.281
L7	45.804	73.808	18537.479	15.828	22.915	808.967	37099.350	36.911	7.021	13.462
	52.091	84.057	27382.443	18.026	26.060	1050.730	54800.916	42.037	8.111	15.552

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
L1 148.000-116.000				1	1	1		
L2 116.000-93.500				1	1	1		
L3 93.500-74.750				1	1	0.967368		
L4 74.750-57.750				1	1	0.974999		
L5 57.750-39.500				1	1	0.967245		
L6 39.500-31.750				1	1	0.971676		

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
L7 31.750-0.000				1	1	1.10118		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
LDF7-50A(1-5/8") (E)	B	No	Inside Pole	147.000 - 0.000	0.000	0	12	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001 0.001
LDF5-50A(7/8") (E)	B	No	Inside Pole	147.000 - 0.000	0.000	0	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000 0.000
LDF6-50A(1-1/4") (E-Outside/Shielded)	B	No	CaAa (Out Of Face)	147.000 - 0.000	0.000	0	3	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.002 0.004 0.009 0.028
$$										
LDF7-50A(1-5/8") (E)	B	No	Inside Pole	142.000 - 0.000	0.000	0	12	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001 0.001
LDF7-50A(1-5/8") (P-Outside)	B	No	CaAa (Out Of Face)	142.000 - 0.000	0.000	0	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.198 0.298 0.398 0.598 0.998	0.001 0.002 0.004 0.011 0.030
$$										
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	125.000 - 0.000	0.000	0	12	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001 0.001
LDF7-50A(1-5/8") (R-Shielded Outside)	C	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.002 0.004 0.011 0.030
$$										
LDF5-50A(7/8") (E)	C	No	Inside Pole	109.000 - 0.000	0.000	0	3	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000 0.000
MLE Hybrid 3Power/6Fiber RL 2(1 1/4") (E)	C	No	Inside Pole	109.000 - 0.000	0.000	0	3	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001 0.001
ATCB-B01-00	C	No	CaAa (Out Of Face)	109.000 - 0.000	0.000	0	3	No Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
6(5/16") (R-Shielded Outside)								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
HB058-M12-XXXF(5/8") (R-Shielded Outside)	C	No	CaAa (Out Of Face)	109.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.002
								2" Ice	0.000	0.007
								4" Ice	0.000	0.024
$$										
LDF5-50A(7/8") (E)	C	No	Inside Pole	81.000 - 0.000	0.000	0	2	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
$$										
LDF1-50A(1/4") (E)	C	No	Inside Pole	74.000 - 0.000	0.000	0	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
$$										
LDF4-50A(1/2") (E)	B	No	CaAa (Out Of Face)	51.000 - 0.000	0.000	0	1	No Ice	0.063	0.000
								1/2" Ice	0.163	0.001
								1" Ice	0.263	0.002
								2" Ice	0.463	0.007
								4" Ice	0.863	0.023
$$										
Safety Line 3/8 (E)	A	No	CaAa (Out Of Face)	148.000 - 0.000	0.000	0	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
$$										
Detuner (E)	C	No	CaAa (Out Of Face)	147.000 - 15.000	24.000	0	1	No Ice	0.037	0.000
								1/2" Ice	0.137	0.001
								1" Ice	0.238	0.001
								2" Ice	0.437	0.002
								4" Ice	0.838	0.004
Detuner (E)	B	No	CaAa (Out Of Face)	147.000 - 15.000	24.000	0	1	No Ice	0.037	0.000
								1/2" Ice	0.137	0.001
								1" Ice	0.238	0.001
								2" Ice	0.437	0.002
								4" Ice	0.838	0.004
Detuner (E)	A	No	CaAa (Out Of Face)	147.000 - 15.000	24.000	0	1	No Ice	0.037	0.000
								1/2" Ice	0.137	0.001
								1" Ice	0.238	0.001
								2" Ice	0.437	0.002
								4" Ice	0.838	0.004
$$										
Sabre MS-850 (8.5" x 1.25" Plate)	A	No	CaAa (Out Of Face)	35.500 - 0.000	0.000	0	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-850 (8.5" x 1.25" Plate)	B	No	CaAa (Out Of Face)	35.500 - 0.000	0.000	0	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"	A	No	CaAa (Out Of Face)	60.500 - 25.500	0.000	0	1	No Ice	0.208	0.000
								1/2" Ice	0.292	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
Plate)								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)	B	No	CaAa (Out Of Face)	60.500 - 25.500	0.000	0	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)	A	No	CaAa (Out Of Face)	95.500 - 60.500	0.000	0	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)	B	No	CaAa (Out Of Face)	95.500 - 60.500	0.000	0	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

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	148.000-116.000	A	0.000	0.000	0.000	2.362	0.014
		B	0.000	0.000	0.000	6.310	0.661
		C	0.000	0.000	0.000	1.163	0.103
L2	116.000-93.500	A	0.000	0.000	0.000	2.021	0.010
		B	0.000	0.000	0.000	5.632	0.518
		C	0.000	0.000	0.000	0.844	0.299
L3	93.500-74.750	A	0.000	0.000	0.000	4.531	0.008
		B	0.000	0.000	0.000	7.541	0.432
		C	0.000	0.000	0.000	0.703	0.273
L4	74.750-57.750	A	0.000	0.000	0.000	4.223	0.007
		B	0.000	0.000	0.000	6.951	0.392
		C	0.000	0.000	0.000	0.637	0.256
L5	57.750-39.500	A	0.000	0.000	0.000	5.171	0.008
		B	0.000	0.000	0.000	8.824	0.422
		C	0.000	0.000	0.000	0.684	0.275
L6	39.500-31.750	A	0.000	0.000	0.000	2.977	0.003
		B	0.000	0.000	0.000	4.709	0.180
		C	0.000	0.000	0.000	0.291	0.117
L7	31.750-0.000	A	0.000	0.000	0.000	9.735	0.011
		B	0.000	0.000	0.000	16.832	0.733
		C	0.000	0.000	0.000	0.628	0.475

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	148.000-116.000	A	1.180	0.000	0.000	0.000	17.237	0.093
		B		0.000	0.000	0.000	19.768	1.206
		C		0.000	0.000	0.000	8.481	0.184
L2	116.000-93.500	A	1.148	0.000	0.000	0.000	13.039	0.066
		B		0.000	0.000	0.000	16.650	0.931
		C		0.000	0.000	0.000	6.156	0.481
L3	93.500-74.750	A	1.119	0.000	0.000	0.000	16.416	0.053
		B		0.000	0.000	0.000	19.426	0.748
		C		0.000	0.000	0.000	4.898	0.430
L4	74.750-57.750	A	1.087	0.000	0.000	0.000	14.999	0.048
		B		0.000	0.000	0.000	17.727	0.678
		C		0.000	0.000	0.000	4.441	0.398
L5	57.750-39.500	A	1.047	0.000	0.000	0.000	16.001	0.049
		B		0.000	0.000	0.000	22.064	0.724
		C		0.000	0.000	0.000	4.507	0.412
L6	39.500-31.750	A	1.009	0.000	0.000	0.000	8.231	0.021
		B		0.000	0.000	0.000	11.586	0.314
		C		0.000	0.000	0.000	1.914	0.175
L7	31.750-0.000	A	1.000	0.000	0.000	0.000	25.769	0.062
		B		0.000	0.000	0.000	39.215	1.226
		C		0.000	0.000	0.000	3.978	0.680

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	148.000-116.000	0.188	0.059	0.273	-0.082
L2	116.000-93.500	0.243	0.070	0.364	-0.066
L3	93.500-74.750	0.386	-0.027	0.564	-0.191
L4	74.750-57.750	0.398	-0.031	0.587	-0.200
L5	57.750-39.500	0.473	-0.028	0.733	-0.129
L6	39.500-31.750	0.580	-0.073	0.899	-0.159
L7	31.750-0.000	0.544	-0.038	0.908	-0.123

Discrete Tower Loads

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) 800 10121 w/ Mount Pipe	A	From Leg	4.000	0.000	147.000	No Ice	5.685	4.600	0.066
(E)			0.000			1/2" Ice	6.182	5.351	0.114
			-2.000			1" Ice	6.676	6.046	0.168
						2" Ice	7.695	7.526	0.298
						4" Ice	9.858	10.832	0.675
(2) 800 10121 w/ Mount Pipe	B	From Leg	4.000	0.000	147.000	No Ice	5.685	4.600	0.066
(E)			0.000			1/2" Ice	6.182	5.351	0.114
			-2.000			1" Ice	6.676	6.046	0.168
						2" Ice	7.695	7.526	0.298
						4" Ice	9.858	10.832	0.675
(2) 800 10121 w/ Mount Pipe	C	From Leg	4.000	0.000	147.000	No Ice	5.685	4.600	0.066
(E)			0.000			1/2" Ice	6.182	5.351	0.114
			-2.000			1" Ice	6.676	6.046	0.168
						2" Ice	7.695	7.526	0.298
						4" Ice	9.858	10.832	0.675
AM-X-CD-16-65-00T-RET	A	From Leg	4.000	0.000	147.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.139
(E)			-2.000			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
AM-X-CD-16-65-00T-RET	B	From Leg	4.000	0.000	147.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.139
(E)			-2.000			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
P65-15-XLH-RR w/ Mount	C	From Leg	4.000	0.000	147.000	No Ice	5.838	3.665	0.048
Pipe			0.000			1/2" Ice	6.292	4.278	0.092
(E)			-2.000			1" Ice	6.756	4.902	0.142
						2" Ice	7.716	6.235	0.262
						4" Ice	9.772	9.277	0.611
(4) LGP 13519	A	From Leg	4.000	0.000	147.000	No Ice	0.338	0.207	0.005
(E)			0.000			1/2" Ice	0.422	0.280	0.008
			-2.000			1" Ice	0.515	0.362	0.012
						2" Ice	0.726	0.551	0.024
						4" Ice	1.252	1.034	0.071
(4) LGP 13519	B	From Leg	4.000	0.000	147.000	No Ice	0.338	0.207	0.005
(E)			0.000			1/2" Ice	0.422	0.280	0.008
			-2.000			1" Ice	0.515	0.362	0.012
						2" Ice	0.726	0.551	0.024
						4" Ice	1.252	1.034	0.071
(4) LGP 13519	C	From Leg	4.000	0.000	147.000	No Ice	0.338	0.207	0.005
(E)			0.000			1/2" Ice	0.422	0.280	0.008
			-2.000			1" Ice	0.515	0.362	0.012
						2" Ice	0.726	0.551	0.024
						4" Ice	1.252	1.034	0.071
RRUS-11	A	From Leg	4.000	0.000	147.000	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
RRUS-11	B	From Leg	4.000	0.000	147.000	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

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
						4" Ice	5.426	3.042	0.310
RRUS-11	C	From Leg	4.000	0.000	147.000	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
(4) 860 10025	A	From Leg	4.000	0.000	147.000	No Ice	0.163	0.136	0.001
(E)			0.000			1/2" Ice	0.229	0.199	0.003
			-2.000			1" Ice	0.302	0.270	0.005
						2" Ice	0.476	0.439	0.014
						4" Ice	0.927	0.879	0.051
(4) 860 10025	B	From Leg	4.000	0.000	147.000	No Ice	0.163	0.136	0.001
(E)			0.000			1/2" Ice	0.229	0.199	0.003
			-2.000			1" Ice	0.302	0.270	0.005
						2" Ice	0.476	0.439	0.014
						4" Ice	0.927	0.879	0.051
(4) 860 10025	C	From Leg	4.000	0.000	147.000	No Ice	0.163	0.136	0.001
(E)			0.000			1/2" Ice	0.229	0.199	0.003
			-2.000			1" Ice	0.302	0.270	0.005
						2" Ice	0.476	0.439	0.014
						4" Ice	0.927	0.879	0.051
DC6-48-60-18-8F	B	From Leg	4.000	0.000	147.000	No Ice	2.567	2.567	0.019
(E)			0.000			1/2" Ice	2.798	2.798	0.041
			2.000			1" Ice	3.038	3.038	0.067
						2" Ice	3.543	3.543	0.129
						4" Ice	4.658	4.658	0.299
PD320-2	B	From Leg	4.000	0.000	147.000	No Ice	1.800	1.000	0.015
(E)			0.000			1/2" Ice	3.408	2.017	0.022
			5.000			1" Ice	5.016	3.034	0.029
						2" Ice	8.232	5.068	0.043
						4" Ice	14.664	9.136	0.071
Platform Mount [LP 1201-1]	C	None		0.000	147.000	No Ice	23.100	23.100	2.100
(E)						1/2" Ice	26.800	26.800	2.500
						1" Ice	30.500	30.500	2.900
						2" Ice	37.900	37.900	3.700
						4" Ice	52.700	52.700	5.300
$$									
ERICSSON AIR 21 B2A	A	From Leg	4.000	0.000	142.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	B	From Leg	4.000	0.000	142.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	C	From Leg	4.000	0.000	142.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	A	From Leg	4.000	0.000	142.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	B	From Leg	4.000	0.000	142.000	No Ice	6.825	5.642	0.112

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
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	C	From Leg	4.000	0.000	142.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
LNX-6515DS-VTM w/	A	From Leg	4.000	0.000	142.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(P)			1.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/	B	From Leg	4.000	0.000	142.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(P)			1.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/	C	From Leg	4.000	0.000	142.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(P)			1.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
RRUS 11 B12	A	From Leg	4.000	0.000	142.000	No Ice	3.306	1.361	0.051
(P)			0.000			1/2" Ice	3.550	1.540	0.072
			0.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
RRUS 11 B12	B	From Leg	4.000	0.000	142.000	No Ice	3.306	1.361	0.051
(P)			0.000			1/2" Ice	3.550	1.540	0.072
			0.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
RRUS 11 B12	C	From Leg	4.000	0.000	142.000	No Ice	3.306	1.361	0.051
(P)			0.000			1/2" Ice	3.550	1.540	0.072
			0.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
KRY 112 144/1	A	From Leg	4.000	0.000	142.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	B	From Leg	4.000	0.000	142.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	C	From Leg	4.000	0.000	142.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	142.000	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

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
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	142.000	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	4.000	0.000	142.000	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
Platform Mount [LP 1201-1]	C	None		0.000	142.000	No Ice	23.100	23.100	2.100
(E)						1/2" Ice	26.800	26.800	2.500
						1" Ice	30.500	30.500	2.900
						2" Ice	37.900	37.900	3.700
						4" Ice	52.700	52.700	5.300
$$									
(2) DB844G65ZAXY	A	From Leg	4.000	0.000	125.000	No Ice	5.379	5.396	0.042
w/Mount Pipe			0.000			1/2" Ice	6.071	6.491	0.093
(E)			2.000			1" Ice	6.647	7.302	0.150
						2" Ice	7.828	8.960	0.288
						4" Ice	10.341	12.491	0.689
(2) DB844G65ZAXY	B	From Leg	4.000	0.000	125.000	No Ice	5.379	5.396	0.042
w/Mount Pipe			0.000			1/2" Ice	6.071	6.491	0.093
(E)			2.000			1" Ice	6.647	7.302	0.150
						2" Ice	7.828	8.960	0.288
						4" Ice	10.341	12.491	0.689
(2) DB844G65ZAXY	C	From Leg	4.000	0.000	125.000	No Ice	5.379	5.396	0.042
w/Mount Pipe			0.000			1/2" Ice	6.071	6.491	0.093
(E)			2.000			1" Ice	6.647	7.302	0.150
						2" Ice	7.828	8.960	0.288
						4" Ice	10.341	12.491	0.689
P65-16-XL-R w/ Mount Pipe	A	From Leg	4.000	0.000	125.000	No Ice	8.637	6.362	0.057
(E)			0.000			1/2" Ice	9.290	7.538	0.122
			2.000			1" Ice	9.910	8.427	0.196
						2" Ice	11.176	10.239	0.371
						4" Ice	13.829	14.099	0.864
P65-16-XL-R w/ Mount Pipe	B	From Leg	4.000	0.000	125.000	No Ice	8.637	6.362	0.057
(E)			0.000			1/2" Ice	9.290	7.538	0.122
			2.000			1" Ice	9.910	8.427	0.196
						2" Ice	11.176	10.239	0.371
						4" Ice	13.829	14.099	0.864
BXA-70080-6CF-4 w/ Mount	C	From Leg	4.000	0.000	125.000	No Ice	6.006	6.203	0.043
Pipe			0.000			1/2" Ice	6.562	7.359	0.098
(E)			2.000			1" Ice	7.083	8.229	0.160
						2" Ice	8.167	10.019	0.310
						4" Ice	10.691	13.840	0.750
(2) FD9R6004/2C-3L	A	From Leg	4.000	0.000	125.000	No Ice	0.367	0.085	0.003
(E)			0.000			1/2" Ice	0.451	0.136	0.005
			2.000			1" Ice	0.543	0.196	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	125.000	No Ice	0.367	0.085	0.003
(E)			0.000			1/2" Ice	0.451	0.136	0.005
			2.000			1" Ice	0.543	0.196	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	125.000	No Ice	0.367	0.085	0.003

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)			0.000			1/2" Ice	0.451	0.136	0.005
			2.000			1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
HBX-6516DS-VTM w/	A	From Leg	4.000	0.000	125.000	No Ice	3.598	3.241	0.029
Mount Pipe			0.000			1/2" Ice	3.998	3.914	0.062
(R)			2.000			1" Ice	4.435	4.564	0.101
						2" Ice	5.368	5.914	0.199
						4" Ice	7.361	8.877	0.504
HBX-6516DS-VTM w/	B	From Leg	4.000	0.000	125.000	No Ice	3.598	3.241	0.029
Mount Pipe			0.000			1/2" Ice	3.998	3.914	0.062
(R)			2.000			1" Ice	4.435	4.564	0.101
						2" Ice	5.368	5.914	0.199
						4" Ice	7.361	8.877	0.504
HBX-6516DS-VTM w/	C	From Leg	4.000	0.000	125.000	No Ice	3.598	3.241	0.029
Mount Pipe			0.000			1/2" Ice	3.998	3.914	0.062
(R)			2.000			1" Ice	4.435	4.564	0.101
						2" Ice	5.368	5.914	0.199
						4" Ice	7.361	8.877	0.504
HBX-6517DS-VTM w/	A	From Leg	4.000	0.000	125.000	No Ice	5.541	5.021	0.045
Mount Pipe			0.000			1/2" Ice	6.112	6.223	0.092
(R)			2.000			1" Ice	6.654	7.167	0.146
						2" Ice	7.750	9.011	0.281
						4" Ice	10.109	12.898	0.692
HBX-6517DS-VTM w/	B	From Leg	4.000	0.000	125.000	No Ice	5.541	5.021	0.045
Mount Pipe			0.000			1/2" Ice	6.112	6.223	0.092
(R)			2.000			1" Ice	6.654	7.167	0.146
						2" Ice	7.750	9.011	0.281
						4" Ice	10.109	12.898	0.692
HBX-6517DS-VTM w/	C	From Leg	4.000	0.000	125.000	No Ice	5.541	5.021	0.045
Mount Pipe			0.000			1/2" Ice	6.112	6.223	0.092
(R)			2.000			1" Ice	6.654	7.167	0.146
						2" Ice	7.750	9.011	0.281
						4" Ice	10.109	12.898	0.692
DB-T1-6Z-8AB-0Z	A	From Leg	4.000	0.000	125.000	No Ice	5.600	2.333	0.044
(R)			0.000			1/2" Ice	5.915	2.558	0.080
			2.000			1" Ice	6.240	2.791	0.120
						2" Ice	6.914	3.284	0.213
						4" Ice	8.365	4.373	0.455
RRH2x40-AWS	A	From Leg	4.000	0.000	125.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			2.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2x40-AWS	B	From Leg	4.000	0.000	125.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			2.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2x40-AWS	C	From Leg	4.000	0.000	125.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			2.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
Platform Mount [LP 403-1]	C	None		0.000	125.000	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

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
						4" Ice	62.450	62.450	3.872
$$									
TME-800MHz 2X50W RRH W/FILTER (E)	A	From Leg	1.000 0.000 2.000	0.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
TME-800MHz 2X50W RRH W/FILTER (E)	B	From Leg	1.000 0.000 2.000	0.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
TME-800MHz 2X50W RRH W/FILTER (E)	C	From Leg	1.000 0.000 2.000	0.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
PCS 1900MHz 4x45W-65MHz (E)	A	From Leg	1.000 0.000 0.000	0.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.709 2.948 3.195 3.716 4.862	2.611 2.847 3.092 3.608 4.744	0.060 0.083 0.110 0.173 0.347
PCS 1900MHz 4x45W-65MHz (E)	B	From Leg	1.000 0.000 0.000	0.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.709 2.948 3.195 3.716 4.862	2.611 2.847 3.092 3.608 4.744	0.060 0.083 0.110 0.173 0.347
PCS 1900MHz 4x45W-65MHz (E)	C	From Leg	1.000 0.000 0.000	0.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.709 2.948 3.195 3.716 4.862	2.611 2.847 3.092 3.608 4.744	0.060 0.083 0.110 0.173 0.347
Pipe Mount [PM 601-3] (E)	C	None		0.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.390 5.480 6.570 8.750 13.110	4.390 5.480 6.570 8.750 13.110	0.195 0.237 0.280 0.365 0.534
$$									
APXVTM14-C-120 w/ Mount Pipe (R)	A	From Leg	4.000 0.000 1.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.077 0.132 0.193 0.339 0.753
APXVTM14-C-120 w/ Mount Pipe (R)	B	From Leg	4.000 0.000 1.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.077 0.132 0.193 0.339 0.753
APXVTM14-C-120 w/ Mount Pipe (R)	C	From Leg	4.000 0.000 1.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.077 0.132 0.193 0.339 0.753
TD-RRH8x20-25 (R)	B	From Leg	4.000 0.000 1.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397

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
TD-RRH8x20-25	C	From Leg	4.000	0.000	109.000	No Ice	4.720	1.703	0.070
(R)			0.000			1/2" Ice	5.014	1.920	0.097
			1.000			1" Ice	5.316	2.145	0.128
						2" Ice	5.948	2.622	0.201
						4" Ice	7.314	3.680	0.397
TD-RRH8x20-25	A	From Leg	4.000	0.000	109.000	No Ice	4.720	1.703	0.070
(R)			0.000			1/2" Ice	5.014	1.920	0.097
			1.000			1" Ice	5.316	2.145	0.128
						2" Ice	5.948	2.622	0.201
						4" Ice	7.314	3.680	0.397
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000	0.000	109.000	No Ice	8.498	6.946	0.083
(E)			0.000			1/2" Ice	9.149	8.127	0.151
			1.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000	0.000	109.000	No Ice	8.498	6.946	0.083
(E)			0.000			1/2" Ice	9.149	8.127	0.151
			1.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
(2) APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000	0.000	109.000	No Ice	8.498	6.946	0.083
(E)			0.000			1/2" Ice	9.149	8.127	0.151
			1.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
SRL-227	A	From Leg	4.000	0.000	109.000	No Ice	4.625	1.448	0.035
(E)			0.000			1/2" Ice	9.386	3.733	0.071
			4.000			1" Ice	14.147	6.018	0.106
						2" Ice	23.669	10.588	0.178
						4" Ice	42.713	19.728	0.320
DB205-L	B	From Leg	4.000	0.000	109.000	No Ice	1.717	1.717	0.036
(E)			0.000			1/2" Ice	3.450	3.450	0.052
			9.000			1" Ice	5.200	5.200	0.078
						2" Ice	8.750	8.750	0.164
						4" Ice	15.687	15.687	0.472
SD212-SF3P2SNM	B	From Leg	4.000	0.000	109.000	No Ice	2.160	2.160	0.021
(E)			0.000			1/2" Ice	3.960	3.960	0.050
			9.000			1" Ice	5.760	5.760	0.079
						2" Ice	9.360	9.360	0.137
						4" Ice	16.560	16.560	0.253
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	109.000	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
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	109.000	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
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	109.000	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
Platform Mount [LP 1201-1]	C	None		0.000	109.000	No Ice	23.100	23.100	2.100
(E)						1/2" Ice	26.800	26.800	2.500
						1" Ice	30.500	30.500	2.900

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	37.900	37.900	3.700
						4" Ice	52.700	52.700	5.300
Miscellaneous [NA 509-3]	C	None		0.000	107.000	No Ice	11.840	11.840	0.275
(R)						1/2" Ice	16.960	16.960	0.296
						1" Ice	22.080	22.080	0.317
						2" Ice	32.320	32.320	0.360
						4" Ice	52.800	52.800	0.445
$$									
SRL-227	A	From Leg	4.000	0.000	81.000	No Ice	4.625	1.448	0.035
(E)			0.000			1/2" Ice	9.386	3.733	0.071
			2.000			1" Ice	14.147	6.018	0.106
						2" Ice	23.669	10.588	0.178
						4" Ice	42.713	19.728	0.320
SD212	B	From Leg	4.000	0.000	81.000	No Ice	3.000	3.000	0.016
(E)			0.000			1/2" Ice	4.032	4.032	0.174
			-5.000			1" Ice	5.064	5.064	0.341
						2" Ice	7.128	7.128	0.701
						4" Ice	11.256	11.256	1.531
5' x 2" Pipe Mount	A	From Leg	4.000	0.000	81.000	No Ice	1.000	1.000	0.029
(E)			0.000			1/2" Ice	1.393	1.393	0.037
			0.000			1" Ice	1.703	1.703	0.048
						2" Ice	2.351	2.351	0.082
						4" Ice	3.778	3.778	0.196
5' x 2" Pipe Mount	B	From Leg	4.000	0.000	81.000	No Ice	1.000	1.000	0.029
(E)			0.000			1/2" Ice	1.393	1.393	0.037
			0.000			1" Ice	1.703	1.703	0.048
						2" Ice	2.351	2.351	0.082
						4" Ice	3.778	3.778	0.196
5' x 2" Pipe Mount	C	From Leg	4.000	0.000	81.000	No Ice	1.000	1.000	0.029
(E)			0.000			1/2" Ice	1.393	1.393	0.037
			0.000			1" Ice	1.703	1.703	0.048
						2" Ice	2.351	2.351	0.082
						4" Ice	3.778	3.778	0.196
Side Arm Mount [SO 702-3]	C	None		0.000	81.000	No Ice	3.220	3.220	0.081
(E)						1/2" Ice	4.150	4.150	0.114
						1" Ice	5.080	5.080	0.147
						2" Ice	6.940	6.940	0.213
						4" Ice	10.660	10.660	0.345
$$									
$$									
Pipe Mount [PM 601-1]	A	From Leg	0.500	0.000	74.000	No Ice	3.000	0.900	0.065
(E)			0.000			1/2" Ice	3.740	1.120	0.079
			0.000			1" Ice	4.480	1.340	0.093
						2" Ice	5.960	1.780	0.122
						4" Ice	8.920	2.660	0.178
$$									
GPS-TMG-HR-26N	A	From Leg	3.000	0.000	50.000	No Ice	0.160	0.160	0.001
(E)			0.000			1/2" Ice	0.219	0.219	0.002
			1.000			1" Ice	0.285	0.285	0.005
						2" Ice	0.445	0.445	0.014
						4" Ice	0.867	0.867	0.053
4' x 2" Pipe Mount	A	From Leg	3.000	0.000	50.000	No Ice	0.785	0.785	0.029
(E)			0.000			1/2" Ice	1.028	1.028	0.035
			0.000			1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
						4" Ice	3.111	3.111	0.167
Side Arm Mount [SO 701-1]	A	From Leg	3.000	0.000	50.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079

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	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
$$									
Detuner Mount (E)	C	None		0.000	147.000	No Ice	2.830	2.830	0.195
						1/2" Ice	3.920	3.920	0.237
						1" Ice	5.010	5.010	0.279
						2" Ice	7.190	7.190	0.363
						4" Ice	11.550	11.550	0.531
Detuner Mount (E)	C	None		0.000	95.000	No Ice	2.830	2.830	0.195
						1/2" Ice	3.920	3.920	0.237
						1" Ice	5.010	5.010	0.279
						2" Ice	7.190	7.190	0.363
						4" Ice	11.550	11.550	0.531
Detuner Mount (E)	C	None		0.000	50.000	No Ice	2.830	2.830	0.195
						1/2" Ice	3.920	3.920	0.237
						1" Ice	5.010	5.010	0.279
						2" Ice	7.190	7.190	0.363
						4" Ice	11.550	11.550	0.531
Detuner Mount (E)	C	None		0.000	15.000	No Ice	2.830	2.830	0.195
						1/2" Ice	3.920	3.920	0.237
						1" Ice	5.010	5.010	0.279
						2" Ice	7.190	7.190	0.363
						4" Ice	11.550	11.550	0.531

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
HP2-23 (E)	A	Paraboloid w/Shroud (HP)	From Leg	1.000 0.000 1.000	0.000		74.000	2.042	No Ice	3.274	0.027
									1/2" Ice	3.547	0.045
									1" Ice	3.819	0.063
									2" Ice	4.365	0.100
									4" Ice	5.456	0.173
$$											

Load Combinations

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

Maximum 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	148 - 116	Pole	Max Tension	11	0.000	-0.000	0.000
			Max. Compression	14	-21.429	-1.563	0.438
			Max. Mx	5	-10.019	-278.886	-0.668
			Max. My	2	-9.992	0.512	279.646
			Max. Vy	5	15.571	-278.886	-0.668
			Max. Vx	8	15.746	-1.164	-279.238
			Max. Torque	7			1.226
L2	116 - 93.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-34.256	-1.701	-0.830
			Max. Mx	5	-17.423	-800.558	-2.117
			Max. My	8	-17.391	-2.331	-807.938
			Max. Vy	5	22.930	-800.558	-2.117

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	23.203	-2.331	-807.938
			Max. Torque	7			1.236
L3	93.5 - 74.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-38.861	-3.768	-1.528
			Max. Mx	5	-20.466	-1130.613	-2.486
			Max. My	8	-20.431	-2.906	-1142.016
			Max. Vy	5	24.599	-1130.613	-2.486
			Max. Vx	8	24.987	-2.906	-1142.016
			Max. Torque	3			-1.452
L4	74.75 - 57.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-46.716	-4.093	-1.584
			Max. Mx	5	-26.477	-1689.941	-2.881
			Max. My	8	-26.445	-3.714	-1712.073
			Max. Vy	5	26.712	-1689.941	-2.881
			Max. Vx	8	27.246	-3.714	-1712.073
			Max. Torque	9			1.408
L5	57.75 - 39.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-51.509	-4.302	-1.153
			Max. Mx	5	-30.256	-2038.177	-2.753
			Max. My	2	-30.232	3.137	2066.706
			Max. Vy	5	27.970	-2038.177	-2.753
			Max. Vx	8	28.477	-4.185	-2066.556
			Max. Torque	9			1.430
L6	39.5 - 31.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-58.102	-4.536	-1.440
			Max. Mx	5	-35.587	-2417.060	-3.076
			Max. My	8	-35.568	-4.672	-2452.180
			Max. Vy	5	29.177	-2417.060	-3.076
			Max. Vx	8	29.684	-4.672	-2452.180
			Max. Torque	2			-1.412
L7	31.75 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-71.668	-5.130	-2.158
			Max. Mx	5	-46.963	-3381.260	-3.847
			Max. My	8	-46.963	-5.817	-3432.354
			Max. Vy	5	31.595	-3381.260	-3.847
			Max. Vx	8	32.091	-5.817	-3432.354
			Max. Torque	2			-1.549

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	21	71.668	-0.015	-10.488
	Max. H_x	11	46.979	31.572	0.045
	Max. H_z	2	46.979	0.033	32.040
	Max. M_x	2	3430.897	0.033	32.040
	Max. M_z	5	3381.260	-31.572	-0.020
	Max. Torsion	8	1.536	-0.033	-32.068
	Min. Vert	1	46.979	0.000	0.000
	Min. H_x	5	46.979	-31.572	-0.020
	Min. H_z	8	46.979	-0.033	-32.068
	Min. M_x	8	-3432.354	-0.033	-32.068
	Min. M_z	11	-3379.939	31.572	0.045
	Min. Torsion	2	-1.549	0.033	32.040

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	46.979	0.000	0.000	-0.341	-0.631	0.000
Dead+Wind 0 deg - No Ice	46.979	-0.033	-32.040	-3430.897	4.509	1.549
Dead+Wind 30 deg - No Ice	46.979	15.742	-27.740	-2969.424	-1685.259	1.415
Dead+Wind 60 deg - No Ice	46.979	27.314	-16.015	-1712.983	-2924.848	0.860
Dead+Wind 90 deg - No Ice	46.979	31.572	0.020	3.847	-3381.260	0.068
Dead+Wind 120 deg - No Ice	46.979	27.338	16.098	1723.264	-2929.374	-0.638
Dead+Wind 150 deg - No Ice	46.979	15.805	27.802	2976.090	-1694.705	-1.250
Dead+Wind 180 deg - No Ice	46.979	0.033	32.068	3432.354	-5.816	-1.536
Dead+Wind 210 deg - No Ice	46.979	-15.749	27.769	2970.943	1684.464	-1.415
Dead+Wind 240 deg - No Ice	46.979	-27.306	16.042	1714.329	2922.914	-0.911
Dead+Wind 270 deg - No Ice	46.979	-31.572	-0.045	-6.479	3379.939	-0.081
Dead+Wind 300 deg - No Ice	46.979	-27.346	-16.071	-1721.907	2928.672	0.677
Dead+Wind 330 deg - No Ice	46.979	-15.798	-27.772	-2974.560	1692.878	1.264
Dead+Ice+Temp	71.668	0.000	0.000	2.158	-5.130	0.000
Dead+Wind 0 deg+Ice+Temp	71.668	-0.015	-10.480	-1139.404	-2.989	0.932
Dead+Wind 30 deg+Ice+Temp	71.668	5.123	-9.071	-985.491	-563.293	0.712
Dead+Wind 60 deg+Ice+Temp	71.668	8.893	-5.233	-567.083	-974.393	0.291
Dead+Wind 90 deg+Ice+Temp	71.668	10.281	0.012	4.256	-1125.921	-0.209
Dead+Wind 120 deg+Ice+Temp	71.668	8.906	5.266	576.039	-976.524	-0.626
Dead+Wind 150 deg+Ice+Temp	71.668	5.151	9.094	992.811	-567.407	-0.897
Dead+Wind 180 deg+Ice+Temp	71.668	0.015	10.488	1144.410	-7.582	-0.930
Dead+Wind 210 deg+Ice+Temp	71.668	-5.125	9.079	990.514	552.858	-0.715
Dead+Wind 240 deg+Ice+Temp	71.668	-8.891	5.240	572.061	963.655	-0.305
Dead+Wind 270 deg+Ice+Temp	71.668	-10.281	-0.018	-0.337	1115.347	0.208
Dead+Wind 300 deg+Ice+Temp	71.668	-8.908	-5.259	-571.059	966.115	0.640
Dead+Wind 330 deg+Ice+Temp	71.668	-5.149	-9.086	-987.785	556.699	0.902
Dead+Wind 0 deg - Service	46.979	-0.013	-12.516	-1341.597	1.356	0.607
Dead+Wind 30 deg - Service	46.979	6.149	-10.836	-1161.166	-659.293	0.555
Dead+Wind 60 deg - Service	46.979	10.669	-6.256	-669.929	-1143.922	0.339
Dead+Wind 90 deg - Service	46.979	12.333	0.008	1.290	-1322.359	0.029
Dead+Wind 120 deg - Service	46.979	10.679	6.288	673.524	-1145.699	-0.249
Dead+Wind 150 deg - Service	46.979	6.174	10.860	1163.350	-662.991	-0.491
Dead+Wind 180 deg - Service	46.979	0.013	12.527	1341.736	-2.682	-0.605
Dead+Wind 210 deg - Service	46.979	-6.152	10.847	1161.331	658.167	-0.558
Dead+Wind 240 deg - Service	46.979	-10.666	6.266	670.026	1142.352	-0.358
Dead+Wind 270 deg - Service	46.979	-12.333	-0.018	-2.748	1321.030	-0.031
Dead+Wind 300 deg - Service	46.979	-10.682	-6.278	-673.425	1144.612	0.266
Dead+Wind 330 deg - Service	46.979	-6.171	-10.849	-1163.183	661.462	0.496

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	-46.979	0.000	0.000	46.979	0.000	0.000%
2	-0.033	-46.979	-32.040	0.033	46.979	32.040	0.000%
3	15.742	-46.979	-27.740	-15.742	46.979	27.740	0.000%
4	27.314	-46.979	-16.015	-27.314	46.979	16.015	0.000%
5	31.572	-46.979	0.020	-31.572	46.979	-0.020	0.000%
6	27.338	-46.979	16.098	-27.338	46.979	-16.098	0.000%
7	15.805	-46.979	27.802	-15.805	46.979	-27.802	0.000%
8	0.033	-46.979	32.068	-0.033	46.979	-32.068	0.000%
9	-15.749	-46.979	27.769	15.749	46.979	-27.769	0.000%
10	-27.306	-46.979	16.042	27.306	46.979	-16.042	0.000%
11	-31.572	-46.979	-0.045	31.572	46.979	0.045	0.000%
12	-27.346	-46.979	-16.071	27.346	46.979	16.071	0.000%
13	-15.798	-46.979	-27.772	15.798	46.979	27.772	0.000%
14	0.000	-71.668	0.000	-0.000	71.668	-0.000	0.000%
15	-0.015	-71.668	-10.480	0.015	71.668	10.480	0.000%
16	5.123	-71.668	-9.071	-5.123	71.668	9.071	0.000%
17	8.893	-71.668	-5.233	-8.893	71.668	5.233	0.000%
18	10.281	-71.668	0.012	-10.281	71.668	-0.012	0.000%
19	8.906	-71.668	5.266	-8.906	71.668	-5.266	0.000%
20	5.151	-71.668	9.094	-5.151	71.668	-9.094	0.000%
21	0.015	-71.668	10.488	-0.015	71.668	-10.488	0.000%
22	-5.125	-71.668	9.079	5.125	71.668	-9.079	0.000%
23	-8.891	-71.668	5.240	8.891	71.668	-5.240	0.000%
24	-10.281	-71.668	-0.018	10.281	71.668	0.018	0.000%
25	-8.908	-71.668	-5.259	8.908	71.668	5.259	0.000%
26	-5.149	-71.668	-9.086	5.149	71.668	9.086	0.000%
27	-0.013	-46.979	-12.516	0.013	46.979	12.516	0.000%
28	6.149	-46.979	-10.836	-6.149	46.979	10.836	0.000%
29	10.669	-46.979	-6.256	-10.669	46.979	6.256	0.000%
30	12.333	-46.979	0.008	-12.333	46.979	-0.008	0.000%
31	10.679	-46.979	6.288	-10.679	46.979	-6.288	0.000%
32	6.174	-46.979	10.860	-6.174	46.979	-10.860	0.000%
33	0.013	-46.979	12.527	-0.013	46.979	-12.527	0.000%
34	-6.152	-46.979	10.847	6.152	46.979	-10.847	0.000%
35	-10.666	-46.979	6.266	10.666	46.979	-6.266	0.000%
36	-12.333	-46.979	-0.018	12.333	46.979	0.018	0.000%
37	-10.682	-46.979	-6.278	10.682	46.979	6.278	0.000%
38	-6.171	-46.979	-10.849	6.171	46.979	10.849	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005131
3	Yes	6	0.00000001	0.00005060
4	Yes	6	0.00000001	0.00004845
5	Yes	4	0.00000001	0.00062507
6	Yes	6	0.00000001	0.00004945
7	Yes	6	0.00000001	0.00005054
8	Yes	5	0.00000001	0.00006036
9	Yes	6	0.00000001	0.00004805
10	Yes	6	0.00000001	0.00005026
11	Yes	4	0.00000001	0.00049239
12	Yes	6	0.00000001	0.00004993

13	Yes	6	0.00000001	0.00004878
14	Yes	4	0.00000001	0.00007054
15	Yes	5	0.00000001	0.00076064
16	Yes	5	0.00000001	0.00095432
17	Yes	5	0.00000001	0.00094018
18	Yes	5	0.00000001	0.00075463
19	Yes	5	0.00000001	0.00095120
20	Yes	5	0.00000001	0.00096589
21	Yes	5	0.00000001	0.00076445
22	Yes	5	0.00000001	0.00093415
23	Yes	5	0.00000001	0.00093821
24	Yes	5	0.00000001	0.00074450
25	Yes	5	0.00000001	0.00094045
26	Yes	5	0.00000001	0.00093597
27	Yes	4	0.00000001	0.00034499
28	Yes	5	0.00000001	0.00012434
29	Yes	5	0.00000001	0.00011414
30	Yes	4	0.00000001	0.00024594
31	Yes	5	0.00000001	0.00011802
32	Yes	5	0.00000001	0.00012355
33	Yes	4	0.00000001	0.00035872
34	Yes	5	0.00000001	0.00011261
35	Yes	5	0.00000001	0.00012190
36	Yes	4	0.00000001	0.00024031
37	Yes	5	0.00000001	0.00012009
38	Yes	5	0.00000001	0.00011547

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 116	32.245	27	1.928	0.005
L2	119.75 - 93.5	21.175	27	1.744	0.002
L3	93.5 - 74.75	12.656	27	1.289	0.001
L4	79.5 - 57.75	9.173	27	1.083	0.001
L5	57.75 - 39.5	4.850	27	0.785	0.001
L6	45 - 31.75	3.000	27	0.601	0.000
L7	31.75 - 0	1.503	27	0.456	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.000	(2) 800 10121 w/ Mount Pipe	27	31.841	1.925	0.005	25522
142.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	29.822	1.908	0.004	21269
125.000	(2) DB844G65ZAXY w/Mount Pipe	27	23.135	1.804	0.003	5547
111.000	TME-800MHz 2X50W RRH W/FILTER	27	18.073	1.608	0.002	3711
109.000	APXVTM14-C-120 w/ Mount Pipe	27	17.397	1.573	0.002	3565
107.000	Miscellaneous [NA 509-3]	27	16.735	1.536	0.002	3430
95.000	Detuner Mount	27	13.073	1.315	0.001	2836
81.000	SRL-227	27	9.518	1.103	0.001	4752
75.000	HP2-23	27	8.170	1.022	0.001	4762
74.000	Pipe Mount [PM 601-1]	27	7.954	1.009	0.001	4643
50.000	GPS-TMG-HR-26N	27	3.674	0.669	0.000	4792

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
15.000	Detuner Mount	33	0.457	0.235	0.000	6178

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 116	82.371	8	4.926	0.013
L2	119.75 - 93.5	54.111	8	4.457	0.006
L3	93.5 - 74.75	32.352	8	3.296	0.003
L4	79.5 - 57.75	23.452	8	2.768	0.002
L5	57.75 - 39.5	12.402	8	2.007	0.001
L6	45 - 31.75	7.671	8	1.536	0.001
L7	31.75 - 0	3.845	8	1.167	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.000	(2) 800 10121 w/ Mount Pipe	8	81.339	4.918	0.012	10162
142.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	8	76.187	4.874	0.011	8468
125.000	(2) DB844G65ZAXY w/Mount Pipe	8	59.117	4.609	0.007	2206
111.000	TME-800MHz 2X50W RRH W/FILTER	8	46.190	4.110	0.005	1469
109.000	APXVTM14-C-120 w/ Mount Pipe	8	44.464	4.019	0.004	1411
107.000	Miscellaneous [NA 509-3]	8	42.772	3.926	0.004	1356
95.000	Detuner Mount	8	33.417	3.361	0.003	1118
81.000	SRL-227	8	24.333	2.820	0.002	1868
75.000	HP2-23	8	20.889	2.614	0.002	1870
74.000	Pipe Mount [PM 601-1]	8	20.337	2.580	0.002	1823
50.000	GPS-TMG-HR-26N	8	9.396	1.711	0.001	1878
15.000	Detuner Mount	8	1.168	0.600	0.000	2417

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	148 - 146.513	TP30.241x24x0.219	32.000	0.000	0.0	39.000	16.713	-6.060	651.805	0.009*
	146.513 - 145.026					39.000	16.914	-3.014	659.657	0.005
	145.026 - 143.539					39.000	17.116	-3.127	667.510	0.005
	143.539 - 142.053					39.000	17.317	-3.241	675.362	0.005
	142.053 - 140.566					39.000	17.518	-6.242	683.214	0.009
	140.566 - 139.079					39.000	17.720	-6.359	691.066	0.009
	139.079 - 137.592					39.000	17.921	-6.479	698.918	0.009
	137.592 - 136.105					39.000	18.122	-6.600	706.770	0.009
	136.105 - 134.618					39.000	18.324	-6.722	714.623	0.009
	134.618 - 133.132					39.000	18.525	-6.846	722.475	0.009
	133.132 - 131.645					39.000	18.726	-6.972	730.327	0.010
	131.645 - 130.158					39.000	18.928	-7.099	738.179	0.010
	130.158 - 128.671					39.000	19.129	-7.228	746.031	0.010
	128.671 - 127.184					39.000	19.330	-7.358	753.883	0.010
	127.184 - 125.697					39.000	19.532	-7.490	761.735	0.010
	125.697 - 124.211					39.000	19.733	-9.583	769.588	0.012
	124.211 - 122.724					39.000	19.934	-9.709	777.440	0.012
	122.724 - 121.237					39.000	20.136	-9.849	785.292	0.013
	121.237 - 119.75					39.000	20.337	-9.992	793.144	0.013
	119.75 - 116					39.000	20.845	-5.023	812.948	0.006
L2	119.75 - 116	TP34.191x29.072x0.25	26.250	0.000	0.0	39.000	23.451	-5.611	914.573	0.006
	116 - 114.816					39.000	23.634	-10.781	921.720	0.012
	114.816 - 113.632					39.000	23.817	-10.926	928.866	0.012
	113.632 - 112.447					39.000	24.000	-11.072	936.012	0.012
	112.447 - 111.263					39.000	24.184	-11.219	943.158	0.012
	111.263 - 110.079					39.000	24.367	-11.878	950.304	0.012
	110.079 - 108.895					39.000	24.550	-14.826	957.450	0.015
	108.895 - 107.711					39.000	24.733	-14.981	964.596	0.016
	107.711 -					39.000	24.917	-15.380	971.742	0.016

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 $\frac{P}{P_a}$
	106.526									
	106.526 - 105.342					39.000	25.100	-15.539	978.888	0.016
	105.342 - 104.158					39.000	25.283	-15.699	986.034	0.016
	104.158 - 102.974					39.000	25.466	-15.861	993.180	0.016
	102.974 - 101.789					39.000	25.649	-16.024	1000.330	0.016
	101.789 - 100.605					39.000	25.833	-16.189	1007.470	0.016
	100.605 - 99.4211					39.000	26.016	-16.355	1014.620	0.016
	99.4211 - 98.2368					39.000	26.199	-16.523	1021.760	0.016
	98.2368 - 97.0526					39.000	26.382	-16.691	1028.910	0.016
	97.0526 - 95.8684					39.000	26.566	-16.862	1036.060	0.016
	95.8684 - 94.6842					39.000	26.749	-17.222	1043.200	0.017
	94.6842 - 93.5					39.000	26.932	-17.390	1050.350	0.017
L3	93.5 - 92.5	TP37.847x34.191x0.421	18.750	0.000	0.0	31.663	45.344	-17.593	1435.720	0.012
	92.5 - 91.5					31.663	45.605	-17.790	1443.960	0.012
	91.5 - 90.5					31.663	45.865	-17.988	1452.210	0.012
	90.5 - 89.5					31.663	46.125	-18.187	1460.450	0.012
	89.5 - 88.5					31.663	46.386	-18.387	1468.690	0.013
	88.5 - 87.5					31.663	46.646	-18.588	1476.930	0.013
	87.5 - 86.5					31.663	46.906	-18.791	1485.180	0.013
	86.5 - 85.5					31.663	47.167	-18.994	1493.420	0.013
	85.5 - 84.5					31.663	47.427	-19.198	1501.660	0.013
	84.5 - 83.5					31.663	47.687	-19.404	1509.900	0.013
	83.5 - 82.5					31.663	47.947	-19.610	1518.150	0.013
	82.5 - 81.5					31.663	48.208	-19.818	1526.390	0.013
	81.5 - 80.5					31.663	48.468	-20.221	1534.630	0.013
	80.5 - 79.5					31.663	48.729	-20.431	1542.880	0.013
	79.5 - 74.75					31.663	49.965	-10.684	1582.030	0.007
L4	79.5 - 74.75	TP40.663x36.421x0.467	21.750	0.000	0.0	31.703	54.642	-11.576	1732.300	0.007
	74.75 - 73.75					31.703	54.931	-22.565	1741.460	0.013
	73.75 - 72.75					31.703	55.220	-22.799	1750.620	0.013
	72.75 - 71.75					31.703	55.509	-23.035	1759.780	0.013
	71.75 - 70.75					31.703	55.798	-23.271	1768.950	0.013
	70.75 - 69.75					31.703	56.087	-23.509	1778.110	0.013
	69.75 - 68.75					31.703	56.376	-23.747	1787.270	0.013
	68.75 - 67.75					31.703	56.665	-23.987	1796.430	0.013
	67.75 - 66.75					31.703	56.954	-24.228	1805.590	0.013
	66.75 - 65.75					31.703	57.243	-24.469	1814.750	0.013
	65.75 - 64.75					31.703	57.532	-24.712	1823.910	0.014
	64.75 - 63.75					31.703	57.821	-24.956	1833.070	0.014
	63.75 - 62.75					31.703	58.110	-25.202	1842.230	0.014
	62.75 - 61.75					31.703	58.399	-25.448	1851.390	0.014
	61.75 - 60.75					31.703	58.688	-25.696	1860.550	0.014
	60.75 - 59.75					31.703	58.977	-25.945	1869.710	0.014
	59.75 - 58.75					31.703	59.266	-26.195	1878.870	0.014
	58.75 - 57.75					31.703	59.555	-26.445	1888.040	0.014
L5	57.75 - 56.6875	TP44.222x40.663x0.511	18.250	0.000	0.0	32.071	65.486	-26.730	2100.190	0.013
	56.6875 - 55.625					32.071	65.822	-27.016	2110.980	0.013
	55.625 - 54.5625					32.071	66.158	-27.303	2121.760	0.013
	54.5625 - 53.5					32.071	66.494	-27.592	2132.540	0.013
	53.5 - 52.4375					32.071	66.831	-27.881	2143.330	0.013

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 $\frac{P}{P_a}$
	52.4375 - 51.375					32.071	67.167	-28.172	2154.110	0.013
	51.375 - 50.3125					32.071	67.503	-28.465	2164.890	0.013
	50.3125 - 49.25					32.071	67.839	-29.044	2175.680	0.013
	49.25 - 48.1875					32.071	68.176	-29.339	2186.460	0.013
	48.1875 - 47.125					32.071	68.512	-29.636	2197.240	0.013
	47.125 - 46.0625					32.071	68.848	-29.933	2208.030	0.014
	46.0625 - 45					32.071	69.184	-30.232	2218.810	0.014
	45 - 39.5					32.071	70.925	-15.906	2274.630	0.007
L6	45 - 39.5	TP45.108x42.524x0.565	13.250	0.000	0.0	32.121	77.226	-17.211	2480.560	0.007
	39.5 - 38.3929					32.121	77.613	-33.477	2493.010	0.013
	38.3929 - 37.2857					32.121	78.001	-33.821	2505.450	0.013
	37.2857 - 36.1786					32.121	78.388	-34.168	2517.900	0.014
	36.1786 - 35.0714					32.121	78.776	-34.515	2530.350	0.014
	35.0714 - 33.9643					32.121	79.163	-34.865	2542.790	0.014
	33.9643 - 32.8571					32.121	79.551	-35.215	2555.240	0.014
	32.8571 - 31.75					32.121	79.938	-35.568	2567.680	0.014
L7	31.75 - 30.1625	TP51.3x45.108x0.522	31.750	0.000	0.0	35.935	74.320	-36.092	2670.700	0.014
	30.1625 - 28.575					35.935	74.833	-36.625	2689.120	0.014
	28.575 - 26.9875					35.935	75.345	-37.161	2707.530	0.014
	26.9875 - 25.4					35.935	75.858	-37.700	2725.950	0.014
	25.4 - 23.8125					35.935	76.370	-38.242	2744.370	0.014
	23.8125 - 22.225					35.935	76.883	-38.788	2762.780	0.014
	22.225 - 20.6375					35.935	77.395	-39.337	2781.200	0.014
	20.6375 - 19.05					35.935	77.908	-39.889	2799.610	0.014
	19.05 - 17.4625					35.935	78.420	-40.445	2818.030	0.014
	17.4625 - 15.875					35.935	78.933	-41.004	2836.450	0.014
	15.875 - 14.2875					35.935	79.445	-41.760	2854.860	0.015
	14.2875 - 12.7					35.935	79.957	-42.325	2873.280	0.015
	12.7 - 11.1125					35.935	80.470	-42.893	2891.690	0.015
	11.1125 - 9.525					35.935	80.982	-43.465	2910.110	0.015
	9.525 - 7.9375					35.935	81.495	-44.040	2928.530	0.015
	7.9375 - 6.35					35.935	82.007	-44.618	2946.940	0.015
	6.35 - 4.7625					35.935	82.520	-45.200	2965.360	0.015
	4.7625 - 3.175					35.935	83.032	-45.784	2983.770	0.015
	3.175 - 1.5875					35.935	83.545	-46.372	3002.190	0.015
	1.5875 - 0					35.935	84.057	-46.963	3020.610	0.016

* DL controls

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	148 - 146.513	TP30.241x24x0.219	0.861	0.104	39.000	0.003	0.000	0.000	39.000	0.000
	146.513 - 145.026		5.342	0.631	39.000	0.016	0.000	0.000	39.000	0.000
	145.026 - 143.539		11.969	1.381	39.000	0.035	0.000	0.000	39.000	0.000
	143.539 - 142.053		18.763	2.115	39.000	0.054	0.000	0.000	39.000	0.000
	142.053 - 140.566		35.365	3.894	39.000	0.100	0.000	0.000	39.000	0.000
	140.566 - 139.079		49.450	5.321	39.000	0.136	0.000	0.000	39.000	0.000
	139.079 - 137.592		63.703	6.701	39.000	0.172	0.000	0.000	39.000	0.000
	137.592 - 136.105		78.125	8.036	39.000	0.206	0.000	0.000	39.000	0.000
	136.105 - 134.618		92.716	9.328	39.000	0.239	0.000	0.000	39.000	0.000
	134.618 - 133.132		107.478	10.578	39.000	0.271	0.000	0.000	39.000	0.000
	133.132 - 131.645		122.410	11.789	39.000	0.302	0.000	0.000	39.000	0.000
	131.645 - 130.158		137.514	12.962	39.000	0.332	0.000	0.000	39.000	0.000
	130.158 - 128.671		152.790	14.100	39.000	0.362	0.000	0.000	39.000	0.000
	128.671 - 127.184		168.240	15.202	39.000	0.390	0.000	0.000	39.000	0.000
	127.184 - 125.697		183.864	16.272	39.000	0.417	0.000	0.000	39.000	0.000
	125.697 - 124.211		210.598	18.258	39.000	0.468	0.000	0.000	39.000	0.000
	124.211 - 122.724		233.453	19.831	39.000	0.508	0.000	0.000	39.000	0.000
	122.724 - 121.237		256.613	21.363	39.000	0.548	0.000	0.000	39.000	0.000
	121.237 - 119.75		279.947	22.845	39.000	0.586	0.000	0.000	39.000	0.000
	119.75 - 116		162.592	12.628	39.000	0.324	0.000	0.000	39.000	0.000
L2	119.75 - 116	TP34.191x29.072x0.25	177.048	12.431	39.000	0.319	0.000	0.000	39.000	0.000
	116 - 114.816		358.741	24.797	39.000	0.636	0.000	0.000	39.000	0.000
	114.816 - 113.632		377.952	25.723	39.000	0.660	0.000	0.000	39.000	0.000
	113.632 - 112.447		397.272	26.625	39.000	0.683	0.000	0.000	39.000	0.000
	112.447 - 111.263		416.702	27.503	39.000	0.705	0.000	0.000	39.000	0.000
	111.263 - 110.079		437.524	28.443	39.000	0.729	0.000	0.000	39.000	0.000
	110.079 - 108.895		462.987	29.649	39.000	0.760	0.000	0.000	39.000	0.000
	108.895 - 107.711		488.372	30.811	39.000	0.790	0.000	0.000	39.000	0.000
	107.711 - 106.526		514.089	31.957	39.000	0.819	0.000	0.000	39.000	0.000
	106.526 - 105.342		540.252	33.093	39.000	0.849	0.000	0.000	39.000	0.000
	105.342 -		566.521	34.199	39.000	0.877	0.000	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
	104.158									
	104.158 - 102.974		592.897	35.276	39.000	0.905	0.000	0.000	39.000	0.000
	102.974 - 101.789		619.379	36.325	39.000	0.931	0.000	0.000	39.000	0.000
	101.789 - 100.605		645.968	37.347	39.000	0.958	0.000	0.000	39.000	0.000
	100.605 - 99.4211		672.665	38.342	39.000	0.983	0.000	0.000	39.000	0.000
	99.4211 - 98.2368		699.467	39.312	39.000	1.008	0.000	0.000	39.000	0.000
	98.2368 - 97.0526		726.378	40.257	39.000	1.032	0.000	0.000	39.000	0.000
	97.0526 - 95.8684		753.394	41.178	39.000	1.056	0.000	0.000	39.000	0.000
	95.8684 - 94.6842		780.555	42.078	39.000	1.079	0.000	0.000	39.000	0.000
	94.6842 - 93.5		807.941	42.962	39.000	1.102	0.000	0.000	39.000	0.000
L3	93.5 - 92.5	TP37.847x34.191x0.421	831.182	26.363	31.663	0.833	0.000	0.000	31.663	0.000
	92.5 - 91.5		854.508	26.792	31.663	0.846	0.000	0.000	31.663	0.000
	91.5 - 90.5		877.933	27.213	31.663	0.859	0.000	0.000	31.663	0.000
	90.5 - 89.5		901.442	27.626	31.663	0.873	0.000	0.000	31.663	0.000
	89.5 - 88.5		925.050	28.030	31.663	0.885	0.000	0.000	31.663	0.000
	88.5 - 87.5		948.742	28.426	31.663	0.898	0.000	0.000	31.663	0.000
	87.5 - 86.5		972.525	28.814	31.663	0.910	0.000	0.000	31.663	0.000
	86.5 - 85.5		996.408	29.195	31.663	0.922	0.000	0.000	31.663	0.000
	85.5 - 84.5		1020.375	29.568	31.663	0.934	0.000	0.000	31.663	0.000
	84.5 - 83.5		1044.433	29.933	31.663	0.945	0.000	0.000	31.663	0.000
	83.5 - 82.5		1068.592	30.292	31.663	0.957	0.000	0.000	31.663	0.000
	82.5 - 81.5		1092.833	30.644	31.663	0.968	0.000	0.000	31.663	0.000
	81.5 - 80.5		1117.083	30.986	31.663	0.979	0.000	0.000	31.663	0.000
	80.5 - 79.5		1142.017	31.339	31.663	0.990	0.000	0.000	31.663	0.000
	79.5 - 74.75		612.308	15.977	31.663	0.505	0.000	0.000	31.663	0.000
L4	79.5 - 74.75	TP40.663x36.421x0.467	649.638	15.751	31.703	0.497	0.000	0.000	31.703	0.000
	74.75 - 73.75		1287.717	30.893	31.703	0.974	0.000	0.000	31.703	0.000
	73.75 - 72.75		1313.567	31.182	31.703	0.984	0.000	0.000	31.703	0.000
	72.75 - 71.75		1339.500	31.465	31.703	0.993	0.000	0.000	31.703	0.000
	71.75 - 70.75		1365.525	31.743	31.703	1.001	0.000	0.000	31.703	0.000
	70.75 - 69.75		1391.633	32.016	31.703	1.010	0.000	0.000	31.703	0.000
	69.75 - 68.75		1417.833	32.283	31.703	1.018	0.000	0.000	31.703	0.000
	68.75 - 67.75		1444.117	32.545	31.703	1.027	0.000	0.000	31.703	0.000
	67.75 - 66.75		1470.492	32.802	31.703	1.035	0.000	0.000	31.703	0.000
	66.75 - 65.75		1496.975	33.054	31.703	1.043	0.000	0.000	31.703	0.000
	65.75 - 64.75		1523.558	33.302	31.703	1.050	0.000	0.000	31.703	0.000
	64.75 - 63.75		1550.225	33.545	31.703	1.058	0.000	0.000	31.703	0.000

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 $\frac{f_{by}}{F_{by}}$
	63.75 - 62.75		1576.983	33.784	31.703	1.066	0.000	0.000	31.703	0.000
	62.75 - 61.75		1603.825	34.018	31.703	1.073	0.000	0.000	31.703	0.000
	61.75 - 60.75		1630.758	34.247	31.703	1.080	0.000	0.000	31.703	0.000
	60.75 - 59.75		1657.775	34.472	31.703	1.087	0.000	0.000	31.703	0.000
	59.75 - 58.75		1684.883	34.693	31.703	1.094	0.000	0.000	31.703	0.000
	58.75 - 57.75		1712.075	34.910	31.703	1.101	0.000	0.000	31.703	0.000
L5	57.75 - 56.6875	TP44.222x40.663x0.511	1741.067	32.189	32.071	1.004	0.000	0.000	32.071	0.000
	56.6875 - 55.625		1770.150	32.391	32.071	1.010	0.000	0.000	32.071	0.000
	55.625 - 54.5625		1799.333	32.589	32.071	1.016	0.000	0.000	32.071	0.000
	54.5625 - 53.5		1828.608	32.783	32.071	1.022	0.000	0.000	32.071	0.000
	53.5 - 52.4375		1857.975	32.973	32.071	1.028	0.000	0.000	32.071	0.000
	52.4375 - 51.375		1887.442	33.160	32.071	1.034	0.000	0.000	32.071	0.000
	51.375 - 50.3125		1917.000	33.342	32.071	1.040	0.000	0.000	32.071	0.000
	50.3125 - 49.25		1946.625	33.521	32.071	1.045	0.000	0.000	32.071	0.000
	49.25 - 48.1875		1976.500	33.698	32.071	1.051	0.000	0.000	32.071	0.000
	48.1875 - 47.125		2006.475	33.872	32.071	1.056	0.000	0.000	32.071	0.000
	47.125 - 46.0625		2036.542	34.043	32.071	1.061	0.000	0.000	32.071	0.000
	46.0625 - 45		2066.708	34.210	32.071	1.067	0.000	0.000	32.071	0.000
	45 - 39.5		1082.883	17.051	32.071	0.532	0.000	0.000	32.071	0.000
L6	45 - 39.5	TP45.108x42.524x0.565	1141.808	16.797	32.121	0.523	0.000	0.000	32.121	0.000
	39.5 - 38.3929		2256.892	32.867	32.121	1.023	0.000	0.000	32.121	0.000
	38.3929 - 37.2857		2289.183	33.005	32.121	1.028	0.000	0.000	32.121	0.000
	37.2857 - 36.1786		2321.583	33.140	32.121	1.032	0.000	0.000	32.121	0.000
	36.1786 - 35.0714		2354.075	33.272	32.121	1.036	0.000	0.000	32.121	0.000
	35.0714 - 33.9643		2386.675	33.401	32.121	1.040	0.000	0.000	32.121	0.000
	33.9643 - 32.8571		2419.383	33.528	32.121	1.044	0.000	0.000	32.121	0.000
	32.8571 - 31.75		2452.183	33.652	32.121	1.048	0.000	0.000	32.121	0.000
L7	31.75 - 30.1625	TP51.3x45.108x0.522	2499.383	36.563	35.935	1.017	0.000	0.000	35.935	0.000
	30.1625 - 28.575		2546.775	36.745	35.935	1.023	0.000	0.000	35.935	0.000
	28.575 - 26.9875		2594.342	36.920	35.935	1.027	0.000	0.000	35.935	0.000
	26.9875 - 25.4		2642.092	37.091	35.935	1.032	0.000	0.000	35.935	0.000

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 $\frac{f_{by}}{F_{by}}$
	25.4 - 23.8125		2690.033	37.256	35.935	1.037	0.000	0.000	35.935	0.000
	23.8125 - 22.225		2738.150	37.416	35.935	1.041	0.000	0.000	35.935	0.000
	22.225 - 20.6375		2786.458	37.571	35.935	1.046	0.000	0.000	35.935	0.000
	20.6375 - 19.05		2834.950	37.720	35.935	1.050	0.000	0.000	35.935	0.000
	19.05 - 17.4625		2883.617	37.865	35.935	1.054	0.000	0.000	35.935	0.000
	17.4625 - 15.875		2932.475	38.006	35.935	1.058	0.000	0.000	35.935	0.000
	15.875 - 14.2875		2981.575	38.143	35.935	1.061	0.000	0.000	35.935	0.000
	14.2875 - 12.7		3030.925	38.276	35.935	1.065	0.000	0.000	35.935	0.000
	12.7 - 11.1125		3080.467	38.405	35.935	1.069	0.000	0.000	35.935	0.000
	11.1125 - 9.525		3130.183	38.530	35.935	1.072	0.000	0.000	35.935	0.000
	9.525 - 7.9375		3180.083	38.651	35.935	1.076	0.000	0.000	35.935	0.000
	7.9375 - 6.35		3230.175	38.768	35.935	1.079	0.000	0.000	35.935	0.000
	6.35 - 4.7625		3280.442	38.881	35.935	1.082	0.000	0.000	35.935	0.000
	4.7625 - 3.175		3330.900	38.991	35.935	1.085	0.000	0.000	35.935	0.000
	3.175 - 1.5875		3381.533	39.097	35.935	1.088	0.000	0.000	35.935	0.000
	1.5875 - 0		3432.358	39.200	35.935	1.091	0.000	0.000	35.935	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	148 - 146.513	TP30.241x24x0.219	0.002	0.000	26.000	0.000	0.000	0.000	26.000	0.000
	146.513 - 145.026		4.400	0.260	26.000	0.020	0.480	0.028	26.000	0.001
	145.026 - 143.539		4.511	0.264	26.000	0.020	0.481	0.027	26.000	0.001
	143.539 - 142.053		4.623	0.267	26.000	0.021	0.481	0.026	26.000	0.001
	142.053 - 140.566		9.415	0.537	26.000	0.041	0.482	0.026	26.000	0.001
	140.566 - 139.079		9.528	0.538	26.000	0.041	0.483	0.025	26.000	0.001
	139.079 - 137.592		9.641	0.538	26.000	0.041	0.483	0.025	26.000	0.001
	137.592 - 136.105		9.755	0.538	26.000	0.041	0.484	0.024	26.000	0.001
	136.105 - 134.618		9.869	0.539	26.000	0.041	0.484	0.024	26.000	0.001
	134.618 - 133.132		9.984	0.539	26.000	0.041	0.484	0.023	26.000	0.001
	133.132 -		10.100	0.539	26.000	0.041	0.485	0.023	26.000	0.001

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 $\frac{f_{vt}}{F_{vt}}$
	131.645									
	131.645 - 130.158		10.216	0.540	26.000	0.042	0.485	0.022	26.000	0.001
	130.158 - 128.671		10.332	0.540	26.000	0.042	0.485	0.022	26.000	0.001
	128.671 - 127.184		10.449	0.541	26.000	0.042	0.486	0.021	26.000	0.001
	127.184 - 125.697		10.567	0.541	26.000	0.042	0.486	0.021	26.000	0.001
	125.697 - 124.211		15.317	0.776	26.000	0.060	0.937	0.040	26.000	0.002
	124.211 - 122.724		15.520	0.779	26.000	0.060	1.224	0.051	26.000	0.002
	122.724 - 121.237		15.637	0.777	26.000	0.060	1.225	0.050	26.000	0.002
	121.237 - 119.75		15.755	0.775	26.000	0.060	1.226	0.049	26.000	0.002
	119.75 - 116		7.777	0.373	26.000	0.029	0.589	0.022	26.000	0.001
L2	119.75 - 116	TP34.191x29.072x0.25	8.311	0.354	26.000	0.027	0.640	0.022	26.000	0.001
	116 - 114.816		16.178	0.685	26.000	0.053	1.231	0.041	26.000	0.002
	114.816 - 113.632		16.270	0.683	26.000	0.053	1.232	0.041	26.000	0.002
	113.632 - 112.447		16.363	0.682	26.000	0.052	1.233	0.040	26.000	0.002
	112.447 - 111.263		16.456	0.680	26.000	0.052	1.235	0.040	26.000	0.002
	111.263 - 110.079		17.347	0.712	26.000	0.055	1.236	0.039	26.000	0.002
	110.079 - 108.895		21.395	0.871	26.000	0.067	1.236	0.039	26.000	0.001
	108.895 - 107.711		21.485	0.869	26.000	0.067	0.200	0.006	26.000	0.000
	107.711 - 106.526		22.053	0.885	26.000	0.068	0.201	0.006	26.000	0.000
	106.526 - 105.342		22.143	0.882	26.000	0.068	0.203	0.006	26.000	0.000
	105.342 - 104.158		22.233	0.879	26.000	0.068	0.204	0.006	26.000	0.000
	104.158 - 102.974		22.323	0.877	26.000	0.067	0.206	0.006	26.000	0.000
	102.974 - 101.789		22.414	0.874	26.000	0.067	0.207	0.006	26.000	0.000
	101.789 - 100.605		22.504	0.871	26.000	0.067	0.208	0.006	26.000	0.000
	100.605 - 99.4211		22.595	0.868	26.000	0.067	0.210	0.006	26.000	0.000
	99.4211 - 98.2368		22.685	0.866	26.000	0.067	0.211	0.006	26.000	0.000
	98.2368 - 97.0526		22.776	0.863	26.000	0.066	0.213	0.006	26.000	0.000
	97.0526 - 95.8684		22.866	0.861	26.000	0.066	0.214	0.006	26.000	0.000
	95.8684 - 94.6842		23.074	0.863	26.000	0.066	0.215	0.006	26.000	0.000
	94.6842 - 93.5		23.203	0.862	26.000	0.066	0.684	0.018	26.000	0.001
L3	93.5 - 92.5	TP37.847x34.191x0.421	23.288	0.514	21.108	0.049	0.687	0.011	21.108	0.001
	92.5 - 91.5		23.379	0.513	21.108	0.049	0.689	0.011	21.108	0.000
	91.5 - 90.5		23.470	0.512	21.108	0.048	0.692	0.010	21.108	0.000
	90.5 - 89.5		23.561	0.511	21.108	0.048	0.695	0.010	21.108	0.000
	89.5 - 88.5		23.652	0.510	21.108	0.048	0.698	0.010	21.108	0.000
	88.5 - 87.5		23.743	0.509	21.108	0.048	0.701	0.010	21.108	0.000
	87.5 - 86.5		23.835	0.508	21.108	0.048	0.704	0.010	21.108	0.000

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 $\frac{f_{vt}}{F_{vt}}$
	86.5 - 85.5		23.927	0.507	21.108	0.048	0.707	0.010	21.108	0.000
	85.5 - 84.5		24.019	0.506	21.108	0.048	0.710	0.010	21.108	0.000
	84.5 - 83.5		24.111	0.506	21.108	0.048	0.713	0.010	21.108	0.000
	83.5 - 82.5		24.203	0.505	21.108	0.048	0.716	0.010	21.108	0.000
	82.5 - 81.5		24.296	0.504	21.108	0.048	0.719	0.010	21.108	0.000
	81.5 - 80.5		24.894	0.514	21.108	0.049	1.224	0.017	21.108	0.001
	80.5 - 79.5		24.987	0.513	21.108	0.049	1.227	0.016	21.108	0.001
	79.5 - 74.75		12.618	0.253	21.108	0.024	0.613	0.008	21.108	0.000
L4	79.5 - 74.75	TP40.663x36.421x0.467	13.015	0.238	21.135	0.023	0.636	0.007	21.135	0.000
	74.75 - 73.75		25.818	0.470	21.135	0.044	1.259	0.015	21.135	0.001
	73.75 - 72.75		25.905	0.469	21.135	0.044	1.262	0.015	21.135	0.001
	72.75 - 71.75		25.991	0.468	21.135	0.044	1.265	0.014	21.135	0.001
	71.75 - 70.75		26.078	0.467	21.135	0.044	1.268	0.014	21.135	0.001
	70.75 - 69.75		26.165	0.467	21.135	0.044	1.271	0.014	21.135	0.001
	69.75 - 68.75		26.252	0.466	21.135	0.044	1.274	0.014	21.135	0.001
	68.75 - 67.75		26.339	0.465	21.135	0.044	1.277	0.014	21.135	0.001
	67.75 - 66.75		26.426	0.464	21.135	0.044	1.280	0.014	21.135	0.001
	66.75 - 65.75		26.542	0.464	21.135	0.044	1.269	0.014	21.135	0.001
	65.75 - 64.75		26.629	0.463	21.135	0.044	1.272	0.014	21.135	0.001
	64.75 - 63.75		26.717	0.462	21.135	0.044	1.275	0.013	21.135	0.001
	63.75 - 62.75		26.805	0.461	21.135	0.044	1.278	0.013	21.135	0.001
	62.75 - 61.75		26.893	0.461	21.135	0.044	1.282	0.013	21.135	0.001
	61.75 - 60.75		26.981	0.460	21.135	0.043	1.285	0.013	21.135	0.001
	60.75 - 59.75		27.069	0.459	21.135	0.043	1.288	0.013	21.135	0.001
	59.75 - 58.75		27.158	0.458	21.135	0.043	1.291	0.013	21.135	0.001
	58.75 - 57.75		27.246	0.458	21.135	0.043	1.294	0.013	21.135	0.001
L5	57.75 - 56.6875	TP44.222x40.663x0.511	27.335	0.417	21.381	0.039	1.298	0.012	21.381	0.001
	56.6875 - 55.625		27.425	0.417	21.381	0.039	1.302	0.012	21.381	0.001
	55.625 - 54.5625		27.514	0.416	21.381	0.039	1.306	0.011	21.381	0.001
	54.5625 - 53.5		27.604	0.415	21.381	0.039	1.310	0.011	21.381	0.001
	53.5 - 52.4375		27.693	0.414	21.381	0.039	1.313	0.011	21.381	0.001
	52.4375 - 51.375		27.783	0.414	21.381	0.039	1.317	0.011	21.381	0.001
	51.375 - 50.3125		27.873	0.413	21.381	0.039	1.321	0.011	21.381	0.001
	50.3125 - 49.25		28.088	0.414	21.381	0.039	1.339	0.011	21.381	0.001
	49.25 - 48.1875		28.178	0.413	21.381	0.039	1.343	0.011	21.381	0.001
	48.1875 - 47.125		28.268	0.413	21.381	0.039	1.347	0.011	21.381	0.001
	47.125 - 46.0625		28.358	0.412	21.381	0.039	1.351	0.011	21.381	0.001
	46.0625 - 45		28.449	0.411	21.381	0.038	1.355	0.011	21.381	0.001
	45 - 39.5		14.282	0.201	21.381	0.019	0.669	0.005	21.381	0.000
L6	45 - 39.5	TP45.108x42.524x0.565	14.776	0.191	21.414	0.018	0.694	0.005	21.414	0.000
	39.5 - 38.3929		29.132	0.375	21.414	0.035	1.367	0.010	21.414	0.000
	38.3929 - 37.2857		29.224	0.375	21.414	0.035	1.372	0.010	21.414	0.000
	37.2857 - 36.1786		29.316	0.374	21.414	0.035	1.378	0.010	21.414	0.000
	36.1786 - 35.0714		29.407	0.373	21.414	0.035	1.383	0.009	21.414	0.000
	35.0714 - 33.9643		29.500	0.373	21.414	0.035	1.388	0.009	21.414	0.000
	33.9643 - 32.8571		29.592	0.372	21.414	0.035	1.393	0.009	21.414	0.000
	32.8571 - 31.75		29.684	0.371	21.414	0.035	1.398	0.009	21.414	0.000

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 $\frac{f_{vt}}{F_{vt}}$
L7	31.75 - 30.1625	TP51.3x45.108x0.522	29.806	0.401	23.957	0.033	1.405	0.010	23.957	0.000
	30.1625 - 28.575		29.922	0.400	23.957	0.033	1.411	0.010	23.957	0.000
	28.575 - 26.9875		30.038	0.399	23.957	0.033	1.418	0.010	23.957	0.000
	26.9875 - 25.4		30.154	0.398	23.957	0.033	1.424	0.010	23.957	0.000
	25.4 - 23.8125		30.270	0.396	23.957	0.033	1.431	0.010	23.957	0.000
	23.8125 - 22.225		30.387	0.395	23.957	0.033	1.438	0.010	23.957	0.000
	22.225 - 20.6375		30.503	0.394	23.957	0.033	1.444	0.009	23.957	0.000
	20.6375 - 19.05		30.619	0.393	23.957	0.033	1.451	0.009	23.957	0.000
	19.05 - 17.4625		30.735	0.392	23.957	0.033	1.458	0.009	23.957	0.000
	17.4625 - 15.875		30.851	0.391	23.957	0.033	1.465	0.009	23.957	0.000
	15.875 - 14.2875		31.047	0.391	23.957	0.033	1.472	0.009	23.957	0.000
	14.2875 - 12.7		31.163	0.390	23.957	0.033	1.479	0.009	23.957	0.000
	12.7 - 11.1125		31.279	0.389	23.957	0.032	1.486	0.009	23.957	0.000
	11.1125 - 9.525		31.395	0.388	23.957	0.032	1.493	0.009	23.957	0.000
	9.525 - 7.9375		31.511	0.387	23.957	0.032	1.500	0.009	23.957	0.000
	7.9375 - 6.35		31.627	0.386	23.957	0.032	1.507	0.009	23.957	0.000
	6.35 - 4.7625		31.743	0.385	23.957	0.032	1.514	0.009	23.957	0.000
	4.7625 - 3.175		31.859	0.384	23.957	0.032	1.521	0.009	23.957	0.000
	3.175 - 1.5875		31.975	0.383	23.957	0.032	1.528	0.009	23.957	0.000
	1.5875 - 0		32.091	0.382	23.957	0.032	1.536	0.009	23.957	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	148 - 146.513	0.009	0.003	0.000	0.000	0.000	0.012*	1.000	H1-3+VT
	146.513 - 145.026	0.005	0.016	0.000	0.020	0.001	0.021	1.333	H1-3+VT
	145.026 - 143.539	0.005	0.035	0.000	0.020	0.001	0.040	1.333	H1-3+VT
	143.539 - 142.053	0.005	0.054	0.000	0.021	0.001	0.059	1.333	H1-3+VT
	142.053 - 140.566	0.009	0.100	0.000	0.041	0.001	0.109	1.333	H1-3+VT
	140.566 - 139.079	0.009	0.136	0.000	0.041	0.001	0.146	1.333	H1-3+VT
	139.079 - 137.592	0.009	0.172	0.000	0.041	0.001	0.182	1.333	H1-3+VT
	137.592 - 136.105	0.009	0.206	0.000	0.041	0.001	0.216	1.333	H1-3+VT
	136.105 - 134.618	0.009	0.239	0.000	0.041	0.001	0.249	1.333	H1-3+VT
	134.618 - 133.132	0.009	0.271	0.000	0.041	0.001	0.281	1.333	H1-3+VT
	133.132 - 131.645	0.010	0.302	0.000	0.041	0.001	0.312	1.333	H1-3+VT
	131.645 - 130.158	0.010	0.332	0.000	0.042	0.001	0.342	1.333	H1-3+VT
	130.158 - 128.671	0.010	0.362	0.000	0.042	0.001	0.372	1.333	H1-3+VT
	128.671 - 127.184	0.010	0.390	0.000	0.042	0.001	0.400	1.333	H1-3+VT
	127.184 - 125.697	0.010	0.417	0.000	0.042	0.001	0.428	1.333	H1-3+VT
	125.697 - 124.211	0.012	0.468	0.000	0.060	0.002	0.482	1.333	H1-3+VT
	124.211 - 122.724	0.012	0.508	0.000	0.060	0.002	0.522	1.333	H1-3+VT
	122.724 - 121.237	0.013	0.548	0.000	0.060	0.002	0.561	1.333	H1-3+VT
	121.237 - 119.75	0.013	0.586	0.000	0.060	0.002	0.599	1.333	H1-3+VT
	119.75 - 116	0.006	0.324	0.000	0.029	0.001	0.330	1.333	H1-3+VT
L2	119.75 - 116	0.006	0.319	0.000	0.027	0.001	0.325	1.333	H1-3+VT
	116 - 114.816	0.012	0.636	0.000	0.053	0.002	0.648	1.333	H1-3+VT
	114.816 - 113.632	0.012	0.660	0.000	0.053	0.002	0.672	1.333	H1-3+VT
	113.632 - 112.447	0.012	0.683	0.000	0.052	0.002	0.695	1.333	H1-3+VT
	112.447 - 111.263	0.012	0.705	0.000	0.052	0.002	0.718	1.333	H1-3+VT

Section No.	Elevation ft	Ratio P / P_a	Ratio f_{bx} / F_{bx}	Ratio f_{by} / F_{bv}	Ratio f_v / F_v	Ratio f_{vt} / F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	111.263 - 110.079	0.012	0.729	0.000	0.055	0.002	0.743 ✓	1.333	H1-3+VT ✓
	110.079 - 108.895	0.015	0.760	0.000	0.067	0.001	0.777 ✓	1.333	H1-3+VT ✓
	108.895 - 107.711	0.016	0.790	0.000	0.067	0.000	0.807 ✓	1.333	H1-3+VT ✓
	107.711 - 106.526	0.016	0.819	0.000	0.068	0.000	0.836 ✓	1.333	H1-3+VT ✓
	106.526 - 105.342	0.016	0.849	0.000	0.068	0.000	0.866 ✓	1.333	H1-3+VT ✓
	105.342 - 104.158	0.016	0.877	0.000	0.068	0.000	0.894 ✓	1.333	H1-3+VT ✓
	104.158 - 102.974	0.016	0.905	0.000	0.067	0.000	0.922 ✓	1.333	H1-3+VT ✓
	102.974 - 101.789	0.016	0.931	0.000	0.067	0.000	0.949 ✓	1.333	H1-3+VT ✓
	101.789 - 100.605	0.016	0.958	0.000	0.067	0.000	0.975 ✓	1.333	H1-3+VT ✓
	100.605 - 99.4211	0.016	0.983	0.000	0.067	0.000	1.000 ✓	1.333	H1-3+VT ✓
	99.4211 - 98.2368	0.016	1.008	0.000	0.067	0.000	1.025 ✓	1.333	H1-3+VT ✓
	98.2368 - 97.0526	0.016	1.032	0.000	0.066	0.000	1.050 ✓	1.333	H1-3+VT ✓
	97.0526 - 95.8684	0.016	1.056	0.000	0.066	0.000	1.073 ✓	1.333	H1-3+VT ✓
	95.8684 - 94.6842	0.017	1.079	0.000	0.066	0.000	1.097 ✓	1.333	H1-3+VT ✓
	94.6842 - 93.5	0.017	1.102	0.000	0.066	0.001	1.119 ✓	1.333	H1-3+VT ✓
L3	93.5 - 92.5	0.012	0.833	0.000	0.049	0.001	0.845 ✓	1.333	H1-3+VT ✓
	92.5 - 91.5	0.012	0.846	0.000	0.049	0.000	0.859 ✓	1.333	H1-3+VT ✓
	91.5 - 90.5	0.012	0.859	0.000	0.048	0.000	0.872 ✓	1.333	H1-3+VT ✓
	90.5 - 89.5	0.012	0.873	0.000	0.048	0.000	0.886 ✓	1.333	H1-3+VT ✓
	89.5 - 88.5	0.013	0.885	0.000	0.048	0.000	0.898 ✓	1.333	H1-3+VT ✓
	88.5 - 87.5	0.013	0.898	0.000	0.048	0.000	0.911 ✓	1.333	H1-3+VT ✓
	87.5 - 86.5	0.013	0.910	0.000	0.048	0.000	0.923 ✓	1.333	H1-3+VT ✓
	86.5 - 85.5	0.013	0.922	0.000	0.048	0.000	0.935 ✓	1.333	H1-3+VT ✓
	85.5 - 84.5	0.013	0.934	0.000	0.048	0.000	0.947 ✓	1.333	H1-3+VT ✓
	84.5 - 83.5	0.013	0.945	0.000	0.048	0.000	0.959 ✓	1.333	H1-3+VT ✓
	83.5 - 82.5	0.013	0.957	0.000	0.048	0.000	0.970 ✓	1.333	H1-3+VT ✓
	82.5 - 81.5	0.013	0.968	0.000	0.048	0.000	0.981	1.333	H1-3+VT ✓

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
	81.5 - 80.5	0.013	0.979	0.000	0.049	0.001	0.992	1.333	H1-3+VT
	80.5 - 79.5	0.013	0.990	0.000	0.049	0.001	1.004	1.333	H1-3+VT
	79.5 - 74.75	0.007	0.505	0.000	0.024	0.000	0.511	1.333	H1-3+VT
L4	79.5 - 74.75	0.007	0.497	0.000	0.023	0.000	0.504	1.333	H1-3+VT
	74.75 - 73.75	0.013	0.974	0.000	0.044	0.001	0.988	1.333	H1-3+VT
	73.75 - 72.75	0.013	0.984	0.000	0.044	0.001	0.997	1.333	H1-3+VT
	72.75 - 71.75	0.013	0.993	0.000	0.044	0.001	1.006	1.333	H1-3+VT
	71.75 - 70.75	0.013	1.001	0.000	0.044	0.001	1.015	1.333	H1-3+VT
	70.75 - 69.75	0.013	1.010	0.000	0.044	0.001	1.024	1.333	H1-3+VT
	69.75 - 68.75	0.013	1.018	0.000	0.044	0.001	1.032	1.333	H1-3+VT
	68.75 - 67.75	0.013	1.027	0.000	0.044	0.001	1.040	1.333	H1-3+VT
	67.75 - 66.75	0.013	1.035	0.000	0.044	0.001	1.049	1.333	H1-3+VT
	66.75 - 65.75	0.013	1.043	0.000	0.044	0.001	1.057	1.333	H1-3+VT
	65.75 - 64.75	0.014	1.050	0.000	0.044	0.001	1.065	1.333	H1-3+VT
	64.75 - 63.75	0.014	1.058	0.000	0.044	0.001	1.072	1.333	H1-3+VT
	63.75 - 62.75	0.014	1.066	0.000	0.044	0.001	1.080	1.333	H1-3+VT
	62.75 - 61.75	0.014	1.073	0.000	0.044	0.001	1.087	1.333	H1-3+VT
	61.75 - 60.75	0.014	1.080	0.000	0.043	0.001	1.095	1.333	H1-3+VT
	60.75 - 59.75	0.014	1.087	0.000	0.043	0.001	1.102	1.333	H1-3+VT
	59.75 - 58.75	0.014	1.094	0.000	0.043	0.001	1.109	1.333	H1-3+VT
	58.75 - 57.75	0.014	1.101	0.000	0.043	0.001	1.116	1.333	H1-3+VT
L5	57.75 - 56.6875	0.013	1.004	0.000	0.039	0.001	1.017	1.333	H1-3+VT
	56.6875 - 55.625	0.013	1.010	0.000	0.039	0.001	1.023	1.333	H1-3+VT
	55.625 - 54.5625	0.013	1.016	0.000	0.039	0.001	1.029	1.333	H1-3+VT
	54.5625 - 53.5	0.013	1.022	0.000	0.039	0.001	1.036	1.333	H1-3+VT
	53.5 - 52.4375	0.013	1.028	0.000	0.039	0.001	1.042	1.333	H1-3+VT

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
	52.4375 - 51.375	0.013	1.034	0.000	0.039	0.001	1.047	1.333	H1-3+VT
	51.375 - 50.3125	0.013	1.040	0.000	0.039	0.001	1.053	1.333	H1-3+VT
	50.3125 - 49.25	0.013	1.045	0.000	0.039	0.001	1.059	1.333	H1-3+VT
	49.25 - 48.1875	0.013	1.051	0.000	0.039	0.001	1.065	1.333	H1-3+VT
	48.1875 - 47.125	0.013	1.056	0.000	0.039	0.001	1.070	1.333	H1-3+VT
	47.125 - 46.0625	0.014	1.061	0.000	0.039	0.001	1.075	1.333	H1-3+VT
	46.0625 - 45	0.014	1.067	0.000	0.038	0.001	1.081	1.333	H1-3+VT
	45 - 39.5	0.007	0.532	0.000	0.019	0.000	0.539	1.333	H1-3+VT
L6	45 - 39.5	0.007	0.523	0.000	0.018	0.000	0.530	1.333	H1-3+VT
	39.5 - 38.3929	0.013	1.023	0.000	0.035	0.000	1.037	1.333	H1-3+VT
	38.3929 - 37.2857	0.013	1.028	0.000	0.035	0.000	1.041	1.333	H1-3+VT
	37.2857 - 36.1786	0.014	1.032	0.000	0.035	0.000	1.046	1.333	H1-3+VT
	36.1786 - 35.0714	0.014	1.036	0.000	0.035	0.000	1.050	1.333	H1-3+VT
	35.0714 - 33.9643	0.014	1.040	0.000	0.035	0.000	1.054	1.333	H1-3+VT
	33.9643 - 32.8571	0.014	1.044	0.000	0.035	0.000	1.058	1.333	H1-3+VT
	32.8571 - 31.75	0.014	1.048	0.000	0.035	0.000	1.062	1.333	H1-3+VT
L7	31.75 - 30.1625	0.014	1.017	0.000	0.033	0.000	1.031	1.333	H1-3+VT
	30.1625 - 28.575	0.014	1.023	0.000	0.033	0.000	1.036	1.333	H1-3+VT
	28.575 - 26.9875	0.014	1.027	0.000	0.033	0.000	1.041	1.333	H1-3+VT
	26.9875 - 25.4	0.014	1.032	0.000	0.033	0.000	1.046	1.333	H1-3+VT
	25.4 - 23.8125	0.014	1.037	0.000	0.033	0.000	1.051	1.333	H1-3+VT
	23.8125 - 22.225	0.014	1.041	0.000	0.033	0.000	1.056	1.333	H1-3+VT
	22.225 - 20.6375	0.014	1.046	0.000	0.033	0.000	1.060	1.333	H1-3+VT
	20.6375 - 19.05	0.014	1.050	0.000	0.033	0.000	1.064	1.333	H1-3+VT
	19.05 - 17.4625	0.014	1.054	0.000	0.033	0.000	1.068	1.333	H1-3+VT
	17.4625 - 15.875	0.014	1.058	0.000	0.033	0.000	1.072	1.333	H1-3+VT
	15.875 - 14.2875	0.015	1.061	0.000	0.033	0.000	1.076	1.333	H1-3+VT

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
	14.2875 - 12.7	0.015	1.065	0.000	0.033	0.000	1.080	1.333	H1-3+VT
	12.7 - 11.1125	0.015	1.069	0.000	0.032	0.000	1.084	1.333	H1-3+VT
	11.1125 - 9.525	0.015	1.072	0.000	0.032	0.000	1.087	1.333	H1-3+VT
	9.525 - 7.9375	0.015	1.076	0.000	0.032	0.000	1.091	1.333	H1-3+VT
	7.9375 - 6.35	0.015	1.079	0.000	0.032	0.000	1.094	1.333	H1-3+VT
	6.35 - 4.7625	0.015	1.082	0.000	0.032	0.000	1.097	1.333	H1-3+VT
	4.7625 - 3.175	0.015	1.085	0.000	0.032	0.000	1.101	1.333	H1-3+VT
	3.175 - 1.5875	0.015	1.088	0.000	0.032	0.000	1.104	1.333	H1-3+VT
	1.5875 - 0	0.016	1.091	0.000	0.032	0.000	1.107	1.333	H1-3+VT

* DL controls

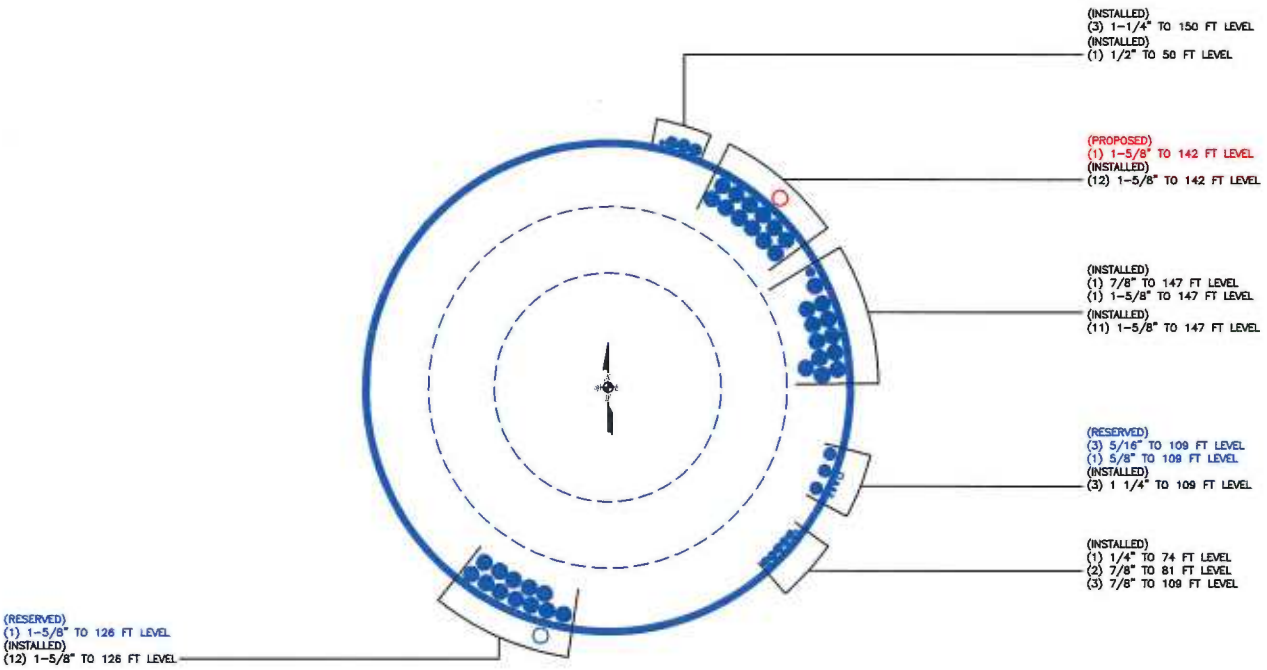
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	148 - 116	Pole	TP30.241x24x0.219	1	-9.992	1057.261	44.9	Pass*
L2	116 - 93.5	Pole	TP34.191x29.072x0.25	2	-17.390	1400.116	83.8	Pass*
L3	93.5 - 74.75	Pole	TP37.847x34.191x0.421	3	-20.431	2056.659	75.4	Pass*
L4	74.75 - 57.75	Pole	TP40.663x36.421x0.467	4	-26.445	2516.757	83.7	Pass*
L5	57.75 - 39.5	Pole	TP44.222x40.663x0.511	5	-30.232	2957.674	81.1	Pass*
L6	39.5 - 31.75	Pole	TP45.108x42.524x0.565	6	-35.568	3422.717	79.7	Pass*
L7	31.75 - 0	Pole	TP51.3x45.108x0.522	7	-46.963	4026.473	83.0	Pass*
							Summary	
						Pole (L2)	83.8	Pass*
						RATING =	**83.8**	Pass*

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

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 855662 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Reinforced Pole Stress and Effective Thickness Check

AeroSolutions LLC
5500 Flatiron Parkway, Suite 100
Boulder, CO 80301
720-304-6881

Section		Loads				Pole														Unreinforced Pole - Rev. F					Reinforced Pole					Rev. F	Reinforcement 1								Composite							
Section	Elevation (ft)	Moment (ft-kip)	Compression (kip)	Shear (kip)	Torsion (kip-ft)	Number of Sides	OD (in)	Thickness (in)	Yield Strength (ksi)	Flat Width (in)	Area (in²)	Moment of Inertia (in⁴)	Percent of Composite Moment of Inertia	Angle Offset to Pole Flat	Distance to Extreme Fiber (in)	Section Modulus (in³)	Torsion Constant (in⁴)	Polygonal Compact Criterion	Allowable Bending Stress (ksi)	Allowable Bending Moment Strength (ft-kip)	Allowable Axial Stress (ksi)	Allowable Shear Stress (ksi)	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Torsion Shear Stress (ksi)	Stress Ratio	Moment in Pole when Reinforced	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Torsion Shear Stress (ksi)	Reinforced Pole Stress Ratio	Qty	Model	Position (F-Flat, C-Corner)	Gap Between Pole and Back of Rein. (in)	Tension only or Tension & Comp.	Total Moment of Inertia (in⁴)	Axial Force (kip)	Stress Ratio	Centroid Offset (in)	Area (in²)	Moment of Inertia (in⁴)	Controlling Stress Ratio	Thickness (in)	Weight Multiplier	Derated Yield Stress (ksi)	% Error in Derated Yield Stress
Section	*Elevation*	*Moment*	*Compressio*	*Shear*	*Torsion*	*PoleSides*	*PoleOD*	*PoleT*	*PoleFy*	*PoleW*	*PoleA*	*PoleI*	*PoleIPer*	*PoleCPoint*	*PoleC*	*PoleS*	*PoleJ*	*PoleWTT*	*PoleFb*	*PoleMall*	*PoleFa*	*PoleFv*	*PoleFbAct*	*PoleFaAct*	*PoleFvAct*	*PoleFvtAct*	*PoleSR*	*PoleMomen*	*RPoleFb*	*RPoleFaAct*	*RPoleFvAct*	*RPoleFvtAct*	*RPoleSR*	*ReinfQty*	*ReinfModel*	*ReinfPos*	*ReinfGap*	*ReinfTC*	*ReinfITotal*	*ReinfP*	*ReinfSR*	*CompYBar*	*CompA*	*CompI*	*CompSR*	*tPoleT*	*tPoleWM*	*FDPoleFy*	*FDPoleSRCheck*
1	148	0.0	0.0	0.0	0.0	18	24.0000	0.2188	65	3.85	16.5	1178	[illegible]	TRUE	12.17	97	2316	[illegible]	52.0	419.5	52.0	34.7	0.0	0.00	0.00	0.00	0.000	0.0	0.0	0.00	0.00	0.00	0.000									0.000	16.5	1178	0.000	0.2188	1.00	65.0	143.8%
2	139.75	279.9	10.0	15.5	1.1	18	29.5096	0.2188	65	4.82	20.3	2202	100%	TRUE	14.97	147	4364	176	52.0	637.5	52.0	34.7	22.8	0.49	0.00	0.05	0.449	279.9	22.8	0.49	0.00	0.00	0.449									0.000	20.3	2202	0.449	0.2188	1.00	65.0	0.7%
3	116	338.9	10.6	16.1	1.2	18	30.2450	0.4688	65	4.51	44.2	4951	100%	TRUE	15.32	333	9818	77	52.0	1400.4	52.0	34.7	12.6	0.24	0.00	0.02	0.247	339.6	12.6	0.24	0.00	0.00	0.247									0.000	44.2	4951	0.247	0.4688	1.00	65.0	0.6%
4	93.5	807.9	17.6	23.2	0.7	18	34.1968	0.2500	65	5.59	26.9	3916	100%	TRUE	17.24	226	7761	180	52.0	976.3	52.0	34.7	42.9	0.65	0.00	0.02	0.838	807.9	42.9	0.65	0.00	0.00	0.838									0.000	26.9	3916	0.838	0.2500	1.00	65.0	0.3%
5	79.5	1142.0	20.4	25.0	1.1	18	35.9208	0.2500	65	6.07	29.1	4939	50%	[illegible]	18.46	268	9787	196	52.0	1158.0	52.0	34.7	51.2	0.70	0.00	0.03	0.994	687.7	30.8	0.70	0.00	0.00	0.697	3	CCI-XFP-090100	3	0	T&C	3263	190.1	0.754	0.000	47.1	8202	0.754	0.4206	0.97	88.8	3.1%
6	74.75	1283.9	22.3	25.6	1.2	18	37.8470	0.5625	65	5.68	68.5	11671	77%	[illegible]	18.92	617	23157	81	52.0	3671.8	52.0	34.7	24.8	0.34	0.00	0.01	0.479	975.7	19.0	0.34	0.00	0.00	0.372	3	CCI-XFP-090100	3	6	T&C	3429	116.3	0.466	0.000	84.5	15094	0.466	0.7365	0.97	51.2	3.1%
7	57.75	1712.1	26.4	27.2	1.3	18	40.6627	0.3325	65	6.62	40.0	8123	58%	[illegible]	20.33	404	16300	171	52.0	1732.3	52.0	34.7	50.8	0.66	0.00	0.02	0.980	1158.1	34.4	0.66	0.00	0.00	0.674	3	CCI-XFP-090100	3	6	T&C	3933	211.3	0.837	0.000	58.0	12157	0.837	0.4668	0.97	51.3	3.0%
8	45	2066.7	30.2	28.4	1.4	18	43.1493	0.3325	65	7.08	42.5	9840	52%	[illegible]	21.57	456	19502	182	52.0	1975.9	52.0	34.7	64.4	0.71	0.00	0.02	1.260	1279.8	33.7	0.71	0.00	0.00	0.661	3	CCI-XFP-090125	3	6	T&C	6031	281.6	0.811	0.000	66.6	15891	0.811	0.5112	0.97	51.9	3.0%
9	39.5	2224.7	33.2	28.0	1.4	18	44.2230	0.6875	65	6.59	94.9	22709	78%	[illegible]	22.11	1027	45056	77	52.0	4448.7	52.0	34.7	26.0	0.35	0.00	0.01	0.507	1738.8	[illegible]	0.35	0.00	0.00	0.398	3	CCI-XFP-090125	3	6	T&C	6145	165.8	0.489	0.000	119.2	29050	0.489	0.8904	0.97	52.0	3.0%
10	31.75	2452.2	35.6	29.7	1.4	18	45.1083	0.3750	65	7.28	53.2	13445	67%	[illegible]	22.55	596	26652	157	52.0	2582.6	52.0	34.7	49.4	0.57	0.00	0.01	0.862	1645.4	33.1	0.67	0.00	0.00	0.650	3	CCI-XFP-090125	3	6	T&C	6593	276.8	0.797	0.000	77.6	20628	0.797	0.5854	0.97	52.0	3.0%
11	0	3432.4	47.0	32.1	1.5	18	51.9000	0.3750	65	8.38	60.6	20074	73%	[illegible]	27.82	727	39320	180	52.0	3148.5	52.0	34.7	56.7	0.78	0.00	0.01	1.105	2516.2	41.5	0.78	0.00	0.00	0.814	3	CCI-XFP-093125	3	6	T&C	7309	388.5	0.830	1.971	99.4	27382	0.830	0.9215	1.16	57.9	3.5%
																											1.105						0.838							0.857				0.826				

Rein1

Bottom	Top	Qty	Model	Position	T or T&C
0	31.75	3	FP-085125	F	T&C
31.75	57.75	3	FP-065125	F	T&C
57.75	93.5	3	FP-060100	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Flats (Used for relative orientation only. Actual flat numbers may vary.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		1					1					1					
1						1						1					
1						1						1					

Rein2

Bottom	Top	Qty	Model	Position	T or T&C
0				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Rein3

Bottom	Top	Qty	Model	Position	T or T&C
0				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Reinforcement Capacity

AeroSolutions LLC
Optimizing Your Tower Infrastructure
5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
CCI-XFP-040075	10.2	3.00	0.14	4.00	0.375	0	0.75	4	0	0	1.1875	65	80	0.80	16	1.00	16	82.5	110.0	Rupture	123.8	Rupture
CCI-XFP-045100	15.3	4.50	0.38	7.59	0.5	0	1	4.5	0	0	1.1875	65	80	0.80	20	1.00	20	129.7	172.9	Compress.	195.0	Rupture
CCI-XFP-060100	20.4	6.00	0.50	18.00	0.5	0	1	6	0	0	1.1875	65	80	0.80	16	1.00	16	189.3	252.3	Compress.	285.0	Rupture
CCI-XFP-065125	27.6	8.13	1.06	28.61	0.625	0	1.25	6.5	0	0	1.1875	65	80	0.80	19	1.00	19	260.4	347.2	Compress.	393.8	Rupture
CCI-XFP-085125	36.2	10.63	1.38	63.97	0.625	0	1.25	8.5	0	0	1.1875	65	80	0.80	17	1.00	17	350.9	467.9	Compress.	543.1	Compress.

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

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

Site Data

BU#: *855662*
Site Name: *WINDSORCENTRAL*
App #: *260649 Rev. 3*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	58	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	57	in
Thick:	2.75	in
Grade:	55	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:	51.3	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

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

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	3432.35923	ft-kips
Unfactored Axial, P:	46.963	kips
Unfactored Shear, V:	32.091417	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	174.6 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	89.6% Pass

Base Plate Results Flexural Check

Base Plate Stress:	49.3 ksi
Allowable PL Bending Stress:	55.0 ksi
Base Plate Stress Ratio:	89.6% Pass

PL Ref. Data
Yield Line (in): 29.31
Max PL Length: 29.31

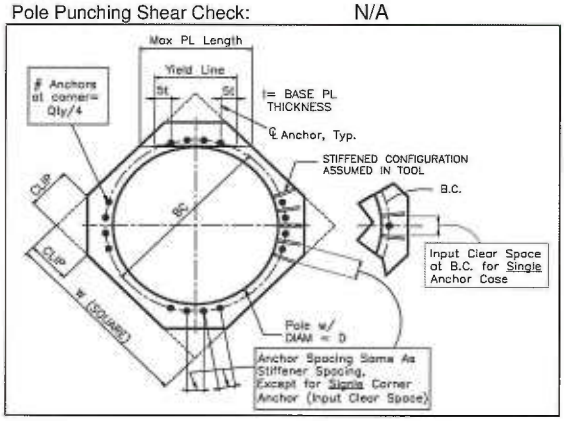
N/A - Unstiffened

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



CCI Foundation Tool Suite - Monopole Pier - Beta Release

CCI Foundation Tool Suite - v1.0 Date: 07-10-2014

BU:	855662
Site Name:	WINDSORCENTRAL, CT
App Number:	260649 Rev. 3
Work Order:	936346

Monopole Drilled Pier

Input

Criteria

TIA Revision:	F
ACI 318 Revision:	2002
Seismic Category:	B

Forces

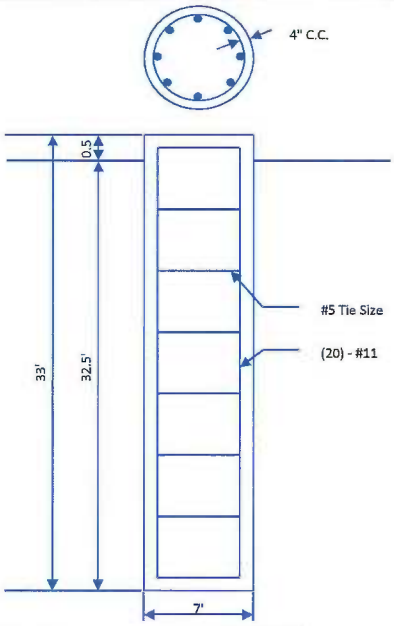
Compression	47 kips
Shear	32 kips
Moment	3432 k-ft
Swelling Force	0 kips

Foundation Dimensions

Pier Diameter:	7 ft
Ext. above grade:	0.5 ft
Depth below grade:	32.5 ft

Material Properties

Number of Rebar:	20
Rebar Size:	11
Tie Size	5
Rebar tensile strength:	60 ksi
Concrete Strength:	3000 psi
Ultimate Concrete Strain	0.003 in/in
Clear Cover to Ties:	4 in



Soil Profile: Soil

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	2	0	2	100	0	0	0	0	0	
2	3	2	5	37.6	0	0	0	0	0	
3	7	5	12	55		35			0	
4	4	12	16	50		31			0	
5	16.5	16	32.5	50	800				4.8	

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	7.04 ft
Max Moment, Mu:	3683.98 k-ft
Soil Safety Factor:	2.01
Safety Factor Req'd:	2
RATING:	99.7%

Soil Axial Capacity

Skin Friction (k):	135.67 kips
End Bearing (k):	92.36 kips
Comp. Capacity (k), ϕCn:	228.03 kips
Comp. (k), Cu:	61.10 kips
RATING:	26.8%

Concrete/Steel Check

Mu (from soil analysis)	4789.17 k-ft
ϕMn	4974.53 k-ft
RATING:	96.3%

rho provided	0.56
rho required	0.33 OK
Rebar Spacing	10.11
Spacing required	22.56 OK
Dev. Length required	25.13
Dev. Length provided	61.78 OK

Overall Foundation Rating: 99.7%

APPENDIX D

TOWER MODIFICATION DRAWINGS

TOWER MODIFICATION DRAWINGS PREPARED FOR: CROWN CASTLE

SITE NAME: WINDSORCENTRAL
BU NUMBER: 855662

SITE ADDRESS:
340 BLOOMFIELD AVENUE
WINDSOR, CT 06095
HARTFORD COUNTY, USA

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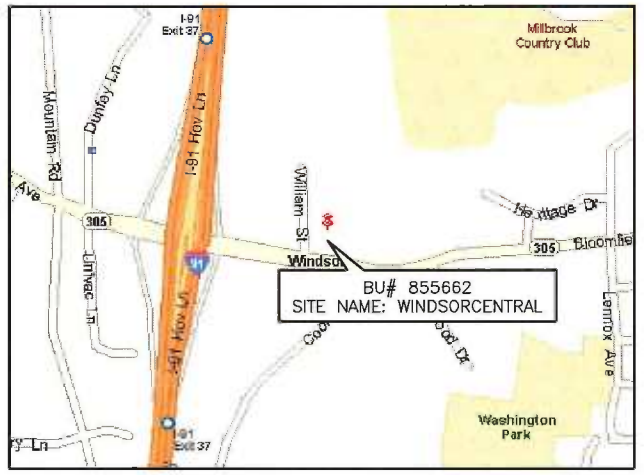
4. B+T GROUP PROJECT ENGINEER
   ROBBIE FRAZIER
   (918) 587-4630
   RFRAZIER@BTGRP.COM
   1717 S BOULDER AVENUE, SUITE 300
   TULSA, OK 74119

5. B+T GROUP ENGINEER (EOR)
   CHAD E TUTTLE, P.E.
   (918) 587-4630
   CTUTTLE@BTGRP.COM
   1717 S BOULDER AVENUE, SUITE 300
   TULSA, OK 74119



MAP

DIRECTIONS

UPDATED 6/04 WINDOR-CENTRAL CT-138 I-91 NORTH. FOLLOW THROUGH HARTFORD AND GET OFF AT EXIT 37. AT THE END OF THE RAMP TURN RIGHT FOLLOW TO WINDSOR PUBLIC SAFETY BUILDING MAKE LEFT MONO POLE IS IN THE REAR OF THE BUILDING.

TOWER INFORMATION

TOWER MANUFACTURER / DWG #:	SUMMIT MANUFACTURING, LLC. / 11986
TOWER HEIGHT / TYPE:	148' MONOPOLE
TOWER LOCATION: DATUM: (NAD 1983)	LAT. 41° 51' 9.3" LONG. -72° 39' 37.8" ELEV. 131 FT AMSL
STRUCTURAL DESIGN DRAWING REPORT:	B+T GROUP / WO. # 936346
STRUCTURAL ANALYSIS REPORT:	AEROSOLUTIONS / WO. # 905184
STRUCTURAL ANALYSIS DATE:	08/07/14
APPLICATION ID / REVISION #:	260649 / 3
CCISITES DOCUMENT ID:	5233690

CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS BASED ON THE REQUIREMENTS OF TIA/EIA-222-F STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES USING FASTEST MILE WIND SPEED OF 80 MPH WITH NO ICE, 38 MPH WITH 1.00 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, AJAX BOLT NOTES AND DETAIL
S4	TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.
S5	TOWER SECTIONS (0'-35.5', 25.5'-60.5' AND 60.5'-95.5')
S6	IN-LINE SPLICE DETAIL
D1	DETAILS

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	10/07/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' 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.
N/A	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.
X	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.
X	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 50% 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.

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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	10/07/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

SHEET NUMBER: S2

REVISION: 0

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 AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRE-TENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF HRC 38 OR HIGHER.

5. AS AN ALTERNATIVE TO USING DTI WASHERS, AJAX BOLTS MAY BE PRETENSIONED PER AISC TURN-OF-NUT METHOD.

NOTES FOR AJAX M20 'ONE-SIDE' BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURES'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
1413 ROCKINGHAM ROAD
BELLOWS FALLS, VERMONT 05101, USA
PHONE 1-800-552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRUBUTORS.HTML

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 3/4" NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

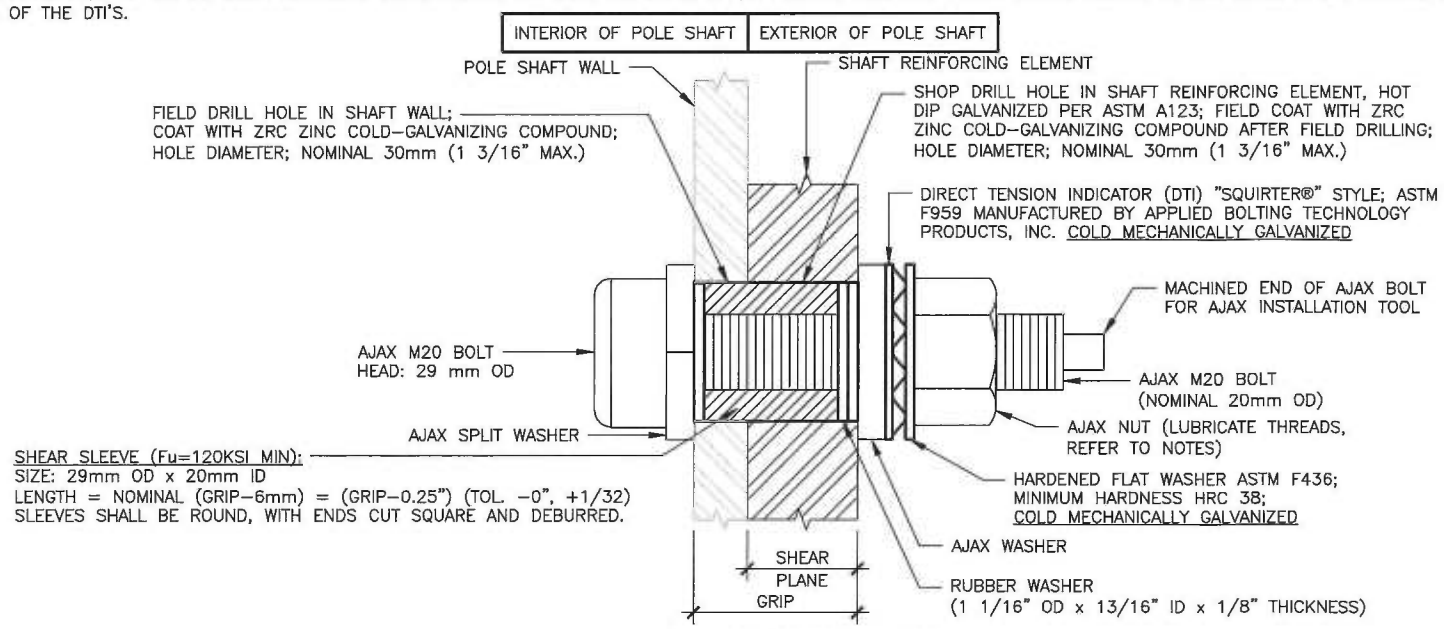
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLT. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF HRC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF HRC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 32, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



1 TYPICAL AJAX BOLT DETAIL
SCALE: N.T.S.

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.

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.

B+T GRP
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TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
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PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

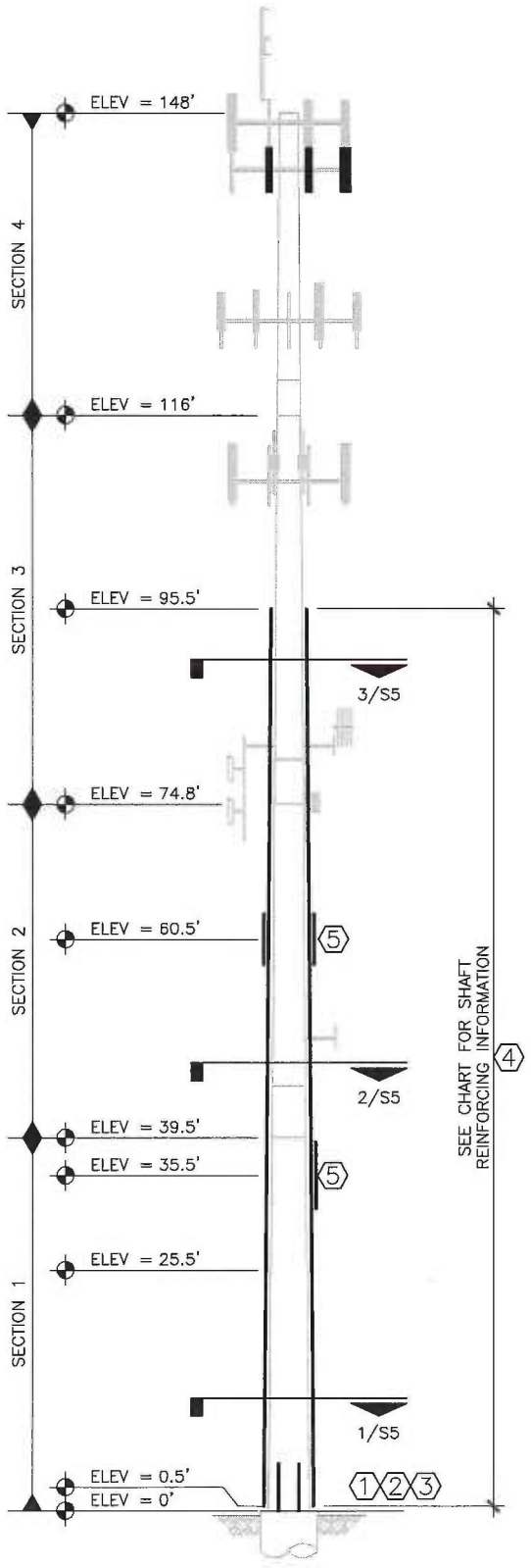
WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' MONOPOLE

SHEET TITLE
GENERAL NOTES, AJAX BOLT NOTES AND DETAIL

SHEET NUMBER: S3
REVISION: 0



1 TOWER ELEVATION
SCALE: N.T.S.

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

BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	AJAX BOLTS PER PLATE	TOTAL AJAX BOLT QTY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	TOTAL STEEL WEIGHT	
0'-6"	35'-6"	CCI-SFP-08512535	35'-0"	3	49	147	15	15	17"	3793	LBS.
25'-6"	60'-6"	CCI-SFP-06512535	35'-0"	2	40	80	11	11	19"	1934	LBS.
35'-6"	60'-6"	CCI-SFP-06512525	25'-0"	1	34	34	11	11	19"	691	LBS.
60'-6"	95'-6"	CCI-SFP-06010035	35'-0"	3	39	117	8	8	16"	2142	LBS.
						378				8560	LBS.

NOTES:
1. AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
2. 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.
3. ALL SHIMS SHALL BE ASTM A36.
4. HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
5. SHOP WELDS ARE ASSUMED E80XX OR GREATER, PER STANDARD SPLICE DETAIL.
6. IF SCOPE OF MODIFICATION REQUIRES REMOVAL OF TOWER ID TAG, IT MUST BE REPLACED.
7. 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.
8. 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.
9. 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.

TOWER MODIFICATIONS:

1. CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
2. THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S4.
3. INSTALL NEW TRANSITION STIFFENERS RE: SHEET S5.
4. INSTALL NEW REINFORCING ELEMENTS RE: SHEET S5.
5. INSTALL NEW IN-LINE SPLICES RE: SHEET S6.

* CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.
** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

NEW CCI FLAT PLATE (65KSI) REINFORCING ELEMENTS

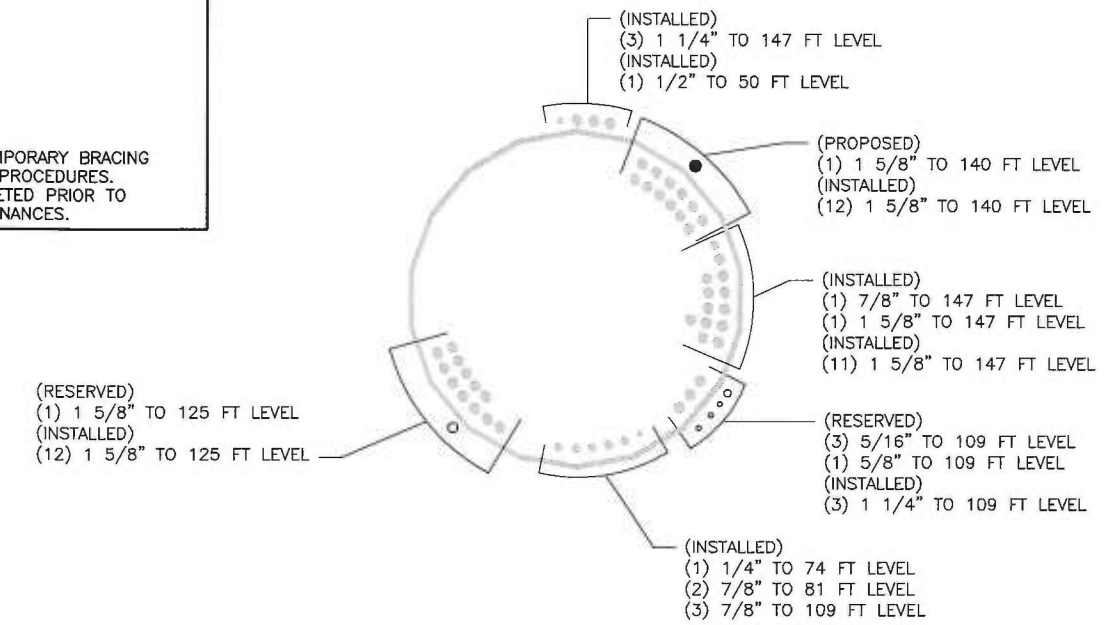
START ELEVATION	END ELEVATION	QTY	FLAT #	FLAT PLATE *
0.5'	35.5'	3	3, 8 & 13	CCI-SFP-08512535
25.5'	60.5'	2	1 & 7	CCI-SFP-06512535
35.5'	60.5'	1	13	CCI-SFP-06512525
60.5'	95.5'	3	1, 7 & 13	CCI-SFP-06010035

* SEE CMRP 65 KSI PARTS CATALOG EDITION 2 REV. 1 FOR PART DETAILS

ALL BOLTS SHALL BE AJAX 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 MEMBER SCHEDULE

SECTION	NUMBER OF SIDES	THICKNESS	BOTTOM DIAMETER	TOP DIAMETER	LAP SPLICE
1	18	0.375"	51.300"	42.524"	66"
2	18	0.313"	44.222"	36.421"	57"
3	18	0.250"	37.847"	29.072"	45"
4	18	0.219"	30.241"	24.000"	---



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	10/07/14	ISSUED FOR CONSTRUCTION

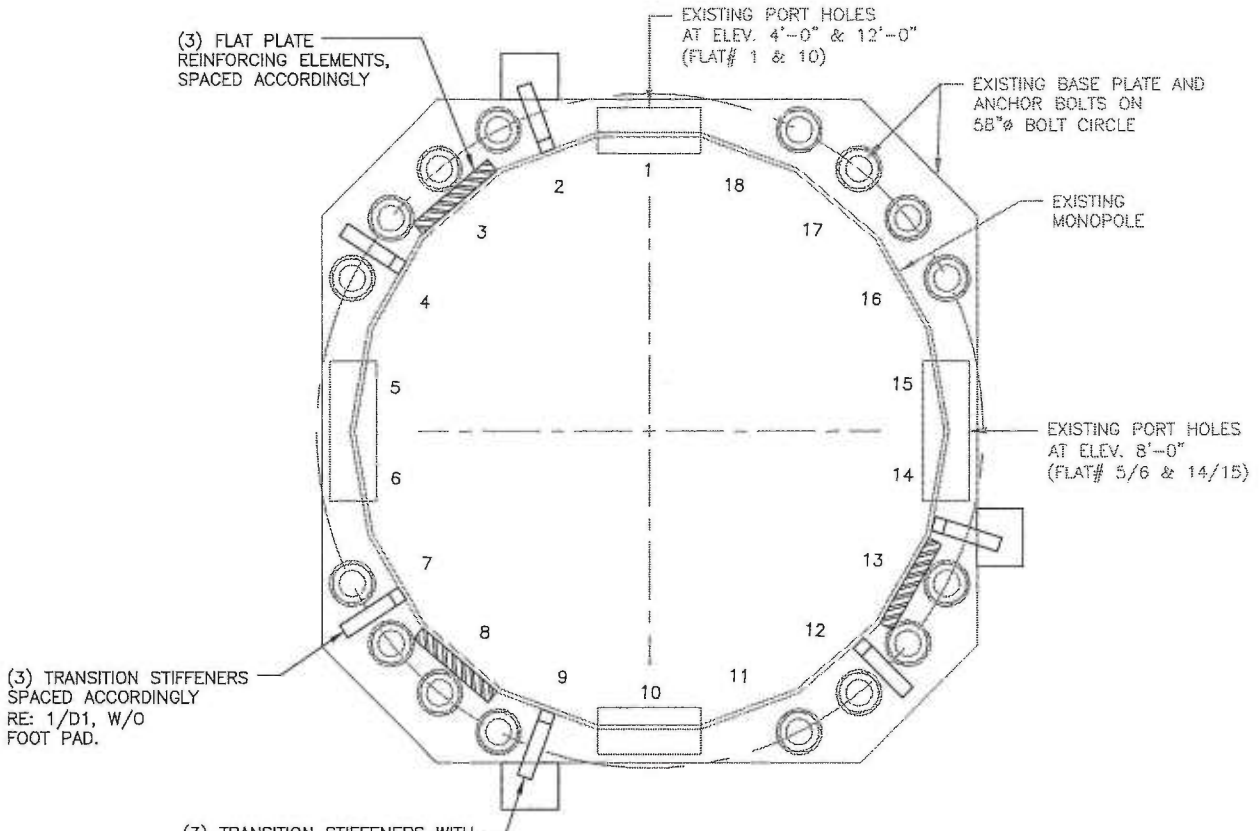
PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

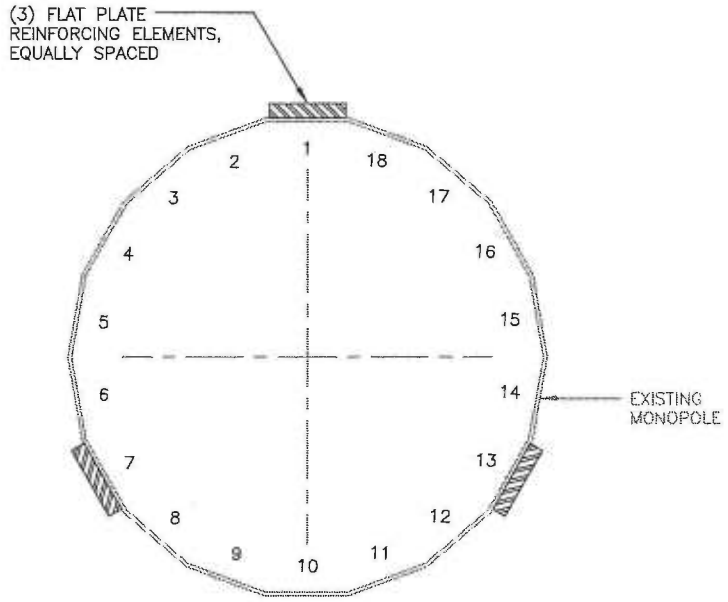
WINDSORCENTRAL
855662
340 BLOOMFIELD AVENUE
WINDSOR, CT
EXISTING 148' MONOPOLE

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

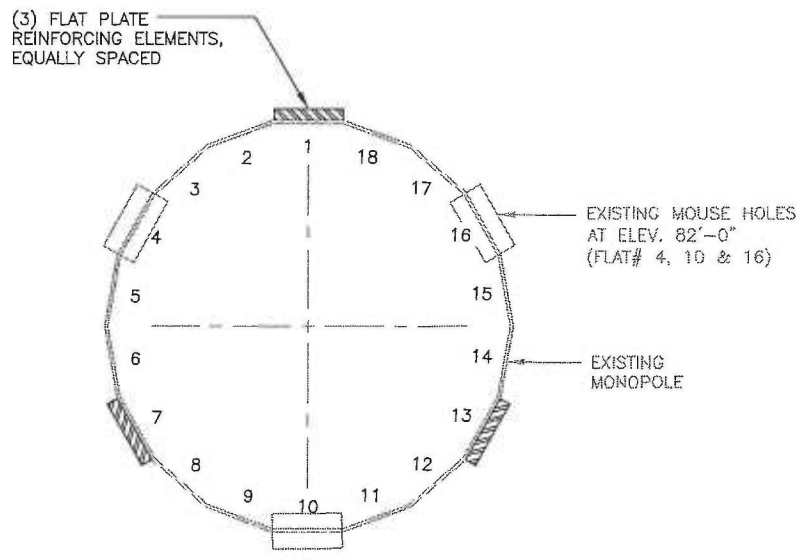
SHEET NUMBER: S4
REVISION: 0



1 TOWER SECTION (0'-35.5')
SCALE: N.T.S.



2 TOWER SECTION (25.5'-60.5')
SCALE: N.T.S.



3 TOWER SECTION (60.5'-95.5')
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	10/08/14	ISSUED FOR CONSTRUCTION
1	10/23/14	UPDATED PORT INFO.

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

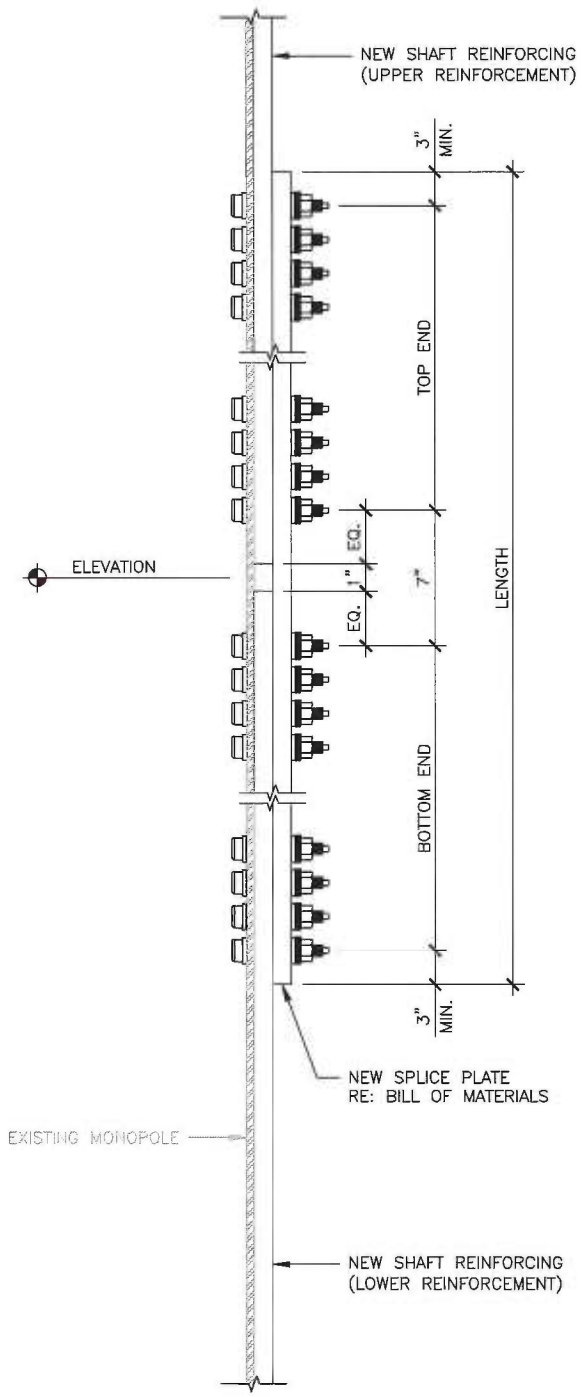
WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' MONOPOLE

SHEET TITLE
TOWER SECTIONS
0'-35.5', 25.5'-60.5' AND
60.5'-95.5'

SHEET NUMBER:	REVISION:
S5	1



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)	AJAX BOLTS PER SPLICE	TOTAL AJAX BOLTS	TOTAL STEEL WEIGHT	
35'-6"	6 1/2"	1 1/4"	7'-1"	1	11	15	26	26	196	LBS.
60'-6"	6"	1"	5'-4"	3	8	11	19	57	326	LBS.
							TOTAL:	83	522	LBS.

* O.C. DISTANCE ON TERMINATION BOLTS TO BE 3 IN. U.N.O.
* USE SHIM PLATES AS REQUIRED.
**BOLT QTY INCLUDED IN S4 BILL OF MATERIALS
***STEEL WEIGHT NOT INCLUDED IN S4 BILL OF MATERIALS.

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CROWN CASTLE

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REV	DATE	DESCRIPTION
0	10/07/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

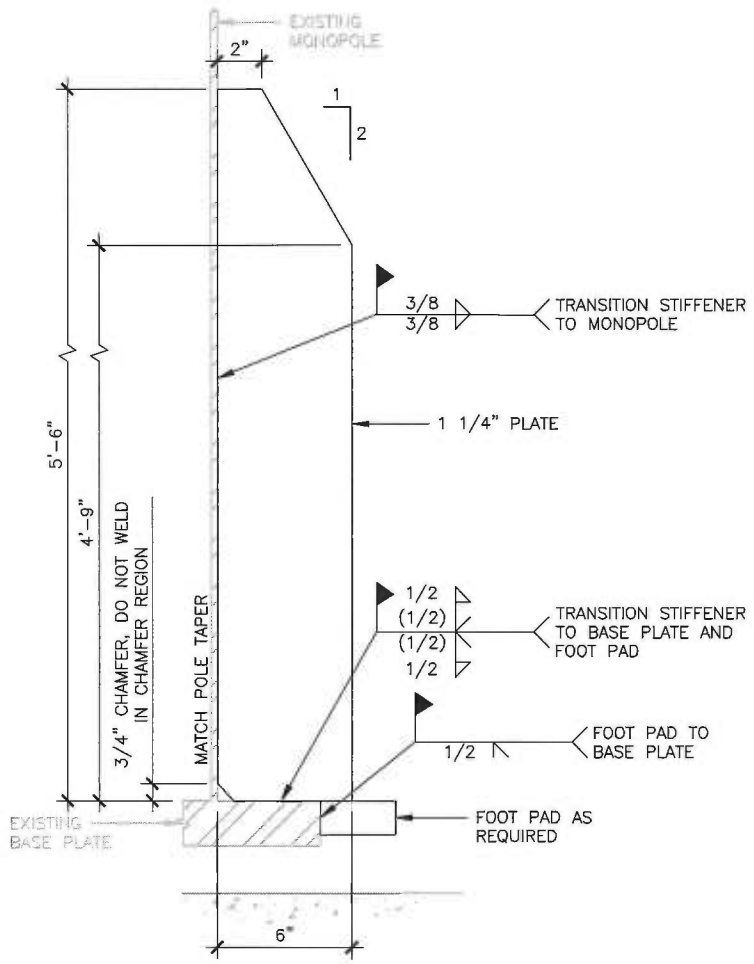
EXISTING 148' MONOPOLE

SHEET TITLE

IN-LINE SPLICE DETAIL

SHEET NUMBER: S6

REVISION: 0



1 CCI-TRANSITION STIFFENER DETAIL
SCALE: N.T.S.

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CROWN CASTLE

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REV	DATE	DESCRIPTION
0	10/07/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' MONOPOLE

SHEET TITLE

DETAILS

SHEET NUMBER: D1

REVISION: 0

TOWER MODIFICATION DRAWINGS PREPARED FOR: CROWN CASTLE

SITE NAME: WINDSORCENTRAL
BU NUMBER: 855662

SITE ADDRESS:
340 BLOOMFIELD AVENUE
WINDSOR, CT 06095
HARTFORD COUNTY, USA

PROJECT CONTACTS:

1. CROWN TOWER STRUCTURAL ANALYST

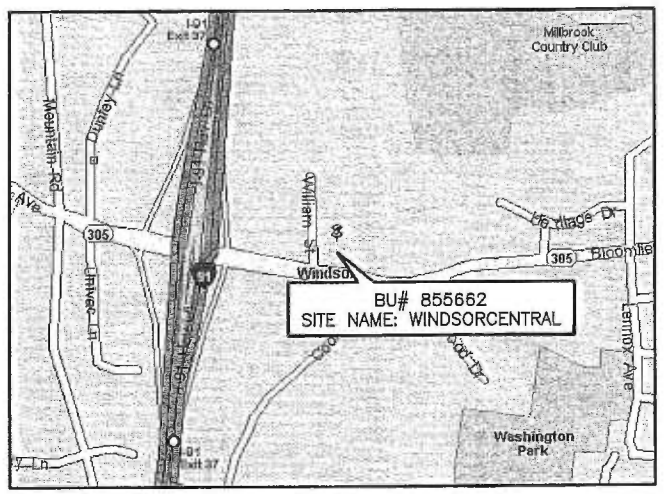
TIMOTHY HOWELL
(980) 209-8242
TIMOTHY.HOWELL@CROWNCASTLE.COM
3530 TORINGDON WAY SUITE 300
CHARLOTTE, NC 28277

2. CROWN PROJECT MANAGER

JERRY BRUNO
(781) 970-0069
JERRY.BRUNO@CROWNCASTLE.COM

3. CROWN CONSTRUCTION MANAGER

N/A



MAP

4. B+T GROUP PROJECT ENGINEER

ROBBIE FRAZIER
(918) 587-4630
RFRAZIER@BTGRP.COM
1717 S BOULDER AVENUE, SUITE 300
TULSA, OK 74119

5. B+T GROUP ENGINEER (EOR)

CHAD E TUTTLE, P.E.
(918) 587-4630
CTUTTLE@BTGRP.COM
1717 S BOULDER AVENUE, SUITE 300
TULSA, OK 74119

DIRECTIONS

UPDATED 6/04 WINDOR-CENTRAL CT-138 I-91 NORTH. FOLLOW THROUGH HARTFORD AND GET OFF AT EXIT 37. AT THE END OF THE RAMP TURN RIGHT FOLLOW TO WINDSOR PUBLIC SAFETY BUILDING MAKE LEFT MONO POLE IS IN THE REAR OF THE BUILDING.

TOWER INFORMATION

TOWER MANUFACTURER / DWG #:	SUMMIT MANUFACTURING, LLC. / 11986
TOWER HEIGHT / TYPE:	148' MONOPOLE
TOWER LOCATION: DATUM: (NAD 1983)	LAT. 41° 51' 9.3" LONG. -72° 39' 37.8" ELEV. 131 FT AMSL
STRUCTURAL DESIGN DRAWING REPORT:	B+T GROUP / WO. # 936346
STRUCTURAL ANALYSIS REPORT:	AEROSOLUTIONS / WO. # 905184
STRUCTURAL ANALYSIS DATE:	08/07/14
APPLICATION ID / REVISION #:	260649 / 3
CCISITES DOCUMENT ID:	5233690

CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS BASED ON THE REQUIREMENTS OF TIA/EIA-222-F STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES USING FASTEST MILE WIND SPEED OF 80 MPH WITH NO ICE, 38 MPH WITH 1.00 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, AJAX BOLT NOTES AND DETAIL
S4	TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.
S5	TOWER SECTIONS (0'-35.5', 25.5'-60.5' AND 60.5'-95.5')
S6	IN-LINE SPLICE DETAIL
D1	DETAILS

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SUITE 300
TULSA, OK 74119
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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	10/08/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD E TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
10/8/14

WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' MONOPOLE

SHEET TITLE

TITLE SHEET

SHEET NUMBER:	REVISION:
S1	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.
N/A	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.
X	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.
X	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 50% 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	10/08/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
10/8/14

WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

SHEET NUMBER: S2

REVISION: 0

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 AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRE-TENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF HRC 38 OR HIGHER.

5. AS AN ALTERNATIVE TO USING DTI WASHERS, AJAX BOLTS MAY BE PRETENSIONED PER AISC TURN-OF-NUT METHOD.

NOTES FOR AJAX M20 'ONE-SIDE' BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURES'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
1413 ROCKINGHAM ROAD
BELLOWS FALLS, VERMONT 05101, USA
PHONE 1-800-552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRUBUTORS.HTML

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 3/4" NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

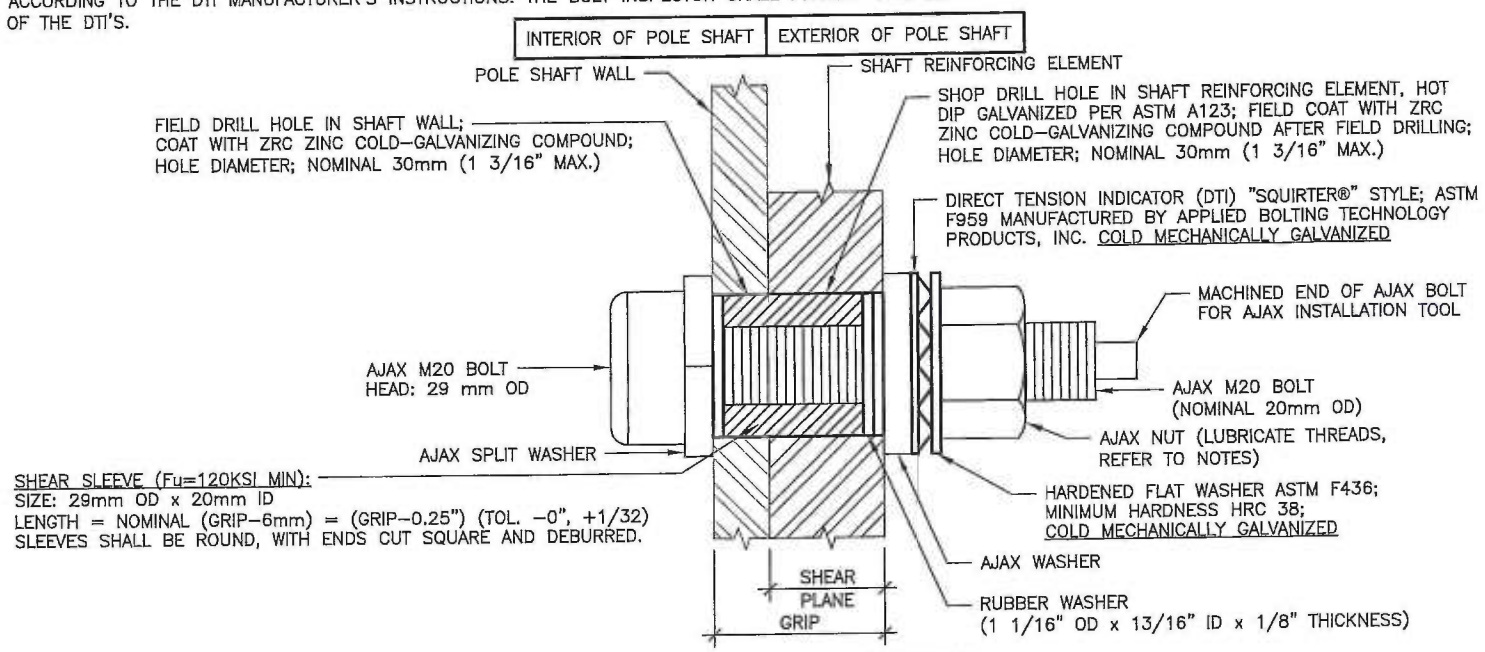
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLT. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF HRC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF HRC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 32, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



1 TYPICAL AJAX BOLT DETAIL
SCALE: N.T.S.

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.

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.

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PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	10/08/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

STATE OF CONNECTICUT ★ CHAD A. CASTLE ★ No. 23924 LICENSED PROFESSIONAL ENGINEER 10/8/14

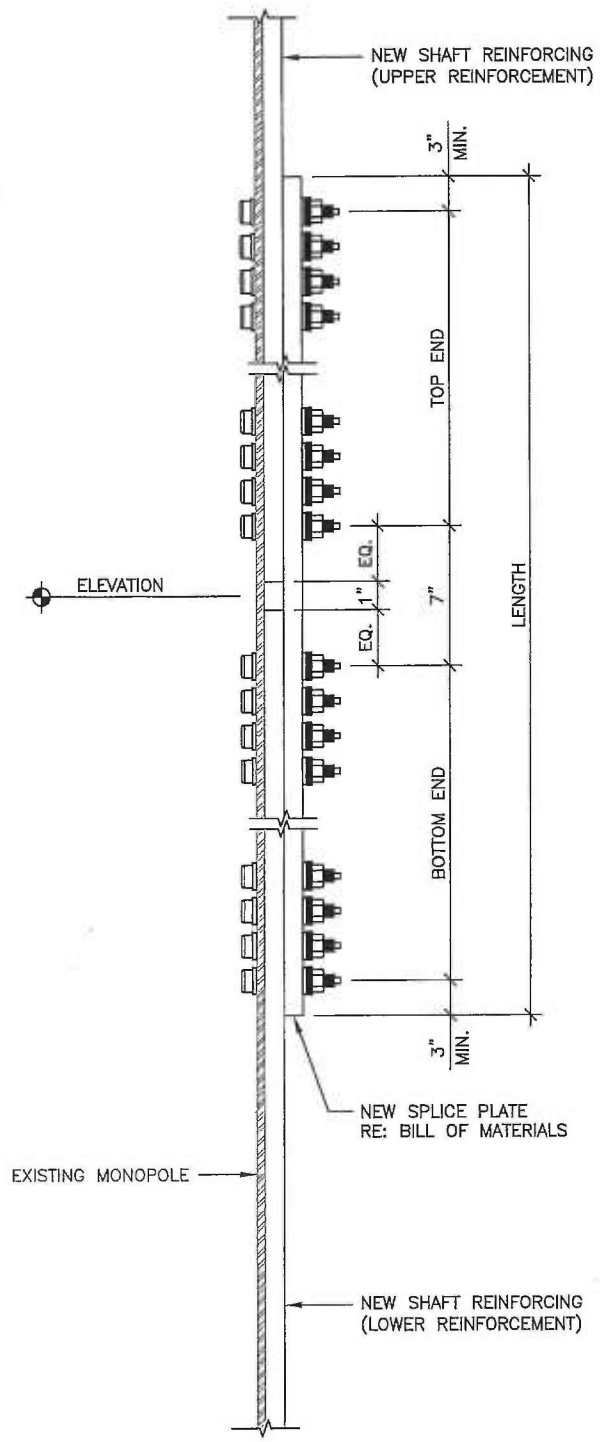
WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' MONOPOLE

SHEET TITLE
GENERAL NOTES, AJAX BOLT NOTES AND DETAIL

SHEET NUMBER: S3
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)	AJAX BOLTS PER SPLICE	TOTAL AJAX BOLTS	TOTAL STEEL WEIGHT	
35'-6"	6 1/2"	1 1/4"	7'-1"	1	11	15	26	26	196	LBS.
60'-6"	6"	1"	5'-4"	3	8	11	19	57	326	LBS.
							TOTAL:	83	522	LBS.

* O.C. DISTANCE ON TERMINATION BOLTS TO BE 3 IN. U.N.O.
* USE SHIM PLATES AS REQUIRED.
**BOLT QTY INCLUDED IN S4 BILL OF MATERIALS
***STEEL WEIGHT NOT INCLUDED IN S4 BILL OF MATERIALS.

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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	10/08/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
10/8/14

WINDSORCENTRAL
855662

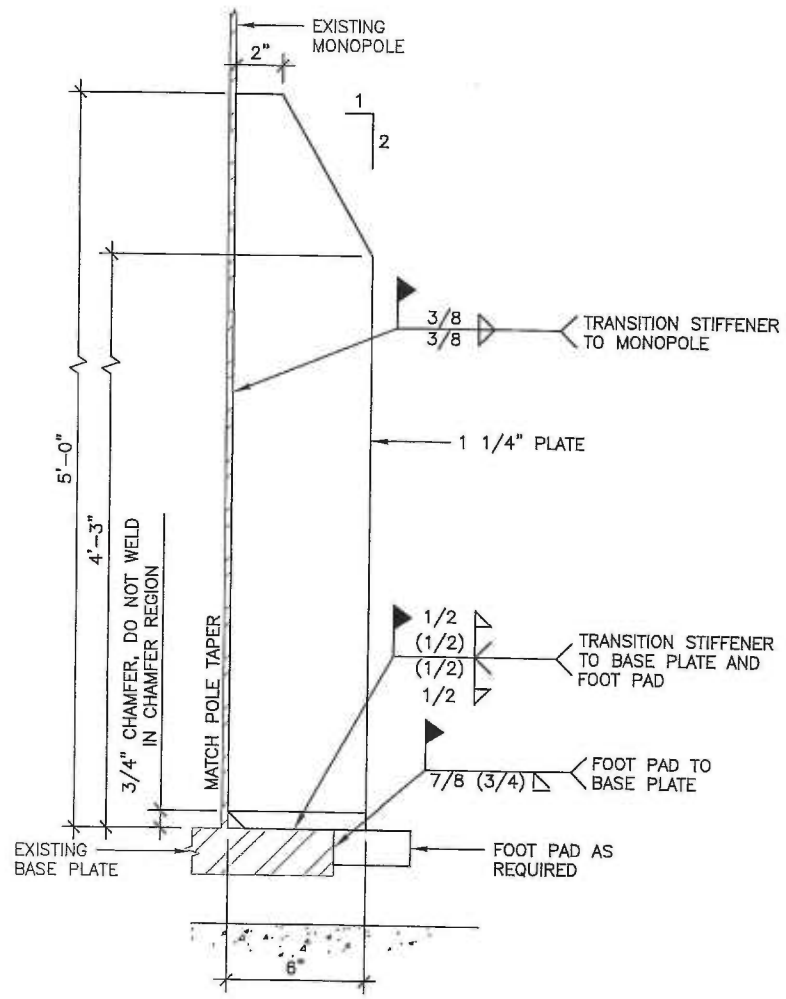
340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' MONOPOLE

SHEET TITLE
IN-LINE SPLICE DETAIL

SHEET NUMBER: S6

REVISION: 0



1 CCI-TRANSITION STIFFENER DETAIL
SCALE: N.T.S.

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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	10/08/14	ISSUED FOR CONSTRUCTION

PROJECT NO:	91728.004.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	RA
CHECKED BY:	ASP

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD SOTTILE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
10/9/14

WINDSORCENTRAL
855662

340 BLOOMFIELD AVENUE
WINDSOR, CT

EXISTING 148' MONOPOLE

SHEET TITLE

DETAILS

SHEET NUMBER: D1

REVISION: 0

EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CT11063B

Windsor Fire Department_1
340 Bloomfield Avenue
Windsor, CT 06095

March 12, 2015

EBI Project Number: 6215001358

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	43.02 %

21 B Street Burlington, MA 01803 Tel: (781) 273.2500 Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

March 12, 2015

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

Emissions Analysis for Site: **CT11063B – Windsor Fire Department_1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **340 Bloomfield Avenue, Windsor, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **340 Bloomfield Avenue, Windsor, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the **Ericsson AIR21 (B4A/B2P& B4A/B2P)** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 (B4A/B2P& B4A/B2P)** have a maximum gain of **15.9 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **143 feet** above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	143	Height (AGL):	143	Height (AGL):	143
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	0.89	Antenna B1 MPE%	0.89	Antenna C1 MPE%	0.89
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	143	Height (AGL):	143	Height (AGL):	143
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	0.89	Antenna B2 MPE%	0.89	Antenna C2 MPE%	0.89
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	143	Height (AGL):	143	Height (AGL):	143
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.35	Antenna B3 MPE%	0.35	Antenna C3 MPE%	0.35

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**6.43**
Verizon Wireless	17.88 %
AT&T	16.99 %
Clearwire	1.10 %
Sprint	0.62 %
Site Total MPE %:	**43.02 %**

T-Mobile Sector 1 Total:	2.14 %
T-Mobile Sector 2 Total:	2.14 %
T-Mobile Sector 3 Total:	2.14 %
Site Total:	43.02 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

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Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	2.14 %
Sector 2:	2.14 %
Sector 3 :	2.14 %
T-Mobile Total:	6.43 %
Site Total:	43.02 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **43.02%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803