STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

August 3, 2012

Jennifer Young Gaudet
HPC Wireless Services
46 Mill Plain Road, Floor 2
Danbury, CT 06811

RE: **EM-CING-052-120719** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 130 Birdseye Road, Farmington, Connecticut.

Dear Ms. Gaudet:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Modifications to the tower be completed in accordance with the recommendations made in the Structural Modification Report prepared by B+T Group dated July 10, 2012 , and stamped by Chad Tuttle; and
- Prior to antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the tower and foundation will not exceed 100 percent of the post-construction structural rating.
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated July 18, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

CSC
CONNECTICUT SITING COUNCIL

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Mike Clark, Chairman, Town of Farmington
Kathleen Eagen, Town Manager, Town of Farmington
Jeffrey Ollendorf, Town Planner, Town of Farmington
Crown Castle

EM-CING-052-120719

HPC Wireless Services
46 Mill Plain Rd.
Floor 2
Danbury, CT, 06811
P.: 203.797.1112

HPC WIRELESS SERVICES

ORIGINAL

July 18, 2012

RECEIVED
JUL 19 2012
CONNECTICUT
SITING COUNCIL

VIA OVERNIGHT COURIER

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051
Attn: Ms. Linda Roberts, Executive Director

Re: New Cingular Wireless PCS, LLC – exempt modification
130 Birdseye Road, Farmington, Connecticut

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of New Cingular Wireless PCS, LLC ("AT&T"). AT&T is making modifications to certain existing sites in its Connecticut system in order to implement LTE technology. Please accept this letter and attachments as notification, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies ("R.S.C.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the Chair of the Town Council of the Town of Farmington.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle and located at 130 Birdseye Road, Farmington, (coordinates 41°-42'-55.4" N, 72°-48'-30.08" W). Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration, subject to modifications detailed in the attached structural documentation. Also included is a power density report reflecting the modification to AT&T's operations at the site.

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

1. AT&T will add three (3) LTE panel antennas to the existing T-arms at a center line of approximately 130', for a total of six (6) antennas. Six (6) RRUs (remote radio units will be mounted to the monopole behind the antennas, and a surge arrestor will be attached to a pipe on the T-arm. AT&T will also place a DC power and fiber run from

the equipment to the antennas along the existing coaxial cable run. The changes will not extend the height of the approximately 140' structure.

2. AT&T will place related equipment in its existing equipment sheter and will attach a new GPS antenna to the Shelter. These changes will be within the existing compound and will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six (6) decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached report prepared by C Squared Systems, LLC, AT&T's operations at the site will result in a power density of approximately 1.93%; the combined site operations will result in a total power density of approximately 51.70%.

Please feel free to contact me by phone at (860) 798-7454 or by e-mail at jgaudet@hpcwireless.com with questions concerning this matter. Thank you for your consideration.

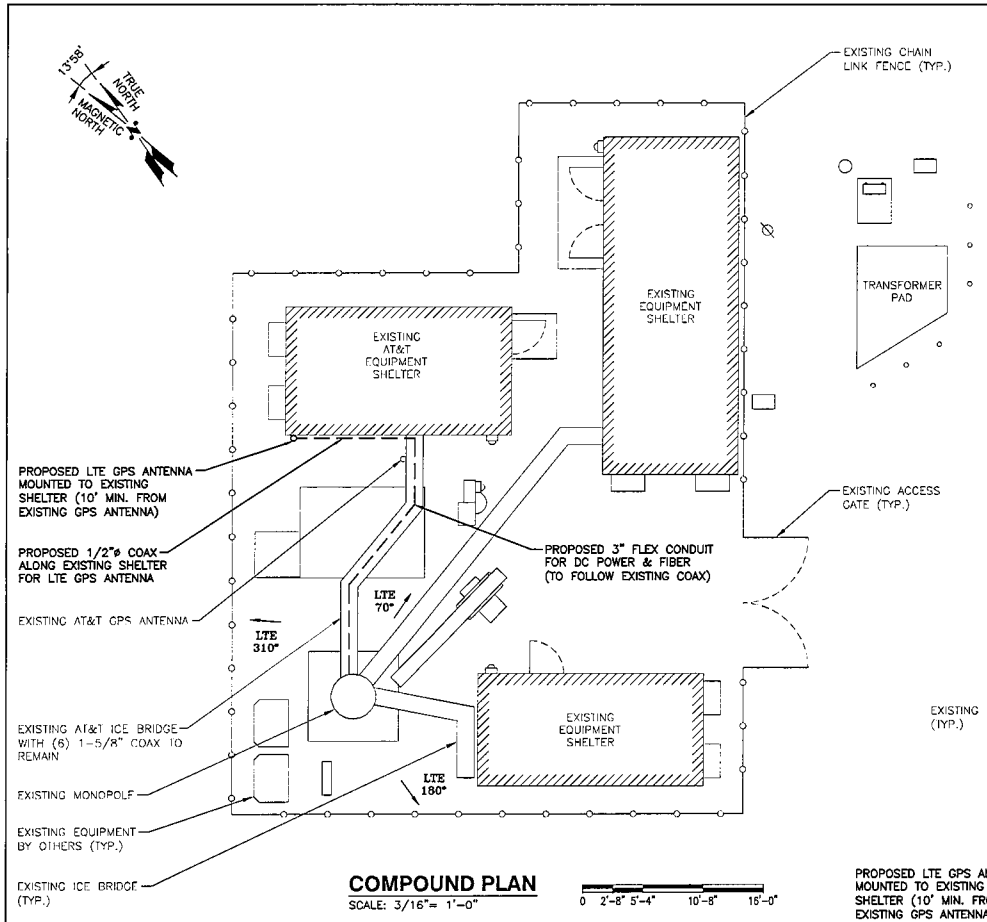
Respectfully yours,

Jennifer Young Gaudet (JYG)

Jennifer Young Gaudet

Attachments

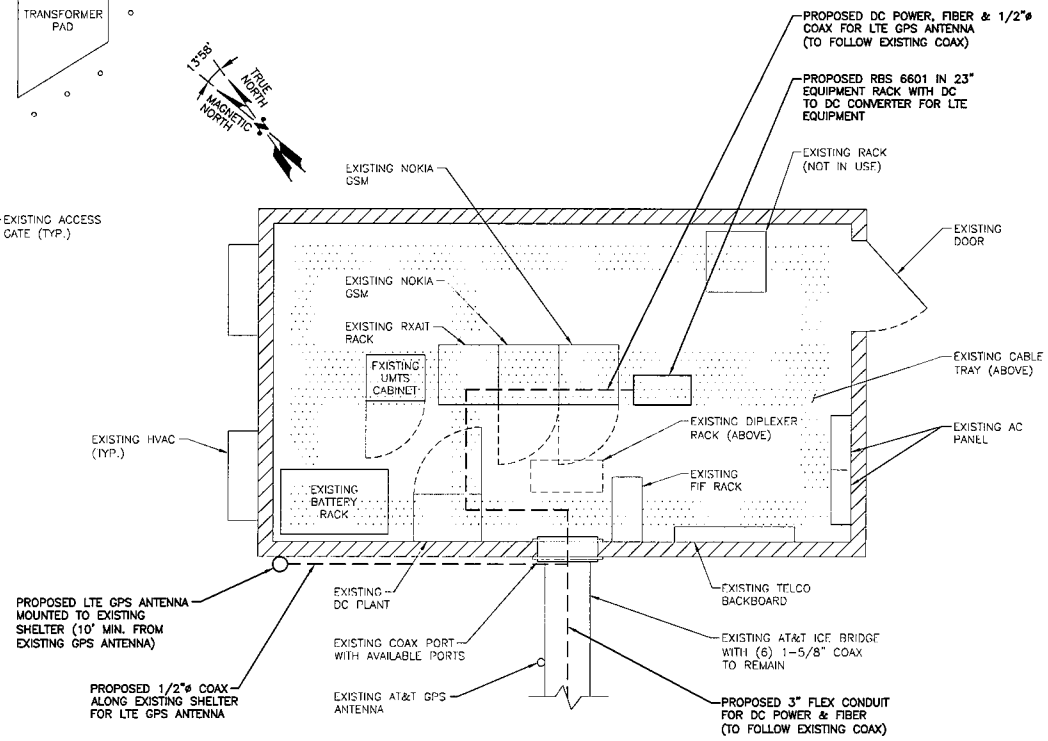
cc: Honorable Jeffrey J. Hogan, Chair, Town Council
Kathleen A. Eagen, Town Manager
Media Park Realty, Inc. (underlying property owner)



COMPOUND PLAN

SCALE: 3/16"= 1'-0"

0 2'-8" 5'-4" 10'-8" 15'-0"



EQUIPMENT PLAN

SCALE: 1/2"= 1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

NOTE:

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

NOTE:

ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT5255
SITE NAME: FARMINGTON
DEAD WOOD SWAMP
CROWN CASTLE ID: 876335
130 BIRD'S EYE ROAD
FARMINGTON, CT 06032
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	05/25/12	ISSUED FOR CONSTRUCTION	DC	DPH	
0	04/09/12	ISSUED FOR REVIEW	MJS	DC	DPH

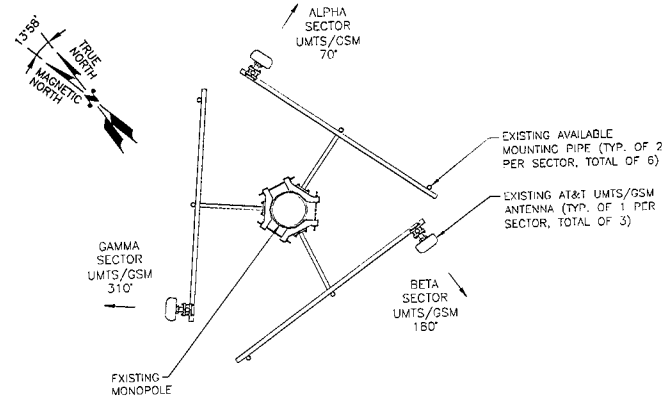
SCALE: AS SHOWN | DESIGNED BY: MJS | DRAWN BY: MJS

STATE OF CONNECTICUT — BRENT P. HAMM — No. 24175 — LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND AND EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5255.01	A-1	1



EXISTING UMTS/GSM ANTENNA PLAN

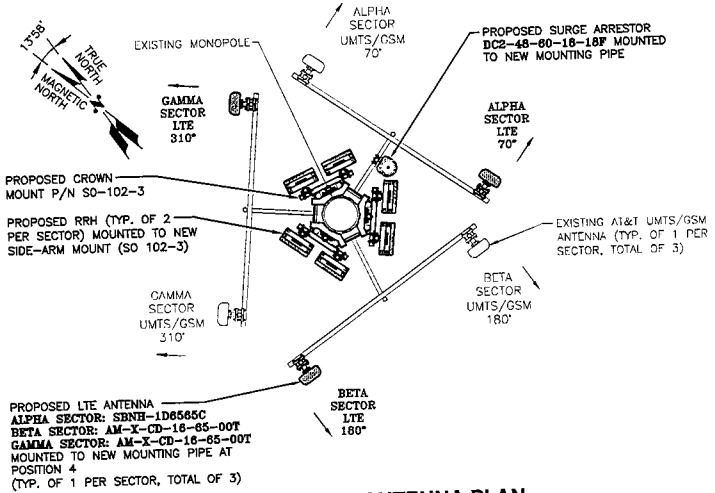
N.T.S.

NOTE:

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

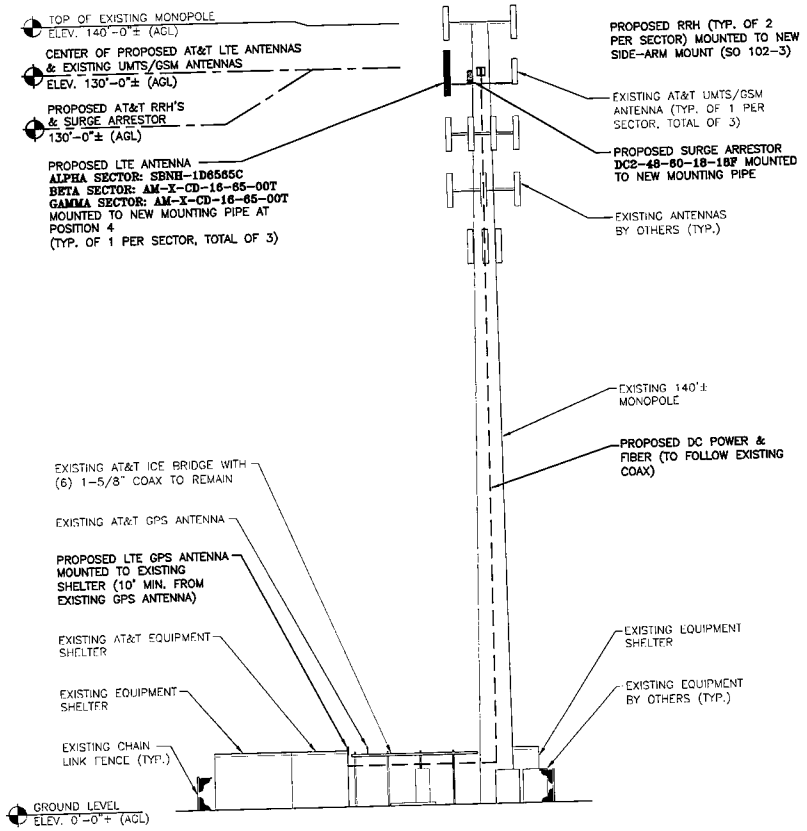
NOTE:

ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



PROPOSED LTE ANTENNA PLAN

N.T.S.



NORTHWEST ELEVATION

SCALE: 3/32"=1'-0"

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

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5996

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
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SITE NUMBER: CT5255
SITE NAME: FARMINGTON
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130 BIRD'S EYE ROAD
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at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	05/25/12	ISSUED FOR CONSTRUCTION	MJS	DC	DPH
0	04/09/12	ISSUED FOR REVIEW			

SCALE: AS SHOWN | DESIGNED BY: MJS | DRAWN BY: MJS

STATE OF CONNECTICUT — DANIEL P. HAMM — No. 24176 — LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUT AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5255.01	A-2	1

July 10, 2012

Mr. Andrew Bazinet
Crown Castle USA Inc.
349 West Commercial St., Suite 2630
East Rochester, NY 14445
(585) 899-3442

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

Subject:	**Structural Modification Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5255
	Carrier Site Name:	AWE-Farmington Dead Swamp
Crown Castle Designation:	**Crown Castle BU Number:**	876335
	Crown Castle Site Name:	East Farmington
	Crown Castle JDE Job Number:	183509
	Crown Castle Work Order Number:	501350
	Crown Castle Application Number:	145061 Rev. 0
Engineering Firm Designation:	**B+T Group Project Number:**	77969.005
Site Data:	**3 A Birdseye Road, Farmington, Hartford County, CT** **Latitude *41° 42' 56.58"*, Longitude *-72° 48' 39.08"*** **140 Foot - Monopole**	

Dear Mr. Bazinet,

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 469007, in accordance with application 145061, revision 0.

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

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code 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.

Ali Abbaszadeh
Project Engineer

Chad E. Tuttle, P.E
President

STATE OF CONNECTICUT ★ CHAD E. TUTTLE ★ No. 23824 LICENSED PROFESSIONAL ENGINEER
7/10/12

tnxTower Report - version 6.0.4.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft. monopole tower designed by Summit Manufacturing in November of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been reinforced as specified by B+T Engineering in 2008 and those reinforcements are incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 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
130.0	130.0	6	Ericsson	RRUS-11	1 2	3/8 3/4	--
		1	--	Side Arm Mount [SO 102-3]			
128.0	130.0	1	Andrew	SBNH-1D6565C			
		2	KMW Communications	AM-X-CD-16-65-00T-RET			
		1	Raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
139.0	139.0	6(MLA)	--	(MLA Antenna)	6(MLA)	1 5/8	2
		6	Decibel	DB980H90A-M	6	1 5/8	1
		1	--	Platform Mount [LP 601-1]			
128.0	130.0	3	Powerwave Technologies	7770.00	9	7/8	1
	128.0	6	Powerwave Technologies	LGP21401			
		1	--	T-Arm Mount [TA 602-3]			
120.0	120.0	12	Swedcom	ALP 9212-N	12	7/8	1
		1	--	Platform Mount [LP 601-1]			
108.0	109.0	3	Antel	BXA-185060/8CFx2	12	1 5/8	1
		2	Antel	BXA-70063/6CFx2			
		1	Antel	BXA-70063/6CFx4			
		6	Antel	LPD-6513			
		6	RFS/Celwave	FD9R6004/2C-3L			
	108.0	1	--	Platform Mount [LP 304-1]			
100.0	100.0	3	Ericsson	KRY 112 144/1	12	7/8	1
		3	Ericsson	KRY 112 89/5			
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20			
		1	--	Side Arm Mount [SO 102-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
90.0	90.0	3	Kathrein	742 213	6	7/8	1
		3	--	Pipe Mount			
70.0	72.0	2	Lucent	KS24019-L112A	2	5/16	1
	70.0	2	--	Side Arm Mount [SO 701-1]			
49.0	51.0	1	Lucent	KS24019-L112A	1	1/2	1
	49.0	1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) MLA Equipment; Not Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
Information Not Available						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Locate Revision #0	145061	CCI Sites
Tower Manufacturing Drawing	Summit Manufacturing, Dtd 11/03/1997	1615361	CCI Sites
Tower Modification Drawing	B&T Engineering, Inc.	Dtd. 12/09/08	On File
Foundation Drawing	Summit Manufacturing, Job No.2933	1440555	CCI Sites
Geotech Report	Dr. Clarence Welti Geotechnical Engineering, Dtd.06/19/06	1850446	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 04/09/2012	CCI Sites

3.1) Analysis Method

tnxTower (version 6.0.4.0), 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 – LC4

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	140 - 91.75	Pole	TP25.89x16x0.25	1	-8.539	964.748	98.8	Pass
L2	91.75 - 77.75	Pole	TP28.415x24.724x0.313	2	-11.169	1470.099	98.3	Pass
L3	77.75 - 69	Pole	TP30.056x28.415x0.441	3	-12.905	1786.007	94.4	Pass
L4	69 - 46.5	Pole	TP34.67x30.056x0.513	4	-16.888	2542.737	83.1	Pass
L5	46.5 - 20.5	Pole	TP39.4x32.721x0.554	5	-25.803	3052.743	91.5	Pass
L6	20.5 - 0	Pole	TP43.58x39.4x0.58	6	-32.004	3558.910	89.3	Pass
							Summary	
						Pole (L1)	98.8	Pass
						RATING =	**98.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC4

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	88.3	Pass
1	Base Plate	Base	85.6	Pass
1	Base Foundation	Base	98.96	Pass

Structure Rating (max from all components) =	**98.8%**

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Capacities up to 100% are considered acceptable based on analysis methods used.

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.

MODIFICATIONS BASED ON STRUCTURAL ANALYSIS FROM B+T ENGINEERING DATED 05/04/12 AND ACCOMPANIED BY ANALYSIS FROM B+T GROUP DATED 07/10/12.

EXISTING MEMBER SCHEDULE

SECTION	NUMBER OF SIDES	THICKNESS	BOTTOM DIAMETER	TOP DIAMETER
1	12	0.375"	43.580"	33.822"
2	12	0.313"	34.670"	28.380"
3	12	0.313"	28.380"	23.724"
4	12	0.250"	25.890"	16.000"

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 ALL FIELD CONNECTIONS SHALL BE MADE WITH A325X BOLTS, U.N.O.
1.6 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.
1.7 ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CCUSA POLICY "CUTTING AND WELDING PLAN" (DOC #ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.

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 2 WEEKS PRIOR TO FABRICATION.

KEY NOTES

(#) TOWER MODIFICATION I.D.

TOWER MODIFICATIONS:

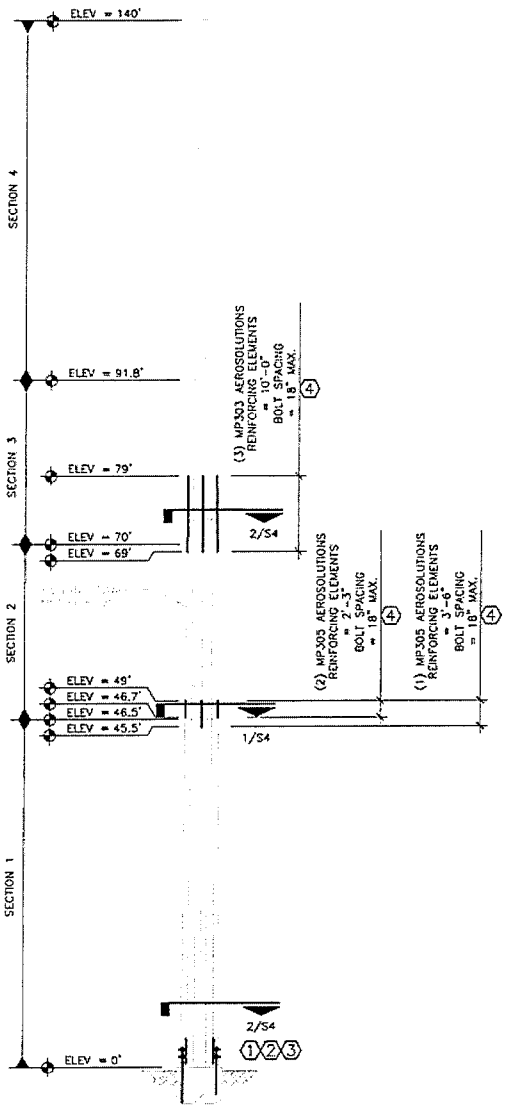
(1) CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.

(2) THE NEW AND EXISTING TRANSMISSION MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DISTRIBUTION DIAGRAM
RE: DETAIL 2/S1.

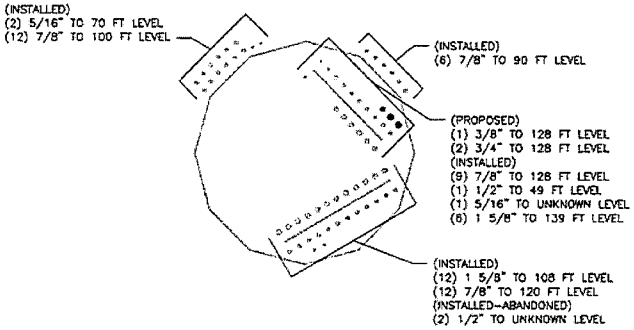
(3) INSTALL NEW ANCHOR RODS
RE: SHEET S3.

(4) INSTALL NEW AEROSOLUTION MP3 REINFORCING ELEMENTS
RE: SHEET S4.

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



1 TOWER ELEVATION
SCALE: N.T.S.



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

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

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/10/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.005
PROJECT ENG:	ALI ABBASZADEH
DRAWN BY:	TEW
CHECKED BY:	SSV

B+T ENGINEERING, INC.

EAST FARMINGTON
876336
3 A BIRDSEYE ROAD
FARMINGTON, CT
EXISTING 140' MONOPOLE

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

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 APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS 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.
N/A	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
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.
X	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.
X	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 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
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 DUE TO FIELD CONDITIONS.
		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.
X	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 INSPECTOR 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
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
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/10/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	77069.005
PROJECT ENG:	ALI ABBASZADEH
DRAWN BY:	TBW
CHECKED BY:	SSV

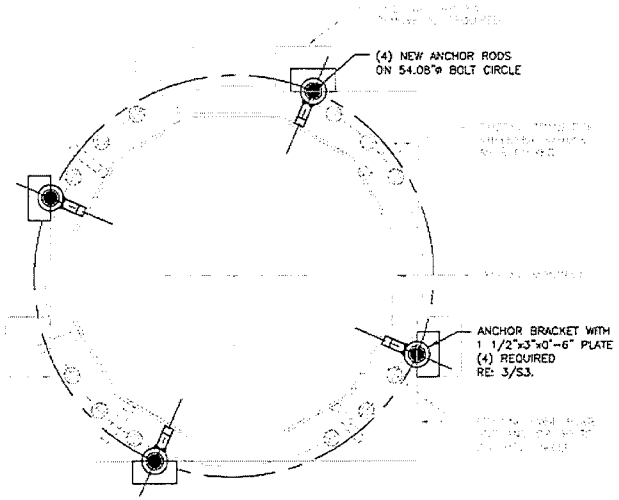
B+T ENGINEERING, INC.

EAST FARMINGTON
876336
3 A BIROSEYE ROAD
FARMINGTON, CT

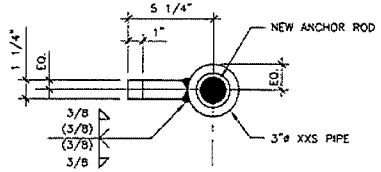
EXISTING 140'
MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

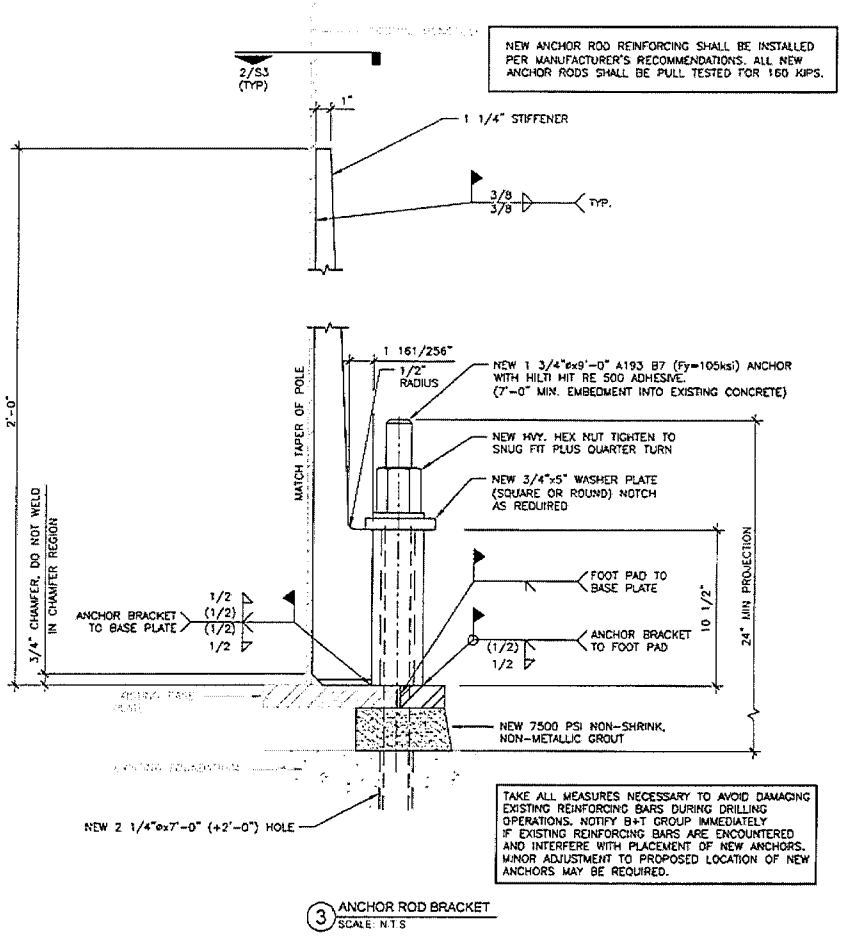
SHEET NUMBER:	REVISION:
S2	0



1 ANCHOR ROD DETAIL
SCALE: N.T.S.



2 ANCHOR ROD BRACKET PLAN
SCALE: N.T.S.



3 ANCHOR ROD BRACKET
SCALE: N.T.S

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

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/10/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.005
PROJECT ENG.	ALI ABBASZADEH
DRAWN BY:	TEW
CHECKED BY:	SSV

B+T ENGINEERING, INC.

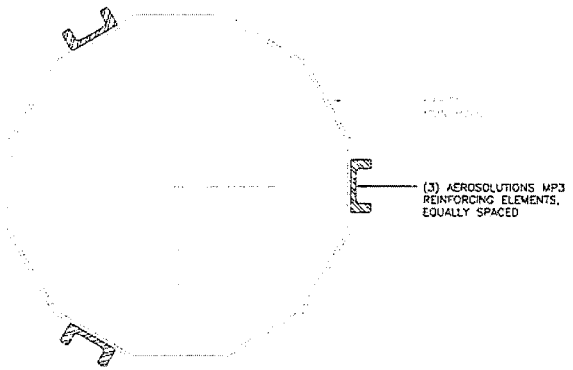
7/10/12

EAST FARMINGTON
876336
3 A BIRDSEYE ROAD
FARMINGTON, CT
EXISTING 140'
MONOPOLE

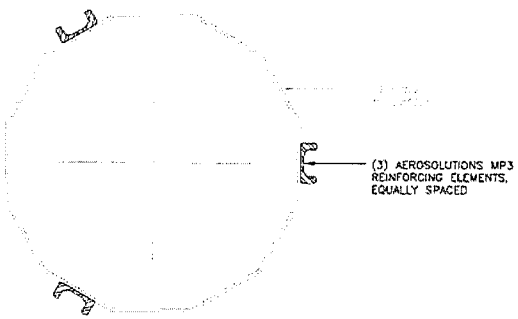
SHEET TITLE
ANCHOR ROD SECTIONS AND DETAILS

SHEET NUMBER: S3

REVISION: 0



1 TOWER SECTION (45.5'-49')
SCALE: N.T.S.



2 TOWER SECTION (69'-79')
SCALE: N.T.S.

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

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/10/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.005
PROJECT ENG:	ALI ABBASZADEH
DRAWN BY:	TEW
CHECKED BY:	SSV

B+T ENGINEERING, INC.

EAST FARMINGTON
876336
3 A BIRDSEYE ROAD
FARMINGTON, CT

EXISTING 140'
MONOPOLE

SHEET TITLE
TOWER SECTIONS
45.5'-49' AND 69'-79'

SHEET NUMBER: S4

REVISION: 0

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

at&t

CT5255 - AWE-Farmington Dead Swamp

3A Birdseye Road, Farmington, CT 06032

(a.k.a. 130 Birdseye Road)

June 29, 2012

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the monopole tower located at 3A Birdseye Road in Farmington, CT. The coordinates of the tower are 41° 42' 56.58" N, 72° 48' 39.08" W.

AT&T is proposing the following modifications:

1) Install three 700 MHz LTE antennas (one per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \text{x Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular GSM	*131*	*1900*	*2*	*646*	*0.0271*	*1.0000*	*2.71%*
Cingular UMTS	*131*	*880*	*1*	*500*	*0.0105*	*0.5867*	*1.79%*
Nextel	120	851	9	100	0.0225	0.5673	3.96%
Sprint	140	1957.5	11	122	0.0246	1.0000	2.46%
Pocket	90	2130	3	631	0.0840	1.0000	8.40%
Verizon	109	869	9	306	0.0833	0.5793	14.39%
Verizon	109	1970	3	428	0.0389	1.0000	3.89%
Verizon	109	757	1	881	0.0267	0.5047	5.28%
T-Mobile GSM	100	1945	8	198	0.0570	1.0000	5.70%
T-Mobile UMTS	100	2100	2	791	0.0569	1.0000	5.69%
AT&T UMTS	130	880	2	565	0.0024	0.5867	0.41%
AT&T UMTS	130	1900	2	875	0.0037	1.0000	0.37%
AT&T LTE	130	734	1	1375	0.0029	0.4893	0.60%
AT&T GSM	130	880	1	283	0.0006	0.5867	0.10%
AT&T GSM	130	1900	4	525	0.0045	1.0000	0.45%
						Total	**51.70%**

Table 1: Carrier Information[1] [2] [3]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 3/29/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[3] Antenna height listed for AT&T is in reference to the B&T Engineering, Inc Structural Analysis dated May 4, 2012.

5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **51.70% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Daniel L. Goulet
C Squared Systems, LLC

June 29, 2012
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[4] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[5] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

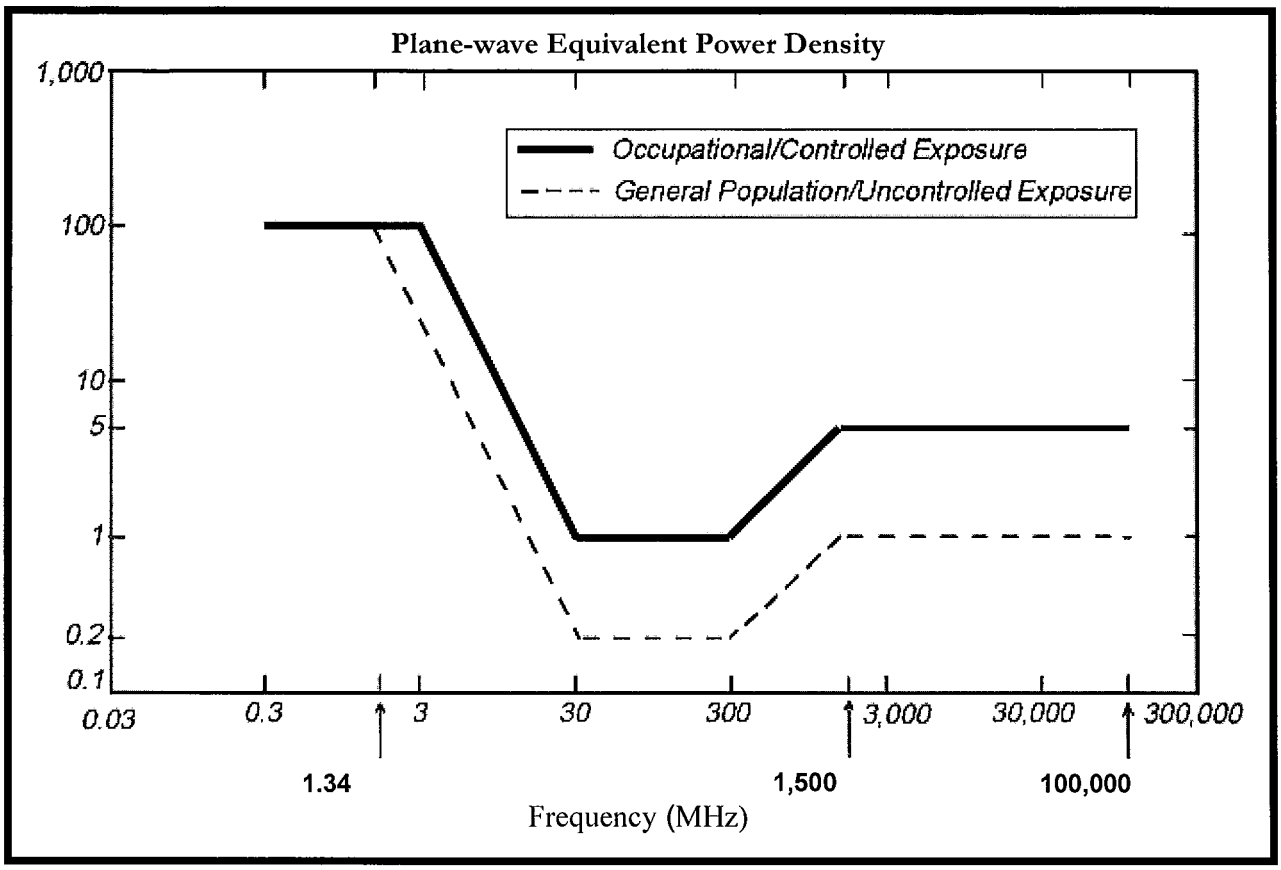
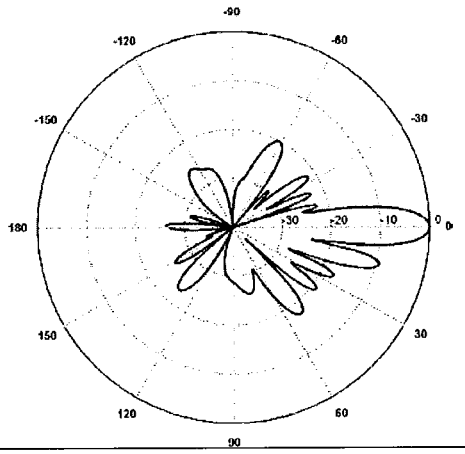


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

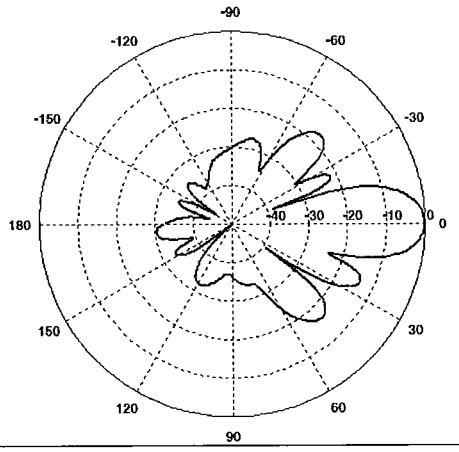
700 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	698-806 MHz
Gain:	13.6 dBd
Vertical Beamwidth:	8.6°
Horizontal Beamwidth:	71°
Polarization:	± 45°
Size L x W x D:	96.42" x 11.85" x 7.1"



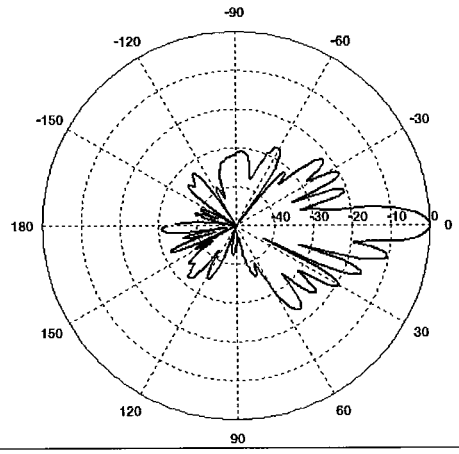
850 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	824-896 MHz
Gain:	11.4 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	85°
Polarization:	Dual Linear ±45°
Size L x W x D:	55.4" x 11.0" x 5.0"



1900 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	90°
Polarization:	Dual Linear ±45°
Size L x W x D:	55.4" x 11.0" x 5.0"



July 10, 2012

Mr. Andrew Bazinet
Crown Castle USA Inc.
349 West Commercial St., Suite 2630
East Rochester, NY 14445
(585) 899-3442

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

Subject:	**Structural Modification Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5255
	Carrier Site Name:	AWE-Farmington Dead Swamp
Crown Castle Designation:	**Crown Castle BU Number:**	876335
	Crown Castle Site Name:	East Farmington
	Crown Castle JDE Job Number:	183509
	Crown Castle Work Order Number:	501350
	Crown Castle Application Number:	145061 Rev. 0
Engineering Firm Designation:	**B+T Group Project Number:**	77969.005
Site Data:	**3 A Birdseye Road, Farmington, Hartford County, CT** **Latitude *41° 42' 56.58"*, Longitude *-72° 48' 39.08"*** **140 Foot - Monopole**	

Dear Mr. Bazinet,

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 469007, in accordance with application 145061, revision 0.

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

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code 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.

Ali Abbaszadeh
Project Engineer

Chad E. Tuttle, P.E
President

STATE OF CONNECTICUT * CHAD E. TUTTLE * No. 23024 LICENSED PROFESSIONAL ENGINEER

7/10/12

tnxTower Report - version 6.0.4.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft. monopole tower designed by Summit Manufacturing in November of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been reinforced as specified by B+T Engineering in 2008 and those reinforcements are incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 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
130.0	130.0	6	Ericsson	RRUS-11	1 2	3/8 3/4	--
		1	--	Side Arm Mount [SO 102-3]			
128.0	130.0	1	Andrew	SBNH-1D6565C			
		2	KMW Communications	AM-X-CD-16-65-00T-RET			
		1	Raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
139.0	139.0	6(MLA)	--	(MLA Antenna)	6(MLA)	1 5/8	2
		6	Decibel	DB980H90A-M	6	1 5/8	1
		1	--	Platform Mount [LP 601-1]			
128.0	130.0	3	Powerwave Technologies	7770.00	9	7/8	1
	128.0	6	Powerwave Technologies	LGP21401			
		1	--	T-Arm Mount [TA 602-3]			
120.0	120.0	12	Swedcom	ALP 9212-N	12	7/8	1
		1	--	Platform Mount [LP 601-1]			
108.0	109.0	3	Antel	BXA-185060/8CFx2	12	1 5/8	1
		2	Antel	BXA-70063/6CFx2			
		1	Antel	BXA-70063/6CFx4			
		6	Antel	LPD-6513			
		6	RFS/Celwave	FD9R6004/2C-3L			
	108.0	1	--	Platform Mount [LP 304-1]			
100.0	100.0	3	Ericsson	KRY 112 144/1	12	7/8	1
		3	Ericsson	KRY 112 89/5			
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20			
		1	--	Side Arm Mount [SO 102-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
90.0	90.0	3	Kathrein	742 213	6	7/8	1
		3	--	Pipe Mount			
70.0	72.0	2	Lucent	KS24019-L112A	2	5/16	1
	70.0	2	--	Side Arm Mount [SO 701-1]			
49.0	51.0	1	Lucent	KS24019-L112A	1	1/2	1
	49.0	1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) MLA Equipment; Not Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
Information Not Available						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Locate Revision #0	145061	CCI Sites
Tower Manufacturing Drawing	Summit Manufacturing, Dtd 11/03/1997	1615361	CCI Sites
Tower Modification Drawing	B&T Engineering, Inc.	Dtd. 12/09/08	On File
Foundation Drawing	Summit Manufacturing, Job No.2933	1440555	CCI Sites
Geotech Report	Dr. Clarence Welti Geotechnical Engineering, Dtd.06/19/06	1850446	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 04/09/2012	CCI Sites

3.1) Analysis Method

tnxTower (version 6.0.4.0), 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 – LC4

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	140 - 91.75	Pole	TP25.89x16x0.25	1	-8.539	964.748	98.8	Pass
L2	91.75 - 77.75	Pole	TP28.415x24.724x0.313	2	-11.169	1470.099	98.3	Pass
L3	77.75 - 69	Pole	TP30.056x28.415x0.441	3	-12.905	1786.007	94.4	Pass
L4	69 - 46.5	Pole	TP34.67x30.056x0.513	4	-16.888	2542.737	83.1	Pass
L5	46.5 - 20.5	Pole	TP39.4x32.721x0.554	5	-25.803	3052.743	91.5	Pass
L6	20.5 - 0	Pole	TP43.58x39.4x0.58	6	-32.004	3558.910	89.3	Pass
							Summary	
						Pole (L1)	98.8	Pass
						RATING =	**98.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC4

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	88.3	Pass
1	Base Plate	Base	85.6	Pass
1	Base Foundation	Base	98.96	Pass

Structure Rating (max from all components) =	**98.8%**

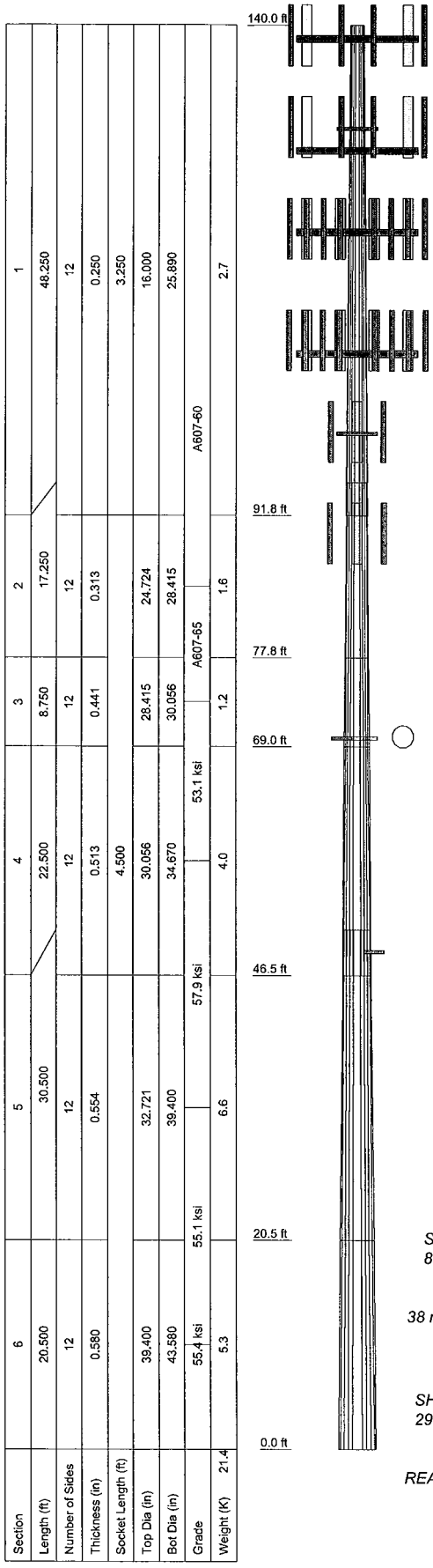
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Capacities up to 100% are considered acceptable based on analysis methods used.

4.1) Recommendations

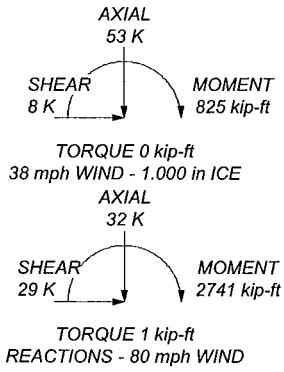
1) All modifications proposed in this report shall be installed in accordance with the attached drawings (Appendix D) for the determined available structural capacity to be effective.

APPENDIX A

tnxTOWER OUTPUT



Section	1	2	3	4	5	6
Length (ft)	48.250	17.250	8.750	22.500	30.500	20.500
Number of Sides	12	12	12	12	12	12
Thickness (in)	0.250	0.313	0.441	0.513	0.554	0.580
Socket Length (ft)	3.250			4.500		
Top Dia (in)	16.000	24.724	28.415	30.056	32.721	39.400
Bot Dia (in)	25.890	28.415	30.056	34.670	39.400	43.580
Grade	A607-60	A607-65		53.1 ksi	57.9 ksi	55.1 ksi / 55.4 ksi
Weight (K)	2.7	1.6	1.2	4.0	6.6	5.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980H90A-M w/ Mount Pipe (E)	139	BXA-185060/8CFx2 w/ Mount Pipe (E)	109
(2) DB980H90A-M w/ Mount Pipe (E)	139	BXA-70063/6CFx2 w/ Mount Pipe (E)	109
(2) DB980H90A-M w/ Mount Pipe (E)	139	BXA-70063/6CFx2 w/ Mount Pipe (E)	109
(2) 6' x 2" Mount Pipe (E)	139	BXA-70063/6CFx4 w/ Mount Pipe (E)	109
(2) 6' x 2" Mount Pipe (E)	139		
(2) 6' x 2" Mount Pipe (E)	139	(2) LPD-6513 w/ Mount Pipe (E)	109
Platform Mount [LP 601-1] (E)	139	(2) LPD-6513 w/ Mount Pipe (E)	109
(2) RRUS-11 (P)	130	(2) LPD-6513 w/ Mount Pipe (E)	109
(2) RRUS-11 (P)	130	(2) FD9R6004/2C-3L (E)	109
(2) RRUS-11 (P)	130	(2) FD9R6004/2C-3L (E)	109
Side Arm Mount [SO 102-3] (P)	130	(2) FD9R6004/2C-3L (E)	109
7770.00 w/ Mount Pipe (E)	130	Platform Mount [LP 304-1] (E)	108
7770.00 w/ Mount Pipe (E)	130	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe (E)	100
7770.00 w/ Mount Pipe (E)	130		
AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	130	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe (E)	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	130	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe (E)	100
SBNH-1D6565C w/ Mount Pipe (P)	130	KRY 112 144/1 (E)	100
		KRY 112 144/1 (E)	100
DC6-48-60-18-8F (P)	130	KRY 112 144/1 (E)	100
(2) LGP21401 (E)	128	KRY 112 89/5 (E)	100
(2) LGP21401 (E)	128	KRY 112 89/5 (E)	100
(2) LGP21401 (E)	128	KRY 112 89/5 (E)	100
6' x 2" Mount Pipe (E)	128	Side Arm Mount [SO 102-3] (E)	100
6' x 2" Mount Pipe (E)	128	742 213 w/ Mount Pipe (E)	90
6' x 2" Mount Pipe (E)	128	742 213 w/ Mount Pipe (E)	90
T-Arm Mount [TA 602-3] (E)	128	742 213 w/ Mount Pipe (E)	90
(4) ALP 9212-N w/ Mount Pipe (E)	120	KS24019-L112A (E)	72
(4) ALP 9212-N w/ Mount Pipe (E)	120	KS24019-L112A (E)	72
(4) ALP 9212-N w/ Mount Pipe (E)	120	Side Arm Mount [SO 701-1] (E)	70
Platform Mount [LP 601-1] (E)	120	Side Arm Mount [SO 701-1] (E)	70
BXA-185060/8CFx2 w/ Mount Pipe (E)	109	KS24019-L112A (E)	51
		Side Arm Mount [SO 701-1] (E)	49
BXA-185060/8CFx2 w/ Mount Pipe (E)	109		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	57.9 ksi	58 ksi	65 ksi
A607-65	65 ksi	80 ksi	55.1 ksi	55 ksi	65 ksi
53.1 ksi	53 ksi	65 ksi	55.4 ksi	55 ksi	65 ksi

TOWER DESIGN NOTES

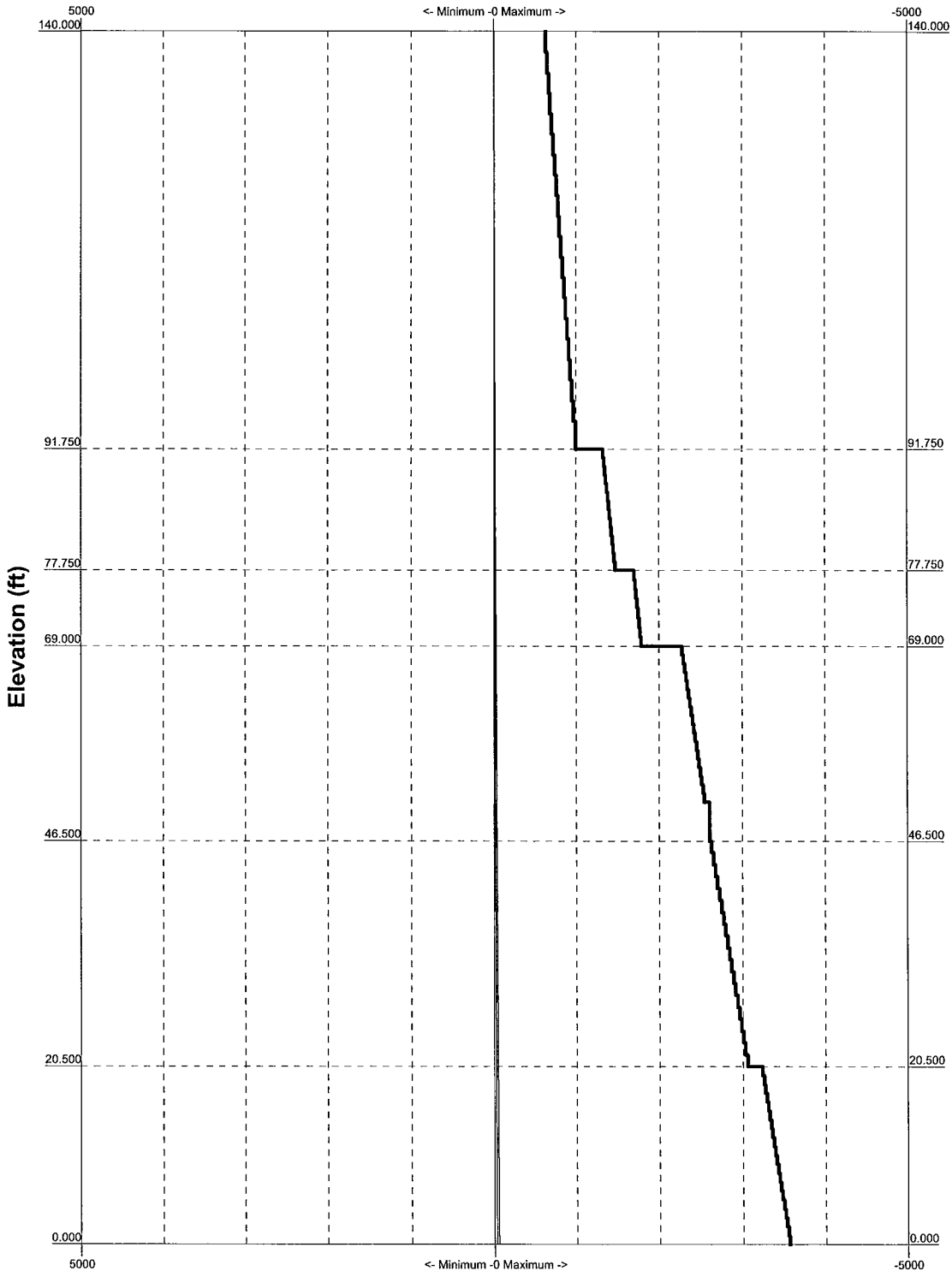
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.8%

BT Engineering
1717 S. Boulder, Suite 300
Tulsa, OK 74145
Phone: (918) 587 - 4630
FAX: (918) 295 - 0265

Job: 77969 .004 - East Farmington, CT (BU# 87633		
Project: 140' Summit Monopole / App ID: 145061; Rev:0		
Client: Crown Castle	Drawn by: A. Abbaszadeh	App'd:
Code: TIA/EIA-222-F	Date: 07/10/12	Scale: NTS
Path:		Dwg No. E-1

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

Leg Capacity ——— **Leg Compression (K)**



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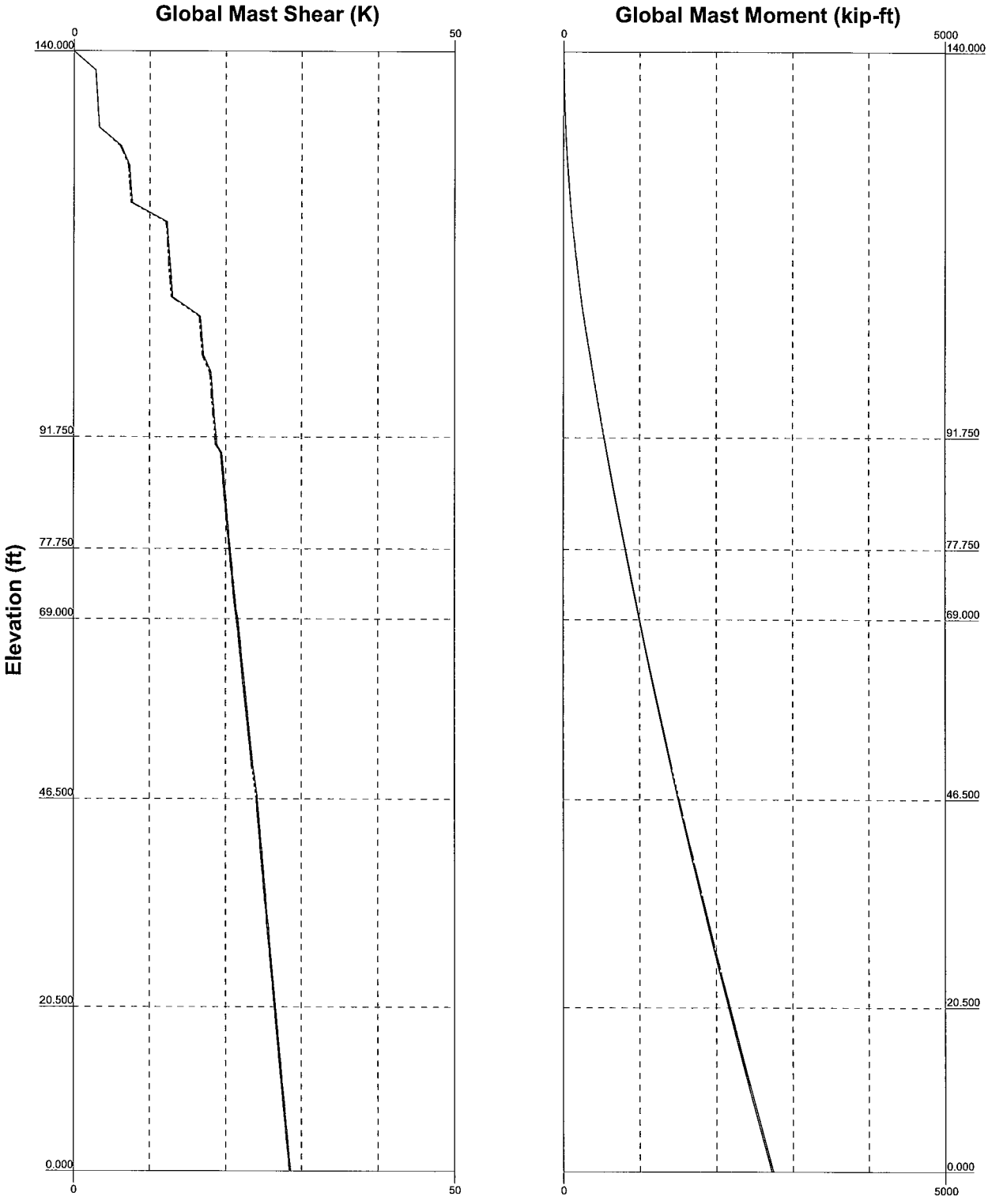
Job: ***77969 .004 - East Farmington, CT (BU# 87633*****		
Project: ***140' Summit Monopole / App ID: 145061; Rev:0***		
Client: Crown Castle	Drawn by: A. Abbaszadeh	App'd:
Code: TIA/EIA-222-F	Date: 07/10/12	Scale: NTS
Path:		Dwg No. E-3

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

Vx ---------- Vz

Maximum Values

Mx ---------- Mz



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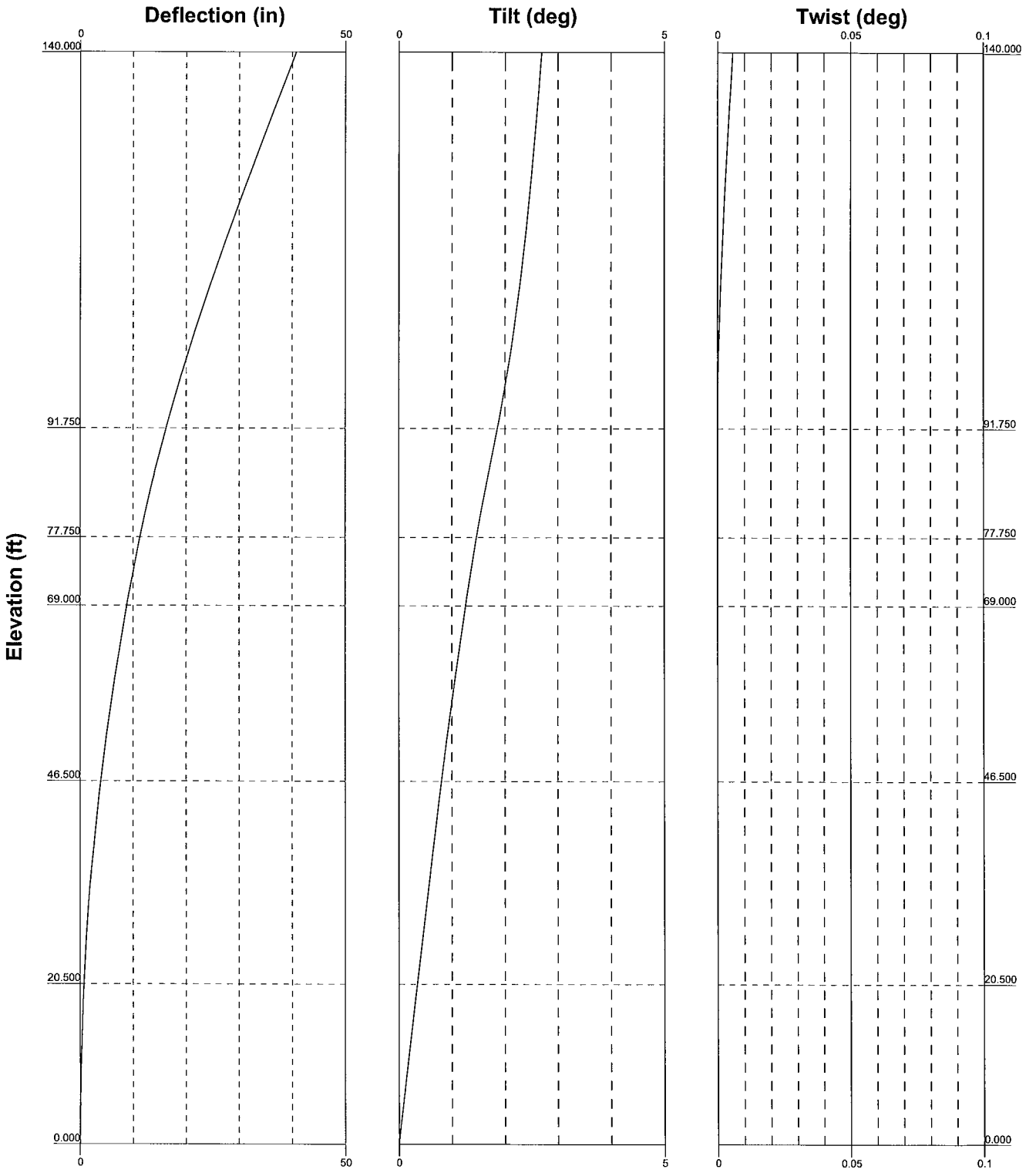
Tulsa, OK 74145
Phone: (918) 587 - 4630
FAX: (918) 295 - 0265

Job: 77969 .004 - East Farmington, CT (BU# 876335			
Project: 140' Summit Monopole / App ID: 145061; Rev:0			
Client: Crown Castle	Drawn by: A. Abbaszadeh	App'd:	
Code: TIA/EIA-222-F	Date: 07/10/12	Scale: NTS	
Path:		Dwg No. E-4	

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

Maximum Values



BT Engineering
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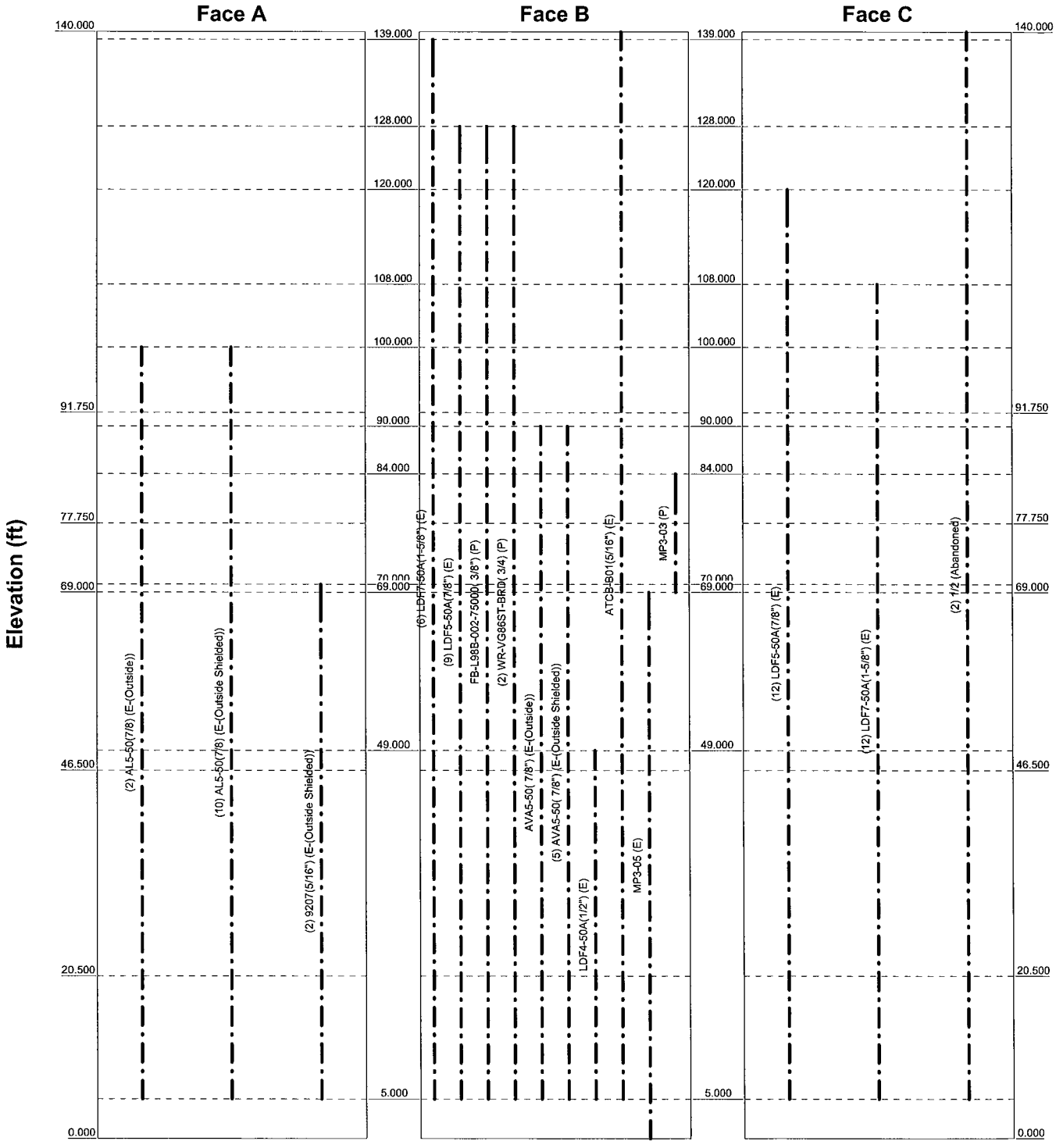
Tulsa, OK 74145
Phone: (918) 587 - 4630
FAX: (918) 295 - 0265

Job: 77969 .004 - East Farmington, CT (BU# 876335			
Project: 140' Summit Monopole / App ID: 145061; Rev:0			
Client: Crown Castle	Drawn by: A. Abbaszadeh	App'd:	
Code: TIA/EIA-222-F	Date: 07/10/12	Scale: NTS	
Path:		Dwg No. E-5	

Feedline Distribution Chart
0' - 140'

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



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Tulsa, OK 74145
Phone: (918) 587 - 4630
FAX: (918) 295 - 0265

Job: ***77969 .004 - East Farmington, CT (BU# 87633***			
Project: ***140' Summit Monopole / App ID: 145061; Rev:0***			
Client: Crown Castle	Drawn by: A. Abbaszadeh	App'd:	
Code: TIA/EIA-222-F	Date: 07/10/12	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline 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		

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	140.000-91.750	48.250	3.250	12	16.000	25.890	0.250	1.000	A607-60 (60 ksi)
L2	91.750-77.750	17.250	0.000	12	24.724	28.415	0.313	1.250	A607-65 (65 ksi)
L3	77.750-69.000	8.750	0.000	12	28.415	30.056	0.441	1.764	53.1 ksi (53 ksi)
L4	69.000-46.500	22.500	4.500	12	30.056	34.670	0.513	2.052	57.9 ksi (58 ksi)
L5	46.500-20.500	30.500	0.000	12	32.721	39.400	0.554	2.215	55.1 ksi

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L6	20.500-0.000	20.500		12	39.400	43.580	0.580	2.320	(55 ksi) 55.4 ksi (55 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.564	12.679	401.443	5.638	8.288	48.437	813.432	6.240	3.618	14.472
	26.803	20.640	1731.952	9.179	13.411	129.144	3509.405	10.158	6.269	25.074
L2	26.316	24.564	1868.385	8.739	12.807	145.888	3785.855	12.090	5.788	18.523
	29.417	28.278	2850.537	10.061	14.719	193.664	5775.961	13.918	6.778	21.689
L3	29.417	39.724	3967.748	10.015	14.719	269.567	8039.734	19.551	6.433	14.588
	31.116	42.054	4707.774	10.602	15.569	302.381	9539.227	20.698	6.873	15.585
L4	31.116	48.810	5437.549	10.576	15.569	349.255	11017.949	24.023	6.680	13.019
	35.893	56.433	8403.867	12.228	17.959	467.946	17028.513	27.775	7.916	15.429
L5	34.895	57.362	7575.906	11.516	16.949	446.970	15350.839	28.232	7.285	13.155
	40.790	69.272	13342.598	13.907	20.409	653.754	27035.721	34.094	9.075	16.387
L6	40.790	72.513	13947.871	13.898	20.409	683.411	28262.168	35.688	9.005	15.522
	45.117	80.320	18956.014	15.394	22.574	839.711	38410.024	39.531	10.125	17.453

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 140.000-91.750				1	1	1		
L2 91.750-77.750				1	1	1		
L3 77.750-69.000				1	1	1		
L4 69.000-46.500				1	1	1		
L5 46.500-20.500				1	1	1		
L6 20.500-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF7-50A(1-5/8") (E)	B	No	Inside Pole	139.000 - 5.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
/								
LDF5-50A(7/8") (E)	B	No	Inside Pole	128.000 - 5.000	9	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
FB-L98B-002-75000(3/8") (P)	B	No	Inside Pole	128.000 - 5.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4) (P)	B	No	Inside Pole	128.000 - 5.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
/								
LDF5-50A(7/8") (E)	C	No	Inside Pole	120.000 - 5.000	12	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
/								
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	108.000 - 5.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
/								
AL5-50(7/8) (E-(Outside))	A	No	CaAa (Out Of Face)	100.000 - 5.000	2	No Ice	0.110	0.000
						1/2" Ice	0.210	0.001
						1" Ice	0.310	0.003
						2" Ice	0.510	0.008
						4" Ice	0.910	0.025
AL5-50(7/8) (E-(Outside Shielded))	A	No	CaAa (Out Of Face)	100.000 - 5.000	10	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.008
						4" Ice	0.000	0.025
/								
AVA5-50(7/8") (E-(Outside))	B	No	CaAa (Out Of Face)	90.000 - 5.000	1	No Ice	0.110	0.000
						1/2" Ice	0.210	0.001
						1" Ice	0.310	0.003
						2" Ice	0.510	0.008
						4" Ice	0.910	0.025
AVA5-50(7/8") (E-(Outside Shielded))	B	No	CaAa (Out Of Face)	90.000 - 5.000	5	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.008
						4" Ice	0.000	0.025
/								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
9207(5/16")	A	No	CaAa (Out Of	70.000 - 5.000	2	No Ice	0.000	0.001
(E-(Outside Shielded))			Face)			1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.022
/								
LDF4-50A(1/2")	B	No	Inside Pole	49.000 - 5.000	1	No Ice	0.000	0.000
(E)						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
/								
1/2	C	No	Inside Pole	140.000 - 5.000	2	No Ice	0.000	0.000
(Abandoned)						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
ATCB-B01(5/16")	B	No	Inside Pole	140.000 - 5.000	1	No Ice	0.000	0.000
(E)						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
/								
MP3-05	B	No	CaAa (Out Of	69.000 - 0.000	1	No Ice	0.348	0.000
(E)			Face)			1/2" Ice	0.432	0.000
						1" Ice	0.515	0.000
						2" Ice	0.682	0.000
						4" Ice	1.015	0.000
MP3-03	B	No	CaAa (Out Of	84.000 - 69.000	1	No Ice	0.262	0.000
(P)			Face)			1/2" Ice	0.345	0.000
						1" Ice	0.428	0.000
						2" Ice	0.595	0.000
						4" Ice	0.928	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	140.000-91.750	A	0.000	0.000	0.000	1.815	0.026
		B	0.000	0.000	0.000	0.000	0.389
		C	0.000	0.000	0.000	0.000	0.296
L2	91.750-77.750	A	0.000	0.000	0.000	3.080	0.044
		B	0.000	0.000	0.000	2.985	0.151
		C	0.000	0.000	0.000	0.000	0.200
L3	77.750-69.000	A	0.000	0.000	0.000	1.925	0.029
		B	0.000	0.000	0.000	3.254	0.096
		C	0.000	0.000	0.000	0.000	0.125
L4	69.000-46.500	A	0.000	0.000	0.000	4.950	0.097
		B	0.000	0.000	0.000	10.317	0.248
		C	0.000	0.000	0.000	0.000	0.322
L5	46.500-20.500	A	0.000	0.000	0.000	5.720	0.112
		B	0.000	0.000	0.000	11.922	0.290
		C	0.000	0.000	0.000	0.000	0.372
L6	20.500-0.000	A	0.000	0.000	0.000	3.410	0.067
		B	0.000	0.000	0.000	8.849	0.173
		C	0.000	0.000	0.000	0.000	0.222

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	140.000-91.750	A	1.161	0.000	0.000	0.000	5.646	0.360
		B		0.000	0.000	0.000	0.000	0.389
		C		0.000	0.000	0.000	0.000	0.296
L2	91.750-77.750	A	1.120	0.000	0.000	0.000	9.580	0.610
		B		0.000	0.000	0.000	7.038	0.399
		C		0.000	0.000	0.000	0.000	0.200
L3	77.750-69.000	A	1.101	0.000	0.000	0.000	5.777	0.355
		B		0.000	0.000	0.000	6.785	0.258
		C		0.000	0.000	0.000	0.000	0.125
L4	69.000-46.500	A	1.069	0.000	0.000	0.000	14.570	0.969
		B		0.000	0.000	0.000	19.135	0.641
		C		0.000	0.000	0.000	0.000	0.322
L5	46.500-20.500	A	1.001	0.000	0.000	0.000	16.836	1.120
		B		0.000	0.000	0.000	22.112	0.744
		C		0.000	0.000	0.000	0.000	0.372
L6	20.500-0.000	A	1.000	0.000	0.000	0.000	9.610	0.595
		B		0.000	0.000	0.000	15.366	0.412
		C		0.000	0.000	0.000	0.000	0.222

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	140.000-91.750	0.000	-0.066	0.000	-0.178
L2	91.750-77.750	0.237	-0.140	0.411	-0.398
L3	77.750-69.000	0.389	-0.041	0.605	-0.246
L4	69.000-46.500	0.476	0.011	0.681	-0.206
L5	46.500-20.500	0.487	0.011	0.713	-0.215
L6	20.500-0.000	0.477	0.065	0.693	-0.096

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) DB980H90A-M w/ Mount	C	From Leg	4.000	0.000	139.000	No Ice	4.036	3.619	0.030
Pipe			0.000			1/2" Ice	4.499	4.481	0.064
(E)			0.000			1" Ice	4.947	5.219	0.107
						2" Ice	5.870	6.744	0.216
						4" Ice	8.046	9.995	0.549
(2) DB980H90A-M w/ Mount	B	From Leg	4.000	0.000	139.000	No Ice	4.036	3.619	0.030
Pipe			0.000			1/2" Ice	4.499	4.481	0.064
(E)			0.000			1" Ice	4.947	5.219	0.107

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	5.870	6.744	0.216
						4" Ice	8.046	9.995	0.549
(2) DB980H90A-M w/ Mount Pipe	A	From Leg	4.000	0.000	139.000	No Ice	4.036	3.619	0.030
(E)			0.000			1/2" Ice	4.499	4.481	0.064
			0.000			1" Ice	4.947	5.219	0.107
						2" Ice	5.870	6.744	0.216
						4" Ice	8.046	9.995	0.549
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	139.000	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	139.000	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	A	From Leg	4.000	0.000	139.000	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 601-1]	C	None		0.000	139.000	No Ice	28.470	28.470	1.122
(E)						1/2" Ice	33.590	33.590	1.514
						1" Ice	38.710	38.710	1.905
						2" Ice	48.950	48.950	2.689
						4" Ice	69.430	69.430	4.255
/									
(2) RRUS-11	C	From Leg	2.000	0.000	130.000	No Ice	4.424	1.628	0.055
(P)			0.000			1/2" Ice	4.708	1.838	0.081
			0.000			1" Ice	5.001	2.057	0.110
						2" Ice	5.613	2.519	0.179
						4" Ice	6.940	3.549	0.368
(2) RRUS-11	B	From Leg	2.000	0.000	130.000	No Ice	4.424	1.628	0.055
(P)			0.000			1/2" Ice	4.708	1.838	0.081
			0.000			1" Ice	5.001	2.057	0.110
						2" Ice	5.613	2.519	0.179
						4" Ice	6.940	3.549	0.368
(2) RRUS-11	A	From Leg	2.000	0.000	130.000	No Ice	4.424	1.628	0.055
(P)			0.000			1/2" Ice	4.708	1.838	0.081
			0.000			1" Ice	5.001	2.057	0.110
						2" Ice	5.613	2.519	0.179
						4" Ice	6.940	3.549	0.368
Side Arm Mount [SO 102-3]	C	None		0.000	130.000	No Ice	3.000	3.000	0.081
(P)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
/									
/									
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	130.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.101
			0.000			1" Ice	7.128	5.711	0.155
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	130.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.101

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	7.128	5.711	0.155
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	130.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.101
			0.000			1" Ice	7.128	5.711	0.155
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) LGP21401	C	From Leg	4.000	0.000	128.000	No Ice	1.288	0.000	0.014
(E)			0.000			1/2" Ice	1.445	0.000	0.021
			0.000			1" Ice	1.611	0.000	0.030
						2" Ice	1.969	0.000	0.055
						4" Ice	2.788	0.000	0.135
(2) LGP21401	B	From Leg	4.000	0.000	128.000	No Ice	1.288	0.000	0.014
(E)			0.000			1/2" Ice	1.445	0.000	0.021
			0.000			1" Ice	1.611	0.000	0.030
						2" Ice	1.969	0.000	0.055
						4" Ice	2.788	0.000	0.135
(2) LGP21401	A	From Leg	4.000	0.000	128.000	No Ice	1.288	0.000	0.014
(E)			0.000			1/2" Ice	1.445	0.000	0.021
			0.000			1" Ice	1.611	0.000	0.030
						2" Ice	1.969	0.000	0.055
						4" Ice	2.788	0.000	0.135
AM-X-CD-16-65-00T-RET	C	From Leg	4.000	0.000	130.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.136
(P)			0.000			1" Ice	9.767	8.368	0.210
						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	130.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.136
(P)			0.000			1" Ice	9.767	8.368	0.210
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
SBNH-1D6565C w/ Mount	A	From Leg	4.000	0.000	130.000	No Ice	7.934	9.842	0.099
Pipe			0.000			1/2" Ice	8.629	11.366	0.169
(P)			0.000			1" Ice	9.334	12.914	0.253
						2" Ice	10.682	15.267	0.455
						4" Ice	13.473	20.139	1.028
DC6-48-60-18-8F	A	From Leg	4.000	0.000	130.000	No Ice	2.216	2.216	0.020
(P)			0.000			1/2" Ice	2.436	2.436	0.039
			0.000			1" Ice	2.664	2.664	0.061
						2" Ice	3.146	3.146	0.116
						4" Ice	4.214	4.214	0.268
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	128.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	128.000	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	A	From Leg	4.000	0.000	128.000	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	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
T-Arm Mount [TA 602-3]	C	None		0.000	128.000	No Ice	11.590	11.590	0.774
(E)						1/2" Ice	15.440	15.440	0.990
						1" Ice	19.290	19.290	1.206
						2" Ice	26.990	26.990	1.639
						4" Ice	42.390	42.390	2.503
/									
(4) ALP 9212-N w/ Mount	C	From Leg	4.000	0.000	120.000	No Ice	6.021	7.050	0.037
Pipe			0.000			1/2" Ice	6.505	7.833	0.094
(E)			0.000			1" Ice	6.992	8.588	0.161
						2" Ice	7.995	10.151	0.317
						4" Ice	10.128	13.500	0.746
(4) ALP 9212-N w/ Mount	B	From Leg	4.000	0.000	120.000	No Ice	6.021	7.050	0.037
Pipe			0.000			1/2" Ice	6.505	7.833	0.094
(E)			0.000			1" Ice	6.992	8.588	0.161
						2" Ice	7.995	10.151	0.317
						4" Ice	10.128	13.500	0.746
(4) ALP 9212-N w/ Mount	A	From Leg	4.000	0.000	120.000	No Ice	6.021	7.050	0.037
Pipe			0.000			1/2" Ice	6.505	7.833	0.094
(E)			0.000			1" Ice	6.992	8.588	0.161
						2" Ice	7.995	10.151	0.317
						4" Ice	10.128	13.500	0.746
Platform Mount [LP 601-1]	C	None		0.000	120.000	No Ice	28.470	28.470	1.122
(E)						1/2" Ice	33.590	33.590	1.514
						1" Ice	38.710	38.710	1.905
						2" Ice	48.950	48.950	2.689
						4" Ice	69.430	69.430	4.255
/									
BXA-185060/8CFx2 w/	C	From Leg	4.000	0.000	109.000	No Ice	3.486	3.295	0.032
Mount Pipe			0.000			1/2" Ice	3.960	4.103	0.063
(E)			0.000			1" Ice	4.404	4.788	0.103
						2" Ice	5.417	6.207	0.203
						4" Ice	7.581	9.292	0.514
BXA-185060/8CFx2 w/	B	From Leg	4.000	0.000	109.000	No Ice	3.486	3.295	0.032
Mount Pipe			0.000			1/2" Ice	3.960	4.103	0.063
(E)			0.000			1" Ice	4.404	4.788	0.103
						2" Ice	5.417	6.207	0.203
						4" Ice	7.581	9.292	0.514
BXA-185060/8CFx2 w/	A	From Leg	4.000	0.000	109.000	No Ice	3.486	3.295	0.032
Mount Pipe			0.000			1/2" Ice	3.960	4.103	0.063
(E)			0.000			1" Ice	4.404	4.788	0.103
						2" Ice	5.417	6.207	0.203
						4" Ice	7.581	9.292	0.514
BXA-70063/6CFx2 w/ Mount	C	From Leg	4.000	0.000	109.000	No Ice	7.751	5.180	0.039
Pipe			0.000			1/2" Ice	8.295	6.114	0.093
(E)			0.000			1" Ice	8.846	6.924	0.158
						2" Ice	9.974	8.593	0.313
						4" Ice	12.335	12.132	0.754
BXA-70063/6CFx2 w/ Mount	B	From Leg	4.000	0.000	109.000	No Ice	7.751	5.180	0.039
Pipe			0.000			1/2" Ice	8.295	6.114	0.093
(E)			0.000			1" Ice	8.846	6.924	0.158
						2" Ice	9.974	8.593	0.313
						4" Ice	12.335	12.132	0.754
BXA-70063/6CFx4 w/ Mount	A	From Leg	4.000	0.000	109.000	No Ice	7.751	5.180	0.039
Pipe			0.000			1/2" Ice	8.295	6.114	0.093
(E)			0.000			1" Ice	8.846	6.924	0.158
						2" Ice	9.974	8.593	0.313

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	12.335	12.132	0.754
(2) LPD-6513 w/ Mount Pipe	C	From Leg	4.000	0.000	109.000	No Ice	6.652	6.319	0.046
(E)			0.000			1/2" Ice	7.114	7.000	0.103
			0.000			1" Ice	7.586	7.700	0.169
						2" Ice	8.561	9.152	0.323
						4" Ice	10.649	12.328	0.744
(2) LPD-6513 w/ Mount Pipe	B	From Leg	4.000	0.000	109.000	No Ice	6.652	6.319	0.046
(E)			0.000			1/2" Ice	7.114	7.000	0.103
			0.000			1" Ice	7.586	7.700	0.169
						2" Ice	8.561	9.152	0.323
						4" Ice	10.649	12.328	0.744
(2) LPD-6513 w/ Mount Pipe	A	From Leg	4.000	0.000	109.000	No Ice	6.652	6.319	0.046
(E)			0.000			1/2" Ice	7.114	7.000	0.103
			0.000			1" Ice	7.586	7.700	0.169
						2" Ice	8.561	9.152	0.323
						4" Ice	10.649	12.328	0.744
(2) FD9R6004/2C-3L	C	From Leg	4.000	0.000	109.000	No Ice	0.000	0.085	0.003
(E)			0.000			1/2" Ice	0.000	0.136	0.005
			0.000			1" Ice	0.000	0.196	0.009
						2" Ice	0.000	0.343	0.020
						4" Ice	0.000	0.740	0.063
(2) FD9R6004/2C-3L	B	From Leg	4.000	0.000	109.000	No Ice	0.000	0.085	0.003
(E)			0.000			1/2" Ice	0.000	0.136	0.005
			0.000			1" Ice	0.000	0.196	0.009
						2" Ice	0.000	0.343	0.020
						4" Ice	0.000	0.740	0.063
(2) FD9R6004/2C-3L	A	From Leg	4.000	0.000	109.000	No Ice	0.000	0.085	0.003
(E)			0.000			1/2" Ice	0.000	0.136	0.005
			0.000			1" Ice	0.000	0.196	0.009
						2" Ice	0.000	0.343	0.020
						4" Ice	0.000	0.740	0.063
Platform Mount [LP 304-1]	C	None		0.000	108.000	No Ice	17.460	17.460	1.349
(E)						1/2" Ice	22.440	22.440	1.625
						1" Ice	27.420	27.420	1.900
						2" Ice	37.380	37.380	2.451
						4" Ice	57.300	57.300	3.554
/									
APX16DWV-16DWV-S-E-A	C	From Leg	2.000	0.000	100.000	No Ice	7.466	3.494	0.061
20 w/ Mount Pipe			0.000			1/2" Ice	7.994	4.263	0.108
(E)			0.000			1" Ice	8.518	4.960	0.164
						2" Ice	9.595	6.403	0.298
						4" Ice	11.873	9.490	0.683
APX16DWV-16DWV-S-E-A	B	From Leg	2.000	0.000	100.000	No Ice	7.466	3.494	0.061
20 w/ Mount Pipe			0.000			1/2" Ice	7.994	4.263	0.108
(E)			0.000			1" Ice	8.518	4.960	0.164
						2" Ice	9.595	6.403	0.298
						4" Ice	11.873	9.490	0.683
APX16DWV-16DWV-S-E-A	A	From Leg	2.000	0.000	100.000	No Ice	7.466	3.494	0.061
20 w/ Mount Pipe			0.000			1/2" Ice	7.994	4.263	0.108
(E)			0.000			1" Ice	8.518	4.960	0.164
						2" Ice	9.595	6.403	0.298
						4" Ice	11.873	9.490	0.683
KRY 112 144/1	C	From Leg	2.000	0.000	100.000	No Ice	0.411	0.189	0.011
(E)			0.000			1/2" Ice	0.500	0.256	0.014
			0.000			1" Ice	0.597	0.332	0.018
						2" Ice	0.818	0.510	0.032
						4" Ice	1.363	0.970	0.081

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
KRY 112 144/1	B	From Leg	2.000	0.000	100.000	No Ice	0.411	0.189	0.011
(E)			0.000			1/2" Ice	0.500	0.256	0.014
			0.000			1" Ice	0.597	0.332	0.018
						2" Ice	0.818	0.510	0.032
						4" Ice	1.363	0.970	0.081
KRY 112 144/1	A	From Leg	2.000	0.000	100.000	No Ice	0.411	0.189	0.011
(E)			0.000			1/2" Ice	0.500	0.256	0.014
			0.000			1" Ice	0.597	0.332	0.018
						2" Ice	0.818	0.510	0.032
						4" Ice	1.363	0.970	0.081
KRY 112 89/5	C	From Leg	2.000	0.000	100.000	No Ice	0.233	0.428	0.015
(E)			0.000			1/2" Ice	0.302	0.529	0.020
			0.000			1" Ice	0.380	0.640	0.027
						2" Ice	0.562	0.886	0.046
						4" Ice	1.028	1.482	0.110
KRY 112 89/5	B	From Leg	2.000	0.000	100.000	No Ice	0.233	0.428	0.015
(E)			0.000			1/2" Ice	0.302	0.529	0.020
			0.000			1" Ice	0.380	0.640	0.027
						2" Ice	0.562	0.886	0.046
						4" Ice	1.028	1.482	0.110
KRY 112 89/5	A	From Leg	2.000	0.000	100.000	No Ice	0.233	0.428	0.015
(E)			0.000			1/2" Ice	0.302	0.529	0.020
			0.000			1" Ice	0.380	0.640	0.027
						2" Ice	0.562	0.886	0.046
						4" Ice	1.028	1.482	0.110
Side Arm Mount [SO 102-3]	C	None		0.000	100.000	No Ice	3.000	3.000	0.081
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
/									
742 213 w/ Mount Pipe	C	From Leg	2.000	0.000	90.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.091
			0.000			1" Ice	6.501	6.982	0.144
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.682
742 213 w/ Mount Pipe	B	From Leg	2.000	0.000	90.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.091
			0.000			1" Ice	6.501	6.982	0.144
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.682
742 213 w/ Mount Pipe	A	From Leg	2.000	0.000	90.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.091
			0.000			1" Ice	6.501	6.982	0.144
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.682
/									
KS24019-L112A	C	From Leg	2.000	0.000	72.000	No Ice	0.156	0.156	0.005
(E)			0.000			1/2" Ice	0.225	0.225	0.007
			0.000			1" Ice	0.302	0.302	0.009
						2" Ice	0.484	0.484	0.018
						4" Ice	0.951	0.951	0.056
KS24019-L112A	A	From Leg	2.000	0.000	72.000	No Ice	0.156	0.156	0.005
(E)			0.000			1/2" Ice	0.225	0.225	0.007
			0.000			1" Ice	0.302	0.302	0.009
						2" Ice	0.484	0.484	0.018
						4" Ice	0.951	0.951	0.056

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Side Arm Mount [SO 701-1]	C	From Leg	0.500	0.000	70.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
Side Arm Mount [SO 701-1]	A	From Leg	0.500	0.000	70.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
/									
KS24019-L112A	B	From Leg	2.000	0.000	51.000	No Ice	0.156	0.156	0.005
(E)			0.000			1/2" Ice	0.225	0.225	0.007
			0.000			1" Ice	0.302	0.302	0.009
						2" Ice	0.484	0.484	0.018
						4" Ice	0.951	0.951	0.056
Side Arm Mount [SO 701-1]	B	From Leg	0.500	0.000	49.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
/									

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

Comb. No.	Description
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 91.75	40.718	30	2.695	0.008
L2	95 - 77.75	17.544	30	1.950	0.003
L3	77.75 - 69	11.297	30	1.464	0.001
L4	69 - 46.5	8.801	30	1.259	0.001
L5	51 - 20.5	4.752	30	0.890	0.001
L6	20.5 - 0	0.727	30	0.343	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.000	(2) DB980H90A-M w/ Mount Pipe	30	40.154	2.684	0.008	16554
130.000	(2) RRUS-11	30	35.101	2.577	0.007	8276
128.000	(2) LGP21401	30	33.991	2.552	0.007	6897
120.000	(4) ALP 9212-N w/ Mount Pipe	30	29.630	2.443	0.005	4137
109.000	BXA-185060/8CFx2 w/ Mount Pipe	30	23.954	2.262	0.004	2668
108.000	Platform Mount [LP 304-1]	30	23.462	2.243	0.004	2585
100.000	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	30	19.707	2.074	0.003	2067
90.000	742 213 w/ Mount Pipe	30	15.541	1.811	0.002	1888
72.000	KS24019-L112A	30	9.612	1.326	0.001	2363
70.000	Side Arm Mount [SO 701-1]	30	9.067	1.281	0.001	2493
51.000	KS24019-L112A	30	4.752	0.890	0.001	3410
49.000	Side Arm Mount [SO 701-1]	30	4.378	0.852	0.001	3400

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 91.75	103.800	5	6.875	0.021
L2	95 - 77.75	44.782	5	4.976	0.006
L3	77.75 - 69	28.848	5	3.738	0.004
L4	69 - 46.5	22.478	5	3.215	0.003
L5	51 - 20.5	12.139	5	2.274	0.002
L6	20.5 - 0	1.858	5	0.877	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.000	(2) DB980H90A-M w/ Mount Pipe	5	102.364	6.845	0.021	6644
130.000	(2) RRUS-11	5	89.501	6.573	0.017	3321
128.000	(2) LGP21401	5	86.674	6.509	0.017	2767
120.000	(4) ALP 9212-N w/ Mount Pipe	5	75.571	6.234	0.014	1658
109.000	BXA-185060/8CFx2 w/ Mount Pipe	5	61.115	5.773	0.010	1067
108.000	Platform Mount [LP 304-1]	5	59.862	5.725	0.010	1033
100.000	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	5	50.294	5.293	0.008	824
90.000	742 213 w/ Mount Pipe	5	39.675	4.622	0.005	750
72.000	KS24019-L112A	5	24.548	3.385	0.003	932
70.000	Side Arm Mount [SO 701-1]	5	23.156	3.271	0.003	982
51.000	KS24019-L112A	5	12.139	2.274	0.002	1340
49.000	Side Arm Mount [SO 701-1]	5	11.184	2.176	0.002	1335

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	140 - 137.632	TP25.89x16x0.25	48.250	0.000	0.0	36.000	13.070	-1.246	470.504	0.003
	137.632 - 135.263					36.000	13.460	-1.370	484.573	0.003
	135.263 - 132.895					36.000	13.851	-1.497	498.641	0.003
	132.895 - 130.526					36.000	14.242	-1.626	512.710	0.003
	130.526 - 128.158					36.000	14.633	-2.290	526.779	0.004
	128.158 - 125.789					36.000	15.024	-3.246	540.848	0.006
	125.789 - 123.421					36.000	15.414	-3.391	554.916	0.006
	123.421 - 121.053					36.000	15.805	-3.541	568.985	0.006
	121.053 - 118.684					36.000	16.196	-4.762	583.054	0.008
	118.684 - 116.316					36.000	16.587	-4.929	597.123	0.008
	116.316 - 113.947					36.000	16.978	-5.102	611.192	0.008
	113.947 - 111.579					36.000	17.368	-5.282	625.260	0.008
	111.579 - 109.211					36.000	17.759	-5.468	639.329	0.009
	109.211 - 106.842					36.000	18.150	-7.158	653.398	0.011
	106.842 - 104.474					36.000	18.541	-7.366	667.467	0.011
	104.474 - 102.105					36.000	18.931	-7.582	681.535	0.011
	102.105 - 99.7368					36.000	19.322	-8.068	695.604	0.012
	99.7368 - 97.3684					36.000	19.713	-8.300	709.673	0.012
	97.3684 - 95					36.000	20.104	-8.539	723.742	0.012
	95 - 91.75					36.000	20.640	-4.107	743.047	0.006
L2	95 - 91.75	TP28.415x24.724x0.313	17.250	0.000	0.0	39.000	25.264	-5.008	985.284	0.005
	91.75 - 90.75					39.000	25.479	-9.255	993.681	0.009
	90.75 - 89.75					39.000	25.694	-9.488	1002.080	0.009
	89.75 - 88.75					39.000	25.910	-9.622	1010.480	0.010
	88.75 - 87.75					39.000	26.125	-9.757	1018.870	0.010
	87.75 - 86.75					39.000	26.340	-9.893	1027.270	0.010
	86.75 - 85.75					39.000	26.556	-10.030	1035.670	0.010
	85.75 - 84.75					39.000	26.771	-10.169	1044.070	0.010
	84.75 - 83.75					39.000	26.986	-10.309	1052.460	0.010
	83.75 - 82.75					39.000	27.202	-10.449	1060.860	0.010
	82.75 - 81.75					39.000	27.417	-10.591	1069.260	0.010
	81.75 - 80.75					39.000	27.632	-10.734	1077.660	0.010
	80.75 - 79.75					39.000	27.847	-10.878	1086.050	0.010
	79.75 - 78.75					39.000	28.063	-11.023	1094.450	0.010
	78.75 - 77.75					39.000	28.278	-11.169	1102.850	0.010

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 $\frac{P}{P_a}$
L3	77.75 - 76.6563	TP30.056x28.415x0.441	8.750	0.000	0.0	31.860	40.015	-11.367	1274.880	0.009
	76.6563 - 75.5625					31.860	40.306	-11.563	1284.160	0.009
	75.5625 - 74.4688					31.860	40.597	-11.761	1293.440	0.009
	74.4688 - 73.375					31.860	40.889	-11.960	1302.720	0.009
	73.375 - 72.2813					31.860	41.180	-12.161	1312.000	0.009
	72.2813 - 71.1875					31.860	41.471	-12.372	1321.280	0.009
	71.1875 - 70.0938					31.860	41.763	-12.575	1330.560	0.009
	70.0938 - 69					31.860	42.054	-12.905	1339.840	0.010
L4	69 - 68	TP34.67x30.056x0.513	22.500	0.000	0.0	34.740	49.149	-13.117	1707.440	0.008
	68 - 67					34.740	49.488	-13.328	1719.210	0.008
	67 - 66					34.740	49.827	-13.541	1730.980	0.008
	66 - 65					34.740	50.166	-13.755	1742.750	0.008
	65 - 64					34.740	50.504	-13.970	1754.520	0.008
	64 - 63					34.740	50.843	-14.187	1766.290	0.008
	63 - 62					34.740	51.182	-14.405	1778.060	0.008
	62 - 61					34.740	51.521	-14.624	1789.830	0.008
	61 - 60					34.740	51.860	-14.845	1801.600	0.008
	60 - 59					34.740	52.198	-15.067	1813.370	0.008
	59 - 58					34.740	52.537	-15.290	1825.140	0.008
	58 - 57					34.740	52.876	-15.514	1836.910	0.008
	57 - 56					34.740	53.215	-15.740	1848.680	0.009
	56 - 55					34.740	53.554	-15.967	1860.450	0.009
	55 - 54					34.740	53.892	-16.195	1872.220	0.009
	54 - 53					34.740	54.231	-16.425	1883.990	0.009
	53 - 52					34.740	54.570	-16.656	1895.760	0.009
	52 - 51					34.740	54.909	-16.888	1907.530	0.009
	51 - 46.5					34.740	56.433	-9.255	1960.500	0.005
L5	51 - 46.5	TP39.4x32.721x0.554	30.500	0.000	0.0	33.060	59.119	-9.592	1954.470	0.005
	46.5 - 45.1316					33.060	59.653	-19.199	1972.140	0.010
	45.1316 - 43.7632					33.060	60.188	-19.544	1989.810	0.010
	43.7632 - 42.3947					33.060	60.722	-19.891	2007.470	0.010
	42.3947 - 41.0263					33.060	61.256	-20.241	2025.140	0.010
	41.0263 - 39.6579					33.060	61.791	-20.593	2042.800	0.010
	39.6579 - 38.2895					33.060	62.325	-20.949	2060.470	0.010
	38.2895 - 36.9211					33.060	62.860	-21.306	2078.140	0.010
	36.9211 - 35.5526					33.060	63.394	-21.667	2095.800	0.010
	35.5526 - 34.1842					33.060	63.928	-22.030	2113.470	0.010
	34.1842 - 32.8158					33.060	64.463	-22.395	2131.130	0.011
	32.8158 - 31.4474					33.060	64.997	-22.764	2148.800	0.011
	31.4474 - 30.0789					33.060	65.531	-23.134	2166.470	0.011
	30.0789 - 28.7105					33.060	66.066	-23.508	2184.130	0.011
	28.7105 -					33.060	66.600	-23.884	2201.800	0.011

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 $\frac{P}{P_a}$
	27.3421									
	27.3421 - 25.9737					33.060	67.134	-24.263	2219.470	0.011
	25.9737 - 24.6053					33.060	67.669	-24.644	2237.130	0.011
	24.6053 - 23.2368					33.060	68.203	-25.028	2254.800	0.011
	23.2368 - 21.8684					33.060	68.738	-25.414	2272.460	0.011
	21.8684 - 20.5					33.060	69.272	-25.803	2290.130	0.011
L6	20.5 - 19.475	TP43.58x39.4x0.58	20.500	0.000	0.0	33.240	72.903	-26.104	2423.290	0.011
	19.475 - 18.45					33.240	73.293	-26.401	2436.270	0.011
	18.45 - 17.425					33.240	73.684	-26.700	2449.250	0.011
	17.425 - 16.4					33.240	74.074	-27.000	2462.220	0.011
	16.4 - 15.375					33.240	74.465	-27.302	2475.200	0.011
	15.375 - 14.35					33.240	74.855	-27.606	2488.180	0.011
	14.35 - 13.325					33.240	75.245	-27.910	2501.150	0.011
	13.325 - 12.3					33.240	75.636	-28.217	2514.130	0.011
	12.3 - 11.275					33.240	76.026	-28.524	2527.110	0.011
	11.275 - 10.25					33.240	76.416	-28.833	2540.080	0.011
	10.25 - 9.225					33.240	76.807	-29.144	2553.060	0.011
	9.225 - 8.2					33.240	77.197	-29.456	2566.040	0.011
	8.2 - 7.175					33.240	77.588	-29.769	2579.010	0.012
	7.175 - 6.15					33.240	77.978	-30.084	2591.990	0.012
	6.15 - 5.125					33.240	78.368	-30.400	2604.970	0.012
	5.125 - 4.1					33.240	78.759	-30.718	2617.950	0.012
	4.1 - 3.075					33.240	79.149	-31.037	2630.920	0.012
	3.075 - 2.05					33.240	79.540	-31.358	2643.900	0.012
	2.05 - 1.025					33.240	79.930	-31.680	2656.880	0.012
	1.025 - 0					33.240	80.321	-32.004	2669.850	0.012

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	140 - 137.632	TP25.89x16x0.25	3.820	0.890	36.000	0.025	0.000	0.000	36.000	0.000
	137.632 - 135.263		10.673	2.344	36.000	0.065	0.000	0.000	36.000	0.000
	135.263 - 132.895		17.905	3.712	36.000	0.103	0.000	0.000	36.000	0.000
	132.895 - 130.526		25.527	5.003	36.000	0.139	0.000	0.000	36.000	0.000
	130.526 - 128.158		38.597	7.164	36.000	0.199	0.000	0.000	36.000	0.000
	128.158 - 125.789		55.462	9.762	36.000	0.271	0.000	0.000	36.000	0.000
	125.789 - 123.421		72.906	12.186	36.000	0.339	0.000	0.000	36.000	0.000
	123.421 - 121.053		90.763	14.425	36.000	0.401	0.000	0.000	36.000	0.000
	121.053 - 118.684		114.867	17.381	36.000	0.483	0.000	0.000	36.000	0.000
	118.684 - 116.316		144.058	20.776	36.000	0.577	0.000	0.000	36.000	0.000
	116.316 -		173.673	23.901	36.000	0.664	0.000	0.000	36.000	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 $\frac{f_{by}}{F_{by}}$
	113.947									
	113.947 - 111.579		203.716	26.781	36.000	0.744	0.000	0.000	36.000	0.000
	111.579 - 109.211		234.192	29.440	36.000	0.818	0.000	0.000	36.000	0.000
	109.211 - 106.842		271.906	32.717	36.000	0.909	0.000	0.000	36.000	0.000
	106.842 - 104.474		311.610	35.923	36.000	0.998	0.000	0.000	36.000	0.000
	104.474 - 102.105		351.748	38.884	36.000	1.080	0.000	0.000	36.000	0.000
	102.105 - 99.7368		392.543	41.647	36.000	1.157	0.000	0.000	36.000	0.000
	99.7368 - 97.3684		435.540	44.386	36.000	1.233	0.000	0.000	36.000	0.000
	97.3684 - 95		478.975	46.924	36.000	1.303	0.000	0.000	36.000	0.000
	95 - 91.75		248.524	23.093	36.000	0.641	0.000	0.000	36.000	0.000
L2	95 - 91.75	TP28.415x24.724x0.313	290.846	22.609	39.000	0.580	0.000	0.000	39.000	0.000
	91.75 - 90.75		558.153	42.653	39.000	1.094	0.000	0.000	39.000	0.000
	90.75 - 89.75		577.168	43.365	39.000	1.112	0.000	0.000	39.000	0.000
	89.75 - 88.75		596.697	44.086	39.000	1.130	0.000	0.000	39.000	0.000
	88.75 - 87.75		616.318	44.784	39.000	1.148	0.000	0.000	39.000	0.000
	87.75 - 86.75		636.031	45.459	39.000	1.166	0.000	0.000	39.000	0.000
	86.75 - 85.75		655.838	46.114	39.000	1.182	0.000	0.000	39.000	0.000
	85.75 - 84.75		675.738	46.747	39.000	1.199	0.000	0.000	39.000	0.000
	84.75 - 83.75		695.732	47.361	39.000	1.214	0.000	0.000	39.000	0.000
	83.75 - 82.75		715.822	47.956	39.000	1.230	0.000	0.000	39.000	0.000
	82.75 - 81.75		736.005	48.532	39.000	1.244	0.000	0.000	39.000	0.000
	81.75 - 80.75		756.284	49.091	39.000	1.259	0.000	0.000	39.000	0.000
	80.75 - 79.75		776.658	49.632	39.000	1.273	0.000	0.000	39.000	0.000
	79.75 - 78.75		797.129	50.157	39.000	1.286	0.000	0.000	39.000	0.000
	78.75 - 77.75		817.696	50.667	39.000	1.299	0.000	0.000	39.000	0.000
L3	77.75 - 76.6563	TP30.056x28.415x0.441	840.308	36.860	31.860	1.157	0.000	0.000	31.860	0.000
	76.6563 - 75.5625		863.042	37.308	31.860	1.171	0.000	0.000	31.860	0.000
	75.5625 - 74.4688		885.900	37.745	31.860	1.185	0.000	0.000	31.860	0.000
	74.4688 - 73.375		908.892	38.170	31.860	1.198	0.000	0.000	31.860	0.000
	73.375 - 72.2813		932.000	38.585	31.860	1.211	0.000	0.000	31.860	0.000
	72.2813 - 71.1875		955.233	38.989	31.860	1.224	0.000	0.000	31.860	0.000
	71.1875 - 70.0938		978.608	39.384	31.860	1.236	0.000	0.000	31.860	0.000
	70.0938 - 69		1002.267	39.775	31.860	1.248	0.000	0.000	31.860	0.000
L4	69 - 68	TP34.67x30.056x0.513	1023.967	34.695	34.740	0.999	0.000	0.000	34.740	0.000
	68 - 67		1045.767	34.946	34.740	1.006	0.000	0.000	34.740	0.000
	67 - 66		1067.667	35.190	34.740	1.013	0.000	0.000	34.740	0.000
	66 - 65		1089.675	35.428	34.740	1.020	0.000	0.000	34.740	0.000
	65 - 64		1111.792	35.660	34.740	1.026	0.000	0.000	34.740	0.000
	64 - 63		1134.008	35.885	34.740	1.033	0.000	0.000	34.740	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 - 62		1156.333	36.105	34.740	1.039	0.000	0.000	34.740	0.000
	62 - 61		1178.767	36.319	34.740	1.045	0.000	0.000	34.740	0.000
	61 - 60		1201.300	36.528	34.740	1.051	0.000	0.000	34.740	0.000
	60 - 59		1223.942	36.731	34.740	1.057	0.000	0.000	34.740	0.000
	59 - 58		1246.700	36.929	34.740	1.063	0.000	0.000	34.740	0.000
	58 - 57		1269.550	37.121	34.740	1.069	0.000	0.000	34.740	0.000
	57 - 56		1292.517	37.310	34.740	1.074	0.000	0.000	34.740	0.000
	56 - 55		1315.592	37.493	34.740	1.079	0.000	0.000	34.740	0.000
	55 - 54		1338.775	37.672	34.740	1.084	0.000	0.000	34.740	0.000
	54 - 53		1362.067	37.846	34.740	1.089	0.000	0.000	34.740	0.000
	53 - 52		1385.467	38.016	34.740	1.094	0.000	0.000	34.740	0.000
	52 - 51		1408.983	38.182	34.740	1.099	0.000	0.000	34.740	0.000
	51 - 46.5		764.855	19.614	34.740	0.565	0.000	0.000	34.740	0.000
L5	51 - 46.5	TP39.4x32.721x0.554	751.635	18.988	33.060	0.574	0.000	0.000	33.060	0.000
	46.5 - 45.1316		1549.658	38.444	33.060	1.163	0.000	0.000	33.060	0.000
	45.1316 - 43.7632		1583.000	38.572	33.060	1.167	0.000	0.000	33.060	0.000
	43.7632 - 42.3947		1616.508	38.692	33.060	1.170	0.000	0.000	33.060	0.000
	42.3947 - 41.0263		1650.183	38.807	33.060	1.174	0.000	0.000	33.060	0.000
	41.0263 - 39.6579		1684.033	38.916	33.060	1.177	0.000	0.000	33.060	0.000
	39.6579 - 38.2895		1718.050	39.019	33.060	1.180	0.000	0.000	33.060	0.000
	38.2895 - 36.9211		1752.242	39.116	33.060	1.183	0.000	0.000	33.060	0.000
	36.9211 - 35.5526		1786.600	39.209	33.060	1.186	0.000	0.000	33.060	0.000
	35.5526 - 34.1842		1821.133	39.296	33.060	1.189	0.000	0.000	33.060	0.000
	34.1842 - 32.8158		1855.850	39.379	33.060	1.191	0.000	0.000	33.060	0.000
	32.8158 - 31.4474		1890.733	39.457	33.060	1.194	0.000	0.000	33.060	0.000
	31.4474 - 30.0789		1925.792	39.531	33.060	1.196	0.000	0.000	33.060	0.000
	30.0789 - 28.7105		1961.025	39.601	33.060	1.198	0.000	0.000	33.060	0.000
	28.7105 - 27.3421		1996.442	39.667	33.060	1.200	0.000	0.000	33.060	0.000
	27.3421 - 25.9737		2032.033	39.730	33.060	1.202	0.000	0.000	33.060	0.000
	25.9737 - 24.6053		2067.800	39.788	33.060	1.204	0.000	0.000	33.060	0.000
	24.6053 - 23.2368		2103.750	39.844	33.060	1.205	0.000	0.000	33.060	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 $\frac{f_{by}}{F_{by}}$
	23.2368 - 21.8684		2139.883	39.896	33.060	1.207	0.000	0.000	33.060	0.000
	21.8684 - 20.5		2176.192	39.945	33.060	1.208	0.000	0.000	33.060	0.000
L6	20.5 - 19.475	TP43.58x39.4x0.58	2203.508	38.275	33.240	1.151	0.000	0.000	33.240	0.000
	19.475 - 18.45		2230.925	38.337	33.240	1.153	0.000	0.000	33.240	0.000
	18.45 - 17.425		2258.433	38.396	33.240	1.155	0.000	0.000	33.240	0.000
	17.425 - 16.4		2286.050	38.454	33.240	1.157	0.000	0.000	33.240	0.000
	16.4 - 15.375		2313.758	38.510	33.240	1.159	0.000	0.000	33.240	0.000
	15.375 - 14.35		2341.567	38.565	33.240	1.160	0.000	0.000	33.240	0.000
	14.35 - 13.325		2369.475	38.618	33.240	1.162	0.000	0.000	33.240	0.000
	13.325 - 12.3		2397.483	38.669	33.240	1.163	0.000	0.000	33.240	0.000
	12.3 - 11.275		2425.600	38.719	33.240	1.165	0.000	0.000	33.240	0.000
	11.275 - 10.25		2453.808	38.767	33.240	1.166	0.000	0.000	33.240	0.000
	10.25 - 9.225		2482.117	38.814	33.240	1.168	0.000	0.000	33.240	0.000
	9.225 - 8.2		2510.525	38.860	33.240	1.169	0.000	0.000	33.240	0.000
	8.2 - 7.175		2539.042	38.904	33.240	1.170	0.000	0.000	33.240	0.000
	7.175 - 6.15		2567.658	38.947	33.240	1.172	0.000	0.000	33.240	0.000
	6.15 - 5.125		2596.367	38.988	33.240	1.173	0.000	0.000	33.240	0.000
	5.125 - 4.1		2625.192	39.028	33.240	1.174	0.000	0.000	33.240	0.000
	4.1 - 3.075		2654.108	39.067	33.240	1.175	0.000	0.000	33.240	0.000
	3.075 - 2.05		2683.125	39.105	33.240	1.176	0.000	0.000	33.240	0.000
	2.05 - 1.025		2712.250	39.142	33.240	1.178	0.000	0.000	33.240	0.000
	1.025 - 0		2741.475	39.177	33.240	1.179	0.000	0.000	33.240	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	140 - 137.632	TP25.89x16x0.25	2.814	0.215	24.000	0.018	0.001	0.000	24.000	0.000
	137.632 - 135.263		2.973	0.221	24.000	0.019	0.001	0.000	24.000	0.000
	135.263 - 132.895		3.135	0.226	24.000	0.019	0.002	0.000	24.000	0.000
	132.895 - 130.526		3.301	0.232	24.000	0.020	0.003	0.000	24.000	0.000
	130.526 - 128.158		6.159	0.421	24.000	0.036	0.967	0.084	24.000	0.004
	128.158 - 125.789		7.280	0.485	24.000	0.041	1.116	0.092	24.000	0.004
	125.789 - 123.421		7.454	0.484	24.000	0.041	1.117	0.088	24.000	0.004
	123.421 - 121.053		7.630	0.483	24.000	0.041	1.118	0.084	24.000	0.003
	121.053 - 118.684		12.240	0.756	24.000	0.064	1.118	0.080	24.000	0.003
	118.684 - 116.316		12.419	0.749	24.000	0.063	1.119	0.076	24.000	0.003
	116.316 - 113.947		12.599	0.742	24.000	0.063	1.120	0.073	24.000	0.003
	113.947 - 111.579		12.782	0.736	24.000	0.062	1.120	0.069	24.000	0.003
	111.579 - 109.211		12.966	0.730	24.000	0.062	1.121	0.066	24.000	0.003
	109.211 - 106.842		16.683	0.919	24.000	0.078	1.122	0.064	24.000	0.003
	106.842 - 104.474		16.866	0.910	24.000	0.077	1.122	0.061	24.000	0.003
	104.474 - 102.105		17.050	0.901	24.000	0.076	1.123	0.059	24.000	0.002
	102.105 - 99.7368		18.075	0.935	24.000	0.079	1.124	0.056	24.000	0.002
	99.7368 - 97.3684		18.261	0.926	24.000	0.078	1.124	0.054	24.000	0.002
	97.3684 - 95		18.447	0.918	24.000	0.078	1.125	0.052	24.000	0.002
	95 - 91.75		8.712	0.422	24.000	0.036	0.519	0.023	24.000	0.001
L2	95 - 91.75	TP28.415x24.724x0.313	10.034	0.397	26.000	0.031	0.607	0.022	26.000	0.001
	91.75 - 90.75		18.833	0.739	26.000	0.058	1.127	0.041	26.000	0.002
	90.75 - 89.75		19.488	0.758	26.000	0.059	1.128	0.040	26.000	0.002
	89.75 - 88.75		19.580	0.756	26.000	0.059	1.129	0.039	26.000	0.002
	88.75 - 87.75		19.672	0.753	26.000	0.059	1.130	0.039	26.000	0.001
	87.75 - 86.75		19.765	0.750	26.000	0.059	1.130	0.038	26.000	0.001
	86.75 - 85.75		19.859	0.748	26.000	0.058	1.131	0.037	26.000	0.001
	85.75 - 84.75		19.953	0.745	26.000	0.058	1.132	0.037	26.000	0.001
	84.75 - 83.75		20.047	0.743	26.000	0.058	1.133	0.036	26.000	0.001
	83.75 - 82.75		20.142	0.740	26.000	0.058	1.134	0.036	26.000	0.001
	82.75 - 81.75		20.237	0.738	26.000	0.058	1.135	0.035	26.000	0.001
	81.75 - 80.75		20.333	0.736	26.000	0.058	1.136	0.035	26.000	0.001
	80.75 - 79.75		20.429	0.734	26.000	0.057	1.137	0.034	26.000	0.001
	79.75 - 78.75		20.525	0.731	26.000	0.057	1.138	0.034	26.000	0.001
	78.75 - 77.75		20.622	0.729	26.000	0.057	1.139	0.033	26.000	0.001
L3	77.75 - 76.6563	TP30.056x28.415x0.441	20.734	0.518	21.240	0.050	1.140	0.023	21.240	0.001
	76.6563 - 75.5625		20.848	0.517	21.240	0.049	1.140	0.023	21.240	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 $\frac{f_{vt}}{F_{vt}}$
	75.5625 - 74.4688		20.963	0.516	21.240	0.049	1.140	0.023	21.240	0.001
	74.4688 - 73.375		21.078	0.516	21.240	0.049	1.140	0.022	21.240	0.001
	73.375 - 72.2813		21.194	0.515	21.240	0.049	1.141	0.022	21.240	0.001
	72.2813 - 71.1875		21.321	0.514	21.240	0.049	1.150	0.022	21.240	0.001
	71.1875 - 70.0938		21.438	0.513	21.240	0.049	1.150	0.022	21.240	0.001
	70.0938 - 69		21.655	0.515	21.240	0.049	1.202	0.022	21.240	0.001
L4	69 - 68	TP34.67x30.056x0.513	21.757	0.443	23.160	0.039	1.202	0.019	23.160	0.001
	68 - 67		21.861	0.442	23.160	0.039	1.201	0.019	23.160	0.001
	67 - 66		21.965	0.441	23.160	0.039	1.201	0.019	23.160	0.001
	66 - 65		22.070	0.440	23.160	0.039	1.201	0.018	23.160	0.001
	65 - 64		22.175	0.439	23.160	0.039	1.201	0.018	23.160	0.001
	64 - 63		22.280	0.438	23.160	0.038	1.201	0.018	23.160	0.001
	63 - 62		22.386	0.437	23.160	0.038	1.200	0.018	23.160	0.001
	62 - 61		22.492	0.437	23.160	0.038	1.200	0.017	23.160	0.001
	61 - 60		22.599	0.436	23.160	0.038	1.200	0.017	23.160	0.001
	60 - 59		22.706	0.435	23.160	0.038	1.200	0.017	23.160	0.001
	59 - 58		22.813	0.434	23.160	0.038	1.200	0.017	23.160	0.001
	58 - 57		22.921	0.433	23.160	0.038	1.199	0.016	23.160	0.001
	57 - 56		23.029	0.433	23.160	0.038	1.199	0.016	23.160	0.001
	56 - 55		23.138	0.432	23.160	0.038	1.199	0.016	23.160	0.001
	55 - 54		23.247	0.431	23.160	0.038	1.199	0.016	23.160	0.001
	54 - 53		23.356	0.431	23.160	0.038	1.199	0.016	23.160	0.001
	53 - 52		23.466	0.430	23.160	0.038	1.198	0.015	23.160	0.001
	52 - 51		23.576	0.429	23.160	0.038	1.198	0.015	23.160	0.001
	51 - 46.5		12.325	0.218	23.160	0.019	0.614	0.007	23.160	0.000
L5	51 - 46.5	TP39.4x32.721x0.554	11.872	0.201	22.040	0.019	0.576	0.007	22.040	0.000
	46.5 - 45.1316		24.311	0.408	22.040	0.038	1.140	0.013	22.040	0.001
	45.1316 - 43.7632		24.434	0.406	22.040	0.037	1.140	0.013	22.040	0.001
	43.7632 - 42.3947		24.558	0.404	22.040	0.037	1.140	0.013	22.040	0.001
	42.3947 - 41.0263		24.682	0.403	22.040	0.037	1.140	0.013	22.040	0.001
	41.0263 - 39.6579		24.807	0.401	22.040	0.037	1.139	0.012	22.040	0.001
	39.6579 - 38.2895		24.932	0.400	22.040	0.037	1.139	0.012	22.040	0.001
	38.2895 - 36.9211		25.058	0.399	22.040	0.037	1.139	0.012	22.040	0.001
	36.9211 - 35.5526		25.184	0.397	22.040	0.037	1.139	0.012	22.040	0.001
	35.5526 - 34.1842		25.311	0.396	22.040	0.037	1.138	0.012	22.040	0.001
	34.1842 - 32.8158		25.439	0.395	22.040	0.036	1.138	0.011	22.040	0.001
	32.8158 - 31.4474		25.567	0.393	22.040	0.036	1.138	0.011	22.040	0.001
	31.4474 - 30.0789		25.696	0.392	22.040	0.036	1.138	0.011	22.040	0.000
	30.0789 - 28.7105		25.825	0.391	22.040	0.036	1.138	0.011	22.040	0.000
	28.7105 - 27.3421		25.955	0.390	22.040	0.036	1.137	0.011	22.040	0.000
	27.3421 - 25.9737		26.086	0.389	22.040	0.036	1.137	0.010	22.040	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 $\frac{f_{vt}}{F_{vt}}$
	25.9737 - 24.6053		26.217	0.387	22.040	0.036	1.137	0.010	22.040	0.000
	24.6053 - 23.2368		26.349	0.386	22.040	0.036	1.137	0.010	22.040	0.000
	23.2368 - 21.8684		26.481	0.385	22.040	0.036	1.137	0.010	22.040	0.000
	21.8684 - 20.5		26.614	0.384	22.040	0.035	1.136	0.010	22.040	0.000
L6	20.5 - 19.475	TP43.58x39.4x0.58	26.706	0.366	22.160	0.034	1.136	0.009	22.160	0.000
	19.475 - 18.45		26.802	0.366	22.160	0.034	1.136	0.009	22.160	0.000
	18.45 - 17.425		26.898	0.365	22.160	0.033	1.135	0.009	22.160	0.000
	17.425 - 16.4		26.995	0.364	22.160	0.033	1.134	0.009	22.160	0.000
	16.4 - 15.375		27.092	0.364	22.160	0.033	1.134	0.009	22.160	0.000
	15.375 - 14.35		27.189	0.363	22.160	0.033	1.133	0.009	22.160	0.000
	14.35 - 13.325		27.287	0.363	22.160	0.033	1.132	0.009	22.160	0.000
	13.325 - 12.3		27.384	0.362	22.160	0.033	1.132	0.009	22.160	0.000
	12.3 - 11.275		27.482	0.361	22.160	0.033	1.131	0.008	22.160	0.000
	11.275 - 10.25		27.580	0.361	22.160	0.033	1.130	0.008	22.160	0.000
	10.25 - 9.225		27.679	0.360	22.160	0.033	1.130	0.008	22.160	0.000
	9.225 - 8.2		27.777	0.360	22.160	0.033	1.129	0.008	22.160	0.000
	8.2 - 7.175		27.876	0.359	22.160	0.033	1.128	0.008	22.160	0.000
	7.175 - 6.15		27.975	0.359	22.160	0.033	1.128	0.008	22.160	0.000
	6.15 - 5.125		28.074	0.358	22.160	0.033	1.127	0.008	22.160	0.000
	5.125 - 4.1		28.174	0.358	22.160	0.033	1.126	0.008	22.160	0.000
	4.1 - 3.075		28.273	0.357	22.160	0.033	1.126	0.008	22.160	0.000
	3.075 - 2.05		28.373	0.357	22.160	0.033	1.125	0.008	22.160	0.000
	2.05 - 1.025		28.473	0.356	22.160	0.033	1.124	0.008	22.160	0.000
	1.025 - 0		28.574	0.356	22.160	0.033	1.124	0.008	22.160	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	140 - 137.632	0.003	0.025	0.000	0.018	0.000	0.027 ✔	1.333	H1-3+VT ✔
	137.632 - 135.263	0.003	0.065	0.000	0.019	0.000	0.068 ✔	1.333	H1-3+VT ✔
	135.263 - 132.895	0.003	0.103	0.000	0.019	0.000	0.106 ✔	1.333	H1-3+VT ✔
	132.895 - 130.526	0.003	0.139	0.000	0.020	0.000	0.142 ✔	1.333	H1-3+VT ✔
	130.526 - 128.158	0.004	0.199	0.000	0.036	0.004	0.204 ✔	1.333	H1-3+VT ✔
	128.158 - 125.789	0.006	0.271	0.000	0.041	0.004	0.278 ✔	1.333	H1-3+VT ✔
	125.789 - 123.421	0.006	0.339	0.000	0.041	0.004	0.345 ✔	1.333	H1-3+VT ✔
	123.421 - 121.053	0.006	0.401	0.000	0.041	0.003	0.407 ✔	1.333	H1-3+VT ✔
	121.053 - 118.684	0.008	0.483	0.000	0.064	0.003	0.492 ✔	1.333	H1-3+VT ✔
	118.684 -	0.008	0.577	0.000	0.063	0.003	0.587	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
	116.316						✔		
	116.316 - 113.947	0.008	0.664	0.000	0.063	0.003	0.673 ✔	1.333	H1-3+VT ✔
	113.947 - 111.579	0.008	0.744	0.000	0.062	0.003	0.753 ✔	1.333	H1-3+VT ✔
	111.579 - 109.211	0.009	0.818	0.000	0.062	0.003	0.827 ✔	1.333	H1-3+VT ✔
	109.211 - 106.842	0.011	0.909	0.000	0.078	0.003	0.921 ✔	1.333	H1-3+VT ✔
	106.842 - 104.474	0.011	0.998	0.000	0.077	0.003	1.011 ✔	1.333	H1-3+VT ✔
	104.474 - 102.105	0.011	1.080	0.000	0.076	0.002	1.093 ✔	1.333	H1-3+VT ✔
	102.105 - 99.7368	0.012	1.157	0.000	0.079	0.002	1.170 ✔	1.333	H1-3+VT ✔
	99.7368 - 97.3684	0.012	1.233	0.000	0.078	0.002	1.246 ✔	1.333	H1-3+VT ✔
	97.3684 - 95	0.012	1.303	0.000	0.078	0.002	1.317 ✔	1.333	H1-3+VT ✔
	95 - 91.75	0.006	0.641	0.000	0.036	0.001	0.647 ✔	1.333	H1-3+VT ✔
L2	95 - 91.75	0.005	0.580	0.000	0.031	0.001	0.585 ✔	1.333	H1-3+VT ✔
	91.75 - 90.75	0.009	1.094	0.000	0.058	0.002	1.104 ✔	1.333	H1-3+VT ✔
	90.75 - 89.75	0.009	1.112	0.000	0.059	0.002	1.122 ✔	1.333	H1-3+VT ✔
	89.75 - 88.75	0.010	1.130	0.000	0.059	0.002	1.141 ✔	1.333	H1-3+VT ✔
	88.75 - 87.75	0.010	1.148	0.000	0.059	0.001	1.159 ✔	1.333	H1-3+VT ✔
	87.75 - 86.75	0.010	1.166	0.000	0.059	0.001	1.176 ✔	1.333	H1-3+VT ✔
	86.75 - 85.75	0.010	1.182	0.000	0.058	0.001	1.193 ✔	1.333	H1-3+VT ✔
	85.75 - 84.75	0.010	1.199	0.000	0.058	0.001	1.209 ✔	1.333	H1-3+VT ✔
	84.75 - 83.75	0.010	1.214	0.000	0.058	0.001	1.225 ✔	1.333	H1-3+VT ✔
	83.75 - 82.75	0.010	1.230	0.000	0.058	0.001	1.240 ✔	1.333	H1-3+VT ✔
	82.75 - 81.75	0.010	1.244	0.000	0.058	0.001	1.255 ✔	1.333	H1-3+VT ✔
	81.75 - 80.75	0.010	1.259	0.000	0.058	0.001	1.270 ✔	1.333	H1-3+VT ✔
	80.75 - 79.75	0.010	1.273	0.000	0.057	0.001	1.284 ✔	1.333	H1-3+VT ✔
	79.75 - 78.75	0.010	1.286	0.000	0.057	0.001	1.297 ✔	1.333	H1-3+VT ✔
	78.75 - 77.75	0.010	1.299	0.000	0.057	0.001	1.310 ✔	1.333	H1-3+VT ✔
L3	77.75 - 76.6563	0.009	1.157	0.000	0.050	0.001	1.167	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
	76.6563 - 75.5625	0.009	1.171	0.000	0.049	0.001	1.181 ✔	1.333	H1-3+VT ✔
	75.5625 - 74.4688	0.009	1.185	0.000	0.049	0.001	1.194 ✔	1.333	H1-3+VT ✔
	74.4688 - 73.375	0.009	1.198	0.000	0.049	0.001	1.208 ✔	1.333	H1-3+VT ✔
	73.375 - 72.2813	0.009	1.211	0.000	0.049	0.001	1.221 ✔	1.333	H1-3+VT ✔
	72.2813 - 71.1875	0.009	1.224	0.000	0.049	0.001	1.234 ✔	1.333	H1-3+VT ✔
	71.1875 - 70.0938	0.009	1.236	0.000	0.049	0.001	1.246 ✔	1.333	H1-3+VT ✔
	70.0938 - 69	0.010	1.248	0.000	0.049	0.001	1.259 ✔	1.333	H1-3+VT ✔
L4	69 - 68	0.008	0.999	0.000	0.039	0.001	1.007 ✔	1.333	H1-3+VT ✔
	68 - 67	0.008	1.006	0.000	0.039	0.001	1.014 ✔	1.333	H1-3+VT ✔
	67 - 66	0.008	1.013	0.000	0.039	0.001	1.021 ✔	1.333	H1-3+VT ✔
	66 - 65	0.008	1.020	0.000	0.039	0.001	1.028 ✔	1.333	H1-3+VT ✔
	65 - 64	0.008	1.026	0.000	0.039	0.001	1.035 ✔	1.333	H1-3+VT ✔
	64 - 63	0.008	1.033	0.000	0.038	0.001	1.041 ✔	1.333	H1-3+VT ✔
	63 - 62	0.008	1.039	0.000	0.038	0.001	1.048 ✔	1.333	H1-3+VT ✔
	62 - 61	0.008	1.045	0.000	0.038	0.001	1.054 ✔	1.333	H1-3+VT ✔
	61 - 60	0.008	1.051	0.000	0.038	0.001	1.060 ✔	1.333	H1-3+VT ✔
	60 - 59	0.008	1.057	0.000	0.038	0.001	1.066 ✔	1.333	H1-3+VT ✔
	59 - 58	0.008	1.063	0.000	0.038	0.001	1.072 ✔	1.333	H1-3+VT ✔
	58 - 57	0.008	1.069	0.000	0.038	0.001	1.077 ✔	1.333	H1-3+VT ✔
	57 - 56	0.009	1.074	0.000	0.038	0.001	1.083 ✔	1.333	H1-3+VT ✔
	56 - 55	0.009	1.079	0.000	0.038	0.001	1.088 ✔	1.333	H1-3+VT ✔
	55 - 54	0.009	1.084	0.000	0.038	0.001	1.093 ✔	1.333	H1-3+VT ✔
	54 - 53	0.009	1.089	0.000	0.038	0.001	1.099 ✔	1.333	H1-3+VT ✔
	53 - 52	0.009	1.094	0.000	0.038	0.001	1.103 ✔	1.333	H1-3+VT ✔
	52 - 51	0.009	1.099	0.000	0.038	0.001	1.108 ✔	1.333	H1-3+VT ✔
	51 - 46.5	0.005	0.565	0.000	0.019	0.000	0.569	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
L5	51 - 46.5	0.005	0.574	0.000	0.019	0.000	0.579 ✔	1.333	H1-3+VT ✔
	46.5 - 45.1316	0.010	1.163	0.000	0.038	0.001	1.173 ✔	1.333	H1-3+VT ✔
	45.1316 - 43.7632	0.010	1.167	0.000	0.037	0.001	1.177 ✔	1.333	H1-3+VT ✔
	43.7632 - 42.3947	0.010	1.170	0.000	0.037	0.001	1.181 ✔	1.333	H1-3+VT ✔
	42.3947 - 41.0263	0.010	1.174	0.000	0.037	0.001	1.184 ✔	1.333	H1-3+VT ✔
	41.0263 - 39.6579	0.010	1.177	0.000	0.037	0.001	1.188 ✔	1.333	H1-3+VT ✔
	39.6579 - 38.2895	0.010	1.180	0.000	0.037	0.001	1.191 ✔	1.333	H1-3+VT ✔
	38.2895 - 36.9211	0.010	1.183	0.000	0.037	0.001	1.194 ✔	1.333	H1-3+VT ✔
	36.9211 - 35.5526	0.010	1.186	0.000	0.037	0.001	1.197 ✔	1.333	H1-3+VT ✔
	35.5526 - 34.1842	0.010	1.189	0.000	0.037	0.001	1.199 ✔	1.333	H1-3+VT ✔
	34.1842 - 32.8158	0.011	1.191	0.000	0.036	0.001	1.202 ✔	1.333	H1-3+VT ✔
	32.8158 - 31.4474	0.011	1.194	0.000	0.036	0.001	1.204 ✔	1.333	H1-3+VT ✔
	31.4474 - 30.0789	0.011	1.196	0.000	0.036	0.000	1.207 ✔	1.333	H1-3+VT ✔
	30.0789 - 28.7105	0.011	1.198	0.000	0.036	0.000	1.209 ✔	1.333	H1-3+VT ✔
	28.7105 - 27.3421	0.011	1.200	0.000	0.036	0.000	1.211 ✔	1.333	H1-3+VT ✔
	27.3421 - 25.9737	0.011	1.202	0.000	0.036	0.000	1.213 ✔	1.333	H1-3+VT ✔
	25.9737 - 24.6053	0.011	1.204	0.000	0.036	0.000	1.215 ✔	1.333	H1-3+VT ✔
	24.6053 - 23.2368	0.011	1.205	0.000	0.036	0.000	1.217 ✔	1.333	H1-3+VT ✔
	23.2368 - 21.8684	0.011	1.207	0.000	0.036	0.000	1.218 ✔	1.333	H1-3+VT ✔
	21.8684 - 20.5	0.011	1.208	0.000	0.035	0.000	1.220 ✔	1.333	H1-3+VT ✔
L6	20.5 - 19.475	0.011	1.151	0.000	0.034	0.000	1.163 ✔	1.333	H1-3+VT ✔
	19.475 - 18.45	0.011	1.153	0.000	0.034	0.000	1.164 ✔	1.333	H1-3+VT ✔
	18.45 - 17.425	0.011	1.155	0.000	0.033	0.000	1.166 ✔	1.333	H1-3+VT ✔
	17.425 - 16.4	0.011	1.157	0.000	0.033	0.000	1.168 ✔	1.333	H1-3+VT ✔
	16.4 - 15.375	0.011	1.159	0.000	0.033	0.000	1.170 ✔	1.333	H1-3+VT ✔
	15.375 - 14.35	0.011	1.160	0.000	0.033	0.000	1.172 ✔	1.333	H1-3+VT ✔

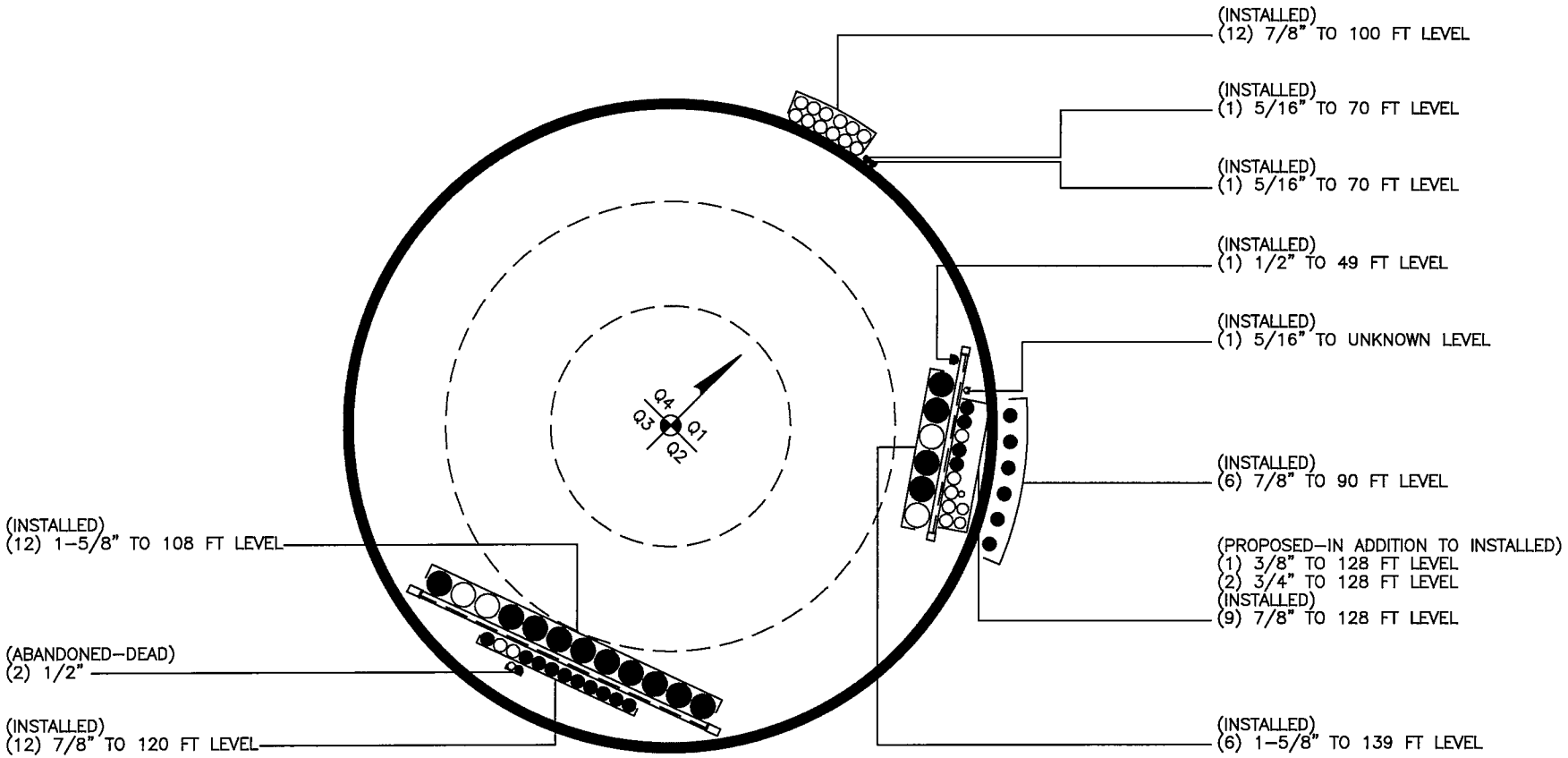
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	14.35 - 13.325	0.011	1.162	0.000	0.033	0.000	1.173	1.333	H1-3+VT
	13.325 - 12.3	0.011	1.163	0.000	0.033	0.000	1.175	1.333	H1-3+VT
	12.3 - 11.275	0.011	1.165	0.000	0.033	0.000	1.176	1.333	H1-3+VT
	11.275 - 10.25	0.011	1.166	0.000	0.033	0.000	1.178	1.333	H1-3+VT
	10.25 - 9.225	0.011	1.168	0.000	0.033	0.000	1.179	1.333	H1-3+VT
	9.225 - 8.2	0.011	1.169	0.000	0.033	0.000	1.181	1.333	H1-3+VT
	8.2 - 7.175	0.012	1.170	0.000	0.033	0.000	1.182	1.333	H1-3+VT
	7.175 - 6.15	0.012	1.172	0.000	0.033	0.000	1.184	1.333	H1-3+VT
	6.15 - 5.125	0.012	1.173	0.000	0.033	0.000	1.185	1.333	H1-3+VT
	5.125 - 4.1	0.012	1.174	0.000	0.033	0.000	1.186	1.333	H1-3+VT
	4.1 - 3.075	0.012	1.175	0.000	0.033	0.000	1.187	1.333	H1-3+VT
	3.075 - 2.05	0.012	1.176	0.000	0.033	0.000	1.189	1.333	H1-3+VT
	2.05 - 1.025	0.012	1.178	0.000	0.033	0.000	1.190	1.333	H1-3+VT
	1.025 - 0	0.012	1.179	0.000	0.033	0.000	1.191	1.333	H1-3+VT

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	140 - 91.75	Pole	TP25.89x16x0.25	1	-8.539	964.748	98.8	Pass
L2	91.75 - 77.75	Pole	TP28.415x24.724x0.313	2	-11.169	1470.099	98.3	Pass
L3	77.75 - 69	Pole	TP30.056x28.415x0.441	3	-12.905	1786.007	94.4	Pass
L4	69 - 46.5	Pole	TP34.67x30.056x0.513	4	-16.888	2542.737	83.1	Pass
L5	46.5 - 20.5	Pole	TP39.4x32.721x0.554	5	-25.803	3052.743	91.5	Pass
L6	20.5 - 0	Pole	TP43.58x39.4x0.58	6	-32.004	3558.910	89.3	Pass
							Summary	
						Pole (L1)	98.8	Pass
						RATING =	**98.8**	**Pass**

APPENDIX B

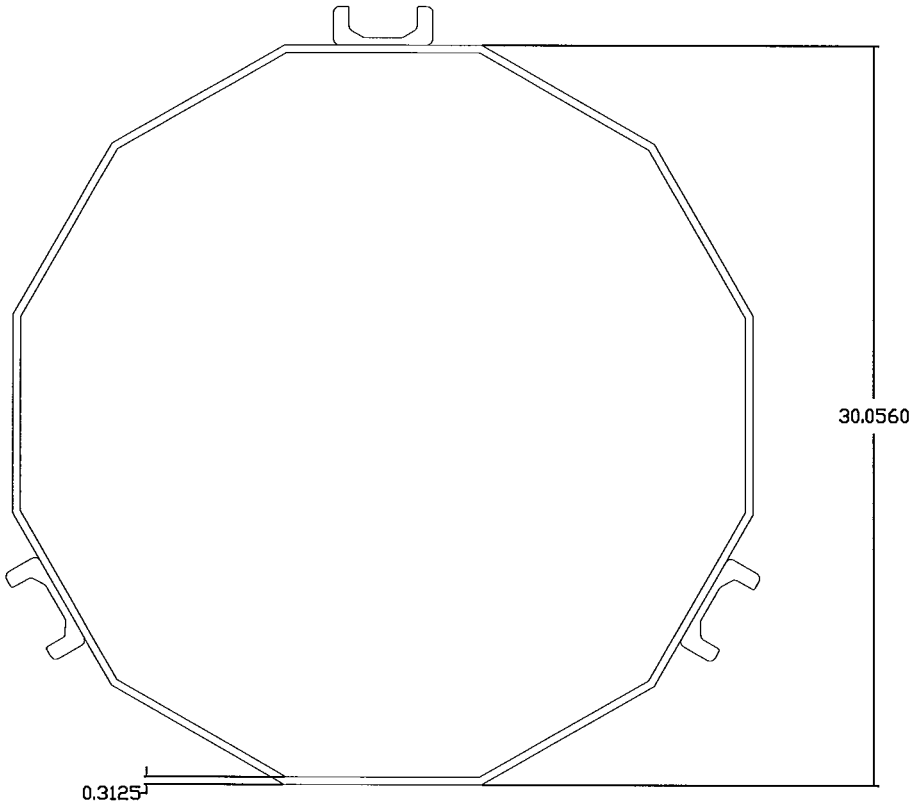
BASE LEVEL DRAWING



BUSINESS UNIT: 876335 TOWER ID: C_BASELEVEL

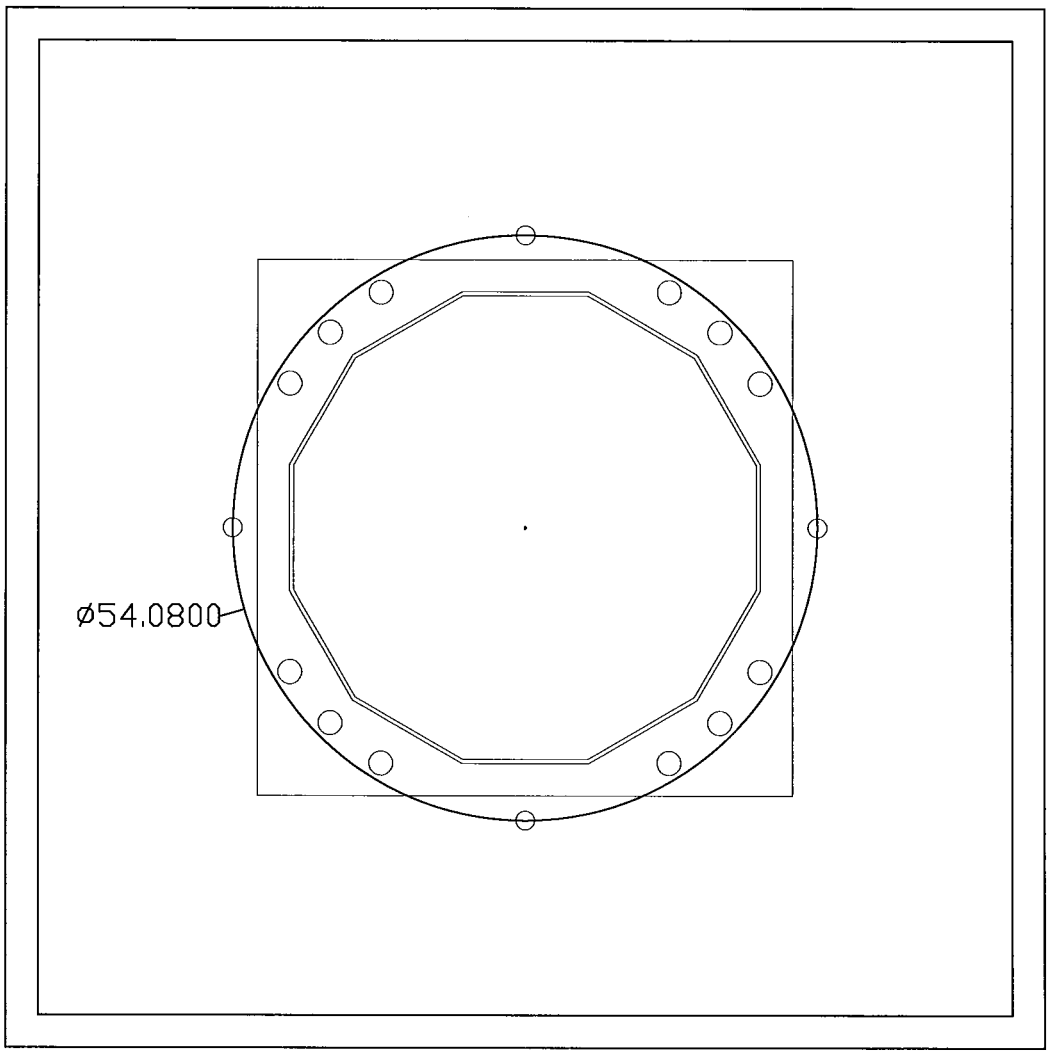
APPENDIX C

ADDITIONAL CALCULATIONS



---------- REGIONS ----------

Area: 38.9062
Perimeter: 229.5816
Bounding Box:
Lower Bound: X= -15.3028 Y= -15.0280
Upper Bound: X= 15.3028 Y= 16.5980
Centroid: X= 0.0000 Y= 0.0000
Moments of inertia: X= 4494.2921 Y= 4494.2921
Products of inertia : XY: 0.0000
Radii of gyration: X= 10.7478 Y= 10.7478
Principal moments and X-Y directions about centroid:
I: 4494.2921 along X= 1.0000 Y= 0.0000 Z= 0.0000
J: 4494.2921 along X= 0.0000 Y= 1.0000 Z= 0.0000



---------- REGIONS ----------

Area: 57.3341
Perimeter: 106.8142
Bounding box: X: -27.9150 -- 27.9150
Y: -27.9150 -- 27.9150
Centroid: X: 0.0000
Y: 0.0000
Moments of inertia: X: 19046.9068
Y: 19046.9068
Product of inertia: XY: 0.0000
Radii of gyration: X: 18.2266
Y: 18.2266
Principal moments and X-Y directions about centroid:
I: 19046.9068 along [0.5969 -0.8023]
J: 19046.9068 along [0.8023 0.5969]

PROJECT 77696.005 // BV # 876335
SUBJECT Anchor Rod Calc.
DATE 07/10/2012 PAGE 1 OF 1

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

$I_x = I_y = 19046.907\ in^4$; $y = 27.04''$

$$\sigma = \frac{MY}{I} = \frac{2{,}782\ k\text{-}ft \times 12\ (\text{in}/\text{ft}) \times 27.04''}{19046.91\ in^4}$$

$$= 47.39\ KSI$$

$$T = 47.39 \times \left(\frac{1.75^2 \times \pi}{4}\right) = 114.0\ kips \quad \text{for one anchor}$$

$$T_{all} = 0.33 \times \left(\frac{1.75^2 \times \pi}{4}\right) \times 125\ KSI \times \frac{4}{3} = 132.26\ kips$$

$$\frac{T_{anchor}}{T_{all}} = 86\%$$

Bending moment resisted by the new anchor rods:

$$M = 114.0 \times 54.08'' = 6165.12\ kip.in$$

$$= 513\ kip.ft$$

Bending moment resisted by the existing anchor rods:

$$M = 2{,}741\ k.ft - 513\ kip.ft = 2{,}228\ kip.ft.$$

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

Site Data

BU#: *876335*
Site Name: *East Farmington, CT*
App #: *145061; Rev:0*

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

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	9	ft
Pad Thickness, T:	4	ft
Pad Width=Length, L:	20	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	8	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	64.00	ft^2
Pier Height:	5.50	ft
Soil (above pad) Height:	5.00	ft

Soil Parameters		
Unit Weight, γ:	80.0	pcf
Ultimate Bearing Capacity, qn:	12.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	9.00	ksf
Passive Pres. Coeff., Kp	3.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	39.2	kips
Pad Force Location Above D:	1.81	ft
ϕ(Passive Pressure Moment):	70.84	ft-kips
Factored O.T. M(WL), "1.6W":	4082.1	ft-kips
Factored OT (MW-Msoil), M1	4011.22	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	2.89	ft
Sum of Soil Wedges Wt:	34.05	kips
Soil Wedges ecc, K1:	5.17	ft
Ftg+Soil above Pad wt:	427.2	kips
Unfactored (Total ftg-soil Wt):	461.25	kips
1.2D. **No Soil Wedges.**	551.04	kips
0.9D. **With Soil Wedges**	443.93	kips

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

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	32	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	29	kips
Unfactored WL Moment, M:	2741	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	38.4	kips
0.90	0.9D+1.6W, Pu:	28.8	kips
1.35	Vu:	39.15	kips
	Mu:	3700.35	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	551.04	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	4011.22	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	7.28	ft
Orthogonal qu=	5.06	ksf
qu/ϕ*qn Ratio=	**56.26%**	Pass

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	5.15	ft
Diagonal qu=	5.85	ksf
qu/ϕ*qn Ratio=	**64.98%**	Pass

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	443.93	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	3852.92	ft-kips

Orthogonal ecc3 = M2/P2 =	8.68	ft
Ortho Non Bearing Length,NBL=	17.36	ft
Orthogonal qu=	8.40	ksf
Diagonal qu=	7.44	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	2741.00		
M Orthogonal:	2769.84	**98.96%**	Pass
M Diagonal:	2769.84	**98.96%**	Pass

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#: *876335*
Site Name: *East Farmington, CT*
App #: *145061; Rev:0*

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	51	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	49.5	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:		in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:	Fillet	**
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	43.58	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2228	ft-kips
Unfactored Axial, P:	32	kips
Unfactored Shear, V:	29	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	172.1 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	88.3% Pass

Base Plate Results Flexural Check

Base Plate Stress:	42.8 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	85.6% Pass

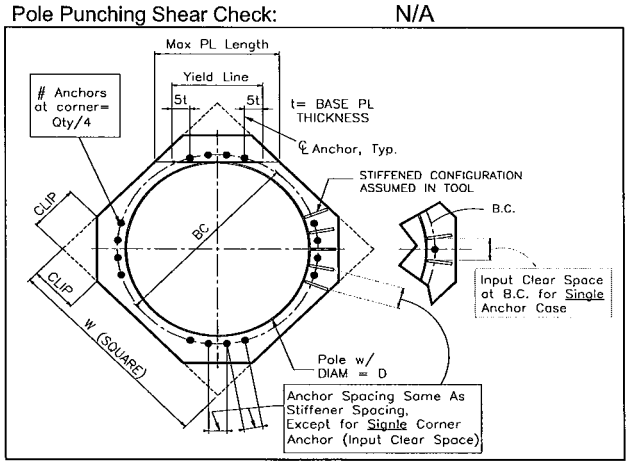
PL Ref. Data
Yield Line (in):
26.42
Max PL Length:
26.42

N/A - Unstiffened
Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

APPENDIX D

TOWER MODIFICATION DRAWINGS

MODIFICATIONS BASED ON STRUCTURAL ANALYSIS FROM B+T ENGINEERING DATED 05/04/12 AND ACCOMPANIED BY ANALYSIS FROM B+T GROUP DATED 07/10/12.

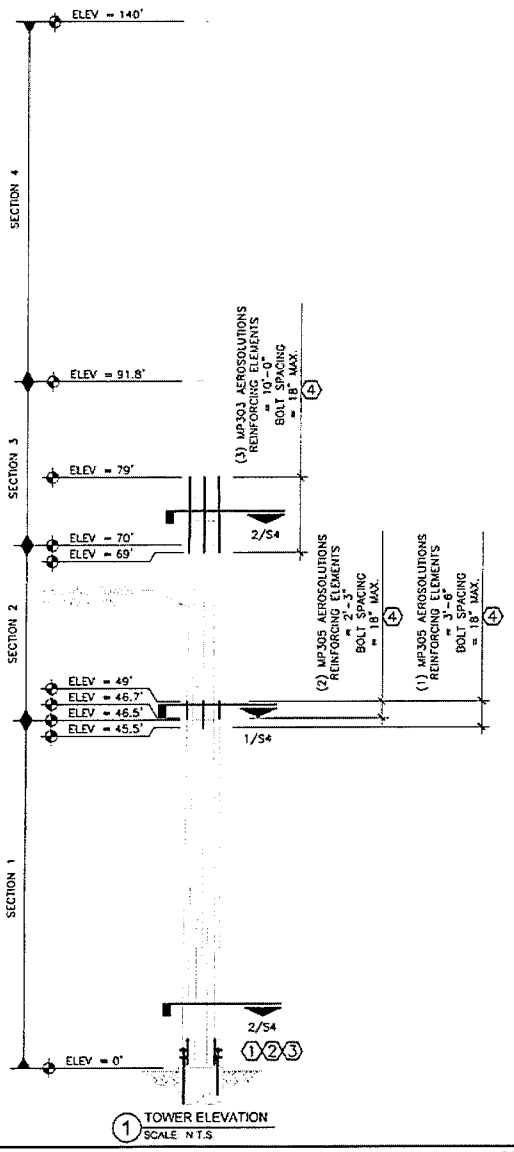
EXISTING MEMBER SCHEDULE

SECTION	NUMBER OF SIDES	THICKNESS	BOTTOM DIAMETER	TOP DIAMETER
1	12	0.375"	43.580"	33.122"
2	12	0.313"	34.670"	28.380"
3	12	0.313"	28.380"	24.724"
4	12	0.250"	25.389"	16.000"

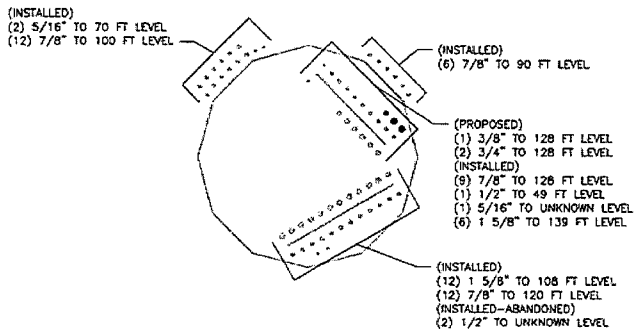
TOWER MODIFICATIONS:

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 MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DISTRIBUTION DIAGRAM
   RE: DETAIL 2/S1.
3. INSTALL NEW ANCHOR RODS
   RE: SHEET S3.
4. INSTALL NEW AEROSOLUTION MP3 REINFORCING ELEMENTS
   RE: SHEET S4.

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



1 TOWER ELEVATION
SCALE: N.T.S.



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

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 ALL FIELD CONNECTIONS SHALL BE MADE WITH A325X BOLTS, U.N.O.
1.6 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.
1.7 ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CCUSA POLICY "CUTTING AND WELDING PLAN" (DOC #ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.

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 2 WEEKS PRIOR TO FABRICATION.

KEY NOTES

(#) TOWER MODIFICATION I.D.

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

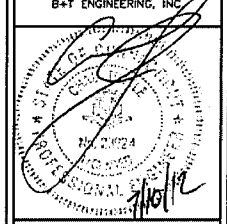
CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/10/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.005
PROJECT ENG:	ALI ABBASZADEH
DRAWN BY:	TEW
CHECKED BY:	SSV

B+T ENGINEERING, INC.



EAST FARMINGTON
876336
3 A BIRDSEYE ROAD
FARMINGTON, CT
EXISTING 140' MONOPOLE

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

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 APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS 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.
N/A	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
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.
X	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.
X	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 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
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 DUE TO FIELD CONDITIONS.
		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.
X	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 INSPECTOR 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
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
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

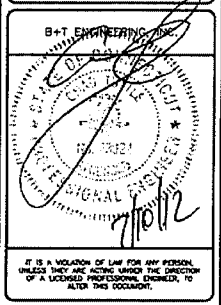
CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/10/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.005
PROJECT ENG:	ALI ABRASZADEH
DRAWN BY:	TEW
CHECKED BY:	SSV

B+T ENGINEERING, INC.

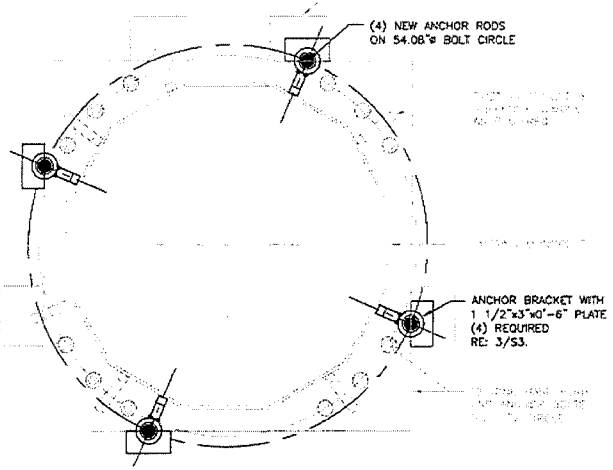


IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

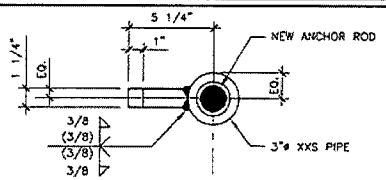
EAST FARMINGTON
876336
3 A BIRDSEYE ROAD
FARMINGTON, CT
EXISTING 140'
MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

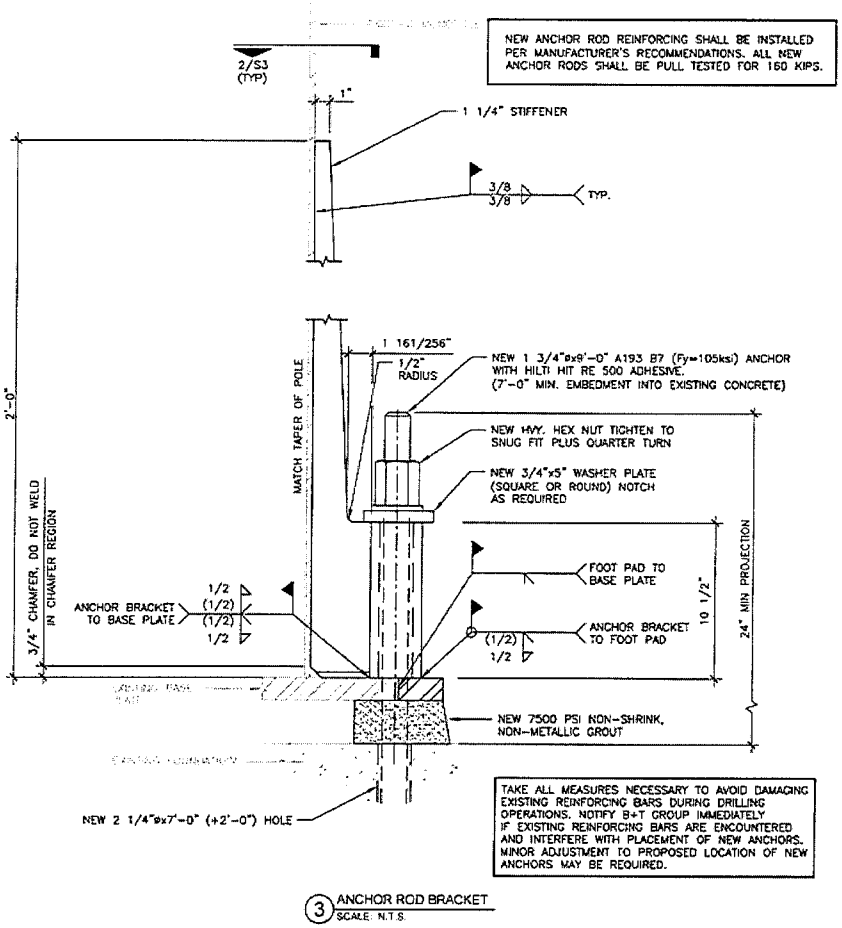
SHEET NUMBER:	REVISION:
S2	0



1 ANCHOR ROD DETAIL
SCALE: N.T.S.



2 ANCHOR ROD BRACKET PLAN
SCALE: N.T.S



3 ANCHOR ROD BRACKET
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
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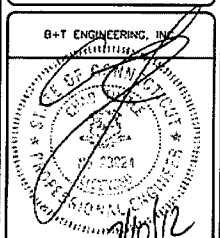
CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/10/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.005
PROJECT ENG.	ALI ABBASZADEH
DRAWN BY:	TEW
CHECKED BY:	SSV

B+T ENGINEERING, INC.

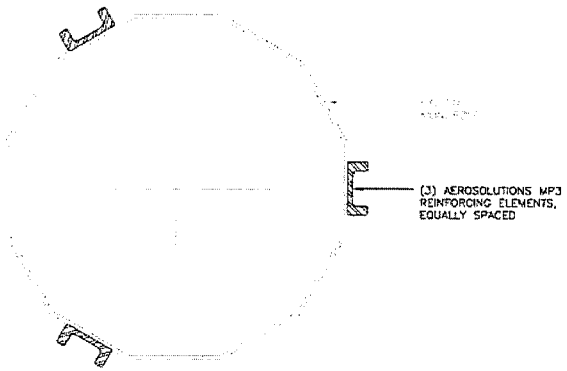


EAST FARMINGTON
876336
3 A BIRDSEYE ROAD
FARMINGTON, CT

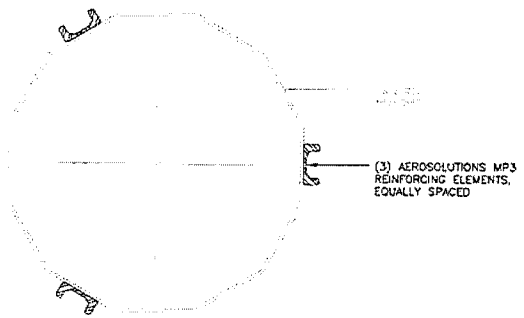
EXISTING 140' MONOPOLE

SHEET TITLE
ANCHOR ROD SECTIONS AND DETAILS

SHEET NUMBER	REVISION
S3	0



1 TOWER SECTION (45.5'-49')
SCALE: N.T.S.



2 TOWER SECTION (69'-79')
SCALE: N.T.S.

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SUITE 300
TULSA, OK 74119
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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/10/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	77969.005
PROJECT ENG:	ALI ABBASZADEH
DRAWN BY:	TEW
CHECKED BY:	SSV

B+T ENGINEERING, INC.

EAST FARMINGTON
876336
3 A BIROSEYE ROAD
FARMINGTON, CT
EXISTING 140'
MONOPOLE

SHEET TITLE
TOWER SECTIONS
45.5'-49' AND 69'-79'

SHEET NUMBER: S4
REVISION: 0