Crown Castle
3530 Toringdon Way
Suite 300
Charlotte, NC 28277

Tel: 704-405-6600

www.crowncastle.com

April 10, 2014

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

RE: **T-Mobile-Exempt Modification - Crown Site BU: 876335**
T-Mobile Site ID: CTHA233B
Located at: 130 Birdseye Road, Farmington, CT 06030

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of T-Mobile. T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement their Modernization technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Mrs. Kathleen A. Eagen, Manager for Town of Farmington.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **130 Birdseye Road, Farmington, CT 06030**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile's operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 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 the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. T-Mobile's replacement antennas will be located at the same elevation on the existing tower.

2. There will be no proposed modifications to the ground and no extension of boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for T-Mobile's modified facility is included as Exhibit-3.

5. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.

For the foregoing reasons, T-Mobile respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Donna Neal.

Sincerely,

Jeff Barbadora
Real Estate Specialist

Enclosure

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mrs. Kathleen A. Eagen, Manager
Town of Farmington
1 Monteith Drive
Farmington, CT 06032

T-Mobile

NORTHEAST LLC.

SITE NAME: CT233/GLOBAL SIGNAL MP

SITE ID NUMBER: CTHA233B

SITE ADDRESS: 130 BIRDSEYE ROAD
FARMINGTON, CT 06030

PROJECT SUMMARY

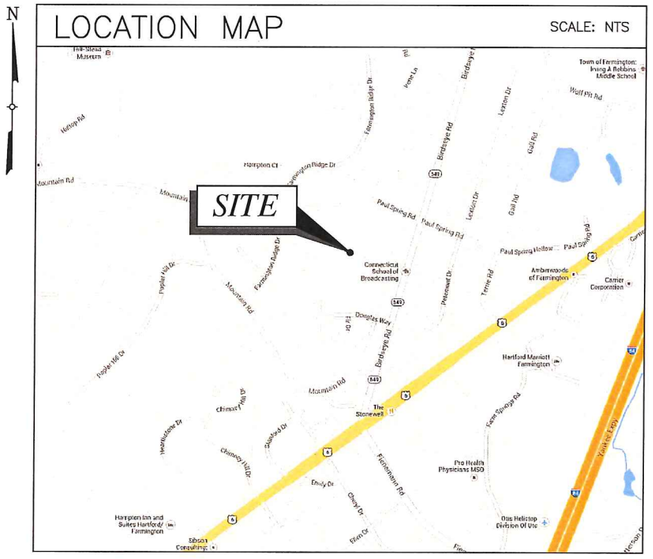
SITE ID NUMBER:	CTHA233B
SITE NAME:	CT233/GLOBAL SIGNAL MP
CROWN BU#:	876335
SITE ADDRESS:	130 BIRDSEYE ROAD FARMINGTON, CT 06030
COUNTY:	HARTFORD
PROPERTY OWNER:	CROWN CASTLE USA
APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06032 PHONE: (800) 692-7100
ENGINEER/ SURVEYOR/ STRUCTURAL ENG:	TECTONIC ENGINEERING CONSULTANTS P.C. 1279 ROUTE 300 NEWBURGH, NY 12550
CONTACT:	TAMMY NOSEK
PHONE:	(845) 567-6656 EXT. 2807
SITE ACQUISITION:	CROWN CASTLE 1200 MACARTHUR BLVD SUITE 200 MAHWAH, NJ 07430
CONTACT:	PAUL HUGHES
PHONE:	(585) 259-7604
PARCEL INFO:	0119-3A
LATITUDE: (NAD 83)	41.71918° N
LONGITUDE: (NAD 83)	72.80973° W

SITE DIRECTIONS

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TAKE THE 1ST RIGHT ONTO W NEWBERRY RD. TURN RIGHT ONTO WOODLAND AVE. TURN RIGHT ONTO WINTONBURY AVE. TURN LEFT ONTO CT-189 S-TUNXIS AVE. TAKE THE 1ST RIGHT ONTO CT-178 W-MOUNTAIN AVE. TURN LEFT ONTO CT-185 E-SIMSBURY RD. SLIGHT RIGHT ONTO MOUNTAIN RD. TURN RIGHT ONTO FARMINGTON AVE. TURN LEFT ONTO SOUTH RD. TAKE THE 1ST RIGHT ONTO BIRDSEYE RD. DESTINATION WILL BE ON THE RIGHT AT 130 BIRDSEYE RD, FARMINGTON, CT 06032.

LOCATION MAP

SCALE: NTS



SHEET INDEX

SHEET NO	DESCRIPTION	REV NO
T-1	TITLE SHEET	1
A-1	SITE PLAN	1
A-2	EQUIPMENT LAYOUT PLANS	1
A-3	ELEVATION & DETAIL	1
A-4	ANTENNA LAYOUT PLANS & DETAILS	1
A-5	DETAILS	1
A-6	DETAILS	1
A-7	NOTES	1
A-8	NOTES	1

THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL ITEMS HAVE BEEN ADDRESSED AND EACH OF THE DRAWINGS HAS BEEN REVISED AND ISSUED "FOR CONSTRUCTION".

811 Know what's **below.** **Call** before you dig.

CONFIGURATION
2C
REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3
ORIGINAL SIZE IN INCHES

TECTONIC
- PLANNING
- ENGINEERING
- SURVEYING
- CONSTRUCTION MANAGEMENT

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Fax: (845) 567-8703

T-Mobile
T-MOBILE NORTHEAST LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
PHONE: (860) 692-7100

CROWN CASTLE

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
7061.CTHA233B	JQ

REV	DATE	REVISION	DRAWN BY
0	04/07/14	FOR COMMENT	SF
1	04/08/14	FOR CONSTRUCTION	AS

ISSUED BY	DATE

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

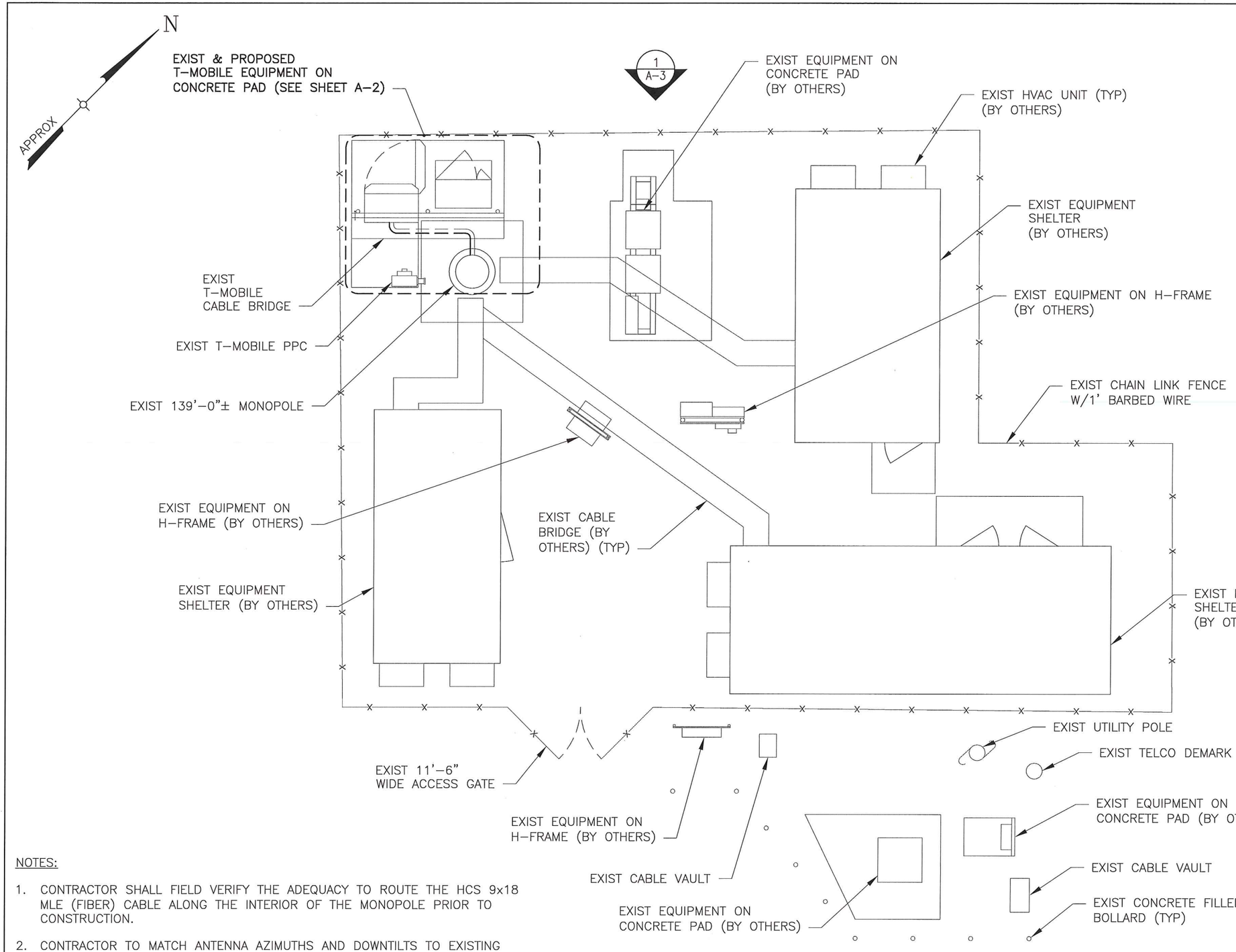
CTHA233B
CT233/GLOBAL SIGNAL MP
130 BIRDSEYE ROAD
FARMINGTON, CT 06030

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



NOTES:

1. CONTRACTOR SHALL FIELD VERIFY THE ADEQUACY TO ROUTE THE HCS 9x18 MLE (FIBER) CABLE ALONG THE INTERIOR OF THE MONOPOLE PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO MATCH ANTENNA AZIMUTHS AND DOWNTILTS TO EXISTING CONDITION AND NOTIFY RF ENGINEER OF ANY DISCREPANCY.
3. LOCK & TAG BREAKERS FOR ALL EQUIPMENT BEING TURNED OFF (WHEN APPLICABLE).
4. CONTRACTOR TO RE–VERIFY CABLE LENGTHS PRIOR TO CONSTRUCTION.
5. SEE RFDS FOR FINAL EQUIPMENT CONFIGURATION.

1 / A–1 SITE PLAN

SCALE: 1/8" = 1'–0'

CONFIGURATION
2C
REFER TO LATEST T–MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

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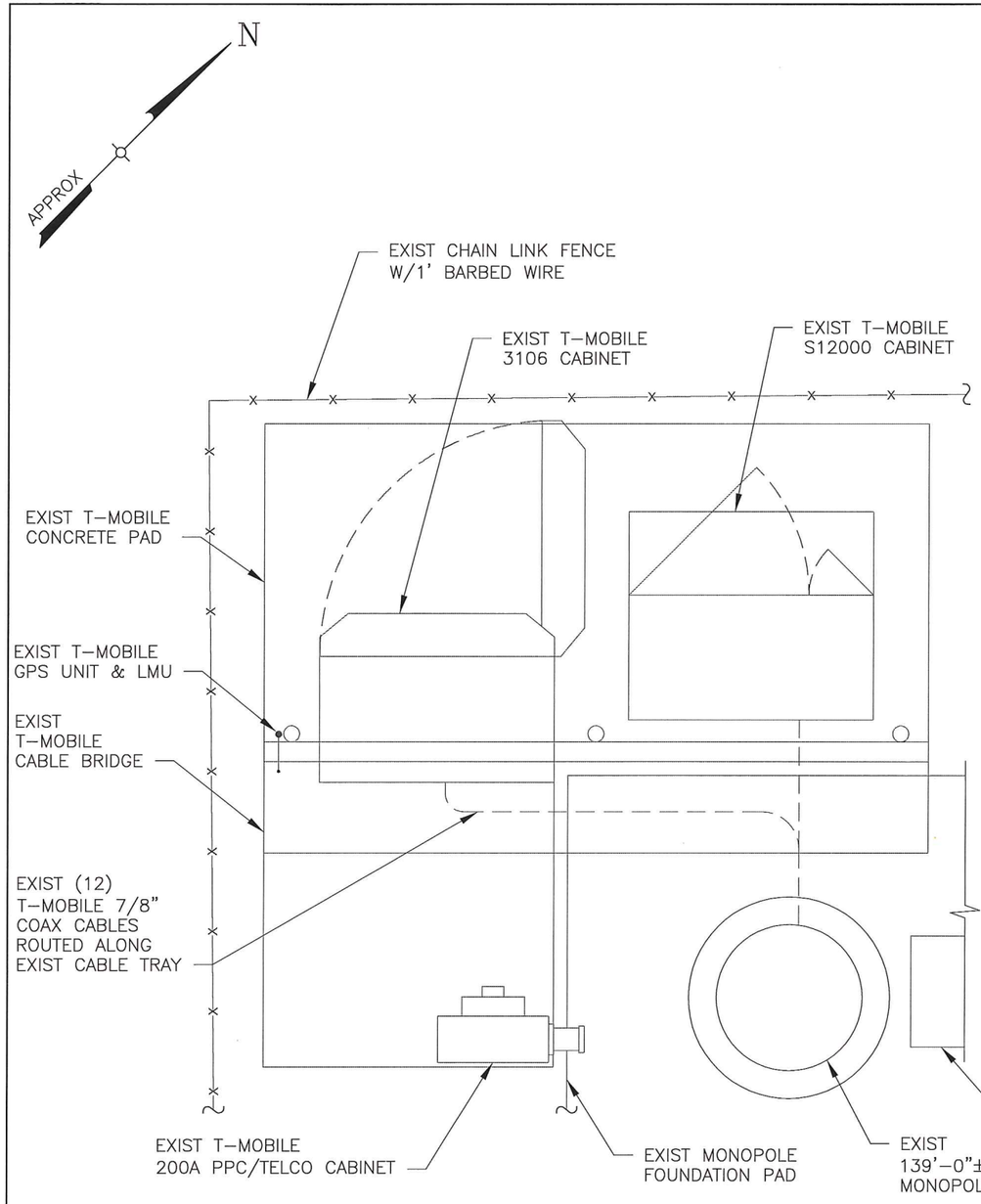
SHEET TITLE

SITE PLAN

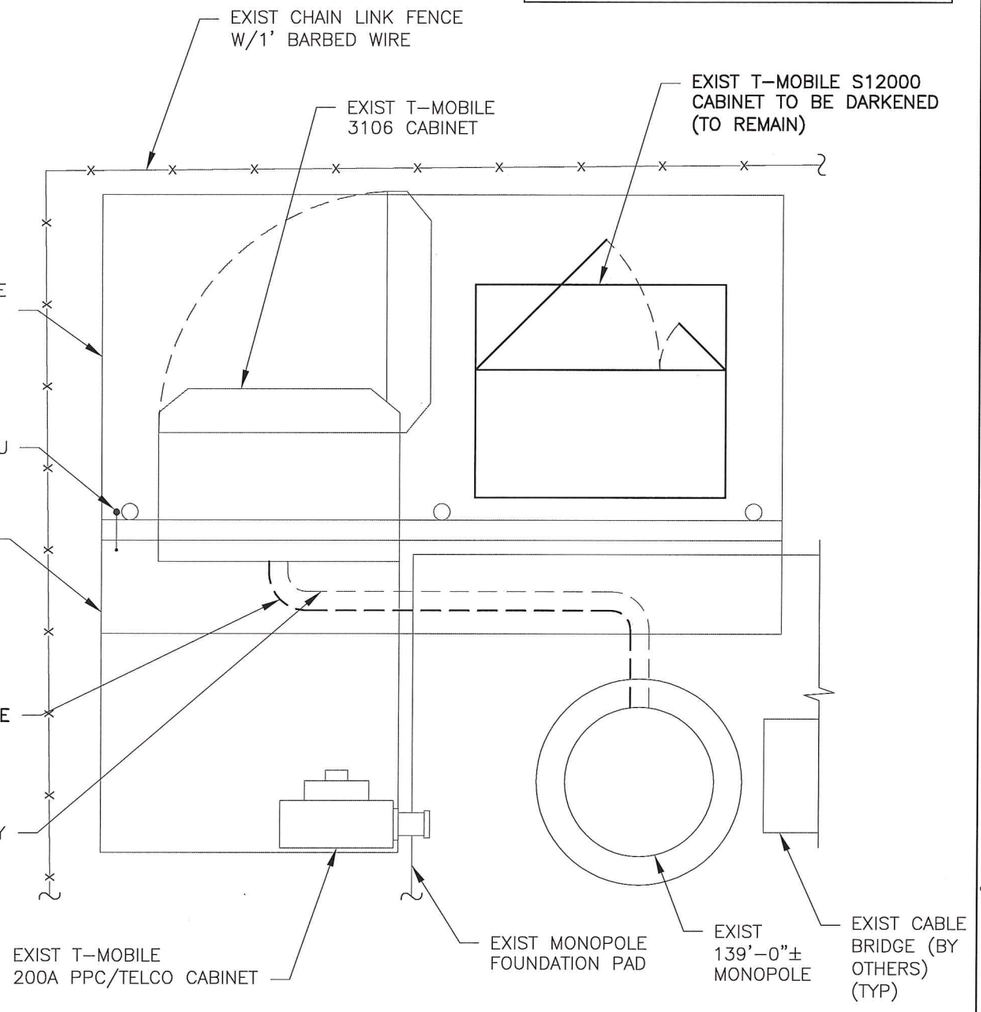
SHEET NUMBER

A–1



1 A-2 EXIST EQUIPMENT PLAN

SCALE: 3/8" = 1'-0'



2 A-2 PROPOSED EQUIPMENT PLAN

SCALE: 3/8" = 1'-0'

HCS LENGTH			
FROM EQUIPMENT CABINET TO ANTENNA			
SECTOR	ALPHA	BETA	GAMMA
LENGTH	120'±	120'±	120'±
SIZE	1"		
HCS 9x18 MLE			

CONFIGURATION
2C
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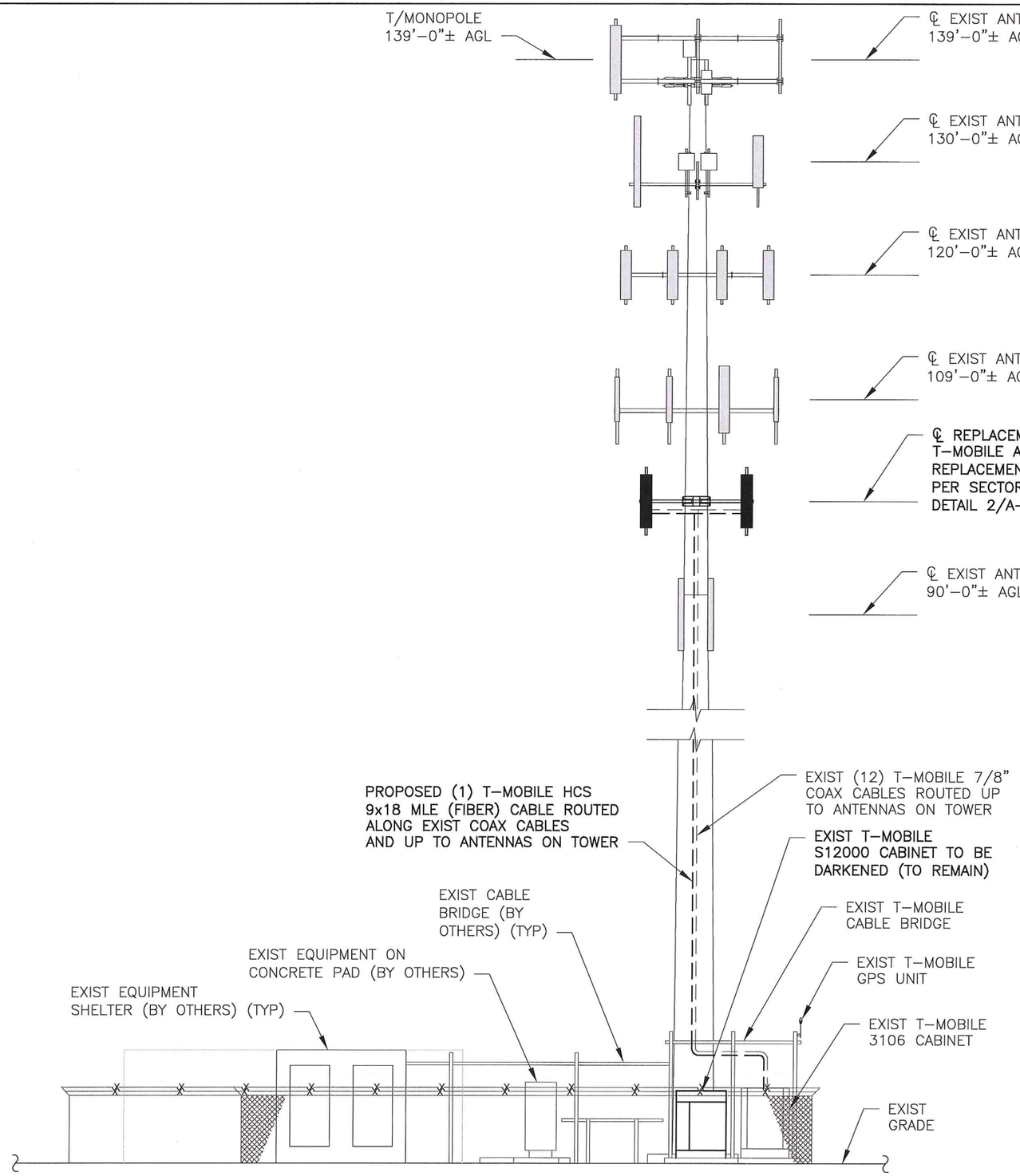
SHEET TITLE

EQUIPMENT LAYOUT PLANS

SHEET NUMBER

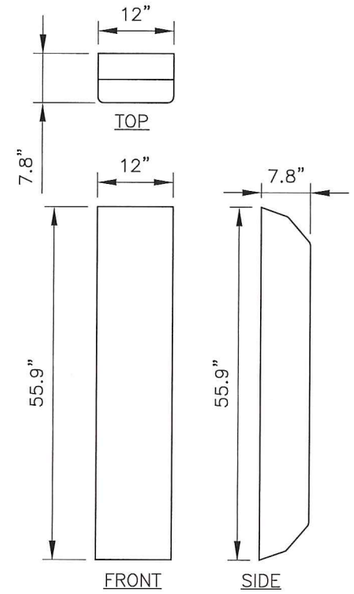
A-2



1 / A-3 ELEVATION

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

THE PROPOSED INSTALLATION, PROPOSED MOUNTS & EXISTING MONOPOLE SHALL BE STRUCTURALLY ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS)



AIR 21

2 / A-3 ANTENNA DETAIL

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

ELEVATION NOTE:

ELEVATION OF EXIST MONOPOLE HAS BEEN ARBITRARILY ASSIGNED AS EL 553'-0"±. THIS IS APPROXIMATELY 139'-0"± ABOVE GRADE WHICH WAS ESTIMATED AS EL 414'-0"± TAKEN FROM U.S.G.S. QUAD MAP, AND DOES NOT NECESSARILY CORRESPOND TO ACTUAL ELEVATION ABOVE SEA LEVEL. ALL OTHER ELEVATIONS INDICATED WERE DETERMINED ON THIS BASIS.

CONFIGURATION
2C

REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

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CROWN CASTLE

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LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

CTHA233B
CT233/GLOBAL SIGNAL MP
130 BIRDSEYE ROAD
FARMINGTON, CT 06030

SHEET TITLE

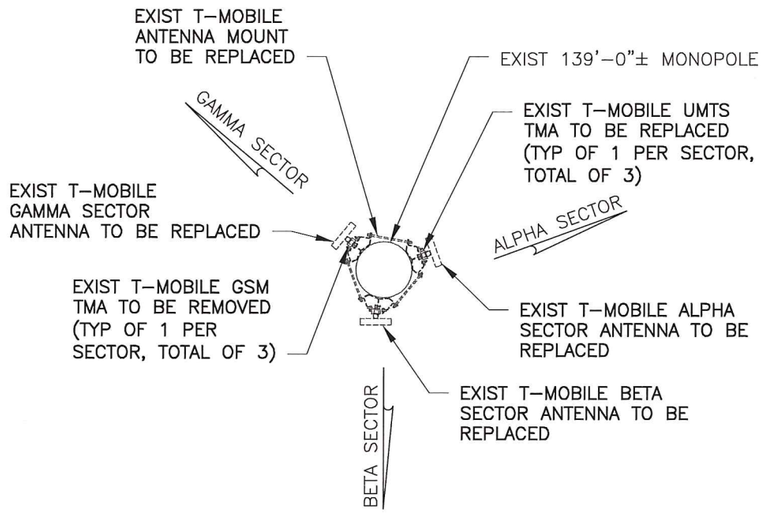
ELEVATION & DETAIL

SHEET NUMBER

A-3

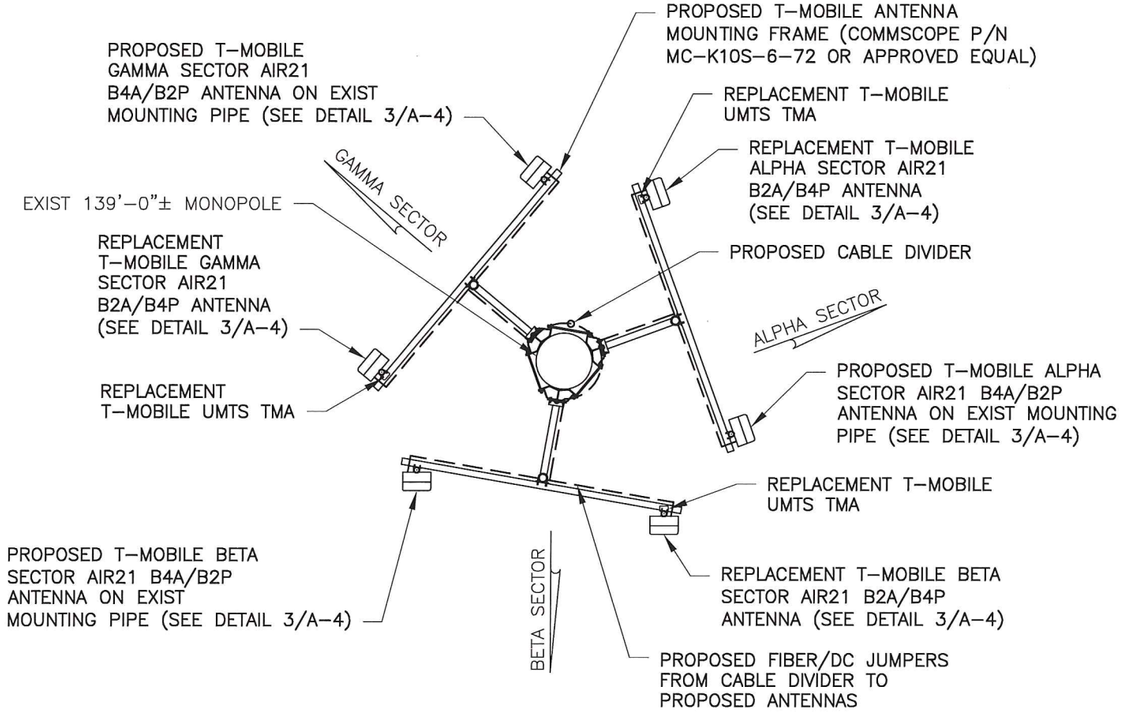
N

APPROX



1 / A–4 EXIST ANTENNA PLAN

SCALE: 3/16" = 1'–0"



2 / A–4 PROPOSED ANTENNA PLAN

SCALE: 3/16" = 1'–0"

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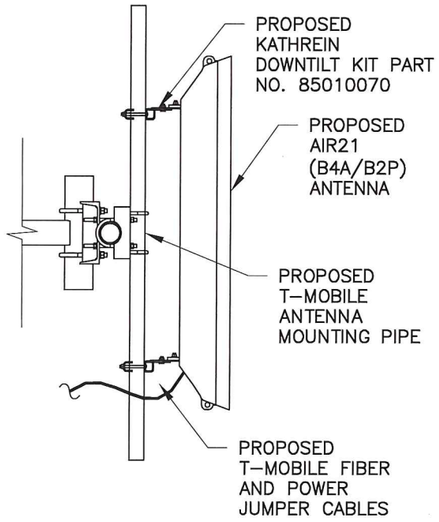
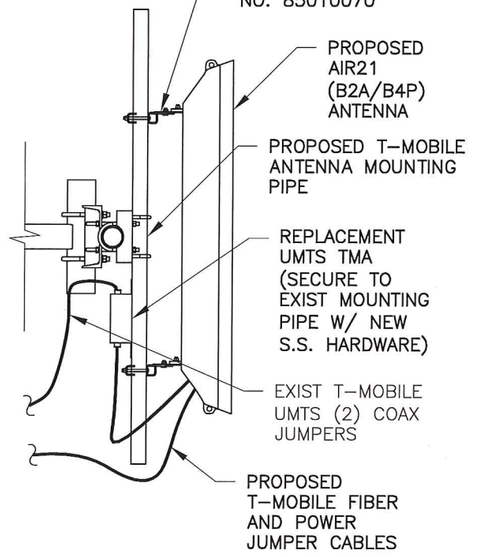
EXIST ANTENNA SCHEDULE

SECTOR	MAKE	QUANTITY	MODEL#	SIZE
ALPHA	RFS	1	APX16DWV–16DWV	55.9x13.3x3.15
BETA	RFS	1	APX16DWV–16DWV	55.9x13.3x3.15
GAMMA	RFS	1	APX16DWV–16DWV	55.9x13.3x3.15

PROPOSED ANTENNA SCHEDULE

SECTOR	MAKE	QUANTITY	MODEL#	SIZE
ALPHA	ERICSSON	1	AIR21 B2A/B4P	12x8x56
	ERICSSON	1	AIR21 B4A/B2P	12x8x56
BETA	ERICSSON	1	AIR21 B2A/B4P	12x8x56
	ERICSSON	1	AIR21 B4A/B2P	12x8x56
GAMMA	ERICSSON	1	AIR21 B2A/B4P	12x8x56
	ERICSSON	1	AIR21 B4A/B2P	12x8x56





3 / A–4 ANTENNA DETAIL

SCALE: 1/2" = 1'–0"

CONFIGURATION
2C
REFER TO LATEST T–MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

ORIGINAL SIZE IN INCHES

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NEWBURGH, NY 12550
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T-Mobile

T–MOBILE NORTHEAST LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
PHONE: (860) 692–7100

CROWN CASTLE

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
7061.CTHA233B	JQ

REV	DATE	REVISION	DRAWN BY
0	04/07/14	FOR COMMENT	SF
1	04/08/14	FOR CONSTRUCTION	AS

ISSUED BY | DATE

SITE INFORMATION

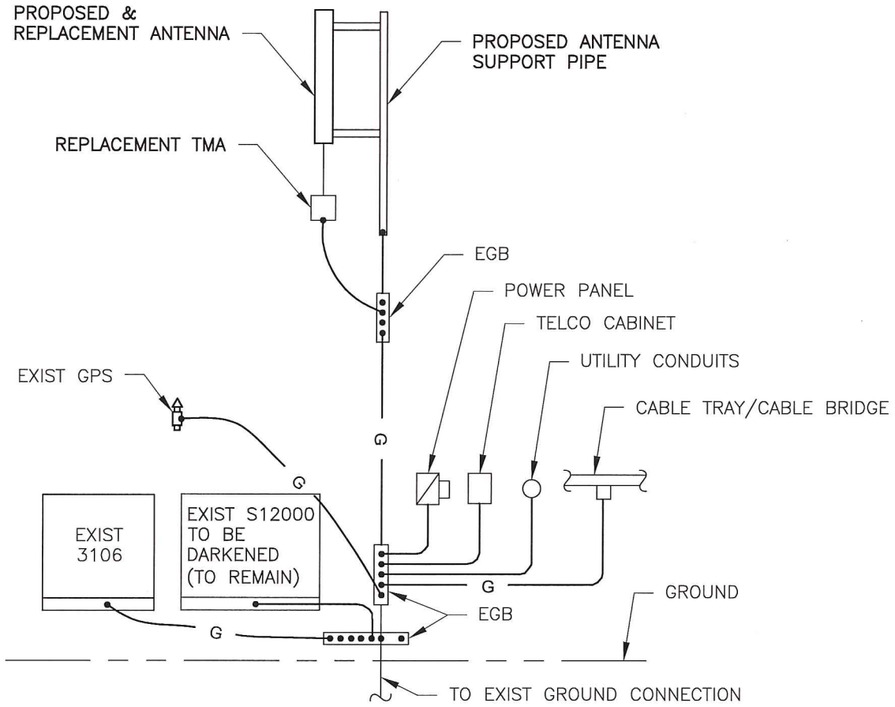
CTHA233B
CT233/GLOBAL SIGNAL MP
130 BIRDSEYE ROAD
FARMINGTON, CT 06030

SHEET TITLE

ANTENNA LAYOUT PLANS & DETAILS

SHEET NUMBER

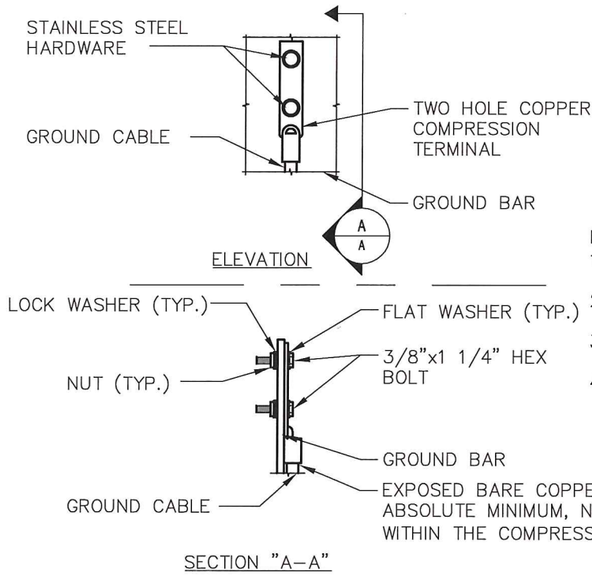
A–4



1 / A-5

GROUNDING RISER DIAGRAM

SCALE: NTS

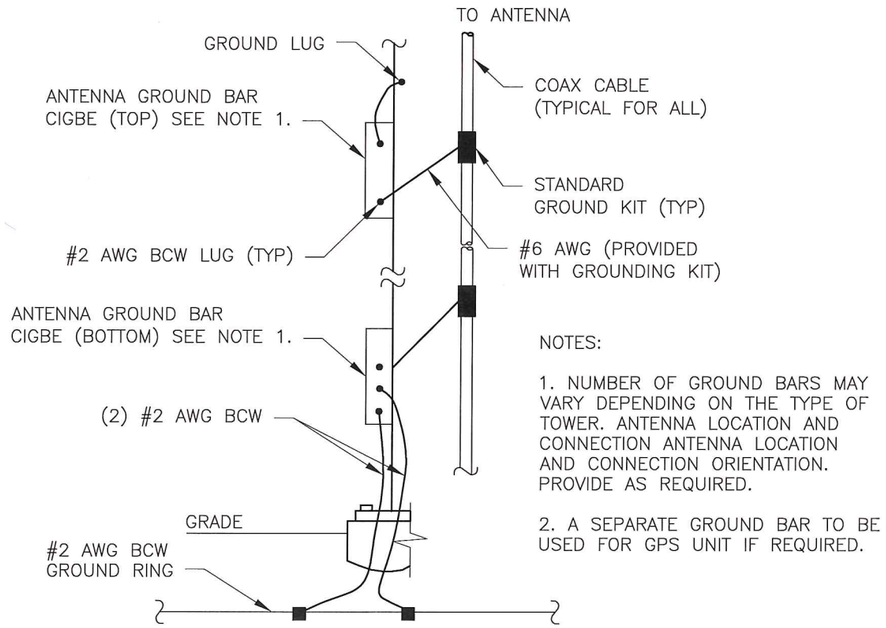


NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.
4. ALL GROUND LUGS MUST NE HEAT SHRUNK AT WIRE/LUG CONNECTION.

2 / A-5

GROUNDING BAR CONN. DETAIL

SCALE: NTS



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

2. A SEPARATE GROUND BAR TO BE USED FOR GPS UNIT IF REQUIRED.

3 / A-5

ANTENNA CABLE GROUNDING

SCALE: NTS

CONFIGURATION
2C
REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

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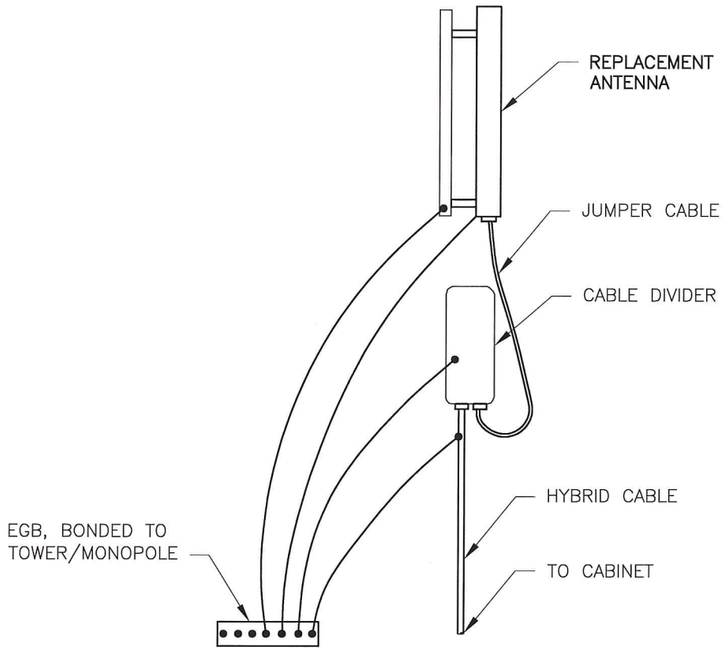
SHEET TITLE

DETAILS

SHEET NUMBER

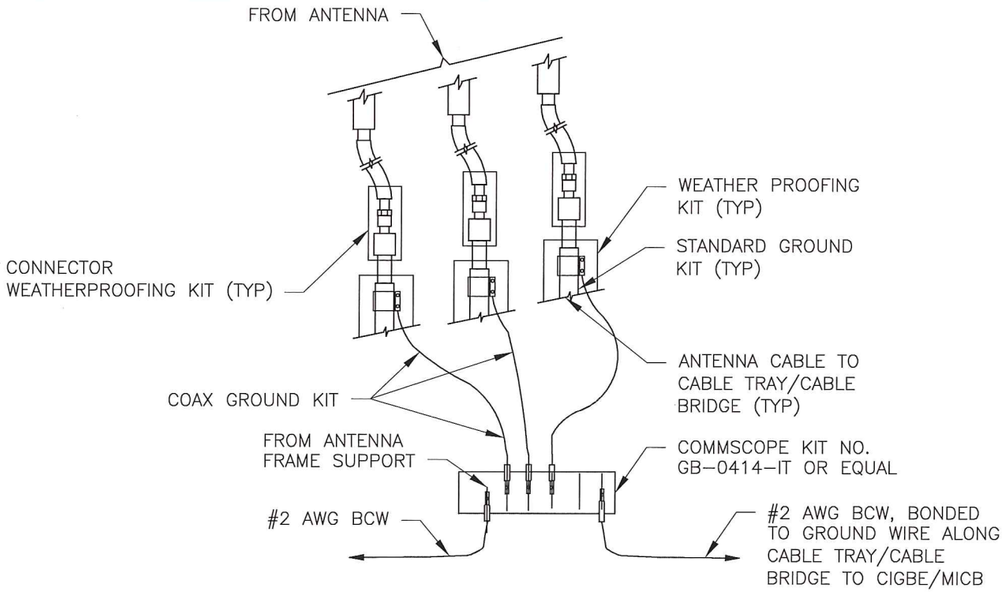
A-5



HYBRID CABLE CONNECTION AND GROUNDING DETAIL

1 / A-6

SCALE: NTS

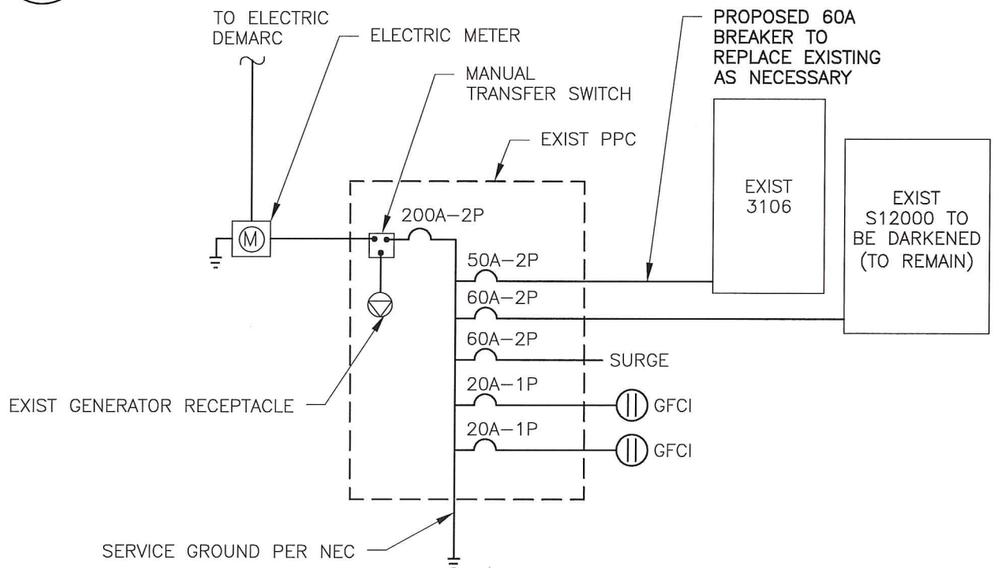


NOTE:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

2 / A-6

SCALE: NTS



NOTE: CONTRACTOR TO VERIFY EXISTING CONDUCTORS ARE #6AWG OR LARGER FOR 60A CIRCUIT

ONE-LINE POWER DIAGRAM

3 / A-6

SCALE: NTS

CONFIGURATION
2C
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0 1 2 3

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SHEET TITLE

DETAILS

SHEET NUMBER

A-6

GENERAL NOTES

1. CONTRACTOR SHALL NOT COMMENCE ANY WORK UNTIL HE OBTAINS, AT HIS OWN EXPENSE, ALL INSURANCE REQUIRED BY T–MOBILE, THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
2. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATE "ISSUED FOR PERMIT"
3. THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
4. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES OR OTHER PUBLIC AUTHORITIES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THIS PROJECT IN ACCORDANCE WITH THE OVERALL INTENT OF THESE DRAWINGS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
8. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
9. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
10. POWER TO THE FACILITY IS MONITORED BY AN EXISTING METER.
11. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
12. CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
13. IF ANY PIPING EXISTS BENEATH THE SITE AREA, CONTRACTOR MUST LOCATE IT AND CONTACT OWNER'S REPRESENTATIVE.
14. THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
15. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.
16. THE CONTRACTOR IS TO REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. THE CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUB–CONTRACTORS AND RELATED PARTIES. THE SUB–CONTRACTOR SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
17. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
18. ALL MATERIAL PROVIDED BY T–MOBILE IS TO BE REVIEWED BY THE CONTRACTOR AND ALL APPLICABLE SUB–CONTRACTORS PRIOR TO INSTALLATION. ANY DEFICIENCIES TO PROVIDE MATERIALS SHALL BE BROUGHT TO THE CONSTRUCTION MANAGER'S ATTENTION IMMEDIATELY.
19. THE MATERIALS INSTALLED SHALL MEET REQUIREMENTS OF CONTRACTORS DOCUMENTS. NO SUBSTITUTIONS ARE ALLOWED.
20. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.

GENERAL NOTES

21. THE CONTRACTOR SHALL RECEIVE CLARIFICATION AND AUTHORIZATION IN WRITING TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONSTRUCTION DOCUMENTS.
22. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
23. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST–ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAND PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
24. THE CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
26. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS MAY TAKE PRECEDENCE.
27. THE CONTRACTOR SHALL REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
28. THE CONTRACTOR SHALL KEEP CONTRACT AREA CLEAN, HAZARD FREE AND DISPOSE OF ALL DEBRIS AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITIONS AND FREE FROM PAINT SPOTS, DUST OR SMUDGES OF ANY NATURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
29. BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORK, UNUSED AND USELESS MATERIALS, RUBBISH AND TEMPORARY STRUCTURES.
30. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2005 CONNECTICUT STATE BUILDING CODE (INCLUDING AMENDMENTS) AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
31. CONTRACTOR SHALL VISIT THE JOB SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
32. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT AND APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
33. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
34. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.

CONFIGURATION

2C

REFER TO LATEST T–MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

ORIGINAL SIZE IN INCHES

TECTONIC

- PLANNING
- ENGINEERING
- SURVEYING
- CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Survey Consultants P.C.

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T–Mobile

T–MOBILE NORTHEAST LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
PHONE: (860) 692–7100

CROWN CASTLE

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
7061.CTHA233B	JQ

REV	DATE	REVISION	DRAWN BY
0	04/07/14	FOR COMMENT	SF
1	04/08/14	FOR CONSTRUCTION	AS

ISSUED BY	DATE

STATE OF CONNECTICUT
ANTONIO A GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

CTHA233B
CT233/GLOBAL SIGNAL MP
130 BIRDSEYE ROAD
FARMINGTON, CT 06030

SHEET TITLE

NOTES

SHEET NUMBER

A–7

GROUNDING NOTES

1. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
2. ALL GROUNDING WORK SHALL BE IN ACCORDANCE WITH T–MOBILE STANDARD PRACTICE.
3. ALL BUS CONNECTORS SHALL BE TWO–HOLE, LONG–BARREL TYPE COMPRESSION LUGS, T&B OR EQUAL, UNLESS OTHERWISE NOTED ON DRAWINGS. ALL LUGS SHALL BE ATTACHED TO BUSSES USING BOLTS, NUTS, AND LOCK WASHERS. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED.
4. ALL CONNECTORS SHALL BE CRIMPED USING HYDRAULIC CRIMPING TOOLS, T&B #TBM 8 OR EQUIVALENT.
5. ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FILED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A NON–OXIDIZING AGENT APPLIED PRIOR TO INSTALLATION.
6. ALL COPPER BUSSES SHALL BE CLEANED, POLISHED, AND A NON–OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.
7. ALL BENDS SHALL BE AS SHALLOW AS POSSIBLE, WITH NO TURN SHORTER THAN AN 8–INCH NOMINAL RADIUS.
8. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2. ALL GROUNDING CONDUCTORS SHALL RUN THROUGH PVC SLEEVES WHEREVER CONDUCTORS RUN THROUGH WALLS, FLOORS, OR CEILINGS. IF CONDUCTORS MUST RUN THROUGH EMT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.
9. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 10 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE PROJECT MANAGER FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE.
10. ALL ROOF TOP ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 GROUND WIRE CONNECTED TO THE NEAREST GROUND BUS. ALL CONNECTIONS ARE TO BE CAD–WELDED IF POSSIBLE.
11. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE PROJECT MANAGER.
12. GROUNDING CONNECTION TO TRAVEL IN A DOWNWARD DIRECTION.
13. ALL EXPOSED #2 WIRE MUST BE TINN NOT BTW.
14. TECTONIC TAKES NO RESPONSIBILITY OR LIABILITY FOR THE GROUNDING SYSTEM AS SHOWN ON THIS SITE. THIS IS A STANDARD GROUNDING SYSTEM.

TECTONIC

- PLANNING
- ENGINEERING
- SURVEYING
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CROWN CASTLE

APPROVALS

LANDLORD _____
RF _____
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STATE OF CONNECTICUT
ANTONIO A. QUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

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CT233/GLOBAL SIGNAL MP
130 BIRDSEYE ROAD
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SHEET TITLE

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SHEET NUMBER

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REFER TO LATEST T–MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

ORIGINAL SIZE IN INCHES

March 27, 2014

Patrick Byrum
Crown Castle
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Charlotte, NC 28277
(704) 405-6532

B+T Group
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Tulsa, OK 74119
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Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CTHA233B
	Carrier Site Name:	CT233/Global Signal MP
Crown Castle Designation:	**Crown Castle BU Number:**	876335
	Crown Castle Site Name:	EAST FARMINGTON
	Crown Castle JDE Job Number:	268443
	Crown Castle Work Order Number:	730472
	Crown Castle Application Number:	223704 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	77969.12.01
Site Data:	**3 A Birdseye Road, Farmington, Hartford County, CT** **Latitude *41° 42' 56.94"*, Longitude *-72° 48' 37.42"*** **140 Foot - Monopole Tower**	

Dear Patrick Byrum,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 628730, in accordance with application 223704, revision 1.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

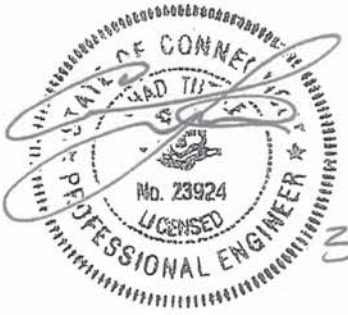
LC4.7: Modified Structure w/Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2003 IBC; 2003 IRC (State Building Code, 2005 CT supplement) based upon a wind speed of 80 mph fastest mile.

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

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

Respectfully submitted by:
B+T Engineering, Inc.



3/27/14

Kishore Machani
Project Engineer

Chad E. Tuttle, P.E.
President

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft. monopole designed by Summit in November of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.This tower has been reinforced in 2008 & modified in 2012 and 2013 by B+T Group and those modifications are incorporated in this analysis. The proposed B+T Group Mods dated: 02/10/2014 ware also considered 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
100.0	100.0	3	Ericsson	ERICSSON AIR 21 B2A B4P	1	1 5/8	--
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		1	--	T-Arm Mount [TA 702-3]			

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	3	Rfs Celwave	APXV9ERR18-C-A20	3	1 1/4	1
		1	--	Platform Mount [LP 601-1]			
137.0	140.0	3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER	--	--	1
	137.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz			
		1	--	Side Arm Mount [SO 102-3]			
129.0	130.0	6	Ericsson	RRUS-11	--	--	1
	129.0	1	--	Side Arm Mount [SO 102-3]			
128.0	130.0	3	Ericsson	RRUS-11	--	--	2
		2	Kmw	AM-X-CD-16-65-00T-RET	9 2 1	7/8 3/4 3/8	1
		1	Andrew	SBNH-1D6565C			
		3	Powerwave	7770.00			
		1	Raycap	DC6-48-60-18-8F			
	128.0	6	Powerwave	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]			
110.0	110.0	1	Raycap	TME-DB-T16Z-8AB-0Z	--	--	2
		1	--	Side Arm Mount [SO 102-1]			
108.0	109.0	3	Antel	BXA-171063-12CF-EDIN-2	1	1 5/8	2
		3	Antel	BXA-70063-4CF-EDIN-X			
		1	Kathrein	800 10735V01			
		3	Antel	BXA-185060/8CFx2	12	1 5/8	1
		2	Antel	BXA-70063-6CF-EDIN-4			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		6	Rfs Celwave	FD9R6004/2C-3L			
	108.0	1	--	Platform Mount [LP 304-1]			
		3	Alcatel Lucent	RRH2x40-AWS	--	--	2
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**	**--**	**--**	**3**
		1	**--**	**Side Arm Mount [SO 102-3]**			
90.0	90.0	3	Kathrein	742 213	6	7/8	1
		1	--	Pipe Mount [PM 601-3]			
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) Reserved Equipment
3) Equipment To Be Removed

Table 3 - Design Antenna and Cable Information

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

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	T-Mobile Co-Locate Revision #1	223704	CCI Sites
Tower Manufacturing Drawing	Summit Manufacturing, Dtd 11/03/1997	1615361	CCI Sites
Tower Modification Drawing	B&T Engineering, Project No.79807	Date:12/09/2008	CCI Sites
Tower Modification Drawing	B&T Engineering, Project No.77969.005	Date:07/10/2012	CCI Sites
Post Modification Inspection	TEP, Project No:127152	3413367	CCI Sites
Tower Modification Drawings	B&T Engineering, Project No.77969.007.01	Date:03/04/2013	CCI Sites
Tower Modification Drawings	B&T Engineering, Project No.77969.011.01	Date:02/10/2014	CCI Sites
Foundation Drawing	Summit Manufacturing, Job No.2933	1440555	CCI Sites
Geotech Report	FDH Project Number 1310091600	1531892	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 03/19/2014	CCI Sites

3.1) Analysis Method

TnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Mount areas and weights are assumed based on photographs provided.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)-LC4.7

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	140 - 102.333	Pole	TP23.721x16x0.25	1	-8.183	906.684	92.0	Pass
L2	102.333 - 91.75	Pole	TP25.89x23.721x0.376	2	-10.052	1266.550	82.8	Pass
L3	91.75 - 85.333	Pole	TP26.706x24.724x0.422	3	-12.243	1716.051	88.9	Pass
L4	85.333 - 82.5	Pole	TP27.287x26.706x0.601	4	-12.807	2344.747	72.1	Pass
L5	82.5 - 77.1667	Pole	TP28.38x27.287x0.527	5	-13.904	2207.568	88.6	Pass
L6	77.1667 - 66.667	Pole	TP30.534x28.38x0.512	6	-16.378	2323.192	87.8	Pass
L7	66.667 - 60	Pole	TP31.901x30.534x0.508	7	-17.787	2243.412	94.0	Pass
L8	60 - 46.5	Pole	TP34.67x31.901x0.505	8	-19.934	2334.509	92.6	Pass
L9	46.5 - 44.25	Pole	TP34.506x33.122x0.554	9	-22.471	2658.668	95.9	Pass
L10	44.25 - 27.75	Pole	TP37.89x34.506x0.652	10	-27.269	3481.183	88.9	Pass
L11	27.75 - 24.083	Pole	TP38.642x37.89x0.645	11	-28.381	3516.534	90.3	Pass
L12	24.083 - 18.083	Pole	TP39.872x38.642x0.551	12	-30.289	2998.290	98.0	Pass
L13	18.083 - 0	Pole	TP43.58x39.872x0.626	13	-35.984	4100.215	97.9	Pass
							Summary	
						Pole (L12)	98.0	Pass
						RATING =	**98.0**	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	93.0	Pass
1	Base Plate	Base	90.6	Pass
1	Base Foundation	Base	50.3	Pass

Structure Rating (max from all components) =	98.0%

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

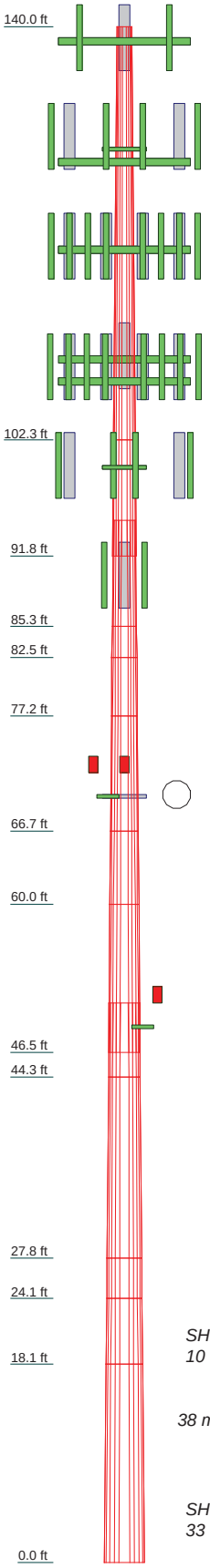
4.1) Recommendations

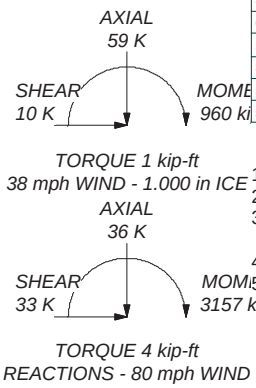
For the determined structural capacity to be effective the modifications proposed in B+T mod drawings, dated 02/10/2014 shall be installed prior to any loading changes.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13
Length (ft)	37.667	10.583	9.667	2.833	5.333	10.500	6.667	13.500	6.750	16.500	3.667	6.000	18.083
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.250	0.376	0.422	0.601	0.527	0.512	0.508	0.505	0.554	0.652	0.645	0.551	0.626
Socket Length (ft)		3.250						4.500					
Top Dia (in)	16.000	23.721	24.724	26.706	27.287	28.380	30.534	31.901	33.122	34.506	37.890	38.642	39.872
Bot Dia (in)	23.721	25.890	26.706	27.287	28.380	30.534	31.901	34.670	34.506	37.890	38.642	39.872	43.580
Grade	A607-60	52.584702ksi	60.01407ksi	56.810582ksi	58.450152ksi	58.742734ksi	54.670493ksi	53.993176ksi	54.865969ksi	55.708333ksi	55.701895ksi	53.739219ksi	59.216199ksi
Weight (K)	2.0	1.0	1.2	0.5	0.9	1.9	1.1	2.6	1.3	4.0	0.9	1.6	4.9





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXV9ERR18-C-A20 w/ Mount Pipe (E)	139	BXA-185060/8CFx2 w/ Mount Pipe (E)	108
APXV9ERR18-C-A20 w/ Mount Pipe (E)	139	BXA-70063-6CF-EDIN-4 w/Mount Pipe (E)	108
APXV9ERR18-C-A20 w/ Mount Pipe (E)	139	BXA-70063-6CF-EDIN-4 w/Mount Pipe (E)	108
(3) 5' x 2' Pipe Mount (E)	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe (R)	108
(3) 5' x 2' Pipe Mount (E)	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe (R)	108
(3) 5' x 2' Pipe Mount (E)	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe (R)	108
Platform Mount [LP 601-1] (E)	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe (R)	108
PCS 1900MHz 4x45W-65MHz (E)	137	BXA-171063-12CF-EDIN-2 w/ Mount Pipe (R)	108
PCS 1900MHz 4x45W-65MHz (E)	137	BXA-171063-12CF-EDIN-2 w/ Mount Pipe (R)	108
PCS 1900MHz 4x45W-65MHz (E)	137	BXA-171063-12CF-EDIN-2 w/ Mount Pipe (R)	108
800MHz 2X50W RRH W/FILTER (E)	137	BXA-171063-12CF-EDIN-2 w/ Mount Pipe (R)	108
800MHz 2X50W RRH W/FILTER (E)	137	800 10735V01 w/ Mount Pipe (R)	108
800MHz 2X50W RRH W/FILTER (E)	137	RRH2x40-AWS (R)	108
Side Arm Mount [SO 102-3] (E)	137	RRH2x40-AWS (R)	108
(2) RRUS-11 (E)	129	RRH2x40-AWS (R)	108
(2) RRUS-11 (E)	129	(2) FD9R6004/2C-3L (E)	108
(2) RRUS-11 (E)	129	(2) FD9R6004/2C-3L (E)	108
5' x 2' Pipe Mount (E)	129	(2) FD9R6004/2C-3L (E)	108
5' x 2' Pipe Mount (E)	129	Platform Mount [LP 304-1] (E)	108
5' x 2' Pipe Mount (E)	129	KRY 112 144/1 (E)	100
Side Arm Mount [SO 102-3] (E)	129	KRY 112 144/1 (E)	100
7770.00 w/ Mount Pipe (E)	128	KRY 112 144/1 (E)	100
7770.00 w/ Mount Pipe (E)	128	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (P)	100
7770.00 w/ Mount Pipe (E)	128	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (P)	100
(2) LGP21401 (E)	128	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (P)	100
(2) LGP21401 (E)	128	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	100
(2) LGP21401 (E)	128	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	100
SBNH-1D6565C w/ Mount Pipe (E)	128	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	128	T-Arm Mount [TA 702-3] (P-Contact Info)	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	128	742 213 w/ Mount Pipe (E)	90
DC6-48-60-18-8F (E)	128	742 213 w/ Mount Pipe (E)	90
RRUS-11 (R)	128	742 213 w/ Mount Pipe (E)	90
RRUS-11 (R)	128	Pipe Mount [PM 601-3] (E)	90
RRUS-11 (R)	128	KS24019-L112A (E)	70
6' x 2" Mount Pipe (E)	128	KS24019-L112A (E)	70
6' x 2" Mount Pipe (E)	128	Side Arm Mount [SO 701-1] (E)	70
6' x 2" Mount Pipe (E)	128	Side Arm Mount [SO 701-1] (E)	70
T-Arm Mount [TA 602-3] (E)	128	KS24019-L112A (E)	49
(4) ALP 9212-N w/ Mount Pipe (E)	120	Side Arm Mount [SO 701-1] (E)	49
(4) ALP 9212-N w/ Mount Pipe (E)	120		
(4) ALP 9212-N w/ Mount Pipe (E)	120		
Platform Mount [LP 601-1] (E)	120		
TME-DB-T16Z-8AB-0Z w/mount pipe (R)	110		
Side Arm Mount [SO 102-1] (R)	110		
BXA-185060/8CFx2 w/ Mount Pipe (E)	108		
BXA-185060/8CFx2 w/ Mount Pipe (E)	108		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	53.993176ksi	54 ksi	69 ksi
52.584702ksi	53 ksi	68 ksi	54.865969ksi	55 ksi	70 ksi
60.01407ksi	60 ksi	75 ksi	55.708333ksi	56 ksi	71 ksi
56.810582ksi	57 ksi	72 ksi	55.701895ksi	56 ksi	71 ksi
58.450152ksi	58 ksi	73 ksi	53.739219ksi	54 ksi	69 ksi
58.742734ksi	59 ksi	74 ksi	59.216199ksi	59 ksi	74 ksi
54.670493ksi	55 ksi	70 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: 98.0%

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

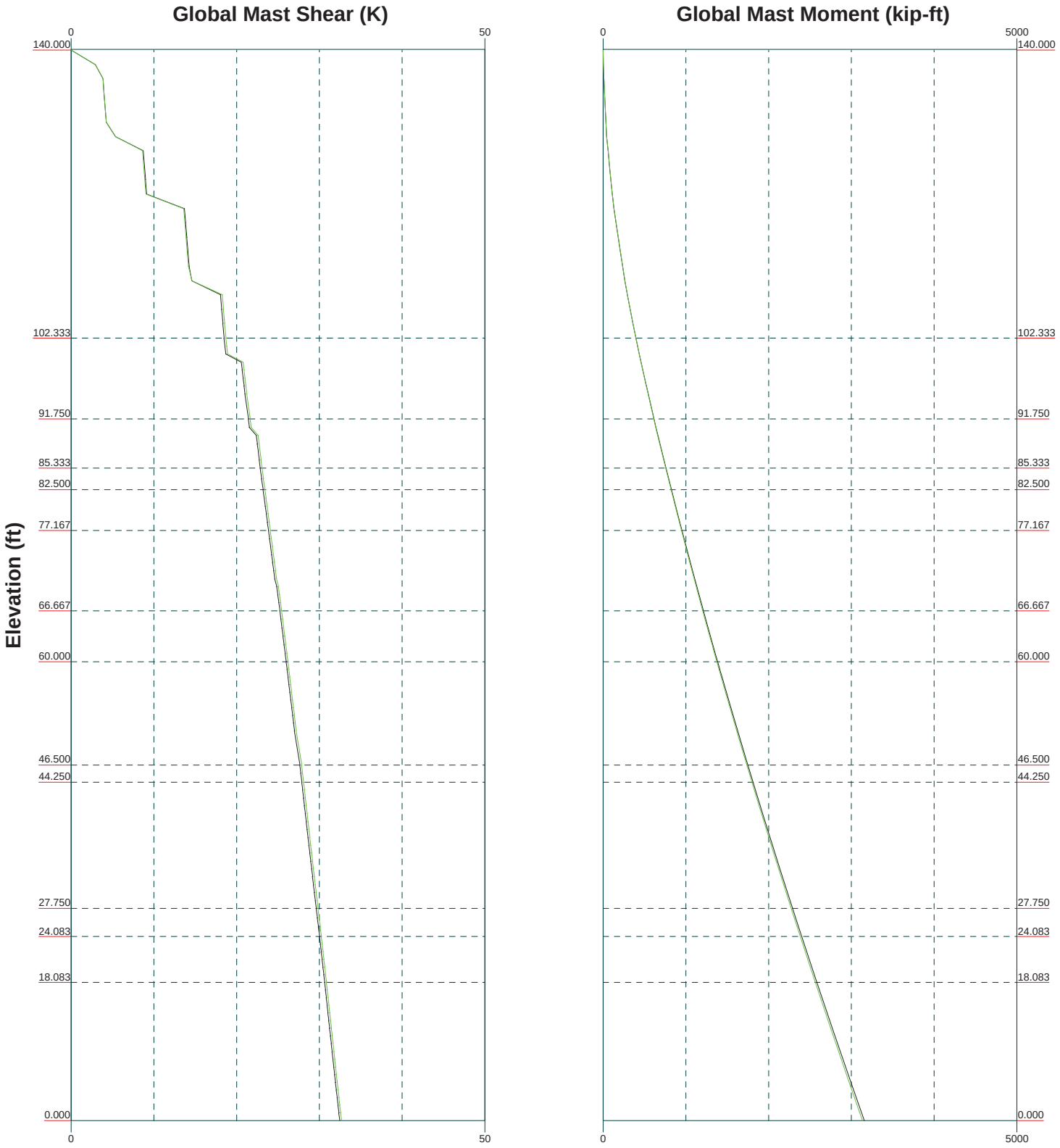
Job: 77969 .012.001 - East Farmington, CT (BU# 876335			
Project:			
Client: Crown Castle	Drawn by: Kishore Machani		App'd:
Code: TIA/EIA-222-F	Date: 03/27/14		Scale: NTS
Path: S:\Projects\Crown Castle\77969_876335_East Farmington\Engineering\Aero Calculations_012\Working RISA\876335 EAST FARMINGTON.eri			Dwg No. E-1

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

Vx Vz

Maximum Values

Mx Mz



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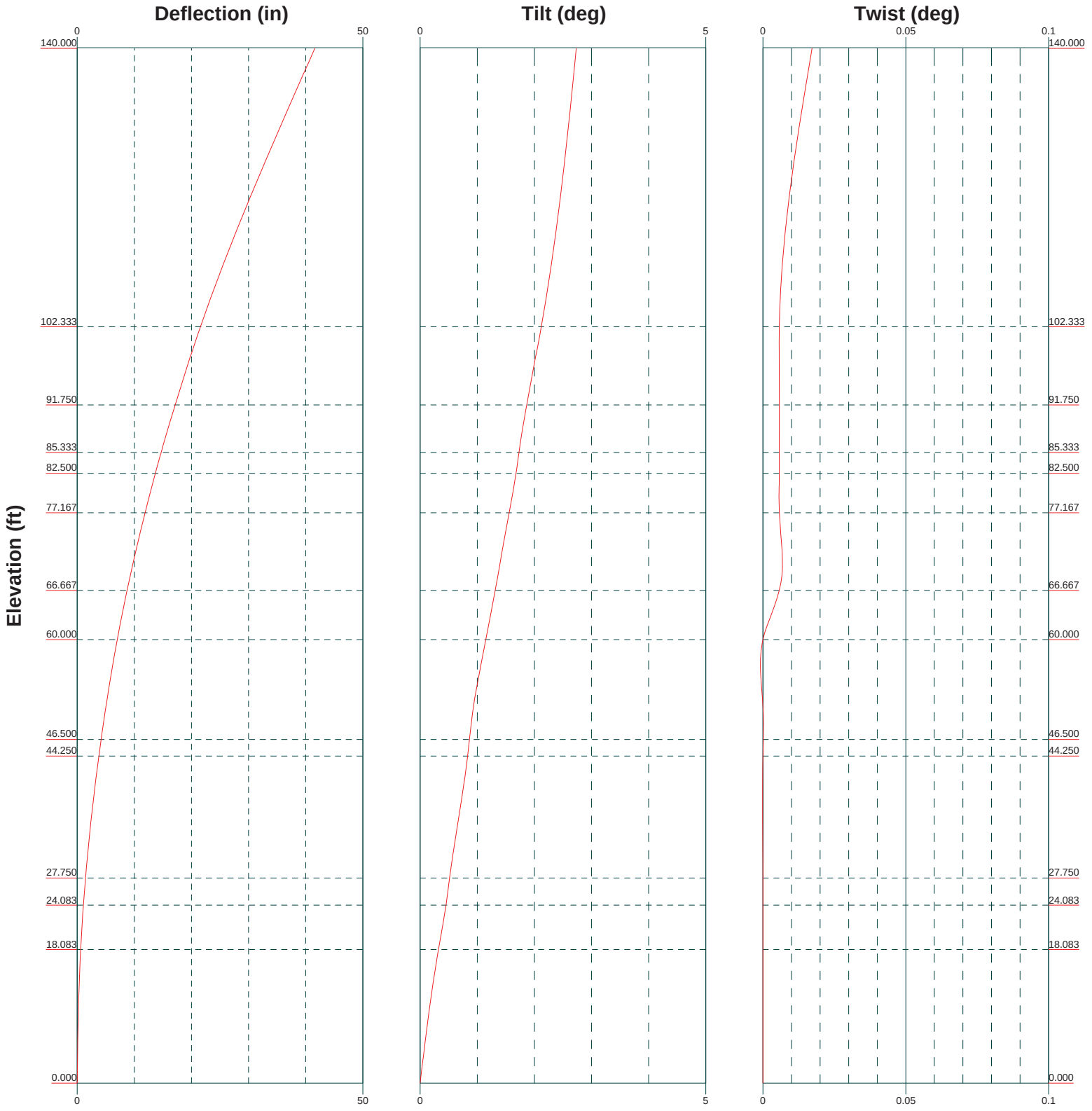
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 77969 .012.001 - East Farmington, CT (BU# 876335		
Project:		
Client: Crown Castle	Drawn by: Kishore Machani	App'd:
Code: TIA/EIA-222-F	Date: 03/27/14	Scale: NTS
Path: S:\Projects\Crown Castle\77969_876335_East Farmington\Engineering\Aero Calculations_012\Working RISA\876335 EAST FARMINGTON.eri		Dwg No. E-4

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

Maximum Values



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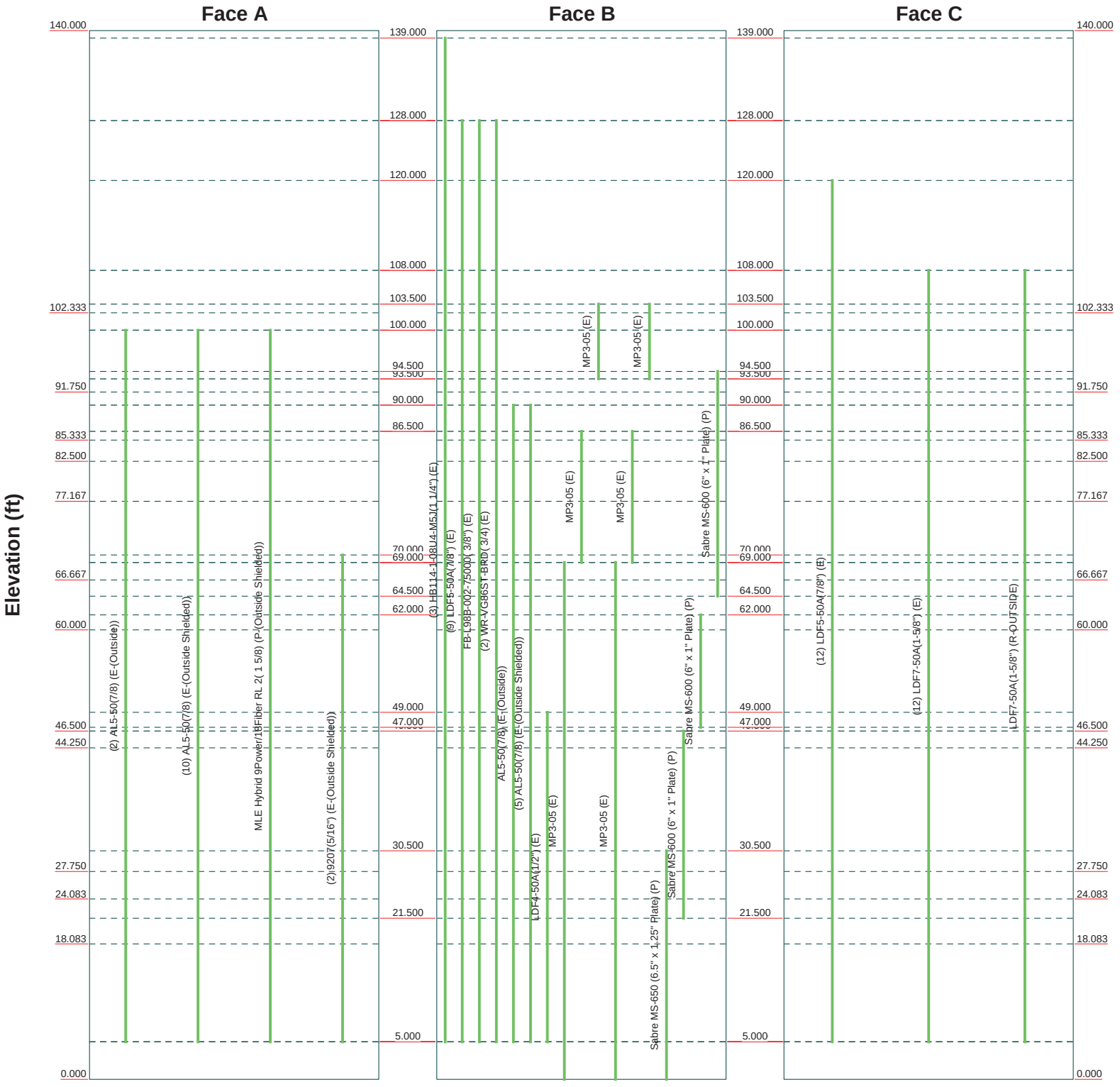
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: *77969 .012.001 - East Farmington, CT (BU# 876335*			
Project:			
Client: Crown Castle	Drawn by: Kishore Machani	App'd:	
Code: TIA/EIA-222-F	Date: 03/27/14	Scale: NTS	
Path: S:\Projects\Crown Castle\77969_876335_East Farmington\Engineering\Aero Calculations_012\Working RISA\876335 EAST FARMINGTON.eri		Dwg No. E-5	

Feed Line Distribution Chart
0' - 140'

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



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FAX: (918) 295-0265

Job:	***77969 .012.001 - East Farmington, CT (BU# 876335***		
Project:			
Client: Crown Castle		Drawn by: Kishore Machani	App'd:
Code: TIA/EIA-222-F		Date: 03/27/14	Scale: NTS
Path: S:\Projects\Crown Castle\77969_876335_East Farmington\Engineering\Aero Calculations_012\Working RISA\876335 EAST FARMINGTON.eri			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.
Tower Rating: 98.0%.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	140.000-102.333	37.667	0.000	12	16.000	23.721	0.250	1.000	A607-60 (60 ksi)
L2	102.333-91.750	10.583	3.250	12	23.721	25.890	0.376	1.506	52.584702ksi (53 ksi)
L3	91.750-85.333	9.667	0.000	12	24.724	26.706	0.422	1.690	60.01407ksi (60 ksi)
L4	85.333-82.500	2.833	0.000	12	26.706	27.287	0.601	2.402	56.810582ksi (57 ksi)
L5	82.500-77.167	5.333	0.000	12	27.287	28.380	0.527	2.106	58.450152ksi (58 ksi)
L6	77.167-66.667	10.500	0.000	12	28.380	30.534	0.512	2.046	58.742734ksi (59 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
L7	66.667-60.000	6.667	0.000	12	30.534	31.901	0.508	2.030	54.670493ksi (55 ksi)
L8	60.000-46.500	13.500	4.500	12	31.901	34.670	0.505	2.020	53.993176ksi (54 ksi)
L9	46.500-44.250	6.750	0.000	12	33.122	34.506	0.554	2.217	54.865969ksi (55 ksi)
L10	44.250-27.750	16.500	0.000	12	34.506	37.890	0.652	2.606	55.708333ksi (56 ksi)
L11	27.750-24.083	3.667	0.000	12	37.890	38.642	0.645	2.581	55.701895ksi (56 ksi)
L12	24.083-18.083	6.000	0.000	12	38.642	39.872	0.551	2.204	53.739219ksi (54 ksi)
L13	18.083-0.000	18.083		12	39.872	43.580	0.626	2.504	59.216199ksi (59 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
	24.558	18.894	1328.505	8.403	12.287	108.120	2691.912	9.299	5.687	22.749
L2	24.558	28.293	1968.030	8.357	12.287	160.167	3987.763	13.925	5.348	14.21
	26.803	30.922	2569.219	9.134	13.411	191.575	5205.935	15.219	5.930	15.754
L3	26.286	33.056	2491.704	8.700	12.807	194.559	5048.869	16.269	5.494	13.005
	27.648	35.752	3152.414	9.409	13.834	227.881	6387.646	17.596	6.025	14.263
L4	27.648	50.481	4391.062	9.346	13.834	317.420	8897.481	24.845	5.548	9.238
	28.249	51.604	4690.723	9.554	14.134	331.865	9504.677	25.398	5.703	9.497
L5	28.249	45.369	4146.813	9.580	14.134	293.384	8402.567	22.329	5.902	11.209
	29.381	47.222	4676.188	9.972	14.701	318.090	9475.225	23.241	6.195	11.766
L6	29.381	45.901	4550.244	9.977	14.701	309.523	9220.027	22.591	6.235	12.189
	31.611	49.448	5688.740	10.748	15.816	359.674	11526.930	24.337	6.812	13.318
L7	31.611	49.072	5646.975	10.749	15.816	357.033	11442.303	24.152	6.823	13.442
	33.026	51.307	6454.178	11.239	16.525	390.577	13077.914	25.252	7.189	14.165
L8	33.026	51.058	6423.885	11.240	16.525	388.744	13016.533	25.129	7.196	14.248
	35.893	55.561	8277.854	12.231	17.959	460.929	16773.176	27.345	7.938	15.717
L9	35.246	58.117	7868.028	11.659	17.157	458.585	15942.758	28.603	7.391	13.337
	35.723	60.587	8914.451	12.155	17.874	498.733	18063.094	29.819	7.762	14.007
L10	35.723	71.032	10391.436	12.120	17.874	581.365	21055.866	34.960	7.501	11.512
	39.226	78.131	13828.786	13.331	19.627	704.586	28020.869	38.454	8.408	12.904
L11	39.226	77.372	13699.075	13.334	19.627	697.977	27758.040	38.080	8.425	13.06
	40.005	78.934	14545.675	13.603	20.016	726.690	29473.482	38.849	8.627	13.372
L12	40.005	67.576	12514.610	13.636	20.016	625.220	25357.993	33.259	8.879	16.116
	41.278	69.759	13766.893	14.077	20.654	666.560	27895.458	34.333	9.209	16.715
L13	41.278	79.100	15550.809	14.050	20.654	752.932	31510.156	38.931	9.008	14.392
	45.117	86.574	20388.247	15.378	22.574	903.156	41312.116	42.609	10.002	15.979

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 140.000-102.333				1	1	1		
L2 102.333-91.750				1	1	0.956127		
L3				1	1	1.07562		

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
91.750-85.333 L4				1	1	0.926259		
85.333-82.500 L5				1	1	1.03548		
82.500-77.167 L6				1	1	1.09168		
77.167-66.667 L7				1	1	0.947739		
66.667-60.000 L8				1	1	1.04477		
60.000-46.500 L9				1	1	0.957484		
46.500-44.250 L10				1	1	0.948284		
44.250-27.750 L11				1	1	0.950131		
27.750-24.083 L12				1	1	1.1218		
24.083-18.083 L13				1	1	0.955568		
18.083-0.000								

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
HB114-1-08U4-M5J(1 1/4") (E)	B	No	Inside Pole	139.000 - 5.000	3	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001 0.001
@ LDF5-50A(7/8") (E)	B	No	Inside Pole	128.000 - 5.000	9	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000 0.000
FB-L98B-002-75000(3/8") (E)	B	No	Inside Pole	128.000 - 5.000	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000 0.000
WR-VG86ST-BRD(3/4) (E)	B	No	Inside Pole	128.000 - 5.000	2	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001 0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
////								
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
LDF7-50A(1-5/8") (R-OUTSIDE)	C	No	CaAa (Out Of Face)	108.000 - 5.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
						2" Ice	0.598	0.011
						4" Ice	0.998	0.030
////								
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
MLE Hybrid 9Power/18Fiber RL 2(1 5/8) (P-(Outside Shielded))	A	No	CaAa (Out Of Face)	100.000 - 5.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.029
////								
AL5-50(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
AL5-50(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
////								
9207(5/16") (E-(Outside Shielded))	A	No	CaAa (Out Of Face)	70.000 - 5.000	2	No Ice	0.000	0.001
						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") (E)	B	No	Inside Pole	49.000 - 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
////								
MP3-05 (E)	B	No	CaAa (Out Of Face)	69.000 - 0.000	1	No Ice	0.348	0.000
						1/2" Ice	0.432	0.000
						1" Ice	0.515	0.000
						2" Ice	0.682	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						4" Ice	1.015	0.000
MP3-05 (E)	B	No	CaAa (Out Of Face)	86.500 - 69.000	1	No Ice	0.348	0.000
						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
MP3-05 (E)	B	No	CaAa (Out Of Face)	103.500 - 93.500	1	No Ice	0.348	0.000
						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
@								
MP3-05 (E)	B	No	CaAa (Out Of Face)	69.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
MP3-05 (E)	B	No	CaAa (Out Of Face)	86.500 - 69.000	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
MP3-05 (E)	B	No	CaAa (Out Of Face)	103.500 - 93.500	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
@								
Sabre MS-650 (6.5" x 1.25" Plate) (P)	B	No	CaAa (Out Of Face)	30.500 - 0.000	1	No Ice	0.208	0.000
						1/2" Ice	0.292	0.000
						1" Ice	0.375	0.000
						2" Ice	0.542	0.000
						4" Ice	0.875	0.000
Sabre MS-600 (6" x 1" Plate) (P)	B	No	CaAa (Out Of Face)	46.500 - 21.500	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000
Sabre MS-600 (6" x 1" Plate) (P)	B	No	CaAa (Out Of Face)	62.000 - 47.000	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000
Sabre MS-600 (6" x 1" Plate) (P)	B	No	CaAa (Out Of Face)	94.500 - 64.500	1	No Ice	0.167	0.000
						1/2" Ice	0.250	0.000
						1" Ice	0.333	0.000
						2" Ice	0.500	0.000
						4" Ice	0.833	0.000
*								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.000-102.333	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.407	0.227
		C	0.000	0.000	0.000	1.122	0.130
L2	102.333-91.750	A	0.000	0.000	0.000	1.815	0.035

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
		B	0.000	0.000	0.000	3.535	0.079
		C	0.000	0.000	0.000	2.095	0.155
L3	91.750-85.333	A	0.000	0.000	0.000	1.412	0.027
		B	0.000	0.000	0.000	1.989	0.055
		C	0.000	0.000	0.000	1.271	0.094
L4	85.333-82.500	A	0.000	0.000	0.000	0.623	0.012
		B	0.000	0.000	0.000	1.771	0.026
		C	0.000	0.000	0.000	0.561	0.041
L5	82.500-77.167	A	0.000	0.000	0.000	1.173	0.022
		B	0.000	0.000	0.000	3.333	0.048
		C	0.000	0.000	0.000	1.056	0.078
L6	77.167-66.667	A	0.000	0.000	0.000	2.310	0.048
		B	0.000	0.000	0.000	6.562	0.095
		C	0.000	0.000	0.000	2.079	0.154
L7	66.667-60.000	A	0.000	0.000	0.000	1.467	0.036
		B	0.000	0.000	0.000	3.750	0.060
		C	0.000	0.000	0.000	1.320	0.097
L8	60.000-46.500	A	0.000	0.000	0.000	2.970	0.073
		B	0.000	0.000	0.000	8.354	0.122
		C	0.000	0.000	0.000	2.673	0.197
L9	46.500-44.250	A	0.000	0.000	0.000	0.495	0.012
		B	0.000	0.000	0.000	1.406	0.021
		C	0.000	0.000	0.000	0.446	0.033
L10	44.250-27.750	A	0.000	0.000	0.000	3.630	0.089
		B	0.000	0.000	0.000	10.885	0.151
		C	0.000	0.000	0.000	3.267	0.241
L11	27.750-24.083	A	0.000	0.000	0.000	0.807	0.020
		B	0.000	0.000	0.000	3.056	0.034
		C	0.000	0.000	0.000	0.726	0.054
L12	24.083-18.083	A	0.000	0.000	0.000	1.320	0.032
		B	0.000	0.000	0.000	4.431	0.055
		C	0.000	0.000	0.000	1.188	0.088
L13	18.083-0.000	A	0.000	0.000	0.000	2.878	0.071
		B	0.000	0.000	0.000	11.505	0.120
		C	0.000	0.000	0.000	2.590	0.191

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	140.000-102.333	A	1.168	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.634	0.227
		C		0.000	0.000	0.000	2.446	0.157
L2	102.333-91.750	A	1.138	0.000	0.000	0.000	5.571	0.390
		B		0.000	0.000	0.000	5.732	0.079
		C		0.000	0.000	0.000	4.504	0.202
L3	91.750-85.333	A	1.126	0.000	0.000	0.000	4.333	0.303
		B		0.000	0.000	0.000	4.490	0.146
		C		0.000	0.000	0.000	2.731	0.123
L4	85.333-82.500	A	1.119	0.000	0.000	0.000	1.891	0.130
		B		0.000	0.000	0.000	3.461	0.079
		C		0.000	0.000	0.000	1.195	0.054
L5	82.500-77.167	A	1.112	0.000	0.000	0.000	3.545	0.243
		B		0.000	0.000	0.000	6.496	0.148
		C		0.000	0.000	0.000	2.242	0.101
L6	77.167-66.667	A	1.098	0.000	0.000	0.000	6.921	0.486
		B		0.000	0.000	0.000	12.710	0.287
		C		0.000	0.000	0.000	4.384	0.198

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
L7	66.667-60.000	A	1.081	0.000	0.000	0.000	4.350	0.324
		B		0.000	0.000	0.000	7.145	0.179
		C		0.000	0.000	0.000	2.762	0.125
L8	60.000-46.500	A	1.059	0.000	0.000	0.000	8.688	0.634
		B		0.000	0.000	0.000	15.890	0.354
		C		0.000	0.000	0.000	5.532	0.251
L9	46.500-44.250	A	1.039	0.000	0.000	0.000	1.448	0.106
		B		0.000	0.000	0.000	2.677	0.059
		C		0.000	0.000	0.000	0.922	0.042
L10	44.250-27.750	A	1.010	0.000	0.000	0.000	10.296	0.716
		B		0.000	0.000	0.000	20.237	0.410
		C		0.000	0.000	0.000	6.600	0.302
L11	27.750-24.083	A	1.000	0.000	0.000	0.000	2.274	0.156
		B		0.000	0.000	0.000	5.623	0.090
		C		0.000	0.000	0.000	1.459	0.067
L12	24.083-18.083	A	1.000	0.000	0.000	0.000	3.720	0.256
		B		0.000	0.000	0.000	8.061	0.147
		C		0.000	0.000	0.000	2.388	0.110
L13	18.083-0.000	A	1.000	0.000	0.000	0.000	8.111	0.558
		B		0.000	0.000	0.000	20.150	0.321
		C		0.000	0.000	0.000	5.207	0.239

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	140.000-102.333	-0.028	0.035	-0.062	0.061
L2	102.333-91.750	0.131	0.104	0.083	-0.040
L3	91.750-85.333	0.111	0.039	0.188	-0.087
L4	85.333-82.500	0.379	0.196	0.492	0.110
L5	82.500-77.167	0.383	0.198	0.500	0.112
L6	77.167-66.667	0.389	0.202	0.513	0.116
L7	66.667-60.000	0.344	0.175	0.451	0.072
L8	60.000-46.500	0.398	0.206	0.533	0.120
L9	46.500-44.250	0.406	0.210	0.549	0.127
L10	44.250-27.750	0.443	0.232	0.598	0.159
L11	27.750-24.083	0.593	0.319	0.796	0.280
L12	24.083-18.083	0.518	0.275	0.692	0.212
L13	18.083-0.000	0.505	0.273	0.680	0.242

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXV9ERR18-C-A20 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	7.471 8.656 9.556 11.388 15.527	0.088 0.158 0.237 0.421 0.935
APXV9ERR18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	139.000	No Ice 1/2" Ice	8.498 9.149	7.471 8.656	0.088 0.158

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1" Ice	9.767	9.556	0.237
						2" Ice	11.031	11.388	0.421
						4" Ice	13.679	15.527	0.935
APXV9ERR18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	139.000	No Ice 1/2" Ice	8.498 9.149	7.471 8.656	0.088 0.158
(E)			0.000			1" Ice	9.767	9.556	0.237
						2" Ice	11.031	11.388	0.421
						4" Ice	13.679	15.527	0.935
(3) 5' x 2' Pipe Mount	A	From Leg	4.000	0.000	139.000	No Ice	1.188	1.188	0.018
(E)			0.000 0.000			1/2" Ice 1" Ice	1.496 1.807	1.496 1.807	0.027 0.040
						2" Ice	2.458	2.458	0.076
						4" Ice	3.919	3.919	0.196
(3) 5' x 2' Pipe Mount	B	From Leg	4.000	0.000	139.000	No Ice	1.188	1.188	0.018
(E)			0.000 0.000			1/2" Ice 1" Ice	1.496 1.807	1.496 1.807	0.027 0.040
						2" Ice	2.458	2.458	0.076
						4" Ice	3.919	3.919	0.196
(3) 5' x 2' Pipe Mount	C	From Leg	4.000	0.000	139.000	No Ice	1.188	1.188	0.018
(E)			0.000 0.000			1/2" Ice 1" Ice	1.496 1.807	1.496 1.807	0.027 0.040
						2" Ice	2.458	2.458	0.076
						4" Ice	3.919	3.919	0.196
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
////									
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.000 0.000	0.000	137.000	No Ice 1/2" Ice	2.709 2.948	2.611 2.847	0.060 0.083
(E)			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.000 0.000	0.000	137.000	No Ice 1/2" Ice	2.709 2.948	2.611 2.847	0.060 0.083
(E)			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.000 0.000	0.000	137.000	No Ice 1/2" Ice	2.709 2.948	2.611 2.847	0.060 0.083
(E)			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
800MHz 2X50W RRH W/FILTER	A	From Leg	4.000 0.000	0.000	137.000	No Ice 1/2" Ice	2.401 2.613	2.254 2.460	0.064 0.086
(E)			3.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
800MHz 2X50W RRH W/FILTER	B	From Leg	4.000 0.000	0.000	137.000	No Ice 1/2" Ice	2.401 2.613	2.254 2.460	0.064 0.086
(E)			3.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
800MHz 2X50W RRH W/FILTER	C	From Leg	4.000 0.000	0.000	137.000	No Ice 1/2" Ice	2.401 2.613	2.254 2.460	0.064 0.086
(E)			3.000			1" Ice	2.833	2.675	0.111

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	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
Side Arm Mount [SO 102-3]	C	None		0.000	137.000	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
////									
(2) RRUS-11	A	From Leg	2.000	0.000	129.000	No Ice	4.424	1.186	0.055
(E)			0.000			1/2" Ice	4.708	1.351	0.081
			1.000			1" Ice	5.001	1.526	0.110
						2" Ice	5.613	1.900	0.179
						4" Ice	6.940	2.753	0.368
(2) RRUS-11	B	From Leg	2.000	0.000	129.000	No Ice	4.424	1.186	0.055
(E)			0.000			1/2" Ice	4.708	1.351	0.081
			1.000			1" Ice	5.001	1.526	0.110
						2" Ice	5.613	1.900	0.179
						4" Ice	6.940	2.753	0.368
(2) RRUS-11	C	From Leg	2.000	0.000	129.000	No Ice	4.424	1.186	0.055
(E)			0.000			1/2" Ice	4.708	1.351	0.081
			1.000			1" Ice	5.001	1.526	0.110
						2" Ice	5.613	1.900	0.179
						4" Ice	6.940	2.753	0.368
5' x 2' Pipe Mount	A	From Leg	4.000	0.000	129.000	No Ice	1.188	1.188	0.018
(E)			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
						2" Ice	2.458	2.458	0.076
						4" Ice	3.919	3.919	0.196
5' x 2' Pipe Mount	B	From Leg	4.000	0.000	129.000	No Ice	1.188	1.188	0.018
(E)			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
						2" Ice	2.458	2.458	0.076
						4" Ice	3.919	3.919	0.196
5' x 2' Pipe Mount	C	From Leg	4.000	0.000	129.000	No Ice	1.188	1.188	0.018
(E)			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
						2" Ice	2.458	2.458	0.076
						4" Ice	3.919	3.919	0.196
Side Arm Mount [SO 102-3]	C	None		0.000	129.000	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
////									
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	128.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			2.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	128.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			2.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	128.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			2.000			1" Ice	7.128	5.711	0.157

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) LGP21401	A	From Leg	4.000	0.000	128.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			0.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	B	From Leg	4.000	0.000	128.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			0.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	C	From Leg	4.000	0.000	128.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			0.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.000	0.000	128.000	No Ice	11.644	9.842	0.094
			0.000			1/2" Ice	12.365	11.366	0.183
(E)			2.000			1" Ice	13.095	12.914	0.283
						2" Ice	14.553	15.267	0.516
						4" Ice	17.825	20.139	1.160
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.000	0.000	128.000	No Ice	8.498	6.304	0.074
			0.000			1/2" Ice	9.149	7.479	0.139
(E)			2.000			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000	0.000	128.000	No Ice	8.498	6.304	0.074
			0.000			1/2" Ice	9.149	7.479	0.139
(E)			2.000			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
DC6-48-60-18-8F	A	From Leg	4.000	0.000	128.000	No Ice	2.567	4.317	0.019
(E)			0.000			1/2" Ice	2.798	4.596	0.050
			2.000			1" Ice	3.038	4.885	0.085
						2" Ice	3.543	5.488	0.167
						4" Ice	4.658	6.797	0.383
RRUS-11	A	From Leg	2.000	0.000	128.000	No Ice	4.424	1.186	0.055
(R)			0.000			1/2" Ice	4.708	1.351	0.081
			2.000			1" Ice	5.001	1.526	0.110
						2" Ice	5.613	1.900	0.179
						4" Ice	6.940	2.753	0.368
RRUS-11	B	From Leg	2.000	0.000	128.000	No Ice	4.424	1.186	0.055
(R)			0.000			1/2" Ice	4.708	1.351	0.081
			2.000			1" Ice	5.001	1.526	0.110
						2" Ice	5.613	1.900	0.179
						4" Ice	6.940	2.753	0.368
RRUS-11	C	From Leg	2.000	0.000	128.000	No Ice	4.424	1.186	0.055
(R)			0.000			1/2" Ice	4.708	1.351	0.081
			2.000			1" Ice	5.001	1.526	0.110
						2" Ice	5.613	1.900	0.179
						4" Ice	6.940	2.753	0.368
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
						4" Ice	4.702	4.702	0.231

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
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	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
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 Pipe	A	From Leg	4.000	0.000	120.000	No Ice	6.021	7.050	0.037
(E)			0.000			1/2" Ice	6.505	7.833	0.096
			0.000			1" Ice	6.992	8.588	0.162
						2" Ice	7.995	10.151	0.317
						4" Ice	10.128	13.500	0.746
(4) ALP 9212-N w/ Mount Pipe	B	From Leg	4.000	0.000	120.000	No Ice	6.021	7.050	0.037
(E)			0.000			1/2" Ice	6.505	7.833	0.096
			0.000			1" Ice	6.992	8.588	0.162
						2" Ice	7.995	10.151	0.317
						4" Ice	10.128	13.500	0.746
(4) ALP 9212-N w/ Mount Pipe	C	From Leg	4.000	0.000	120.000	No Ice	6.021	7.050	0.037
(E)			0.000			1/2" Ice	6.505	7.833	0.096
			0.000			1" Ice	6.992	8.588	0.162
						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
////									
TME-DB-T16Z-8AB-0Z w/mount pipe	A	From Leg	4.000	0.000	110.000	No Ice	5.660	2.752	0.053
(R)			0.000			1/2" Ice	5.997	3.126	0.095
			0.000			1" Ice	6.344	3.521	0.142
						2" Ice	7.075	4.417	0.254
						4" Ice	8.662	6.448	0.561
Side Arm Mount [SO 102-1]	A	None		0.000	110.000	No Ice	1.500	1.500	0.025
(R)						1/2" Ice	1.740	1.750	0.035
						1" Ice	1.980	2.000	0.045
						2" Ice	2.460	2.500	0.065
						4" Ice	3.420	3.500	0.105
////									
BXA-185060/8CFx2 w/ Mount Pipe	A	From Leg	4.000	0.000	108.000	No Ice	3.201	3.020	0.028
(E)			0.000			1/2" Ice	3.579	3.639	0.059
			1.000			1" Ice	3.986	4.261	0.095
						2" Ice	4.879	5.556	0.187
						4" Ice	6.800	8.457	0.475
BXA-185060/8CFx2 w/ Mount Pipe	B	From Leg	4.000	0.000	108.000	No Ice	3.201	3.020	0.028
(E)			0.000			1/2" Ice	3.579	3.639	0.059
			1.000			1" Ice	3.986	4.261	0.095
						2" Ice	4.879	5.556	0.187

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	6.800	8.457	0.475
BXA-185060/8CFx2 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.201 3.579 3.986 4.879 6.800	3.020 3.639 4.261 5.556 8.457	0.028 0.059 0.095 0.187 0.475
BXA-70063-6CF-EDIN-4 w/Mount Pipe (E)	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.751 8.295 8.846 9.974 12.335	5.180 6.114 6.924 8.593 12.132	0.039 0.095 0.159 0.313 0.754
BXA-70063-6CF-EDIN-4 w/Mount Pipe (E)	B	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.751 8.295 8.846 9.974 12.335	5.180 6.114 6.924 8.593 12.132	0.039 0.095 0.159 0.313 0.754
BXA-70063-4CF-EDIN-X w/ Mount Pipe (R)	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.399 5.844 6.299 7.240 9.261	3.693 4.295 4.913 6.258 9.285	0.028 0.070 0.118 0.235 0.576
BXA-70063-4CF-EDIN-X w/ Mount Pipe (R)	B	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.399 5.844 6.299 7.240 9.261	3.693 4.295 4.913 6.258 9.285	0.028 0.070 0.118 0.235 0.576
BXA-70063-4CF-EDIN-X w/ Mount Pipe (R)	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.399 5.844 6.299 7.240 9.261	3.693 4.295 4.913 6.258 9.285	0.028 0.070 0.118 0.235 0.576
BXA-171063-12CF-EDIN-2 w/ Mount Pipe (R)	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
BXA-171063-12CF-EDIN-2 w/ Mount Pipe (R)	B	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
BXA-171063-12CF-EDIN-2 w/ Mount Pipe (R)	C	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
800 10735V01 w/ Mount Pipe (R)	A	From Leg	4.000 0.000 1.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.042 9.720 10.373 11.691 14.446	5.489 6.710 7.688 9.563 13.514	0.058 0.121 0.192 0.362 0.849
RRH2x40-AWS (R)	A	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2x40-AWS	B	From Leg	4.000	0.000	108.000	No Ice	2.522	1.589	0.044

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
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2x40-AWS	C	From Leg	4.000	0.000	108.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
(2) FD9R6004/2C-3L	A	From Leg	4.000	0.000	108.000	No Ice	0.367	0.085	0.003
(E)			0.000			1/2" Ice	0.451	0.136	0.005
			1.000			1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L	B	From Leg	4.000	0.000	108.000	No Ice	0.367	0.085	0.003
(E)			0.000			1/2" Ice	0.451	0.136	0.005
			1.000			1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L	C	From Leg	4.000	0.000	108.000	No Ice	0.367	0.085	0.003
(E)			0.000			1/2" Ice	0.451	0.136	0.005
			1.000			1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
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
////									
KRY 112 144/1	A	From Leg	3.000	0.000	100.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	B	From Leg	3.000	0.000	100.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	C	From Leg	3.000	0.000	100.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
ERICSSON AIR 21 B2A	A	From Leg	3.000	0.000	100.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			0.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	B	From Leg	3.000	0.000	100.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			0.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	C	From Leg	3.000	0.000	100.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169

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
(P)			0.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	3.000 0.000	0.000	100.000	No Ice 1/2" Ice	6.825 7.347	5.642 6.480	0.112 0.169
(P)			0.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	3.000 0.000	0.000	100.000	No Ice 1/2" Ice	6.825 7.347	5.642 6.480	0.112 0.169
(P)			0.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	3.000 0.000	0.000	100.000	No Ice 1/2" Ice	6.825 7.347	5.642 6.480	0.112 0.169
(P)			0.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
T-Arm Mount [TA 702-3] (P-Contact Info)	C	None		0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.640 6.550 7.460 9.280 12.920	5.640 6.550 7.460 9.280 12.920	0.339 0.429 0.519 0.699 1.059
////									
742 213 w/ Mount Pipe (E)	A	From Leg	1.000 0.000 0.000	0.000	90.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.094 0.146 0.277 0.683
742 213 w/ Mount Pipe (E)	B	From Leg	1.000 0.000 0.000	0.000	90.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.094 0.146 0.277 0.683
742 213 w/ Mount Pipe (E)	C	From Leg	1.000 0.000 0.000	0.000	90.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.094 0.146 0.277 0.683
Pipe Mount [PM 601-3] (E)	C	None		0.000	90.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.390 5.480 6.570 8.750 13.110	4.390 5.480 6.570 8.750 13.110	0.195 0.237 0.280 0.365 0.534
////									
KS24019-L112A (E)	C	From Leg	2.000 0.000 2.000	0.000	70.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.156 0.225 0.302 0.484 0.951	0.156 0.225 0.302 0.484 0.951	0.005 0.007 0.009 0.018 0.056
KS24019-L112A (E)	A	From Leg	2.000 0.000 2.000	0.000	70.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.156 0.225 0.302 0.484 0.951	0.156 0.225 0.302 0.484 0.951	0.005 0.007 0.009 0.018 0.056
Side Arm Mount [SO 701-1] (E)	C	From Leg	0.500 0.000	0.000	70.000	No Ice 1/2" Ice	0.850 1.140	1.670 2.340	0.065 0.079

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
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	49.000	No Ice	0.156	0.156	0.005
(E)			0.000			1/2" Ice	0.225	0.225	0.007
			2.000			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
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

Comb. No.	Description
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	140 - 102.333	Pole	Max Tension	2	0.000	0.000	-0.000
			Max. Compression	14	-20.847	-0.802	3.382
			Max. Mx	5	-8.213	-396.393	0.320
			Max. My	2	-8.181	0.198	396.854
			Max. Vy	5	18.489	-396.393	0.320
			Max. Vx	2	-18.708	0.198	396.854
			Max. Torque	11			-3.635
L2	102.333 - 91.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-24.410	-0.782	3.705
			Max. Mx	5	-10.081	-543.510	0.056
			Max. My	2	-10.050	0.522	545.604
			Max. Vy	5	21.018	-543.510	0.056
			Max. Vx	2	-21.238	0.522	545.604
			Max. Torque	11			-3.629
L3	91.75 - 85.333	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-27.997	-0.846	4.158
			Max. Mx	5	-12.272	-755.543	-0.297
			Max. My	2	-12.243	0.945	759.796
			Max. Vy	5	22.854	-755.543	-0.297
			Max. Vx	2	-23.075	0.945	759.796
			Max. Torque	11			-3.615
L4	85.333 - 82.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-28.828	-0.893	4.286
			Max. Mx	5	-12.835	-820.766	-0.402
			Max. My	2	-12.807	1.068	825.651
			Max. Vy	5	23.207	-820.766	-0.402
			Max. Vx	2	-23.427	1.068	825.651
			Max. Torque	11			-3.610
L5	82.5 - 77.1667	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-30.405	-0.984	4.529
			Max. Mx	5	-13.931	-946.228	-0.602
			Max. My	2	-13.904	1.301	952.305
			Max. Vy	5	23.858	-946.228	-0.602
			Max. Vx	2	-24.080	1.301	952.305
			Max. Torque	11			-3.603
L6	77.1667 - 66.667	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-33.887	-0.995	5.138
			Max. Mx	5	-16.401	-1203.545	-0.976
			Max. My	2	-16.378	1.906	1212.105
			Max. Vy	5	25.237	-1203.545	-0.976
			Max. Vx	2	-25.445	1.906	1212.105
			Max. Torque	11			-3.632
L7	66.667 - 60	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-35.887	-1.113	5.496

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	5	-17.807	-1374.274	-1.303
			Max. My	2	-17.787	2.279	1384.243
			Max. Vy	5	26.000	-1374.274	-1.303
			Max. Vx	2	-26.207	2.279	1384.243
			Max. Torque	11			-3.623
L8	60 - 46.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-38.804	-1.276	5.984
			Max. Mx	5	-19.950	-1612.687	-1.748
			Max. My	2	-19.934	2.781	1624.558
			Max. Vy	5	27.005	-1612.687	-1.748
			Max. Vx	2	-27.212	2.781	1624.558
			Max. Torque	11			-3.609
L9	46.5 - 44.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-42.226	-1.584	6.243
			Max. Mx	5	-22.487	-1798.189	-2.097
			Max. My	2	-22.471	2.986	1811.353
			Max. Vy	5	27.886	-1798.189	-2.097
			Max. Vx	2	-28.105	2.986	1811.353
			Max. Torque	12			-3.573
L10	44.25 - 27.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-48.401	-1.865	7.075
			Max. Mx	5	-27.279	-2272.395	-2.731
			Max. My	2	-27.269	3.724	2289.249
			Max. Vy	5	29.630	-2272.395	-2.731
			Max. Vx	2	-29.848	3.724	2289.249
			Max. Torque	12			-3.573
L11	27.75 - 24.083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-49.821	-1.928	7.262
			Max. Mx	5	-28.390	-2381.741	-2.871
			Max. My	2	-28.381	3.887	2399.412
			Max. Vy	5	30.032	-2381.741	-2.871
			Max. Vx	2	-30.249	3.887	2399.412
			Max. Torque	12			-3.573
L12	24.083 - 18.083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-52.209	-2.034	7.575
			Max. Mx	5	-30.295	-2563.701	-3.101
			Max. My	2	-30.289	4.154	2582.706
			Max. Vy	5	30.649	-2563.701	-3.101
			Max. Vx	2	-30.865	4.154	2582.706
			Max. Torque	12			-3.574
L13	18.083 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-59.165	-2.278	8.292
			Max. Mx	5	-35.984	-3134.075	-3.825
			Max. My	2	-35.984	4.955	3157.041
			Max. Vy	5	32.475	-3134.075	-3.825
			Max. Vx	2	-32.688	4.955	3157.041
			Max. Torque	12			-3.576

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	59.165	0.007	9.522
	Max. H_x	11	35.997	32.461	0.045
	Max. H_z	2	35.997	0.045	32.674
	Max. M_x	2	3157.041	0.045	32.674

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M_z	5	3134.075	-32.461	-0.045
	Max. Torsion	6	3.548	-28.135	-16.376
	Min. Vert	1	35.997	0.000	0.000
	Min. H_x	5	35.997	-32.461	-0.045
	Min. H_z	8	35.997	-0.045	-32.674
	Min. M_x	8	-3154.247	-0.045	-32.674
	Min. M_z	11	-3133.571	32.461	0.045
	Min. Torsion	12	-3.576	28.135	16.376

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	35.997	0.000	0.000	-1.357	-0.245	0.000
Dead+Wind 0 deg - No Ice	35.997	-0.045	-32.674	-3157.041	4.955	1.254
Dead+Wind 30 deg - No Ice	35.997	16.192	-28.274	-2731.694	-1562.650	-0.617
Dead+Wind 60 deg - No Ice	35.997	28.090	-16.299	-1574.736	-2711.631	-2.314
Dead+Wind 90 deg - No Ice	35.997	32.461	0.045	3.825	-3134.075	-3.383
Dead+Wind 120 deg - No Ice	35.997	28.135	16.376	1580.965	-2716.783	-3.548
Dead+Wind 150 deg - No Ice	35.997	16.269	28.319	2734.081	-1571.619	-2.773
Dead+Wind 180 deg - No Ice	35.997	0.045	32.674	3154.247	-5.445	-1.262
Dead+Wind 210 deg - No Ice	35.997	-16.192	28.274	2728.901	1562.135	0.590
Dead+Wind 240 deg - No Ice	35.997	-28.090	16.299	1571.968	2711.109	2.294
Dead+Wind 270 deg - No Ice	35.997	-32.461	-0.045	-6.575	3133.571	3.391
Dead+Wind 300 deg - No Ice	35.997	-28.135	-16.376	-1583.721	2716.304	3.576
Dead+Wind 330 deg - No Ice	35.997	-16.269	-28.319	-2736.861	1571.147	2.793
Dead+Ice+Temp	59.165	0.000	-0.000	-8.292	-2.278	0.000
Dead+Wind 0 deg+Ice+Temp	59.165	-0.007	-9.522	-959.845	-1.349	0.437
Dead+Wind 30 deg+Ice+Temp	59.165	4.742	-8.242	-831.900	-476.122	-0.157
Dead+Wind 60 deg+Ice+Temp	59.165	8.220	-4.754	-483.288	-823.935	-0.708
Dead+Wind 90 deg+Ice+Temp	59.165	9.496	0.007	-7.423	-951.587	-1.068
Dead+Wind 120 deg+Ice+Temp	59.165	8.228	4.767	468.186	-824.884	-1.143
Dead+Wind 150 deg+Ice+Temp	59.165	4.755	8.250	816.100	-477.767	-0.912
Dead+Wind 180 deg+Ice+Temp	59.165	0.007	9.522	943.093	-3.251	-0.437
Dead+Wind 210 deg+Ice+Temp	59.165	-4.742	8.242	815.148	471.520	0.155
Dead+Wind 240 deg+Ice+Temp	59.165	-8.220	4.754	466.538	819.332	0.706
Dead+Wind 270 deg+Ice+Temp	59.165	-9.496	-0.007	-9.325	946.985	1.069
Dead+Wind 300 deg+Ice+Temp	59.165	-8.228	-4.767	-484.934	820.284	1.145
Dead+Wind 330 deg+Ice+Temp	59.165	-4.755	-8.250	-832.850	473.169	0.913
Dead+Wind 0 deg - Service	35.997	-0.017	-12.763	-1236.012	1.782	0.496
Dead+Wind 30 deg - Service	35.997	6.325	-11.045	-1069.594	-611.517	-0.243
Dead+Wind 60 deg - Service	35.997	10.973	-6.367	-616.951	-1061.028	-0.915
Dead+Wind 90 deg - Service	35.997	12.680	0.017	0.627	-1226.300	-1.341
Dead+Wind 120 deg - Service	35.997	10.990	6.397	617.658	-1063.057	-1.408
Dead+Wind 150 deg - Service	35.997	6.355	11.062	1068.807	-615.035	-1.099
Dead+Wind 180 deg - Service	35.997	0.017	12.763	1233.191	-2.286	-0.497
Dead+Wind 210 deg - Service	35.997	-6.325	11.045	1066.774	611.008	0.239
Dead+Wind 240 deg - Service	35.997	-10.973	6.367	614.135	1060.519	0.912
Dead+Wind 270 deg - Service	35.997	-12.680	-0.017	-3.441	1225.794	1.342
Dead+Wind 300 deg - Service	35.997	-10.990	-6.397	-620.472	1062.554	1.412
Dead+Wind 330 deg - Service	35.997	-6.355	-11.062	-1071.625	614.534	1.102

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.000	-35.997	0.000	0.000	35.997	0.000	0.000%
2	-0.045	-35.997	-32.674	0.045	35.997	32.674	0.000%
3	16.192	-35.997	-28.274	-16.192	35.997	28.274	0.000%
4	28.090	-35.997	-16.299	-28.090	35.997	16.299	0.000%
5	32.461	-35.997	0.045	-32.461	35.997	-0.045	0.000%
6	28.135	-35.997	16.376	-28.135	35.997	-16.376	0.000%
7	16.269	-35.997	28.319	-16.269	35.997	-28.319	0.000%
8	0.045	-35.997	32.674	-0.045	35.997	-32.674	0.000%
9	-16.192	-35.997	28.274	16.192	35.997	-28.274	0.000%
10	-28.090	-35.997	16.299	28.090	35.997	-16.299	0.000%
11	-32.461	-35.997	-0.045	32.461	35.997	0.045	0.000%
12	-28.135	-35.997	-16.376	28.135	35.997	16.376	0.000%
13	-16.269	-35.997	-28.319	16.269	35.997	28.319	0.000%
14	0.000	-59.165	0.000	-0.000	59.165	0.000	0.000%
15	-0.007	-59.165	-9.522	0.007	59.165	9.522	0.000%
16	4.742	-59.165	-8.242	-4.742	59.165	8.242	0.000%
17	8.220	-59.165	-4.754	-8.220	59.165	4.754	0.000%
18	9.496	-59.165	0.007	-9.496	59.165	-0.007	0.000%
19	8.228	-59.165	4.767	-8.228	59.165	-4.767	0.000%
20	4.755	-59.165	8.250	-4.755	59.165	-8.250	0.000%
21	0.007	-59.165	9.522	-0.007	59.165	-9.522	0.000%
22	-4.742	-59.165	8.242	4.742	59.165	-8.242	0.000%
23	-8.220	-59.165	4.754	8.220	59.165	-4.754	0.000%
24	-9.496	-59.165	-0.007	9.496	59.165	0.007	0.000%
25	-8.228	-59.165	-4.767	8.228	59.165	4.767	0.000%
26	-4.755	-59.165	-8.250	4.755	59.165	8.250	0.000%
27	-0.017	-35.997	-12.763	0.017	35.997	12.763	0.000%
28	6.325	-35.997	-11.045	-6.325	35.997	11.045	0.000%
29	10.973	-35.997	-6.367	-10.973	35.997	6.367	0.000%
30	12.680	-35.997	0.017	-12.680	35.997	-0.017	0.000%
31	10.990	-35.997	6.397	-10.990	35.997	-6.397	0.000%
32	6.355	-35.997	11.062	-6.355	35.997	-11.062	0.000%
33	0.017	-35.997	12.763	-0.017	35.997	-12.763	0.000%
34	-6.325	-35.997	11.045	6.325	35.997	-11.045	0.000%
35	-10.973	-35.997	6.367	10.973	35.997	-6.367	0.000%
36	-12.680	-35.997	-0.017	12.680	35.997	0.017	0.000%
37	-10.990	-35.997	-6.397	10.990	35.997	6.397	0.000%
38	-6.355	-35.997	-11.062	6.355	35.997	11.062	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00085920
3	Yes	6	0.00000001	0.00004436
4	Yes	6	0.00000001	0.00004766
5	Yes	5	0.00000001	0.00012799
6	Yes	6	0.00000001	0.00004251
7	Yes	6	0.00000001	0.00004780
8	Yes	5	0.00000001	0.00004354
9	Yes	6	0.00000001	0.00004595
10	Yes	6	0.00000001	0.00004299
11	Yes	5	0.00000001	0.00013930
12	Yes	6	0.00000001	0.00004883
13	Yes	6	0.00000001	0.00004318

14	Yes	4	0.00000001	0.00012600
15	Yes	5	0.00000001	0.00078530
16	Yes	6	0.00000001	0.00009360
17	Yes	6	0.00000001	0.00009529
18	Yes	5	0.00000001	0.00078431
19	Yes	6	0.00000001	0.00009051
20	Yes	6	0.00000001	0.00009305
21	Yes	5	0.00000001	0.00076546
22	Yes	6	0.00000001	0.00009120
23	Yes	6	0.00000001	0.00008991
24	Yes	5	0.00000001	0.00078007
25	Yes	6	0.00000001	0.00009563
26	Yes	6	0.00000001	0.00009268
27	Yes	4	0.00000001	0.00027619
28	Yes	5	0.00000001	0.00015175
29	Yes	5	0.00000001	0.00017095
30	Yes	4	0.00000001	0.00085168
31	Yes	5	0.00000001	0.00014219
32	Yes	5	0.00000001	0.00017179
33	Yes	4	0.00000001	0.00029812
34	Yes	5	0.00000001	0.00015994
35	Yes	5	0.00000001	0.00014356
36	Yes	4	0.00000001	0.00087872
37	Yes	5	0.00000001	0.00017857
38	Yes	5	0.00000001	0.00014610

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 102.333	41.591	27	2.730	0.016
L2	102.333 - 91.75	21.575	27	2.121	0.008
L3	95 - 85.333	18.452	27	1.943	0.007
L4	85.333 - 82.5	14.700	27	1.733	0.005
L5	82.5 - 77.1667	13.689	27	1.678	0.005
L6	77.1667 - 66.667	11.881	27	1.558	0.004
L7	66.667 - 60	8.728	27	1.309	0.003
L8	60 - 46.5	7.012	27	1.150	0.003
L9	51 - 44.25	5.048	27	0.934	0.002
L10	44.25 - 27.75	3.788	27	0.831	0.002
L11	27.75 - 24.083	1.462	27	0.518	0.001
L12	24.083 - 18.083	1.091	27	0.450	0.001
L13	18.083 - 0	0.605	27	0.323	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.000	APXV9ERR18-C-A20 w/ Mount Pipe	27	41.017	2.718	0.016	13465
137.000	PCS 1900MHz 4x45W-65MHz	27	39.870	2.693	0.015	13465
129.000	(2) RRUS-11	27	35.320	2.588	0.014	6120
128.000	7770.00 w/ Mount Pipe	27	34.758	2.575	0.014	5610
120.000	(4) ALP 9212-N w/ Mount Pipe	27	30.356	2.458	0.012	3365
110.000	TME-DB-T16Z-8AB-0Z w/mount pipe	27	25.186	2.284	0.010	2242
108.000	BXA-185060/8CFx2 w/ Mount Pipe	27	24.210	2.244	0.010	2102
100.000	KRY 112 144/1	27	20.550	2.065	0.008	2119

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.000	742 213 w/ Mount Pipe	27	16.458	1.829	0.006	2598
70.000	KS24019-L112A	27	9.670	1.388	0.003	2439
49.000	KS24019-L112A	27	4.657	0.900	0.002	3192

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 102.333	105.897	2	6.954	0.041
L2	102.333 - 91.75	55.008	2	5.405	0.021
L3	95 - 85.333	47.056	2	4.954	0.017
L4	85.333 - 82.5	37.499	2	4.420	0.013
L5	82.5 - 77.1667	34.920	2	4.279	0.012
L6	77.1667 - 66.667	30.314	2	3.973	0.011
L7	66.667 - 60	22.275	2	3.341	0.008
L8	60 - 46.5	17.896	2	2.934	0.006
L9	51 - 44.25	12.886	2	2.385	0.005
L10	44.25 - 27.75	9.671	2	2.121	0.004
L11	27.75 - 24.083	3.734	2	1.322	0.002
L12	24.083 - 18.083	2.785	2	1.149	0.002
L13	18.083 - 0	1.545	2	0.825	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	APXV9ERR18-C-A20 w/ Mount Pipe	2	104.440	6.922	0.040	5413
137.000	PCS 1900MHz 4x45W-65MHz	2	101.526	6.857	0.039	5413
129.000	(2) RRUS-11	2	89.961	6.593	0.035	2459
128.000	7770.00 w/ Mount Pipe	2	88.533	6.558	0.035	2254
120.000	(4) ALP 9212-N w/ Mount Pipe	2	77.343	6.262	0.031	1350
110.000	TME-DB-T16Z-8AB-0Z w/mount pipe	2	64.195	5.820	0.026	897
108.000	BXA-185060/8CFx2 w/ Mount Pipe	2	61.713	5.719	0.025	841
100.000	KRY 112 144/1	2	52.399	5.264	0.020	846
90.000	742 213 w/ Mount Pipe	2	41.977	4.664	0.014	1033
70.000	KS24019-L112A	2	24.677	3.541	0.009	963
49.000	KS24019-L112A	2	11.888	2.298	0.004	1255

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 - 102.333 (1)	TP23.721x16x0.25	37.667	0.000	0.0	36.000	18.894	-8.183	680.183	0.012
L2	102.333 - 91.75 (2)	TP25.89x23.721x0.376	10.583	0.000	0.0	31.551	30.115	-10.052	950.150	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 $\frac{P}{P_a}$
L3	91.75 - 85.333 (3)	TP26.706x24.724x0.422	9.667	0.000	0.0	36.008	35.752	-12.243	1287.360	0.010
L4	85.333 - 82.5 (4)	TP27.287x26.706x0.601	2.833	0.000	0.0	34.086	51.604	-12.807	1759.000	0.007
L5	82.5 - 77.1667 (5)	TP28.38x27.287x0.527	5.333	0.000	0.0	35.070	47.222	-13.904	1656.090	0.008
L6	77.1667 - 66.667 (6)	TP30.534x28.38x0.512	10.500	0.000	0.0	35.246	49.448	-16.378	1742.830	0.009
L7	66.667 - 60 (7)	TP31.901x30.534x0.508	6.667	0.000	0.0	32.802	51.307	-17.787	1682.980	0.011
L8	60 - 46.5 (8)	TP34.67x31.901x0.505 H1-3+VT (1.39 CR) - 8	13.500	0.000	0.0	32.396	54.060	-19.934	1751.320	0.011
L9	46.5 - 44.25 (9)	TP34.506x33.122x0.554 H1-3+VT (1.34 CR) - 9	6.750	0.000	0.0	32.920	60.587	-22.471	1994.500	0.011
L10	44.25 - 27.75 (10)	TP37.89x34.506x0.652	16.500	0.000	0.0	33.425	78.131	-27.269	2611.540	0.010
L11	27.75 - 24.083 (11)	TP38.642x37.89x0.645	3.667	0.000	0.0	33.421	78.934	-28.381	2638.060	0.011
L12	24.083 - 18.083 (12)	TP39.872x38.642x0.551 H1-3+VT (1.46 CR) - 12	6.000	0.000	0.0	32.243	69.759	-30.289	2249.280	0.013
L13	18.083 - 0 (13)	TP43.58x39.872x0.626	18.083	0.000	0.0	35.530	86.574	-35.984	3075.930	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 - 102.333 (1)	TP23.721x16x0.25	396.984	44.060	36.000	1.224	0.000	0.000	36.000	0.000
L2	102.333 - 91.75 (2)	TP25.89x23.721x0.376	545.617	36.048	31.551	1.143	0.000	0.000	31.551	0.000
L3	91.75 - 85.333 (3)	TP26.706x24.724x0.422	759.797	40.010	36.008	1.111	0.000	0.000	36.008	0.000
L4	85.333 - 82.5 (4)	TP27.287x26.706x0.601	825.653	29.855	34.086	0.876	0.000	0.000	34.086	0.000
L5	82.5 - 77.1667 (5)	TP28.38x27.287x0.527	952.308	35.926	35.070	1.024	0.000	0.000	35.070	0.000
L6	77.1667 - 66.667 (6)	TP30.534x28.38x0.512	1212.108	40.440	35.246	1.147	0.000	0.000	35.246	0.000
L7	66.667 - 60 (7)	TP31.901x30.534x0.508	1384.242	42.529	32.802	1.297	0.000	0.000	32.802	0.000
L8	60 - 46.5 (8)	TP34.67x31.901x0.505	1624.558	44.694	32.396	1.380	0.000	0.000	32.396	0.000
L9	46.5 - 44.25 (9)	TP34.506x33.122x0.554	1811.358	43.583	32.920	1.324	0.000	0.000	32.920	0.000
L10	44.25 - 27.75 (10)	TP37.89x34.506x0.652	2289.250	38.989	33.425	1.166	0.000	0.000	33.425	0.000
L11	27.75 - 24.083 (11)	TP38.642x37.89x0.645	2399.417	39.622	33.421	1.186	0.000	0.000	33.421	0.000
L12	24.083 - 18.083 (12)	TP39.872x38.642x0.551	2582.708	46.496	32.243	1.442	0.000	0.000	32.243	0.000
L13	18.083 - 0 (13)	TP43.58x39.872x0.626	3157.042	41.947	35.530	1.181	0.000	0.000	35.530	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 - 102.333 (1)	TP23.721x16x0.25	18.692	0.989	24.000	0.084	2.575	0.135	24.000	0.006
L2	102.333 - 91.75 (2)	TP25.89x23.721x0.376	21.221	0.705	21.034	0.068	2.576	0.080	21.034	0.004
L3	91.75 - 85.333 (3)	TP26.706x24.724x0.422	23.075	0.645	24.006	0.055	0.880	0.022	24.006	0.001
L4	85.333 - 82.5 (4)	TP27.287x26.706x0.601	23.427	0.454	22.724	0.041	0.891	0.015	22.724	0.001
L5	82.5 - 77.1667 (5)	TP28.38x27.287x0.527	24.080	0.510	23.380	0.044	0.911	0.016	23.380	0.001
L6	77.1667 - 66.667 (6)	TP30.534x28.38x0.512	25.445	0.515	23.497	0.044	0.849	0.013	23.497	0.001
L7	66.667 - 60 (7)	TP31.901x30.534x0.508	26.207	0.511	21.868	0.047	0.872	0.013	21.868	0.001
L8	60 - 46.5 (8)	TP34.67x31.901x0.505	27.212	0.503	21.597	0.047	0.907	0.012	21.597	0.001
L9	46.5 - 44.25 (9)	TP34.506x33.122x0.554	28.105	0.464	21.946	0.043	1.033	0.012	21.946	0.001
L10	44.25 - 27.75 (10)	TP37.89x34.506x0.652	29.848	0.382	22.283	0.035	1.105	0.009	22.283	0.000
L11	27.75 - 24.083 (11)	TP38.642x37.89x0.645	30.249	0.383	22.281	0.035	1.127	0.009	22.281	0.000
L12	24.083 - 18.083 (12)	TP39.872x38.642x0.551	30.865	0.442	21.496	0.042	1.159	0.010	21.496	0.000
L13	18.083 - 0 (13)	TP43.58x39.872x0.626	32.688	0.378	23.686	0.032	1.254	0.008	23.686	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 - 102.333 (1)	0.012	1.224	0.000	0.084	0.006	1.238 ✔	1.333	H1-3+VT ✔
L2	102.333 - 91.75 (2)	0.011	1.143	0.000	0.068	0.004	1.155 ✔	1.333	H1-3+VT ✔
L3	91.75 - 85.333 (3)	0.010	1.111	0.000	0.055	0.001	1.121 ✔	1.333	H1-3+VT ✔
L4	85.333 - 82.5 (4)	0.007	0.876	0.000	0.041	0.001	0.884 ✔	1.333	H1-3+VT ✔
L5	82.5 - 77.1667 (5)	0.008	1.024	0.000	0.044	0.001	1.033 ✔	1.333	H1-3+VT ✔
L6	77.1667 - 66.667 (6)	0.009	1.147	0.000	0.044	0.001	1.157 ✔	1.333	H1-3+VT ✔
L7	66.667 - 60 (7)	0.011	1.297	0.000	0.047	0.001	1.308 ✔	1.333	H1-3+VT ✔
L8	60 - 46.5 (8)	0.011	1.380	0.000	0.047	0.001	1.392 ✘	1.333	H1-3+VT ✘
L9	46.5 - 44.25 (9)	0.011	1.324	0.000	0.043	0.001	1.336 ✘	1.333	H1-3+VT ✘
L10	44.25 - 27.75 (10)	0.010	1.166	0.000	0.035	0.000	1.177 ✔	1.333	H1-3+VT ✔
L11	27.75 - 24.083 (11)	0.011	1.186	0.000	0.035	0.000	1.197 ✔	1.333	H1-3+VT ✔
L12	24.083 - 18.083 (12)	0.013	1.442	0.000	0.042	0.000	1.456 ✘	1.333	H1-3+VT ✘
L13	18.083 - 0 (13)	0.012	1.181	0.000	0.032	0.000	1.193	1.333	H1-3+VT ✔

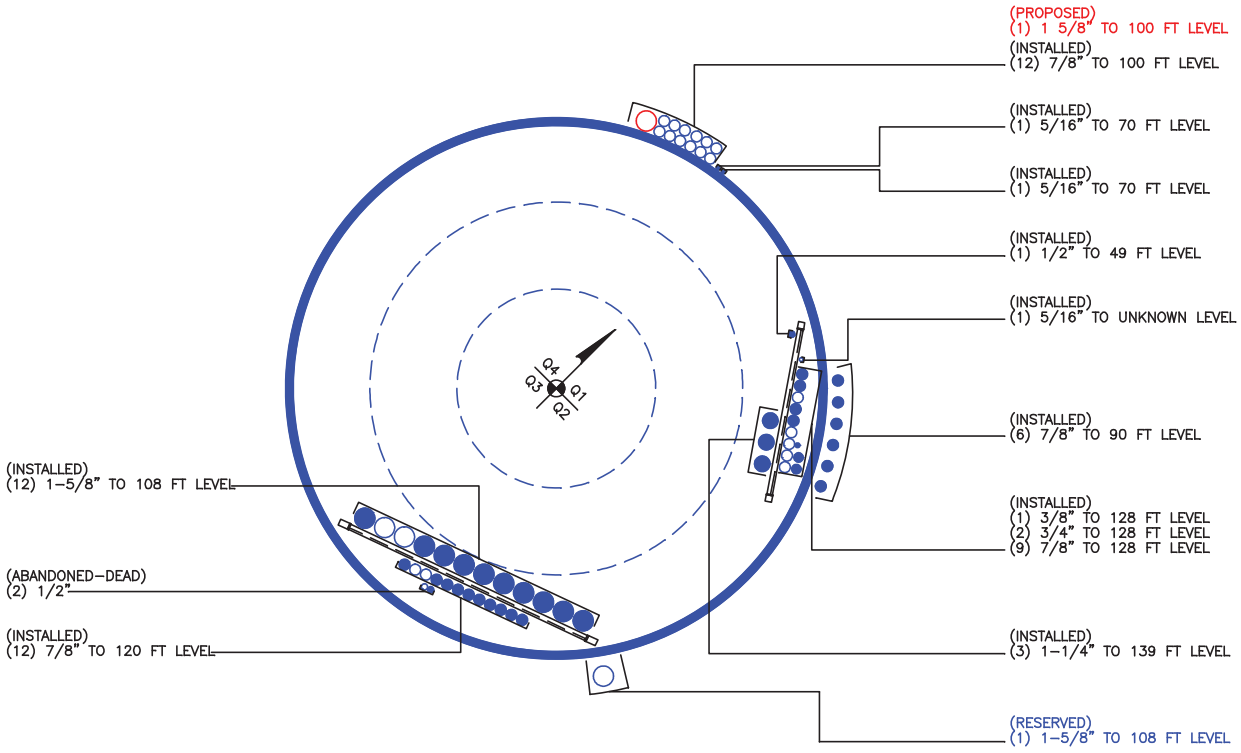
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
							✔		

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
L1	140 - 102.333	Pole	TP23.721x16x0.25	1	-8.183	906.684	92.0	Pass
L2	102.333 - 91.75	Pole	TP25.89x23.721x0.376	2	-10.052	1266.550	82.8	Pass
L3	91.75 - 85.333	Pole	TP26.706x24.724x0.422	3	-12.243	1716.051	88.9	Pass
L4	85.333 - 82.5	Pole	TP27.287x26.706x0.601	4	-12.807	2344.747	72.1	Pass
L5	82.5 - 77.1667	Pole	TP28.38x27.287x0.527	5	-13.904	2207.568	88.6	Pass
L6	77.1667 - 66.667	Pole	TP30.534x28.38x0.512	6	-16.378	2323.192	87.8	Pass
L7	66.667 - 60	Pole	TP31.901x30.534x0.508	7	-17.787	2243.412	94.0	Pass
L8	60 - 46.5	Pole	TP34.67x31.901x0.505	8	-19.934	2334.509	92.6	Pass
L9	46.5 - 44.25	Pole	TP34.506x33.122x0.554	9	-22.471	2658.668	95.9	Pass
L10	44.25 - 27.75	Pole	TP37.89x34.506x0.652	10	-27.269	3481.183	88.9	Pass
L11	27.75 - 24.083	Pole	TP38.642x37.89x0.645	11	-28.381	3516.534	90.3	Pass
L12	24.083 - 18.083	Pole	TP39.872x38.642x0.551	12	-30.289	2998.290	98.0	Pass
L13	18.083 - 0	Pole	TP43.58x39.872x0.626	13	-35.984	4100.215	97.9	Pass
							Summary	
						Pole (L12)	98.0	Pass
						RATING =	**98.0**	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876335 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Reinforcement 1						
Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	18.083	4	MP305	F	0	T&C
18.083	24.083	4	MP305	F	0	T&C
24.083	44.25	3	MP305	F	0	T&C
44.25	66.667	3	MP305	F	0	T&C
66.667	77.1667	4	MP303	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 2						
Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
77.1667	85.333	3	MP303	F	0	T&C
94.667	102.333	3	MP303	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 3						
Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	27.75	1	CCI 1.25x6.5	F	0	T&C
24.083	44.25	2	CCI 1x6	F	0	T&C
49	60	1	CCI 1x6	F	0	T&C
66.667	82.5	2	CCI 1x6	F	0	T&C
82.5	93	2	CCI 1x6	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Bottom Elevation	Top Elevation	Original Thickness	Original Yield Stress	Original Ultimate Stress	Reinforced Shaft Capacity	Reinf. 1 QTY	Reinf. 1 Type	Rein. 1 Capacity	Reinf. 2 QTY	Reinf. 2 Type	Rein. 2 Capacity	Reinf. 3 QTY	Reinf. 3 Type	Rein. 3 Capacity	Control Stress Ratio	Top Height	Section Length	Lap Splice	# of Sides	Top Diameter	Bottom Diameter	Equivalent Shaft Thickness
102.3330	140.0000	0.2500	60	75	92.0%										**92.0%**	140.0000	37.6670	0.0000	12	16.0000	23.7208	
91.7500	102.3330	0.2500	60	75	73.6%				3	MP303	82.8%				**82.8%**	102.3330	10.5830	3.2500	12	23.7208	25.8900	
85.3330	95.0000	0.3125	65	80	88.9%							2	CCI 1x6	68.4%	**88.9%**	95.0000	9.6670	0.0000	12	24.7238	26.7058	
82.5000	85.3330	0.3125	65	80	63.2%				3	MP303	72.1%	2	CCI 1x6	68.9%	**72.1%**	85.3330	2.8330	0.0000	12	26.7058	27.2866	
77.1667	82.5000	0.3125	65	80	77.6%				3	MP303	88.6%	2	CCI 1x6	61.1%	**88.6%**	82.5000	5.3333	0.0000	12	27.2866	28.3800	
66.6670	77.1667	0.3125	65	80	87.6%	4	MP303	77.7%				2	CCI 1x6	68.6%	**87.6%**	77.1667	10.4997	0.0000	12	28.3800	30.5336	
60.0000	66.6670	0.3125	65	80	80.0%	3	MP305	94.0%							**94.0%**	66.6670	6.6670	0.0000	12	30.5336	31.9010	
46.5000	60.0000	0.3125	65	80	89.1%	3	MP305	92.6%				1	CCI 1x6	31.5%	**92.6%**	60.0000	13.5000	4.5000	12	31.9010	34.6700	
44.2500	51.0000	0.3750	65	80	81.9%	3	MP305	95.9%							**95.9%**	51.0000	6.7500	0.0000	12	33.1220	34.5062	
27.7500	44.2500	0.3750	65	80	80.0%	3	MP305	87.4%				2	CCI 1x6	88.9%	**88.9%**	44.2500	16.5000	0.0000	12	34.5062	37.8896	
24.0830	27.7500	0.3750	65	80	81.2%	3	MP305	88.6%				2	CCI 1x6	90.3%	**90.3%**	27.7500	3.6670	0.0000	12	37.8896	38.6416	
18.0830	24.0830	0.3750	65	80	90.7%	4	MP305	98.0%				1	CCI 1.25x6.5	0.0%	**98.0%**	24.0830	6.0000	0.0000	12	38.6416	39.8719	
0.0000	18.0830	0.3750	65	80	90.1%	4	MP305	97.9%				1	CCI 1.25x6.5	69.4%	**97.9%**	18.0830	18.0830	0.0000	12	39.8719	43.5800	

Anchor Rod Information for TIA/EIA-222-F and TIA-222-G-2

Site Information	
ID:	876335
Name:	EAST FARMINGTON
App. #:	223704 Revision # 1

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Base Reactions		
Moment:	3157	ft-kip
Axial:	36	kip
Shear:	33	kip
Base Plate Type:	Square	

Design Information	
TIA Code:	F
ASIF:	1.333
Failure:	100%
eta Factor:	0.50

Original Anchor Rod Data

Quantity:	12	
Diameter:	2.25	in
Material:	#18J	
Bolt Circle:	51.0	in
Bolt Spacing:	6	in
Bolt Group Area:	47.71	in^2
Bolt Group MOIx:	15513	in^4

Reactions Seen by Original AR Group

Moment:	2355.8	kip-ft
Axial:	36.0	kip
Shear:	32.7	kip

Original AR Capacity Check

Tension Load:	181.8	kip
Allowable load:	194.8	kip
AR Capacity:	93.3%	Pass

First Added Anchor Rod Data

Quantity:	6	
Diameter:	1.75	in
Material:	A193 B7	
Bolt Circle:	54.1	in
Bolt Group Area:	14.43	in^2
Bolt Group MOIx:	5276	in^4

Reactions Seen by First Added AR Group

Moment:	801.2	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

First Added AR Capacity Check

Tension Load:	118.5	kip
Allowable load:	132.3	kip
AR Capacity:	89.6%	Pass

Second Added Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Third Added Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Rein1

Bottom	Top	Qty	Model	Position	T or T&C
0	18.083	4	MP305	F	T&C
18.083	24.083	4	MP305	F	T&C
24.083	44.25	3	MP305	F	T&C
44.25	66.667	3	MP305	F	T&C
66.667	77.1667	4	MP303	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

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

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

Rein2

Bottom	Top	Qty	Model	Position	T or T&C
77.1667	85.333	3	MP303	F	T&C
94.667	102.333	3	MP303	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

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

Rein3

Bottom	Top	Qty	Model	Position	T or T&C
0	27.75	1	Cl 1.25x6.5	F	T&C
24.083	44.25	2	CCI 1x6	F	T&C
49	60	1	CCI 1x6	F	T&C
66.667	82.5	2	CCI 1x6	F	T&C
82.5	93	2	CCI 1x6	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

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

Reinforcement Capacity

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

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
MP303	9.9	2.92	0.66	6.57	0.59	0	0.30	4.06	1.57	0.64	1.21875	65	80	0.80	18	1.00	18	96.4	128.6	Rupture	**144.7**	Rupture
MP304	14.1	4.13	0.91	11.86	0.61	0	0.43	4.78	1.61	0.84	1.21875	65	80	0.80	18	1.00	18	137.3	183.1	Rupture	**206.0**	Rupture
MP305	19.2	5.65	2.15	20.79	0.79	0	0.5	5.33	2.09	0.91	1.21875	65	80	0.80	18	1.00	18	194.5	259.3	Rupture	**291.8**	Rupture
MP306	28.8	8.47	4.95	52.50	0.93	0	0.64	6.89	2.61	1.01	1.21875	65	80	0.80	24	1.00	24	298.7	398.3	Rupture	**448.1**	Rupture
CCI 1x4.5	15.3	4.50	0.38	7.59	0.5	0	1	4.5	0	0	1.21875	65	80	0.80	20	1.00	20	128.8	171.7	Rupture	193.1	Rupture
CCI 1x6	20.4	6.00	0.50	18.00	0.5	0	1	6	0	0	1.21875	65	80	0.80	16	1.00	16	188.8	251.7	Rupture	283.1	Rupture
CCI 1.25x6.5	27.6	8.13	1.06	28.61	0.625	0	1.25	6.5	0	0	1.21875	65	80	0.80	19	1.00	19	260.4	347.2	Compress.	391.4	Rupture
CCI 1.25x8.5	36.2	10.63	1.38	63.97	0.625	0	1.25	8.5	0	0	1.21875	65	80	0.80	17	1.00	17	350.9	467.9	Compress.	541.4	Rupture

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*
App #: *223704 Revision # 1*

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:	6	in

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

Pole Data		
Diam:	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:	2355.81759	ft-kips
Unfactored Axial, P:	35.9843	kips
Unfactored Shear, V:	32.68823	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	181.8	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	93.2%	**Pass**

Base Plate Results Flexural Check

Base Plate Stress:	45.3	ksi
Allowable PL Bending Stress:	50.0	ksi
Base Plate Stress Ratio:	90.6%	**Pass**

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

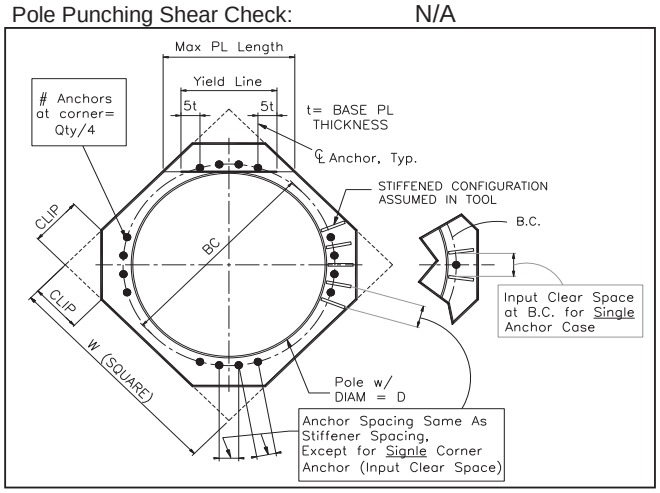
N/A - Unstiffened

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

Micropile Foundation Modification

Diameter	8	in
Circumfere	50	in

Top of Layer	Bottom of Layer	Layer Thickness (ft)	Skin Friction (psi)	Force (k)
9	19	10	0	0
19	23	4	30	72
23	26	3	250	452
26	30	4	0	0
30	41	11	0	0

Ultimate Uplift	525	k
Allowable Uplift	262.4	k
y	9	ft
Mn/Ω*1.33	6282	k-ft
Mu	3157	k-ft
Unity	**50.3%**	

Bar	1.75	in
Min. Ult Yield Capacity	312	k

>	262	k
Good		

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

T-Mobile Existing Facility

Site ID: CTHA233B
Global Signal MP

130 Birdseye Road
Farmington, CT 06032

April 9, 2014

EBI Project Number: 62142281

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

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April 9, 2014

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

Re: Emissions Values for Site: **CTHA233B - Global Signal MP**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 130 Birdseye Road, Farmington, CT, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (µW/cm2). The general population exposure limit for the cellular band is 567 µW/cm2, and the general population exposure limit for the PCS and AWS bands is 1000 µW/cm2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 130 Birdseye Road, Farmington, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is a 6 foot person standing at the base of the tower.

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

1) 2 GSM channels (1935.000 MHz—to 1945.000 MHz) were considered for each sector of the proposed installation.
2) 2 UMTS channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation.
3) 2 LTE channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation.
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
6) The antenna used in this modeling is the Ericsson AIR21 for LTE, UMTS and GSM. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.6 dBd gain value at its main lobe. Actual antenna gain values were used for all calculations as per the manufacturers specifications.

7) The antenna mounting height centerline of the proposed antennas is **100 feet** above ground level (AGL).
8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

Site ID	CTHA233B-Global Signal MP
Site Addresss	130 Birdseye Road, Farmington, CT 06032
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	100	94	None	0	0	48.326044	1.966217	0.19662%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	100	94	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	100	94	1-5/8"	0	0	24.163022	0.983109	0.09831%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	100	94	1-5/8"	0	0	24.163022	0.983109	0.09831%
														Sector total Power Density Value:			0.393%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	100	94	None	0	0	48.326044	1.966217	0.19662%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	100	94	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	100	94	1-5/8"	0	0	24.163022	0.983109	0.09831%
2b	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	100	94	1-5/8"	0	0	24.163022	0.983109	0.09831%
														Sector total Power Density Value:			0.393%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	100	94	None	0	0	48.326044	1.966217	0.19662%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	100	94	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	100	94	1-5/8"	0	0	24.163022	0.983109	0.09831%
2b	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	100	94	1-5/8"	0	0	24.163022	0.983109	0.09831%
														Sector total Power Density Value:			0.393%

Site Composite MPE %

Carrier	MPE %
T-Mobile	1.180%
Nextel	3.960%
Sprint	3.980%
Metro PCS	15.010%
Verizon	23.560%
AT&T	19.290%
Total Site MPE %	**66.980%**

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Summary

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

The anticipated Maximum Composite contributions from the T-Mobile facility are **1.180% (0.393% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **66.980%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

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