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: 876326**
T-Mobile Site ID: CT11280A
Located at: 440 Hayden Station Road, Windsor, CT 06095

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 Honorable Donald Trinks, Mayor for Town of Windsor.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **440 Hayden Station Road, Windsor, CT 06095**. 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: Honorable Donald Trinks, Mayor
Town of Windsor
275 Broad Street
Windsor, CT 06095

T-Mobile

NORTHEAST LLC.

SITE NAME: WINDSOR LOCKS/AIRPORT

SITE ID NUMBER: CT11280A

SITE ADDRESS: 440 HAYDEN STATION ROAD
WINDSOR, CT 06095

PROJECT SUMMARY

SITE ID NUMBER:	CT11280A
SITE NAME:	WINDSOR LOCKS/AIRPORT
CROWN BU#:	876326
SITE ADDRESS:	440 HAYDEN STATION ROAD WINDSOR, CT 06095
COUNTY:	HARTFORD
PROPERTY OWNER:	CROWN CASTLE USA
APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 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:	49-471-109
LATITUDE: (NAD 83)	41.89784° N
LONGITUDE: (NAD 83)	72.64400° W

SITE DIRECTIONS

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TAKE THE 2ND RIGHT ONTO DAY HILL RD. TURN RIGHT ONTO CT-75 S/POQUONOCK AVE. TURN LEFT ONTO THE INTERSTATE 91 N RAMP TO SPRINGFIELD. MERGE ONTO I-91 N. TAKE EXIT 39-41 FOR KENNEDY RD TOWARD CENTER ST. MERGE ONTO ARCHER RD. TURN LEFT ONTO HAYDEN STATION RD. DESTINATION WILL BE ON THE RIGHT.

N

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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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.CT11280A	JQ

REV	DATE	REVISION	DRAWN BY
0	4/7/14	FOR COMMENT	MP
1	4/8/14	FOR CONSTRUCTION	AS

ISSUED BY | DATE

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

SITE INFORMATION

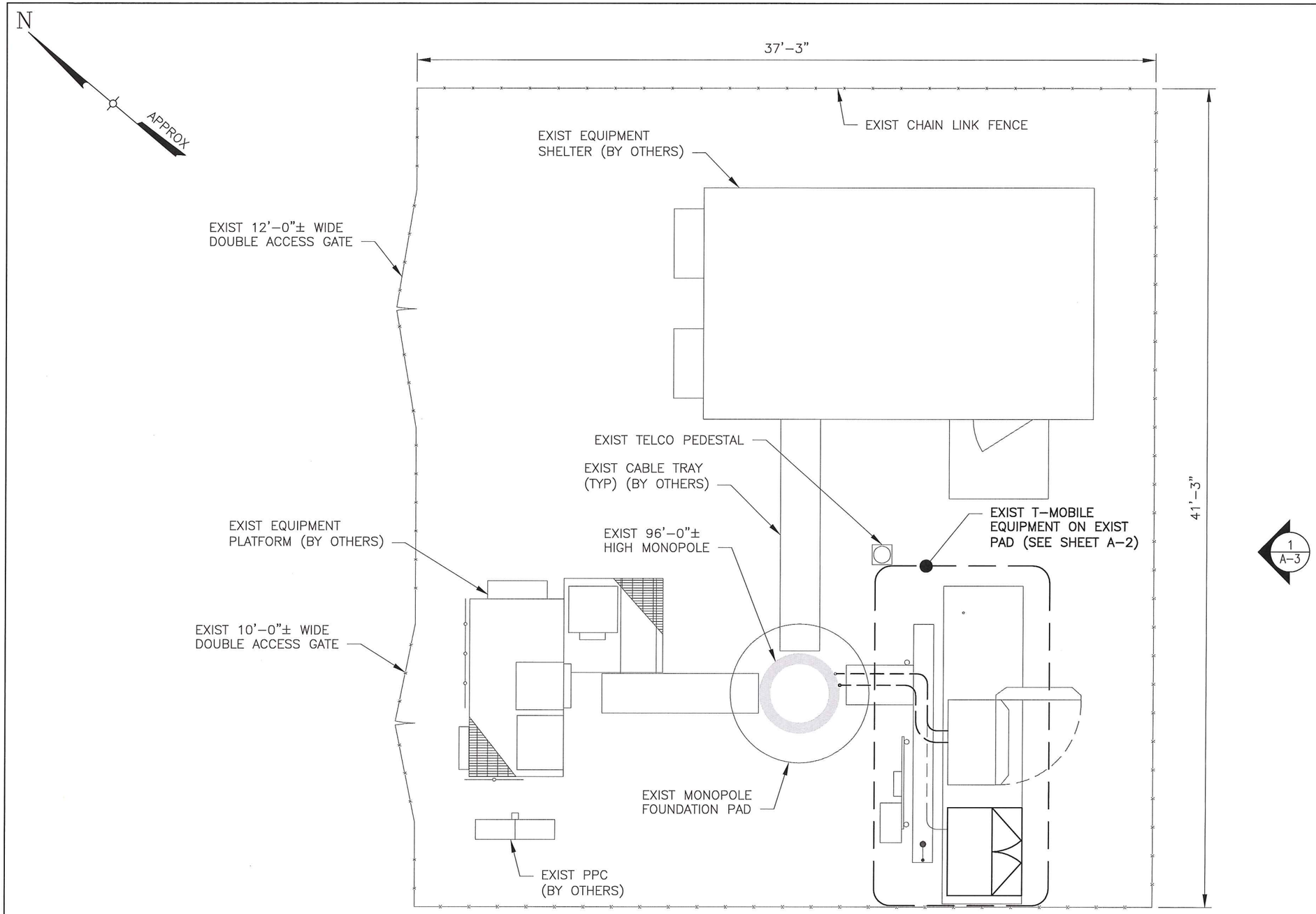
CT11280A
WINDSOR LOCKS/AIRPORT
440 HAYDEN STATION RD
WINDSOR, CT 06095

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



NOTES:

1. CONTRACTOR SHALL FIELD VERIFY THE ADEQUACY TO ROUTE THE HCS 9x18 MLE (FIBER) CABLE IN 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: 3/16" = 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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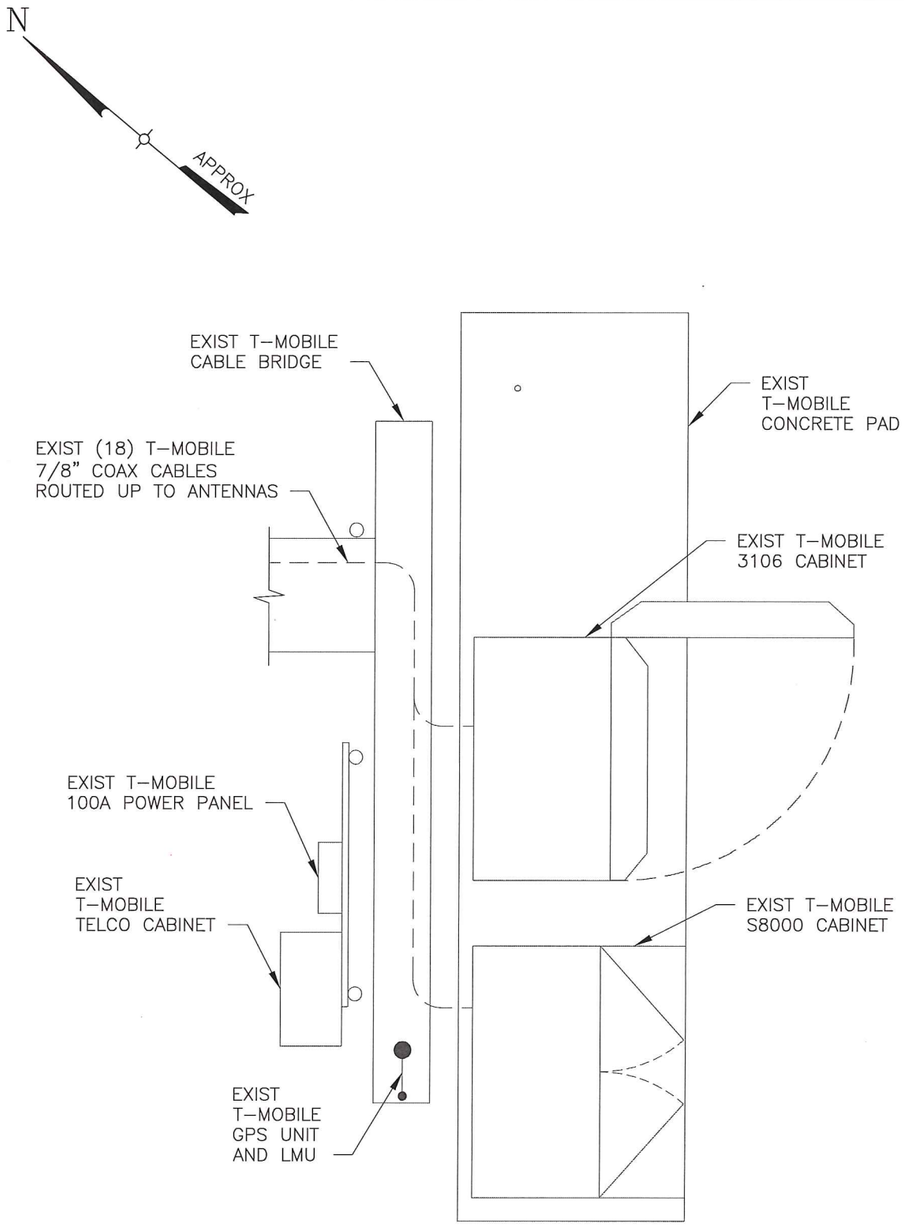
WINDSOR LOCKS/AIRPORT
440 HAYDEN STATION RD
WINDSOR, CT 06095

SHEET TITLE

SITE PLAN

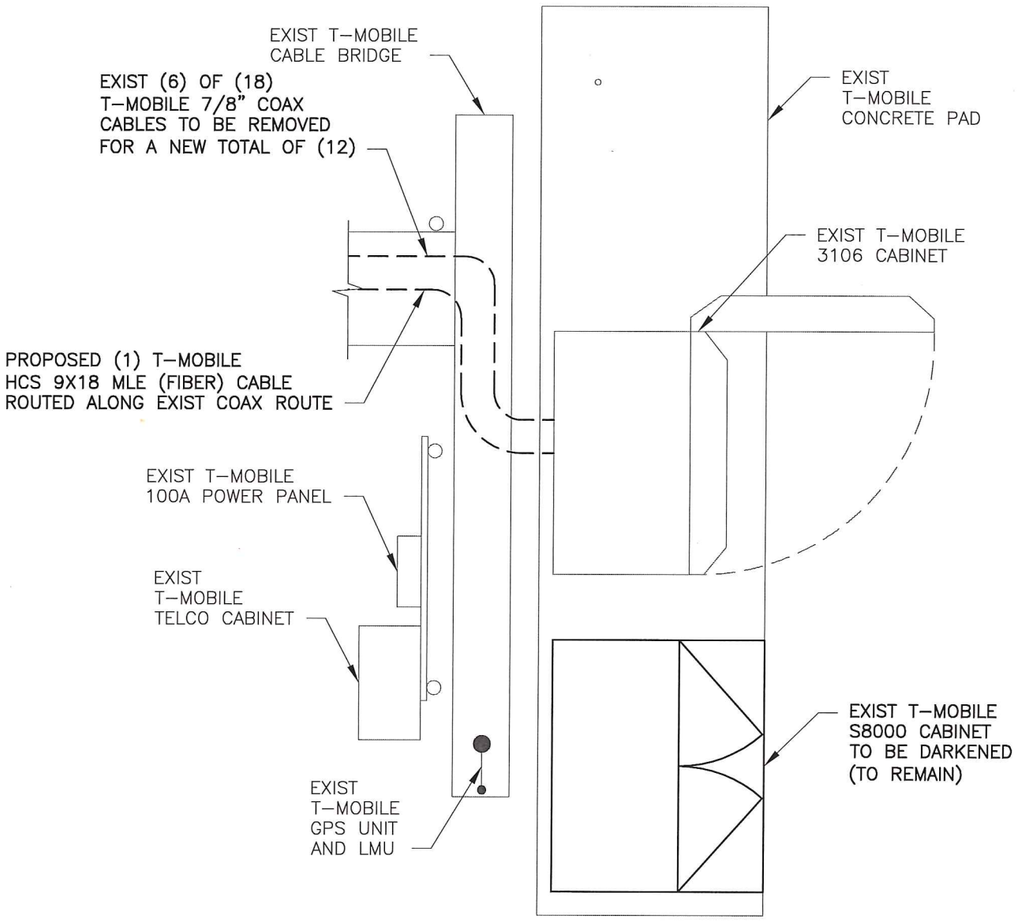
SHEET NUMBER

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	100'±	100'±	100'±
SIZE	1"		
HCS 9x18 MLE			

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

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WINDSOR LOCKS/AIRPORT
440 HAYDEN STATION RD
WINDSOR, CT 06095

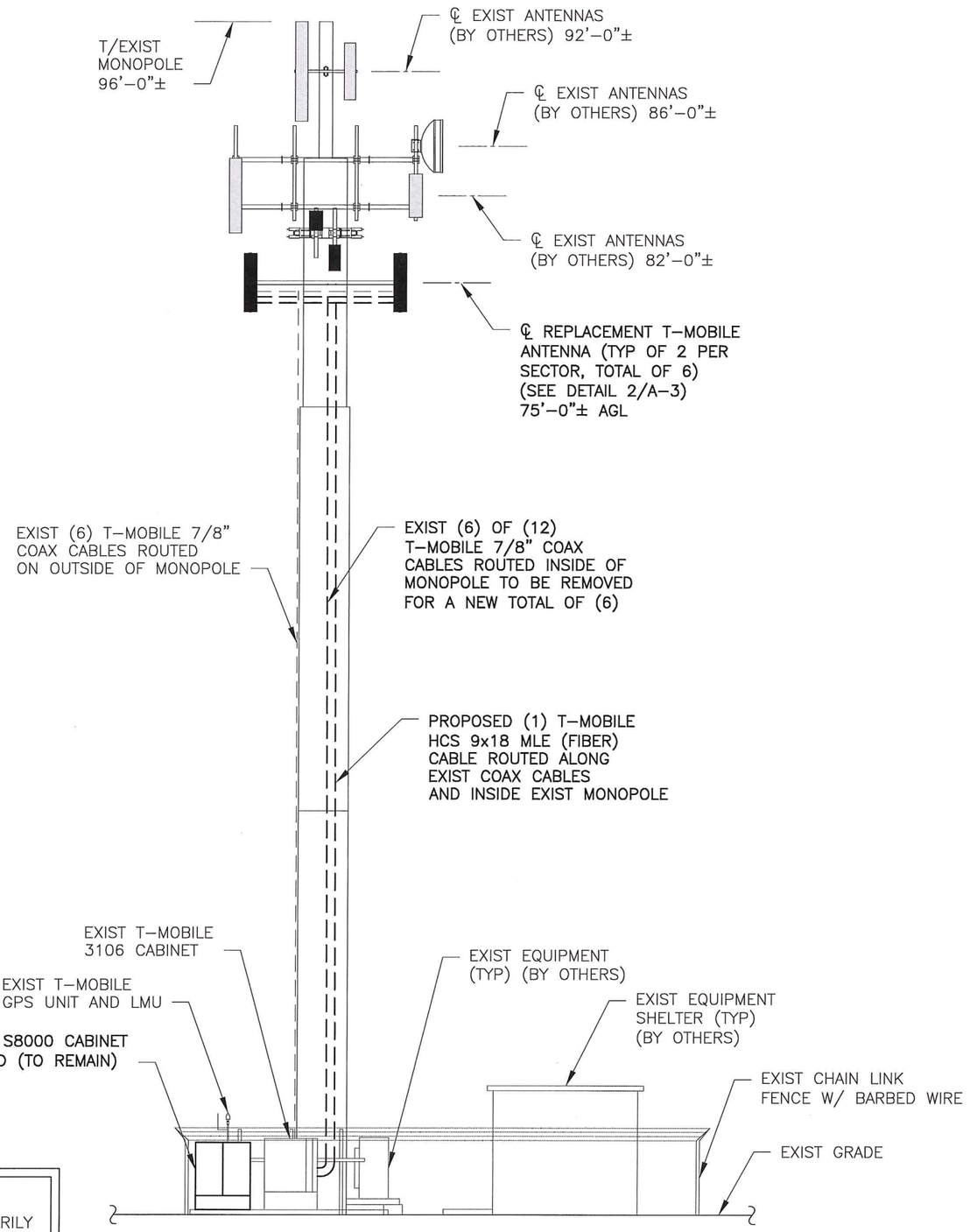
SHEET TITLE

EQUIPMENT LAYOUT PLANS

SHEET NUMBER

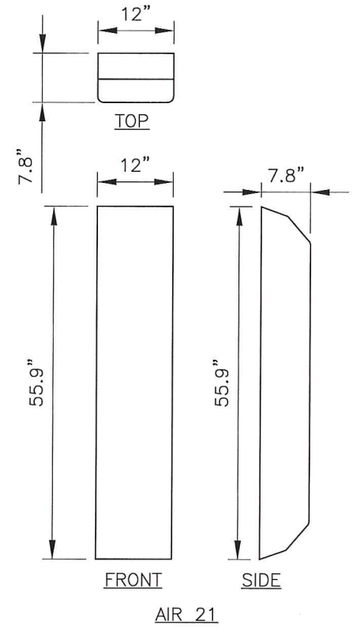
A-2

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



1 / A-3 ELEVATION

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



2 / A-3 ANTENNA DETAIL

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

ELEVATION NOTE:

ELEVATION OF EXIST MONOPOLE HAS BEEN ARBITRARILY ASSIGNED AS EL 253'-0"±. THIS IS APPROXIMATELY 96'-0"± ABOVE GRADE WHICH WAS ESTIMATED AS EL 157'-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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PHONE: (860) 692-7100

CROWN CASTLE

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RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

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

SITE INFORMATION

CT11280A
WINDSOR LOCKS/AIRPORT
440 HAYDEN STATION RD
WINDSOR, CT 06095

SHEET TITLE

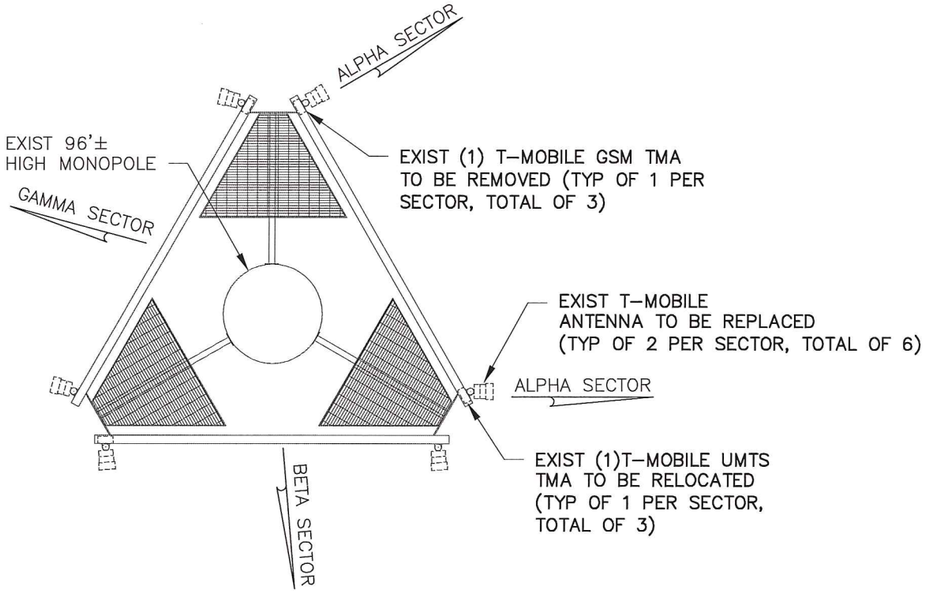
ELEVATION & DETAIL

SHEET NUMBER

A-3

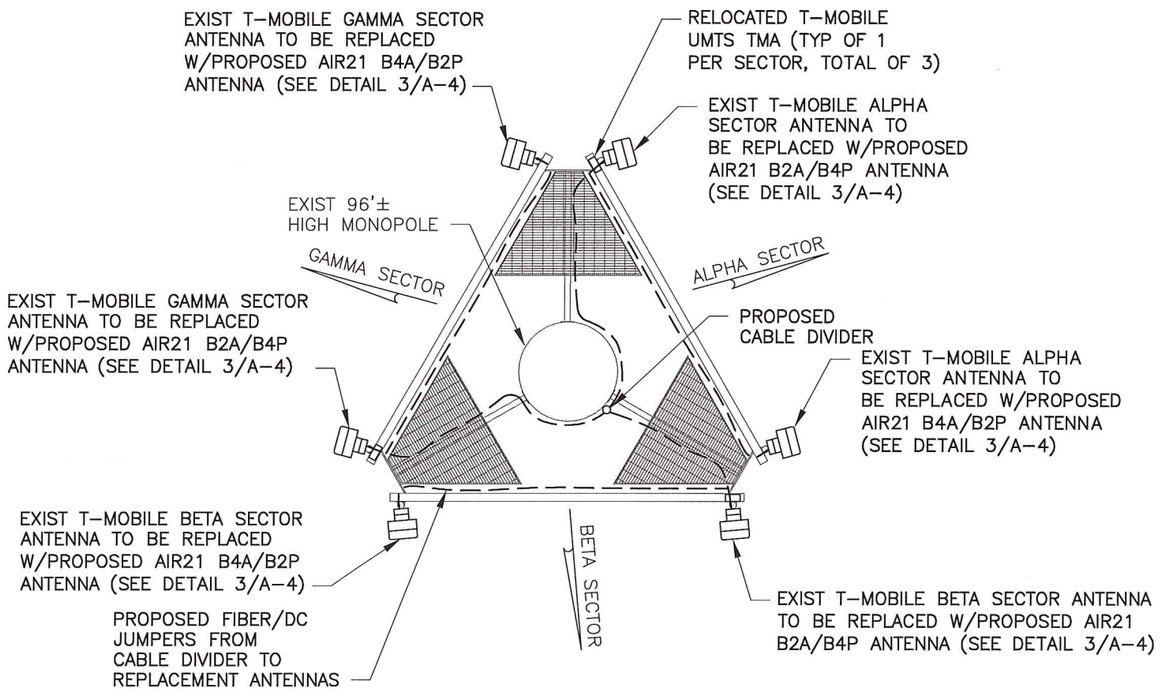
N

APPROX



1 / A–4 EXIST ANTENNA PLAN

SCALE: 3/16" = 1'–0"



2 / A–4 PROPOSED ANTENNA PLAN

SCALE: 3/16" = 1'–0"

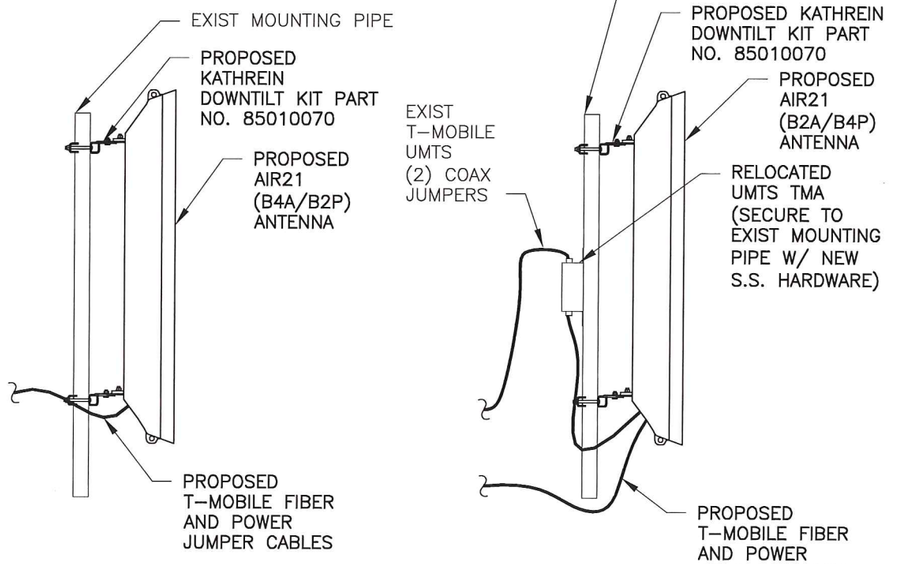
THE PROPOSED INSTALLATION, EXISTING MOUNTS & EXISTING MONOPOLE SHALL BE STRUCTURALLY ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).

EXIST ANTENNA SCHEDULE

SECTOR	MAKE	QUANTITY	MODEL#	SIZE
ALPHA	RFS	1	APX16DWV_16DWVS	55.9x13.3x3.15
ALPHA	EMS	1	DR65–18–02DP	54x12x5
BETA	RFS	1	APX16DWV_16DWVS	55.9x13.3x3.15
BETA	EMS	1	DR65–18–02DP	54x12x5
GAMMA	RFS	1	APX16DWV_16DWVS	55.9x13.3x3.15
GAMMA	EMS	1	DR65–18–02DP	54x12x5

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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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.CT11280A	JQ

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

SITE INFORMATION

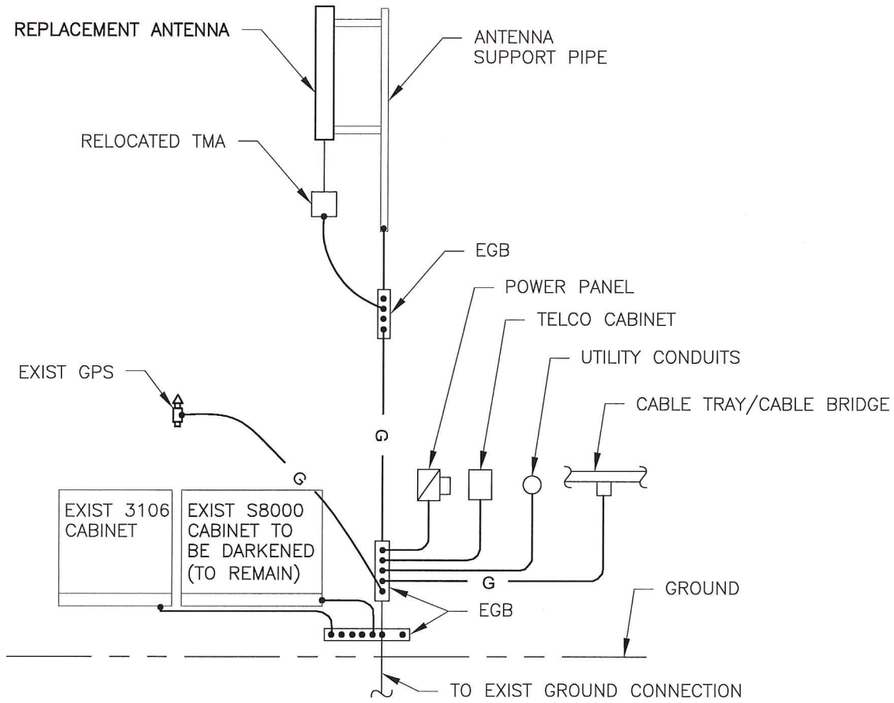
CT11280A
WINDSOR LOCKS/AIRPORT
440 HAYDEN STATION RD
WINDSOR, CT 06095

SHEET TITLE

ANTENNA LAYOUT PLANS & DETAILS

SHEET NUMBER

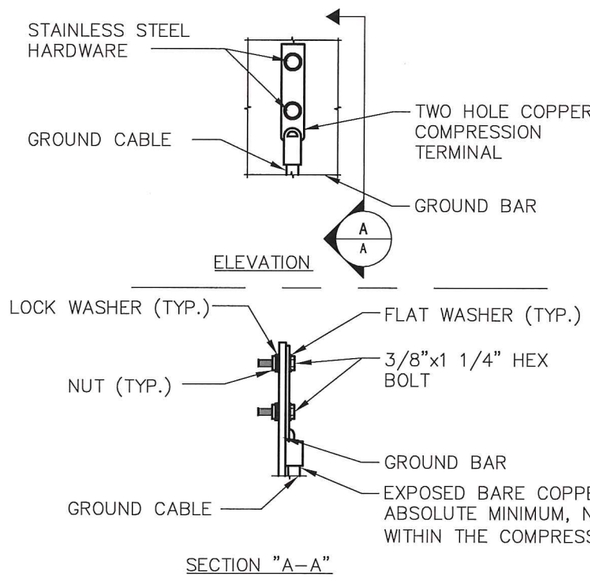
A–4



1 / A–5

GROUNDING RISER DIAGRAM

SCALE: NTS

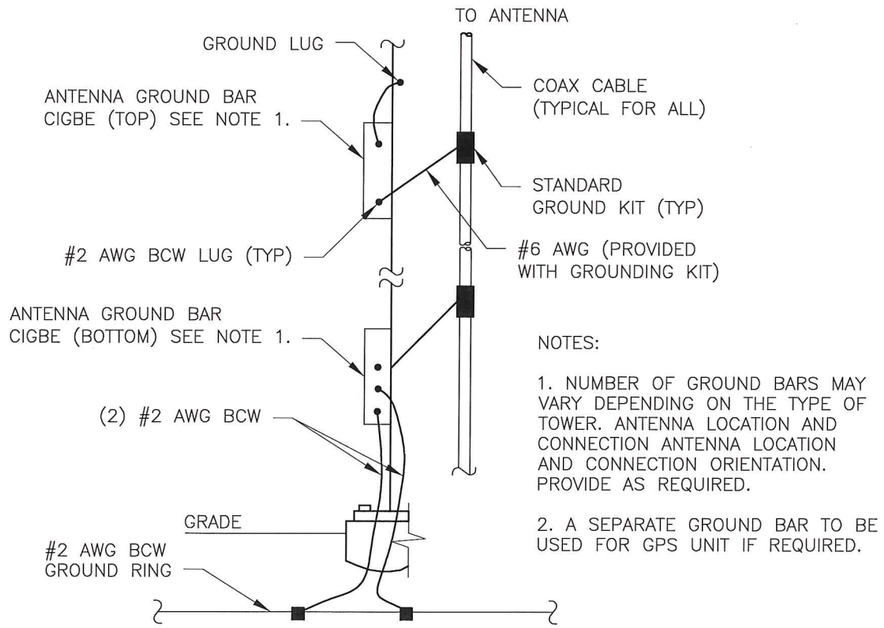


NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.
4. ALL GROUND LUGS MUST NE HEAT SHRUNK AT WIRE/LUG CONNECTION.

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.

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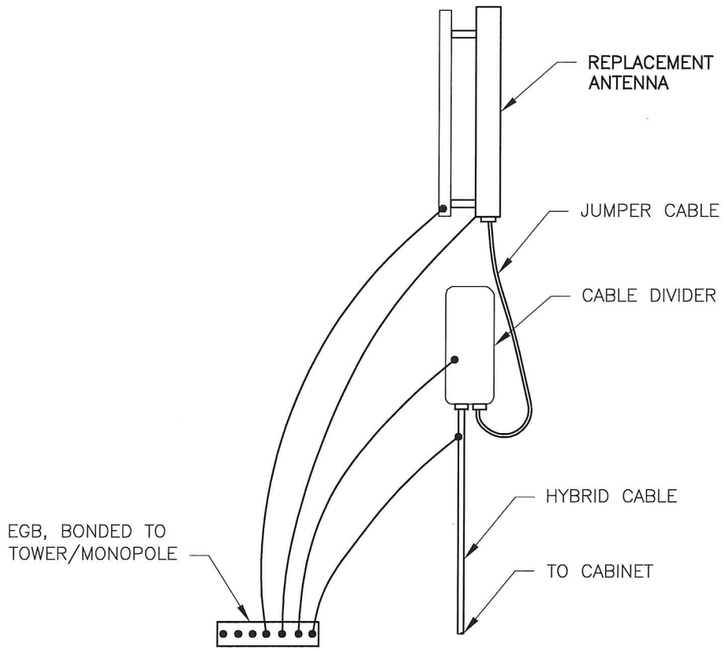
SHEET TITLE

DETAILS

SHEET NUMBER

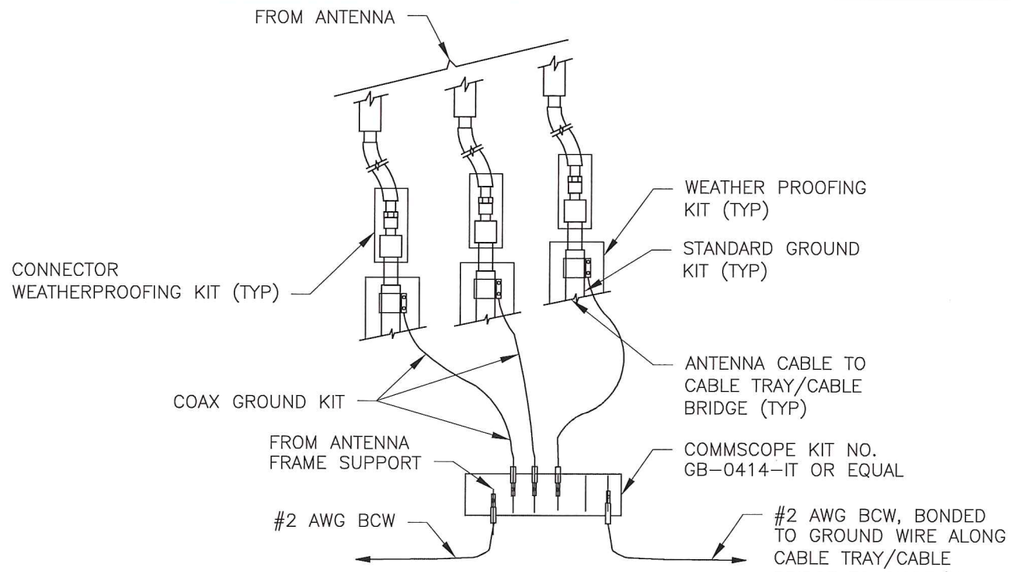
A–5



HYBRID CABLE CONNECTION AND GROUNDING DETAIL

1 / A-6

SCALE: NTS

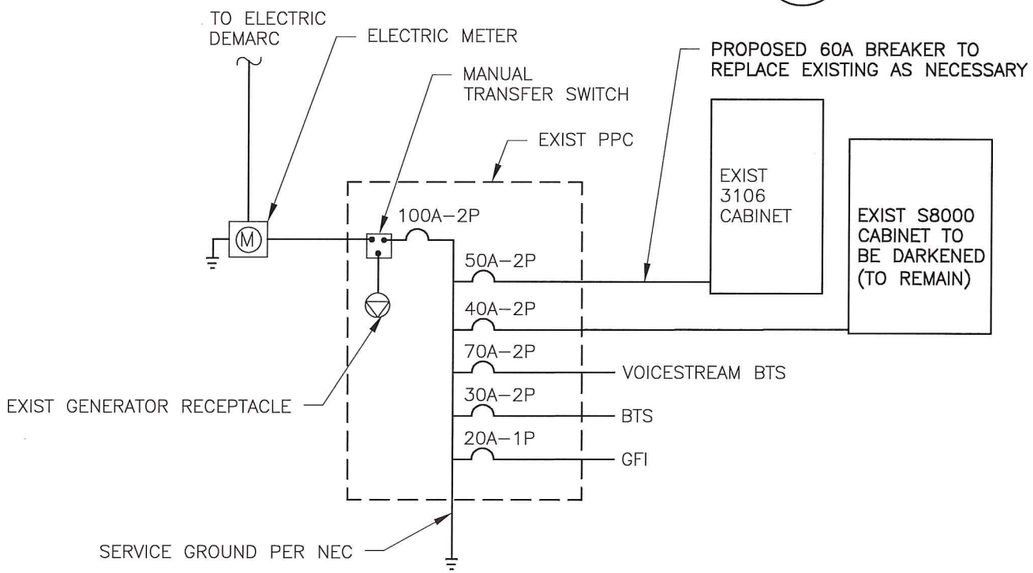


NOTE:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

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

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ANTONIO A. GUARINO
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

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WINDSOR LOCKS/AIRPORT
440 HAYDEN STATION RD
WINDSOR, CT 06095

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.

1279 ROUTE 300
NEWBURGH, NY 12550
Phone: (845) 567–6656
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.CT11280A	JQ

REV	DATE	REVISION	DRAWN BY
0	4/7/14	FOR COMMENT	MP
1	4/8/14	FOR CONSTRUCTION	AS

ISSUED BY	DATE

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

SITE INFORMATION

CT11280A
WINDSOR LOCKS/AIRPORT
440 HAYDEN STATION RD
WINDSOR, CT 06095

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 • CONSTRUCTION MANAGEMENT
• ENGINEERING
• SURVEYING
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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.CT11280A	JQ

REV	DATE	REVISION	DRAWN BY
0	4/7/14	FOR COMMENT	MP
1	4/8/14	FOR CONSTRUCTION	AS

ISSUED BY	DATE

SITE INFORMATION

CT11280A
WINDSOR LOCKS/AIRPORT
440 HAYDEN STATION RD
WINDSOR, CT 06095

CONFIGURATION

2C

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

SHEET TITLE

NOTES

SHEET NUMBER

A–8

0 1 2 3

ORIGINAL SIZE IN INCHES

Date: **March 29, 2014**

Mitzi Parker
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2149

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11280A
	Carrier Site Name:	Windsor Locks/Airport
Crown Castle Designation:	**Crown Castle BU Number:**	876326
	Crown Castle Site Name:	HAYDEN STATION
	Crown Castle JDE Job Number:	265893
	Crown Castle Work Order Number:	731462
	Crown Castle Application Number:	223701 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	731462
Site Data:	**440 Hayden Station Road, WINDSOR, Hartford County, CT** **Latitude *41° 53' 52.2"*, Longitude *-72° 38' 38.7"*** **96 Foot - Monopole Tower**	

Dear Mitzi Parker,

Crown Castle 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 731462, in accordance with application 223701, revision 0.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

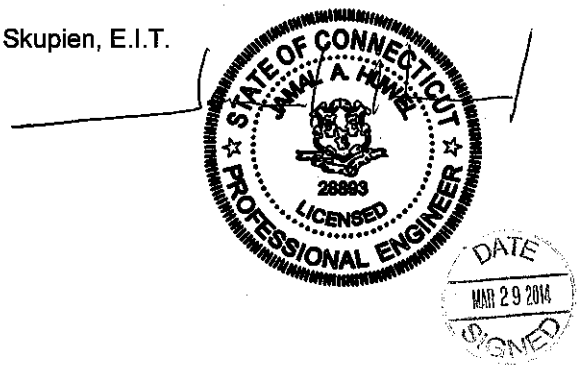
This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 80 mph fastest mile.

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

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

Structural analysis prepared by: Drew Skupien, E.I.T.

Respectfully submitted by:



Jamal A. Huwel, P.E.
Manager Engineering

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 96 ft Monopole tower designed by ROHN in January of 1997. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F. This tower was extended in the past from 85ft to 96ft.

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
75.0	75.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1	1-5/8	-
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			

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
92.0	92.0	6	ericsson	RRUS-11	6 1 2	1-5/8 3/8 3/4	1
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		3	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	T-Arm Mount [TA 702-3]			
83.0	86.0	3	dragonwave	A-ANT-11G-4-C	3 6 3	1-1/4 5/16 1/2	1
		3	dragonwave	HORIZON DUO			
	83.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	-	-	1
		3	alcatel lucent	TD-RRH8x20-25	1	5/8	2
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 502-1]	-	-	1
	82.0	3	kathrein	840 10045			
		3	samsung telecommunications	WIMAX DAP HEAD			
79.0	80.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
	79.0	1	tower mounts	Side Arm Mount [SO 104-3]			
	77.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
75.0	75.0	3	andrew	ONEBASE TWIN DUAL DUPLEX TMA	6	7/8	3
		3	ems wireless	DR65-18-00DPL2Q w/ Mount Pipe			
		3	rfs celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 304-1]	12	7/8	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)
85	85	12	swedcom	ALP9212	12	1 5/8
75	75	12	swedcom	ALP9212	12	1 5/8
60	60	12	swedcom	ALP9212	12	1 5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clough, Harbor, & Associates LLP	1530918	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, Inc.	1640630	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, Inc.	1639483	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	URS	1771083	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) The flange connection details at 85' are unknown; this connection was not included in this analysis
6) Tower extension geometry was taken from the URS analysis, noted in table 4.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	96 - 85	Pole	P12x.5	1	-2.23	538.65	15.5	Pass
L2	85 - 65	Pole	P42x3/8	2	-10.60	1484.55	18.6	Pass
L3	65 - 32.5	Pole	P48x3/8	3	-17.53	1643.28	43.5	Pass
L4	32.5 - 0	Pole	P48x1/2	4	-26.50	2356.76	54.3	Pass
							Summary	
						Pole (L4)	54.3	Pass
						Rating =	54.3	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	55.2	Pass
1, 2, 3	Base Plate	0	54.3	Pass
1	Base Foundation	0	35.8	Pass
1	Flange Bolts at 32.5'	32.5	28.8	Pass
1, 2, 3	Flange Plate at 32.5'	32.5	43.5	Pass
1	Flange Bolts at 65'	65	9.3	Pass
1, 2, 3	Flange Plate at 65'	65	18.6	Pass

Structure Rating (max from all components) =	**55.2%**

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.
3) Flange plates have the same capacity as their respective shaft.

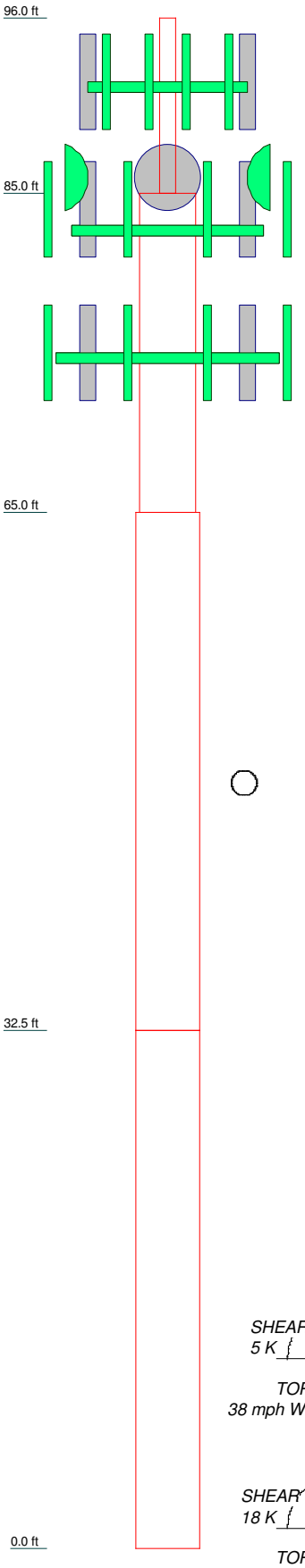
4.1) Recommendations

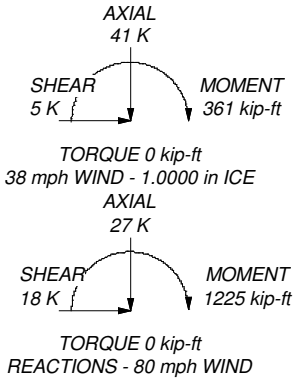
The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P12x.5	11.00	A53-B-35	0.7
2	P42x3/8	20.00	A53-B-42	3.3
3	P48x3/8	32.50		6.2
4	P48x1/2	32.50		8.3
				18.5





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
7770.00 w/ Mount Pipe	92	WIMAX DAP HEAD	83
7770.00 w/ Mount Pipe	92	WIMAX DAP HEAD	83
7770.00 w/ Mount Pipe	92	WIMAX DAP HEAD	83
P65-17-XLH-RR w/ Mount Pipe	92	A-ANT-11G-4-C	83
P65-17-XLH-RR w/ Mount Pipe	92	A-ANT-11G-4-C	83
P65-17-XLH-RR w/ Mount Pipe	92	A-ANT-11G-4-C	83
(2) RRUS-11	92	PCS 1900MHz 4x45W-65MHz	79
(2) RRUS-11	92	PCS 1900MHz 4x45W-65MHz	79
(2) RRUS-11	92	PCS 1900MHz 4x45W-65MHz	79
(2) LGP21401	92	Side Arm Mount [SO 104-3]	79
(2) LGP21401	92	4' x 2" Pipe Mount	79
(2) LGP21401	92	4' x 2" Pipe Mount	79
DC6-48-60-18-8F	92	4' x 2" Pipe Mount	79
T-Arm Mount [TA 702-3]	92	800MHz 2X50W RRH W/FILTER	79
APXVSPP18-C-A20 w/ Mount Pipe	83	800MHz 2X50W RRH W/FILTER	79
APXVSPP18-C-A20 w/ Mount Pipe	83	800MHz 2X50W RRH W/FILTER	79
APXVSPP18-C-A20 w/ Mount Pipe	83	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	75
APXVTM14-C-120 w/ Mount Pipe	83	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	75
APXVTM14-C-120 w/ Mount Pipe	83	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	75
APXVTM14-C-120 w/ Mount Pipe	83	KRY 112 144/1	75
TD-RRH8x20-25	83	KRY 112 144/1	75
TD-RRH8x20-25	83	KRY 112 144/1	75
TD-RRH8x20-25	83	Platform Mount [LP 304-1]	75
Platform Mount [LP 502-1]	83	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	75
(2) 4' x 2" Pipe Mount	83	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	75
(2) 4' x 2" Pipe Mount	83	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	75
(2) 4' x 2" Pipe Mount	83		
HORIZON DUO	83		
HORIZON DUO	83		
HORIZON DUO	83		
840 10045	83		
840 10045	83		
840 10045	83		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A53-B-42	42 ksi	63 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: 54.3%

CROWN CASTLE
We Are Solutions

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2149
FAX: (724) 416-4594

Job: ***BU# 876326***			
Project: ***Existing 95' Monopole***			
Client: Crown Castle	Drawn by: jskupien	App'd:	
Code: TIA/EIA-222-F	Date: 03/26/14	Scale: NTS	
Path: R:\SA Models - Letters\Work Area\DSkupien\876326\876326.en		Dwg No. E-1	

Tower Input Data

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

4) Tower is located in Hartford County, Connecticut.
5) Basic wind speed of 80 mph.
6) Nominal ice thickness of 1.0000 in.
7) Ice thickness is considered to increase with height.
8) Ice density of 56 pcf.
9) A wind speed of 38 mph is used in combination with ice.
10) Temperature drop of 50 °F.
11) Deflections calculated using a wind speed of 50 mph.
12) A non-linear (P-delta) analysis was used.
13) Pressures are calculated at each section.
14) Stress ratio used in pole design is 1.333.
15) 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		

Pole Section Geometry

Section	*Elevation*	*Section Length*	*Pole Size*	*Pole Grade*	*Socket Length*
	ft	*ft*			*ft*
L1	96.00-85.00	11.00	P12x.5	A53-B-35 (35 ksi)	
L2	85.00-65.00	20.00	P42x3/8	A53-B-42 (42 ksi)	
L3	65.00-32.50	32.50	P48x3/8	A53-B-42 (42 ksi)	
L4	32.50-0.00	32.50	P48x1/2	A53-B-42 (42 ksi)	

Tower Elevation	*Gusset Area (per face)*	*Gusset Thickness*	*Gusset Grade*	*Adjust. Factor A_f*	*Adjust. Factor A_r*	*Weight Mult.*	*Double Angle Stitch Bolt Spacing Diagonals*	*Double Angle Stitch Bolt Spacing Horizontals*
ft	*ft^2*	*in*					*in*	*in*

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 96.00-85.00				1	1	1		
L2 85.00-65.00				1	1	1		
L3 65.00-32.50				1	1	1		
L4 32.50-0.00				1	1	1		

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 plf
LDF7-50A(1-5/8")	B	No	Inside Pole	92.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	B	No	Inside Pole	92.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	B	No	Inside Pole	92.00 - 8.00	2	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
						2" Ice	0.00	0.59
						4" Ice	0.00	0.59
*								
2" Rigid Conduit	A	No	CaAa (Out Of Face)	83.00 - 2.00	1	No Ice	0.20	2.80
						1/2" Ice	0.30	4.33
						1" Ice	0.40	6.47
						2" Ice	0.60	12.57
						4" Ice	1.00	32.12
2" Rigid Conduit	A	No	CaAa (Out Of Face)	83.00 - 2.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	4.33
						1" Ice	0.00	6.47
						2" Ice	0.00	12.57
						4" Ice	0.00	32.12
ATCB-B01-001(5/16)	A	No	CaAa (Out Of Face)	83.00 - 2.00	4	No Ice	0.00	0.07
						1/2" Ice	0.00	0.57
						1" Ice	0.00	1.68
						2" Ice	0.00	5.73
						4" Ice	0.00	21.16
ATCB-B01-001(5/16)	A	No	CaAa (Out Of Face)	83.00 - 2.00	2	No Ice	0.00	0.07
						1/2" Ice	0.00	0.57
						1" Ice	0.00	1.68
						2" Ice	0.00	5.73
						4" Ice	0.00	21.16
FSJ4-50B(1/2")	A	No	CaAa (Out Of Face)	83.00 - 2.00	3	No Ice	0.00	0.14
						1/2" Ice	0.00	0.76
						1" Ice	0.00	2.00
						2" Ice	0.00	6.30
						4" Ice	0.00	22.23
HB114-1-08U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	83.00 - 2.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.18
						2" Ice	0.00	9.73
						4" Ice	0.00	28.15
HB058-M12-XXXF(5/8")	A	No	CaAa (Out Of Face)	83.00 - 2.00	1	No Ice	0.00	0.24
						1/2" Ice	0.00	1.06
						1" Ice	0.00	2.49
						2" Ice	0.00	7.18

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*						4" Ice	0.00	23.89
LDF5-50A(7/8")	C	No	Inside Pole	75.00 - 2.00	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	75.00 - 2.00	1	No Ice	0.16	1.07
						1/2" Ice	0.26	2.37
						1" Ice	0.36	4.28
						2" Ice	0.56	9.93
						4" Ice	0.96	28.56

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	96.00-85.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
L2	85.00-65.00	A	0.000	0.000	0.000	3.600	0.18
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	0.000	1.625	0.05
L3	65.00-32.50	A	0.000	0.000	0.000	6.500	0.32
		B	0.000	0.000	0.000	0.000	0.20
		C	0.000	0.000	0.000	5.281	0.16
L4	32.50-0.00	A	0.000	0.000	0.000	6.100	0.30
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	4.956	0.15

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	96.00-85.00	A	1.129	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.00
L2	85.00-65.00	A	1.104	0.000	0.000	0.000	7.573	0.92
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	0.000	3.832	0.09
L3	65.00-32.50	A	1.049	0.000	0.000	0.000	13.318	1.54
		B		0.000	0.000	0.000	0.000	0.20
		C		0.000	0.000	0.000	12.099	0.28
L4	32.50-0.00	A	1.000	0.000	0.000	0.000	12.200	1.34
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	11.056	0.25

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	96.00-85.00	0.0000	0.0000	0.0000	0.0000
L2	85.00-65.00	-0.0982	-0.1945	-0.2048	-0.3490
L3	65.00-32.50	-0.1936	-0.1633	-0.3903	-0.2707
L4	32.50-0.00	-0.1826	-0.1541	-0.3621	-0.2523

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
7770.00 w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.70 12.42 13.15 14.64 17.91	8.94 10.45 11.99 14.31 19.14	0.09 0.18 0.27 0.50 1.13
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.70 12.42 13.15 14.64 17.91	8.94 10.45 11.99 14.31 19.14	0.09 0.18 0.27 0.50 1.13
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.70 12.42 13.15 14.64 17.91	8.94 10.45 11.99 14.31 19.14	0.09 0.18 0.27 0.50 1.13
(2) RRUS-11	A	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
(2) RRUS-11	B	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
(2) RRUS-11	C	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
(2) LGP21401	A	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14

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
						4" Ice			
(2) LGP21401	B	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
DC6-48-60-18-8F	A	From Leg	1.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.27 1.46 1.66 2.09 3.10	1.27 1.46 1.66 2.09 3.10	0.02 0.04 0.05 0.10 0.21
T-Arm Mount [TA 702-3]	C	None		0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.64 6.55 7.46 9.28 12.92	5.64 6.55 7.46 9.28 12.92	0.34 0.43 0.52 0.70 1.06
*									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.07 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.07 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.07 0.13 0.19 0.34 0.75
TD-RRH8x20-25	A	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice	4.72 5.01 5.32	1.70 1.92 2.15	0.07 0.10 0.13

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
						1" Ice	5.95	2.62	0.20
						2" Ice	7.31	3.68	0.40
						4" Ice			
TD-RRH8x20-25	B	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
Platform Mount [LP 502-1]	C	None		0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.35 45.67 58.99 85.63 138.91	32.35 45.67 58.99 85.63 138.91	0.93 1.19 1.46 2.00 3.07
(2) 4' x 2" Pipe Mount	A	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.03 0.04 0.04 0.07 0.17
(2) 4' x 2" Pipe Mount	B	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.03 0.04 0.04 0.07 0.17
(2) 4' x 2" Pipe Mount	C	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.03 0.04 0.04 0.07 0.17
*									
HORIZON DUO	A	From Leg	4.00 0.00 3.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.00 1.60	0.34 0.43 0.52 0.73 1.25	0.01 0.01 0.02 0.04 0.10
HORIZON DUO	B	From Leg	4.00 0.00 3.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.00 1.60	0.34 0.43 0.52 0.73 1.25	0.01 0.01 0.02 0.04 0.10
HORIZON DUO	C	From Leg	4.00 0.00 3.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.00 1.60	0.34 0.43 0.52 0.73 1.25	0.01 0.01 0.02 0.04 0.10
840 10045	A	From Leg	4.00 0.00 -1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.19 5.54 5.91 6.67 8.30	1.36 1.62 1.89 2.44 3.74	0.04 0.06 0.09 0.16 0.35
840 10045	B	From Leg	4.00	0.0000	83.00	No Ice	5.19	1.36	0.04

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
			0.00			1/2"	5.54	1.62	0.06
			-1.00			Ice	5.91	1.89	0.09
						1" Ice	6.67	2.44	0.16
						2" Ice	8.30	3.74	0.35
						4" Ice			
840 10045	C	From Leg	4.00	0.0000	83.00	No Ice	5.19	1.36	0.04
			0.00			1/2"	5.54	1.62	0.06
			-1.00			Ice	5.91	1.89	0.09
						1" Ice	6.67	2.44	0.16
						2" Ice	8.30	3.74	0.35
						4" Ice			
WIMAX DAP HEAD	A	From Leg	4.00	0.0000	83.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			-1.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
WIMAX DAP HEAD	B	From Leg	4.00	0.0000	83.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			-1.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
WIMAX DAP HEAD	C	From Leg	4.00	0.0000	83.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			-1.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
*									
800MHz 2X50W RRH W/FILTER	A	From Leg	1.00	0.0000	79.00	No Ice	2.40	2.25	0.06
			0.00			1/2"	2.61	2.46	0.09
			1.00			Ice	2.83	2.68	0.11
						1" Ice	3.30	3.13	0.17
						2" Ice	4.34	4.15	0.34
						4" Ice			
800MHz 2X50W RRH W/FILTER	B	From Leg	1.00	0.0000	79.00	No Ice	2.40	2.25	0.06
			0.00			1/2"	2.61	2.46	0.09
			1.00			Ice	2.83	2.68	0.11
						1" Ice	3.30	3.13	0.17
						2" Ice	4.34	4.15	0.34
						4" Ice			
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00	0.0000	79.00	No Ice	2.40	2.25	0.06
			0.00			1/2"	2.61	2.46	0.09
			1.00			Ice	2.83	2.68	0.11
						1" Ice	3.30	3.13	0.17
						2" Ice	4.34	4.15	0.34
						4" Ice			
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.00	0.0000	79.00	No Ice	2.71	2.61	0.06
			0.00			1/2"	2.95	2.85	0.08
			-2.00			Ice	3.20	3.09	0.11
						1" Ice	3.72	3.61	0.17
						2" Ice	4.86	4.74	0.35
						4" Ice			
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.00	0.0000	79.00	No Ice	2.71	2.61	0.06
			0.00			1/2"	2.95	2.85	0.08
			-2.00			Ice	3.20	3.09	0.11
						1" Ice	3.72	3.61	0.17
						2" Ice	4.86	4.74	0.35
						4" Ice			
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.00	0.0000	79.00	No Ice	2.71	2.61	0.06
			0.00			1/2"	2.95	2.85	0.08
			-2.00			Ice	3.20	3.09	0.11
						1" Ice	3.72	3.61	0.17
						2" Ice	4.86	4.74	0.35

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
						4" Ice			
Side Arm Mount [SO 104-3]	C	None		0.0000	79.00	No Ice	3.30	3.30	0.29
						1/2" Ice	4.13	4.13	0.32
						1" Ice	4.96	4.96	0.35
						2" Ice	6.62	6.62	0.41
						4" Ice	9.94	9.94	0.53
4' x 2" Pipe Mount	A	From Leg	1.00 0.00 0.00	0.0000	79.00	No Ice	0.79	0.79	0.03
						1/2" Ice	1.03	1.03	0.04
						1" Ice	1.28	1.28	0.04
						2" Ice	1.81	1.81	0.07
						4" Ice	3.11	3.11	0.17
4' x 2" Pipe Mount	B	From Leg	1.00 0.00 0.00	0.0000	79.00	No Ice	0.79	0.79	0.03
						1/2" Ice	1.03	1.03	0.04
						1" Ice	1.28	1.28	0.04
						2" Ice	1.81	1.81	0.07
						4" Ice	3.11	3.11	0.17
4' x 2" Pipe Mount	C	From Leg	1.00 0.00 0.00	0.0000	79.00	No Ice	0.79	0.79	0.03
						1/2" Ice	1.03	1.03	0.04
						1" Ice	1.28	1.28	0.04
						2" Ice	1.81	1.81	0.07
						4" Ice	3.11	3.11	0.17
*									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice	0.41	0.20	0.01
						1/2" Ice	0.50	0.27	0.01
							0.59	0.35	0.02

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
						1" Ice	0.81	0.53	0.03
						2" Ice	1.36	1.00	0.08
						4" Ice			
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
Platform Mount [LP 304-1]	C	None		0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	17.46 22.44 27.42 37.38 57.30	17.46 22.44 27.42 37.38 57.30	1.35 1.62 1.90 2.45 3.55

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-11G-4-C	A	Paraboloid w/o Radome	From Leg	4.00 0.00 3.00	0.0000		83.00	4.23	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.07 14.63 15.20 16.37 18.85	0.12 0.13 0.14 0.19 0.41
A-ANT-11G-4-C	B	Paraboloid w/o Radome	From Leg	4.00 0.00 3.00	0.0000		83.00	4.23	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.07 14.63 15.20 16.37 18.85	0.12 0.13 0.14 0.19 0.41
A-ANT-11G-4-C	C	Paraboloid w/o Radome	From Leg	4.00 0.00 3.00	0.0000		83.00	4.23	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.07 14.63 15.20 16.37 18.85	0.12 0.13 0.14 0.19 0.41

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	96 - 85	Pole	Max Tension	2	0.00	-0.00	-0.00
			Max. Compression	14	-4.24	0.00	0.09
			Max. Mx	11	-2.24	21.53	0.43
			Max. My	2	-2.23	0.00	21.87
			Max. Vy	11	-4.25	21.53	0.43
			Max. Vx	2	-4.55	0.00	21.87
			Max. Torque	11			-0.18
L2	85 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.70	0.07	1.66
			Max. Mx	11	-10.61	220.87	8.66
			Max. My	2	-10.60	0.02	227.51
			Max. Vy	11	-12.37	220.87	8.66
			Max. Vx	2	-12.68	0.02	227.51
			Max. Torque	11			-0.20
L3	65 - 32.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.97	0.33	4.61
			Max. Mx	11	-17.54	668.85	22.19
			Max. My	2	-17.53	0.08	685.85
			Max. Vy	11	-15.11	668.85	22.19
			Max. Vx	2	-15.41	0.08	685.85
			Max. Torque	11			-0.24
L4	32.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.91	0.56	7.16
			Max. Mx	11	-26.50	1197.85	35.62
			Max. My	2	-26.50	0.13	1225.14
			Max. Vy	11	-17.42	1197.85	35.62
			Max. Vx	2	-17.71	0.13	1225.14
			Max. Torque	11			-0.27

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	40.91	0.00	0.00
	Max. H_x	11	26.51	17.41	0.39
	Max. H_z	2	26.51	0.00	17.71
	Max. M_x	2	1225.14	0.00	17.71
	Max. M_z	5	1197.59	-17.41	0.39
	Max. Torsion	5	0.27	-17.41	0.39
	Min. Vert	2	26.51	0.00	17.71
	Min. H_x	5	26.51	-17.41	0.39
	Min. H_z	8	26.51	0.00	-17.54
	Min. M_x	8	-1207.72	0.00	-17.54
	Min. M_z	11	-1197.85	17.41	0.39
	Min. Torsion	11	-0.27	17.41	0.39

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	26.51	0.00	-0.00	-1.52	0.13	0.00
Dead+Wind 0 deg - No Ice	26.51	-0.00	-17.71	-1225.14	0.13	-0.09
Dead+Wind 30 deg - No Ice	26.51	9.05	-14.88	-1021.80	-628.28	-0.06
Dead+Wind 60 deg - No Ice	26.51	15.19	-8.77	-606.19	-1047.16	-0.19
Dead+Wind 90 deg - No Ice	26.51	17.41	-0.39	-35.62	-1197.59	-0.27
Dead+Wind 120 deg - No Ice	26.51	15.34	8.85	610.30	-1059.59	-0.10
Dead+Wind 150 deg - No Ice	26.51	8.36	15.27	1052.82	-569.23	0.10
Dead+Wind 180 deg - No Ice	26.51	-0.00	17.54	1207.72	0.13	0.09
Dead+Wind 210 deg - No Ice	26.51	-8.36	15.27	1052.82	569.50	0.06
Dead+Wind 240 deg - No Ice	26.51	-15.34	8.85	610.30	1059.86	0.19
Dead+Wind 270 deg - No Ice	26.51	-17.41	-0.39	-35.62	1197.85	0.27
Dead+Wind 300 deg - No Ice	26.51	-15.19	-8.77	-606.19	1047.43	0.10
Dead+Wind 330 deg - No Ice	26.51	-9.05	-14.88	-1021.80	628.55	-0.10
Dead+Ice+Temp	40.91	-0.00	-0.00	-7.16	0.56	0.00
Dead+Wind 0 deg+Ice+Temp	40.91	0.00	-5.01	-361.05	0.56	-0.05
Dead+Wind 30 deg+Ice+Temp	40.91	2.55	-4.23	-304.10	-180.35	-0.05
Dead+Wind 60 deg+Ice+Temp	40.91	4.31	-2.49	-182.42	-302.82	-0.08
Dead+Wind 90 deg+Ice+Temp	40.91	4.94	-0.09	-15.52	-346.96	-0.09
Dead+Wind 120 deg+Ice+Temp	40.91	4.34	2.51	169.64	-305.83	-0.03
Dead+Wind 150 deg+Ice+Temp	40.91	2.39	4.33	297.83	-166.05	0.04
Dead+Wind 180 deg+Ice+Temp	40.91	0.00	4.97	343.06	0.56	0.05
Dead+Wind 210 deg+Ice+Temp	40.91	-2.39	4.33	297.83	167.17	0.05
Dead+Wind 240 deg+Ice+Temp	40.91	-4.34	2.51	169.64	306.96	0.08
Dead+Wind 270 deg+Ice+Temp	40.91	-4.94	-0.09	-15.52	348.09	0.09
Dead+Wind 300 deg+Ice+Temp	40.91	-4.31	-2.49	-182.42	303.95	0.03
Dead+Wind 330 deg+Ice+Temp	40.91	-2.55	-4.23	-304.10	181.48	-0.04
Dead+Wind 0 deg - Service	26.51	0.00	-6.92	-479.92	0.13	-0.04
Dead+Wind 30 deg - Service	26.51	3.54	-5.82	-400.41	-245.53	-0.02
Dead+Wind 60 deg - Service	26.51	5.94	-3.43	-237.92	-409.30	-0.07
Dead+Wind 90 deg - Service	26.51	6.81	-0.15	-14.85	-468.14	-0.11
Dead+Wind 120 deg -	26.51	5.99	3.46	237.66	-414.16	-0.04

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service						
Dead+Wind 150 deg - Service	26.51	3.27	5.97	410.66	-222.47	0.04
Dead+Wind 180 deg - Service	26.51	0.00	6.86	471.24	0.13	0.04
Dead+Wind 210 deg - Service	26.51	-3.27	5.97	410.66	222.74	0.02
Dead+Wind 240 deg - Service	26.51	-5.99	3.46	237.66	414.43	0.07
Dead+Wind 270 deg - Service	26.51	-6.81	-0.15	-14.85	468.41	0.11
Dead+Wind 300 deg - Service	26.51	-5.94	-3.43	-237.92	409.57	0.04
Dead+Wind 330 deg - Service	26.51	-3.54	-5.82	-400.41	245.80	-0.04

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-26.51	0.00	0.00	26.51	0.00	0.000%
2	0.00	-26.51	-17.71	0.00	26.51	17.71	0.003%
3	9.05	-26.51	-14.88	-9.05	26.51	14.88	0.001%
4	15.19	-26.51	-8.77	-15.19	26.51	8.77	0.001%
5	17.41	-26.51	-0.39	-17.41	26.51	0.39	0.003%
6	15.34	-26.51	8.85	-15.34	26.51	-8.85	0.001%
7	8.36	-26.51	15.27	-8.36	26.51	-15.27	0.001%
8	0.00	-26.51	17.54	0.00	26.51	-17.54	0.003%
9	-8.36	-26.51	15.27	8.36	26.51	-15.27	0.001%
10	-15.34	-26.51	8.85	15.34	26.51	-8.85	0.001%
11	-17.41	-26.51	-0.39	17.41	26.51	0.39	0.003%
12	-15.19	-26.51	-8.77	15.19	26.51	8.77	0.001%
13	-9.05	-26.51	-14.88	9.05	26.51	14.88	0.001%
14	0.00	-40.91	0.00	0.00	40.91	0.00	0.000%
15	0.00	-40.91	-5.01	-0.00	40.91	5.01	0.000%
16	2.55	-40.91	-4.23	-2.55	40.91	4.23	0.000%
17	4.31	-40.91	-2.49	-4.31	40.91	2.49	0.000%
18	4.94	-40.91	-0.09	-4.94	40.91	0.09	0.000%
19	4.34	-40.91	2.51	-4.34	40.91	-2.51	0.000%
20	2.39	-40.91	4.33	-2.39	40.91	-4.33	0.000%
21	0.00	-40.91	4.97	-0.00	40.91	-4.97	0.000%
22	-2.39	-40.91	4.33	2.39	40.91	-4.33	0.000%
23	-4.34	-40.91	2.51	4.34	40.91	-2.51	0.000%
24	-4.94	-40.91	-0.09	4.94	40.91	0.09	0.000%
25	-4.31	-40.91	-2.49	4.31	40.91	2.49	0.000%
26	-2.55	-40.91	-4.23	2.55	40.91	4.23	0.000%
27	0.00	-26.51	-6.92	-0.00	26.51	6.92	0.001%
28	3.54	-26.51	-5.82	-3.54	26.51	5.82	0.001%
29	5.94	-26.51	-3.43	-5.94	26.51	3.43	0.001%
30	6.81	-26.51	-0.15	-6.81	26.51	0.15	0.001%
31	5.99	-26.51	3.46	-5.99	26.51	-3.46	0.001%
32	3.27	-26.51	5.97	-3.27	26.51	-5.97	0.001%
33	0.00	-26.51	6.86	-0.00	26.51	-6.86	0.001%
34	-3.27	-26.51	5.97	3.27	26.51	-5.97	0.001%
35	-5.99	-26.51	3.46	5.99	26.51	-3.46	0.001%
36	-6.81	-26.51	-0.15	6.81	26.51	0.15	0.001%
37	-5.94	-26.51	-3.43	5.94	26.51	3.43	0.001%
38	-3.54	-26.51	-5.82	3.54	26.51	5.82	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	8	0.00000001	0.00011594
3	Yes	9	0.00000001	0.00009599
4	Yes	9	0.00000001	0.00009884
5	Yes	8	0.00000001	0.00012486
6	Yes	9	0.00000001	0.00009640
7	Yes	9	0.00000001	0.00008735
8	Yes	8	0.00000001	0.00011473
9	Yes	9	0.00000001	0.00008937
10	Yes	9	0.00000001	0.00009545
11	Yes	8	0.00000001	0.00012489
12	Yes	9	0.00000001	0.00009776
13	Yes	9	0.00000001	0.00009772
14	Yes	6	0.00000001	0.00000001
15	Yes	10	0.00000001	0.00005492
16	Yes	10	0.00000001	0.00005449
17	Yes	10	0.00000001	0.00005448
18	Yes	10	0.00000001	0.00005270
19	Yes	10	0.00000001	0.00005374
20	Yes	10	0.00000001	0.00005228
21	Yes	10	0.00000001	0.00005196
22	Yes	10	0.00000001	0.00005237
23	Yes	10	0.00000001	0.00005389
24	Yes	10	0.00000001	0.00005287
25	Yes	10	0.00000001	0.00005463
26	Yes	10	0.00000001	0.00005458
27	Yes	8	0.00000001	0.00005697
28	Yes	8	0.00000001	0.00005091
29	Yes	8	0.00000001	0.00005242
30	Yes	8	0.00000001	0.00005606
31	Yes	8	0.00000001	0.00005160
32	Yes	8	0.00000001	0.00005080
33	Yes	8	0.00000001	0.00005593
34	Yes	8	0.00000001	0.00005123
35	Yes	8	0.00000001	0.00005142
36	Yes	8	0.00000001	0.00005609
37	Yes	8	0.00000001	0.00005213
38	Yes	8	0.00000001	0.00005136

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	96 - 85	4.014	27	0.3117	0.0004
L2	85 - 65	3.307	27	0.2893	0.0002
L3	65 - 32.5	2.129	27	0.2658	0.0001
L4	32.5 - 0	0.609	27	0.1634	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
92.00	7770.00 w/ Mount Pipe	27	3.754	0.3028	0.0003	59089
86.00	A-ANT-11G-4-C	27	3.370	0.2910	0.0002	31240
83.00	APXVSPP18-C-A20 w/ Mount Pipe	27	3.182	0.2864	0.0001	28890
79.00	800MHz 2X50W RRH W/FILTER	27	2.939	0.2815	0.0001	31542
75.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	2.701	0.2775	0.0001	35691

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	96 - 85	10.243	2	0.7950	0.0011
L2	85 - 65	8.439	2	0.7383	0.0004
L3	65 - 32.5	5.433	2	0.6782	0.0003
L4	32.5 - 0	1.554	2	0.4171	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
92.00	7770.00 w/ Mount Pipe	2	9.580	0.7725	0.0008	23247
86.00	A-ANT-11G-4-C	2	8.599	0.7425	0.0005	12290
83.00	APXVSPP18-C-A20 w/ Mount Pipe	2	8.122	0.7308	0.0004	11363
79.00	800MHz 2X50W RRH W/FILTER	2	7.500	0.7185	0.0003	12401
75.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	6.893	0.7081	0.0003	14024

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	96 - 85 (1)	P12x.5	11.00	0.00	0.0	21.000	19.2423	-2.23	404.09	0.006
L2	85 - 65 (2)	P42x3/8	20.00	0.00	0.0	22.711	49.0383	-10.60	1113.69	0.010
L3	65 - 32.5 (3)	P48x3/8	32.50	0.00	0.0	21.972	56.1069	-17.53	1232.77	0.014
L4	32.5 - 0 (4)	P48x1/2	32.50	0.00	0.0	23.696	74.6128	-26.50	1768.01	0.015

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	96 - 85 (1)	P12x.5	21.87	4.627	23.100	0.200	0.00	0.000	23.100	0.000
L2	85 - 65 (2)	P42x3/8	227.51	5.398	22.711	0.238	0.00	0.000	22.711	0.000
L3	65 - 32.5 (3)	P48x3/8	685.85	12.416	21.972	0.565	0.00	0.000	21.972	0.000
L4	32.5 - 0 (4)	P48x1/2	1225.13	16.766	23.696	0.708	0.00	0.000	23.696	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	96 - 85 (1)	P12x.5	4.55	0.473	14.000	0.034	0.00	0.000	14.000	0.000
L2	85 - 65 (2)	P42x3/8	12.68	0.517	16.800	0.031	0.01	0.000	12.473	0.000
L3	65 - 32.5 (3)	P48x3/8	15.41	0.549	16.800	0.033	0.06	0.001	11.284	0.000
L4	32.5 - 0 (4)	P48x1/2	17.71	0.475	16.800	0.028	0.09	0.001	16.167	0.000

Pole Interaction Design Data

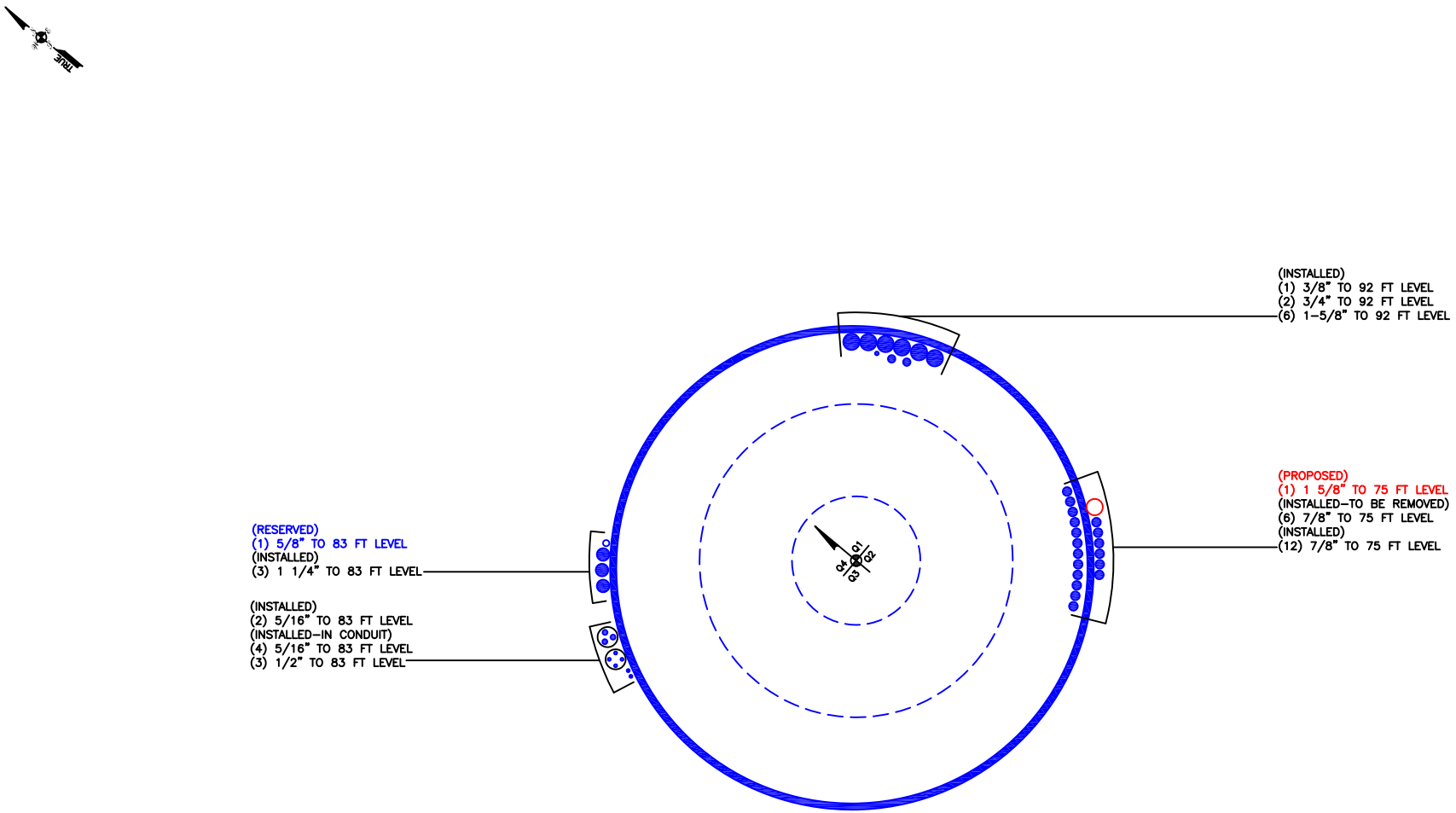
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	96 - 85 (1)	0.006	0.200	0.000	0.034	0.000	0.207 ✔	1.333	H1-3+VT ✔
L2	85 - 65 (2)	0.010	0.238	0.000	0.031	0.000	0.248 ✔	1.333	H1-3+VT ✔
L3	65 - 32.5 (3)	0.014	0.565	0.000	0.033	0.000	0.580 ✔	1.333	H1-3+VT ✔
L4	32.5 - 0 (4)	0.015	0.708	0.000	0.028	0.000	0.723 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	96 - 85	Pole	P12x.5	1	-2.23	538.65	15.5	Pass
L2	85 - 65	Pole	P42x3/8	2	-10.60	1484.55	18.6	Pass
L3	65 - 32.5	Pole	P48x3/8	3	-17.53	1643.28	43.5	Pass
L4	32.5 - 0	Pole	P48x1/2	4	-26.50	2356.76	54.3	Pass
							Summary	
						Pole (L4)	54.3	Pass
						RATING =	**54.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876326 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

Site Data

BU#: *876326*
Site Name: *HAYDEN STATION*
App #: *223701 Rev.0*

Pole Manufacturer:	Rohn

Reactions		
Moment:	227.5	ft-kips
Axial:	10.6	kips
Shear:	12.7	kips
Elevation:	65	feet

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

Bolt Data			
Qty:	20		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	53.5		

Plate Data		
Diam:	59	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	6.60	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

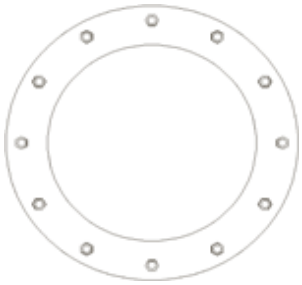
			Rigid
Bolt Tension Capacity, **B**:	103.65	kips	Service, ASD
Max Bolt directly applied T:	9.68	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	3.619	in	
Min PL "treq" for actual **T w/ Pry**:	0.833	in	
Min PL "t1" for actual **T w/o Pry**:	1.106	in	
T allowable with Prying:	55.82	kips	α'>1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	9.68	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	9.3%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	Rohn/Pirod,	OK	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod,	OK	Comp. Y.L. Length:
No Prying			33.14
Tension Side Stress Ratio, (treq/t)^2:	17.3%	**Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



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

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

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

Site Data

BU#: *876326*
Site Name: *HAYDEN STATION*
App #: *223701 Rev.0*

Pole Manufacturer:	Rohn

Bolt Data			
Qty:	20		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	53.5		

Plate Data		
Diam:	59	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.54	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	685.9	ft-kips
Axial:	17.5	kips
Shear:	15.4	kips
Elevation:	32.5	feet

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

Flange Bolt Results

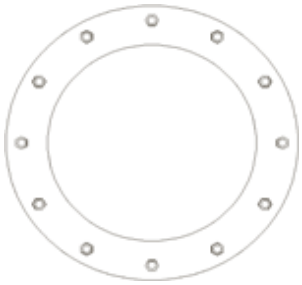
			Rigid
Bolt Tension Capacity, **B**:	103.65	kips	Service, ASD
Max Bolt directly applied T:	29.89	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	2.141	in	
Min PL "treq" for actual **T w/ Pry**:	0.859	in	
Min PL "t1" for actual **T w/o Pry**:	1.150	in	
T allowable with Prying:	98.85	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	29.89	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	28.8%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	Rohn/Pirod,	OK	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod,	OK	Comp. Y.L. Length:
No Prying			23.63
Tension Side Stress Ratio, (treq/t)^2:	18.4%	**Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



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

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

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *876326*
Site Name: *HAYDEN STATION*
App #: *223701 Rev.0*

Pole Manufacturer:	*Rohn*

Reactions		
Moment:	1225	ft-kips
Axial:	27	kips
Shear:	18	kips

Anchor Rod Data		
Qty:	20	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	53.5	in

Plate Data		
Diam:	59	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.54	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

			Rigid
Maximum Rod Tension:	53.6	Kips	Service, ASD
Allowable Tension:	97.2	Kips	Fty*ASIF
Anchor Rod Stress Ratio:	55.2%	**Pass**	

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	Rohn/Pirod, OK	Y.L. Length: 23.63

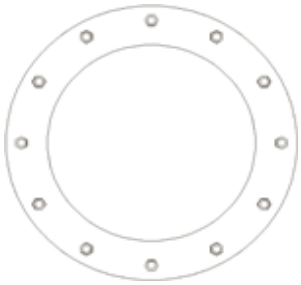
n/a

Stiffener Results N/A for Rohn / Pirod

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

Pole Results

Pole Punching Shear Check: N/A



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

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

CCI Foundation Tool Suite - Monopole Pier - Beta Release

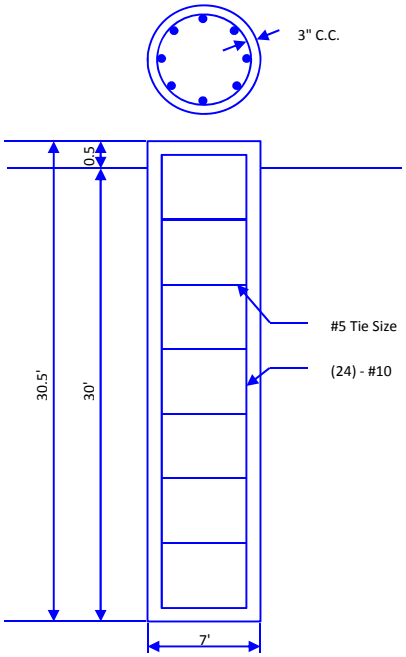
CCI Foundation Tool Suite - v1.0 Date: 3/26/2014

BU:	876326
Site Name:	HAYDEN STATION
App Number:	223701 Rev.0
Work Order:	731462

Monopole Drilled Pier

Input

Criteria		
TIA Revision:	F	
ACI 318 Revision:	2002	
Seismic Category:	B	
Forces		
Compression	27	kips
Shear	18	kips
Moment	1225	k-ft
Swelling Force	0	kips
Foundation Dimensions		
Pier Diameter:	7	ft
Ext. above grade:	0.5	ft
Depth below grade:	30	ft
Material Properties		
Number of Rebar:	24	
Rebar Size:	10	
Tie Size	5	
Rebar tensile strength:	60	ksi
Concrete Strength:	3000	psi
Ultimate Concrete Strain	0.003	in/in
Clear Cover to Ties:	3	in



Soil Profile: 1

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3.5	0	3.5	120					0	
2	22.5	3.5	26	120		32			0	
3	4	26	30	60		32			6	

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	8.07	ft
Max Moment, Mu:	1341.25	k-ft
Soil Safety Factor:	12.66	
Safety Factor Req'd:	2	
RATING:	15.8%	

Soil Axial Capacity

Skin Friction (k):	217.60	kips
End Bearing (k):	115.45	kips
Comp. Capacity (k), ϕCn:	333.06	kips
Comp. (k), Cu:	27.00	kips
RATING:	8.1%	

Concrete/Steel Check

Mu (from soil analysis)	1743.63	k-ft
ϕMn	4872.62	k-ft
RATING:	35.8%	
rho provided	0.55	
rho required	0.33	OK
Rebar Spacing	8.61	
Spacing required	20.32	OK
Dev. Length required	21.68	
Dev. Length provided	55.65	OK

Overall Foundation Rating: 35.8%

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11280A
Windsor Locks/Airport

440 Hayden Station Road
Windsor, CT 06095

April 7, 2014

EBI Project Number: 62142278

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

EBI Consulting
environmental | engineering | due diligence

April 7, 2014

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

Re: Emissions Values for Site: **CT11280A – Windsor Locks/Airport**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 440 Hayden Station Road, Windsor, CT, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (µW/cm2). The number of 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 440 Hayden Station Road, Windsor, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, 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 **75 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	CT11280A-Windsor Locks/Airport
Site Addresss	440 Hayden Station Road, Windsor, CT 06095
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	75	69	None	0	0	48.326044	3.649128	0.36491%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	75	69	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	75	69	1-5/8"	0	0	24.163022	1.824564	0.18246%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	75	69	1-5/8"	0	0	24.163022	1.824564	0.18246%
														Sector total Power Density Value:			0.730%

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	75	69	None	0	0	48.326044	3.649128	0.36491%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	75	69	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	75	69	1-5/8"	0	0	24.163022	1.824564	0.18246%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	75	69	1-5/8"	0	0	24.163022	1.824564	0.18246%
														Sector total Power Density Value:			0.730%

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	75	69	None	0	0	48.326044	3.649128	0.36491%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	75	69	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	75	69	1-5/8"	0	0	24.163022	1.824564	0.18246%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	75	69	1-5/8"	0	0	24.163022	1.824564	0.18246%
														Sector total Power Density Value:			0.730%

Site Composite MPE %

Carrier	MPE %
T-Mobile	2.189%
AT&T	44.380%
Clearwire	2.660%
Sprint	14.440%
Total Site MPE %	**63.669%**

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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 **0.730% (2.189% 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 **63.669%** 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.

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