



Crown Castle
3530 Toringdon Way
Suite 300
Charlotte, NC 28277

Tel: 704-405-6600

www.crowncastle.com

March 25, 2014

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

RE: T-Mobile-Exempt Modification - Crown Site BU: 876327
T-Mobile Site ID: CT11883C
Located at: 59 McGuire Road, South Windsor, CT 06074

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 M. Saud Anwar, Mayor for the Town of South Windsor.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **59 McGuire Road, South Windsor, CT 06074**. 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.

Melanie A. Bachman

March 25, 2014

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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: The Honorable M. Saud Anwar, Mayor
Town of South Windsor
1540 Sullivan Avenue
South Windsor, CT 06074

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NORTHEAST LLC.

SITE NAME: **CT883/SPRINT S. WINDSOR**

SITE ID NUMBER: **CT11883C**

SITE ADDRESS: **59 MCGUIRE ROAD
SOUTH WINDSOR, CT 06074**

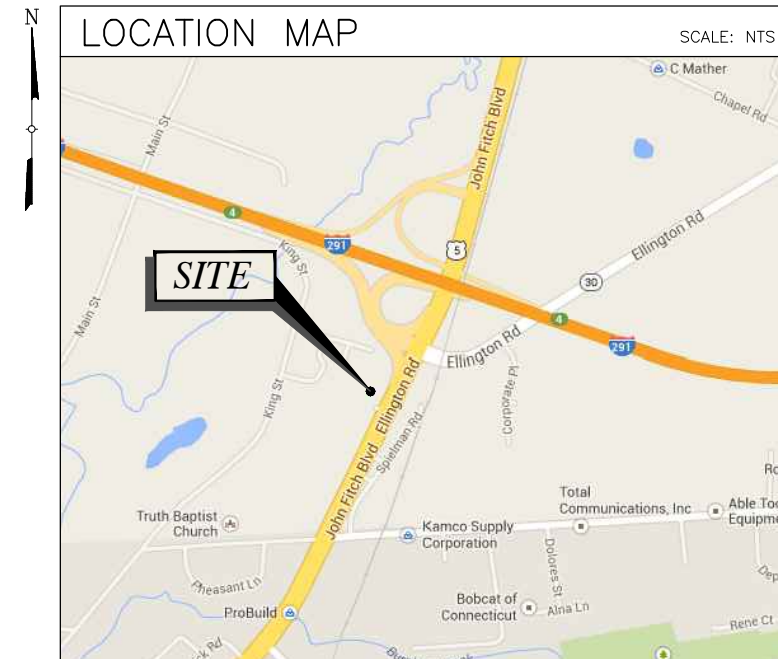
PROJECT SUMMARY

SITE ID NUMBER: CT11883C
 SITE NAME: CT883/SPRINT S. WINDSOR
 CROWN BU#: 876327
 SITE ADDRESS: 59 MCGUIRE ROAD
 SOUTH WINDSOR, CT 06074
 COUNTY: HARTFORD
 PROPERTY OWNER: CROWN CASTLE USA
 APPLICANT: T-MOBILE NORTHEAST, LLC.
 35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 0602
 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: MAP 5 LOT 14.1
 LATITUDE: (NAD 83) 41.80290 N
 LONGITUDE: (NAD 83) 72.61730 W

SITE DIRECTIONS

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TAKE THE 1ST RIGHT ONTO W NEWBERRY RD. TURN LEFT ONTO WOODLAND AVE. TAKE THE 1ST RIGHT ONTO CT-187 S/BLUE HILLS AVE. TURN LEFT ONTO CT-218 E/COTTAGE GROVE RD. CONTINUE TO FOLLOW CT-218 E. TURN RIGHT ONTO THE INTERSTATE 291 E RAMP TO SOUTH WINDSOR. MERGE ONTO I-291 E. TAKE EXIT 4 TO MERGE ONTO US-5 S/ELLINGTON RD. TURN RIGHT ONTO BURNHAM ST. TURN RIGHT ONTO KING ST. TURN RIGHT ONTO MCGUIRE RD. DESTINATION WILL BE ON THE RIGHT.

LOCATION MAP



SHEET INDEX

SHEET NO	DESCRIPTION	REV NO
T-1	TITLE SHEET	0
A-1	SITE PLAN	0
A-2	EQUIPMENT LAYOUT PLANS	0
A-3	ELEVATION & DETAIL	0
A-4	ANTENNA LAYOUT PLANS & DETAILS	0
A-5	DETAILS	0
A-6	DETAILS	0
A-7	NOTES	0
A-8	NOTES	0

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".



Know what's below.
Call before you dig.

CONFIGURATION

2C

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



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



APPROVALS

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

PROJECT NUMBER 7061.CT11883C DESIGNED BY JQ

REV DATE REVISION DRAWN BY

REV	DATE	REVISION	DRAWN BY
Δ	02/21/14	FOR COMMENT	MP

ISSUED BY _____ DATE _____

SITE INFORMATION

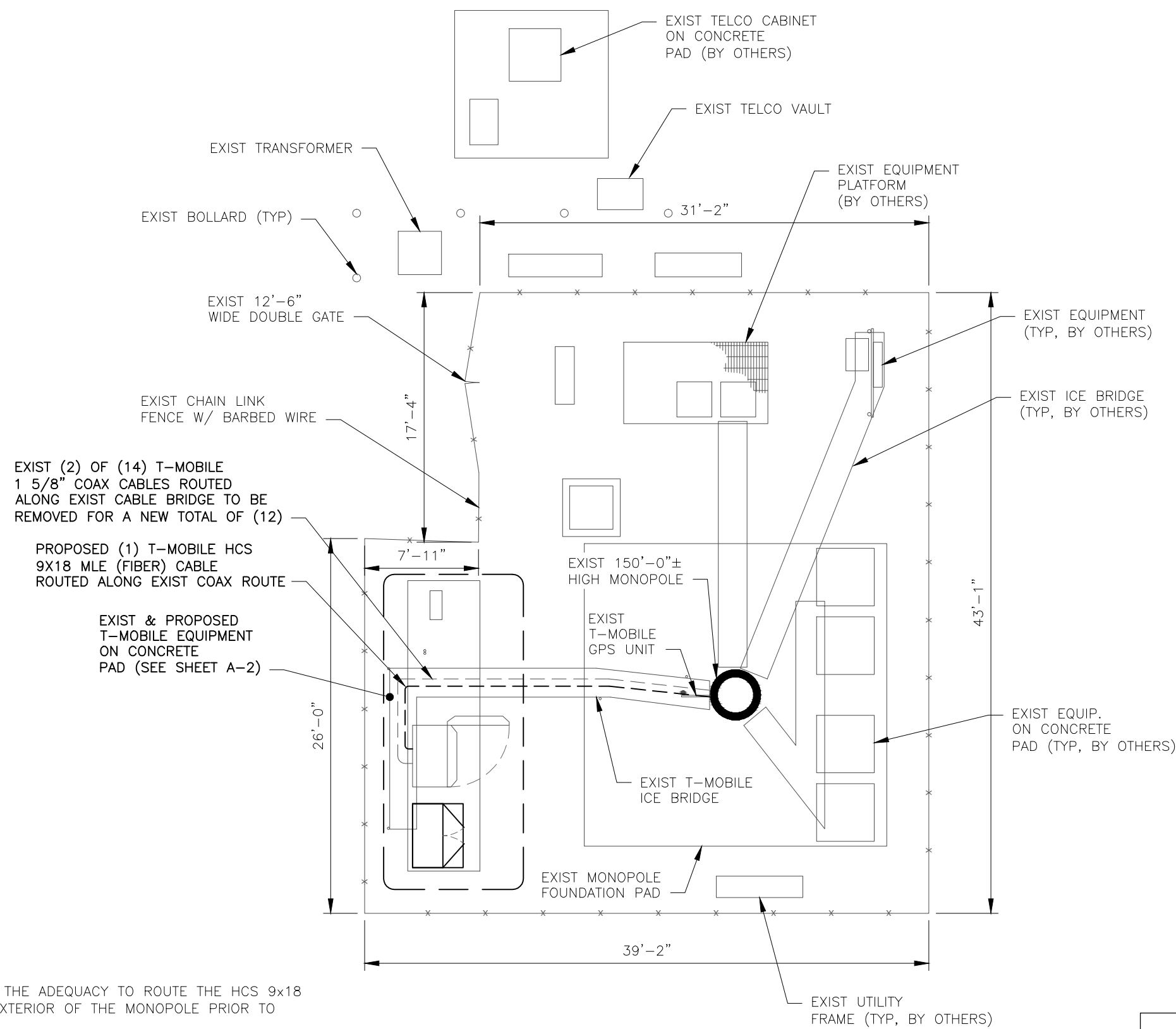
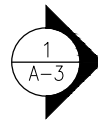
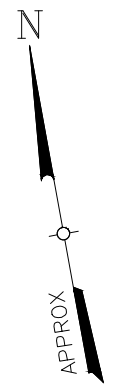
CT11883C
 CT883/SPRINT S. WINDSOR
 59 MCGUIRE RD
 S. WINDSOR, CT 06074

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 EXTERIOR 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
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APPROVALS

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

PROJECT NUMBER 7061.CT11883C DESIGNED BY JQ

REV	DATE	REVISION	DRAWN BY
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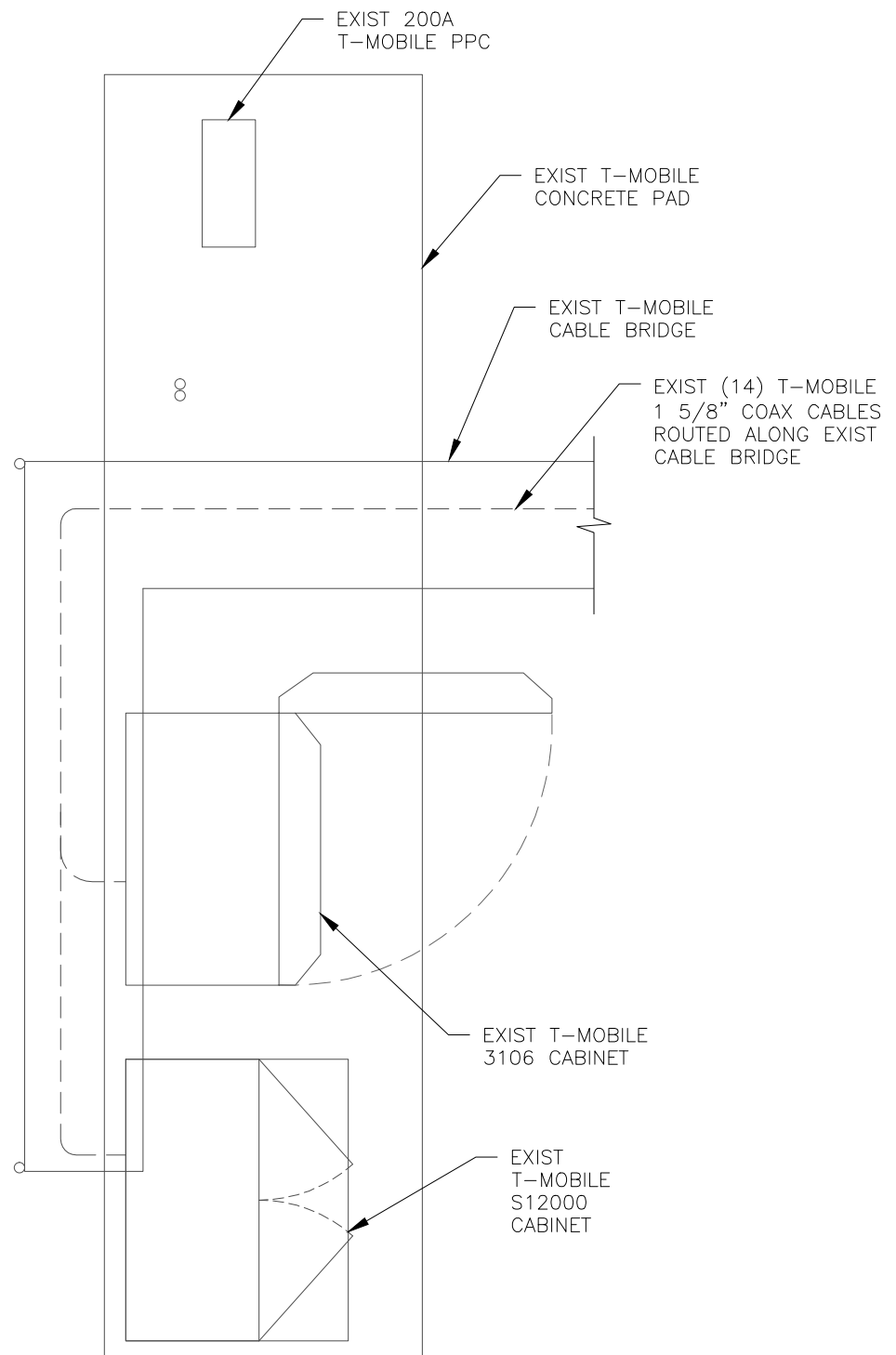
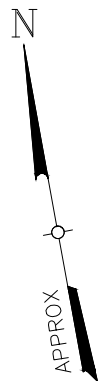
ISSUED BY _____ DATE _____

SITE INFORMATION

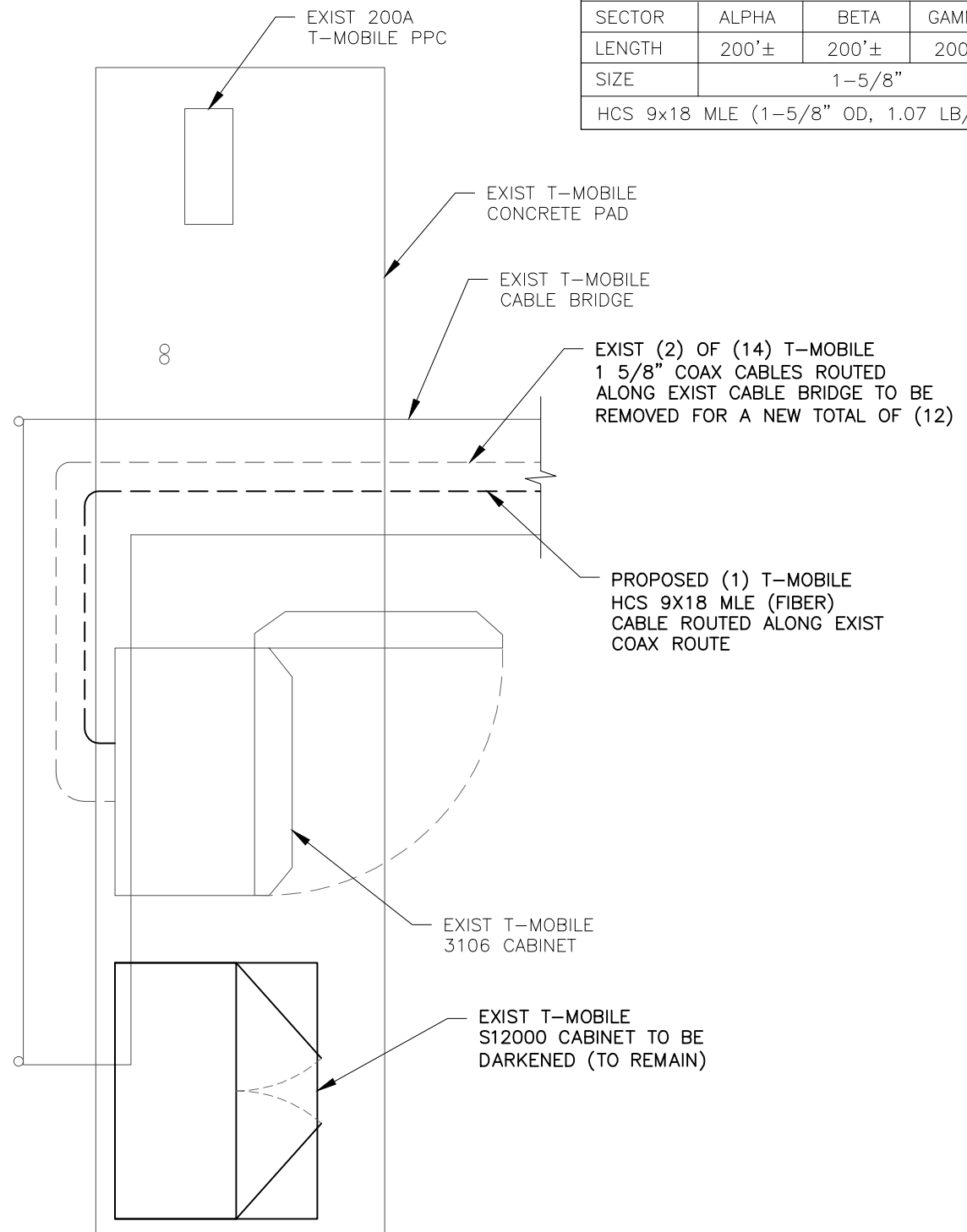
CT11883C
 CT883/SPRINT S. WINDSOR
 59 MCGUIRE RD
 S. WINDSOR, CT 06074

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	200'±	200'±	200'±
SIZE	1-5/8"		
HCS 9x18 MLE (1-5/8" OD, 1.07 LB/FT)			

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PHONE: (860) 692-7100

CROWN CASTLE

APPROVALS

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

PROJECT NUMBER 7061.CT11883C DESIGNED BY JQ

REV	DATE	REVISION	DRAWN BY
Δ	02/21/14	FOR COMMENT	MP

ISSUED BY _____ DATE _____

APPROVALS

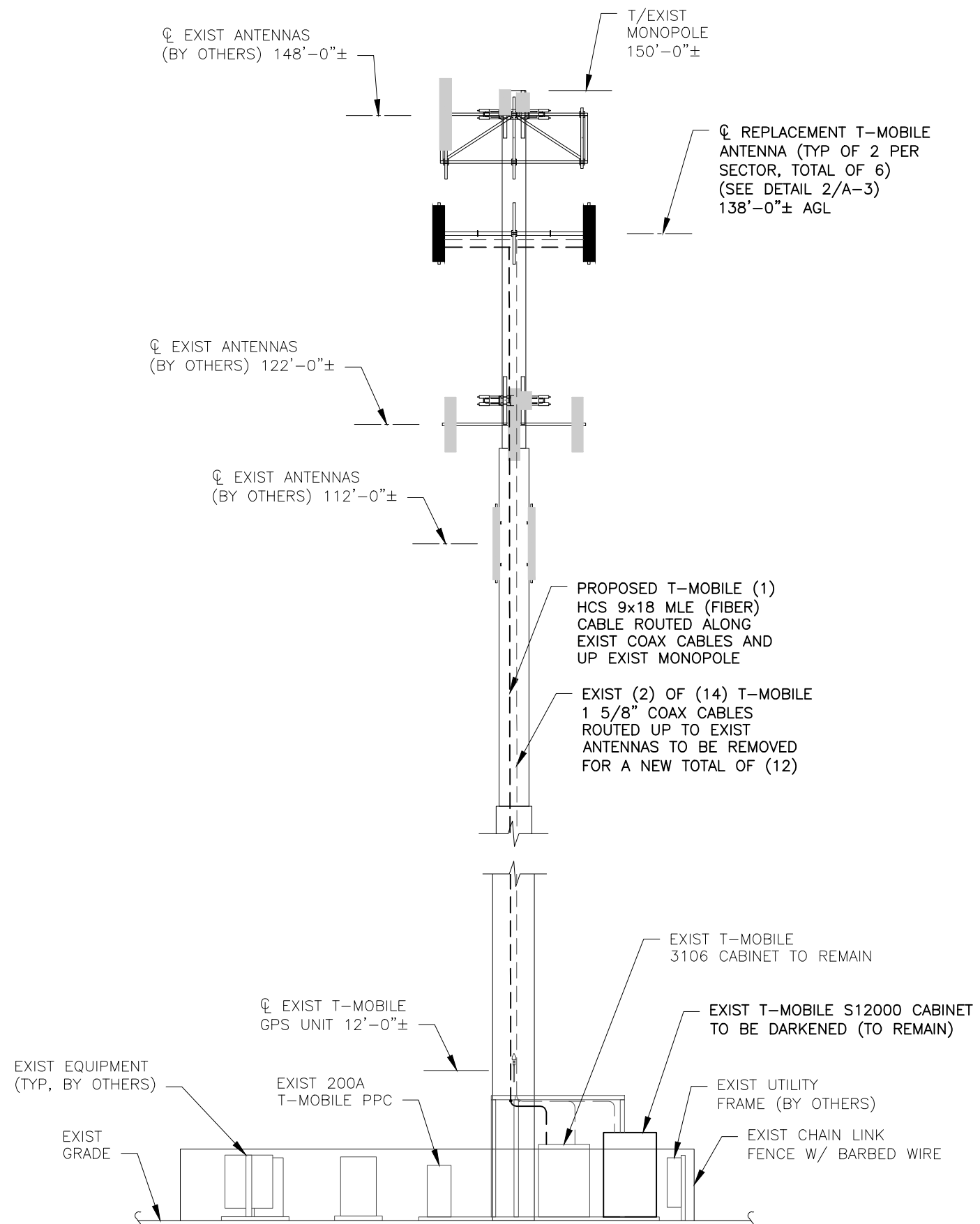
SITE INFORMATION
CT11883C
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S. WINDSOR, CT 06074

SHEET TITLE
EQUIPMENT LAYOUT PLANS

SHEET NUMBER
A-2

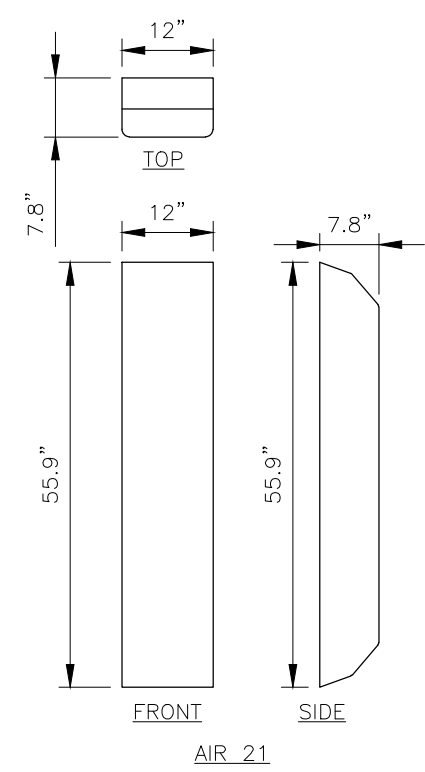
CONFIGURATION
2C
REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.





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

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



2
A-3
ANTENNA DETAIL
SCALE: 1/2" = 1'-0"

ELEVATION NOTE:
ELEVATION OF EXIST MONOPOLE HAS BEEN ARBITRARILY ASSIGNED AS EL 209'-0"±. THIS IS APPROXIMATELY 150'-0"± ABOVE GRADE WHICH WAS ESTIMATED AS EL 59'-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
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CROWN CASTLE

APPROVALS

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

PROJECT NUMBER 7061.CT11883C DESIGNED BY JQ

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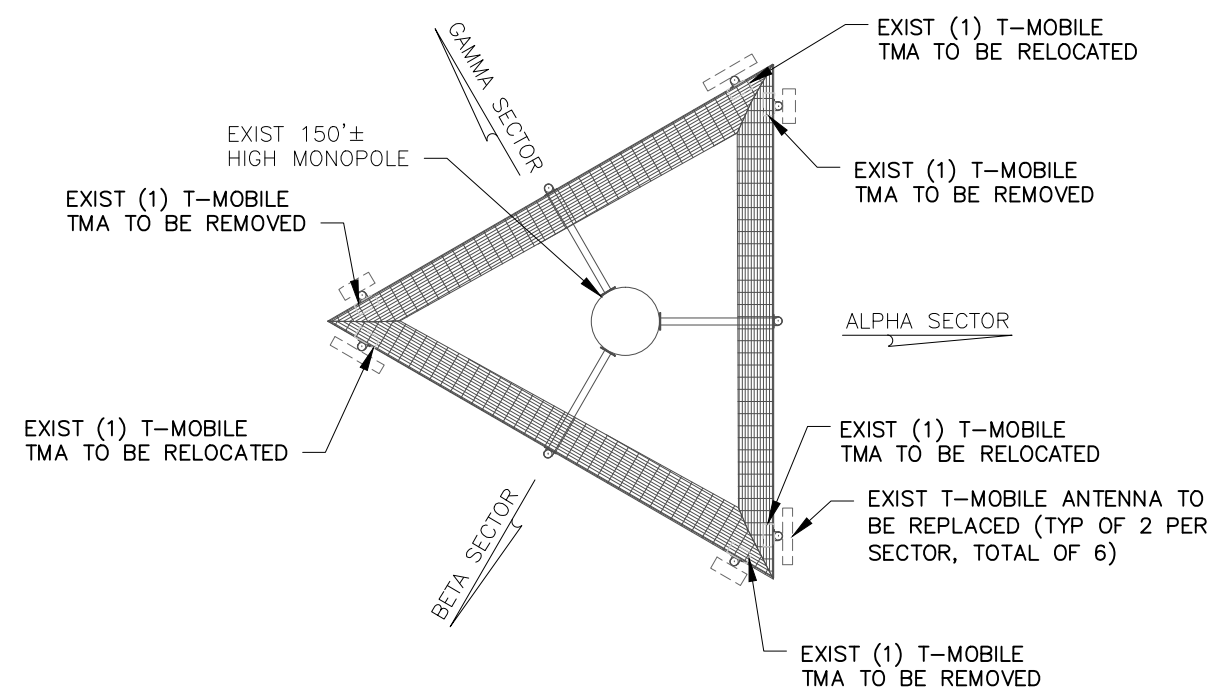
ISSUED BY _____ DATE _____

SITE INFORMATION

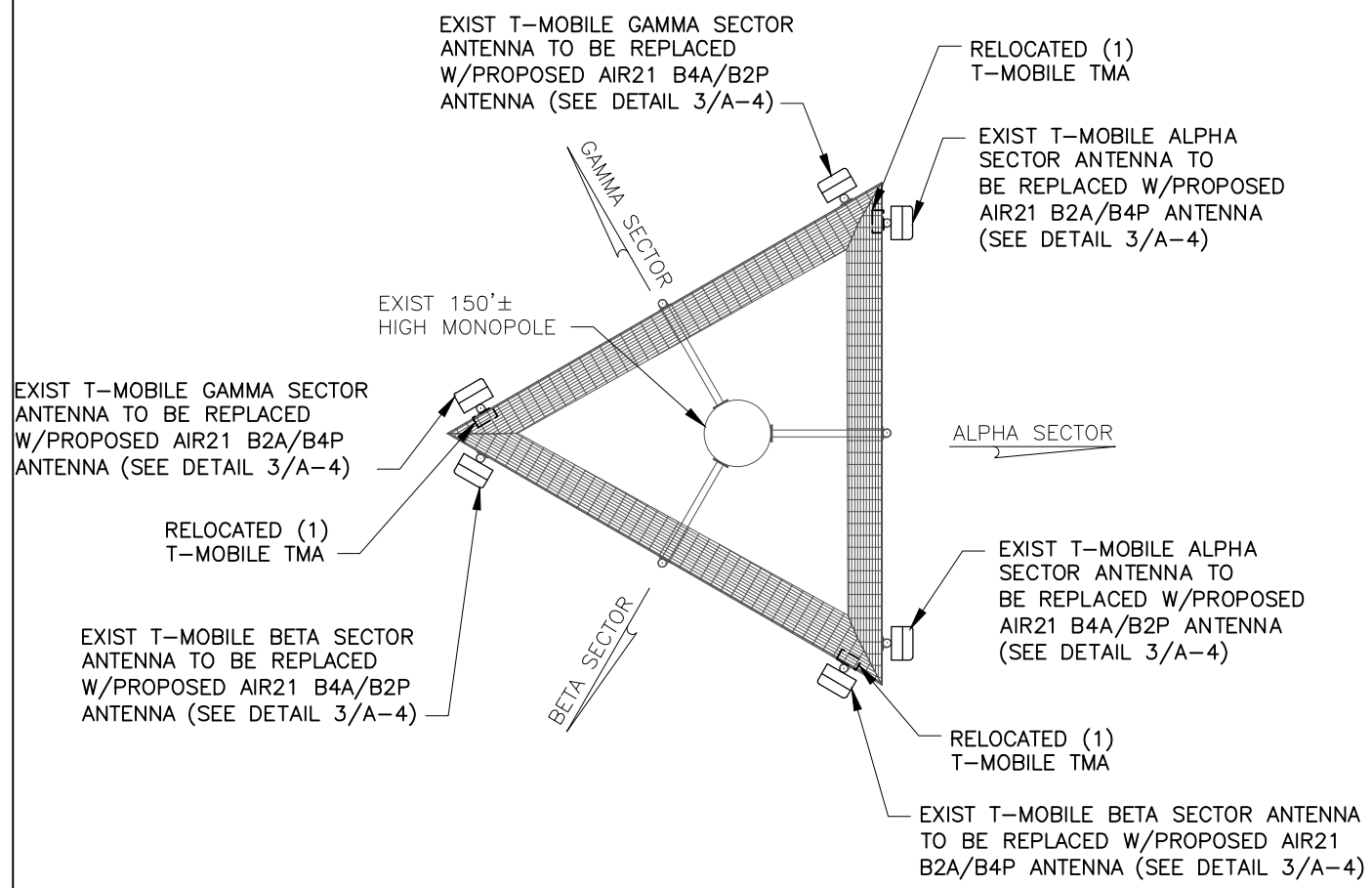
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SHEET TITLE
ELEVATION & DETAIL

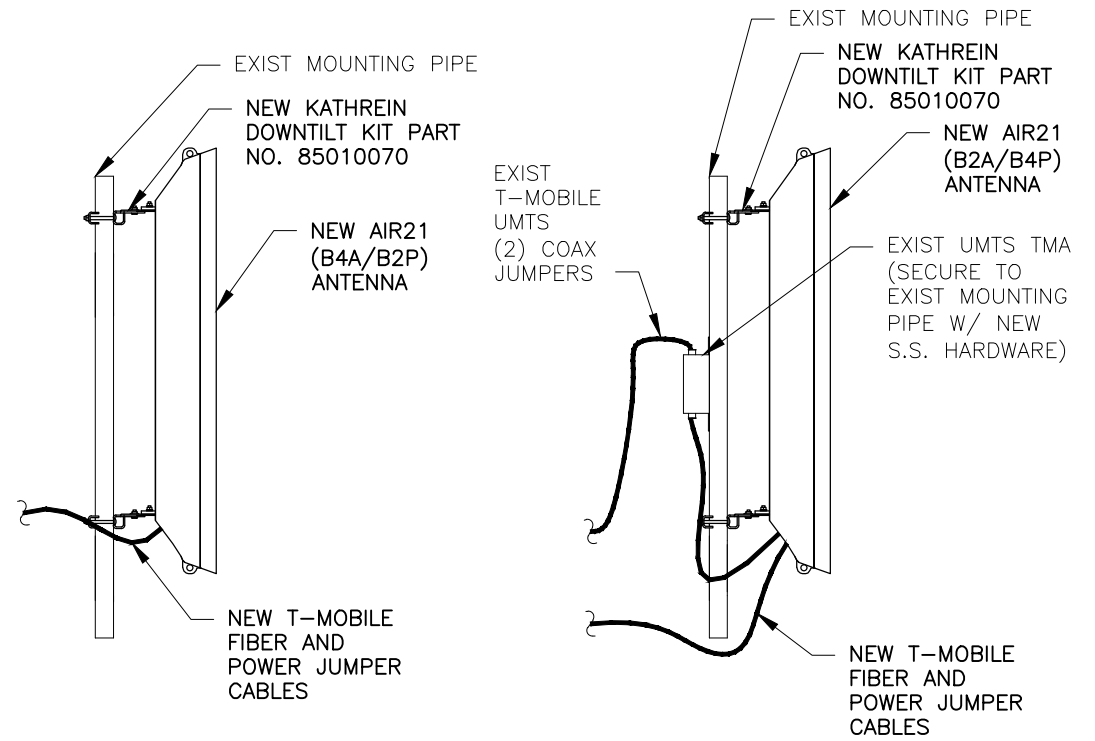
SHEET NUMBER
A-3



1
A-4
EXIST ANTENNA PLAN
SCALE: 3/16" = 1'-0"



2
A-4
PROPOSED ANTENNA PLAN
SCALE: 3/16" = 1'-0"



3
A-4
ANTENNA DETAIL
SCALE: 1/2" = 1'-0"

THE PROPOSED INSTALLATION & 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	ADFD1820-9090B	51.6x12.1x4.5
	EMS	1	TMZXXX-6516-R2M	59.5x19.9x3.5
BETA	RFS	1	ADFD1820-9090B	51.6x12.1x4.5
	EMS	1	TMZXXX-6516-R2M	59.5x19.9x3.5
GAMMA	RFS	1	ADFD1820-9090B	51.6x12.1x4.5
	EMS	1	TMZXXX-6516-R2M	59.5x19.9x3.5

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

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CROWN CASTLE

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACC. _____

PROJECT NUMBER: 7061.CT11883C
DESIGNED BY: JQ

REV	DATE	REVISION	DRAWN BY
1	02/21/14	FOR COMMENT	MP

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SITE INFORMATION

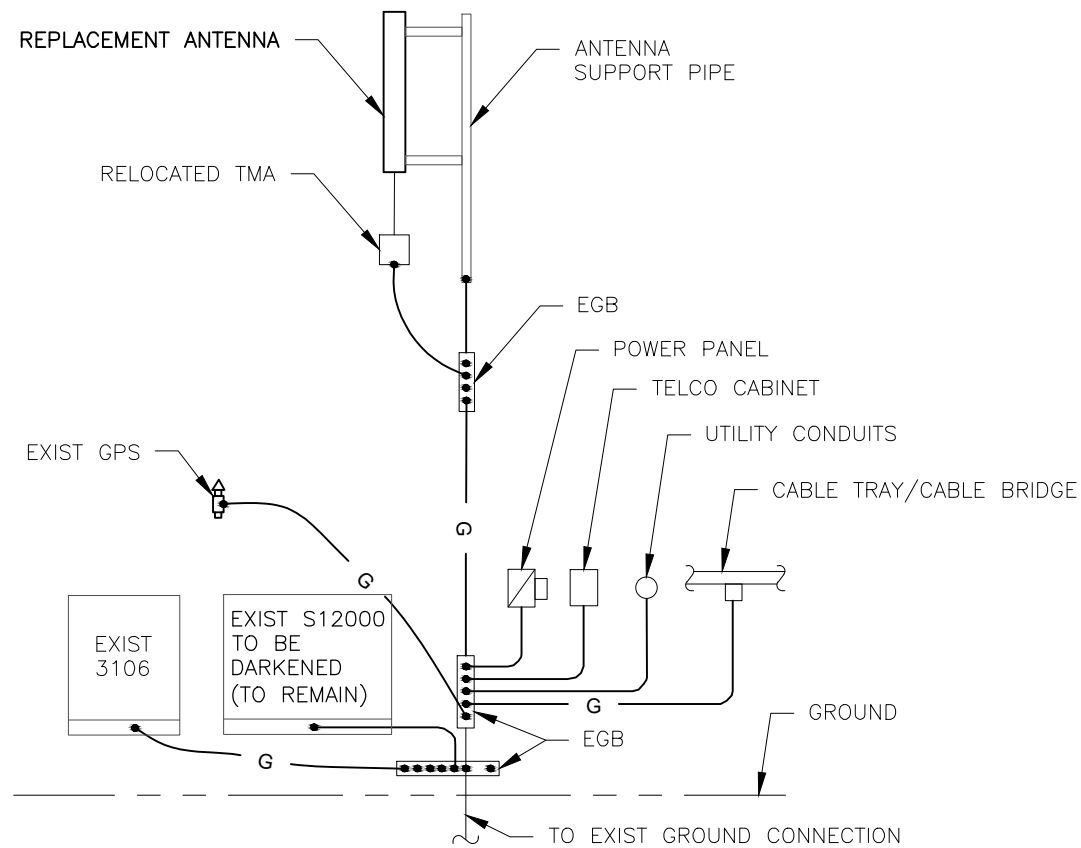
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59 MCGUIRE RD
S. WINDSOR, CT 06074

SHEET TITLE
ANTENNA LAYOUT PLANS & DETAILS

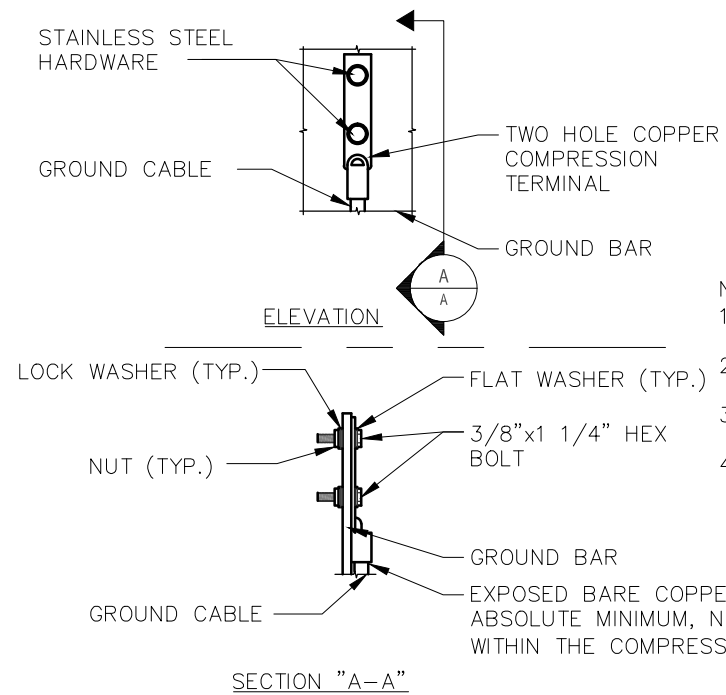
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A-4



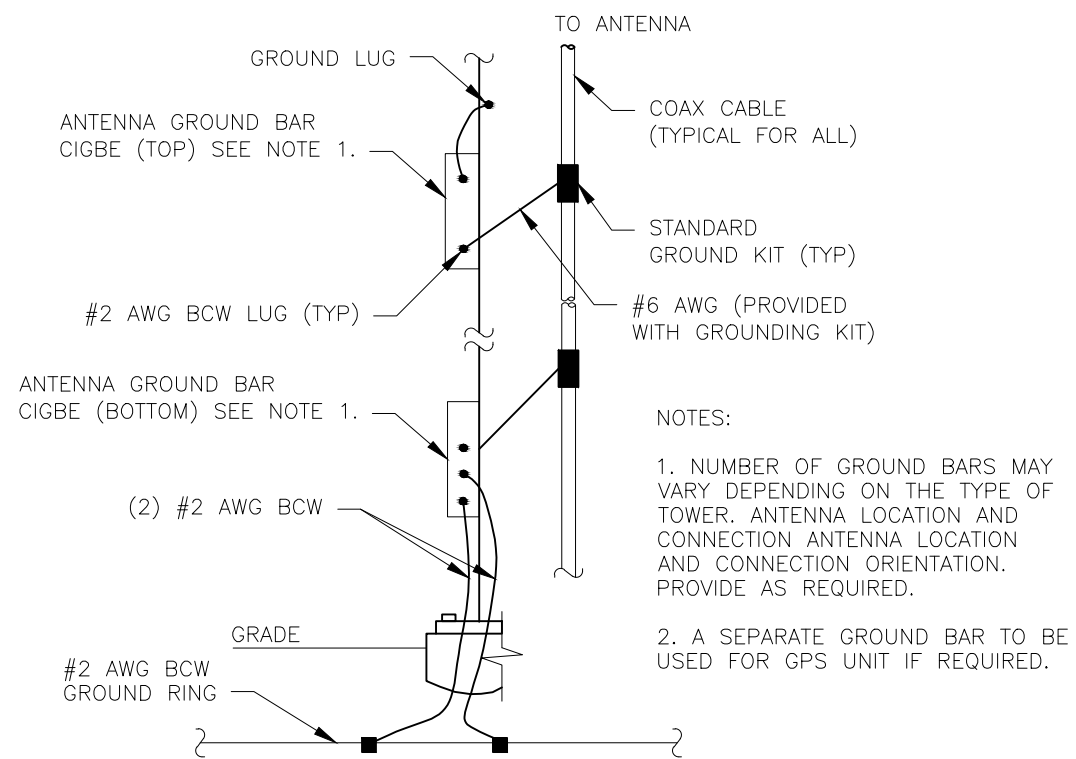


1
A-5
GROUNDING RISER DIAGRAM
SCALE: NTS



- NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
 2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
 3. CADWELD DOWNLOADS 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
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APPROVALS

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

PROJECT NUMBER 7061.CT11883C DESIGNED BY JQ

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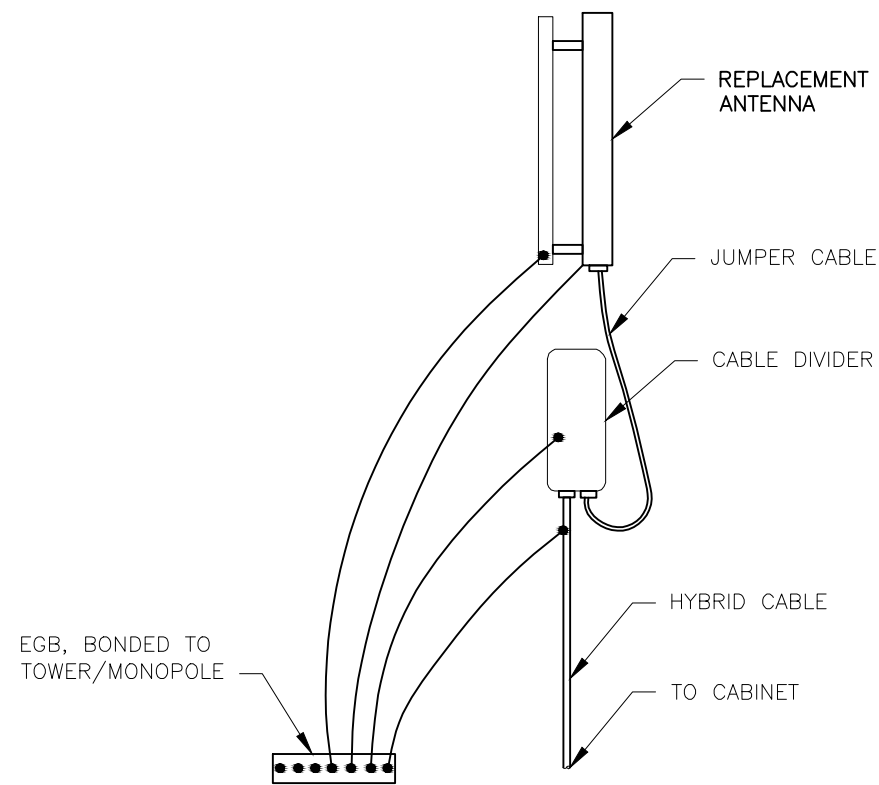
ISSUED BY _____ DATE _____

SITE INFORMATION

CT11883C
CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

SHEET TITLE
DETAILS

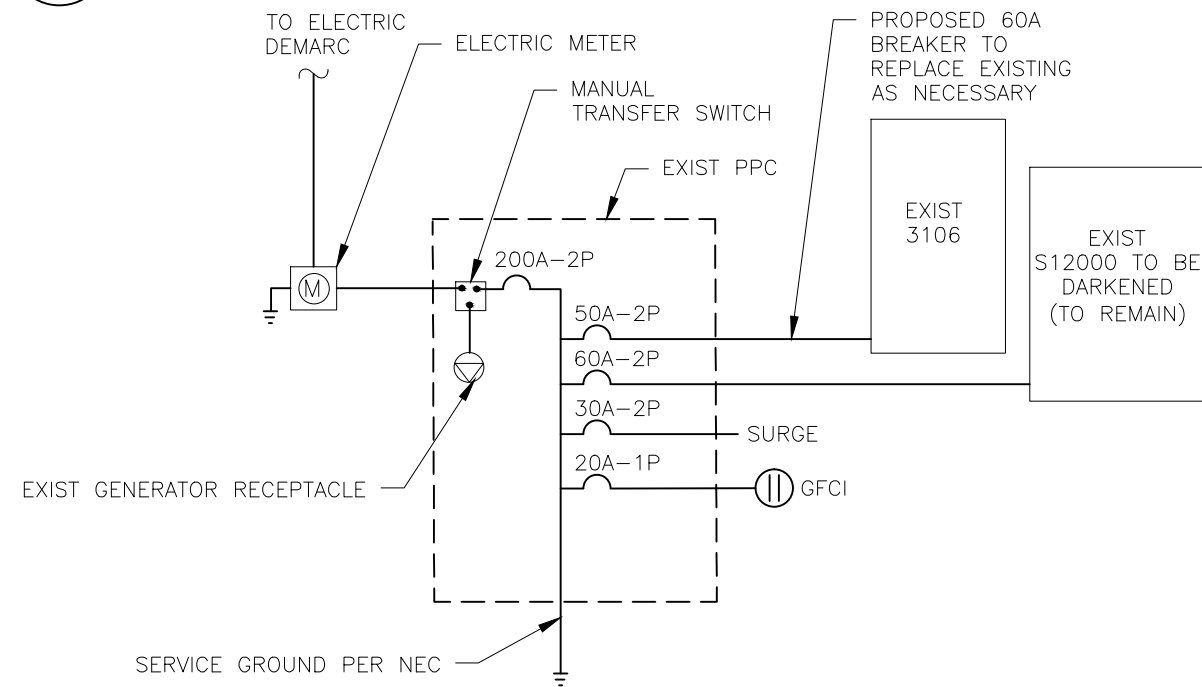
SHEET NUMBER
A-5



HYBRID CABLE CONNECTION AND GROUNDING DETAIL

1
A-6

SCALE: NTS

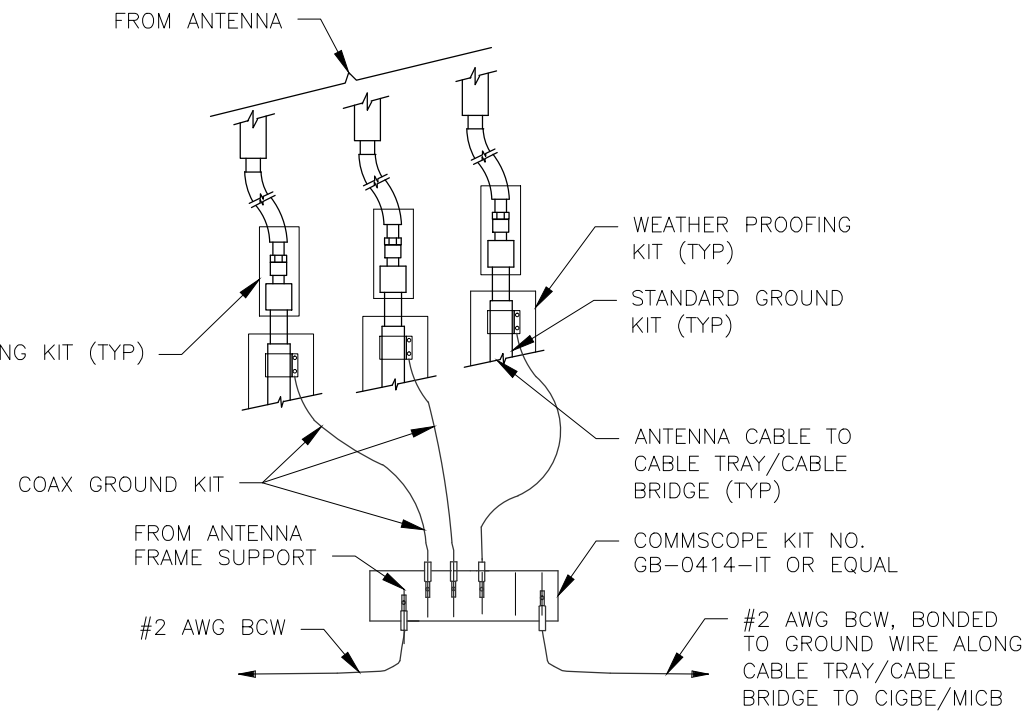


NOTE: CONTRACTOR TO VERIFY EXISTING CONDUCTORS ARE #6AWG OR LARGER FOR 60A CIRCUIT

ONE-LINE POWER DIAGRAM

3
A-6

SCALE: NTS



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

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APPROVALS

LANDLORD	_____		
RF	_____		
CONSTRUCTION	_____		
OPERATIONS	_____		
SITE ACQ.	_____		
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CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

SHEET TITLE

DETAILS

SHEET NUMBER

A-6

GENERAL NOTES

- 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.
- 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"
- THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES OR OTHER PUBLIC AUTHORITIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
- 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.
- 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.
- 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.
- 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.
- POWER TO THE FACILITY IS MONITORED BY AN EXISTING METER.
- ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
- CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
- IF ANY PIPING EXISTS BENEATH THE SITE AREA, CONTRACTOR MUST LOCATE IT AND CONTACT OWNER'S REPRESENTATIVE.
- THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
- 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.
- 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.
- 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.
- 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.
- THE MATERIALS INSTALLED SHALL MEET REQUIREMENTS OF CONTRACTORS DOCUMENTS. NO SUBSTITUTIONS ARE ALLOWED.
- 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

- 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.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
- 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.
- 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.
- 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.
- 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.
- THE CONTRACTOR SHALL REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
- 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.
- BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORK, UNUSED AND USELESS MATERIALS, RUBBISH AND TEMPORARY STRUCTURES.
- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2005 CONNECTICUT STATE BUILDING CODE (INCLUDING AMENDMENTS) AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
- 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.
- 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.
- 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.
- 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.



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 7061.CT11883C DESIGNED BY JQ

REV	DATE	REVISION	DRAWN BY
1	02/21/14	FOR COMMENT	MP

ISSUED BY _____ DATE _____

SITE INFORMATION

CT11883C
CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

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 BUSES 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 BUSES 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.

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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



APPROVALS

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

PROJECT NUMBER	DESIGNED BY
7061.CT11883C	JQ

REV	DATE	REVISION	DRAWN BY
△	02/21/14	FOR COMMENT	MP

ISSUED BY	DATE

SITE INFORMATION

CT11883C
CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

SHEET TITLE

NOTES

SHEET NUMBER

A-8

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





PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
 250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **March 06, 2014**

Patrick Byrum
 Crown Castle
 3530 Toringdon Way Suite 300
 Charlotte, NC 28277
 704.405.6532

Paul J. Ford and Company
 250 E. Broad Street, Suite 600
 Columbus, OH 43215
 614.221.6679
 jmeinerding@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation: *T-Mobile Co-Locate*
Carrier Site Number: CT11883C
Carrier Site Name: CT883/Sprint S. Windsor

Crown Castle Designation:
Crown Castle BU Number: 876327
Crown Castle Site Name: KINGS LOT
Crown Castle JDE Job Number: 260414
Crown Castle Work Order Number: 713158
Crown Castle Application Number: 217370 Rev. 1

Engineering Firm Designation: Paul J. Ford and Company Project Number: 37514-0050 R1

Site Data: 59 McGuire Road, SOUTH WINDSOR, Hartford County, CT
 Latitude 41° 48' 10.77", Longitude -72° 37' 1.96"
 150 Foot - Monopole Tower

Dear Patrick Byrum,

Paul J. Ford and Company 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 622261, in accordance with application 217370, 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 I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the 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.

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

We at Paul J. Ford and Company 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:


 Joey Meinerding, E.I.
 Structural Designer



MAR 06 2014



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **March 06, 2014**

Patrick Byrum
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
704.405.6532

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250 E. Broad Street, Suite 600
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Carrier Designation: **T-Mobile Co-Locate**
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The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the 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.

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Respectfully submitted by:

Joey Meinerding, E.I.
Structural Designer

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1) INTRODUCTION

This tower is a 150 ft. Monopole tower designed by ROHN in December of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the 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
138.0	138.0	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
148.0	149.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	--	--	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
	148.0	1	tower mounts	Side Arm Mount [SO 102-3]			
146.0	148.0	3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe	1	5/8	2
		3	alcatel lucent	TD-RRH8x20-25			
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe	3	1-1/4	1
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
	146.0	1	tower mounts	Platform Mount [LP 501-1]			
138.0	138.0	3	andrew	ADFD1820-9090B-XDM w/ Mount Pipe	--	--	3
		6	andrew	ONEBASE TWIN DUAL DUPLEX TMA			
		3	andrew	TMZXXX-6516-R2M w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 712-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
124.0	124.0	3	ericsson	RRUS 11	--	--	1
		1	tower mounts	Side Arm Mount [SO 102-3]			
122.0	122.0	1	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe	1 2 12	3/8 3/4 1-1/4	1
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		12	powerwave technologies	LGP2140X			
		1	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	T-Arm Mount [TA 602-3]			
112.0	112.0	3	rfs celwave	APX18-206517-CT2 w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
13.0	14.0	1	lucent	KS24019-L112A	1	1/2	1
	13.0	1	tower mounts	Pipe Mount [PM 601-1]			
12.0	13.0	1	lucent	KS24019-L112A	1	1/2	1
	12.0	1	tower mounts	Pipe Mount [PM 601-1]			

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH<, 07-11433G, 09/30/2009	2192521	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Solutions, 080627.06, 11/11/2008	2366960	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, 34738SW, 12/18/1996	1620564	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, 34738SW, 12/15/1996	1619441	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37514-0050 BP, 02/04/2014	4451202	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) Monopole was reinforced in conformance with the referenced modification drawings.
- 5) We found the reinforcement from 30' to 90' to be ineffective. Therefore, we did not consider it in the analysis. The reinforcement from 0' to 15' was effective and was considered in the analysis.
- 6) In accordance with discussions with CCI Corporate Engineering: Based on the assumption that the monopole manufacturer (ROHN/PiRod) has designed the flange plates at splices to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing flange bolts are at a usage capacity of 100% or less, then the existing flange plates are at a usage capacity of 100% or less and no additional analysis of the flange plate is required. This assumption only applies to the flange plates at 90' and 120'.
- 7) Monopole will be reinforced in conformance with the referenced proposed modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 120	Pole	P24x1/4	1	-7.31	589.19	75.5	Pass
L2	120 - 90	Pole	30" x 0.375"	2	-12.04	1166.57	92.8	Pass
L3	90 - 78.75	Pole	36" x 0.375"	3	-14.11	1325.68	87.1	Pass
L4	78.75 - 60	Pole	RPS 36" x 0.51087"	4	-18.37	1634.98	90.2	Pass
L5	60 - 30	Pole	RPS 42" x 0.58495"	5	-27.98	2092.73	92.0	Pass
L6	30 - 13.75	Pole	RPS 42" x 0.71391"	6	-34.40	2768.33	84.3	Pass
L7	13.75 - 7.25	Pole	RPS 42" x 0.82344"	7	-37.14	3038.05	82.7	Pass
L8	7.25 - 0	Pole	RPS 42" x 0.78565"	8	-39.93	2905.35	92.7	Pass
							Summary	
						Pole (L2)	92.8	Pass
						Rating =	92.8	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	91.6	Pass
1	Base Plate	0	63.5	Pass
1	Base Foundation Structural Steel	0	30.5	Pass
1	Base Foundation Soil Interaction	0	85.1	Pass
1	Flange Connection	30	91.2	Pass
1	Flange Connection	60	82.1	Pass
1,2	Flange Connection	90	92.8	Pass
1,2	Flange Connection	120	75.5	Pass

Structure Rating (max from all components) =	92.8%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) See assumption #6.

4.1) Recommendations

Install the proposed modifications per the referenced drawings.

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 80.0 mph.
- 3) Nominal ice thickness of 1.00 in.
- 4) Ice density of 56 pcf.
- 5) A wind speed of 37.6 mph is used in combination with ice.
- 6) Temperature drop of 50 °F.
- 7) Deflections calculated using a wind speed of 50.0 mph.
- 8) A non-linear (P-delta) analysis was used.
- 9) Pressures are calculated at each section.
- 10) Stress ratio used in pole design is 1.333.
- 11) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption	Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feedline Torque Include Angle Block Shear Check <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	--

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	150.00-120.00	30.00	P24x1/4	A53-B-42 (42 ksi)	
L2	120.00-90.00	30.00	30" x 0.375"	A53-B-42 (42 ksi)	
L3	90.00-78.75	11.25	36" x 0.375"	A53-B-42 (42 ksi)	
L4	78.75-60.00	18.75	RPS 36" x 0.51087"	Reinf 35.89 ksi (36 ksi)	
L5	60.00-30.00	30.00	RPS 42" x 0.58495"	Reinf 34.38 ksi (34 ksi)	
L6	30.00-13.75	16.25	RPS 42" x 0.71391"	Reinf 37.38 ksi (37 ksi)	
L7	13.75-7.25	6.50	RPS 42" x 0.82344"	Reinf 35.66 ksi (36 ksi)	
L8	7.25-0.00	7.25	RPS 42" x	Reinf 35.71	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
			0.78565"	ksi (36 ksi)	

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150.00-120.00				1	1	1		
L2 120.00-90.00				1	1	1		
L3 90.00-78.75				1	1	1		
L4 78.75-60.00				1	1	1		
L5 60.00-30.00				1	1	1		
L6 30.00-13.75				1	1	1		
L7 13.75-7.25				1	1	1		
L8 7.25-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	146.00 - 0.00	2	No Ice	0.00	1.08
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.18
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	112.00 - 0.00	1	No Ice	0.00	1.08
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.18
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	146.00 - 112.00	1	No Ice	0.15	1.08
						1/2" Ice	0.25	2.33
						1" Ice	0.35	4.18
HB058-M12-XXXF(5/8")	C	No	CaAa (Out Of Face)	146.00 - 0.00	1	No Ice	0.00	0.24
						1/2" Ice	0.00	1.06
						1" Ice	0.00	2.49

AL7-50(1 5/8)	C	No	Inside Pole	138.00 - 0.00	9	No Ice	0.00	0.52
						1/2" Ice	0.00	0.52
						1" Ice	0.00	0.52
AL7-50(1 5/8)	C	No	CaAa (Out Of Face)	138.00 - 0.00	4	No Ice	0.00	0.52
						1/2" Ice	0.00	2.02
						1" Ice	0.00	4.14
AL7-50(1 5/8)	C	No	CaAa (Out Of Face)	138.00 - 0.00	1	No Ice	0.20	0.52
						1/2" Ice	0.30	2.02
						1" Ice	0.40	4.14
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	138.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	2.37
						1" Ice	0.00	4.28

FB-L98B-002-75000(3/8")	C	No	Inside Pole	122.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	122.00 - 0.00	2	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
2" Conduit	C	No	Inside Pole	122.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
						1" Ice	0.00	1.16

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
LDF6-50A(1-1/4")	C	No	Inside Pole	122.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66

AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	112.00 - 0.00	5	No Ice	0.00	0.70
						1/2" Ice	0.00	2.23
						1" Ice	0.00	4.38
AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	112.00 - 0.00	1	No Ice	0.20	0.70
						1/2" Ice	0.30	2.23
						1" Ice	0.40	4.38

LDF4-50A(1/2")	C	No	Inside Pole	13.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15

LDF4-50A(1/2")	C	No	Inside Pole	12.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15

1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	59.75 - 0.00	1	No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	80.25 - 60.25	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	150.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.532	0.26
L2	120.00-90.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	11.534	0.76
L3	90.00-78.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.716	0.30
L4	78.75-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	10.527	0.49
L5	60.00-30.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	18.108	0.79
L6	30.00-13.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.837	0.43
L7	13.75-7.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.935	0.17
L8	7.25-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.389	0.19

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	150.00-120.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K
L2	120.00-90.00	C		0.000	0.000	0.000	16.332	0.95
		A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L3	90.00-78.75	C		0.000	0.000	0.000	23.534	2.23
		A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L4	78.75-60.00	C		0.000	0.000	0.000	9.550	0.91
		A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L5	60.00-30.00	C		0.000	0.000	0.000	22.138	1.52
		A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L6	30.00-13.75	C		0.000	0.000	0.000	36.719	2.44
		A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L7	13.75-7.25	C		0.000	0.000	0.000	19.948	1.32
		A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L8	7.25-0.00	C		0.000	0.000	0.000	7.979	0.53
		A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.900	0.59

Feed Line Center of Pressure

Section	Elevation	CP _X	CP _Z	CP _X	CP _Z
	ft	in	in	Ice in	Ice in
L1	150.00-120.00	-0.29	0.17	-0.52	0.30
L2	120.00-90.00	-0.43	0.25	-0.74	0.43
L3	90.00-78.75	-0.48	0.28	-0.82	0.48
L4	78.75-60.00	-0.61	0.35	-1.06	0.61
L5	60.00-30.00	-0.67	0.39	-1.14	0.66
L6	30.00-13.75	-0.67	0.39	-1.14	0.66
L7	13.75-7.25	-0.67	0.39	-1.14	0.66
L8	7.25-0.00	-0.67	0.39	-1.14	0.66

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustmen t	Placement	C _A A _A Front	C _A A _A Side	Weight	
			ft	°	ft	ft ²	ft ²	K	
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00	0.000	148.00	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
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00	0.000	148.00	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
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00	0.000	148.00	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
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00	0.000	148.00	No Ice	2.71	2.61	0.06
			0.00			1/2"	2.95	2.85	0.08
			1.00			Ice	3.20	3.09	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00 0.00 1.00	0.000	148.00	1" Ice			
						No Ice	2.71	2.61	0.06
						1/2"	2.95	2.85	0.08
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00 0.00 1.00	0.000	148.00	Ice	3.20	3.09	0.11
						1" Ice			
						No Ice	2.71	2.61	0.06
Side Arm Mount [SO 102-3]	C	None		0.000	148.00	1/2"	2.95	2.85	0.08
						Ice	3.20	3.09	0.11
						No Ice	3.00	3.00	0.08

APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	146.00	1" Ice			
						No Ice	8.50	7.47	0.09
						1/2"	9.15	8.66	0.16
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	146.00	Ice	9.77	9.56	0.24
						1" Ice			
						No Ice	8.50	6.95	0.08
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.000	146.00	1/2"	9.15	8.13	0.15
						Ice	9.77	9.02	0.23
						No Ice	8.50	6.95	0.08
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	146.00	1" Ice			
						No Ice	7.13	4.96	0.08
						1/2"	7.66	5.75	0.13
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	146.00	Ice	8.18	6.47	0.19
						1" Ice			
						No Ice	7.13	4.96	0.08
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.000	146.00	1/2"	7.66	5.75	0.13
						Ice	8.18	6.47	0.19
						No Ice	7.13	4.96	0.08
TD-RRH8x20-25	A	From Leg	4.00 0.00 2.00	0.000	146.00	1" Ice			
						No Ice	4.72	1.70	0.07
						1/2"	5.01	1.92	0.10
TD-RRH8x20-25	B	From Leg	4.00 0.00 2.00	0.000	146.00	Ice	5.32	2.15	0.13
						1" Ice			
						No Ice	4.72	1.70	0.07
TD-RRH8x20-25	C	From Leg	4.00 0.00 2.00	0.000	146.00	1/2"	5.01	1.92	0.10
						Ice	5.32	2.15	0.13
						No Ice	4.72	1.70	0.07
2.375" OD x 5' Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	146.00	1" Ice			
						No Ice	1.19	1.19	0.02
						1/2"	1.50	1.50	0.03
2.375" OD x 5' Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	146.00	Ice	1.81	1.81	0.04
						1" Ice			
						No Ice	1.19	1.19	0.02
2.375" OD x 5' Mount Pipe	C	From Leg	4.00 0.00 2.00	0.000	146.00	1/2"	1.50	1.50	0.03
						Ice	1.81	1.81	0.04
						No Ice	1.19	1.19	0.02
Platform Mount [LP 501-1]	C	None		0.000	146.00	1" Ice			
						No Ice	32.04	32.04	0.98
						1/2"	45.28	45.28	1.28
						Ice	58.51	58.51	1.57

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
						1" Ice			

ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.59	0.20 0.27 0.35	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.59	0.20 0.27 0.35	0.01 0.01 0.02
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.59	0.20 0.27 0.35	0.01 0.01 0.02
Platform Mount [LP 712-1]	C	None		0.000	138.00	No Ice 1/2" Ice 1" Ice	24.53 29.94 35.35	24.53 29.94 35.35	1.34 1.65 1.96

RRUS 11	A	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.10
RRUS 11	B	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.10
RRUS 11	C	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.10
Side Arm Mount [SO 102-3]	C	None		0.000	124.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	0.08 0.11 0.14

(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	122.00	No Ice 1/2" Ice 1" Ice	6.12 6.63 7.13	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.000	122.00	No Ice	6.12	4.25	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.00			1/2"	6.63	5.01	0.10
			0.00			Ice	7.13	5.71	0.16
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.000	122.00	1" Ice	6.12	4.25	0.06
			0.00			No Ice	6.63	5.01	0.10
			0.00			1/2"	6.63	5.01	0.10
			0.00			Ice	7.13	5.71	0.16
AM-X-CD-14-65-00T-RET w/ Mount Pipe	A	From Leg	4.00	0.000	122.00	1" Ice	5.74	4.02	0.05
			0.00			No Ice	6.20	4.63	0.10
			0.00			1/2"	6.66	5.28	0.15
			0.00			Ice	6.66	5.28	0.15
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	4.00	0.000	122.00	1" Ice	11.82	9.06	0.09
			0.00			No Ice	12.59	10.62	0.18
			0.00			1/2"	12.59	10.62	0.18
			0.00			Ice	13.38	12.21	0.28
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00	0.000	122.00	1" Ice	8.50	6.30	0.07
			0.00			No Ice	9.15	7.48	0.14
			0.00			1/2"	9.15	7.48	0.14
			0.00			Ice	9.77	8.37	0.21
(4) LGP2140X	A	From Leg	4.00	0.000	122.00	1" Ice	1.26	0.38	0.01
			0.00			No Ice	1.42	0.49	0.02
			0.00			1/2"	1.42	0.49	0.02
			0.00			Ice	1.58	0.62	0.03
(4) LGP2140X	B	From Leg	4.00	0.000	122.00	1" Ice	1.26	0.38	0.01
			0.00			No Ice	1.42	0.49	0.02
			0.00			1/2"	1.42	0.49	0.02
			0.00			Ice	1.58	0.62	0.03
(4) LGP2140X	C	From Leg	4.00	0.000	122.00	1" Ice	1.26	0.38	0.01
			0.00			No Ice	1.42	0.49	0.02
			0.00			1/2"	1.42	0.49	0.02
			0.00			Ice	1.58	0.62	0.03
DC6-48-60-18-8F	A	From Leg	4.00	0.000	122.00	1" Ice	2.57	2.57	0.02
			0.00			No Ice	2.80	2.80	0.04
			0.00			1/2"	2.80	2.80	0.04
			0.00			Ice	3.04	3.04	0.07
T-Arm Mount [TA 602-3]	C	None		0.000	122.00	1" Ice	11.59	11.59	0.77
						No Ice	15.44	15.44	0.99
						1/2"	15.44	15.44	0.99
						Ice	19.29	19.29	1.21
						1" Ice			

APX18-206517-CT2 w/ Mount Pipe	A	From Leg	1.00	0.000	112.00	No Ice	5.36	4.73	0.05
			0.00			1/2"	5.91	5.90	0.09
			0.00			Ice	6.44	6.79	0.15
						1" Ice			
APX18-206517-CT2 w/ Mount Pipe	B	From Leg	1.00	0.000	112.00	No Ice	5.36	4.73	0.05
			0.00			1/2"	5.91	5.90	0.09
			0.00			Ice	6.44	6.79	0.15
						1" Ice			
APX18-206517-CT2 w/ Mount Pipe	C	From Leg	1.00	0.000	112.00	No Ice	5.36	4.73	0.05
			0.00			1/2"	5.91	5.90	0.09
			0.00			Ice	6.44	6.79	0.15
						1" Ice			
Pipe Mount [PM 601-3]	C	None		0.000	112.00	No Ice	4.39	4.39	0.20
						1/2"	5.48	5.48	0.24
						Ice	6.57	6.57	0.28
						1" Ice			

KS24019-L112A	A	From Leg	1.00	0.000	13.00	No Ice	0.16	0.16	0.01
			0.00			1/2"	0.22	0.22	0.01
			1.00			Ice	0.30	0.30	0.01
						1" Ice			
Pipe Mount [PM 601-1]	A	None		0.000	13.00	No Ice	3.00	0.90	0.07
						1/2"	3.74	1.12	0.08
						Ice	4.48	1.34	0.09
						1" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K

KS24019-L112A	A	From Leg	1.00	0.000	12.00	No Ice	0.16	0.16	0.01
			0.00			1/2"	0.22	0.22	0.01
			1.00			Ice	0.30	0.30	0.01
						1" Ice			
Pipe Mount [PM 601-1]	A	None		0.000	12.00	No Ice	3.00	0.90	0.07
						1/2"	3.74	1.12	0.08
						Ice	4.48	1.34	0.09
						1" Ice			

Bridge Stiffener C6x13 (33" x 6")	A	None		0.000	30.00	No Ice	1.93	1.05	0.08
						1/2"	2.18	1.26	0.09
						Ice	2.45	1.48	0.10
						1" Ice			
Bridge Stiffener C8x18.7 (57" x 6")	A	None		0.000	60.00	No Ice	4.45	2.14	0.19
						1/2"	4.86	2.48	0.21
						Ice	5.29	2.84	0.24
						1" Ice			
Bridge Stiffener C6x13 (45" x 6")	A	None		0.000	90.00	No Ice	2.66	1.56	0.10
						1/2"	2.96	1.84	0.12
						Ice	3.30	2.12	0.14
						1" Ice			

Bridge Stiffener (106" x 15" x 1.25")	A	None		0.000	30.00	No Ice	15.48	1.84	0.63
						1/2"	16.25	2.84	0.69
						Ice	17.04	3.85	0.75
						1" Ice			
Bridge Stiffener (106" x 16" x 1.25")	A	None		0.000	60.00	No Ice	16.49	1.84	0.67
						1/2"	17.28	2.84	0.73
						Ice	18.09	3.85	0.80
						1" Ice			

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L1 150.00-120.00	135.00	1.496	25	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	7.532
L2 120.00-90.00	105.00	1.392	23	75.000	A	0.000	75.000	75.000	100.00	0.000	0.000
					B	0.000	75.000		100.00	0.000	0.000
					C	0.000	75.000		100.00	0.000	11.534
L3 90.00-78.75	84.38	1.308	21	33.750	A	0.000	33.750	33.750	100.00	0.000	0.000
					B	0.000	33.750		100.00	0.000	0.000
					C	0.000	33.750		100.00	0.000	4.716
L4 78.75-60.00	69.38	1.237	20	56.250	A	0.000	56.250	56.250	100.00	0.000	0.000
					B	0.000	56.250		100.00	0.000	0.000
					C	0.000	56.250		100.00	0.000	10.527
L5 60.00-30.00	45.00	1.093	18	105.000	A	0.000	105.000	105.000	100.00	0.000	0.000
					B	0.000	105.000		100.00	0.000	0.000
					C	0.000	105.000		100.00	0.000	18.108
L6 30.00-13.75	21.88	1	16	56.875	A	0.000	56.875	56.875	100.00	0.000	0.000
					B	0.000	56.875		100.00	0.000	0.000
					C	0.000	56.875		100.00	0.000	9.837
L7 13.75-7.25	10.50	1	16	22.750	A	0.000	22.750	22.750	100.00	0.000	0.000

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L8 7.25-0.00	3.63	1	16	25.375	B	0.000	22.750	25.375	100.00	0.000	0.000
					C	0.000	22.750		100.00	0.000	3.935
					A	0.000	25.375		100.00	0.000	0.000
					B	0.000	25.375		100.00	0.000	0.000
					C	0.000	25.375		100.00	0.000	4.389

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 150.00-120.00	135.00	1.496	5	1.00	65.000	A	0.000	65.000	65.000	100.00	0.000	0.000
						B	0.000	65.000	100.00	0.000	0.000	
						C	0.000	65.000	100.00	0.000	16.332	
L2 120.00-90.00	105.00	1.392	5	1.00	80.000	A	0.000	80.000	80.000	100.00	0.000	0.000
						B	0.000	80.000	100.00	0.000	0.000	
						C	0.000	80.000	100.00	0.000	23.534	
L3 90.00-78.75	84.38	1.308	5	1.00	35.625	A	0.000	35.625	35.625	100.00	0.000	0.000
						B	0.000	35.625	100.00	0.000	0.000	
						C	0.000	35.625	100.00	0.000	9.550	
L4 78.75-60.00	69.38	1.237	4	1.00	59.375	A	0.000	59.375	59.375	100.00	0.000	0.000
						B	0.000	59.375	100.00	0.000	0.000	
						C	0.000	59.375	100.00	0.000	22.138	
L5 60.00-30.00	45.00	1.093	4	1.00	110.000	A	0.000	110.000	110.000	100.00	0.000	0.000
						B	0.000	110.000	100.00	0.000	0.000	
						C	0.000	110.000	100.00	0.000	36.719	
L6 30.00-13.75	21.88	1	4	1.00	59.583	A	0.000	59.583	59.583	100.00	0.000	0.000
						B	0.000	59.583	100.00	0.000	0.000	
						C	0.000	59.583	100.00	0.000	19.948	
L7 13.75-7.25	10.50	1	4	1.00	23.833	A	0.000	23.833	23.833	100.00	0.000	0.000
						B	0.000	23.833	100.00	0.000	0.000	
						C	0.000	23.833	100.00	0.000	7.979	
L8 7.25-0.00	3.63	1	4	1.00	26.583	A	0.000	26.583	26.583	100.00	0.000	0.000
						B	0.000	26.583	100.00	0.000	0.000	
						C	0.000	26.583	100.00	0.000	8.900	

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 150.00-120.00	135.00	1.496	10	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000	100.00	0.000	0.000	
					C	0.000	60.000	100.00	0.000	7.532	
L2 120.00-90.00	105.00	1.392	9	75.000	A	0.000	75.000	75.000	100.00	0.000	0.000
					B	0.000	75.000	100.00	0.000	0.000	
					C	0.000	75.000	100.00	0.000	11.534	
L3 90.00-78.75	84.38	1.308	8	33.750	A	0.000	33.750	33.750	100.00	0.000	0.000
					B	0.000	33.750	100.00	0.000	0.000	
					C	0.000	33.750	100.00	0.000	4.716	
L4 78.75-60.00	69.38	1.237	8	56.250	A	0.000	56.250	56.250	100.00	0.000	0.000
					B	0.000	56.250	100.00	0.000	0.000	
					C	0.000	56.250	100.00	0.000	10.527	
L5 60.00-	45.00	1.093	7	105.000	A	0.000	105.000	105.000	100.00	0.000	0.000

Section Elevation ft	z ft	K _z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
30.00				0	B	0.000	105.000		100.00	0.000	0.000
L6 30.00-13.75	21.88	1	6	56.875	C	0.000	105.000		100.00	0.000	18.108
					A	0.000	56.875	56.875	100.00	0.000	0.000
					B	0.000	56.875		100.00	0.000	0.000
L7 13.75-7.25	10.50	1	6	22.750	C	0.000	56.875		100.00	0.000	9.837
					A	0.000	22.750	22.750	100.00	0.000	0.000
					B	0.000	22.750		100.00	0.000	0.000
L8 7.25-0.00	3.63	1	6	25.375	C	0.000	22.750		100.00	0.000	3.935
					A	0.000	25.375	25.375	100.00	0.000	0.000
					B	0.000	25.375		100.00	0.000	0.000
					C	0.000	25.375		100.00	0.000	4.389

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 120	Pole	Max Tension	11	0.00	0	0
			Max. Compression	14	-14.96	1	-1

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	120 - 90	Pole	Max. Mx	11	-7.31	213	0
			Max. My	8	-7.31	0	-212
			Max. Vy	5	12.88	-213	0
			Max. Vx	8	12.83	0	-212
			Max. Torque	9			0
			Max Tension	1	0.00	0	0
			Max. Compression	14	-22.61	3	-2
			Max. Mx	11	-12.04	651	0
			Max. My	8	-12.05	0	-648
			Max. Vy	5	15.89	-650	-1
L3	90 - 78.75	Pole	Max. Vx	8	15.83	0	-648
			Max. Torque	9			0
			Max Tension	1	0.00	0	0
			Max. Compression	14	-25.78	4	-2
			Max. Mx	11	-14.11	836	0
			Max. My	8	-14.11	0	-833
			Max. Vy	5	16.88	-835	-1
			Max. Vx	8	16.82	0	-833
			Max. Torque	9			0
			Max Tension	1	0.00	0	0
L4	78.75 - 60	Pole	Max. Compression	14	-31.78	5	-3
			Max. Mx	11	-18.37	1166	0
			Max. My	8	-18.37	0	-1162
			Max. Vy	5	18.34	-1165	-1
			Max. Vx	8	18.29	0	-1162
			Max. Torque	9			0
			Max Tension	1	0.00	0	0
			Max. Compression	14	-44.61	8	-5
			Max. Mx	11	-27.98	1773	0
			Max. My	8	-27.98	0	-1767
L5	60 - 30	Pole	Max. Vy	5	21.35	-1771	-2
			Max. Vx	8	21.30	0	-1767
			Max. Torque	9			0
			Max Tension	1	0.00	0	0
			Max. Compression	14	-52.76	10	-6
			Max. Mx	11	-34.40	2137	0
			Max. My	8	-34.40	1	-2130
			Max. Vy	5	22.85	-2134	-2
			Max. Vx	8	22.80	1	-2130
			Max. Torque	5			0
L6	30 - 13.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-56.19	11	-6
			Max. Mx	11	-37.14	2288	0
			Max. My	8	-37.14	1	-2280
			Max. Vy	5	23.41	-2284	-2
			Max. Vx	8	23.36	1	-2280
			Max. Torque	5			0
			Max Tension	1	0.00	0	0
			Max. Compression	14	-59.67	11	-7
			Max. Mx	11	-39.93	2459	0
L7	13.75 - 7.25	Pole	Max. My	8	-39.93	1	-2451
			Max. Vy	5	23.80	-2455	-2
			Max. Vx	8	23.75	1	-2451
			Max. Torque	5			0
			Max Tension	1	0.00	0	0
			Max. Compression	14	-59.67	11	-7
			Max. Mx	11	-39.93	2459	0
			Max. My	8	-39.93	1	-2451
			Max. Vy	5	23.80	-2455	-2
			Max. Vx	8	23.75	1	-2451
L8	7.25 - 0	Pole	Max. Torque	5			0
			Max Tension	1	0.00	0	0
			Max. Compression	14	-59.67	11	-7
			Max. Mx	11	-39.93	2459	0
			Max. My	8	-39.93	1	-2451
			Max. Vy	5	23.80	-2455	-2

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	59.67	-0.00	0.00
	Max. H _x	11	39.94	23.79	0.01
	Max. H _z	2	39.94	0.01	23.74
	Max. M _x	2	2449	0.01	23.74
	Max. M _z	5	2455	-23.79	-0.01

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. Torsion	11	0	23.79	0.01
	Min. Vert	11	39.94	23.79	0.01
	Min. H _x	5	39.94	-23.79	-0.01
	Min. H _z	8	39.94	-0.01	-23.74
	Min. M _x	8	-2451	-0.01	-23.74
	Min. M _z	11	-2459	23.79	0.01
	Min. Torsion	5	0	-23.79	-0.01

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	39.94	-0.00	0.00	1	2	0
Dead+Wind 0 deg - No Ice	39.94	-0.01	-23.74	-2449	3	0
Dead+Wind 30 deg - No Ice	39.94	11.89	-20.55	-2120	-1226	0
Dead+Wind 60 deg - No Ice	39.94	20.60	-11.86	-1223	-2126	0
Dead+Wind 90 deg - No Ice	39.94	23.79	0.01	2	-2455	0
Dead+Wind 120 deg - No Ice	39.94	20.61	11.88	1227	-2127	0
Dead+Wind 150 deg - No Ice	39.94	11.91	20.56	2124	-1228	0
Dead+Wind 180 deg - No Ice	39.94	0.01	23.74	2451	1	0
Dead+Wind 210 deg - No Ice	39.94	-11.89	20.55	2123	1230	0
Dead+Wind 240 deg - No Ice	39.94	-20.60	11.86	1225	2130	0
Dead+Wind 270 deg - No Ice	39.94	-23.79	-0.01	0	2459	0
Dead+Wind 300 deg - No Ice	39.94	-20.61	-11.88	-1225	2131	0
Dead+Wind 330 deg - No Ice	39.94	-11.91	-20.56	-2122	1232	0
Dead+Ice+Temp	59.67	0.00	-0.00	7	11	0
Dead+Wind 0 deg+Ice+Temp	59.67	0.00	-6.83	-722	11	0
Dead+Wind 30 deg+Ice+Temp	59.67	3.42	-5.92	-625	-354	0
Dead+Wind 60 deg+Ice+Temp	59.67	5.92	-3.42	-358	-621	0
Dead+Wind 90 deg+Ice+Temp	59.67	6.84	-0.00	7	-718	0
Dead+Wind 120 deg+Ice+Temp	59.67	5.92	3.42	371	-621	0
Dead+Wind 150 deg+Ice+Temp	59.67	3.42	5.92	638	-353	0
Dead+Wind 180 deg+Ice+Temp	59.67	-0.00	6.83	736	12	0
Dead+Wind 210 deg+Ice+Temp	59.67	-3.42	5.92	638	377	0
Dead+Wind 240 deg+Ice+Temp	59.67	-5.92	3.42	372	644	0
Dead+Wind 270 deg+Ice+Temp	59.67	-6.84	0.00	7	741	0
Dead+Wind 300 deg+Ice+Temp	59.67	-5.92	-3.42	-358	643	0
Dead+Wind 330 deg+Ice+Temp	59.67	-3.42	-5.92	-625	376	0
Dead+Wind 0 deg - Service	39.94	-0.00	-9.27	-956	2	0
Dead+Wind 30 deg - Service	39.94	4.64	-8.03	-828	-478	0
Dead+Wind 60 deg - Service	39.94	8.05	-4.63	-477	-830	0
Dead+Wind 90 deg - Service	39.94	9.29	0.00	2	-958	0
Dead+Wind 120 deg - Service	39.94	8.05	4.64	480	-830	0
Dead+Wind 150 deg - Service	39.94	4.65	8.03	831	-479	0
Dead+Wind 180 deg - Service	39.94	0.00	9.27	959	1	0
Dead+Wind 210 deg - Service	39.94	-4.64	8.03	830	482	0
Dead+Wind 240 deg - Service	39.94	-8.05	4.63	480	833	0

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 270 deg - Service	39.94	-9.29	-0.00	1	962	0
Dead+Wind 300 deg - Service	39.94	-8.05	-4.64	-478	834	0
Dead+Wind 330 deg - Service	39.94	-4.65	-8.03	-828	483	0

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-39.94	0.00	0.00	39.94	-0.00	0.000%
2	-0.01	-39.94	-23.74	0.01	39.94	23.74	0.010%
3	11.89	-39.94	-20.55	-11.89	39.94	20.55	0.000%
4	20.60	-39.94	-11.86	-20.60	39.94	11.86	0.000%
5	23.79	-39.94	0.01	-23.79	39.94	-0.01	0.004%
6	20.61	-39.94	11.88	-20.61	39.94	-11.88	0.000%
7	11.91	-39.94	20.56	-11.91	39.94	-20.56	0.000%
8	0.01	-39.94	23.74	-0.01	39.94	-23.74	0.010%
9	-11.89	-39.94	20.55	11.89	39.94	-20.55	0.000%
10	-20.60	-39.94	11.86	20.60	39.94	-11.86	0.000%
11	-23.79	-39.94	-0.01	23.79	39.94	0.01	0.010%
12	-20.61	-39.94	-11.88	20.61	39.94	11.88	0.000%
13	-11.91	-39.94	-20.56	11.91	39.94	20.56	0.000%
14	0.00	-59.67	0.00	-0.00	59.67	0.00	0.001%
15	0.00	-59.67	-6.83	-0.00	59.67	6.83	0.000%
16	3.42	-59.67	-5.92	-3.42	59.67	5.92	0.000%
17	5.92	-59.67	-3.42	-5.92	59.67	3.42	0.000%
18	6.84	-59.67	-0.00	-6.84	59.67	0.00	0.000%
19	5.92	-59.67	3.42	-5.92	59.67	-3.42	0.000%
20	3.42	-59.67	5.92	-3.42	59.67	-5.92	0.000%
21	-0.00	-59.67	6.83	0.00	59.67	-6.83	0.000%
22	-3.42	-59.67	5.92	3.42	59.67	-5.92	0.000%
23	-5.92	-59.67	3.42	5.92	59.67	-3.42	0.000%
24	-6.84	-59.67	0.00	6.84	59.67	-0.00	0.000%
25	-5.92	-59.67	-3.42	5.92	59.67	3.42	0.000%
26	-3.42	-59.67	-5.92	3.42	59.67	5.92	0.000%
27	-0.00	-39.94	-9.27	0.00	39.94	9.27	0.005%
28	4.64	-39.94	-8.03	-4.64	39.94	8.03	0.002%
29	8.05	-39.94	-4.63	-8.05	39.94	4.63	0.002%
30	9.29	-39.94	0.00	-9.29	39.94	-0.00	0.005%
31	8.05	-39.94	4.64	-8.05	39.94	-4.64	0.002%
32	4.65	-39.94	8.03	-4.65	39.94	-8.03	0.002%
33	0.00	-39.94	9.27	-0.00	39.94	-9.27	0.005%
34	-4.64	-39.94	8.03	4.64	39.94	-8.03	0.002%
35	-8.05	-39.94	4.63	8.05	39.94	-4.63	0.002%
36	-9.29	-39.94	-0.00	9.29	39.94	0.00	0.005%
37	-8.05	-39.94	-4.64	8.05	39.94	4.64	0.002%
38	-4.65	-39.94	-8.03	4.65	39.94	8.03	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	13	0.00013163	0.00014455
3	Yes	17	0.00000001	0.00012844
4	Yes	17	0.00000001	0.00012627
5	Yes	14	0.00005729	0.00006678
6	Yes	17	0.00000001	0.00012853
7	Yes	17	0.00000001	0.00012811

8	Yes	13	0.00013163	0.00014618
9	Yes	17	0.00000001	0.00012686
10	Yes	17	0.00000001	0.00012934
11	Yes	13	0.00013160	0.00014836
12	Yes	17	0.00000001	0.00012779
13	Yes	17	0.00000001	0.00012790
14	Yes	9	0.00000001	0.00004136
15	Yes	16	0.00000001	0.00008228
16	Yes	16	0.00000001	0.00009155
17	Yes	16	0.00000001	0.00009141
18	Yes	16	0.00000001	0.00008191
19	Yes	16	0.00000001	0.00009295
20	Yes	16	0.00000001	0.00009308
21	Yes	16	0.00000001	0.00008383
22	Yes	16	0.00000001	0.00009542
23	Yes	16	0.00000001	0.00009565
24	Yes	16	0.00000001	0.00008438
25	Yes	16	0.00000001	0.00009401
26	Yes	16	0.00000001	0.00009381
27	Yes	13	0.00013512	0.00006884
28	Yes	14	0.00000001	0.00009981
29	Yes	14	0.00000001	0.00009454
30	Yes	13	0.00013513	0.00006934
31	Yes	14	0.00000001	0.00009916
32	Yes	14	0.00000001	0.00009840
33	Yes	13	0.00013512	0.00006905
34	Yes	14	0.00000001	0.00009588
35	Yes	14	0.00000001	0.00010160
36	Yes	13	0.00013512	0.00006953
37	Yes	14	0.00000001	0.00009746
38	Yes	14	0.00000001	0.00009779

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	26.79	36	1.591	0.001
L2	120 - 90	17.16	36	1.381	0.001
L3	90 - 78.75	9.44	36	1.011	0.000
L4	78.75 - 60	7.22	36	0.871	0.000
L5	60 - 30	4.23	36	0.638	0.000
L6	30 - 13.75	1.09	36	0.339	0.000
L7	13.75 - 7.25	0.24	36	0.160	0.000
L8	7.25 - 0	0.07	36	0.089	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.00	800MHz 2X50W RRH W/FILTER	36	26.12	1.580	0.001	29828
146.00	APXV9ERR18-C-A20 w/ Mount Pipe	36	25.46	1.569	0.001	29828
138.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	36	22.81	1.522	0.001	12428
124.00	RRUS 11	36	18.36	1.419	0.001	5736
122.00	(2) 7770.00 w/ Mount Pipe	36	17.76	1.400	0.001	5350
112.00	APX18-206517-CT2 w/ Mount Pipe	36	14.86	1.293	0.001	4622
90.00	Bridge Stiffener C6x13 (45" x 6")	36	9.44	1.011	0.000	3950
60.00	Bridge Stiffener C8x18.7 (57" x 6")	36	4.23	0.638	0.000	5419
30.00	Bridge Stiffener C6x13 (33" x 6")	36	1.09	0.339	0.000	5347

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
13.00	KS24019-L112A	36	0.21	0.151	0.000	4931
12.00	KS24019-L112A	36	0.18	0.141	0.000	4751

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	150 - 120	68.40	11	4.064	0.002
L2	120 - 90	43.82	11	3.527	0.002
L3	90 - 78.75	24.12	11	2.582	0.001
L4	78.75 - 60	18.44	11	2.225	0.001
L5	60 - 30	10.81	11	1.631	0.000
L6	30 - 13.75	2.80	11	0.865	0.000
L7	13.75 - 7.25	0.61	11	0.408	0.000
L8	7.25 - 0	0.17	11	0.227	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
148.00	800MHz 2X50W RRH W/FILTER	11	66.70	4.036	0.002	11781
146.00	APXV9ERR18-C-A20 w/ Mount Pipe	11	65.00	4.008	0.002	11781
138.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	11	58.26	3.887	0.002	4908
124.00	RRUS 11	11	46.90	3.623	0.002	2263
122.00	(2) 7770.00 w/ Mount Pipe	11	45.35	3.577	0.002	2111
112.00	APX18-206517-CT2 w/ Mount Pipe	11	37.96	3.303	0.002	1821
90.00	Bridge Stiffener C6x13 (45" x 6")	11	24.12	2.582	0.001	1552
60.00	Bridge Stiffener C8x18.7 (57" x 6")	11	10.81	1.631	0.000	2125
30.00	Bridge Stiffener C6x13 (33" x 6")	11	2.80	0.865	0.000	2094
13.00	KS24019-L112A	11	0.54	0.387	0.000	1930
12.00	KS24019-L112A	11	0.46	0.360	0.000	1860

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	KI/r	F _a	A	Actual P	Allow. P _a	Ratio P/P _a
	ft		ft	ft		ksi	in ²	K	K	
L1	150 - 120 (1)	P24x1/4	30.00	0.00	0.0	23.70	18.65	-7.31	442.00	0.017
L2	120 - 90 (2)	30" x 0.375"	30.00	0.00	0.0	25.07	34.90	-12.04	875.15	0.014
L3	90 - 78.75 (3)	36" x 0.375"	11.25	0.00	0.0	23.70	41.97	-14.11	994.51	0.014
L4	78.75 - 60 (4)	RPS 36" x 0.51087"	18.75	0.00	0.0	21.53	56.96	-18.37	1226.54	0.015
L5	60 - 30 (5)	RPS 42" x 0.58495"	30.00	0.00	0.0	20.63	76.11	-27.98	1569.94	0.018
L6	30 - 13.75 (6)	RPS 42" x 0.71391"	16.25	0.00	0.0	22.43	92.60	-34.40	2076.77	0.017
L7	13.75 - 7.25 (7)	RPS 42" x 0.82344"	6.50	0.00	0.0	21.40	106.52	-37.14	2279.11	0.016
L8	7.25 - 0 (8)	RPS 42" x 0.78565"	7.25	0.00	0.0	21.43	101.72	-39.93	2179.56	0.018

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 $\frac{P}{P_a}$
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Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 120 (1)	P24x1/4	213	23.30	23.70	0.983	0	0.00	23.70	0.000
L2	120 - 90 (2)	30" x 0.375"	651	30.59	25.07	1.220	0	0.00	25.07	0.000
L3	90 - 78.75 (3)	36" x 0.375"	836	27.11	23.70	1.144	0	0.00	23.70	0.000
L4	78.75 - 60 (4)	RPS 36" x 0.51087"	1166	28.09	23.69	1.186	0	0.00	23.69	0.000
L5	60 - 30 (5)	RPS 42" x 0.58495"	1773	27.38	22.69	1.207	0	0.00	22.69	0.000
L6	30 - 13.75 (6)	RPS 42" x 0.71391"	2137	27.29	24.67	1.106	0	0.00	24.67	0.000
L7	13.75 - 7.25 (7)	RPS 42" x 0.82344"	2288	25.53	23.54	1.085	0	0.00	23.54	0.000
L8	7.25 - 0 (8)	RPS 42" x 0.78565"	2459	28.68	23.57	1.217	0	0.00	23.57	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 120 (1)	P24x1/4	12.88	1.38	16.80	0.082	0	0.01	11.90	0.001
L2	120 - 90 (2)	30" x 0.375"	15.89	0.91	16.80	0.054	0	0.00	15.64	0.000
L3	90 - 78.75 (3)	36" x 0.375"	16.87	0.80	16.80	0.048	0	0.00	11.90	0.000
L4	78.75 - 60 (4)	RPS 36" x 0.51087"	18.34	0.64	14.36	0.045	0	0.00	14.36	0.000
L5	60 - 30 (5)	RPS 42" x 0.58495"	21.35	0.56	13.75	0.041	0	0.00	13.75	0.000
L6	30 - 13.75 (6)	RPS 42" x 0.71391"	22.85	0.49	14.95	0.033	0	0.00	14.95	0.000
L7	13.75 - 7.25 (7)	RPS 42" x 0.82344"	23.41	0.44	14.26	0.031	0	0.00	14.26	0.000
L8	7.25 - 0 (8)	RPS 42" x 0.78565"	23.80	0.47	14.28	0.033	0	0.00	14.28	0.000

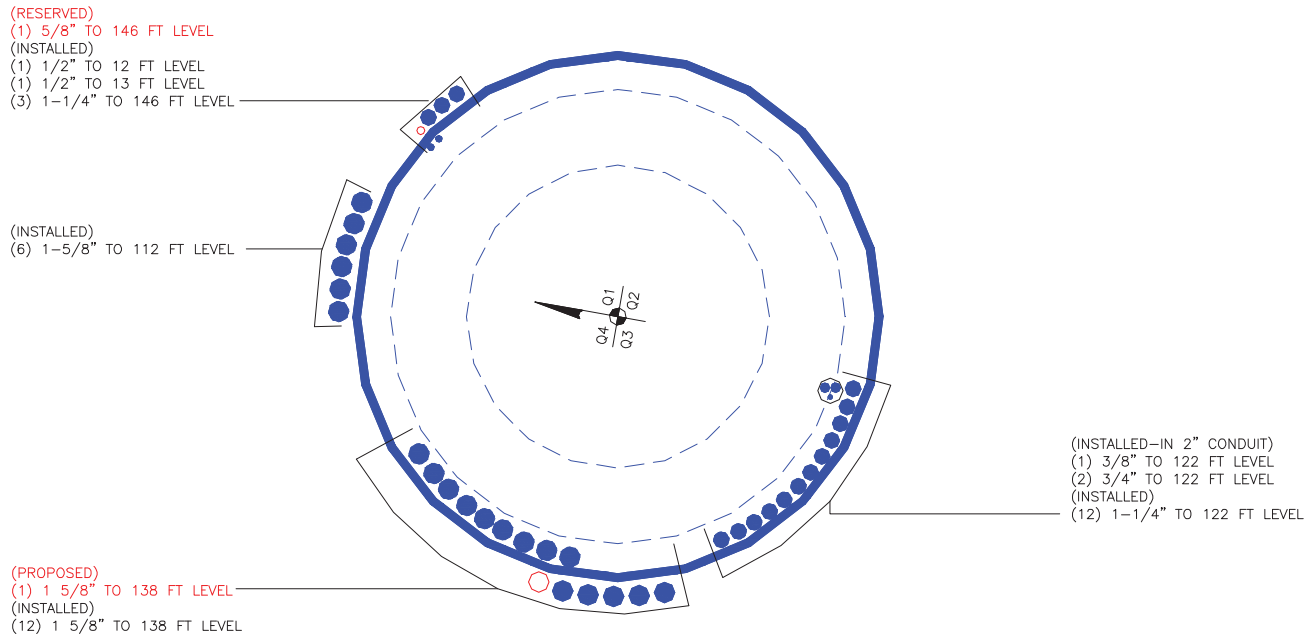
Pole Interaction Design Data

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	150 - 120 (1)	0.017	0.983	0.000	0.082	0.001	1.007	1.333	H1-3+VT ✓
L2	120 - 90 (2)	0.014	1.220	0.000	0.054	0.000	1.237	1.333	H1-3+VT ✓
L3	90 - 78.75 (3)	0.014	1.144	0.000	0.048	0.000	1.161	1.333	H1-3+VT ✓
L4	78.75 - 60 (4)	0.015	1.186	0.000	0.045	0.000	1.203	1.333	H1-3+VT ✓
L5	60 - 30 (5)	0.018	1.207	0.000	0.041	0.000	1.226	1.333	H1-3+VT ✓
L6	30 - 13.75 (6)	0.017	1.106	0.000	0.033	0.000	1.124	1.333	H1-3+VT ✓
L7	13.75 - 7.25 (7)	0.016	1.085	0.000	0.031	0.000	1.102	1.333	H1-3+VT ✓
L8	7.25 - 0 (8)	0.018	1.217	0.000	0.033	0.000	1.236	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L1	150 - 120	Pole	P24x1/4	1	-7.31	589.19	75.5	Pass	
L2	120 - 90	Pole	30" x 0.375"	2	-12.04	1166.57	92.8	Pass	
L3	90 - 78.75	Pole	36" x 0.375"	3	-14.11	1325.68	87.1	Pass	
L4	78.75 - 60	Pole	RPS 36" x 0.51087"	4	-18.37	1634.98	90.2	Pass	
L5	60 - 30	Pole	RPS 42" x 0.58495"	5	-27.98	2092.73	92.0	Pass	
L6	30 - 13.75	Pole	RPS 42" x 0.71391"	6	-34.40	2768.33	84.3	Pass	
L7	13.75 - 7.25	Pole	RPS 42" x 0.82344"	7	-37.14	3038.05	82.7	Pass	
L8	7.25 - 0	Pole	RPS 42" x 0.78565"	8	-39.93	2905.35	92.7	Pass	
							Summary		
							Pole (L2)	92.8	Pass
							RATING =	92.8	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

DESIGNED APPURTENANCE LOADING

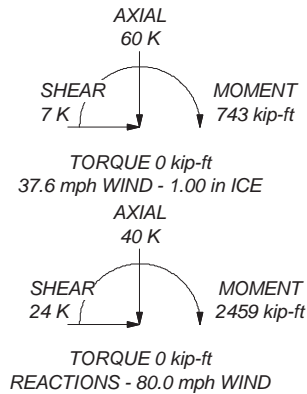
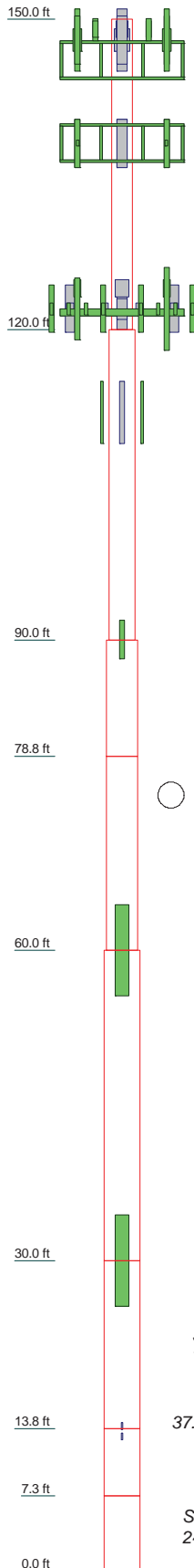
TYPE	ELEVATION	TYPE	ELEVATION
800MHz 2X50W RRR W/FILTER	148	KRY 112 144/1	138
800MHz 2X50W RRR W/FILTER	148	KRY 112 144/1	138
800MHz 2X50W RRR W/FILTER	148	Platform Mount [LP 712-1]	138
PCS 1900MHz 4x45W-65MHz	148	RRUS 11	124
PCS 1900MHz 4x45W-65MHz	148	RRUS 11	124
PCS 1900MHz 4x45W-65MHz	148	RRUS 11	124
Side Arm Mount [SO 102-3]	148	Side Arm Mount [SO 102-3]	124
APXV9ERR18-C-A20 w/ Mount Pipe	146	(2) 7770.00 w/ Mount Pipe	122
APXVSP18-C-A20 w/ Mount Pipe	146	(2) 7770.00 w/ Mount Pipe	122
APXVSP18-C-A20 w/ Mount Pipe	146	(2) 7770.00 w/ Mount Pipe	122
APXVTM14-C-120 w/ Mount Pipe	146	AM-X-CD-14-65-00T-RET w/ Mount Pipe	122
APXVTM14-C-120 w/ Mount Pipe	146		
APXVTM14-C-120 w/ Mount Pipe	146	P65-17-XLH-RR w/ Mount Pipe	122
TD-RRH8x20-25	146	AM-X-CD-16-65-00T-RET w/ Mount Pipe	122
TD-RRH8x20-25	146		
TD-RRH8x20-25	146	(4) LGP2140X	122
2.375" OD x 5' Mount Pipe	146	(4) LGP2140X	122
2.375" OD x 5' Mount Pipe	146	(4) LGP2140X	122
2.375" OD x 5' Mount Pipe	146	DC6-48-60-18-8F	122
Platform Mount [LP 501-1]	146	T-Arm Mount [TA 602-3]	122
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	138	APX18-206517-CT2 w/ Mount Pipe	112
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	138	APX18-206517-CT2 w/ Mount Pipe	112
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	138	Pipe Mount [PM 601-3]	112
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	Bridge Stiffener C6x13 (45" x 6")	90
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	Bridge Stiffener C8x18.7 (57" x 6")	60
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	Bridge Stiffener (106" x 16" x 1.25")	60
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	Bridge Stiffener C6x13 (33" x 6")	30
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	Bridge Stiffener (106" x 15" x 1.25")	30
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	Pipe Mount [PM 601-1]	13
KRY 112 144/1	138	KS24019-L112A	13
		Pipe Mount [PM 601-1]	12
		KS24019-L112A	12

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	Reinf 37.38 ksi	37 ksi	47 ksi
Reinf 35.89 ksi	36 ksi	45 ksi	Reinf 35.66 ksi	36 ksi	45 ksi
Reinf 34.38 ksi	34 ksi	43 ksi	Reinf 35.71 ksi	36 ksi	45 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.0 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.6 mph basic wind with 1.00 in ice.
4. Deflections are based upon a 50.0 mph wind.
5. TOWER RATING: 92.8%



Section	Size	Length (ft)	Grade	Weight (K)
1	P24x1/4	30.00	A53-B-42	1.9
2	30" x 0.375"	30.00	A53-B-42	3.6
3	36" x 0.375"	11.25	A53-B-42	1.6
4	RPS 36" x 0.51087"	18.75	Reinf 35.89 ksi	3.6
5	RPS 42" x 0.58495"	30.00	Reinf 34.38 ksi	7.8
6	RPS 42" x 0.71391"	16.25	Reinf 37.38 ksi	5.1
7	RPS 42" x 0.82344"	6.50	Reinf 35.66 ksi	2.4
8	RPS 42" x 0.93297"	7.25	Reinf 35.71 ksi	2.5
				28.5



Paul J. Ford and Company
 250 E. Broad Street, Suite 600
 Columbus, OH 43215
 Phone: 614.221.6679
 FAX: 614.448.4105

Job: 150 ft Monopole / Kings Lot		
Project: PJF 37514-0050 / BU 876327		
Client: CCI	Drawn by: Joey Meinering	App'd:
Code: TIA/EIA-222-F	Date: 03/06/14	Scale: NTS
Path:		Dwg No. E-1

T:\375_Crown_Castle\2014\37514-0050 BU 876327\I\0 713158 BU 876327 (7806)37514-0050 R1.rvt

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

Site Data

BU#: 876327
 Site Name: Kings Lot
 App #:

Pole Manufacturer: Rohn

Reactions

Moment:	213	ft-kips
Axial:	7.31	kips
Shear:	12.88	kips
Elevation:	120	feet

Bolt Data

Qty:	12		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	35		

Plate Data

Diam:	41	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	6.28	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data

Diam:	24	in
Thick:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu:	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF: 1.3333333

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

Flange Bolt Results

Bolt Tension Capacity, **B**: 103.67 kips
 Max Bolt directly applied T: 23.73 Kips
 Min. PL "tc" for **B** cap. **w/o** Pry: 3.614 in
 Min PL "treq" for actual **T w/ Pry**: 1.307 in
 Min PL "t1" for actual **T w/o Pry**: 1.729 in
 T allowable with Prying: 55.60 kips
 Prying Force, Q: 0.00 kips
 Total Bolt Tension=T+Q: 23.73 kips
 Prying Bolt Stress Ratio=(T+Q)/(B): 22.9% **Pass**

Rigid
Service, ASD
Fty*ASIF

Exterior Flange Plate Results

Flexural Check
 Compression Side Plate Stress: Rohn/Pirod, OK
 Allowable Plate Stress: 36.0 ksi
 Compression Plate Stress Ratio: Rohn/Pirod, OK
No Prying
 Tension Side Stress Ratio, (treq/t)^2: 42.7% **Pass**

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
25.48

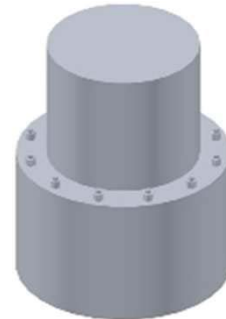
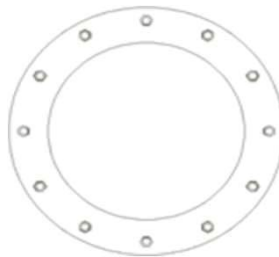
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Stiffener Results

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#: 876327
 Site Name: Kings Lot
 App #:

Pole Manufacturer: Rohn

Bolt Data

Qty:	16	Bolt Fu:	105
Diameter (in.):	1.5	Bolt Fy:	81
Bolt Material:	A325	Bolt Fty:	44.00
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	41		

Plate Data

Diam:	47	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	5.89	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data

Diam:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu:	63	ksi
Reinf. Fillet Weld:	0	"0" if None

Stress Increase Factor

ASIF: 1.3333333

Reactions

Moment:	651	ft-kips
Axial:	12.04	kips
Shear:	15.89	kips
Elevation:	90	feet

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

Flange Bolt Results

Bolt Tension Capacity, **B**: 103.67 kips
 Max Bolt directly applied T: 46.88 Kips
 Min. PL "tc" for **B** cap. **w/o** Pry: 3.733 in
 Min PL "treq" for actual **T w/ Pry**: 1.906 in
 Min PL "t1" for actual **T w/o Pry**: 2.510 in
 T allowable with Prying: 51.63 kips
 Prying Force, Q: 21.68 kips
 Total Bolt Tension=T+Q: 68.57 kips
 Prying Bolt Stress Ratio=(T+Q)/(B): 66.1% **Pass**

Rigid
Service, ASD
Fty*ASIF

$\alpha > 1$ case

Exterior Flange Plate Results

Flexural Check: Rohn/Pirod, OK
 Compression Side Plate Stress: 36.0 ksi
 Allowable Plate Stress: Rohn/Pirod, OK
 Compression Plate Stress Ratio: Rohn/Pirod, OK
Prying Occurs, PL Check:
 Tension Side Stress Ratio, (treq/t)²: 90.8% **Pass**

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
27.95

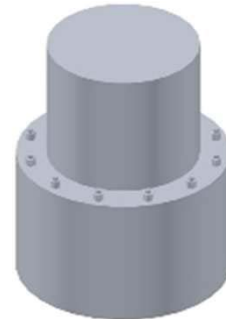
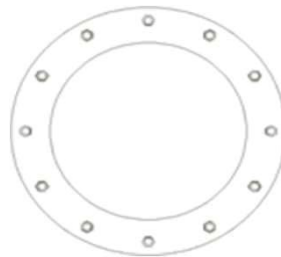
n/a

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



Welded Bridge Stiffener Analysis per TIA/EIA-222-F & AISC 9th Ed. (Green)

General Parameters and Loading:

Flange Elevation:	60.00	ft
TIA Reference Standard:	TIA/EIA-222-F	
AISC Manual:	9th Ed. (Green)	
Method:	ASD	
ASD Stress Increase, ASIF:	1.333333333	
Moment, Mf:	1166.0	k-ft
Axial, Pf:	18.4	kips
Shear, Vf:	18.3	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	36.00	42.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	63	63	ksi
Flange Diameter, Df:	53.00	53.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	0	
Upper Weld Length, L1:	50.00	0.00	in
Lower Weld Length, L2:	50.00	0.00	in
Weld Size, w:	0.3750	0.0000	in
Electrode:	E70	E70	
Effective Stiffener Width, Ws:	7.00	0.00	in
Stiffener Thickness, ts:	1.25	0.00	in
Notch, n:	0.50	0.00	in
Stiffener Fy:	65	0	ksi
Stiffener Fu:	80	0	ksi
Unbraced Length, L:	6.00	0.00	in
K:	1.00	0.00	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	35	0	degrees
Stiffener Circle:	61.00	53.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	12.50	8.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	9.50	5.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

	(1) Bolt Circle		
	Bolt Circle 1	Bolt Circle 2	
Number of Bolt Circles:	(1) Bolt Circle		
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	47.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Table XIX & pg. 4-72:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	0	Num. of Sixteenths in Weld
a:	0.2500	0.0000	= e1 / L1
k:	0	0	
C:	1.2600	0.0000	Tabulated Coefficient
C1:	1.0000	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	312.1	0.0	kips
Allowable Axial, Pa:	504.0	0.0	kips = ASIF C C1 D L
Ratio:	61.9%	0.0%	
Lower Pole			
D:	6	0	Num. of Sixteenths in Weld
a:	0.1900	0.0000	= e2 / L2
k:	0	0	
C:	1.4140	0.0000	Tabulated Coefficient
C1:	1.0000	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	312.1	0.0	kips
Allowable Axial, Pa:	565.6	0.0	kips = ASIF C C1 D L
Ratio:	55.2%	0.0%	

Pole Analysis per AISC Sect. F4:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, P:	312.1	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	3.1	0.0	kips/in = P / (2 L1)
Section Modulus, S:	833.3	0.0	in ² = L1 ² / 3
Bending Stress, fb:	4.7	0.0	kips/in = P e1 / S
Combined Stress, f:	5.6	0.0	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	0.0000	
Allowable Stress, F:	8.4	0.0	kips/in = ASIF (0.4 Fy) tp
Ratio:	67.0%	0.0%	
Lower Pole			
Stiffener Axial, P:	312.1	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	3.1	0.0	ksi = P / (2 L2)
Section Modulus, S:	833.3	0.0	in ² = L2 ² / 3
Bending Stress, fb:	3.6	0.0	ksi = P e2 / S
Combined Stress, f:	4.7	0.0	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	0.0000	
Allowable Stress, F:	8.4	0.0	kips/in = ASIF (0.4 Fy) tp
Ratio:	56.4%	0.0%	

Stiffener 1 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 1	
Gross Area, Ag:	8.7500	in ²
Net Area, An:	8.7500	in ²
Stiffener Axial, P:	312.1	kips
Stiffener Stress, f:	35.7	ksi = P / Ag
b:	16.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.8000	in
Q, Where Qa = 1.0:	0.8787	= Qa 1.340 - 0.00447 (b / ts) Fy ^{1/2}
r:	0.3608	in ³
K L / r:	16.6277	
ASIF:	1.3333	
Allowable Axial, Fa:	43.45	ksi = ASIF Q [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³]
ASIF:	1.3333	
Allowable Bending, Fb:	45.69	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	82.1%	

Stiffener 2 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 2	
Gross Area, Ag:	0.0000	in ²
Net Area, An:	0.0000	in ²
Stiffener Axial, P:	0.0	kips
Stiffener Stress, f:	0.0	ksi = P / Ag
b:	0.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	0.0000	in
Q, Where Qa = 1.0:	0.0000	
r:	0.0000	in ³
K L / r:	0.0000	
ASIF:	0.0000	
Allowable Axial, Fa:	0.00	ksi = ASIF [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³]
ASIF:	0.0000	
Allowable Bending, Fb:	0.00	ksi = ASIF 0.6 Fy
ASIF:	0.0000	
Allowable Net Tension, Ft:	0.00	ksi = ASIF 0.5 Fu
Ratio:	0.0%	

Analysis Summary:

Bridge Stiffener Type 1
Weld Analysis Ratio: 61.9% PASS
Pole Analysis Ratio: 67.0% PASS
Stiffener Analysis Ratio: 82.1% PASS

Bridge Stiffener Type 2
Weld Analysis Ratio: 0.0% PASS
Pole Analysis Ratio: 0.0% PASS
Stiffener Analysis Ratio: 0.0% PASS



v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment = 2459 k-ft
 Axial = 40.0 kips
 Shear = 24.0 kips
 Anchor Qty = 25

TIA Ref. = F
 ASIF = 1.3333
 Max Ratio = 100.0%

Location = Base Plate
 η = N/A for BP, Rev. G Sect. 4.9.9
 Threads = N/A for FP, Rev. G

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in ²	Area, in ²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.500	A354 Gr BC	109	125	0.0	47.00	0.00	1.77	71.94	69.47	69.47	0.00	97.19	71.5%
2	1.500	A354 Gr BC	109	125	20.0	47.00	0.00	1.77	69.58	67.11	67.11	0.00	97.19	69.0%
3	1.500	A354 Gr BC	109	125	40.0	47.00	0.00	1.77	66.06	63.59	63.59	0.00	97.19	65.4%
4	1.500	A354 Gr BC	109	125	60.0	47.00	0.00	1.77	63.15	60.67	60.67	0.00	97.19	62.4%
5	1.500	A354 Gr BC	109	125	80.0	47.00	0.00	1.77	62.52	60.05	60.05	0.00	97.19	61.8%
6	1.500	A354 Gr BC	109	125	100.0	47.00	0.00	1.77	64.70	62.22	62.22	0.00	97.19	64.0%
7	1.500	A354 Gr BC	109	125	120.0	47.00	0.00	1.77	68.59	66.12	66.12	0.00	97.19	68.0%
8	1.500	A354 Gr BC	109	125	140.0	47.00	0.00	1.77	72.35	69.87	69.87	0.00	97.19	71.9%
9	1.500	A354 Gr BC	109	125	160.0	47.00	0.00	1.77	74.37	71.89	71.89	0.00	97.19	74.0%
10	1.500	A354 Gr BC	109	125	180.0	47.00	0.00	1.77	73.84	71.37	71.37	0.00	97.19	73.4%
11	1.500	A354 Gr BC	109	125	200.0	47.00	0.00	1.77	70.89	68.42	68.42	0.00	97.19	70.4%
12	1.500	A354 Gr BC	109	125	220.0	47.00	0.00	1.77	66.59	64.11	64.11	0.00	97.19	66.0%
13	1.500	A354 Gr BC	109	125	240.0	47.00	0.00	1.77	62.72	60.24	60.24	0.00	97.19	62.0%
14	1.500	A354 Gr BC	109	125	260.0	47.00	0.00	1.77	61.14	58.66	58.66	0.00	97.19	60.4%
15	1.500	A354 Gr BC	109	125	280.0	47.00	0.00	1.77	62.60	60.12	60.12	0.00	97.19	61.9%
16	1.500	A354 Gr BC	109	125	300.0	47.00	0.00	1.77	66.14	63.66	63.66	0.00	97.19	65.5%
17	1.500	A354 Gr BC	109	125	320.0	47.00	0.00	1.77	69.85	67.38	67.38	0.00	97.19	69.3%
18	1.500	A354 Gr BC	109	125	340.0	47.00	0.00	1.77	72.07	69.60	69.60	0.00	97.19	71.6%
19	2.250	#18J A615 Gr 75	75	100	30.0	53.00	0.00	3.98	172.14	166.57	166.57	0.00	195.00	85.4%
20	2.250	#18J A615 Gr 75	75	100	110.0	53.00	0.00	3.98	168.31	162.74	162.74	0.00	195.00	83.5%
21	2.250	#18J A615 Gr 75	75	100	210.0	53.00	0.00	3.98	174.26	168.69	168.69	0.00	195.00	86.5%
22	2.250	#18J A615 Gr 75	75	100	290.0	53.00	0.00	3.98	163.07	157.50	157.50	0.00	195.00	80.8%
23	2.000	A193 Gr B7	105	125	95.0	60.00	0.00	3.14	143.99	139.59	139.59	0.00	172.79	80.8%
24	2.000	A193 Gr B7	105	125	230.0	60.00	0.00	3.14	145.68	141.28	141.28	0.00	172.79	81.8%
25	2.000	A193 Gr B7	105	125	335.0	60.00	0.00	3.14	162.75	158.35	158.35	0.00	172.79	91.6%

57.15

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

TIA Rev F

Site Data

BU#: 876327
Site Name: Kings Lot
App #:
Pole Manufacturer: <i>Other</i>

Reactions

Moment:	1288.9	ft-kips
Axial:	22.3	kips
Shear:	13.4	kips

Reactions adjusted to account for additional anchor rods.

Anchor Rod Data

Qty:	18	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	47	in

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

Anchor Rod Results

Maximum Rod Tension:	71.9 Kips
Allowable Tension:	97.2 Kips
Anchor Rod Stress Ratio:	74.0% Pass

Stiffened
Service, ASD
Fty*ASIF

Plate Data

Diam:	53	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.33	in

Base Plate Results

Base Plate Stress:	22.9 ksi	Flexural Check
Allowable Plate Stress:	36.0 ksi	
Base Plate Stress Ratio:	63.5% Pass	

Stiffened
Service, ASD
0.75*Fy*ASIF
Y.L. Length:
N/A, Roark

Stiffener Data (Welding at both sides)

Config:	1	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	5.75	in
Height:	14.25	in
Thick:	0.5	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Stiffener Results

Horizontal Weld :	38.5% Pass
Vertical Weld:	29.9% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	11.4% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	38.8% Pass
Plate Comp. (AISC Bracket):	42.6% Pass

Pole Results

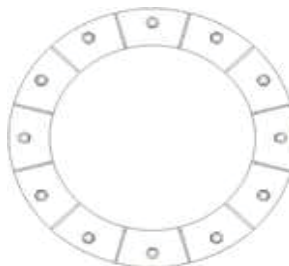
Pole Punching Shear Check:	7.0% Pass
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Pole Data

Diam:	42	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
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* 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#: 876327
Site Name: Kings Lot
App #:
Pole Manufacturer: <i>Other</i>

Reactions

Moment:	757.4	ft-kips
Axial:	11.1	kips
Shear:	6.7	kips

Reactions adjusted to account for additional anchor rods.

Anchor Rod Data

Qty:	4	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	53	in

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

Base Plate and Stiffener Check Only

Plate Data

Diam:	57.5	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	24.25	in

Base Plate Results

Base Plate Stress:
Allowable Plate Stress:
Base Plate Stress Ratio:

Shear Check Only

5.6 ksi
19.2 ksi
29.3% **Pass**

Stiffened

Service, ASD
0.75*Fy*ASIF
Y.L. Length:
N/A, Roark

Stiffener Data (Welding at both sides)

Config:	3	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	7.75	in
Height:	21.75	in
Thick:	0.5	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi
Clear Space between Stiffeners (b):	5	in

Stiffener Results

Horizontal Weld : 26.3% **Pass**
Vertical Weld: 19.5% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2: 6.4% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2: 26.5% **Pass**
Plate Comp. (AISC Bracket): 30.1% **Pass**

Pole Results

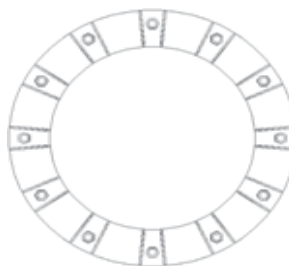
Pole Punching Shear Check: 4.2% **Pass**

Pole Data

Diam:	42	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
-------	-------



* 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

foundation loads

Tower or Pole Weight = **40** kips
 Total Horizontal Force = **24** kips
 Overturning Moment = **2459** ft-kips
 Tower Leg Compression = _____
 Tower Leg Tension = _____

soil properties

Safety factor against overturning = **1.5**
 Soil Density = **115** pcf
 Allowable Soil Bearing = **8** ksf
 Depth to water table = **99** ft

mat dimensions

Depth to Bottom of Footing = **5.5** ft
 Footing Thickness = **6** ft
 Footing Width = **21** ft
 Footing Length = **21** ft
 Base Plate Diameter = _____
 Anchor Plate Diameter = _____
 Depth of Anchor Plate = _____
 Tower Base Width = **3.5** ft
 Tower Center Offset = **0** ft

Summary of analysis results

Overturning Moment: (Stress Ratio = 0.851) **< CONTROLLING CRITERIA**

Calculated Overturning Moment = 2603 ft-kips

Resisting Moment = 4587.5 ft-kips

Factor of Safety against overturning = **1.762 > 1.5 okay**

Soil Bearing

(Stress Ratio = 0.349)

Allowable Soil Bearing = 8 ksf

Calculated Soil Bearing Pressure = 2.789 ksf **< 8 ksf okay**

Bending Moment

(Stress Ratio = 0.305)

Ultimate Bending Moment Resistance = 5216 ft-kips

Calculated Ultimate Bending Moment = 1591 ft-kips **< 5216 ft-kips okay**

Bending Shear

(Stress Ratio = 0.185)

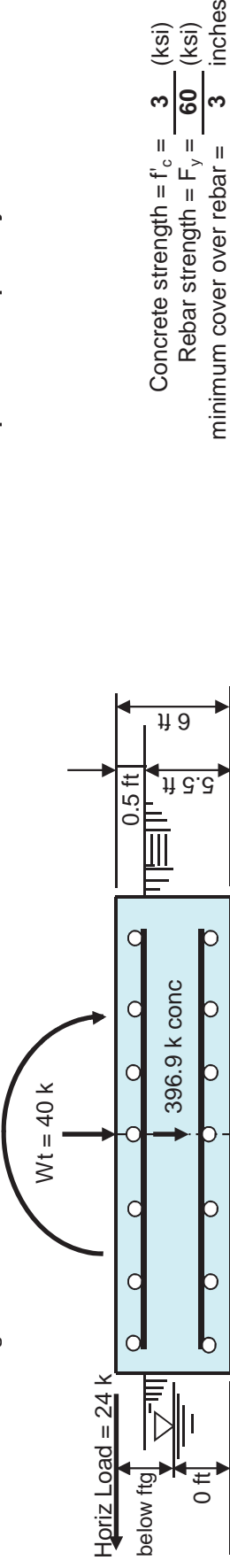
Ultimate Bending Shear Resistance = 1398 kips

Calculated Ultimate Bending Shear = 259 kips **< 1398 kips okay**

(Stress Ratio = 0)

Ultimate Tensile Punching Shear Resistance = 2300 kips

Calculated Ultimate Pullout = 0 kips **< 2300 kips okay**



Overturning Moment = 2459 ft-k

Volume of concrete = **98** yd³
 Rebar = **(88) #8 bars by 20.5 ft long**
 reinforcing steel = (22) #8 @ 11.71 in o.c. ea way top and bottom

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

T-Mobile Existing Facility

Site ID: CT11883C

CT883 / Sprint South Windsor

59 McGuire Road
South Windsor, CT 06074

March 20, 2014

EBI Project Number: 62141468

March 20, 2014

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

Re: Emissions Values for Site: **CT11883C - CT883 / Sprint South Windsor**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 59 McGuire Road, South 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the cellular band is $567 \mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS and AWS bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 59 McGuire Road, South 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 **138 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 calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT11883C - CT883 / Sprint South Windsor
Site Address	59 McGuire Road, South Windsor, CT 06074
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	138	132	None	0	0	48.326044	0.997101	0.09971%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	138	132	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	138	132	1-5/8"	0	0	24.163022	0.498551	0.04986%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	138	132	1-5/8"	0	0	24.163022	0.498551	0.04986%

Sector total Power Density Value: 0.199%

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	138	132	None	0	0	48.326044	0.997101	0.09971%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	138	132	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	138	132	1-5/8"	0	0	24.163022	0.498551	0.04986%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	138	132	1-5/8"	0	0	24.163022	0.498551	0.04986%

Sector total Power Density Value: 0.199%

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	138	132	None	0	0	48.326044	0.997101	0.09971%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	138	132	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	138	132	1-5/8"	0	0	24.163022	0.498551	0.04986%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	138	132	1-5/8"	0	0	24.163022	0.498551	0.04986%

Sector total Power Density Value: 0.199%

Site Composite MPE %	
Carrier	MPE %
T-Mobile	0.598%
Sprint	4.420%
MetroPCS	9.690%
AT&T	23.090%
Total Site MPE %	37.798%

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 **0.598% (0.199% 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 **37.798%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

••T••Mobile••

NORTHEAST LLC.

SITE NAME: CT883/SPRINT S. WINDSOR

SITE ID NUMBER: CT11883C

SITE ADDRESS: 59 MCGUIRE ROAD
SOUTH WINDSOR, CT 06074

PROJECT SUMMARY

SITE ID NUMBER: CT11883C
 SITE NAME: CT883/SPRINT S. WINDSOR
 CROWN BU#: 876327
 SITE ADDRESS: 59 MCGUIRE ROAD
SOUTH WINDSOR, CT 06074
 COUNTY: HARTFORD
 PROPERTY OWNER: CROWN CASTLE USA
 APPLICANT: T-MOBILE NORTHEAST, LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 0602
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: MAP 5 LOT 14.1
 LATITUDE: (NAD 83) 41.80290 N
 LONGITUDE: (NAD 83) 72.61730 W

SITE DIRECTIONS

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TAKE THE 1ST RIGHT ONTO W NEWBERRY RD. TURN LEFT ONTO WOODLAND AVE. TAKE THE 1ST RIGHT ONTO CT-187 S/BLUE HILLS AVE. TURN LEFT ONTO CT-218 E/COTTAGE GROVE RD. CONTINUE TO FOLLOW CT-218 E. TURN RIGHT ONTO THE INTERSTATE 291 E RAMP TO SOUTH WINDSOR. MERGE ONTO I-291 E. TAKE EXIT 4 TO MERGE ONTO US-5 S/ELLINGTON RD. TURN RIGHT ONTO BURNHAM ST. TURN RIGHT ONTO KING ST. TURN RIGHT ONTO MCGUIRE RD. DESTINATION WILL BE ON THE RIGHT.

LOCATION MAP



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".



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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



APPROVALS

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

PROJECT NUMBER: 7061.CT11883C
 DESIGNED BY: JQ

REV	DATE	REVISION	DRAWN BY
Δ	02/21/14	FOR COMMENT	MP
Δ	03/21/14	FOR CONSTRUCTION	MP

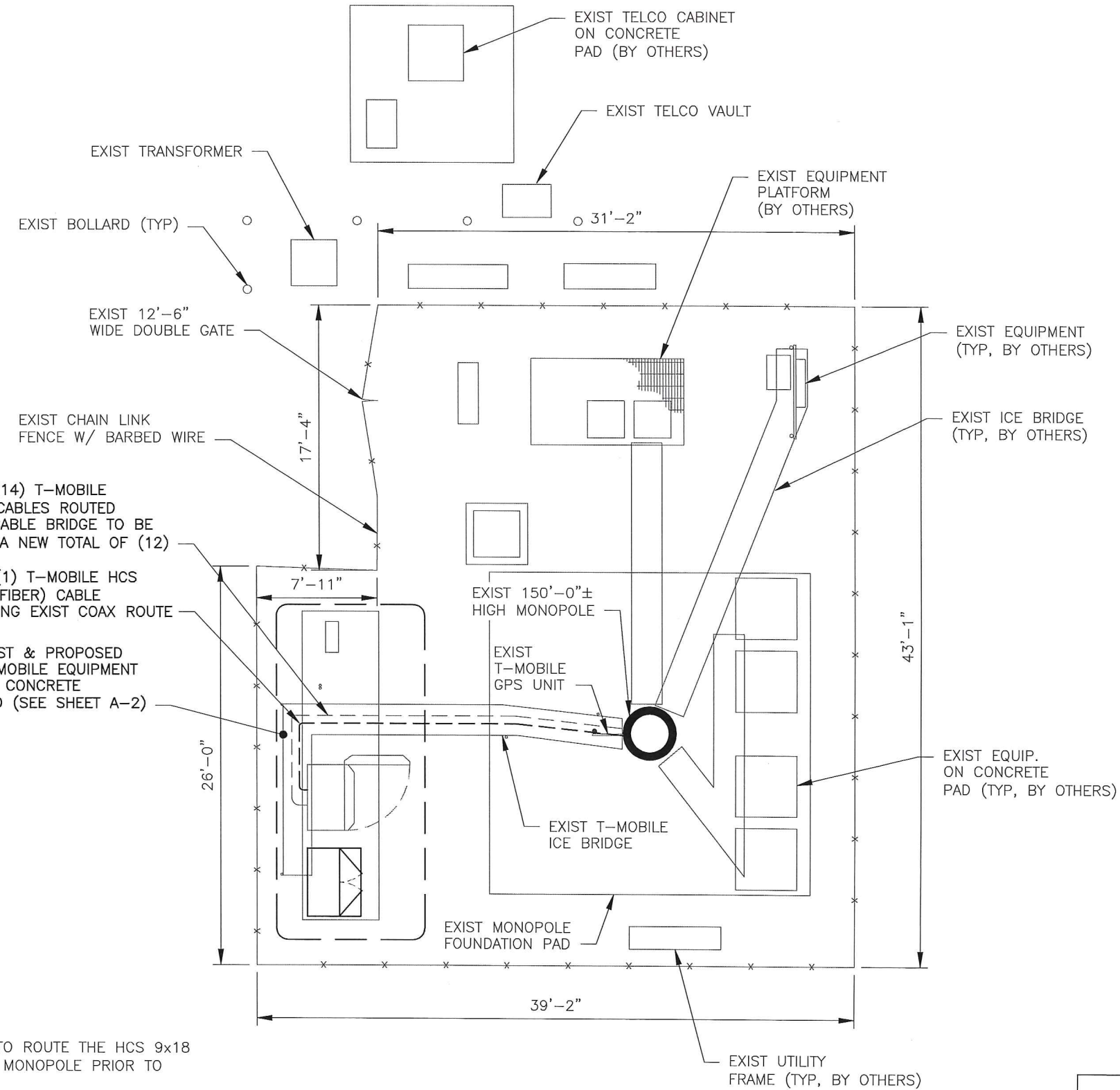
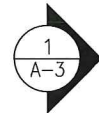
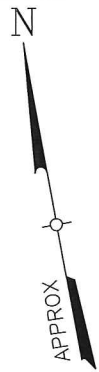
ISSUED BY: JMQ
 DATE: 3/21/14



SITE INFORMATION
 CT11883C
 CT883/SPRINT S. WINDSOR
 59 MCGUIRE RD
 S. WINDSOR, CT 06074

SHEET TITLE
 TITLE SHEET

SHEET NUMBER
 T-1



EXIST (2) OF (14) T-MOBILE
1 5/8" COAX CABLES ROUTED
ALONG EXIST CABLE BRIDGE TO BE
REMOVED FOR A NEW TOTAL OF (12)

PROPOSED (1) T-MOBILE HCS
9X18 MLE (FIBER) CABLE
ROUTED ALONG EXIST COAX ROUTE

EXIST & PROPOSED
T-MOBILE EQUIPMENT
ON CONCRETE
PAD (SEE SHEET A-2)

- NOTES:
1. CONTRACTOR SHALL FIELD VERIFY THE ADEQUACY TO ROUTE THE HCS 9x18 MLE (FIBER) CABLE ALONG THE EXTERIOR 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"



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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

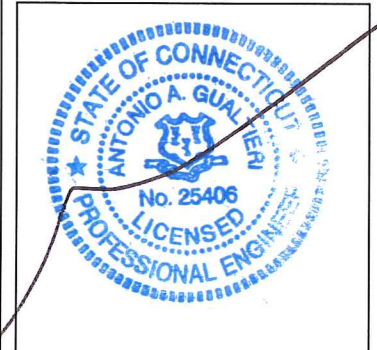


LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER 7061.CT11883C DESIGNED BY JQ

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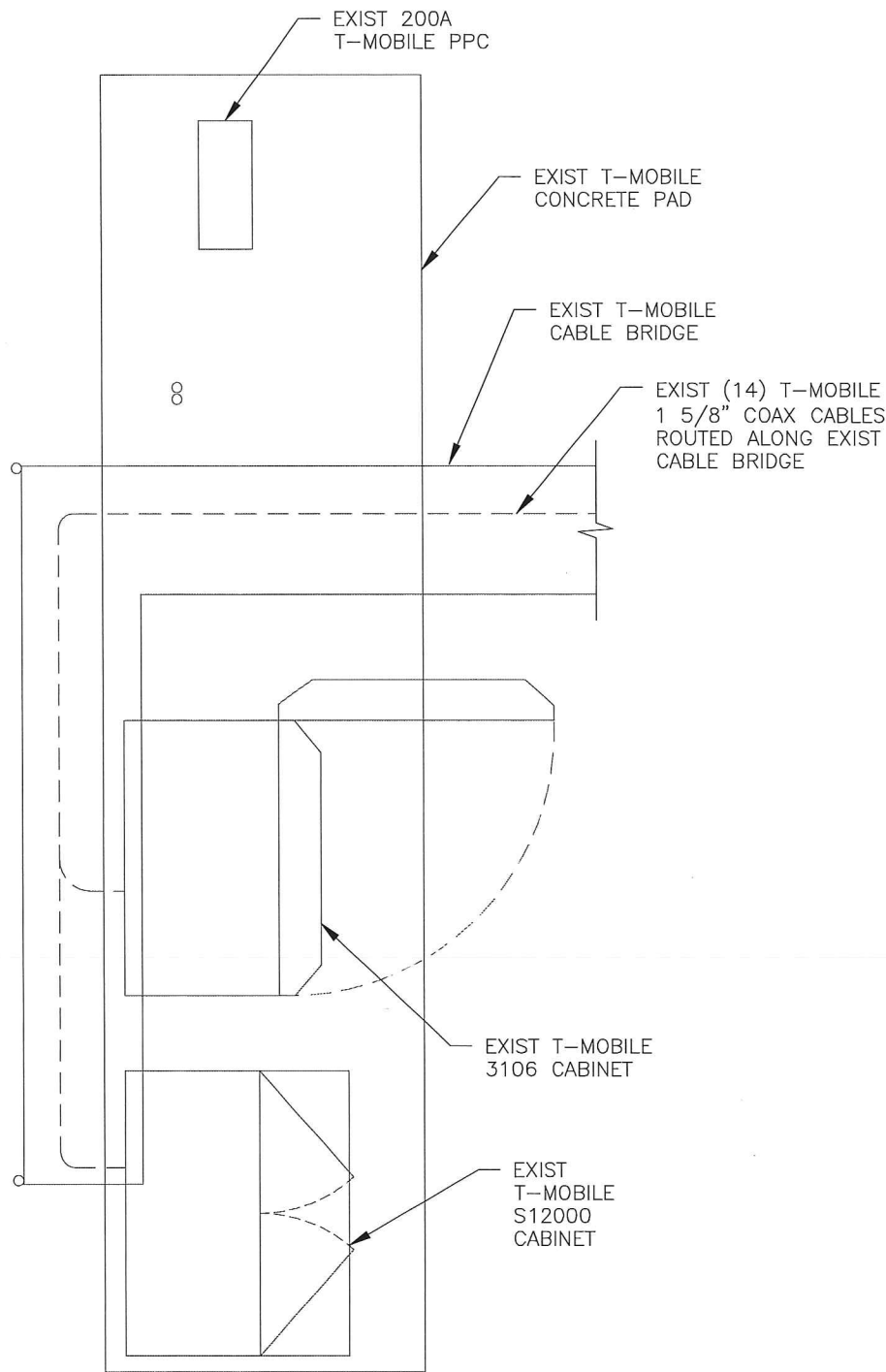
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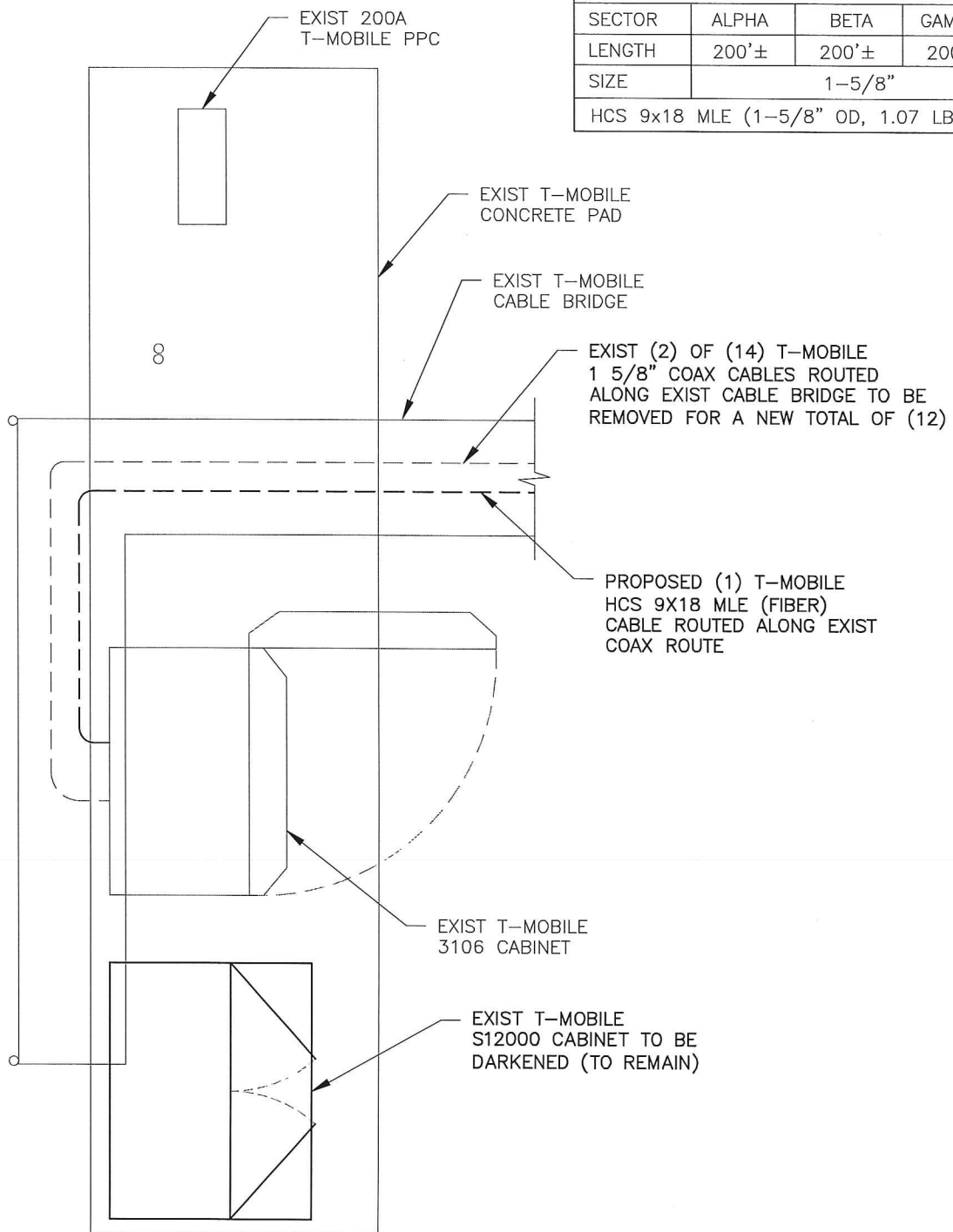
SITE INFORMATION
CT11883C
CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

SHEET TITLE
SITE PLAN

SHEET NUMBER
A-1



1 EXIST EQUIPMENT PLAN
A-2 SCALE: 3/8" = 1'-0"



2 PROPOSED EQUIPMENT PLAN
A-2 SCALE: 3/8" = 1'-0"

HCS LENGTH			
FROM EQUIPMENT CABINET TO ANTENNA			
SECTOR	ALPHA	BETA	GAMMA
LENGTH	200'±	200'±	200'±
SIZE	1-5/8"		
HCS 9x18 MLE (1-5/8" OD, 1.07 LB/FT)			

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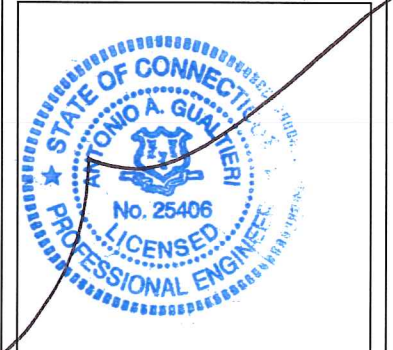
CROWN CASTLE
APPROVALS

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

PROJECT NUMBER 7061.CT11883C DESIGNED BY JQ

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ISSUED BY JMQ DATE 3/21/14



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59 MCGUIRE RD
S. WINDSOR, CT 06074

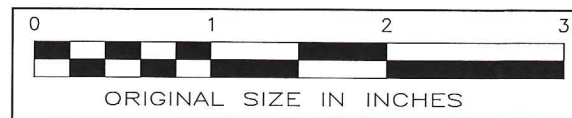
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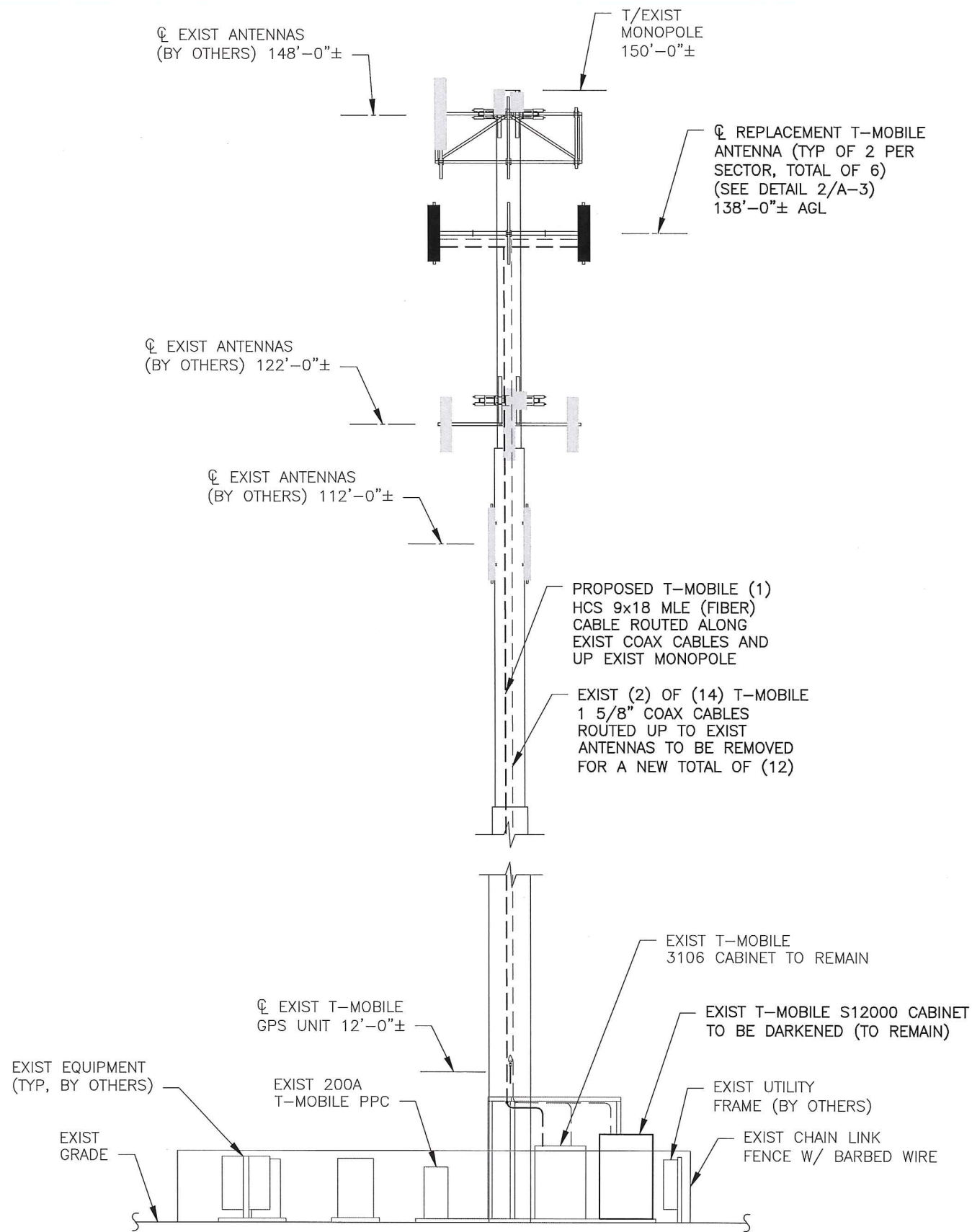
EQUIPMENT LAYOUT PLANS

SHEET NUMBER

A-2

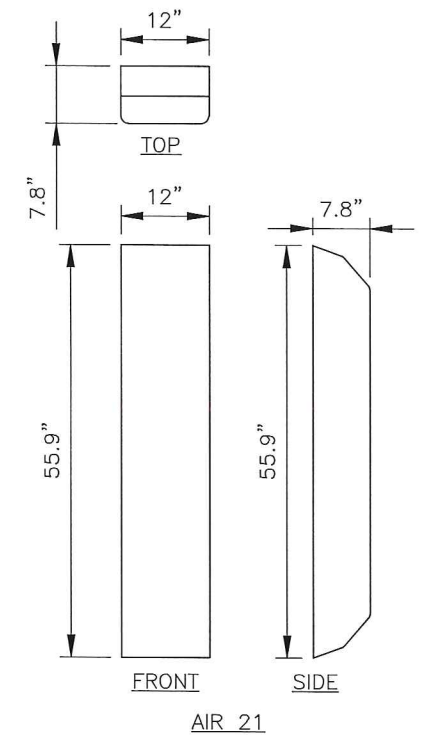
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1
A-3
ELEVATION
SCALE: 3/32" = 1'-0"

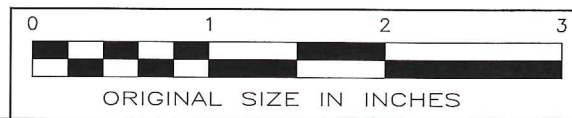
THE PROPOSED INSTALLATION & EXISTING MONOPOLE SHALL BE STRUCTURALLY ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).



2
A-3
ANTENNA DETAIL
SCALE: 1/2" = 1'-0"

ELEVATION NOTE:
ELEVATION OF EXIST MONOPOLE HAS BEEN ARBITRARILY ASSIGNED AS EL 209'-0"±. THIS IS APPROXIMATELY 150'-0"± ABOVE GRADE WHICH WAS ESTIMATED AS EL 59'-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.

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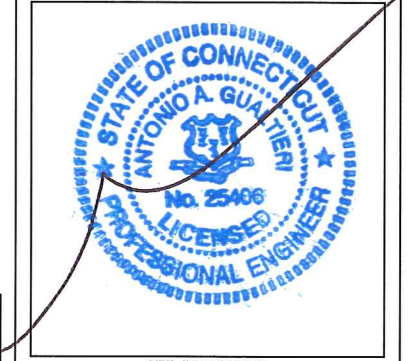
CROWN CASTLE
 APPROVALS

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

PROJECT NUMBER	DESIGNED BY
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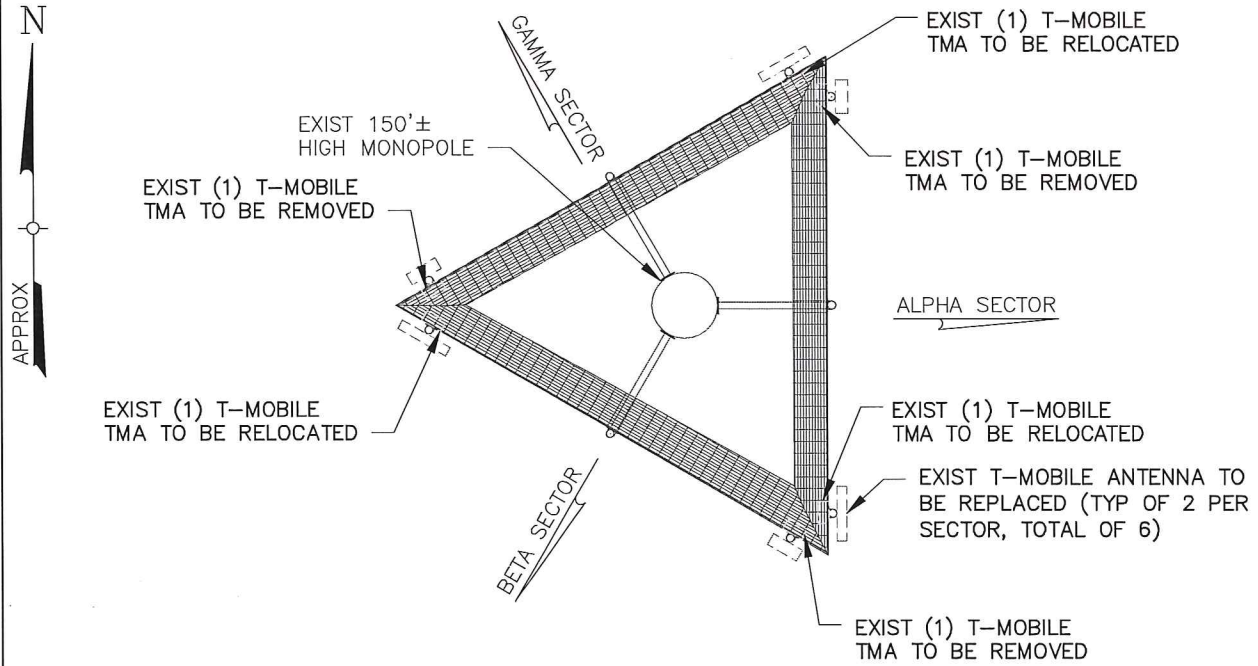
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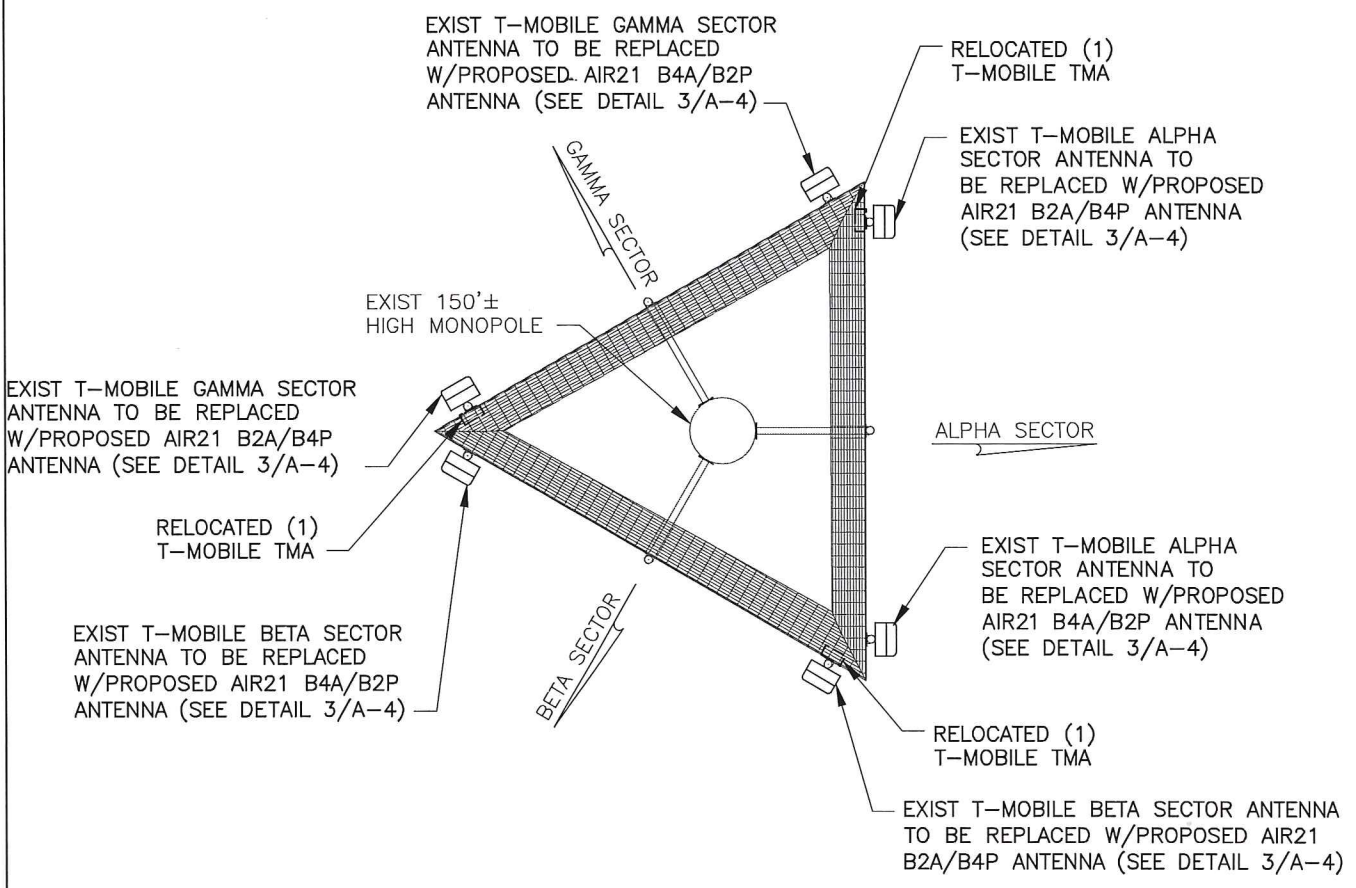
SITE INFORMATION
 CT11883C
 CT883/SPRINT S. WINDSOR
 59 MCGUIRE RD
 S. WINDSOR, CT 06074

SHEET TITLE
ELEVATION & DETAIL

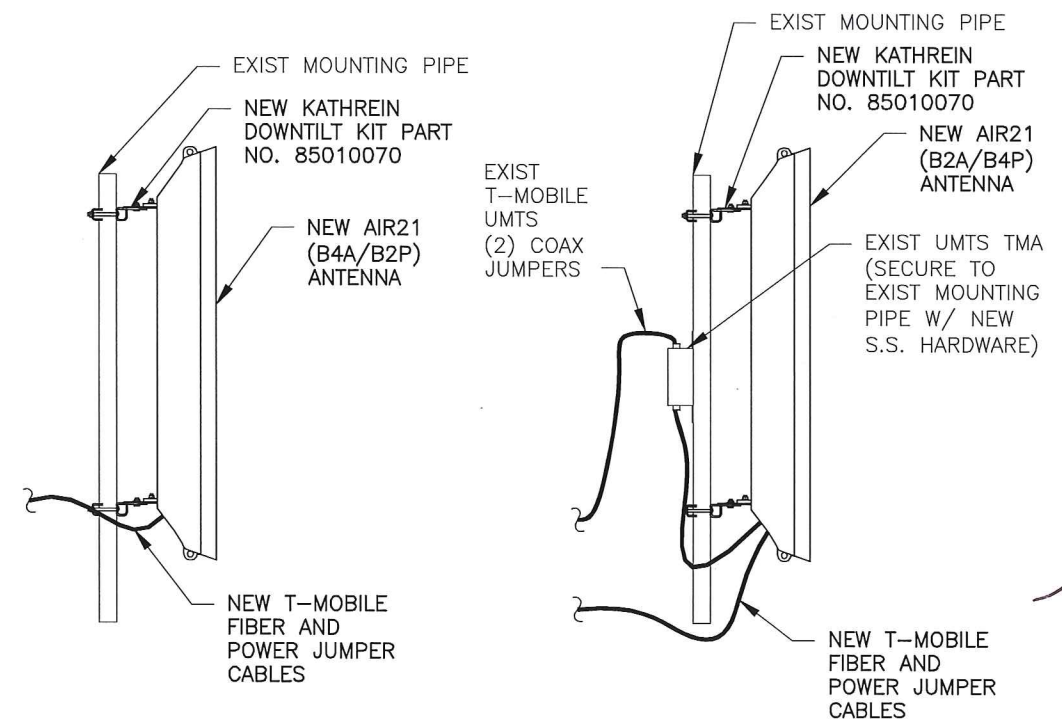
SHEET NUMBER
A-3



1
A-4
EXIST ANTENNA PLAN
SCALE: 3/16" = 1'-0"



2
A-4
PROPOSED ANTENNA PLAN
SCALE: 3/16" = 1'-0"



3
A-4
ANTENNA DETAIL
SCALE: 1/2" = 1'-0"



THE PROPOSED INSTALLATION & 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	ADFD1820-9090B	51.6x12.1x4.5
	EMS	1	TMZXXX-6516-R2M	59.5x19.9x3.5
BETA	RFS	1	ADFD1820-9090B	51.6x12.1x4.5
	EMS	1	TMZXXX-6516-R2M	59.5x19.9x3.5
GAMMA	RFS	1	ADFD1820-9090B	51.6x12.1x4.5
	EMS	1	TMZXXX-6516-R2M	59.5x19.9x3.5

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

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PHONE: (860) 692-7100

CROWN CASTLE
APPROVALS

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RF _____
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OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER: 7061.CT11883C
DESIGNED BY: JQ

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 02/21/14 FOR COMMENT MP
 03/21/14 FOR CONSTRUCTION MP

ISSUED BY: JMQ DATE: 3/21/14



SITE INFORMATION

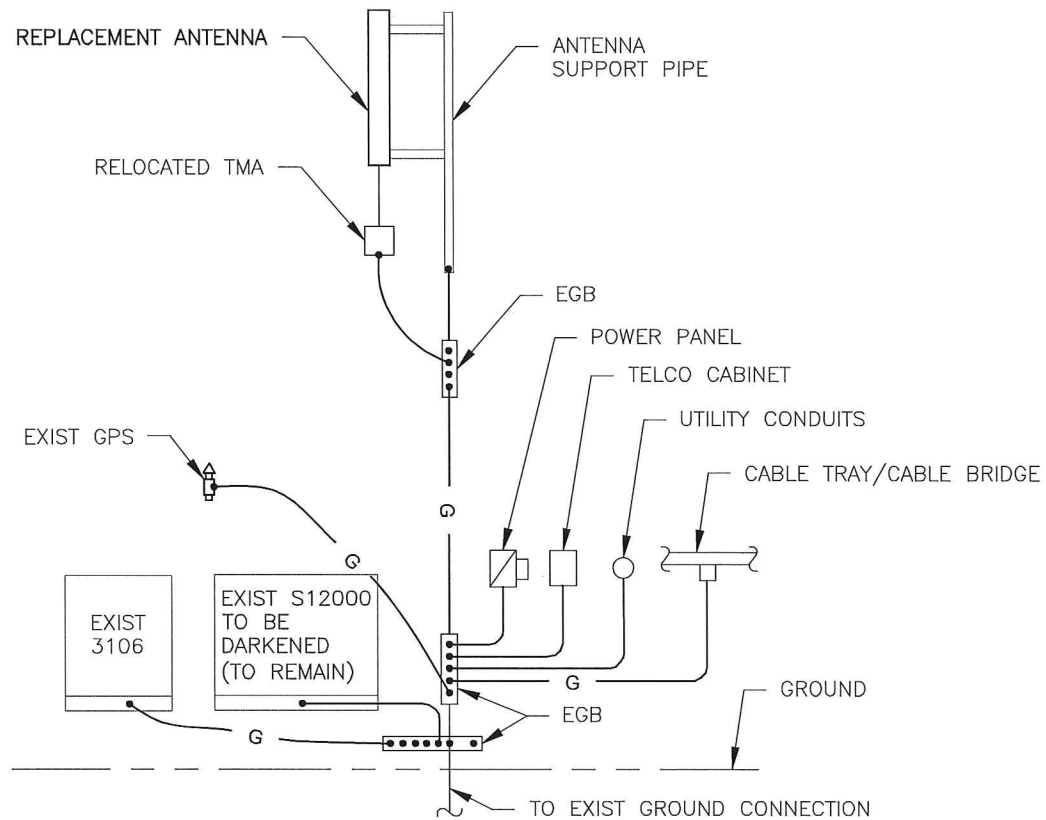
CT11883C
CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

SHEET TITLE

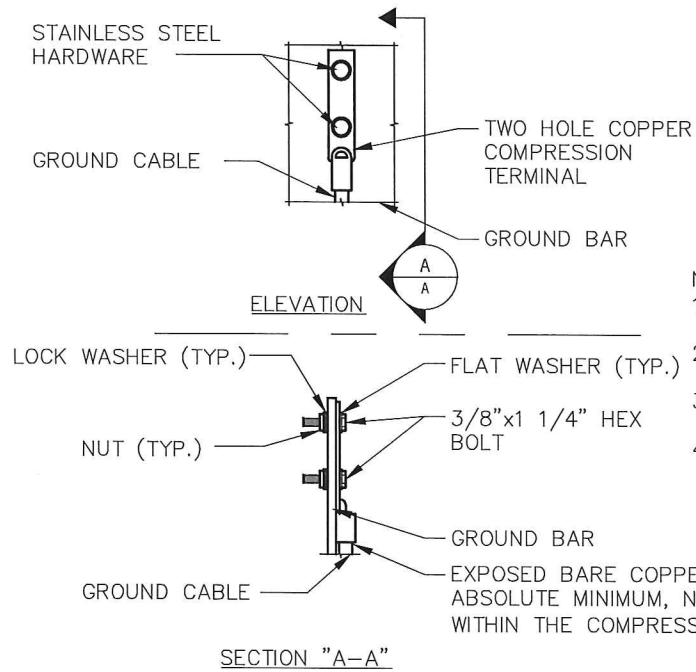
ANTENNA LAYOUT PLANS & DETAILS

SHEET NUMBER

A-4

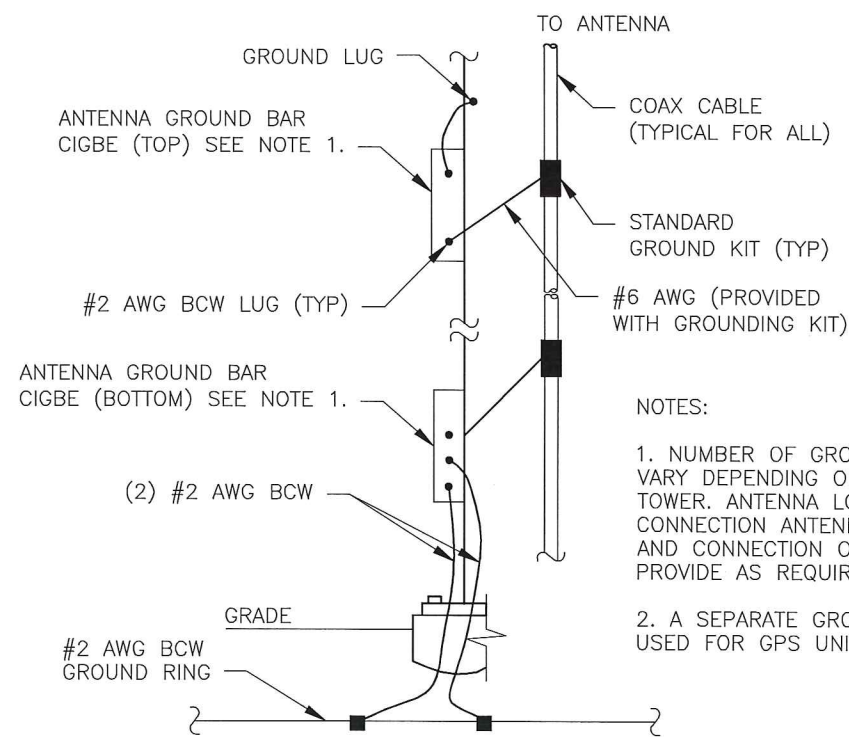


1
A-5
GROUNDING RISER DIAGRAM
SCALE: NTS



- 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 BE 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
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TECTONIC Engineering & Survey Consultants P.C.

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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

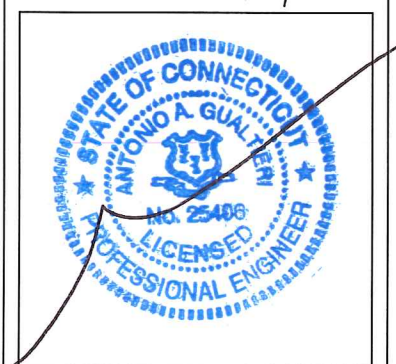


LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER 7061.CT11883C DESIGNED BY JQ

REV	DATE	REVISION	DRAWN BY
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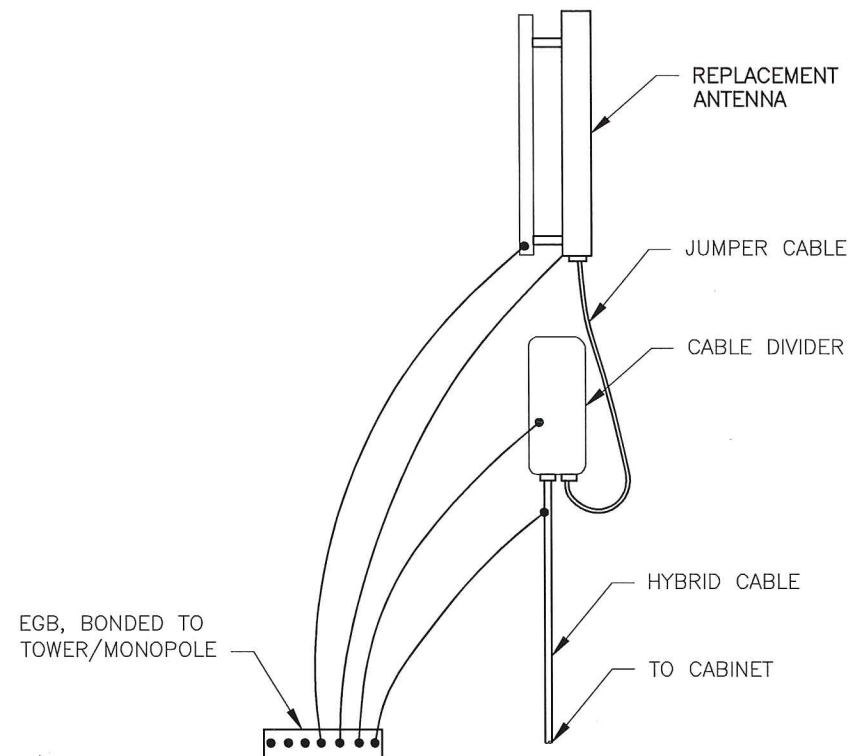
ISSUED BY JMC DATE 3/21/14



SITE INFORMATION
CT11883C
CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

SHEET TITLE
DETAILS

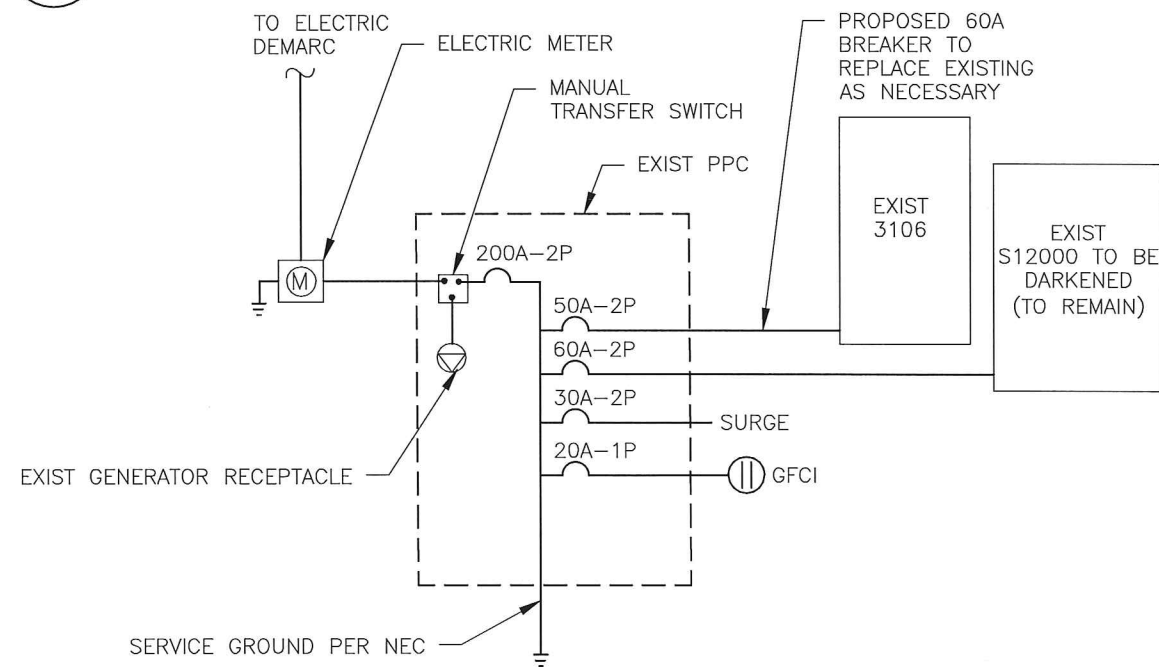
SHEET NUMBER
A-5



HYBRID CABLE CONNECTION AND GROUNDING DETAIL

1
A-6

SCALE: NTS

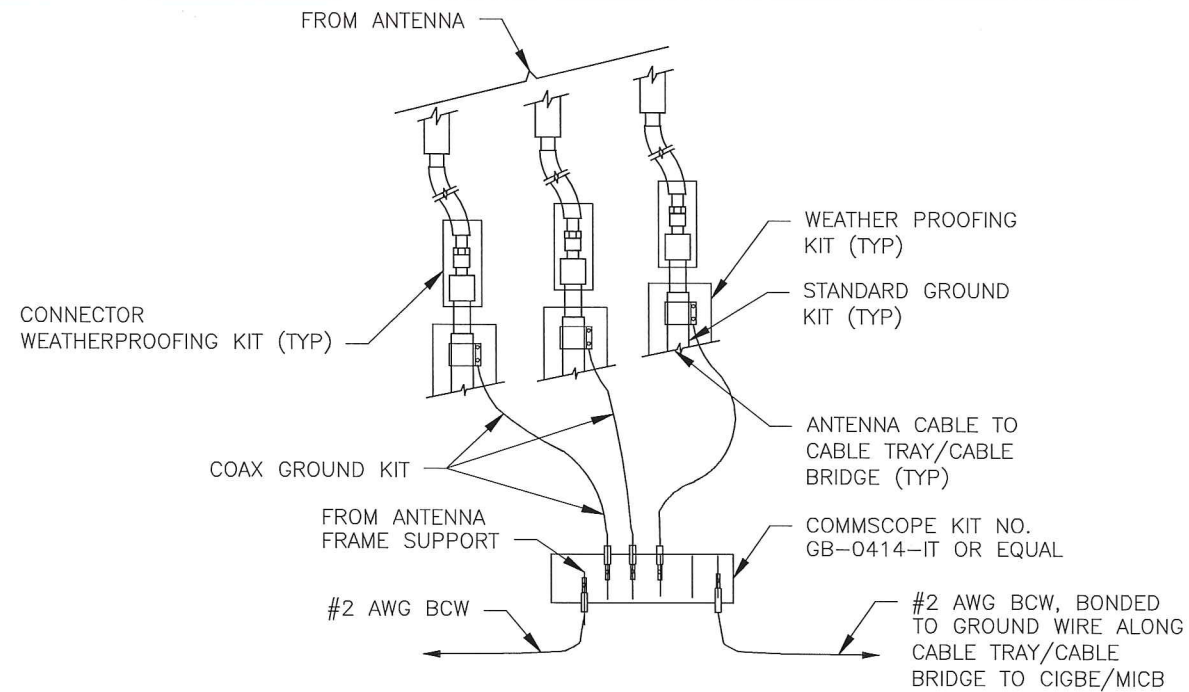


NOTE: CONTRACTOR TO VERIFY EXISTING CONDUCTORS ARE #6AWG OR LARGER FOR 60A CIRCUIT

3
A-6

ONE-LINE POWER DIAGRAM

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



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ISSUED BY SMC DATE 3/21/14

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

SITE INFORMATION
CT11883C
CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

SHEET TITLE
DETAILS

SHEET NUMBER
A-6

GENERAL NOTES

- 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.
- 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"
- THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES OR OTHER PUBLIC AUTHORITIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
- 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.
- 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.
- 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.
- 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.
- POWER TO THE FACILITY IS MONITORED BY AN EXISTING METER.
- ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
- CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
- IF ANY PIPING EXISTS BENEATH THE SITE AREA, CONTRACTOR MUST LOCATE IT AND CONTACT OWNER'S REPRESENTATIVE.
- THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
- 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.
- 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.
- 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.
- 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.
- THE MATERIALS INSTALLED SHALL MEET REQUIREMENTS OF CONTRACTORS DOCUMENTS. NO SUBSTITUTIONS ARE ALLOWED.
- 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

- 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.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
- 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.
- 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.
- 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.
- 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.
- THE CONTRACTOR SHALL REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
- 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.
- BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORK, UNUSED AND USELESS MATERIALS, RUBBISH AND TEMPORARY STRUCTURES.
- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2005 CONNECTICUT STATE BUILDING CODE (INCLUDING AMENDMENTS) AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
- 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.
- 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.
- 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.
- 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

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APPROVALS

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STATE OF CONNECTICUT
ANTONIO A. GUARINI
No. 25408
LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

CT11883C
CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

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.

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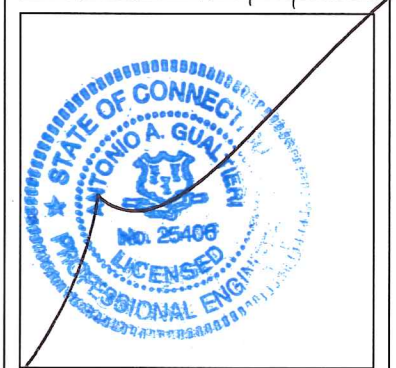


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CT883/SPRINT S. WINDSOR
59 MCGUIRE RD
S. WINDSOR, CT 06074

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A-8