Crown Castle
3530 Toringdon Way
Suite 300
Charlotte, NC 28277

Tel: 704-405-6600

www.crowncastle.com

April 4, 2014

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

RE: **T-Mobile-Exempt Modification - Crown Site BU: 876329**
T-Mobile Site ID: CT11278A
Located at: 28 Brewer Street, Bloomfield, CT 06002

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 Mr. Philip K. Schenck, Jr., Town Manager for Town of Bloomfield.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **28 Brewer Street, Bloomfield, CT 06002**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile's operations at the site (Exhibit-3).

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

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

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

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

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

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

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

Sincerely,

Jeff Barbadora
Real Estate Specialist

Enclosure

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

cc: Mr. Philip K. Schenck, Jr., Town Manager
Town of Bloomfield
800 Bloomfield Avenue, 2nd Floor
Bloomfield, CT 06002

T-Mobile

NORTHEAST LLC.

SITE NAME: **BLOOMFIELD/DTWN**

SITE ID NUMBER: **CT11278A**

SITE ADDRESS: 28 BREWER STREET
BLOOMFIELD, CT 06002

PROJECT SUMMARY

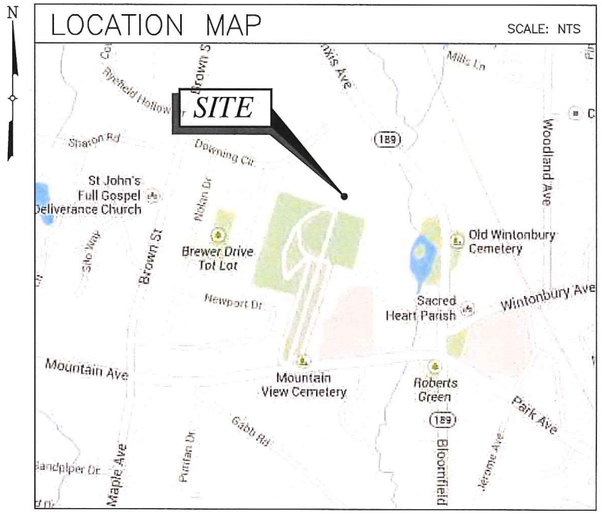
SITE ID NUMBER:	CT11278A
SITE NAME:	BLOOMFIELD/DTWN
CROWN BU#:	876329
SITE ADDRESS:	28 BREWER STREET BLOOMFIELD, CT 06002
COUNTY:	HARTFORD
PROPERTY OWNER:	CROWN CASTLE USA
APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 0602 PHONE: (800) 692-7100
ENGINEER/ SURVEYOR/ STRUCTURAL ENG:	TECTONIC ENGINEERING CONSULTANTS P.C. 1279 ROUTE 300 NEWBURGH, NY 12550
CONTACT: PHONE:	TAMMY NOSEK (845) 567-6656 EXT. 2807
SITE ACQUISITION:	CROWN CASTLE 1200 MACARTHUR BLVD SUITE 200 MAHWAH, NJ 07430
CONTACT: PHONE:	PAUL HUGHES (585) 259-7604
PARCEL INFO:	MAP 177 LOT 1
LATITUDE: (NAD 83)	41.83516 N
LONGITUDE: (NAD 83)	72.74120 W

SITE DIRECTIONS

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TURN LEFT ONTO DAY HILL RD. TURN LEFT ONTO CT-189 S/TUNXIS AVE. CONTINUE ONTO BROWN ST. TURN LEFT ONTO DOWNING CIR. TAKE THE 2ND RIGHT ONTO BREWER DR.

LOCATION MAP

SCALE: NTS



SHEET INDEX

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

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

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

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

0 1 2 3
ORIGINAL SIZE IN INCHES

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

CROWN CASTLE

APPROVALS

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

PROJECT NUMBER	DESIGNED BY
7061.CT11278A	JQ

REV	DATE	REVISION	DRAWN BY
0	02/21/14	FOR COMMENT	MP
1	03/21/14	FOR CONSTRUCTION	MP

ISSUED BY	DATE
JMQ	3/21/14

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

SITE INFORMATION

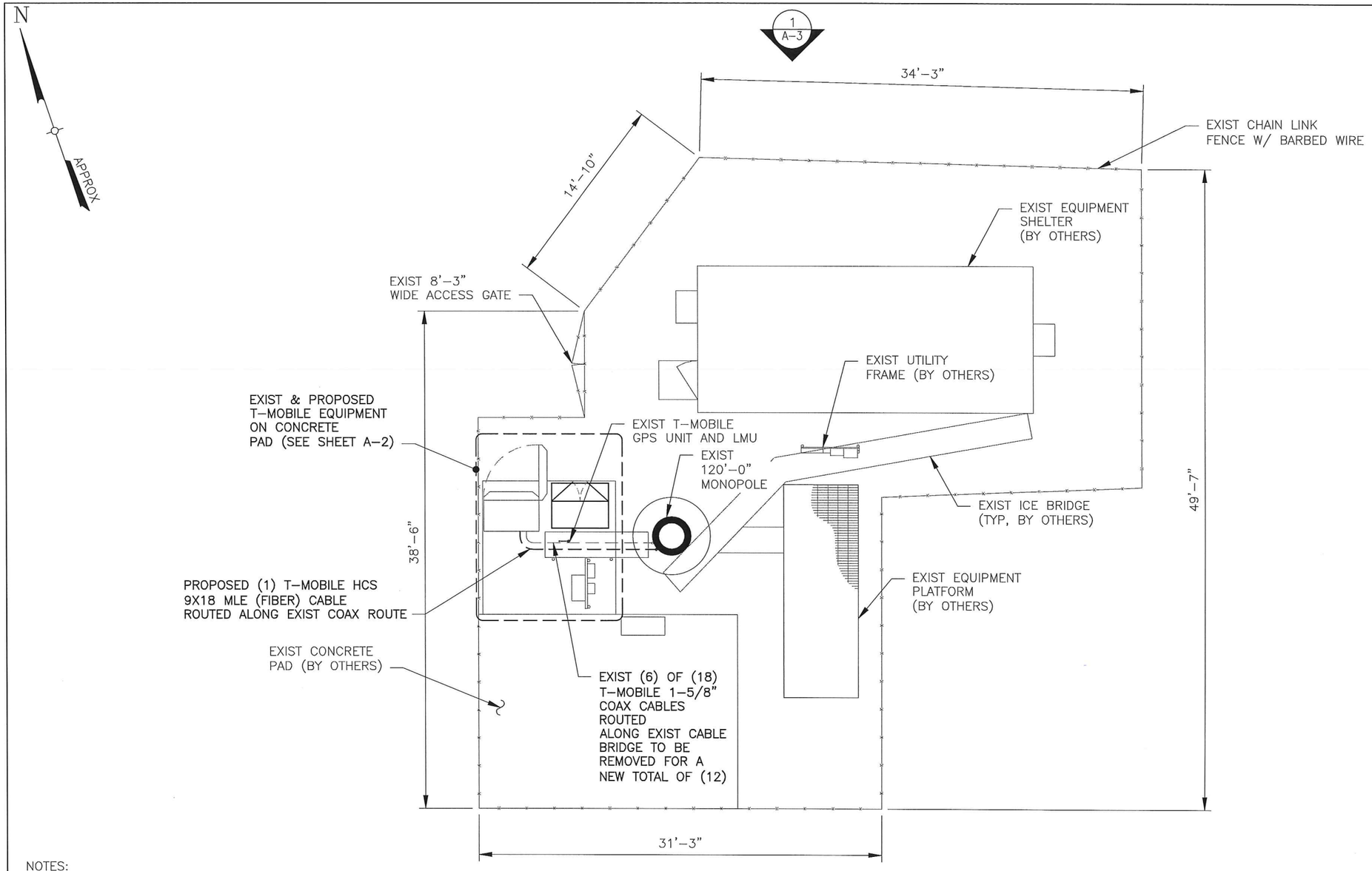
CT11278A
BLOOMFIELD/DTWN
28 BREWER STREET
BLOOMFIELD, CT 06002

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

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

0 1 2 3

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CROWN CASTLE

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CT11278A
BLOOMFIELD/DTWN
28 BREWER STREET
BLOOMFIELD, CT 06002

SHEET TITLE

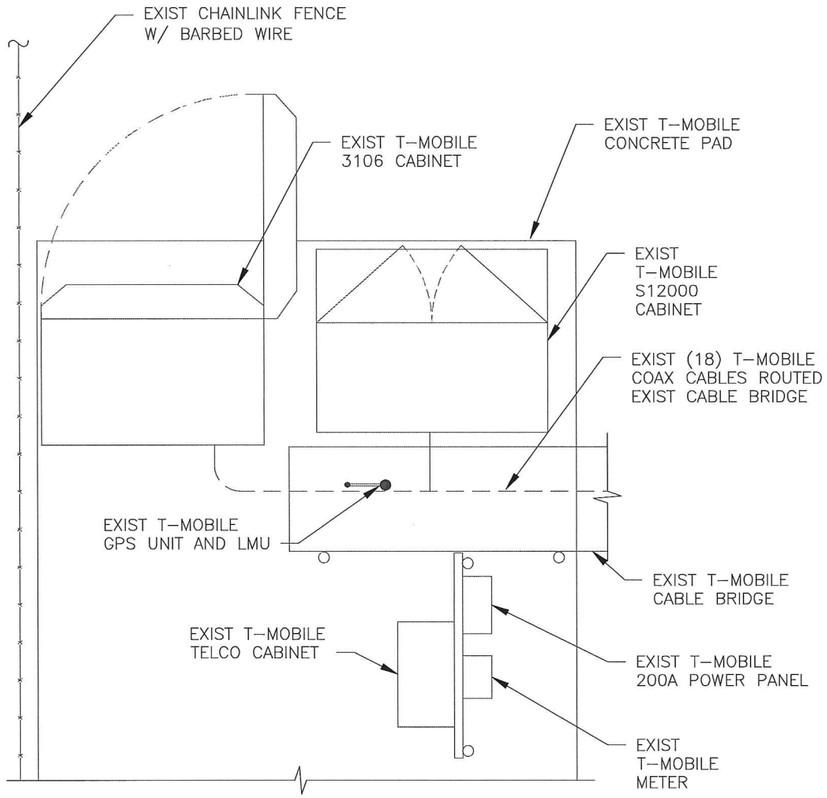
SITE PLAN

SHEET NUMBER

A-1

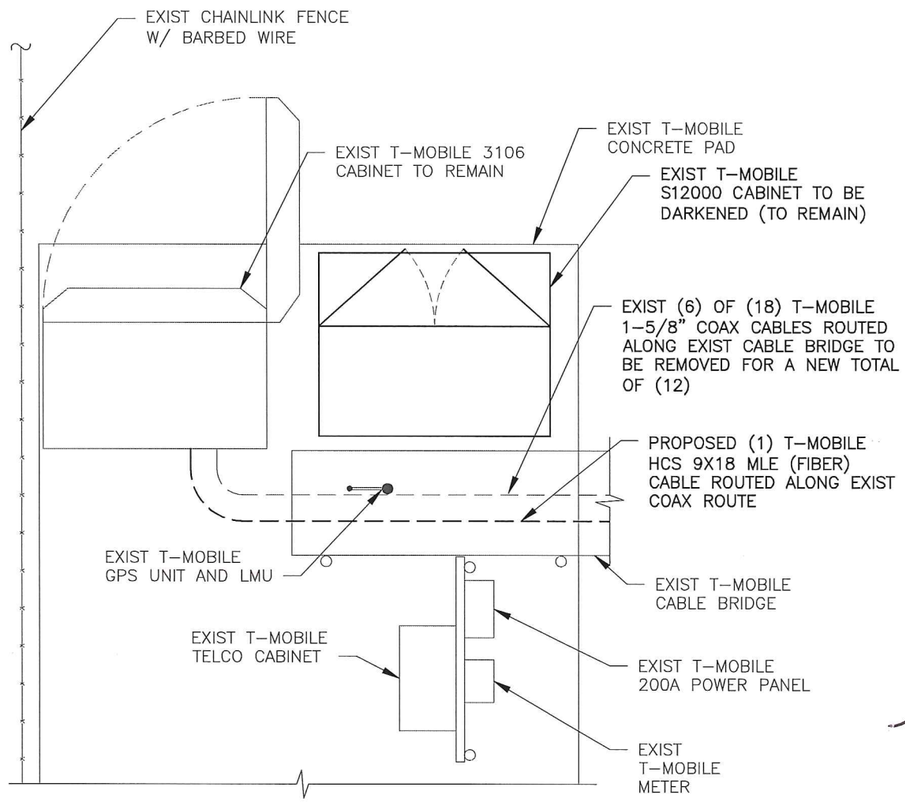
N

APPROX



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	140'±	140'±	140'±
SIZE	1"		
HCS 9x18 MLE (1" OD, 1.03 LB/FT)			

CONFIGURATION
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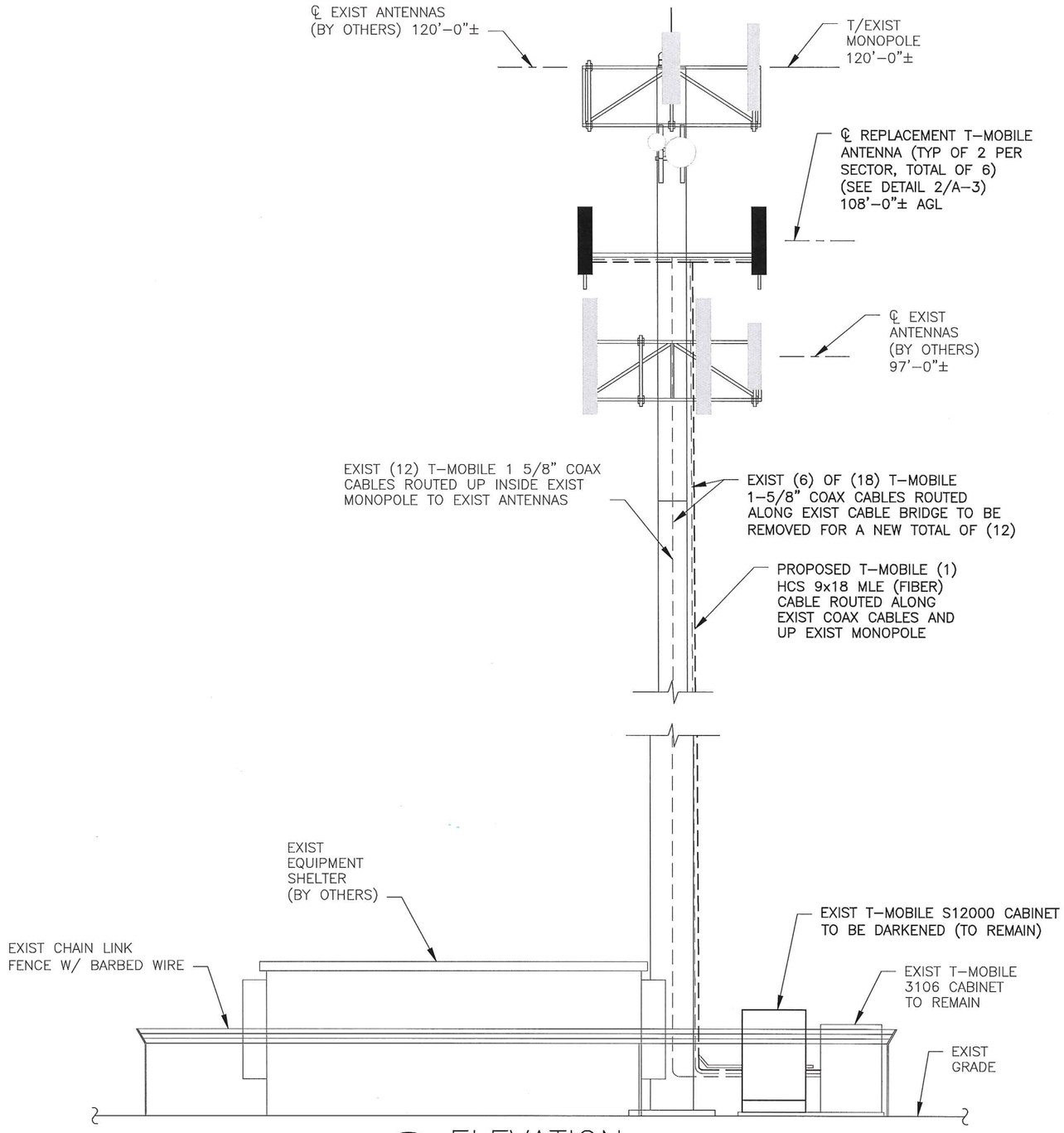
BLOOMFIELD/DTWN
28 BREWER STREET
BLOOMFIELD, CT 06002

SHEET TITLE

EQUIPMENT LAYOUT
PLANS

SHEET NUMBER

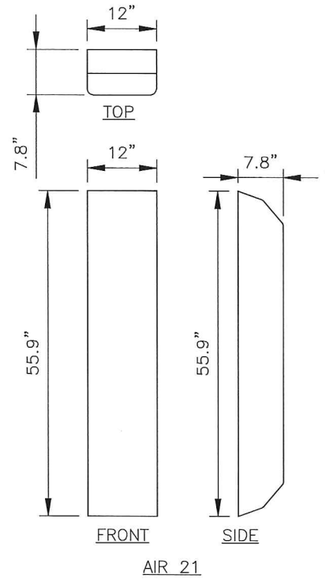
A-2



1 A–3 ELEVATION

SCALE: 1/8" = 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).



AIR 21

2 A–3 ANTENNA DETAIL

SCALE: 1/2" = 1'–0"

ELEVATION NOTE:

ELEVATION OF EXIST MONOPOLE HAS BEEN ARBITRARILY ASSIGNED AS EL 321'–0"±. THIS IS APPROXIMATELY 120'–0"± ABOVE GRADE WHICH WAS ESTIMATED AS EL 201–0"± TAKEN FROM U.S.G.S. QUAD MAP, AND DOES NOT NECESSARILY CORRESPOND TO ACTUAL ELEVATION ABOVE SEA LEVEL. ALL OTHER ELEVATIONS INDICATED WERE DETERMINED ON THIS BASIS.

CONFIGURATION

2C

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

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CROWN CASTLE

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RF _____
CONSTRUCTION _____
OPERATIONS _____
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PROFESSIONAL ENGINEER

SITE INFORMATION

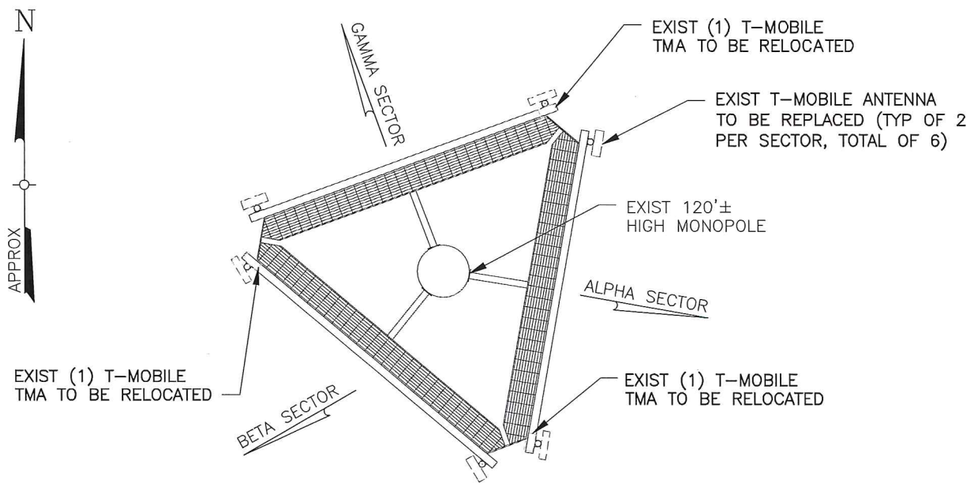
CT11278A
BLOOMFIELD/DTWN
28 BREWER STREET
BLOOMFIELD, CT 06002

SHEET TITLE

ELEVATION & DETAIL

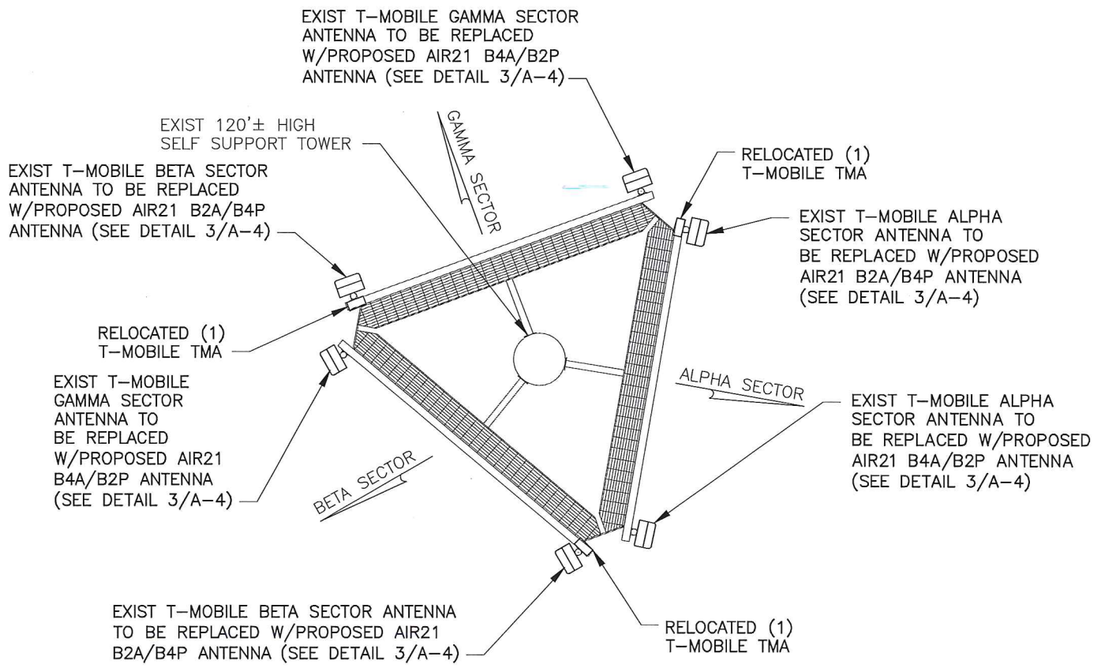
SHEET NUMBER

A–3



1 / A-4 EXIST ANTENNA PLAN

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



2 / A-4 PROPOSED ANTENNA PLAN

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

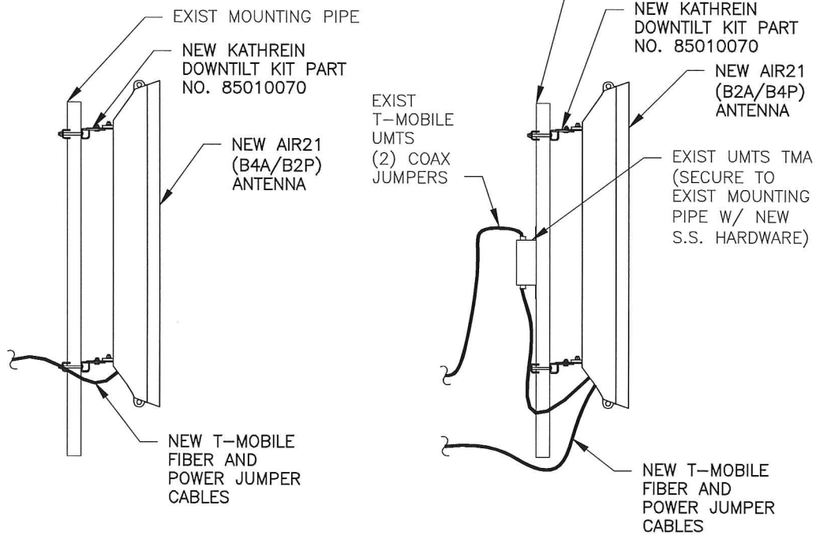
THE PROPOSED INSTALLATION & EXISTING MONOPOLE SHALL BE STRUCTURALLY ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).

EXIST ANTENNA SCHEDULE

SECTOR	MAKE	QUANTITY	MODEL#	SIZE
SECTOR A	RFS	1	APX16DWV_16DWVS	55.9x13x3.15
	EMS	1	DR65-18-02DPL2Q	54x12x5
SECTOR B	RFS	1	APX16DWV-16DWVS	55.9x13x3.15
	EMS	1	DR65-18-02DPL2Q	54x12x5
SECTOR C	RFS	1	APX16DWV_16DWVS	55.9x13x3.15
	EMS	1	DR65-18-02DPL2Q	54x12x5

PROPOSED ANTENNA SCHEDULE

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



3 / A-4 ANTENNA DETAIL

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

CONFIGURATION

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

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

CROWN CASTLE

APPROVALS

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

PROJECT NUMBER: 7061.CT11278A
DESIGNED BY: JQ

REV	DATE	REVISION	DRAWN BY
0	02/21/14	FOR COMMENT	MP
1	03/21/14	FOR CONSTRUCTION	MP

ISSUED BY: JMQ
DATE: 3/21/14

SITE INFORMATION

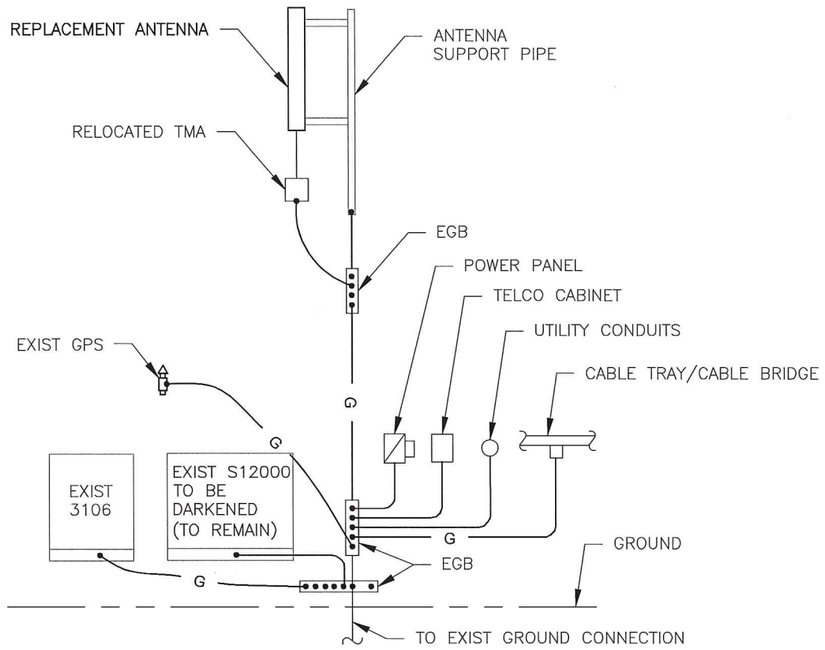
CT11278A
BLOOMFIELD/DTWN
28 BREWER STREET
BLOOMFIELD, CT 06002

SHEET TITLE

ANTENNA LAYOUT PLANS & DETAILS

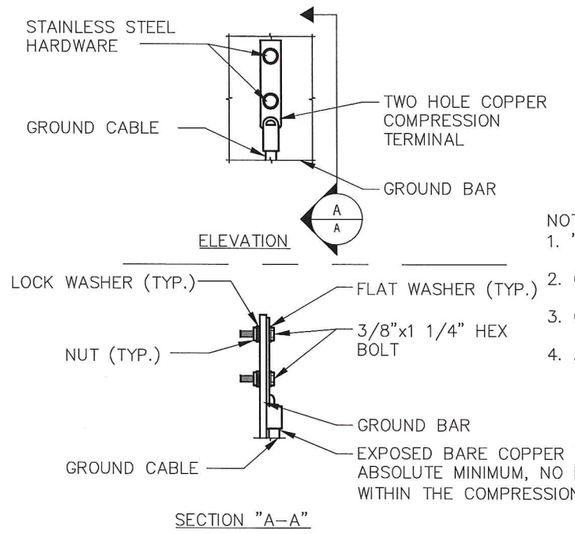
SHEET NUMBER

A-4



1 / A–5 GROUNDING RISER DIAGRAM

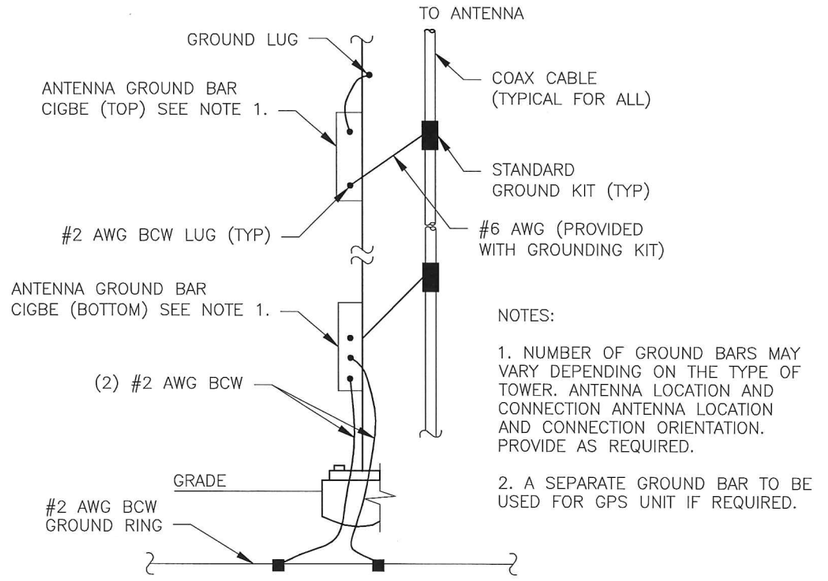
SCALE: NTS



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

2 / A–5 GROUNDING BAR CONN. DETAIL

SCALE: NTS



NOTES:

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

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

3 / A–5 ANTENNA CABLE GROUNDING

SCALE: NTS

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

0 1 2 3

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

SITE INFORMATION

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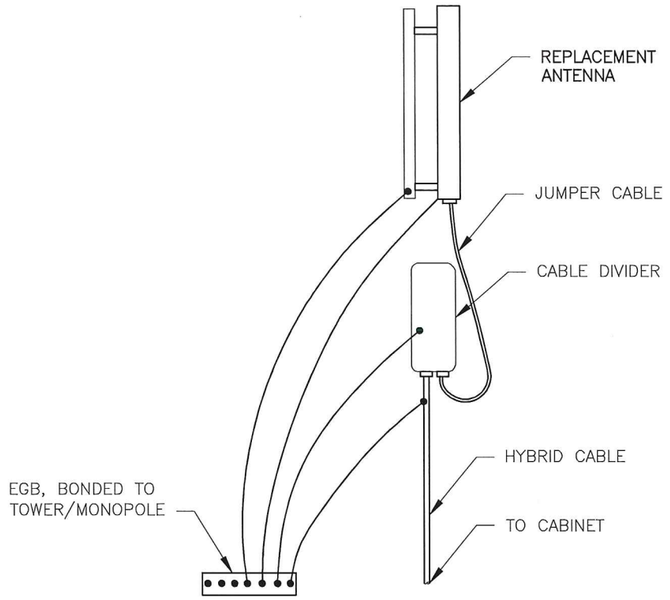
BLOOMFIELD/DTWN
28 BREWER STREET
BLOOMFIELD, CT 06002

SHEET TITLE

DETAILS

SHEET NUMBER

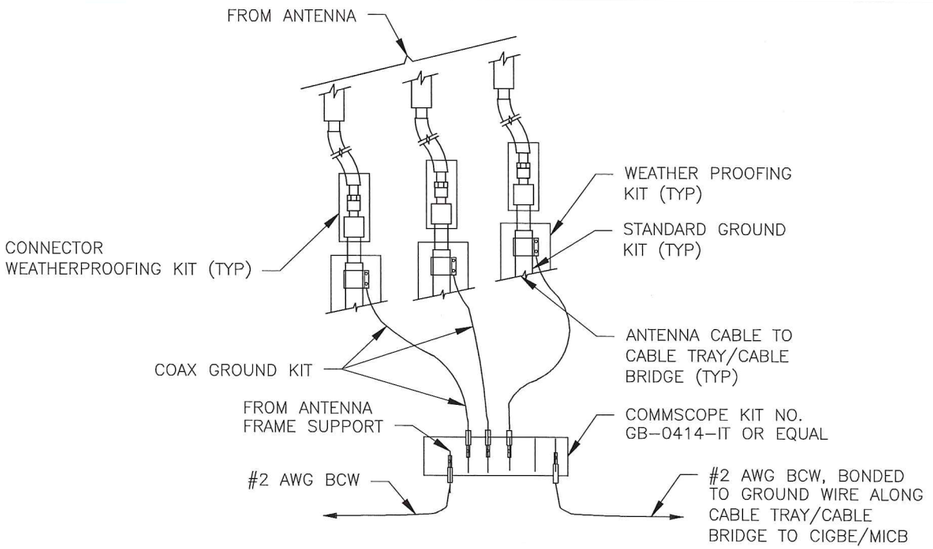
A–5



HYBRID CABLE CONNECTION AND GROUNDING DETAIL

1 / A-6

SCALE: NTS

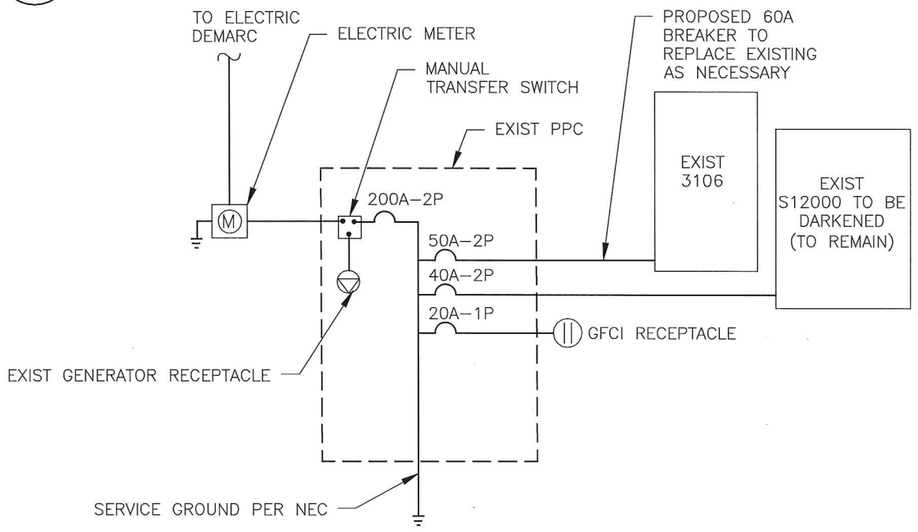


NOTE:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

2 / A-6

SCALE: NTS



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

ONE-LINE POWER DIAGRAM

3 / A-6

SCALE: NTS

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A-6

CONFIGURATION

2C

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0 1 2 3

ORIGINAL SIZE IN INCHES

GENERAL NOTES

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

GENERAL NOTES

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

CONFIGURATION

2C

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

0 1 2 3

ORIGINAL SIZE IN INCHES

TECTONIC

- PLANNING
- ENGINEERING
- SURVEYING
- CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Survey Consultants P.C.
1279 ROUTE 300
NEWBURGH, NY 12550
Phone: (845) 567–6656
Fax: (845) 567–8703

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

CROWN CASTLE

APPROVALS

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

PROJECT NUMBER	DESIGNED BY
7061.CT11278A	JQ

REV	DATE	REVISION	DRAWN BY
0	02/21/14	FOR COMMENT	MP
1	03/21/14	FOR CONSTRUCTION	MP

ISSUED BY	DATE
JMQ	3/21/14

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

SITE INFORMATION

CT11278A
BLOOMFIELD/DTWN
28 BREWER STREET
BLOOMFIELD, CT 06002

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.

CONFIGURATION

2C

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

0 1 2 3

ORIGINAL SIZE IN INCHES

TECTONIC
• PLANNING • CONSTRUCTION MANAGEMENT
• ENGINEERING
• SURVEYING

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CROWN CASTLE

APPROVALS

LANDLORD _____
RF _____
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PROJECT NUMBER	DESIGNED BY
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STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED
PROFESSIONAL ENGINEER

SITE INFORMATION

CT11278A
BLOOMFIELD/DTWN
28 BREWER STREET
BLOOMFIELD, CT 06002

SHEET TITLE

NOTES

SHEET NUMBER

A–8

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

Date: **March 18, 2014**

Steve Tuttle
Crown Castle
8 Parkmeadow Drive
Pittsford, NY 14534

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

Subject: **Structural Modification Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11278A
	Carrier Site Name:	NA
Crown Castle Designation:	**Crown Castle BU Number:**	876329
	Crown Castle Site Name:	MTN. VIEW CEM. (FILLEY PARK)
	Crown Castle JDE Job Number:	261256
	Crown Castle Work Order Number:	727680
	Crown Castle Application Number:	217352 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37513-2485 BP A
Site Data:	**28 Brewer Dr., BLOOMFIELD, Hartford County, CT** **Latitude *41° 50' 6.57"*, Longitude *-72° 44' 28.2"*** **120 Foot - Monopole Tower**	

Dear Steve Tuttle,

Paul J Ford and Company is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 626480, in accordance with application 217352, 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:

LC4.8: 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 1.0 inch ice thickness and 50 mph under service loads.

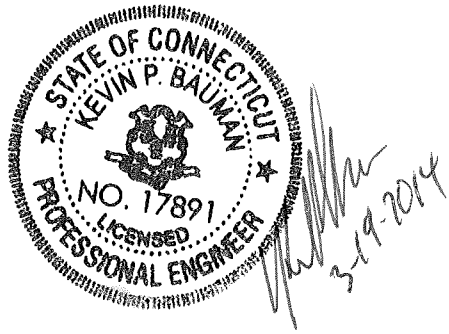
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *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:

Morgan Scroggy, E.I. BKK
Structural Designer

tnxTower Report - version 6.1.4.1



3-19-2014

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

Date: **March 18, 2014**

Steve Tuttle
Crown Castle
8 Parkmeadow Drive
Pittsford, NY 14534

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

Subject: Structural Modification Report

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11278A
	Carrier Site Name:	NA
Crown Castle Designation:	**Crown Castle BU Number:**	876329
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1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by ROHN in January of 1998. The tower was originally designed for a wind speed of 70 mph per TIA/EIA-222-F.

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 1.0 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
107.0	108.0	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
118.0	120.0	3	alcatel lucent	TD-RRH8x20-25	1	5/8	2
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	kathrein	840 10054 w/ Mount Pipe	3 6 2	1-1/4 5/16 1/2	1
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe			
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	samsung telecom	WIMAX DAP HEAD			
	118.0	1	tower mounts	Platform Mount [LP 501-1]			
	116.0	1		A-ANT-18G-1-C			
		1		A-ANT-18G-2-C			
		2	dragonwave	HORIZON COMPACT			
		3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
114.0	115.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-	1
	114.0	1	tower mounts	Pipe Mount [PM 601-3]			2
	113.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107.0	108.0	3	andrew	ONEBASE TWIN DUAL DUPLEX TMA	-	-	3
		3	ems wireless	DR65-18-02DPL2Q w/ Mount Pipe			
		3	rfs celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe			
	107.0	1	tower mounts	Platform Mount [LP 712-1]	18	1-5/8	1
99.0	100.0	2	kmw com	AM-X-CD-14-65-00T-RET w/ Mount Pipe	12 1 2	7/8 3/8 3/4	1
		2	kmw com	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		2		P65-17-XLH-RR w/ Mount Pipe			
	99.0	3	comm comp inc.	DTMABP7819VG12A			
		6	ericsson	RRUS-11			
		6	powerwave technologies	LGP13519			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 501-1]			
59.0	63.0	1	decibel	DB536	1	7/8	1
	59.0	1	tower mounts	Side Arm Mount [SO 702-1]			
48.0	50.0	1	lucent	KS24019-L112A	2	1/2	1
		1	unknown	GPS			
	48.0	1	tower mounts	Pipe Mount [PM 601-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed, Not Included in this SA

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 08/09/96	1529722	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, 34738SW, 10/11/96	1616549	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, 34738SW, 10/17/96	2158527	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Semaan, CT03XC076, 08/25/03	-	Semaan
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, 080063.01, 01/18/08	2205450	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B&T, 79582, 11/03/08	2343687	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD, 2011111.27, 05/31/11	2917489	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) The bridge stiffeners carry the entire load through the flange connection at 30'.
6) The existing "cut down" TS14x10 at 60' act as bridge stiffeners and carry the entire load through the flange connection.
7) Monopole will be reinforced in conformance with the attached 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	120 - 90	Pole	P24x1/4	1	-8.20	589.19	94.9	Pass
L2	90 - 80	Pole	P24x3/8	2	-9.50	934.94	84.0	Pass
L3	80 - 68.5	Pole	RPS 24" x 0.62517"	3	-11.71	1212.06	93.7	Pass
L4	68.5 - 68	Pole	RPS 24" x 0.88003"	4	-11.84	1685.53	69.7	Pass
L5	68 - 63.5	Pole	RPS 24" x 0.61306"	5	-12.69	1362.11	94.3	Pass
L6	63.5 - 60	Pole	RPS 24" x 1.13718"	6	-13.79	2216.54	65.6	Pass
L7	60 - 56.5	Pole	RPS 30" x 0.90733"	7	-14.92	2335.32	52.1	Pass
L8	56.5 - 45.417	Pole	RPS 30" x 0.55714"	8	-17.34	1565.42	94.5	Pass
L9	45.417 - 36.417	Pole	RPS 30" x 0.70733"	9	-19.68	1975.72	88.2	Pass
L10	36.417 - 33.5	Pole	RPS 30" x 0.86188"	10	-20.58	2395.96	76.9	Pass
L11	33.5 - 30	Pole	RPS 30" x 1.23648"	11	-22.04	3145.60	63.3	Pass
L12	30 - 26.5	Pole	RPS 36" x 0.7835"	12	-23.85	2484.77	68.0	Pass
L13	26.5 - 20.583	Pole	RPS 36" x 0.62423"	13	-25.47	1990.28	91.7	Pass
L14	20.583 - 2	Pole	RPS 36" x 0.8638"	14	-32.21	2733.17	85.7	Pass
L15	2 - 0	Pole	RPS 36" x 0.94668"	15	-33.00	2932.48	82.2	Pass
							Summary	
						Pole (L1)	94.9	Pass
						Rating =	94.9	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC4

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	0	90.9	Pass
1	Base Plate	0	72.0	Pass
1	Base Foundation – Steel	0	76.4	Pass
1,3	Base Foundation Soil Interaction	0	35.1	Pass
1	Flange Connection	30	64.8	Pass
1	Flange Connection	60	65.5	Pass
1	Flange Connection	90	94.9	Pass

Structure Rating (max from all components) =	**94.9%**

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Worst case scenario between existing and post installed anchors.
3) Foundation Analysis Notes: According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing caisson foundation was analyzed using the methodology in the software ‘PLS-Caisson’ (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report’s recommendation, the frost depth of the site or half of the caisson diameter.

4.1) Recommendations

- See attached proposed modification 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 mph.
3. Nominal ice thickness of 1.0000 in.
4. Ice thickness is considered to increase with height.
5. Ice density of 56 pcf.
6. A wind speed of 38 mph is used in combination with ice.
7. Temperature drop of 50 °F.
8. Deflections calculated using a wind speed of 50 mph.
9. A non-linear (P-delta) analysis was used.
10. Pressures are calculated at each section.
11. Stress ratio used in pole design is 1.333.
12. Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	120.00-90.00	30.00	P24x1/4	A36M-42 (42 ksi)	
L2	90.00-80.00	10.00	P24x3/8	A36M-42 (42 ksi)	
L3	80.00-68.50	11.50	RPS 24" x 0.62517"	Reinf 33.01 ksi (33 ksi)	
L4	68.50-68.00	0.50	RPS 24" x 0.88003"	Reinf 32.97 ksi (33 ksi)	
L5	68.00-63.50	4.50	RPS 24" x 0.61306"	Reinf 37.81 ksi (38 ksi)	
L6	63.50-60.00	3.50	RPS 24" x 1.13718"	Reinf 33.93 ksi (34 ksi)	
L7	60.00-56.50	3.50	RPS 30" x 0.90733"	Reinf 35.21 ksi (35 ksi)	
L8	56.50-45.42	11.08	RPS 30" x 0.55714"	Reinf 37.98 ksi (38 ksi)	
L9	45.42-36.42	9.00	RPS 30" x 0.70733"	Reinf 37.95 ksi (38 ksi)	
L10	36.42-33.50	2.92	RPS 30" x 0.86188"	Reinf 37.97 ksi (38 ksi)	
L11	33.50-30.00	3.50	RPS 30" x 1.23648"	Reinf 35.20 ksi	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L12	30.00-26.50	3.50	RPS 36" x 0.7835"	(35 ksi) Reinf 35.84 ksi (36 ksi)	
L13	26.50-20.58	5.92	RPS 36" x 0.62423"	Reinf 35.87 ksi (36 ksi)	
L14	20.58-2.00	18.58	RPS 36" x 0.8638"	Reinf 35.84 ksi (36 ksi)	
L15	2.00-0.00	2.00	RPS 36" x 0.94668"	Reinf 35.17 ksi (35 ksi)	

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***								
HB058-M12-XXXF(5/8")	C	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.24
						1/2" Ice	0.00	0.24
						1" Ice	0.00	0.24
						2" Ice	0.00	0.24
						4" Ice	0.00	0.24
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	118.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
						2" Ice	0.00	1.08
						4" Ice	0.00	1.08
***								
ATCB-B01-001(5/16)	C	No	Inside Pole	118.00 - 0.00	6	No Ice	0.00	0.07
						1/2" Ice	0.00	0.07
						1" Ice	0.00	0.07
						2" Ice	0.00	0.07
						4" Ice	0.00	0.07
FSJ4-50B(1/2")	C	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
						2" Ice	0.00	0.14
						4" Ice	0.00	0.14
2" Conduit	C	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.95
						1/2" Ice	0.00	0.95
						1" Ice	0.00	0.95
						2" Ice	0.00	0.95
						4" Ice	0.00	0.95
***								
AL7-50(1 5/8)	C	No	CaAa (Out Of Face)	107.00 - 0.00	2	No Ice	0.20	0.52
						1/2" Ice	0.30	2.02
						1" Ice	0.40	4.14
						2" Ice	0.60	10.20
						4" Ice	1.00	29.65
AL7-50(1 5/8)	C	No	CaAa (Out Of Face)	107.00 - 0.00	4	No Ice	0.00	0.52
						1/2" Ice	0.00	2.02
						1" Ice	0.00	4.14
						2" Ice	0.00	10.20
						4" Ice	0.00	29.65
FLC 158-50J(1-5/8")	C	No	Inside Pole	107.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
						2" Ice	0.00	0.92
						4" Ice	0.00	0.92
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	107.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	2.37
						1" Ice	0.00	4.28
						2" Ice	0.00	9.93
						4" Ice	0.00	28.56
***								
LDF5-50A(7/8")	C	No	Inside Pole	99.00 - 0.00	6	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
FB-L98B-002-75000(3/8")	C	No	Inside Pole	99.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	99.00 - 0.00	2	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
						2" Ice	0.00	0.59
						4" Ice	0.00	0.59
LDF5-50A(7/8")	C	No	Inside Pole	99.00 - 0.00	6	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
***								
***								
LDF5-50A(7/8")	C	No	CaAa (Out Of Face)	59.00 - 0.00	1	No Ice	0.11	0.33
						1/2" Ice	0.21	1.30
						1" Ice	0.31	2.88
						2" Ice	0.51	7.88
						4" Ice	0.91	25.20
***								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	48.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
						2" Ice	0.00	6.58
						4" Ice	0.00	22.78
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	48.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
						2" Ice	0.00	6.58
						4" Ice	0.00	22.78
***								
C8x18.75	C	No	CaAa (Out Of Face)	33.50 - 0.00	2	No Ice	0.42	0.00
						1/2" Ice	0.53	0.00
						1" Ice	0.64	0.00
						2" Ice	0.87	0.00
						4" Ice	1.31	0.00
C8x11.5 brace	C	No	CaAa (Out Of Face)	70.00 - 33.50	2	No Ice	0.42	0.00
						1/2" Ice	0.53	0.00
						1" Ice	0.64	0.00
						2" Ice	0.87	0.00
						4" Ice	1.31	0.00
***								

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice	7.13 7.66 8.18	4.96 5.75 6.47	0.08 0.13 0.19

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	9.26	8.01	0.34
						2" Ice	11.53	11.41	0.75
						4" Ice			
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice	7.13	4.96	0.08
						1/2" Ice	7.66	5.75	0.13
						1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
TD-RRH8x20-25	A	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	B	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice	8.50	7.47	0.09
						1/2" Ice	9.15	8.66	0.16
						1" Ice	9.77	9.56	0.24
						2" Ice	11.03	11.39	0.42
						4" Ice	13.68	15.53	0.94
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
IBC1900HG-2A	A	From Leg	4.00 0.00 -2.00	0.0000	118.00	No Ice	1.13	0.53	0.02
						1/2" Ice	1.27	0.65	0.03
						1" Ice	1.43	0.77	0.04
						2" Ice	1.76	1.04	0.06
						4" Ice	2.53	1.69	0.15
IBC1900HG-2A	B	From Leg	4.00 0.00 -2.00	0.0000	118.00	No Ice	1.13	0.53	0.02
						1/2" Ice	1.27	0.65	0.03
						1" Ice	1.43	0.77	0.04
						2" Ice	1.76	1.04	0.06
						4" Ice	2.53	1.69	0.15
IBC1900HG-2A	C	From Leg	4.00 0.00 -2.00	0.0000	118.00	No Ice	1.13	0.53	0.02
						1/2" Ice	1.27	0.65	0.03
						1" Ice	1.43	0.77	0.04
						2" Ice	1.76	1.04	0.06
						4" Ice	2.53	1.69	0.15
IBC1900BB-1	A	From Leg	4.00 0.00	0.0000	118.00	No Ice	1.13	0.53	0.02
						1/2" Ice	1.27	0.65	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-2.00			Ice	1.43	0.77	0.04
						1" Ice	1.76	1.04	0.06
						2" Ice	2.53	1.69	0.15
						4" Ice			
IBC1900BB-1	B	From Leg	4.00	0.0000	118.00	No Ice	1.13	0.53	0.02
			0.00			1/2"	1.27	0.65	0.03
			-2.00			Ice	1.43	0.77	0.04
						1" Ice	1.76	1.04	0.06
						2" Ice	2.53	1.69	0.15
						4" Ice			
IBC1900BB-1	C	From Leg	4.00	0.0000	118.00	No Ice	1.13	0.53	0.02
			0.00			1/2"	1.27	0.65	0.03
			-2.00			Ice	1.43	0.77	0.04
						1" Ice	1.76	1.04	0.06
						2" Ice	2.53	1.69	0.15
						4" Ice			
*									
840 10054 w/ Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	5.41	2.39	0.05
			0.00			1/2"	5.83	2.92	0.09
			2.00			Ice	6.26	3.47	0.13
						1" Ice	7.16	4.61	0.23
						2" Ice	9.09	7.32	0.53
						4" Ice			
840 10054 w/ Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	5.41	2.39	0.05
			0.00			1/2"	5.83	2.92	0.09
			2.00			Ice	6.26	3.47	0.13
						1" Ice	7.16	4.61	0.23
						2" Ice	9.09	7.32	0.53
						4" Ice			
840 10054 w/ Mount Pipe	C	From Leg	4.00	0.0000	118.00	No Ice	5.41	2.39	0.05
			0.00			1/2"	5.83	2.92	0.09
			2.00			Ice	6.26	3.47	0.13
						1" Ice	7.16	4.61	0.23
						2" Ice	9.09	7.32	0.53
						4" Ice			
WIMAX DAP HEAD	A	From Leg	4.00	0.0000	118.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			2.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
WIMAX DAP HEAD	B	From Leg	4.00	0.0000	118.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			2.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
WIMAX DAP HEAD	C	From Leg	4.00	0.0000	118.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			2.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
(2) HORIZON COMPACT	B	From Leg	4.00	0.0000	118.00	No Ice	0.84	0.43	0.01
			0.00			1/2"	0.97	0.52	0.02
			-2.00			Ice	1.10	0.63	0.03
						1" Ice	1.39	0.86	0.05
						2" Ice	2.08	1.43	0.12
						4" Ice			
Platform Mount [LP 501-1]	C	None		0.0000	118.00	No Ice	32.04	32.04	0.98
						1/2"	45.28	45.28	1.28
						Ice	58.51	58.51	1.57
						1" Ice	84.98	84.98	2.16
						2" Ice	137.92	137.92	3.33
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
Pipe Mount [PM 601-3]	C	None		0.0000	114.00	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28
						2" Ice	8.75	8.75	0.36
						4" Ice	13.11	13.11	0.53
***									
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00 0.00 1.00	0.0000	114.00	No Ice	2.71	2.61	0.06
						1/2" Ice	2.95	2.85	0.08
						1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00 0.00 1.00	0.0000	114.00	No Ice	2.71	2.61	0.06
						1/2" Ice	2.95	2.85	0.08
						1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00 0.00 1.00	0.0000	114.00	No Ice	2.71	2.61	0.06
						1/2" Ice	2.95	2.85	0.08
						1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00 0.00 -1.00	0.0000	114.00	No Ice	2.40	2.25	0.06
						1/2" Ice	2.61	2.46	0.09
						1" Ice	2.83	2.68	0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00 0.00 -1.00	0.0000	114.00	No Ice	2.40	2.25	0.06
						1/2" Ice	2.61	2.46	0.09
						1" Ice	2.83	2.68	0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00 0.00 -1.00	0.0000	114.00	No Ice	2.40	2.25	0.06
						1/2" Ice	2.61	2.46	0.09
						1" Ice	2.83	2.68	0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
***									
Platform Mount [LP 712-1]	C	None		0.0000	107.00	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	107.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
						2" Ice	11.18	12.29	0.81
						4" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.82 7.34 7.85 8.92 11.16	5.63 6.47 7.25 8.85 12.28	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.82 7.34 7.85 8.92 11.16	5.63 6.47 7.25 8.85 12.28	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.82 7.34 7.85 8.92 11.16	5.63 6.47 7.25 8.85 12.28	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
***									
(2) P65-17-XLH-RR w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.82 12.59 13.38 14.94 18.33	9.06 10.62 12.21 14.70 19.64	0.09 0.18 0.28 0.51 1.14
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.74 6.20 6.66 7.62 9.67	4.02 4.63 5.28 6.68 9.74	0.05 0.10 0.15 0.27 0.63
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.74 6.20 6.66 7.62 9.67	4.02 4.63 5.28 6.68 9.74	0.05 0.10 0.15 0.27 0.63

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
7770.00 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	99.00	No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			1.00				1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	99.00	No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			1.00				1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	99.00	No Ice	6.12	4.25	0.06
			0.00				1/2" Ice	6.63	5.01	0.10
			1.00				1" Ice	7.13	5.71	0.16
							2" Ice	8.16	7.16	0.29
							4" Ice	10.36	10.41	0.66
(2) RRUS-11	A	From Leg	4.00	0.00	0.0000	99.00	No Ice	3.25	1.37	0.05
			0.00				1/2" Ice	3.49	1.55	0.07
			0.00				1" Ice	3.74	1.74	0.09
							2" Ice	4.27	2.14	0.15
							4" Ice	5.43	3.04	0.31
(2) RRUS-11	B	From Leg	4.00	0.00	0.0000	99.00	No Ice	3.25	1.37	0.05
			0.00				1/2" Ice	3.49	1.55	0.07
			0.00				1" Ice	3.74	1.74	0.09
							2" Ice	4.27	2.14	0.15
							4" Ice	5.43	3.04	0.31
(2) RRUS-11	C	From Leg	4.00	0.00	0.0000	99.00	No Ice	3.25	1.37	0.05
			0.00				1/2" Ice	3.49	1.55	0.07
			0.00				1" Ice	3.74	1.74	0.09
							2" Ice	4.27	2.14	0.15
							4" Ice	5.43	3.04	0.31
DTMABP7819VG12A	A	From Leg	4.00	0.00	0.0000	99.00	No Ice	1.14	0.39	0.02
			0.00				1/2" Ice	1.28	0.49	0.03
			0.00				1" Ice	1.44	0.59	0.04
							2" Ice	1.77	0.83	0.06
							4" Ice	2.54	1.41	0.14
DTMABP7819VG12A	B	From Leg	4.00	0.00	0.0000	99.00	No Ice	1.14	0.39	0.02
			0.00				1/2" Ice	1.28	0.49	0.03
			0.00				1" Ice	1.44	0.59	0.04
							2" Ice	1.77	0.83	0.06
							4" Ice	2.54	1.41	0.14
DTMABP7819VG12A	C	From Leg	4.00	0.00	0.0000	99.00	No Ice	1.14	0.39	0.02
			0.00				1/2" Ice	1.28	0.49	0.03
			0.00				1" Ice	1.44	0.59	0.04
							2" Ice	1.77	0.83	0.06
							4" Ice	2.54	1.41	0.14
(2) LGP13519	A	From Leg	4.00	0.00	0.0000	99.00	No Ice	0.34	0.21	0.01
			0.00				1/2" Ice	0.42	0.28	0.01
			0.00				1" Ice	0.51	0.36	0.01
							2" Ice	0.73	0.55	0.02
							4" Ice	1.25	1.03	0.07
(2) LGP13519	B	From Leg	4.00	0.00	0.0000	99.00	No Ice	0.34	0.21	0.01
			0.00				1/2" Ice	0.42	0.28	0.01
			0.00				1" Ice	0.51	0.36	0.01
							2" Ice	0.73	0.55	0.02
								1.25	1.03	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
(2) LGP13519	C	From Leg	4.00 0.00 0.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.34 0.42 0.51 0.73 1.25	0.21 0.28 0.36 0.55 1.03	0.01 0.01 0.01 0.02 0.07
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	2.57 2.80 3.04 3.54 4.66	0.02 0.04 0.07 0.13 0.30
Platform Mount [LP 501-1]	C	None		0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.04 45.28 58.51 84.98 137.92	32.04 45.28 58.51 84.98 137.92	0.98 1.28 1.57 2.16 3.33
***									
DB536	A	From Leg	4.00 0.00 4.00	0.0000	59.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.83 3.99 5.16 7.08 9.94	2.83 3.99 5.16 7.08 9.94	0.02 0.04 0.06 0.14 0.40
Side Arm Mount [SO 702-1]	A	None		0.0000	59.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.00 1.00 1.00 1.00	1.43 2.05 2.67 3.91 6.39	0.03 0.04 0.05 0.07 0.12
***									
GPS	A	From Leg	4.00 0.00 2.00	0.0000	48.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.17 0.24 0.31 0.48 0.92	0.17 0.24 0.31 0.48 0.92	0.00 0.00 0.00 0.01 0.05
KS24019-L112A	A	From Leg	4.00 0.00 2.00	0.0000	48.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06
Pipe Mount [PM 601-1]	C	None		0.0000	48.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
***									
Bridge Stiffener (115" x 16.5" x 1.25")	C	None		0.0000	30.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	18.45 19.30 20.17 21.93 25.54	2.00 3.08 4.17 6.40 9.77	0.67 0.74 0.82 1.01 1.50

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-18G-1-C	B	Paraboloid w/o Radome	From Leg	4.00 0.00 -2.00	-6.0000		118.00	1.27	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.28 4.01 4.30 4.88 6.04	0.02 0.04 0.05 0.07 0.11
A-ANT-18G-2-C	B	Paraboloid w/o Radome	From Leg	4.00 0.00 -2.00	20.0000		118.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.04 0.05 0.07 0.11
***											

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 120.00-90.00	105.00	1.392	23	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	6.664
L2 90.00-80.00	85.00	1.31	21	20.000	A	0.000	20.000	20.000	100.00	0.000	0.000
					B	0.000	20.000		100.00	0.000	0.000
					C	0.000	20.000		100.00	0.000	3.920
L3 80.00-68.50	74.25	1.261	21	23.000	A	0.000	23.000	23.000	100.00	0.000	0.000
					B	0.000	23.000		100.00	0.000	0.000
					C	0.000	23.000		100.00	0.000	5.771
L4 68.50-68.00	68.25	1.231	20	1.000	A	0.000	1.000	1.000	100.00	0.000	0.000
					B	0.000	1.000		100.00	0.000	0.000
					C	0.000	1.000		100.00	0.000	0.617
L5 68.00-63.50	65.75	1.218	20	9.000	A	0.000	9.000	9.000	100.00	0.000	0.000
					B	0.000	9.000		100.00	0.000	0.000
					C	0.000	9.000		100.00	0.000	5.554
L6 63.50-60.00	61.75	1.196	20	7.000	A	0.000	7.000	7.000	100.00	0.000	0.000
					B	0.000	7.000		100.00	0.000	0.000
					C	0.000	7.000		100.00	0.000	4.320
L7 60.00-56.50	58.25	1.176	19	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	4.593
L8 56.50-45.42	50.96	1.132	19	27.708	A	0.000	27.708	27.708	100.00	0.000	0.000
					B	0.000	27.708		100.00	0.000	0.000
					C	0.000	27.708		100.00	0.000	14.888
L9 45.42-36.42	40.92	1.063	17	22.500	A	0.000	22.500	22.500	100.00	0.000	0.000
					B	0.000	22.500		100.00	0.000	0.000
					C	0.000	22.500		100.00	0.000	12.090
L10 36.42-33.50	34.96	1.017	17	7.293	A	0.000	7.293	7.293	100.00	0.000	0.000
					B	0.000	7.293		100.00	0.000	0.000
					C	0.000	7.293		100.00	0.000	3.918
L11 33.50-30.00	31.75	1	16	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	4.702
L12 30.00-26.50	28.25	1	16	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500		100.00	0.000	0.000
					C	0.000	10.500		100.00	0.000	4.702
L13 26.50-20.58	23.54	1	16	17.751	A	0.000	17.751	17.751	100.00	0.000	0.000
					B	0.000	17.751		100.00	0.000	0.000
					C	0.000	17.751		100.00	0.000	7.948
L14 20.58-2.00	11.29	1	16	55.749	A	0.000	55.749	55.749	100.00	0.000	0.000
					B	0.000	55.749		100.00	0.000	0.000
					C	0.000	55.749		100.00	0.000	24.963

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L15 2.00-0.00	1.00	1	16	6.000	A	0.000	6.000	6.000	100.00	0.000	0.000
					B	0.000	6.000		100.00	0.000	0.000
					C	0.000	6.000		100.00	0.000	2.687

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 120.00-90.00	105.00	1.392	5	1.1490	65.745	A	0.000	65.745	65.745	100.00	0.000	0.000
						B	0.000	65.745		100.00	0.000	0.000
						C	0.000	65.745		100.00	0.000	14.477
L2 90.00-80.00	85.00	1.31	5	1.1202	21.867	A	0.000	21.867	21.867	100.00	0.000	0.000
						B	0.000	21.867		100.00	0.000	0.000
						C	0.000	21.867		100.00	0.000	8.401
L3 80.00-68.50	74.25	1.261	5	1.1022	25.113	A	0.000	25.113	25.113	100.00	0.000	0.000
						B	0.000	25.113		100.00	0.000	0.000
						C	0.000	25.113		100.00	0.000	11.576
L4 68.50-68.00	68.25	1.231	4	1.0911	1.091	A	0.000	1.091	1.091	100.00	0.000	0.000
						B	0.000	1.091		100.00	0.000	0.000
						C	0.000	1.091		100.00	0.000	1.078
L5 68.00-63.50	65.75	1.218	4	1.0862	9.815	A	0.000	9.815	9.815	100.00	0.000	0.000
						B	0.000	9.815		100.00	0.000	0.000
						C	0.000	9.815		100.00	0.000	9.682
L6 63.50-60.00	61.75	1.196	4	1.0781	7.629	A	0.000	7.629	7.629	100.00	0.000	0.000
						B	0.000	7.629		100.00	0.000	0.000
						C	0.000	7.629		100.00	0.000	7.507
L7 60.00-56.50	58.25	1.176	4	1.0706	9.374	A	0.000	9.374	9.374	100.00	0.000	0.000
						B	0.000	9.374		100.00	0.000	0.000
						C	0.000	9.374		100.00	0.000	8.292
L8 56.50-45.42	50.96	1.132	4	1.0535	29.654	A	0.000	29.654	29.654	100.00	0.000	0.000
						B	0.000	29.654		100.00	0.000	0.000
						C	0.000	29.654		100.00	0.000	27.083
L9 45.42-36.42	40.92	1.063	4	1.0261	24.039	A	0.000	24.039	24.039	100.00	0.000	0.000
						B	0.000	24.039		100.00	0.000	0.000
						C	0.000	24.039		100.00	0.000	21.736
L10 36.42-33.50	34.96	1.017	4	1.0069	7.782	A	0.000	7.782	7.782	100.00	0.000	0.000
						B	0.000	7.782		100.00	0.000	0.000
						C	0.000	7.782		100.00	0.000	6.986
L11 33.50-30.00	31.75	1	4	1.0000	9.333	A	0.000	9.333	9.333	100.00	0.000	0.000
						B	0.000	9.333		100.00	0.000	0.000
						C	0.000	9.333		100.00	0.000	8.357
L12 30.00-26.50	28.25	1	4	1.0000	11.083	A	0.000	11.083	11.083	100.00	0.000	0.000
						B	0.000	11.083		100.00	0.000	0.000
						C	0.000	11.083		100.00	0.000	8.357
L13 26.50-20.58	23.54	1	4	1.0000	18.737	A	0.000	18.737	18.737	100.00	0.000	0.000
						B	0.000	18.737		100.00	0.000	0.000
						C	0.000	18.737		100.00	0.000	14.129
L14 20.58-2.00	11.29	1	4	1.0000	58.846	A	0.000	58.846	58.846	100.00	0.000	0.000
						B	0.000	58.846		100.00	0.000	0.000
						C	0.000	58.846		100.00	0.000	44.372
L15 2.00-0.00	1.00	1	4	1.0000	6.333	A	0.000	6.333	6.333	100.00	0.000	0.000
						B	0.000	6.333		100.00	0.000	0.000
						C	0.000	6.333		100.00	0.000	4.776

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 120.00-90.00	105.00	1.392	9	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	6.664
L2 90.00-80.00	85.00	1.31	8	20.000	A	0.000	20.000	20.000	100.00	0.000	0.000
					B	0.000	20.000		100.00	0.000	0.000
					C	0.000	20.000		100.00	0.000	3.920
L3 80.00-68.50	74.25	1.261	8	23.000	A	0.000	23.000	23.000	100.00	0.000	0.000
					B	0.000	23.000		100.00	0.000	0.000
					C	0.000	23.000		100.00	0.000	5.771
L4 68.50-68.00	68.25	1.231	8	1.000	A	0.000	1.000	1.000	100.00	0.000	0.000
					B	0.000	1.000		100.00	0.000	0.000
					C	0.000	1.000		100.00	0.000	0.617
L5 68.00-63.50	65.75	1.218	8	9.000	A	0.000	9.000	9.000	100.00	0.000	0.000
					B	0.000	9.000		100.00	0.000	0.000
					C	0.000	9.000		100.00	0.000	5.554
L6 63.50-60.00	61.75	1.196	8	7.000	A	0.000	7.000	7.000	100.00	0.000	0.000
					B	0.000	7.000		100.00	0.000	0.000
					C	0.000	7.000		100.00	0.000	4.320
L7 60.00-56.50	58.25	1.176	8	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	4.593
L8 56.50-45.42	50.96	1.132	7	27.708	A	0.000	27.708	27.708	100.00	0.000	0.000
					B	0.000	27.708		100.00	0.000	0.000
					C	0.000	27.708		100.00	0.000	14.888
L9 45.42-36.42	40.92	1.063	7	22.500	A	0.000	22.500	22.500	100.00	0.000	0.000
					B	0.000	22.500		100.00	0.000	0.000
					C	0.000	22.500		100.00	0.000	12.090
L10 36.42-33.50	34.96	1.017	7	7.293	A	0.000	7.293	7.293	100.00	0.000	0.000
					B	0.000	7.293		100.00	0.000	0.000
					C	0.000	7.293		100.00	0.000	3.918
L11 33.50-30.00	31.75	1	6	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	4.702
L12 30.00-26.50	28.25	1	6	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500		100.00	0.000	0.000
					C	0.000	10.500		100.00	0.000	4.702
L13 26.50-20.58	23.54	1	6	17.751	A	0.000	17.751	17.751	100.00	0.000	0.000
					B	0.000	17.751		100.00	0.000	0.000
					C	0.000	17.751		100.00	0.000	7.948
L14 20.58-2.00	11.29	1	6	55.749	A	0.000	55.749	55.749	100.00	0.000	0.000
					B	0.000	55.749		100.00	0.000	0.000
					C	0.000	55.749		100.00	0.000	24.963
L15 2.00-0.00	1.00	1	6	6.000	A	0.000	6.000	6.000	100.00	0.000	0.000
					B	0.000	6.000		100.00	0.000	0.000
					C	0.000	6.000		100.00	0.000	2.687

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

Comb. No.	Description
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 Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 90	21.906	38	1.6482	0.0099
L2	90 - 80	12.000	38	1.3924	0.0065
L3	80 - 68.5	9.274	38	1.1980	0.0046
L4	68.5 - 68	6.619	38	0.9947	0.0033
L5	68 - 63.5	6.516	38	0.9871	0.0033
L6	63.5 - 60	5.633	38	0.8849	0.0028
L7	60 - 56.5	5.002	38	0.8346	0.0025
L8	56.5 - 45.417	4.402	38	0.8014	0.0024
L9	45.417 - 36.417	2.757	38	0.6091	0.0016
L10	36.417 - 33.5	1.747	38	0.4590	0.0011
L11	33.5 - 30	1.480	38	0.4143	0.0009
L12	30 - 26.5	1.191	38	0.3735	0.0008
L13	26.5 - 20.583	0.931	38	0.3364	0.0007
L14	20.583 - 2	0.565	38	0.2531	0.0005
L15	2 - 0	0.005	38	0.0255	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	APXVTM14-C-120 w/ Mount Pipe	38	21.208	1.6396	0.0097	18849
116.00	A-ANT-18G-1-C	38	20.510	1.6309	0.0096	18849
114.00	Pipe Mount [PM 601-3]	38	19.815	1.6217	0.0094	15707
107.00	Platform Mount [LP 712-1]	38	17.412	1.5825	0.0088	7249
99.00	(2) P65-17-XLH-RR w/ Mount Pipe	38	14.767	1.5150	0.0079	4487
59.00	DB536	38	4.828	0.8252	0.0025	4540
48.00	GPS	38	3.103	0.6587	0.0018	3328
30.00	Bridge Stiffener (115" x 16.5" x 1.25")	38	1.191	0.3735	0.0008	4932

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 90	55.967	13	4.2146	0.0252
L2	90 - 80	30.672	13	3.5598	0.0166
L3	80 - 68.5	23.707	13	3.0629	0.0118
L4	68.5 - 68	16.924	13	2.5435	0.0084
L5	68 - 63.5	16.659	13	2.5239	0.0083
L6	63.5 - 60	14.402	13	2.2628	0.0070
L7	60 - 56.5	12.791	13	2.1341	0.0064
L8	56.5 - 45.417	11.257	13	2.0493	0.0060
L9	45.417 - 36.417	7.052	13	1.5577	0.0040
L10	36.417 - 33.5	4.469	13	1.1740	0.0027
L11	33.5 - 30	3.786	13	1.0597	0.0024
L12	30 - 26.5	3.047	13	0.9552	0.0021
L13	26.5 - 20.583	2.382	13	0.8604	0.0019
L14	20.583 - 2	1.445	13	0.6475	0.0013
L15	2 - 0	0.014	13	0.0652	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	APXVTM14-C-120 w/ Mount Pipe	13	54.184	4.1927	0.0248	7440
116.00	A-ANT-18G-1-C	13	52.403	4.1701	0.0244	7440
114.00	Pipe Mount [PM 601-3]	13	50.627	4.1465	0.0240	6200
107.00	Platform Mount [LP 712-1]	13	44.491	4.0460	0.0224	2860
99.00	(2) P65-17-XLH-RR w/ Mount Pipe	13	37.739	3.8731	0.0201	1769
59.00	DB536	13	12.345	2.1100	0.0063	1781
48.00	GPS	13	7.934	1.6845	0.0045	1304
30.00	Bridge Stiffener (115" x 16.5" x 1.25")	13	3.047	0.9552	0.0021	1930

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	120 - 90 (1)	P24x1/4	30.00	0.00	0.0	23.696	18.6532	-8.20	442.00	0.019
L2	90 - 80 (2)	P24x3/8	10.00	0.00	0.0	25.200	27.8325	-9.50	701.38	0.014
L3	80 - 68.5 (3)	RPS 24" x 0.62517"	11.50	0.00	0.0	19.806	45.9089	-11.71	909.27	0.013
L4	68.5 - 68 (4)	RPS 24" x 0.88003"	0.50	0.00	0.0	19.782	63.9197	-11.84	1264.46	0.009
L5	68 - 63.5 (5)	RPS 24" x 0.61306"	4.50	0.00	0.0	22.686	45.0429	-12.69	1021.84	0.012
L6	63.5 - 60 (6)	RPS 24" x 1.13718"	3.50	0.00	0.0	20.358	81.6787	-13.79	1662.82	0.008
L7	60 - 56.5 (7)	RPS 30" x 0.90733"	3.50	0.00	0.0	21.126	82.9275	-14.92	1751.93	0.009
L8	56.5 - 45.417 (8)	RPS 30" x 0.55714"	11.08	0.00	0.0	22.788	51.5340	-17.34	1174.36	0.015
L9	45.417 - 36.417 (9)	RPS 30" x 0.70733"	9.00	0.00	0.0	22.770	65.0925	-19.68	1482.16	0.013
L10	36.417 - 33.5 (10)	RPS 30" x 0.86188"	2.92	0.00	0.0	22.782	78.8966	-20.58	1797.42	0.011
L11	33.5 - 30 (11)	RPS 30" x 1.23648"	3.50	0.00	0.0	21.120	111.7320	-22.04	2359.79	0.009
L12	30 - 26.5 (12)	RPS 36" x 0.7835"	3.50	0.00	0.0	21.504	86.6832	-23.85	1864.04	0.013
L13	26.5 - 20.583 (13)	RPS 36" x 0.62423"	5.92	0.00	0.0	21.522	69.3746	-25.47	1493.08	0.017
L14	20.583 - 2 (14)	RPS 36" x 0.8638"	18.58	0.00	0.0	21.504	95.3494	-32.21	2050.39	0.016

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L15	2 - 0 (15)	RPS 36" x 0.94668"	2.00	0.00	0.0	21.102	104.2510	-33.00	2199.91	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	120 - 90 (1)	P24x1/4	267.39	29.273	23.696	1.235	0.00	0.000	23.696	0.000
L2	90 - 80 (2)	P24x3/8	411.99	30.545	27.720	1.102	0.00	0.000	27.720	0.000
L3	80 - 68.5 (3)	RPS 24" x 0.62517"	585.56	26.873	21.787	1.233	0.00	0.000	21.787	0.000
L4	68.5 - 68 (4)	RPS 24" x 0.88003"	593.29	19.975	21.760	0.918	0.00	0.000	21.760	0.000
L5	68 - 63.5 (5)	RPS 24" x 0.61306"	663.67	31.012	24.955	1.243	0.00	0.000	24.955	0.000
L6	63.5 - 60 (6)	RPS 24" x 1.13718"	719.52	19.367	22.394	0.865	0.00	0.000	22.394	0.000
L7	60 - 56.5 (7)	RPS 30" x 0.90733"	777.29	15.932	23.239	0.686	0.00	0.000	23.239	0.000
L8	56.5 - 45.417 (8)	RPS 30" x 0.55714"	966.48	31.142	25.067	1.242	0.00	0.000	25.067	0.000
L9	45.417 - 36.417 (9)	RPS 30" x 0.70733"	1127.93	29.063	25.047	1.160	0.00	0.000	25.047	0.000
L10	36.417 - 33.5 (10)	RPS 30" x 0.86188"	1181.53	25.378	25.060	1.013	0.00	0.000	25.060	0.000
L11	33.5 - 30 (11)	RPS 30" x 1.23648"	1246.68	19.384	23.232	0.834	0.00	0.000	23.232	0.000
L12	30 - 26.5 (12)	RPS 36" x 0.7835"	1314.58	21.120	23.654	0.893	0.00	0.000	23.654	0.000
L13	26.5 - 20.583 (13)	RPS 36" x 0.62423"	1431.53	28.484	23.674	1.203	0.00	0.000	23.674	0.000
L14	20.583 - 2 (14)	RPS 36" x 0.8638"	1815.69	26.638	23.654	1.126	0.00	0.000	23.654	0.000
L15	2 - 0 (15)	RPS 36" x 0.94668"	1858.49	25.052	23.212	1.079	0.00	0.000	23.212	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	120 - 90 (1)	P24x1/4	14.18	1.520	16.800	0.090	2.55	0.140	11.901	0.012
L2	90 - 80 (2)	P24x3/8	14.74	1.059	16.800	0.063	2.53	0.094	16.800	0.006
L3	80 - 68.5 (3)	RPS 24" x 0.62517"	15.43	0.672	13.204	0.051	1.99	0.046	13.204	0.003
L4	68.5 - 68 (4)	RPS 24" x 0.88003"	15.48	0.484	13.188	0.037	1.99	0.033	13.188	0.003
L5	68 - 63.5 (5)	RPS 24" x 0.61306"	15.82	0.702	15.124	0.046	1.96	0.046	15.124	0.003
L6	63.5 - 60 (6)	RPS 24" x 1.13718"	16.11	0.394	13.572	0.029	1.93	0.026	13.572	0.002
L7	60 - 56.5 (7)	RPS 30" x 0.90733"	16.59	0.400	14.084	0.028	2.15	0.022	14.084	0.002
L8	56.5 - 45.417 (8)	RPS 30" x 0.55714"	17.60	0.683	15.192	0.045	2.06	0.033	15.192	0.002
L9	45.417 - 36.417 (9)	RPS 30" x 0.70733"	18.28	0.562	15.180	0.037	1.98	0.026	15.180	0.002
L10	36.417 - 33.5 (10)	RPS 30" x 0.86188"	18.49	0.469	15.188	0.031	1.96	0.021	15.188	0.001
L11	33.5 - 30 (11)	RPS 30" x 1.23648"	18.75	0.336	14.080	0.024	1.93	0.015	14.080	0.001
L12	30 - 26.5 (12)	RPS 36" x 0.7835"	19.55	0.451	14.336	0.031	1.89	0.015	14.336	0.001
L13	26.5 - 20.583 (13)	RPS 36" x 0.62423"	19.99	0.576	14.348	0.040	1.83	0.018	14.348	0.001
L14	20.583 - 2 (14)	RPS 36" x 0.8638"	21.34	0.448	14.336	0.031	1.65	0.012	14.336	0.001
L15	2 - 0 (15)	RPS 36" x 0.94668"	21.48	0.412	14.068	0.029	1.62	0.011	14.068	0.001

Pole Interaction Design Data

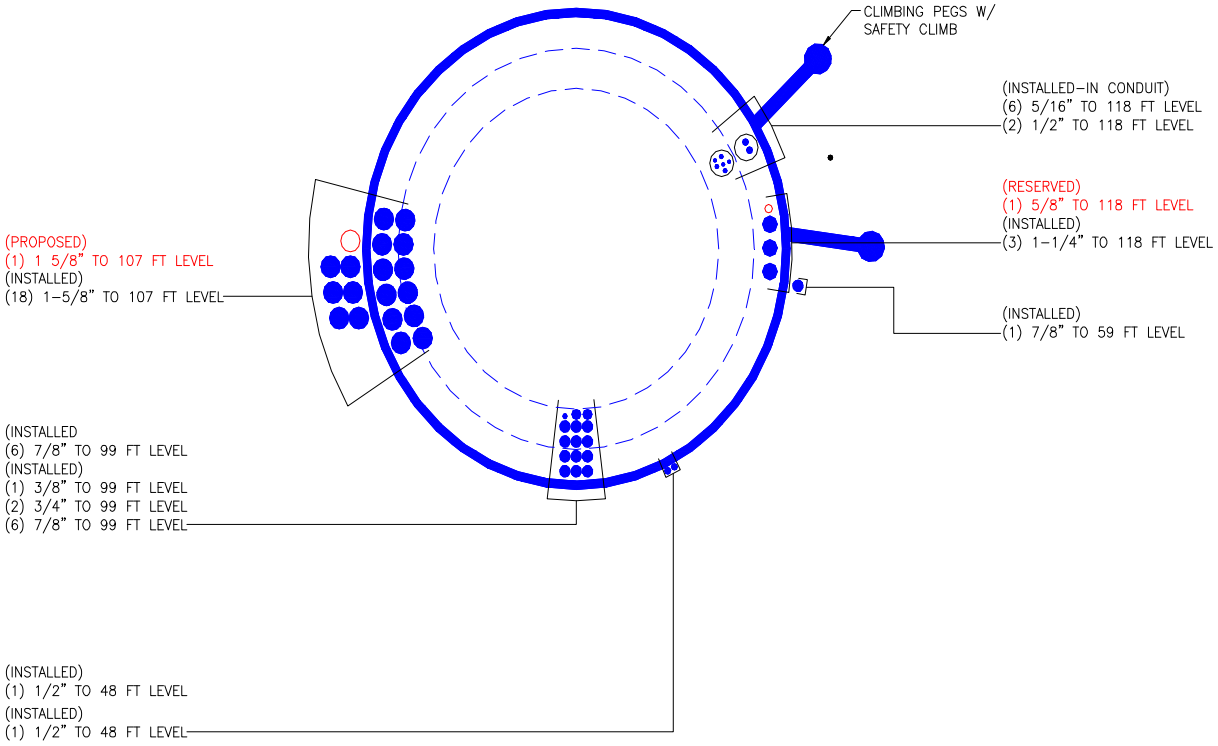
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 90 (1)	0.019	1.235	0.000	0.090	0.012	1.264 ✔	1.333	H1-3+VT ✔
L2	90 - 80 (2)	0.014	1.102	0.000	0.063	0.006	1.120 ✔	1.333	H1-3+VT ✔
L3	80 - 68.5 (3)	0.013	1.233	0.000	0.051	0.003	1.249 ✔	1.333	H1-3+VT ✔
L4	68.5 - 68 (4)	0.009	0.918	0.000	0.037	0.003	0.929 ✔	1.333	H1-3+VT ✔
L5	68 - 63.5 (5)	0.012	1.243	0.000	0.046	0.003	1.258 ✔	1.333	H1-3+VT ✔
L6	63.5 - 60 (6)	0.008	0.865	0.000	0.029	0.002	0.874 ✔	1.333	H1-3+VT ✔
L7	60 - 56.5 (7)	0.009	0.686	0.000	0.028	0.002	0.695 ✔	1.333	H1-3+VT ✔
L8	56.5 - 45.417 (8)	0.015	1.242	0.000	0.045	0.002	1.259 ✔	1.333	H1-3+VT ✔
L9	45.417 - 36.417 (9)	0.013	1.160	0.000	0.037	0.002	1.175 ✔	1.333	H1-3+VT ✔
L10	36.417 - 33.5 (10)	0.011	1.013	0.000	0.031	0.001	1.025 ✔	1.333	H1-3+VT ✔
L11	33.5 - 30 (11)	0.009	0.834	0.000	0.024	0.001	0.844 ✔	1.333	H1-3+VT ✔
L12	30 - 26.5 (12)	0.013	0.893	0.000	0.031	0.001	0.907 ✔	1.333	H1-3+VT ✔
L13	26.5 - 20.583 (13)	0.017	1.203	0.000	0.040	0.001	1.222 ✔	1.333	H1-3+VT ✔
L14	20.583 - 2 (14)	0.016	1.126	0.000	0.031	0.001	1.143 ✔	1.333	H1-3+VT ✔
L15	2 - 0 (15)	0.015	1.079	0.000	0.029	0.001	1.095 ✔	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	120 - 90	Pole	P24x1/4	1	-8.20	589.19	94.9	Pass
L2	90 - 80	Pole	P24x3/8	2	-9.50	934.94	84.0	Pass
L3	80 - 68.5	Pole	RPS 24" x 0.62517"	3	-11.71	1212.06	93.7	Pass
L4	68.5 - 68	Pole	RPS 24" x 0.88003"	4	-11.84	1685.53	69.7	Pass
L5	68 - 63.5	Pole	RPS 24" x 0.61306"	5	-12.69	1362.11	94.3	Pass
L6	63.5 - 60	Pole	RPS 24" x 1.13718"	6	-13.79	2216.54	65.6	Pass
L7	60 - 56.5	Pole	RPS 30" x 0.90733"	7	-14.92	2335.32	52.1	Pass
L8	56.5 - 45.417	Pole	RPS 30" x 0.55714"	8	-17.34	1565.42	94.5	Pass
L9	45.417 - 36.417	Pole	RPS 30" x 0.70733"	9	-19.68	1975.72	88.2	Pass
L10	36.417 - 33.5	Pole	RPS 30" x 0.86188"	10	-20.58	2395.96	76.9	Pass
L11	33.5 - 30	Pole	RPS 30" x 1.23648"	11	-22.04	3145.60	63.3	Pass
L12	30 - 26.5	Pole	RPS 36" x 0.7835"	12	-23.85	2484.77	68.0	Pass
L13	26.5 - 20.583	Pole	RPS 36" x 0.62423"	13	-25.47	1990.28	91.7	Pass
L14	20.583 - 2	Pole	RPS 36" x 0.8638"	14	-32.21	2733.17	85.7	Pass
L15	2 - 0	Pole	RPS 36" x 0.94668"	15	-33.00	2932.48	82.2	Pass
						Summary		
						Pole (L1)	94.9	Pass
						RATING =	**94.9**	**Pass**

APPENDIX B

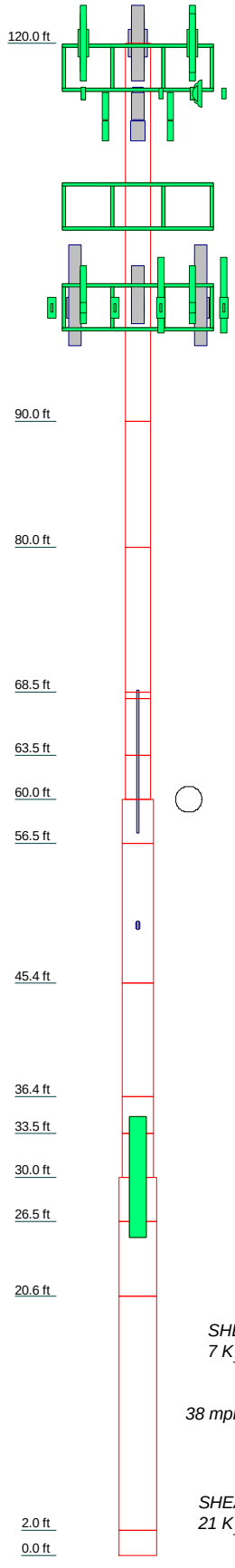
BASE LEVEL DRAWING

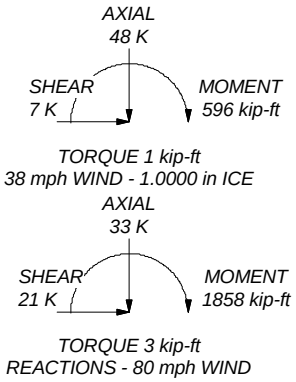

CLIMBING PEGS W/
SAFETY CLIMB
(INSTALLED–IN CONDUIT)
(6) 5/16" TO 118 FT LEVEL
(2) 1/2" TO 118 FT LEVEL
(RESERVED)
(1) 5/8" TO 118 FT LEVEL
(INSTALLED)
(3) 1–1/4" TO 118 FT LEVEL
(INSTALLED)
(1) 7/8" TO 59 FT LEVEL
(PROPOSED)
(1) 1 5/8" TO 107 FT LEVEL
(INSTALLED)
(18) 1–5/8" TO 107 FT LEVEL
(INSTALLED
(6) 7/8" TO 99 FT LEVEL
(INSTALLED)
(1) 3/8" TO 99 FT LEVEL
(2) 3/4" TO 99 FT LEVEL
(6) 7/8" TO 99 FT LEVEL
(INSTALLED)
(1) 1/2" TO 48 FT LEVEL
(INSTALLED)
(1) 1/2" TO 48 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Size	Length (ft)	Grade	Weight (K)
1	P24x1/4	30.00	A36M-42	1.9
2	P24x3/8	10.00		0.9
3	24" x 0.62517"	11.50	Reinf 33.01 ksi	1.8
4		0.50		0.1
5		4.50		0.7
6		3.50		1.0
7		3.50		1.0
8	RPS 30" x 0.5571"	11.08	Reinf 37.98 ksi	1.9
9	30" x 0.70733"	9.00	Reinf 37.95 ksi	2.0
10		2.92		0.8
11		3.50		1.3
12		3.50		1.0
13	RPS 36" x 0.6232"	5.92	Reinf 35.84 ksi	1.4
14	RPS 36" x 0.8638"	18.58	Reinf 35.84 ksi	6.0
15	RPS 36" x 0.94668"	2.00	Reinf 35.17 ksi	0.7
	RPS 36" x 0.94668"		Reinf 35.17 ksi	22.6





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVTM14-C-120 w/ Mount Pipe	118	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107
APXVTM14-C-120 w/ Mount Pipe	118	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107
APXVTM14-C-120 w/ Mount Pipe	118	KRY 112 144/1	107
TD-RRH8x20-25	118	KRY 112 144/1	107
TD-RRH8x20-25	118	KRY 112 144/1	107
TD-RRH8x20-25	118	Platform Mount [LP 712-1]	107
APXV9ERR18-C-A20 w/ Mount Pipe	118	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107
APXVSPP18-C-A20 w/ Mount Pipe	118	AM-X-CD-14-65-00T-RET w/ Mount Pipe	99
APXVSPP18-C-A20 w/ Mount Pipe	118	AM-X-CD-14-65-00T-RET w/ Mount Pipe	99
IBC1900HG-2A	118	7770.00 w/ Mount Pipe	99
IBC1900HG-2A	118	7770.00 w/ Mount Pipe	99
IBC1900HG-2A	118	7770.00 w/ Mount Pipe	99
IBC1900BB-1	118	(2) RRUS-11	99
IBC1900BB-1	118	(2) RRUS-11	99
IBC1900BB-1	118	(2) RRUS-11	99
840 10054 w/ Mount Pipe	118	DTMABP7819VG12A	99
840 10054 w/ Mount Pipe	118	DTMABP7819VG12A	99
840 10054 w/ Mount Pipe	118	DTMABP7819VG12A	99
WIMAX DAP HEAD	118	(2) LGP13519	99
WIMAX DAP HEAD	118	(2) LGP13519	99
WIMAX DAP HEAD	118	(2) LGP13519	99
(2) HORIZON COMPACT	118	DC6-48-60-18-8F	99
Platform Mount [LP 501-1]	118	Platform Mount [LP 501-1]	99
A-ANT-18G-1-C	118	(2) P65-17-XLH-RR w/ Mount Pipe	99
A-ANT-18G-2-C	118	(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	99
PCS 1900MHz 4x45W-65MHz	114	DB536	59
PCS 1900MHz 4x45W-65MHz	114	Side Arm Mount [SO 702-1]	59
800MHz 2X50W RRH W/FILTER	114	Pipe Mount [PM 601-1]	48
800MHz 2X50W RRH W/FILTER	114	GPS	48
800MHz 2X50W RRH W/FILTER	114	KS24019-L112A	48
Pipe Mount [PM 601-3]	114	Bridge Stiffener (115" x 16.5" x 1.25")	30
PCS 1900MHz 4x45W-65MHz	114		
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107		
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107		
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36M-42	42 ksi	60 ksi	Reinf 37.95 ksi	38 ksi	48 ksi
Reinf 33.01 ksi	33 ksi	42 ksi	Reinf 37.97 ksi	38 ksi	48 ksi
Reinf 32.97 ksi	33 ksi	42 ksi	Reinf 35.20 ksi	35 ksi	44 ksi
Reinf 37.81 ksi	38 ksi	48 ksi	Reinf 35.84 ksi	36 ksi	45 ksi
Reinf 33.93 ksi	34 ksi	43 ksi	Reinf 35.87 ksi	36 ksi	45 ksi
Reinf 35.21 ksi	35 ksi	45 ksi	Reinf 35.17 ksi	35 ksi	44 ksi
Reinf 37.98 ksi	38 ksi	48 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 94.9%

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FAX: 614.448.4105

Job:	***Existing 120 ft. Monopole / Mtn. View Cem. (Filley Park)***		
Project:	***PJF: 37513-2485 BP A / BU876329***		
Client: Crown Castle USA	Drawn by: Morgan Scroggy	App'd:	
Code: TIA/EIA-222-F	Date: 03/18/14	Scale: NTS	
Path: G:\TOWER\375_Crown_Castle\2013\37513-2485 BU 876329\WO 727680 BU 876329 - 770\37513-2485 BP A.eri		Dwg No. E-1	

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

Site Data

BU#: *876329*
Site Name:
App #:

Pole Manufacturer:	Rohn

Reactions		
Moment:	267.39	ft-kips
Axial:	8.2	kips
Shear:	14.18	kips
Elevation:	90	feet

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

Bolt Data			
Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	29		

Plate Data		
Diam:	32	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

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

Pole Data		
Diam:	24	in
Thick:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	21.72	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	2.018	in	
Min PL "treq" for actual **T w/ Pry**:	1.057	in	
Min PL "t1" for actual **T w/o Pry**:	1.386	in	
T allowable with Prying:	35.75	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	21.72	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	47.1%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	Rohn/Pirod,	OK	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod,	OK	Comp. Y.L. Length:
No Prying			16.28
Tension Side Stress Ratio, (treq/t)^2:	49.7%	**Pass**	

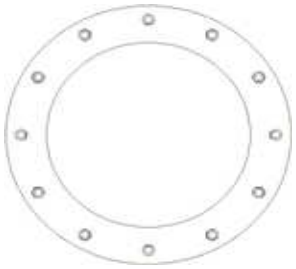
n/a

Stiffener Results N/A for Rohn / Pirod

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

Pole Results

Pole Punching Shear Check: N/A



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

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

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v4.1 - Effective 7-3-12

Date: 3/18/2014
PJF Project: 37513-2485 BP A (60' Flange)
Client Ref. # 876329
Site Name: MTN. View Cem. (Filley Park)
Description: 60' Flange
Owner: CCI
Engineer: MLS

Asymmetric Bolt Analysis

Moment =	719.52	k-ft	TIA Ref.	F		Location =	Flange Plate	
Axial =	13.79	kips	ASIF =	1.3333		η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	16.11	kips	Max Ratio =	100.0%		Threads =	N/A	for FP, Rev. G
Anchor Qty =	4							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt 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	0.000				0.0	46.19	8.00	8.00	190.39	183.49	190.39	290.77	290.77	65.5%
2	0.000				90.0	46.19	8.00	8.00	190.39	183.49	190.39	290.77	290.77	65.5%
3	0.000				180.0	46.19	8.00	8.00	190.39	183.49	190.39	290.77	290.77	65.5%
4	0.000				270.0	46.19	8.00	8.00	190.39	183.49	190.39	290.77	290.77	65.5%
								32.00						

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v2.0, Effective Date: 1-12-12

Date: 3/18/2014
Project No: 37513-2485
Site Name: Site Name
Site Number/BUN: 876329
Description: 30' Flange
Owner: CCI
Engineer: MLS

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

General Parameters and Loading:

Flange Elevation:	30.00	ft
TIA Reference Standard:	TIA/EIA-222-F	
AISC Manual:	9th Ed. (Green)	
Method:	ASD	
ASD Stress Increase, ASIF:	1.333333333	
Moment, Mf:	1246.6	k-ft
Axial, Pf:	22.0	kips
Shear, Vf:	18.8	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	30.00	36.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	47.00	47.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	4	0	
Upper Weld Length, L1:	54.25	0.00	in
Lower Weld Length, L2:	54.25	0.00	in
Weld Size, w:	0.3750	0.0000	in
Electrode:	E80	E70	
Effective Stiffener Width, Ws:	8.00	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:	0	0	degrees
Stiffener Circle:	56.00	47.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	13.00	8.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	10.00	5.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	41.00	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:	0.2396	0.0000	= e1 / L1
k:	0	0	
C:	1.2870	0.0000	Tabulated Cofficient
C1:	1.1400	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	272.8	0.0	kips
Allowable Axial, Pa:	636.7	0.0	kips = ASIF C C1 D L
Ratio:	42.8%	0.0%	

Lower Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	0	Num. of Sixteenths in Weld
a:	0.1843	0.0000	= e2 / L2
k:	0	0	
C:	1.4276	0.0000	Tabulated Cofficient
C1:	1.1400	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	272.8	0.0	kips
Allowable Axial, Pa:	706.3	0.0	kips = ASIF C C1 D L
Ratio:	38.6%	0.0%	

Pole Analysis per AISC Sect. F4:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, P:	272.8	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	2.5	0.0	kips/in= P / (2 L1)
Section Modulus, S:	981.0	0.0	in^2 = $L1^2$ / 3
Bending Stress, fb:	3.6	0.0	kips/in = P e1 / S
Combined Stress, f:	4.4	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:	52.4%	0.0%	

Lower Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, P:	272.8	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	2.5	0.0	ksi = P / (2 L2)
Section Modulus, S:	981.0	0.0	in^2 = $L2^2$ / 3
Bending Stress, fb:	2.8	0.0	ksi = P e2 / S
Combined Stress, f:	3.7	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:	44.6%	0.0%	

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

	Stiffener Type 1	
Gross Area, Ag:	10.0000	in^2
Net Area, An:	10.0000	in^2
Stiffener Axial, P:	272.8	kips
Stiffener Stress, f:	27.3	ksi = P / Ag
b:	17.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	13.6000	in
Q, Where Qa = 1.0:	0.8499	= 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:	42.07	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:	44.19	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	64.8%	

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: 42.8% PASS
Pole Analysis Ratio: 52.4% PASS
Stiffener Analysis Ratio: 64.8% PASS

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

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v4.1 - Effective 7-3-12

Date: 3/18/2014
PJF Project: 37513-2485 BP A
Client Ref. # 876329
Site Name: MTN. View CEM. (Filley Park)
Description: 120' Pole
Owner: CCI
Engineer: MLS

Asymmetric Anchor Rod Analysis

Moment =	1858	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	33.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	21.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	24							

**** 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	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
2	1.500	A354 Gr BC	109	125	22.5	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
3	1.500	A354 Gr BC	109	125	45.0	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
4	1.500	A354 Gr BC	109	125	67.5	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
5	1.500	A354 Gr BC	109	125	90.0	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
6	1.500	A354 Gr BC	109	125	112.5	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
7	1.500	A354 Gr BC	109	125	135.0	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
8	1.500	A354 Gr BC	109	125	157.5	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
9	1.500	A354 Gr BC	109	125	180.0	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
10	1.500	A354 Gr BC	109	125	202.5	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
11	1.500	A354 Gr BC	109	125	225.0	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
12	1.500	A354 Gr BC	109	125	247.5	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
13	1.500	A354 Gr BC	109	125	270.0	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
14	1.500	A354 Gr BC	109	125	292.5	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
15	1.500	A354 Gr BC	109	125	315.0	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
16	1.500	A354 Gr BC	109	125	337.5	41.00	0.00	1.77	81.25	78.45	78.45	0.00	97.19	80.7%
17	1.375	Williams R71	127.7	150	33.8	49.88	0.00	1.68	93.56	90.91	90.91	100.00	100.00	90.9%
18	1.375	Williams R71	127.7	150	56.3	49.88	0.00	1.68	93.56	90.91	90.91	100.00	100.00	90.9%
19	1.375	Williams R71	127.7	150	123.8	49.88	0.00	1.68	93.56	90.91	90.91	100.00	100.00	90.9%
20	1.375	Williams R71	127.7	150	146.3	49.88	0.00	1.68	93.56	90.91	90.91	100.00	100.00	90.9%
21	1.375	Williams R71	127.7	150	213.8	49.88	0.00	1.68	93.56	90.91	90.91	100.00	100.00	90.9%
22	1.375	Williams R71	127.7	150	236.3	49.88	0.00	1.68	93.56	90.91	90.91	100.00	100.00	90.9%
23	1.375	Williams R71	127.7	150	303.8	49.88	0.00	1.68	93.56	90.91	90.91	100.00	100.00	90.9%
24	1.375	Williams R71	127.7	150	326.3	49.88	0.00	1.68	93.56	90.91	90.91	100.00	100.00	90.9%
								41.70						

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

TIA Rev F

Site Data

BU#:	*876329*
Site Name:	*MTN View CEM (Filley Park*
App #:	
Pole Manufacturer:	*Other*

Reactions			**Moment adjusted to account for post installed anchor rods.**
Moment:	1098.6292	ft-kips	
Axial:	31	kips	
Shear:	23	kips	

Anchor Rod Data		
Qty:	16	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	41	in

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

Anchor Rod Results

			Stiffened
Maximum Rod Tension:	78.5	Kips	Service, ASD
Allowable Tension:	97.2	Kips	Fty*ASIF
Anchor Rod Stress Ratio:	80.7%	**Pass**	

Plate Data		
Diam:	47	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.07	in

Base Plate Results Flexural Check

			Stiffened
Base Plate Stress:	25.9	ksi	Service, ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	72.0%	**Pass**	Y.L. Length: N/A, Roark

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:	0.5	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.75	in
Fillet V. Weld:	0.375	in
Width:	5.5	in
Height:	20.5	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Stiffener Results

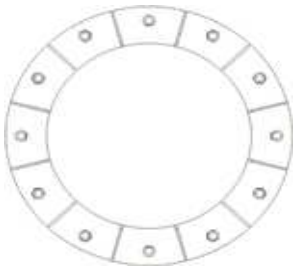
Horizontal Weld :	37.9%	**Pass**
Vertical Weld:	19.4%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	5.6%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	38.2%	**Pass**
Plate Comp. (AISC Bracket):	35.7%	**Pass**

Pole Results

Pole Punching Shear Check:	6.9%	**Pass**

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	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

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

Job Number: \ **Page:** 1
Site Number: 876329 **By:** MLS
Site Name: MTN. View CEM. (Filley Park) **Date:** 3/18/2014

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	1858.0		k-ft
Shear, V =	21.0		kips
Axial Load, P =	33.0		kips
OTM =	1868.5	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DP
ACI Code =	ACI 318-02
Seismic Design Category =	D
Reference Standard =	TIA/EIA-222-F
Use 1.3 Load Factor?	Yes
Load Factor =	1.30

Drilled Pier Parameters

Diameter =	6	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	25	ft
fc' =	3	ksi
εc =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA/EIA-222-F

1. Ult. Skin Friction/2.00 + Ult. End Bearing/2.00
 + Effective Soil Wt. - Buoyant Conc. Wt. ≥ Comp.
2. Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 ≥ Uplift
3. Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 ≥ Uplift

Steel Parameters

Number of Bars =	24	
Rebar Size =	#9	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#5	
Side Clear Cover to Ties =	3	in

Soil Parameters

Water Table Depth =	15.00	ft
Depth to Ignore Soil =	3.00	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Direct Embed Pole Shaft Parameters

Dia @ Grade =		in
Dia @ Depth Below Grade =		in
Number of Sides =		
Thickness =		in
Fy =		ksi
Backfill Condition =		

Maximum Capacity Ratios

Maximum Soil Ratio =	100.0%
Maximum Steel Ratio =	100.0%

Define Soil Layers

Note: Cohesion = Undrained Shear Strengh = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	15	135		36	Sand	8000			15
2	15	137.4		36	Sand	8000			30
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	17.62	ft, from Grade	Shear, V =	21.00	kips
Bending Moment, M =	2238.61	k-ft, from COR	Resisting Shear, Va =	59.83	kips
Resisting Moment, Ma =	6377.51	k-ft, from COR			

MOMENT RATIO = 35.1% OK **SHEAR RATIO = 35.1% OK**

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	72.40	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	33.00	kips
Allowable Comp. Cap., Ca =	101.05	kips

COMPRESSION RATIO = 32.7% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	13.57	sq in	Axial Load, P =	56.33	kips @ 5.00 ft Below Grade
Actual Steel Area =	24.00	sq in	Moment, M =	1961.45	k-ft @ 5.00 ft Below Grade
			Allowable Moment, Ma =	2568.55	k-ft
Allowable Min Axial, Pa =	-996.92	kips, Where Ma = 0 k-ft			
Allowable Max Axial, Pa =	4704.45	kips, Where Ma = 0 k-ft			

MOMENT RATIO = 76.4% OK

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876329*
Site Name: *MTN. View CEM. (Filley Park)*
App #:

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties

Concrete:

Pier Diameter =	6.0	ft
Concrete Area =	4071.5	in^2

Reinforcement:

Clear Cover to **Tie**=	3.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	5.30	ft
Vert. Cage Diameter =	63.62	in
Vertical Bar Size =	9	
Bar Diameter =	1.13	in
Bar Area =	1	in^2
Number of Bars =	24	
As Total=	24	in^2
A s/ Aconc, Rho:	0.0059	0.59%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:
(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.59%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	6115.79	kips
at Mu=(ϕ=0.65)Mn=	3187.43	ft-kips
Max Tu, (φ=0.9) Tn =	1296	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	1961.45	ft-kips **(* Note)**
Max. Service Shaft P:	56.33	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	**Shaft Factored Loads**		
1.30	Mu:	2549.885	ft-kips
1.30	Pu:	73.229	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code=	2002	

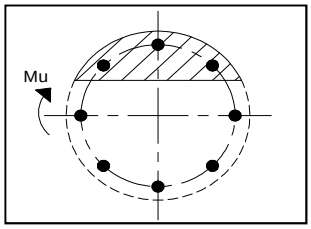
Seismic Properties

Seismic Design Category =	D	
Seismic Risk =	**High**	

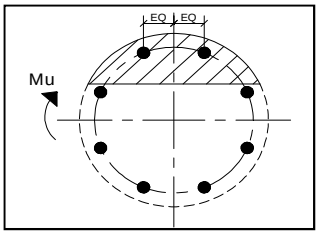
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**12.09**	in
Extreme Steel Strain, ϵt:	**0.0138**	
	ϵt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	73.23	kips
Drilled Shaft Moment Capacity, φMn:	**3339.12**	ft-kips
Drilled Shaft Superimposed Mu:	**2549.89**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**76.4%**

37513-2485 A PERMIT.DWG

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #876329: MTN. VIEW CEM.

APP: 217352 REV. 1; WO: 727680

SITE ADDRESS

28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.

2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

4. (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

   (B.) EFFECTIVE 5/30/2012: UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-NUT" METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI. PRIOR TO STARTING WORK, CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.

   (C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED ['NON-TC'] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. **THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION.** THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.

PROJECT CONTACTS:

MONOPOLE OWNER:
CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
CONTACT: STEVE TUTTLE
PH: (585) 899-3445

STRUCTURAL ENGINEER OF RECORD (EOR):
PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 600
COLUMBUS, OHIO 43215-3708
CONTACT: MORGAN SCROGGY AT MSCROGGY@PJFWEB.COM
PHONE: 614-221-6679

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH (3-SEC GUST) WITH NO ICE, 38 MPH WITH 1 INCH ICE AND 60 MPH SERVICE LOADS, EXPOSURE CATEGORY C.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-2485 A), DATED 3-18-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

FLANGE BRIDGE STIFFENERS
FIELD WELDED STIFFENERS

SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2	GENERAL NOTES
S-3	MONOPOLE PROFILE
S-4	BASE PLATE DETAILS
S-5	BRIDGE STIFFENER DETAILS
S-6	MI CHECKLIST

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
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CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3449

BU #876329: MTN. VIEW CEM.
BLOOMFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-2485 A
DRAWN BY: S.S.
CHECKED BY: M.L.S.
APPROVED BY:
DATE: 3-18-2014

ISSUE DATE OF PERMIT: 3-18-2014

T-1

CROWN CASTLE PROJECT: BU #876329: MTN. VIEW CEM.; BLOOMFIELD, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

A. GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
2. THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT".
5. THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
6. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
7. ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

B. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
2. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
   (A.) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
   (B.) THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.

A. GENERAL:
   (1.) PERFORM CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.

B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)

C. CONCRETE TESTING PER ACI - (NOT REQUIRED)

D. STRUCTURAL STEEL
   (1.) CHECK THE STEEL ON THE JOB WITH THE PLANS.
   (2.) CHECK MILL CERTIFICATIONS.
   (3.) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
   (4.) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
   (5.) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
   (6.) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
   (7.) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
   (8.) CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.

E. WELDING:
   (1.) VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
   (2.) INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
   (3.) APPROVE FIELD WELDING SEQUENCE.
      (A.) A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
   (4.) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
      (A.) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
      (B.) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
      (C.) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
      (D.) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
      (E.) SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
      (F.) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
      (G.) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
      (H.) REVIEW THE REPORTS BY TESTING LABS.
      (I.) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
      (J.) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
      (K.) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.

F. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS: - (NOT REQUIRED)

G. REPORTS:
   (1.) COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.

6. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
7. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
8. RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

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BU #876329: MTN. VIEW CEM.
BLOOMFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-2485 A
DRAWN BY: S.S.
CHECKED BY: M.L.S.
APPROVED BY:
DATE: 3-18-2014

ISSUE DATE OF PERMIT: 3-18-2014

S-1

D. STRUCTURAL STEEL

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:

A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (**AISC**):
   (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
   (B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
   (C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).

B. BY THE AMERICAN WELDING SOCIETY (**AWS**):
   (A.) "STRUCTURAL WELDING CODE - STEEL D1.1."
   (B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"

2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
   (A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
   (B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
   (C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT - (NOT REQUIRED)

F. FOUNDATION WORK - (NOT REQUIRED)

G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)

H. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)

I. TOUCH UP OF GALVANIZING

1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. **GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.**
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

J. HOT DIP GALVANIZING

1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. **ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.**
3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. **PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT.** ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

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APPROVED BY:	S-2
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37513-2485 A PERMIT.DWG

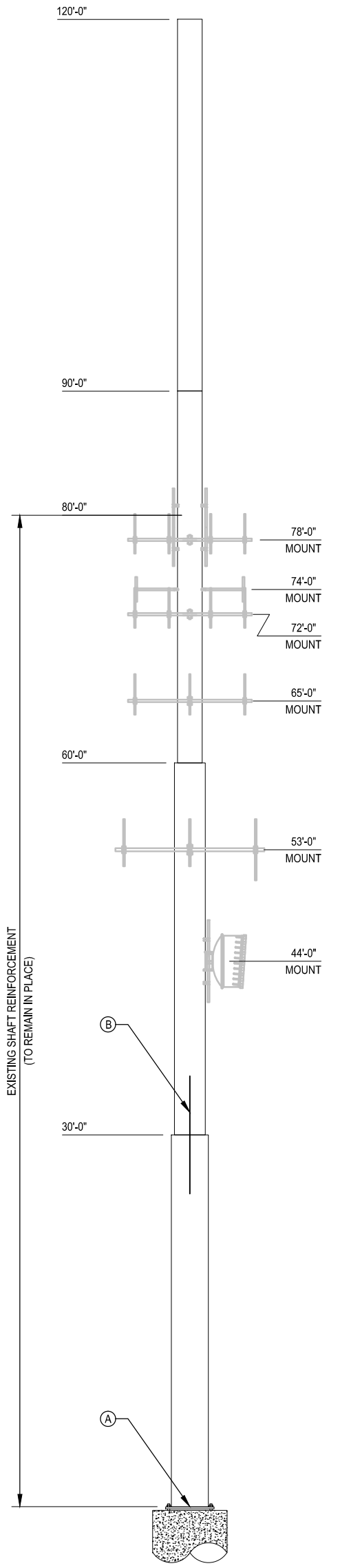
POLE SPECIFICATIONS	
POLE SHAPE TYPE:	ROUND
TAPER:	N/A
SHAFT STEEL:	A36M-42
BASE PL STEEL:	A36
ANCHOR RODS:	1 1/2"ø ASTM A354

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	30.00	0.2500		24.000	24.000
2	30.00	0.3750		24.000	24.000
3	30.00	0.3750		30.000	30.000
4	30.00	0.3750		36.000	36.000
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES					

MODIFICATIONS:

(A) REINFORCE EXISTING STIFFENERS AT BASE PLATE. SEE SHEET S-4.

(B) INSTALL NEW BRIDGE STIFFENERS AT EL. 30'-0". SEE SHEET S-5.



POLE ELEVATION 1 / S-3

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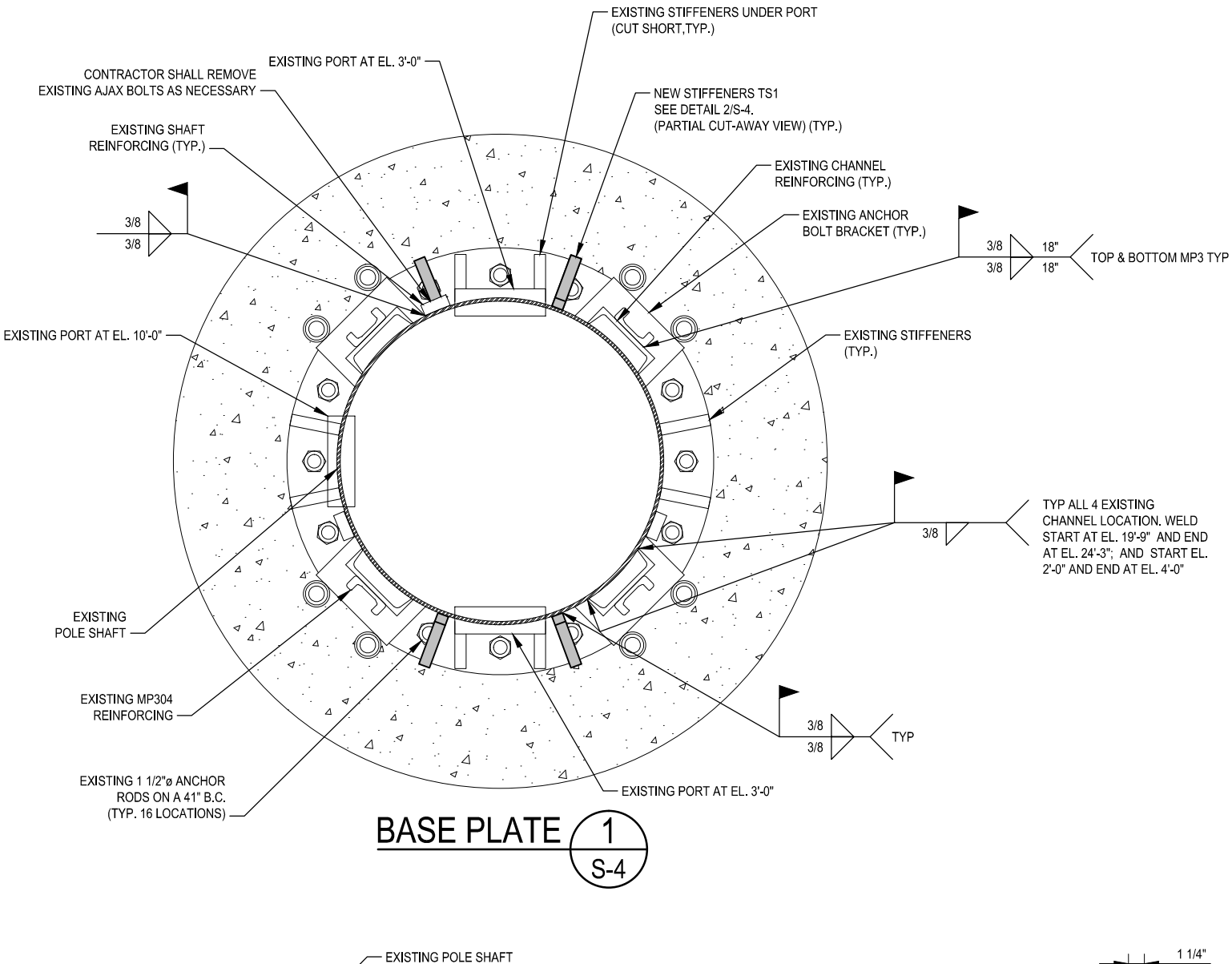
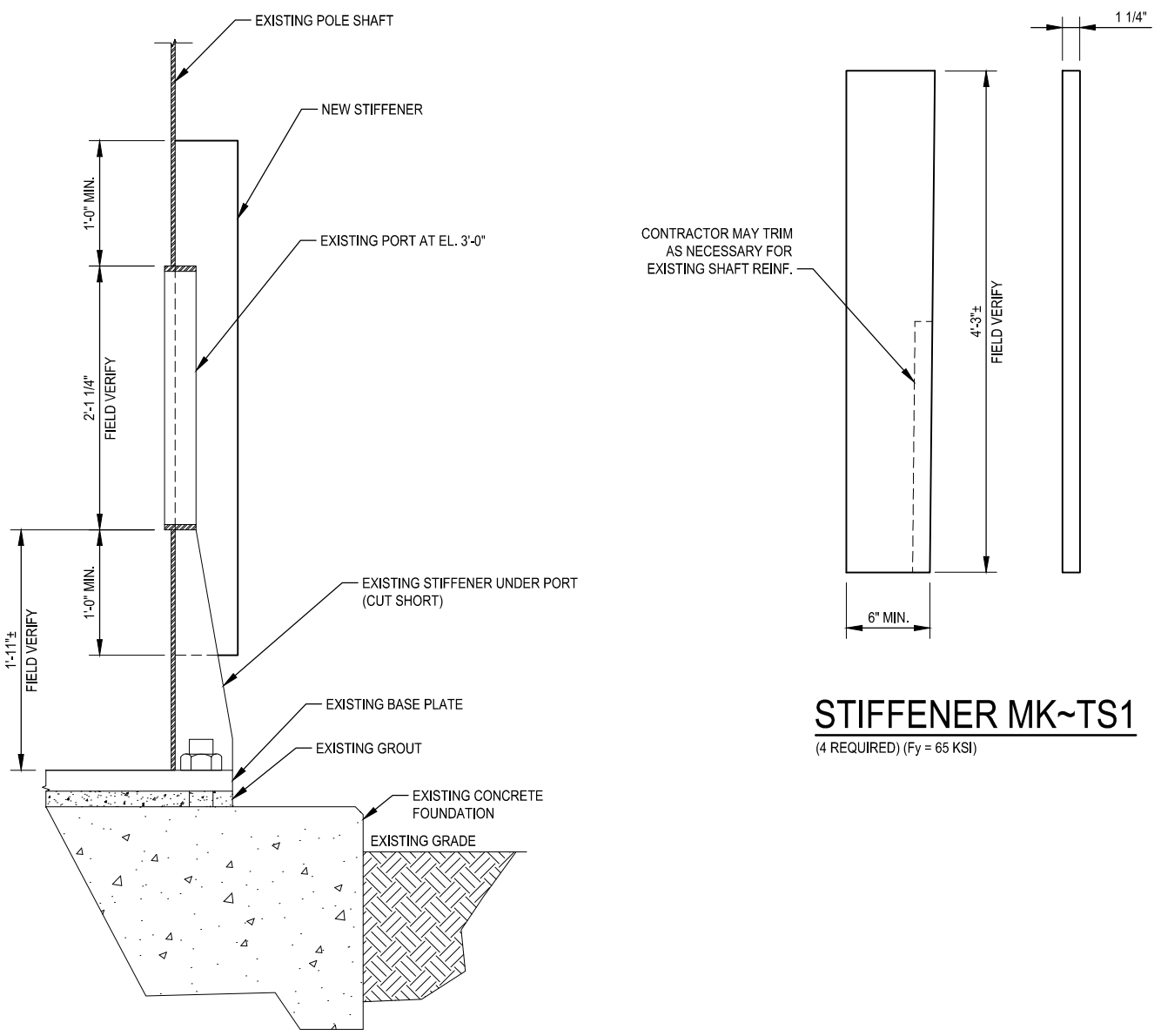
37513-2485 A PERMIT.DWG



BASE PLATE 1 / S-4



NEW STIFFENERS DETAIL 2 / S-4

STIFFENER MK~TS1

(4 REQUIRED) (Fy = 65 KSI)

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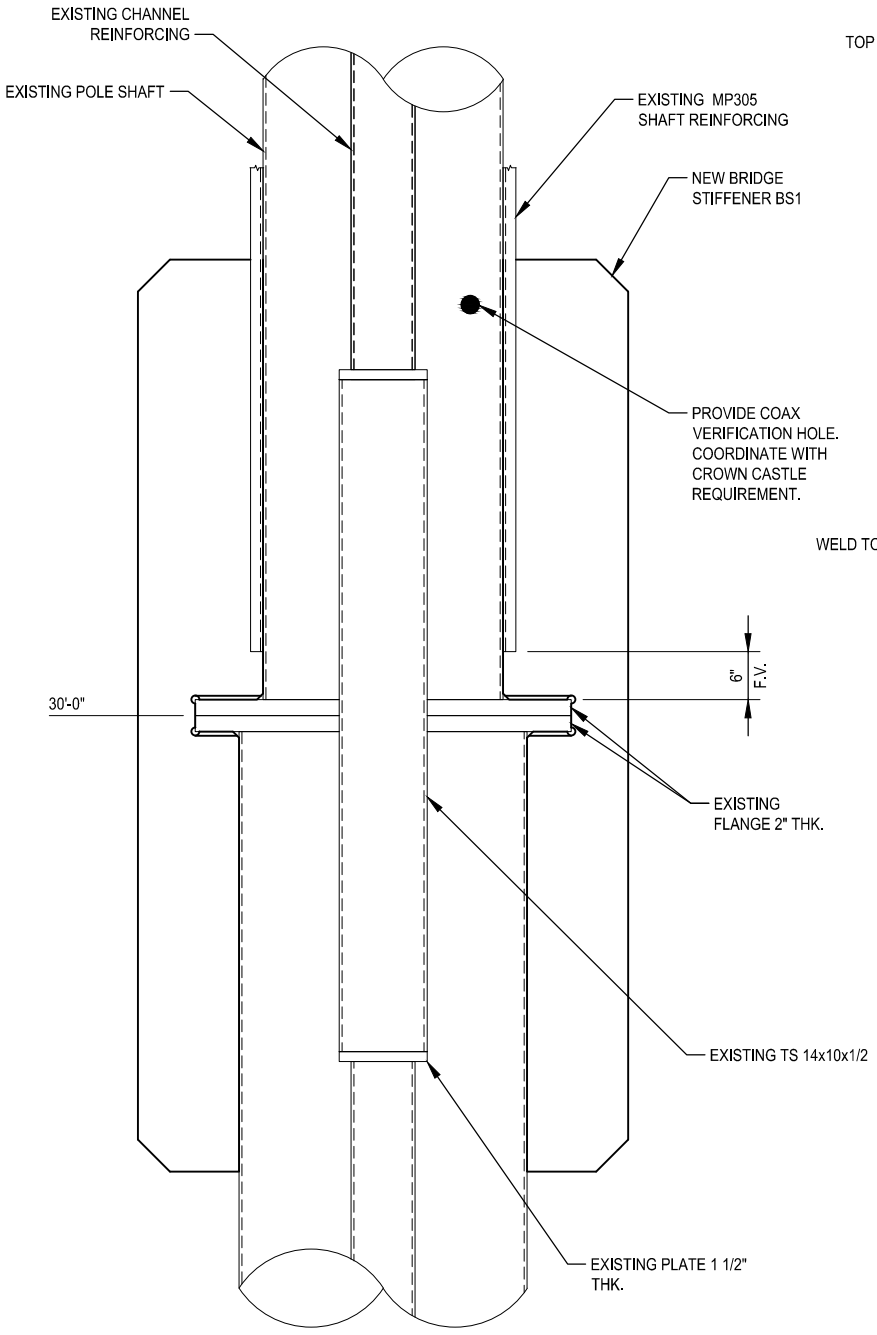
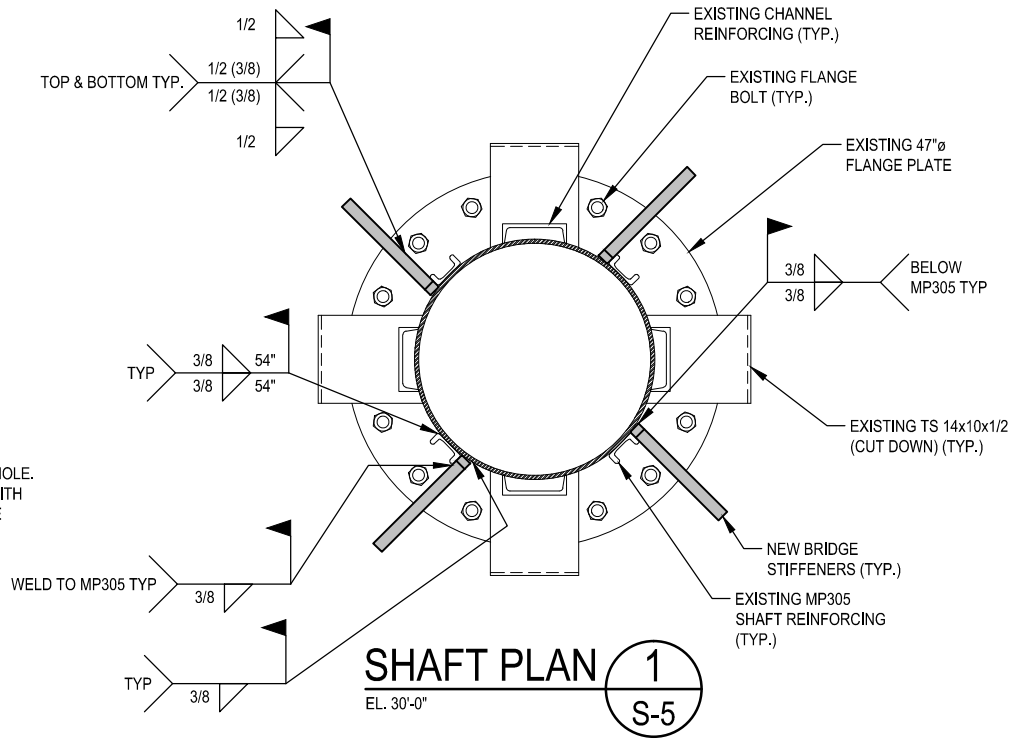
S-4

37513-2485 A PERMIT.DWG



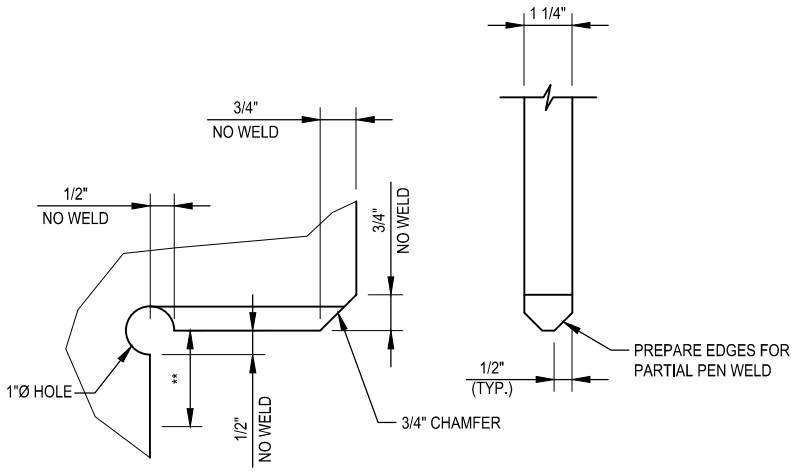
PARTIAL ELEVATION 1/S-5

EL. 30'-0"



SHAFT PLAN 1/S-5

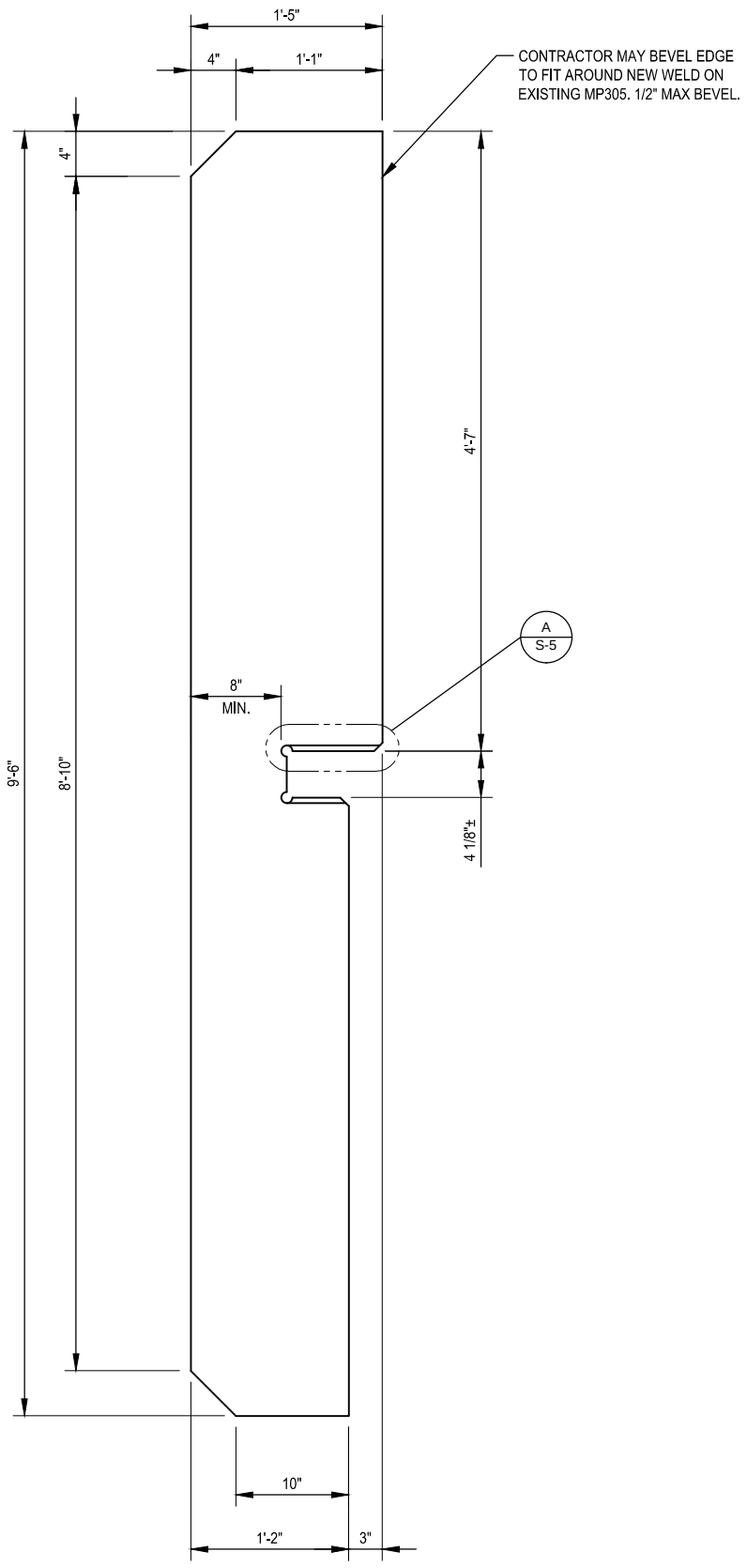
EL. 30'-0"



** NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS

DETAIL A

(TYPICAL)



BRIDGE STIFFENER MK~BS1

(4 REQUIRED) (Fy = 65 KSI)

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MODIFICATION INSPECTION NOTES:

GENERAL
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS..

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR
THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR
THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AN DENG-SOW-10007.

RECOMMENDATIONS
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI
IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S
IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI (ïFAILED MIî), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS
CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR ïPASS AS NOTED MIî REPORT FOR THE ORIGINAL PROJECT.

PHOTOGRAPHS
BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN REQUIREMENTS
NA	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	THIRD PARTY ONSITE BOLT INSPECTION REPORT
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
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CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3449

BU #876329: MTN. VIEW CEM.
BLOOMFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-2485 A
DRAWN BY: S.S.
CHECKED BY: M.L.S.
APPROVED BY:
DATE: 3-18-2014

ISSUE DATE OF PERMIT: 3-18-2014

S-6

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #876329: MTN. VIEW CEM.

APP: 217352 REV. 1; WO: 727680

SITE ADDRESS

28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.

2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

4. (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

   (B.) EFFECTIVE 5/30/2012: UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-NUT" METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI. PRIOR TO STARTING WORK, CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.

   (C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED ['NON-TC'] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. **THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION.** THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.

PROJECT CONTACTS:

MONOPOLE OWNER:
CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
CONTACT: STEVE TUTTLE
PH: (585) 899-3445

STRUCTURAL ENGINEER OF RECORD (EOR):
PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 600
COLUMBUS, OHIO 43215-3708
CONTACT: MORGAN SCROGGY AT MSCROGGY@PJFWEB.COM
PHONE: 614-221-6679

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH (3-SEC GUST) WITH NO ICE, 38 MPH WITH 1 INCH ICE AND 60 MPH SERVICE LOADS, EXPOSURE CATEGORY C.

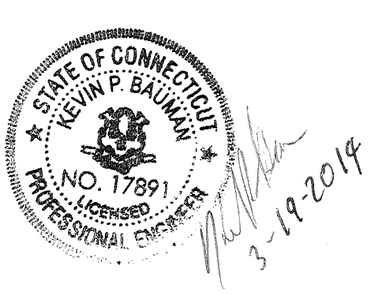
REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-2485 A), DATED 3-18-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

FLANGE BRIDGE STIFFENERS
FIELD WELDED STIFFENERS

SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2	GENERAL NOTES
S-3	MONOPOLE PROFILE
S-4	BASE PLATE DETAILS
S-5	BRIDGE STIFFENER DETAILS
S-6	MI CHECKLIST



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CROWN CASTLE PROJECT: BU #876329: MTN. VIEW CEM.; BLOOMFIELD, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

A. GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
2. THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY "CUTTING AND WELDING PLAN" (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT".
5. THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
6. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
7. ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM; THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

B. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
2. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
   (A.) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
   (B.) THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.

A. GENERAL:
   (1.) PERFORM CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.

B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)

C. CONCRETE TESTING PER ACI - (NOT REQUIRED)

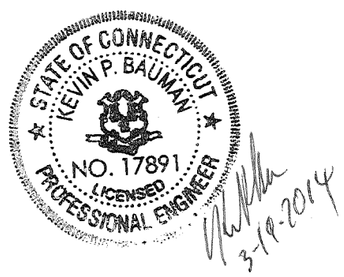
D. STRUCTURAL STEEL
   (1.) CHECK THE STEEL ON THE JOB WITH THE PLANS.
   (2.) CHECK MILL CERTIFICATIONS.
   (3.) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
   (4.) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
   (5.) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
   (6.) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
   (7.) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
   (8.) CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.

E. WELDING:
   (1.) VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
   (2.) INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
   (3.) APPROVE FIELD WELDING SEQUENCE.
      (A.) A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
   (4.) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
      (A.) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
      (B.) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
      (C.) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
      (D.) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
      (E.) SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
      (F.) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
      (G.) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
      (H.) REVIEW THE REPORTS BY TESTING LABS.
      (I.) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
      (J.) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
      (K.) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.

F. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS: - (NOT REQUIRED)

G. REPORTS:
   (1.) COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.

6. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
7. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
8. RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.



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D. STRUCTURAL STEEL

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:

A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
   (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
   (B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
   (C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).

B. BY THE AMERICAN WELDING SOCIETY (AWS):
   (A.) "STRUCTURAL WELDING CODE - STEEL D1.1."
   (B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"

2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
   (A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
   (B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
   (C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT - (NOT REQUIRED)

F. FOUNDATION WORK - (NOT REQUIRED)

G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)

H. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)

I. TOUCH UP OF GALVANIZING

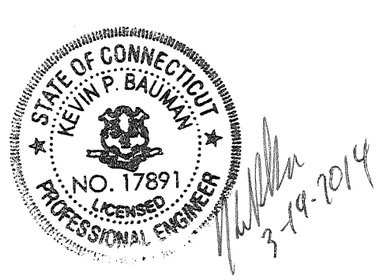
1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. **GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.**
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

J. HOT DIP GALVANIZING

1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. **ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.**
3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. **PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT.** ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".



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CROWN CASTLE
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PH: (585) 899-3445 FAX: (585) 899-3449

BU #876329: MTN. VIEW CEM. BLOOMFIELD, CT

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-2485 A	ISSUE DATE OF PERMIT: 3-18-2014
DRAWN BY: S.S.	
CHECKED BY: M.L.S.	
APPROVED BY: BKK	S-2
DATE: 3-18-2014	

37513-2485 A PERMIT.DWG

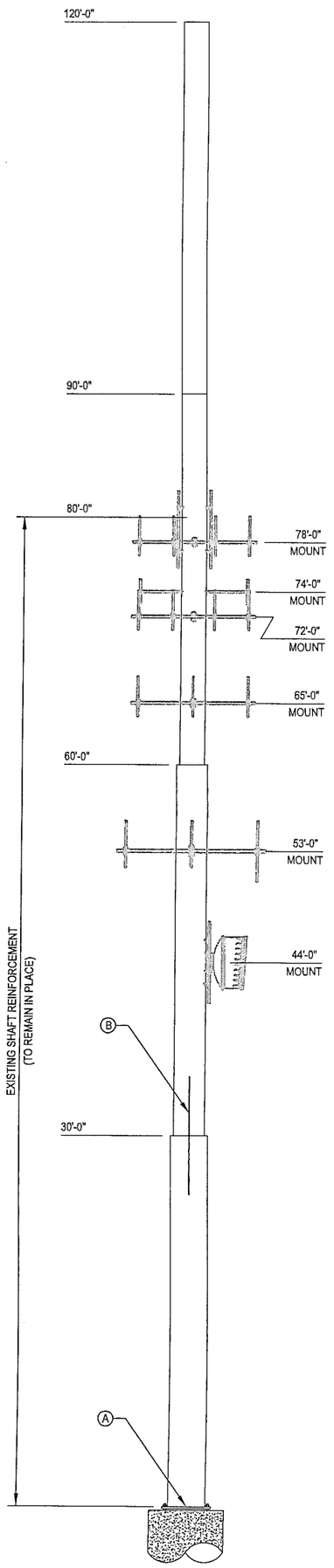
POLE SPECIFICATIONS	
POLE SHAPE TYPE:	ROUND
TAPER:	N/A
SHAFT STEEL:	A36M-42
BASE PL STEEL:	A36
ANCHOR RODS:	1 1/2"ø ASTM A354

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	30.00	0.2500		24.000	24.000
2	30.00	0.3750		24.000	24.000
3	30.00	0.3750		30.000	30.000
4	30.00	0.3750		36.000	36.000
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES					

MODIFICATIONS:

(A) REINFORCE EXISTING STIFFENERS AT BASE PLATE. SEE SHEET S-4.

(B) INSTALL NEW BRIDGE STIFFENERS AT EL. 30'-0". SEE SHEET S-5.



POLE ELEVATION 1 / S-3

STATE OF CONNECTICUT
KEVIN P. BAUMAN
NO. 17891
LICENSED PROFESSIONAL ENGINEER
3-19-2014

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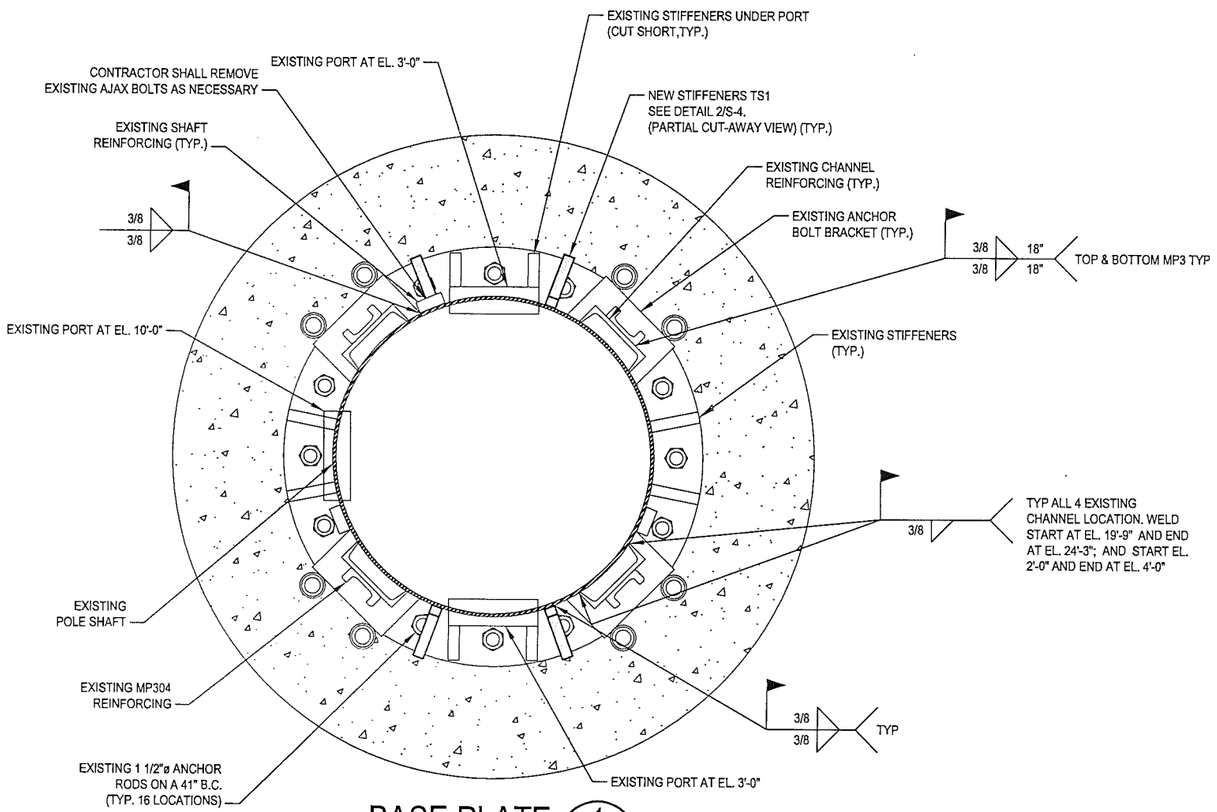
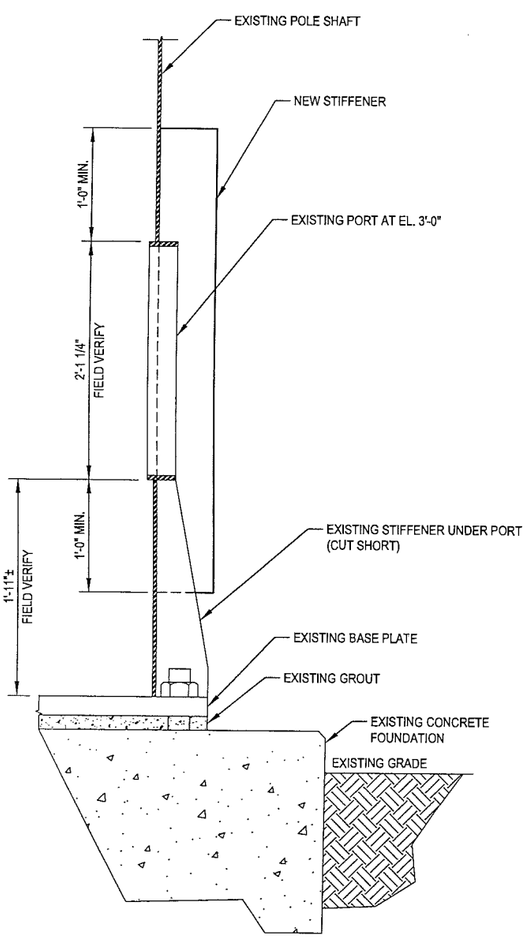
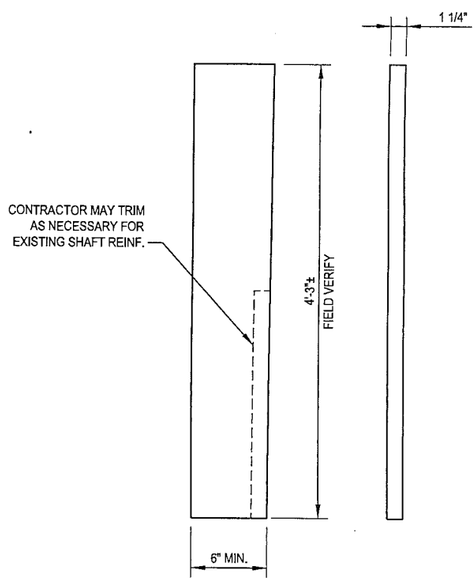
APPROVED BY: BKK	S-3
DATE: 3-18-2014	



BASE PLATE 1 / S-4



NEW STIFFENERS DETAIL 2 / S-4



STIFFENER MK~TS1

(4 REQUIRED) (Fy = 65 KSI)

STATE OF CONNECTICUT
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3-14-2014

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BLOOMFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

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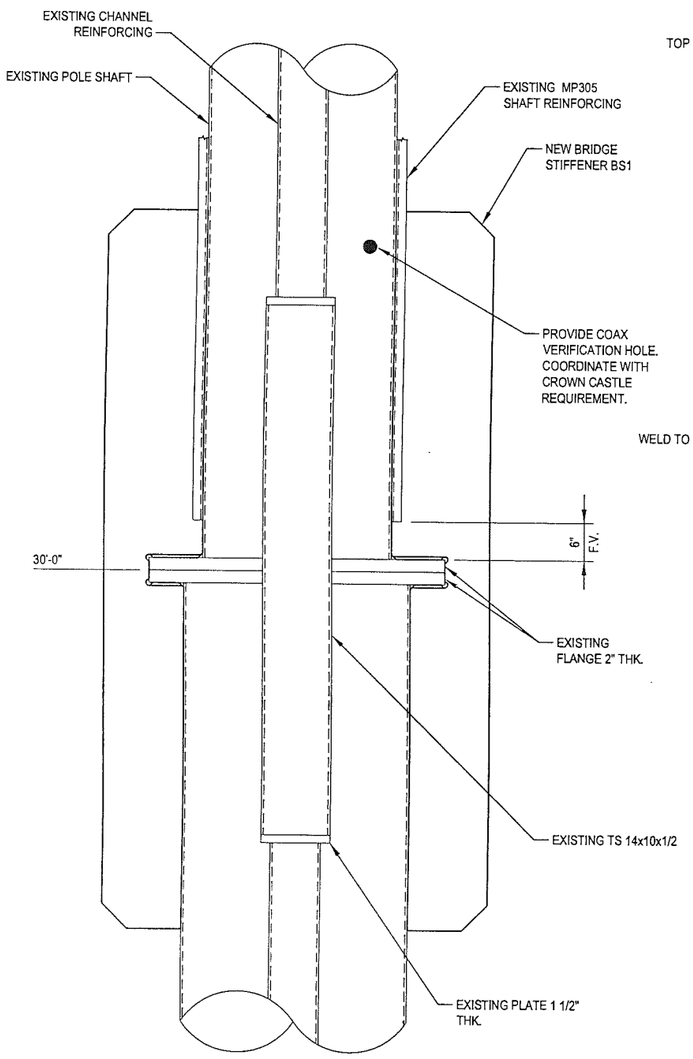
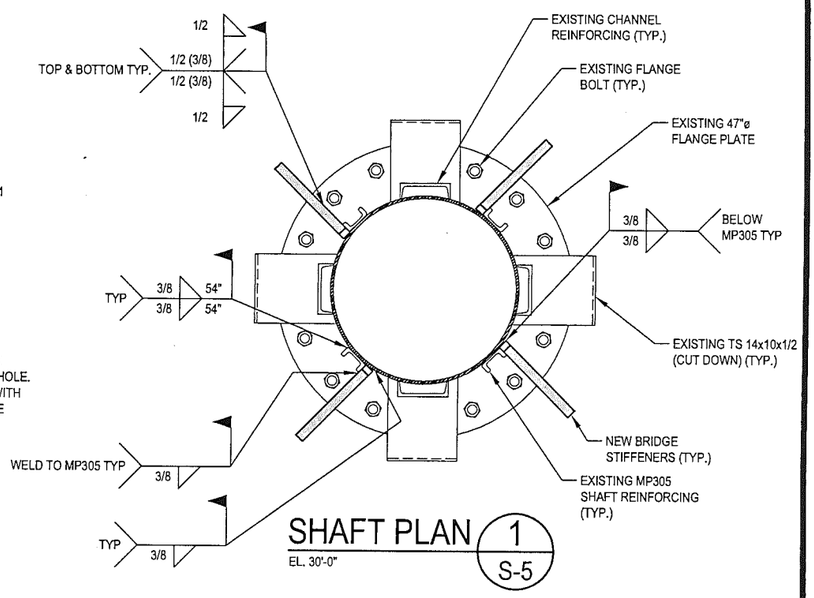
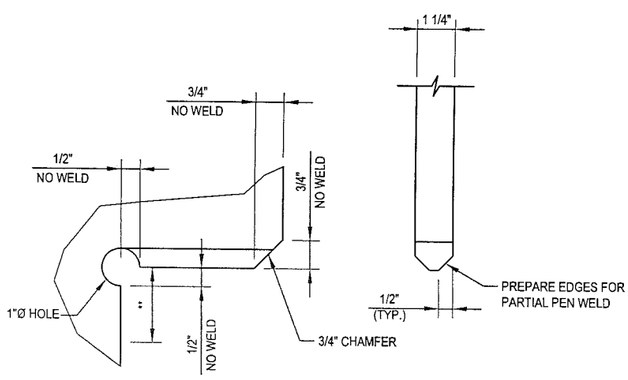
APPROVED BY: BKK	S-4
DATE: 3-18-2014	



PARTIAL ELEVATION 1 / S-5
EL. 30'-0"

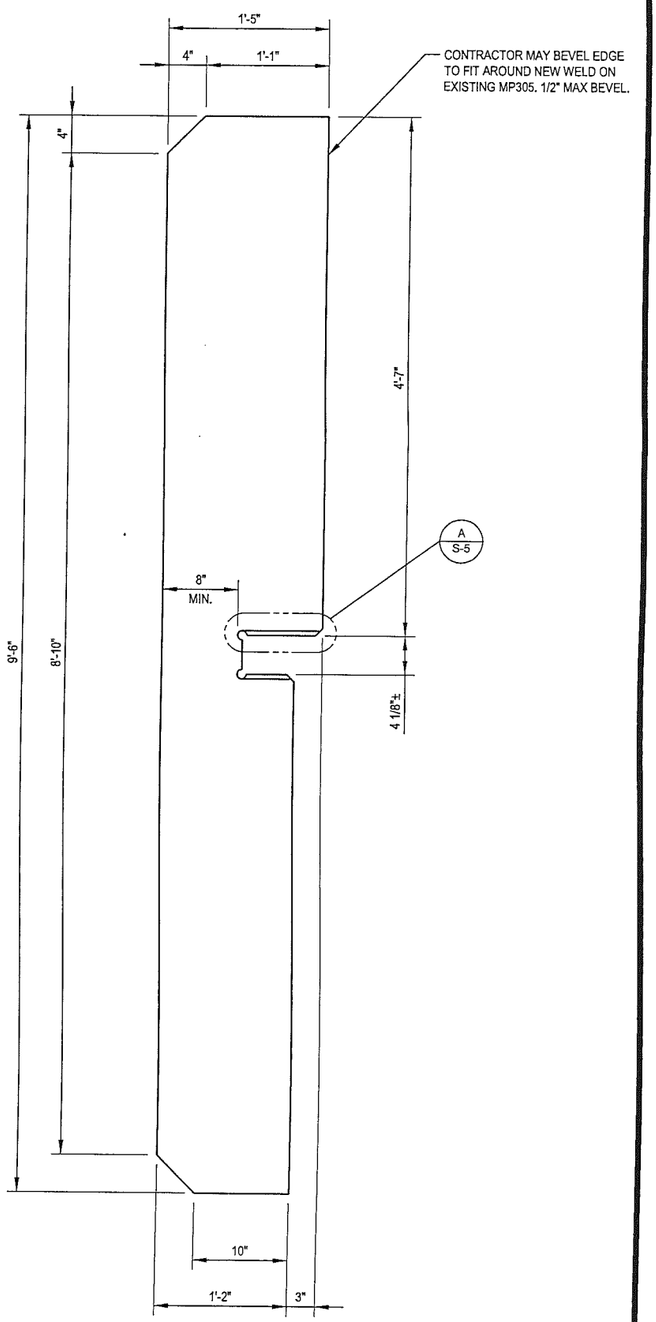


SHAFT PLAN 1 / S-5
EL. 30'-0"

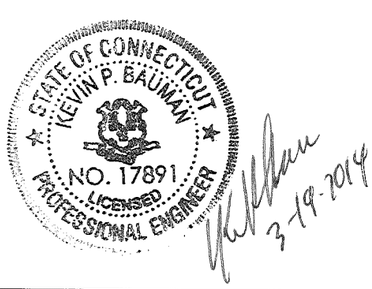


** NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS

DETAIL A
(TYPICAL)



BRIDGE STIFFENER MK~BS1
(4 REQUIRED) (Fy = 65 KSI)



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BU #876329: MTN. VIEW CEM.
BLOOMFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-2485 A	ISSUE DATE OF PERMIT: 3-18-2014
DRAWN BY: S.S.	
CHECKED BY: M.L.S.	
APPROVED BY: BKP	S-5
DATE: 3-18-2014	

MODIFICATION INSPECTION NOTES:

GENERAL
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS..

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR
THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR
THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AN DENG-SOW-10007.

RECOMMENDATIONS
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI
IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S
IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS
CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOGRAPHS
BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS. PLEASE REFER TO ENG-SOW-10007.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
	PRE-CONSTRUCTION
X	MI CHECKLIST DRAWINGS
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
	CONSTRUCTION
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN REQUIREMENTS
NA	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
	POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	THIRD PARTY ONSITE BOLT INSPECTION REPORT
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

STATE OF CONNECTICUT
KEVIN P. BAUMAN
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PROFESSIONAL ENGINEER
3-19-2014

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EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11278A

Bloomfield Downtown

28 Brewer Street
Bloomfield, CT 06002

April 3, 2014

EBI Project Number: 62142009

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

EBI Consulting
environmental | engineering | due diligence

April 3, 2014

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

Re: Emissions Values for Site: **CT11278A - Bloomfield Downtown**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 28 Brewer Street, Bloomfield, CT, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 28 Brewer Street, Bloomfield, 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 **108 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	CT11278A - Bloomfield Downtown
Site Addresss	28 Brewer Street, Bloomfield, CT 06002
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	108	102	None	0	0	48.326044	1.669886	0.16699%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	108	102	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	108	102	1-5/8"	0	0	24.163022	0.834943	0.08349%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	108	102	1-5/8"	0	0	24.163022	0.834943	0.08349%
														Sector total Power Density Value:		0.334%	

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	108	102	None	0	0	48.326044	1.669886	0.16699%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	108	102	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	108	102	1-5/8"	0	0	24.163022	0.834943	0.08349%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	108	102	1-5/8"	0	0	24.163022	0.834943	0.08349%
														Sector total Power Density Value:		0.334%	

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	108	102	None	0	0	48.326044	1.669886	0.16699%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	108	102	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	108	102	1-5/8"	0	0	24.163022	0.834943	0.08349%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	108	102	1-5/8"	0	0	24.163022	0.834943	0.08349%
														Sector total Power Density Value:		0.334%	

Site Composite MPE %

Carrier	MPE %
T-Mobile	1.002%
Verizon Wireless	28.700%
AT&T	40.740%
Clearwire	1.330%
Sprint	12.100%
Town	3.410%
Total Site MPE %	**87.282%**

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Summary

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

The anticipated Maximum Composite contributions from the T-Mobile facility are **1.002% (0.334% 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 **87.282%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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