Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

November 23, 2015

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

RE: **Notice of Exempt Modification for T-Mobile/L700 Crown Site BU: 881533**
Customer Site ID: CT11428A
75 Roberts Road, Groton, CT 06340
Latitude: 41° 21' 36.8" / Longitude: -72° 2' 55.1"

Dear Ms. Bachman:

T-Mobile currently maintains 9 antennas at the 126 - foot level of the existing 145-foot monopole at 75 Roberts Road, Groton, CT. The tower is owned by Crown Castle. The property is owned by Crown Castle. T-Mobile now intends to install three (3) new antennas and three (3) new RRU's. These antennas would be installed at the 126- foot level of the tower.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Rita M. Schmidt, Mayor for the Town of Groton of Groton, as well as the property owner and the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that 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: Kimberly Myl

Sincerely,

Kimberly Myl
Real Estate Specialist
1200 MacArthur Boulevard, Suite 200, Mahwah, New Jersey 07430
201-236-9069
kimberly.myl@crowncastle.com

Attachments:

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: Rita M. Schmidt, Mayor
Town of Groton
12 Bank Street
Mystic, CT 06355

Crown Castle (Both Property Owner and Tower Owner)
1200 MacArthur Boulevard
Suite 200
Mahwah, New Jersey 07430

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11428A
CROWN CASTLE BU #: 881533
SITE NAME: GROTON TOWER
75 ROBERTS ROAD
GROTON, CT 06340
NEW LONDON COUNTY

VICINITY MAP

FROM PARSIPPANY, NJ:

DEPART SYLVAN WAY AND TAKE I-287 N TOWARD ALBANY. USE THE RIGHT 2 LANES TO MERGE ONTO I-287 E/I-87 S TOWARD TAPPAN ZEE BR. STAY ON I-287 E AND FOLLOW SIGNS FOR WHITE PLAINS. KEEP LEFT TO STAY ON I-287 E. MERGE ONTO I-95 N. STAY ON I-95 N, FOLLOW SIGNS FOR NEW LONDON/PROVIDENCE. TAKE EXIT 88 FOR CT-117 TOWARD NOANK/GROTON LONG POINT. TURN LEFT ONTO CT-117 N. USE THE RIGHT LANE TO TAKE THE RT 95 S RAMP TO NEW LONDON. MERGE ONTO I-95 S. SITE WILL BE ON THE RIGHT.

ENGINEER
DEWBERRY ENGINEERS INC.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054

CONTACT: BRYAN HUFF
PHONE #: (973) 576-0147

CONSTRUCTION
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CONTACT: PATRICIA PELON
PHONE #: (518) 373-3507

CONSULTANT TEAM

SITE NAME:
GROTON TOWER

SITE NUMBER:
CT11428A

TOWER OWNER:
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

APPLICANT/DEVELOPER:
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

COORDINATES:
LATITUDE: 41°-21'-36.8" N (NAD83)
LONGITUDE: 72°-02'-55.1" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
702Cu

PROJECT SUMMARY

SITE ADDRESS:
75 ROBERTS ROAD
GROTON, CT 06340
NEW LONDON COUNTY

PROJECT DIRECTORY

- INSTALL (3) NEW ANTENNAS.
- INSTALL (3) NEW RRU'S.

SCOPE OF WORK

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

A.D.A. COMPLIANCE:
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
C-1	COMPOUND PLAN & EQUIPMENT PLANS
C-2	ANTENNA LAYOUTS & ELEVATIONS
C-3	CONSTRUCTION DETAILS
E-1	GROUNDING NOTES & DETAILS

SHEET INDEX

T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11428A
GROTON TOWER

CONSTRUCTION DRAWINGS

0	11/16/15	ISSUED AS FINAL

Dewberry
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT · JIANG YU · NO. 28223 · LICENSED PROFESSIONAL ENGINEER
JIANG YU
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074623
SITE ADDRESS:	

75 ROBERTS ROAD
GROTON, CT 06340
NEW LONDON COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – CROWN CASTLE
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T–MOBILE
   OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF PROJECT MANAGEMENT.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
9. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
10. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
14. CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
15. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
16. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
17. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

1. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:
   A) FALL PROTECTION
   B) CONFINED SPACE
   C) ELECTRICAL SAFETY
   D) TRENCHING & EXCAVATION.
3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
6. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T–MOBILE SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPACTION NOTES.
11. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
5. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
6. CABLES SHALL NOT BE ROUTED THROUGH LADDER–STYLE CABLE TRAY RUNGS.
7. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
8. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
9. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
10. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
11. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL.) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
13. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
14. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
15. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
16. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
17. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
18. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
19. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
20. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
21. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
22. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
23. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
26. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. WIREWAYS SHALL BE EPOXY–COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
28. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
29. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED, OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
30. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
31. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
32. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE (UNO). SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER .....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.

   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.

5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT,
   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
   FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM–A–36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
3. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"Ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
4. NON–STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
7. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T–MOBILE ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK:
   CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK:
   CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.
4. GROUNDING OF ALL EQUIPMENT AND ANTENNAS IS NOT CONSIDERED PART OF THE SCOPE OF THIS PROJECT AND IS THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR AT THE TIME OF CONSTRUCTION. ALL EQUIPMENT AND ANTENNAS TO BE INSTALLED AND GROUNDED IN ACCORDANCE WITH GOVERNING BUILDING CODE, MANUFACTURER RECOMMENDATIONS AND OWNER SPECIFICATIONS.

T-Mobile

T–MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11428A
GROTON TOWER

CONSTRUCTION DRAWINGS

0	11/16/15	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER
JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074623
SITE ADDRESS:	

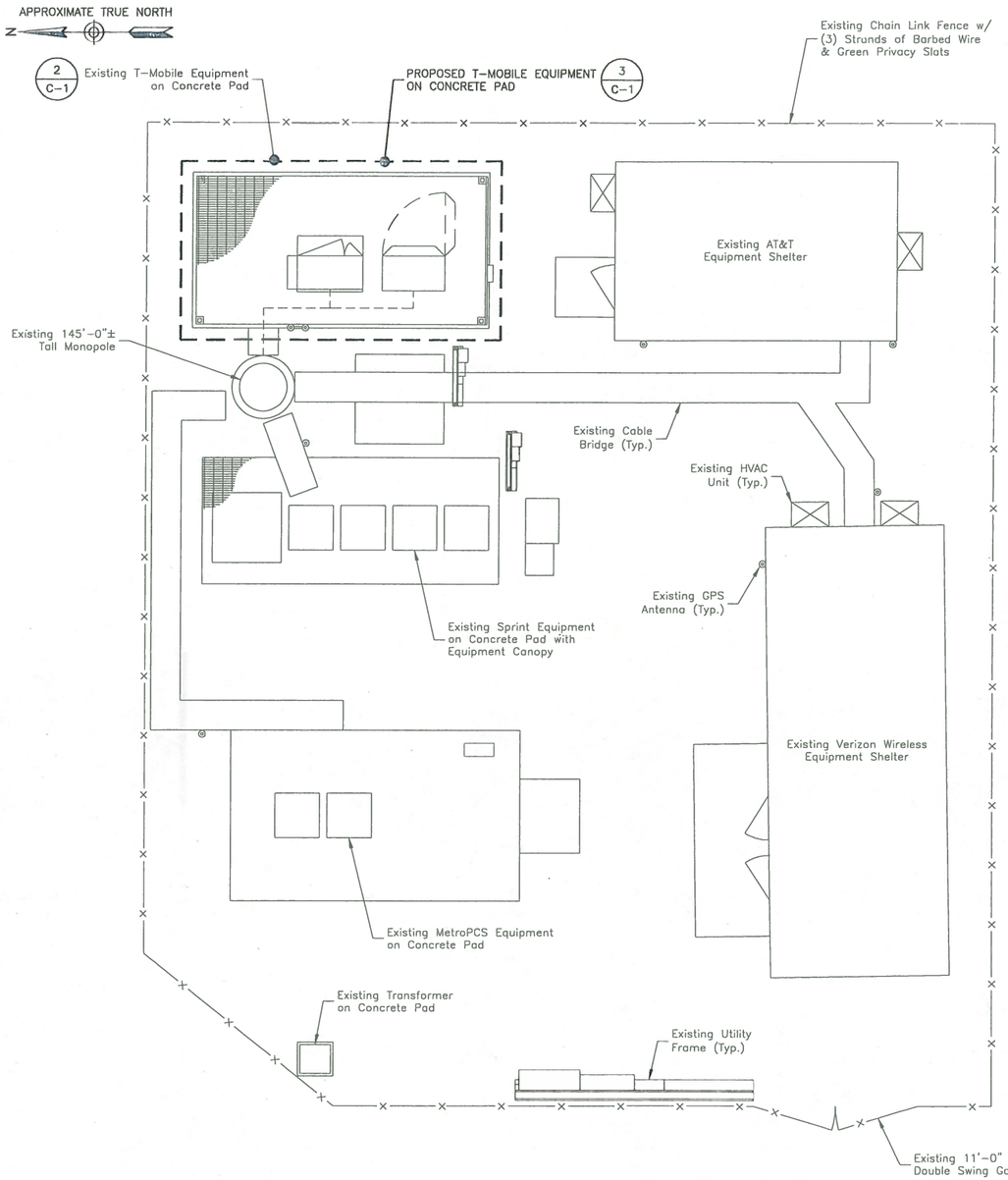
75 ROBERTS ROAD
GROTON, CT 06340
NEW LONDON COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G–1

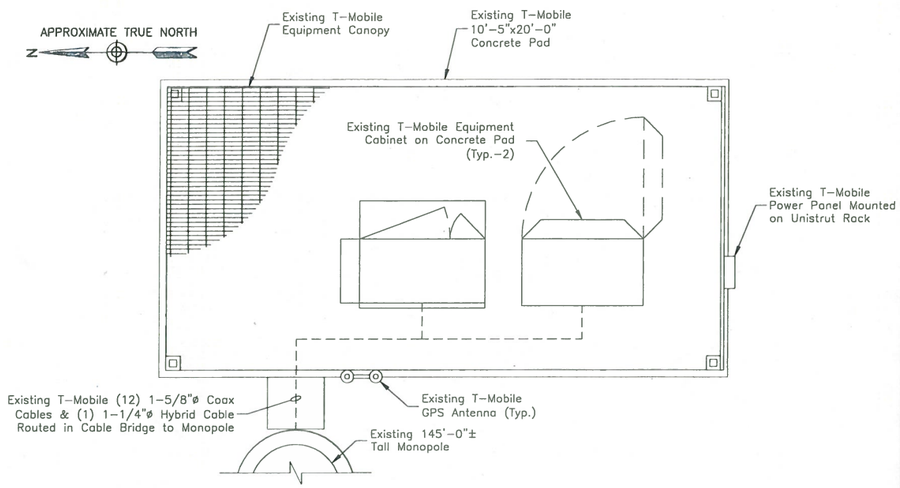


COMPOUND PLAN

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

1

0' 5' 10'

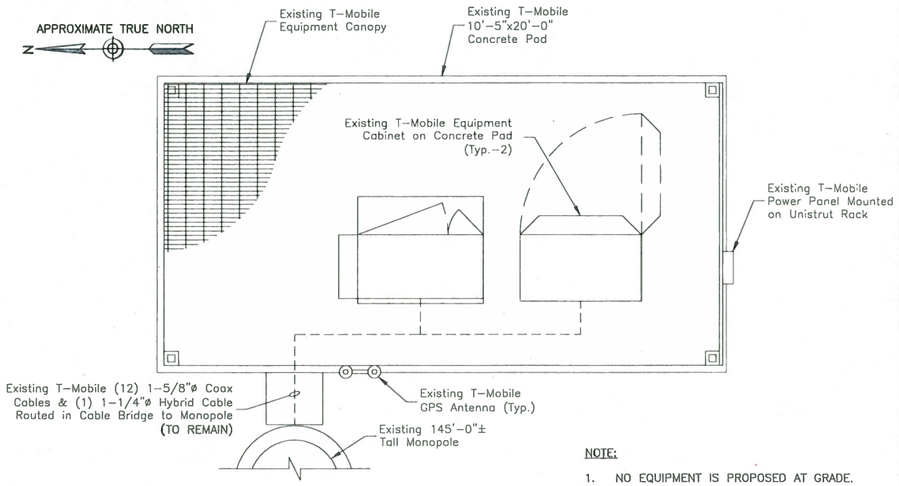


EXISTING EQUIPMENT PLAN

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

2

0' 2' 4' 6'



NOTE:

1. NO EQUIPMENT IS PROPOSED AT GRADE.

PROPOSED EQUIPMENT PLAN

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

3

0' 2' 4' 6'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS & TOWER MODIFICATION DRAWINGS BY B+T GROUP DATED OCTOBER 20, 2015.

T-Mobile
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE

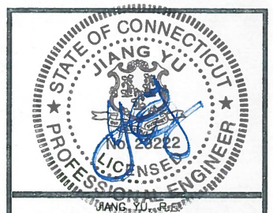
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11428A
GROTON TOWER

CONSTRUCTION DRAWINGS

0	11/16/15	ISSUED AS FINAL

Dewberry
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710



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75 ROBERTS ROAD
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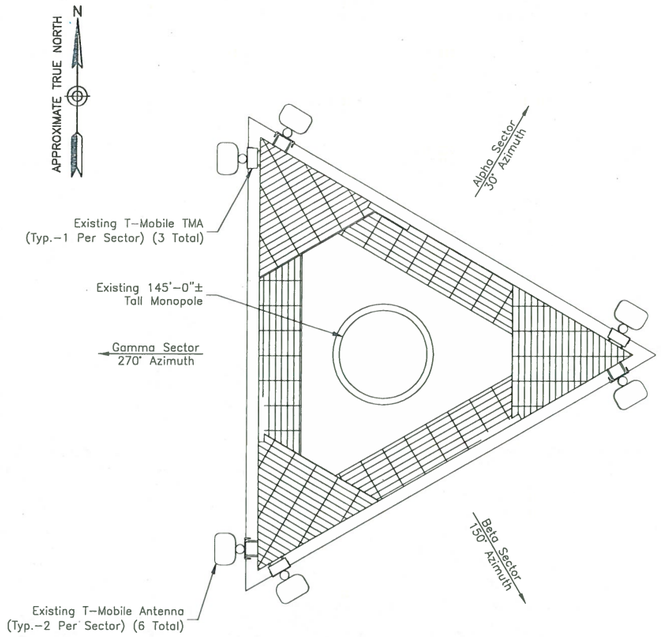
NEW LONDON COUNTY

SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

SHEET NUMBER

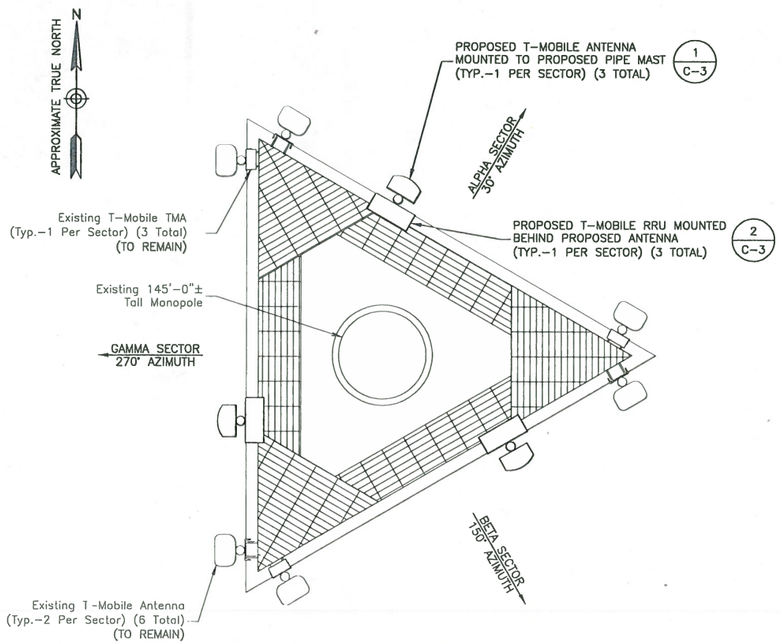
C-1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

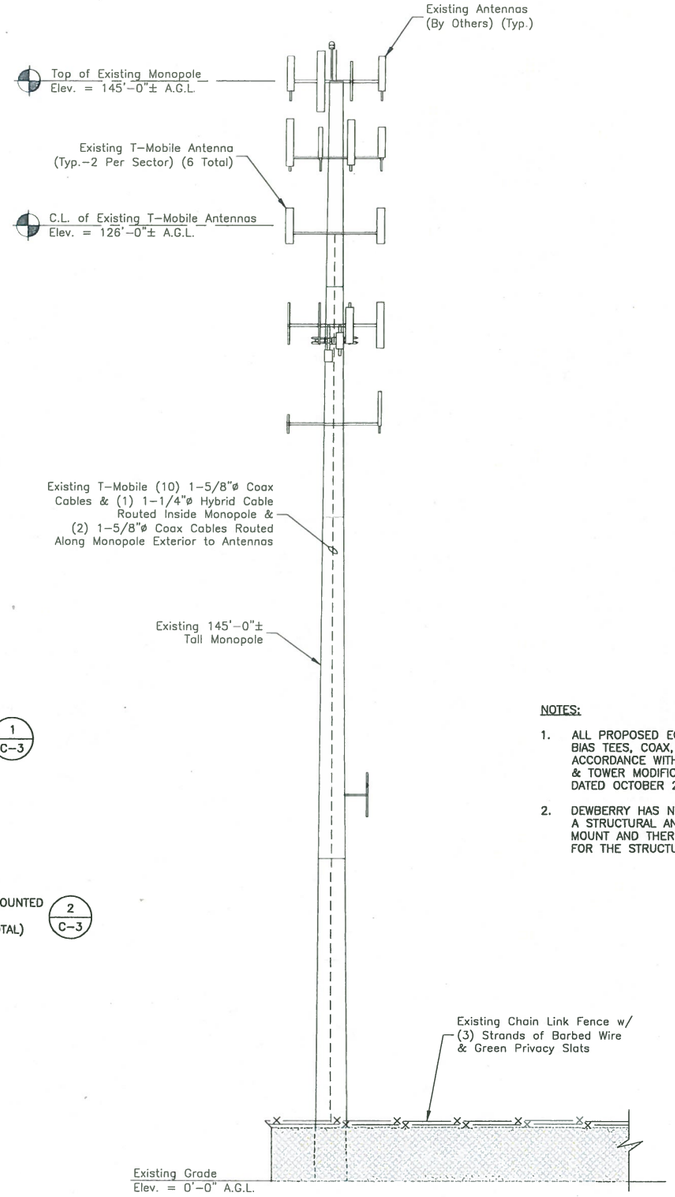
1



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

2

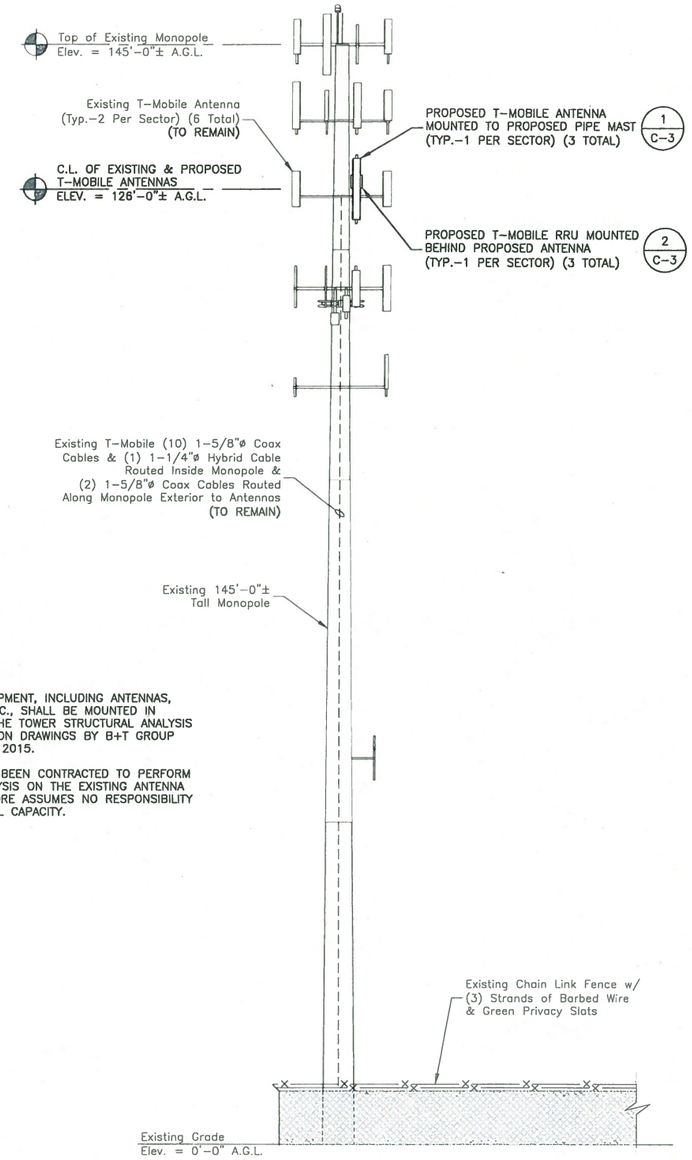


EXISTING ELEVATION

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'

3



PROPOSED ELEVATION

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'

4

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS & TOWER MODIFICATION DRAWINGS BY B+T GROUP DATED OCTOBER 20, 2015.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING ANTENNA MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.

T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11428A
GROTON TOWER

CONSTRUCTION DRAWINGS

0	11/16/15	ISSUED AS FINAL

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
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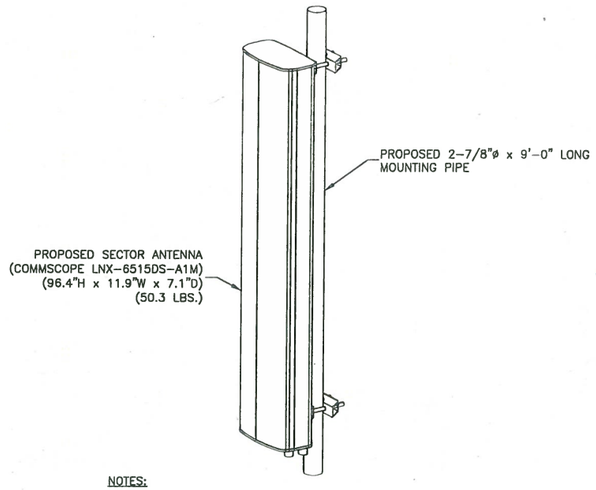
GROTON, CT 06340
NEW LONDON COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

C-2

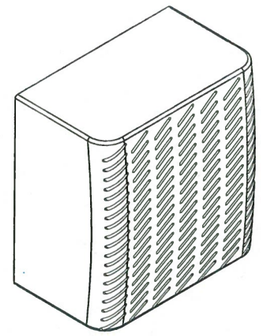


NOTES:

1. MOUNT ANTENNAS PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND ANTENNAS AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED ANTENNAS WITH THE LATEST RFDS.

ISOMETRIC ANTENNA DETAIL 1

SCALE: N.T.S.



SPECIFICATIONS:
HEIGHT: 20.0"
WIDTH: 17.0"
DEPTH: 7.0"
WEIGHT: 50.7 LBS

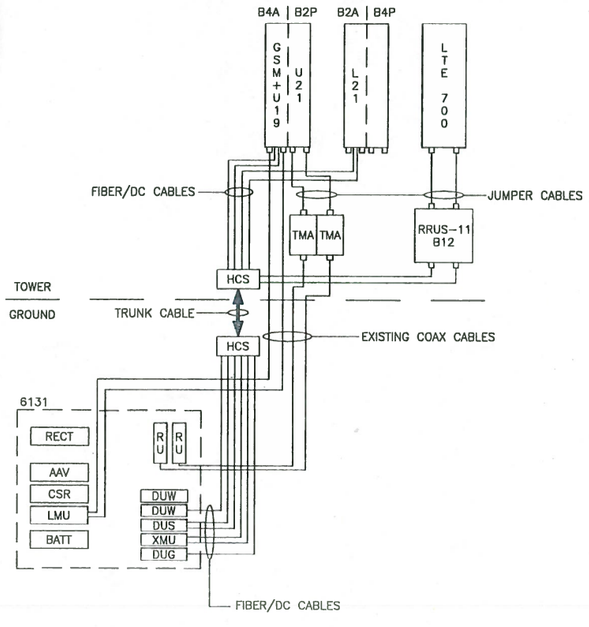
ERICSSON RRUS-11 B12

RRU NOTES:

1. MOUNT EQUIPMENT WITH MANUFACTURER PROVIDED MOUNTING BRACKETS.
2. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED EQUIPMENT WITH THE LATEST RFDS.

RRUS-11 - REMOTE RADIO UNIT 2

SCALE: N.T.S.



SITE CONFIGURATION 702Cu 3

SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH	EXISTING HYBRID	RRU	
	EXISTING	PROPOSED	EXISTING	PROPOSED			EXISTING	PROPOSED
ALPHA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"ø	–	150'-0"	(1) 1-1/4"ø @ 150'-0"	–	–
	–	COMMSCOPE LNX-6515DS-A1M					–	RRUS-11 B12
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN					–	–
BETA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"ø	–	150'-0"		–	–
	–	COMMSCOPE LNX-6515DS-A1M					–	RRUS-11 B12
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN					–	–
GAMMA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"ø	–	150'-0"		–	–
	–	COMMSCOPE LNX-6515DS-A1M					–	RRUS-11 B12
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN					–	–

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600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
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NEW LONDON COUNTY

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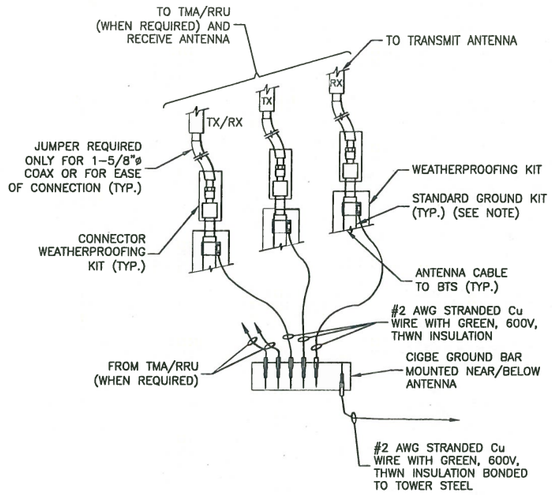
CONSTRUCTION DETAILS

SHEET NUMBER

C-3

GROUNDING NOTES:

1. THE CONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE ENGINEER FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
3. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY THE ENGINEER IN WRITING.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES AND 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE AND ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
6. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE AND UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
7. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO TRANSMISSION EQUIPMENT.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
11. EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
12. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
13. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM T-MOBILE MARKET REPRESENTATIVE.
14. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
15. ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
16. ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT AND STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
21. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
22. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.

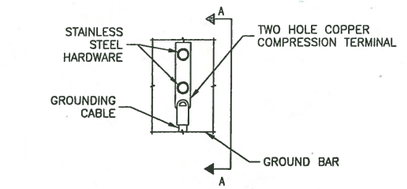


NOTE:

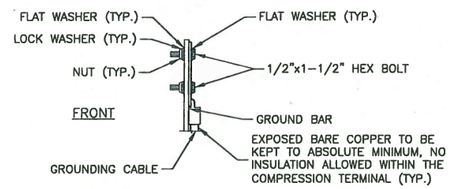
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) 1

SCALE: N.T.S.



ELEVATION



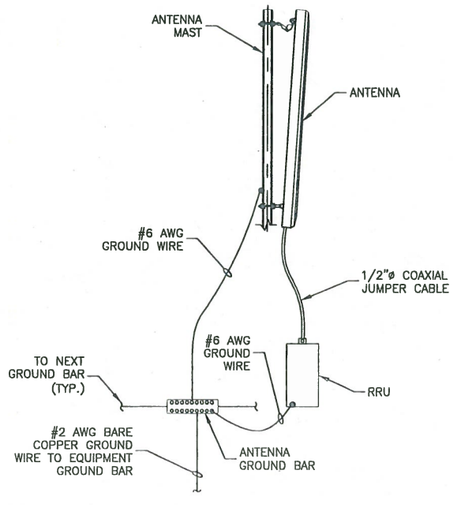
SECTION 'A-A'

NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

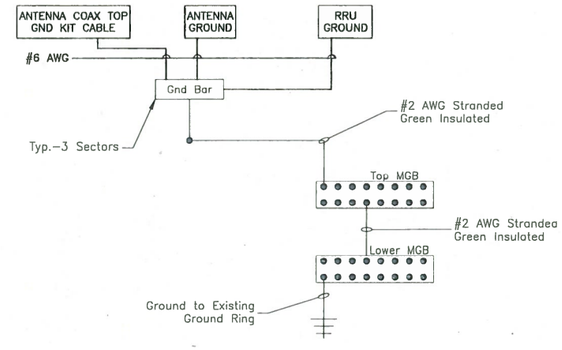
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 2

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL 3

SCALE: N.T.S



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
3. SCHEMATIC GROUNDING DIAGRAM IS TYPICAL FOR EACH SECTOR.
4. VERIFY EXISTING GROUND SYSTEM IS INSTALLED PER T-MOBILE STANDARDS.

SCHEMATIC GROUNDING DIAGRAM 4

SCALE: N.T.S.

T-Mobile

T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11428A
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CONSTRUCTION DRAWINGS

0	11/16/15	ISSUED AS FINAL

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Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 32
LICENSE
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

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SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

October 20, 2015

Mr. Mitchell Abbott
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6612

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

Subject:	**Structural Modification Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11428A
	Carrier Site Name:	Groton/I-95/Buddington Rd
Crown Castle Designation:	**Crown Castle BU Number:**	881533
	Crown Castle Site Name:	Groton Tower
	Crown Castle JDE Job Number:	347089
	Crown Castle Work Order Number:	1133289
	Crown Castle Application Number:	309455 Rev. 3
Engineering Firm Designation:	**B+T Group Project Number:**	92739.005.01
Site Data:	**75 Roberts Road, Groton, CT, New London County** **Latitude *41° 21' 36.8"*, Longitude *-72° 2' 55.1"*** **144.5 Foot - Monopole**	

Dear Mr. Abbott,

B+T Group is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 833783, in accordance with application 309455, revision 3.

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

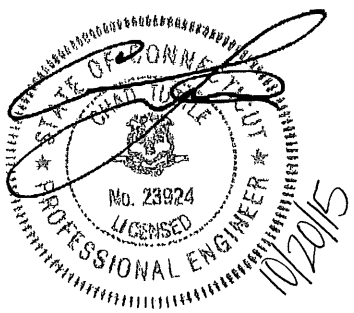
LC4.7: TSA specified load case with proposed modifications **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

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

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

Respectfully submitted by:
B+T Engineering, Inc.
PEC.0001564; Exp: 02/10/16



Robbie Frazier, E.I.
Project Engineer

Chad E. Tuttle, P.E.
Engineer of Record

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This is a 144.5 ft. monopole designed by Engineered Endeavors, Inc. in January of 2001. The monopole was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. This monopole has been modified by Walker Engineering in August of 2007, Vertical Structures Inc. in November of 2008, Crown Castle in February of 2014 and B+T in July of 2015 and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this monopole in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 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
125.0	126.0	3	Commscope	LNX-6515DS-A1M	--	--	--
		3	Ericsson	RRUS 11 B12			

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
145.0	146.0	12	Powerwave	7020.00	12 2	1 5/8 3/4	1
		6	Powerwave	7770.00			
		6	Kathrein	782-10250			
		6	Powerwave	LGP21401			
	145.0	3	CCI Antennas	HPA-65R-BUU-H8	--	--	2
		3	Ericsson	RRUS 11 B4			
		3	Ericsson	RRUS A2			
		3	Ericsson	RRUS 11	1	3/8	1
		1	--	Platform Mount [LP 712-1]			
135.0	137.0	3	Alcatel Lucent	RRH2X60-AWS	1	1-5/8	2
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		6	Commscope	HBXX-6517DS-A2M			
		3	Commscope	LNX-6514DS-AIM			
		1	RFS	DB-T1-6Z-8AB-0Z			
		3	Andrew	LNX-6512DS-VTM	7	1-5/8	1
		1	RFS	DB-T1-6Z-8AB-0Z			
		6	RFS	FD9R6004/2C-3L			
	135.0	1	--	Platform Mount [LP 712-1]			
125.0	126.0	3	Ericsson	ERICSSON AIR 21 B2A B4P	12 1	1-5/8 1-1/4	1
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	Ericsson	KRY 112 144/1			
	125.0	1	--	Platform Mount [LP 712-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
113.0	113.0	3	Alcatel Lucent	TD-RRH8x20-25	3 1	1-1/4 5/8	1
		3	RFS	APXVSPP18-C-A20			
		3	RFS	APXVTM14-C-120			
		1	--	Platform Mount [LP 712-1]			
111.0	111.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz	--	--	1
		1	--	Side Arm Mount [SO 102-3]			
	109.0	3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
100.0	102.0	3	Kathrein	800 10504	6 1	7/8 5/16	1
	100.0	1	--	Platform Mount [LP 712-1]			
51.0	52.0	1	Lucent	KS24019-L112A	1	1/2	1
	51.0	1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
145	145	12	Allgon	7120.16	--	--
		1	Generic	Low Profile Platform		
135	135	12	Allgon	7120.16	--	--
		1	Generic	Low Profile Platform		
125	125	9	Allgon	7120.16	--	--
		1	Generic	Low Profile Platform		
115	115	12	Allgon	7120.16	--	--
		1	Generic	Low Profile Platform		
105	105	12	Allgon	7120.16	--	--
		1	Generic	Low Profile Platform		
95	95	12	Allgon	7120.16	--	--
		1	Generic	Low Profile Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	T-Mobile Co-Locate, Rev# 3	309455	CCI Sites
Tower Manufacturer Drawings	EEI, Job No. 8409	1405782	CCI Sites
Foundation Drawings	URS, Project No. F301877.01/F04	1405796	CCI Sites
Geotech Report	Clarence Welti, Date: 03/13/00	1406209	CCI Sites
Tower Modification Drawings	Walker Engineering, Job No. 0705-0147VRE	2048224	CCI Sites
	Vertical Structures, Job No. 2008-004-155	2353860	CCI Sites
	CCI, Date: 02/25/14	4491288	CCI Sites
	B+T Group, Project No. 92739.004.001	5795331	CCI Sites
Post Modification Reports	Vertical Structures, Project No. 2007-004-164	2304223	CCI Sites
	Vertical Structures, Project No. 2009-004-059	2435103	CCI Sites
	SGS, Project No. 145071	5246681	CCI Sites
Antenna Configuration	Previous SA by SSOE Group Project No. 016-00010-00 BC 1023	5916747	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) Mount areas and weights are assumed based on photographs provided.

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

4) ANALYSIS RESULTS

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

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	144.5 - 117.567	Pole	TP26.875x21x0.188	1	-7.542	-	75.0	Pass[1]
L2	117.567 - 110.5	Pole	TP28.001x25.659x0.25	2	-11.135	-	86.6	Pass[1]
L3	110.5 - 103.5	Pole	TP29.502x28.001x0.414	3	-12.366	-	87.8	Pass[1]
L4	103.5 - 98.5	Pole	TP30.574x29.502x0.408	4	-14.675	-	98.5	Pass[1]
L5	98.5 - 87.184	Pole	TP33x30.574x0.554	5	-16.213	-	82.0	Pass[1]
L6	87.184 - 83	Pole	TP33.407x31.508x0.375	6	-18.706	-	99.4	Pass[1]
L7	83 - 77.25	Pole	TP34.646x33.407x0.563	7	-20.185	-	88.3	Pass[1]
L8	77.25 - 57.25	Pole	TP38.956x34.646x0.601	8	-25.920	-	91.7	Pass[1]
L9	57.25 - 42.108	Pole	TP42.219x38.956x0.588	9	-28.846	-	96.7	Pass[1]
L10	42.108 - 31.25	Pole	TP43.794x40.224x0.636	10	-35.883	-	96.6	Pass[1]
L11	31.25 - 0	Pole	TP50.5x43.794x0.562	11	-48.113	-	97.2	Pass[1]
							Summary	
						Pole (L6)	99.4	Pass[1]
						RATING =	**99.4**	**Pass[1]**

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	98.3	Pass
1	Base Plate	Base	77.3	Pass
1	Base Foundation (Soil Interaction)	Base	63.4	Pass
1	Base Foundation (Steel)	Base	53.9	Pass

Structure Rating (max from all components) =	**99.4%**

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) The percent capacities shown above (excluding foundations) include the 1/3 increase in allowable stresses as allowed by TIA/EIA-222-F.

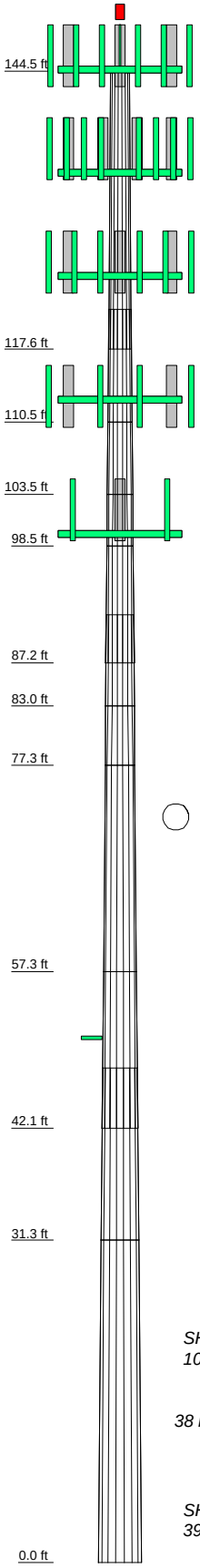
4.1) Recommendations

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

APPENDIX A

tnxTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11
Length (ft)	26.933	10.924	7.000	5.000	11.316	8.809	5.750	20.000	15.142	16.634	31.250
Number of Sides	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.188	0.250	0.414	0.408	0.554	0.375	0.563	0.601	0.588	0.636	0.562
Socket Length (ft)	3.857				4.625				5.776		
Top Dia (in)	21.000	25.659	28.001	29.502	30.574	31.508	33.407	34.646	38.956	40.224	43.794
Bot Dia (in)	26.875	28.001	29.502	30.574	33.000	33.407	34.646	38.956	42.219	43.794	50.500
Grade	A572-65		46.121824ksi	46.174906ksi	46.240546ksi	A572-65		50.959679ksi	51.758335ksi	51.837723ksi	51.936717ksi / 57.502545ksi
Weight (K)	1.3	0.8	0.9	0.6	2.0	1.1	1.1	4.5	3.7	4.6	10.1

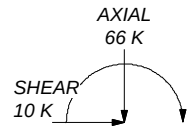


DESIGNED APPURTENANCE LOADING

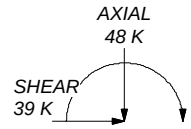
TYPE	ELEVATION	TYPE	ELEVATION
Strobe (E)	149.5	RRH2X60-AWS (R)	135
Lightning Rod 5/8" x 5' (E)	147	RRH2X60-AWS (R)	135
5' x 2" Pipe Mount (E-For Strobe)	147	RRH2X60-AWS (R)	135
Top Hat (E)	146	DB-T1-6Z-8AB-0Z (R)	135
(2) 7770.00 w/ Mount Pipe (E)	145	Platform Mount [LP 712-1] (E)	135
(2) 7770.00 w/ Mount Pipe (E)	145	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	125
(2) 7770.00 w/ Mount Pipe (E)	145	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	125
(2) LGP21401 (E)	145	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	125
(2) LGP21401 (E)	145	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	125
(2) LGP21401 (E)	145	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	125
(2) 782-10250 (E)	145	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	125
(2) 782-10250 (E)	145	KRY 112 144/1 (E)	125
(2) 782-10250 (E)	145	KRY 112 144/1 (E)	125
(4) 7020.00 (E)	145	KRY 112 144/1 (E)	125
(4) 7020.00 (E)	145	LNX-6515DS-A1M w/ Mount Pipe (P)	125
(4) 7020.00 (E)	145	LNX-6515DS-A1M w/ Mount Pipe (P)	125
RRUS 11 (E-Azimuth per photo)	145	LNX-6515DS-A1M w/ Mount Pipe (P)	125
RRUS 11 (E-Azimuth per photo)	145	RRUS 11 B12 (P)	125
RRUS 11 (E-Azimuth per photo)	145	RRUS 11 B12 (P)	125
HPA-65R-BUU-H8 w/ Mount Pipe (R)	145	RRUS 11 B12 (P)	125
HPA-65R-BUU-H8 w/ Mount Pipe (R)	145	Platform Mount [LP 712-1] (E)	125
HPA-65R-BUU-H8 w/ Mount Pipe (R)	145	APXVSPP18-C-A20 w/ Mount Pipe (E)	113
RRUS A2 (R)	145	APXVSPP18-C-A20 w/ Mount Pipe (E)	113
RRUS A2 (R)	145	APXVSPP18-C-A20 w/ Mount Pipe (E)	113
RRUS A2 (R)	145	APXVTM14-C-120 w/ Mount Pipe (E)	113
RRUS 11 B4 (R)	145	APXVTM14-C-120 w/ Mount Pipe (E)	113
RRUS 11 B4 (R)	145	APXVTM14-C-120 w/ Mount Pipe (E)	113
RRUS 11 B4 (R)	145	TD-RRH8x20-25 (E)	113
8'x2" Antenna Mount Pipe (E)	145	TD-RRH8x20-25 (E)	113
8'x2" Antenna Mount Pipe (E)	145	TD-RRH8x20-25 (E)	113
8'x2" Antenna Mount Pipe (E)	145	Platform Mount [LP 712-1] (E)	113
Platform Mount [LP 712-1] (E)	145	PCS 1900MHz 4x45W-65MHz (E)	111
LNX-6512DS-VTM w/ Mount Pipe (E)	135	PCS 1900MHz 4x45W-65MHz (E)	111
LNX-6512DS-VTM w/ Mount Pipe (E)	135	PCS 1900MHz 4x45W-65MHz (E)	111
LNX-6512DS-VTM w/ Mount Pipe (E)	135	800MHz 2X50W RRH W/FILTER (E)	111
(2) FD9R6004/2C-3L (E)	135	800MHz 2X50W RRH W/FILTER (E)	111
(2) FD9R6004/2C-3L (E)	135	800MHz 2X50W RRH W/FILTER (E)	111
(2) FD9R6004/2C-3L (E)	135	Side Arm Mount [SO 102-3] (E)	111
DB-T1-6Z-8AB-0Z (E)	135	800 10504 w/ Mount Pipe (E)	100
LNX-6514DS-AIM w/ Mount Pipe (R)	135	800 10504 w/ Mount Pipe (E)	100
LNX-6514DS-AIM w/ Mount Pipe (R)	135	800 10504 w/ Mount Pipe (E)	100
LNX-6514DS-AIM w/ Mount Pipe (R)	135	7'x2" Antenna Mount Pipe (E)	100
(2) HBXX-6517DS-A2M w/ Mount Pipe (R)	135	7'x2" Antenna Mount Pipe (E)	100
(2) HBXX-6517DS-A2M w/ Mount Pipe (R)	135	7'x2" Antenna Mount Pipe (E)	100
(2) HBXX-6517DS-A2M w/ Mount Pipe (R)	135	Platform Mount [LP 712-1] (E)	100
RRH2x60-700 (R)	135	KS24019-L112A (E)	51
RRH2x60-700 (R)	135	Side Arm Mount [SO 701-1] (E)	51
RRH2x60-700 (R)	135		
RRH2X60-PCS (R)	135		
RRH2X60-PCS (R)	135		
RRH2X60-PCS (R)	135		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	51.758335ksi	52 ksi	67 ksi
46.121824ksi	46 ksi	61 ksi	51.837723ksi	52 ksi	67 ksi
46.174906ksi	46 ksi	61 ksi	51.936717ksi	52 ksi	67 ksi
46.240546ksi	46 ksi	61 ksi	57.502545ksi	58 ksi	73 ksi
50.959679ksi	51 ksi	66 ksi			



TORQUE 0 kip-ft
38 mph WIND - 0.750 in ICE



TORQUE 1 kip-ft
REACTIONS - 85 mph WIND

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. Tower Rating: 99.4%

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

Job:	***92739.005.01 - GROTON TOWER, CT (BU# 881533***		
Project:			
Client: Crown Castle	Drawn by: APatil	App'd:	
Code: TIA/EIA-222-F	Date: 10/12/15	Scale: NTS	
Path:		Dwg No. E-1	

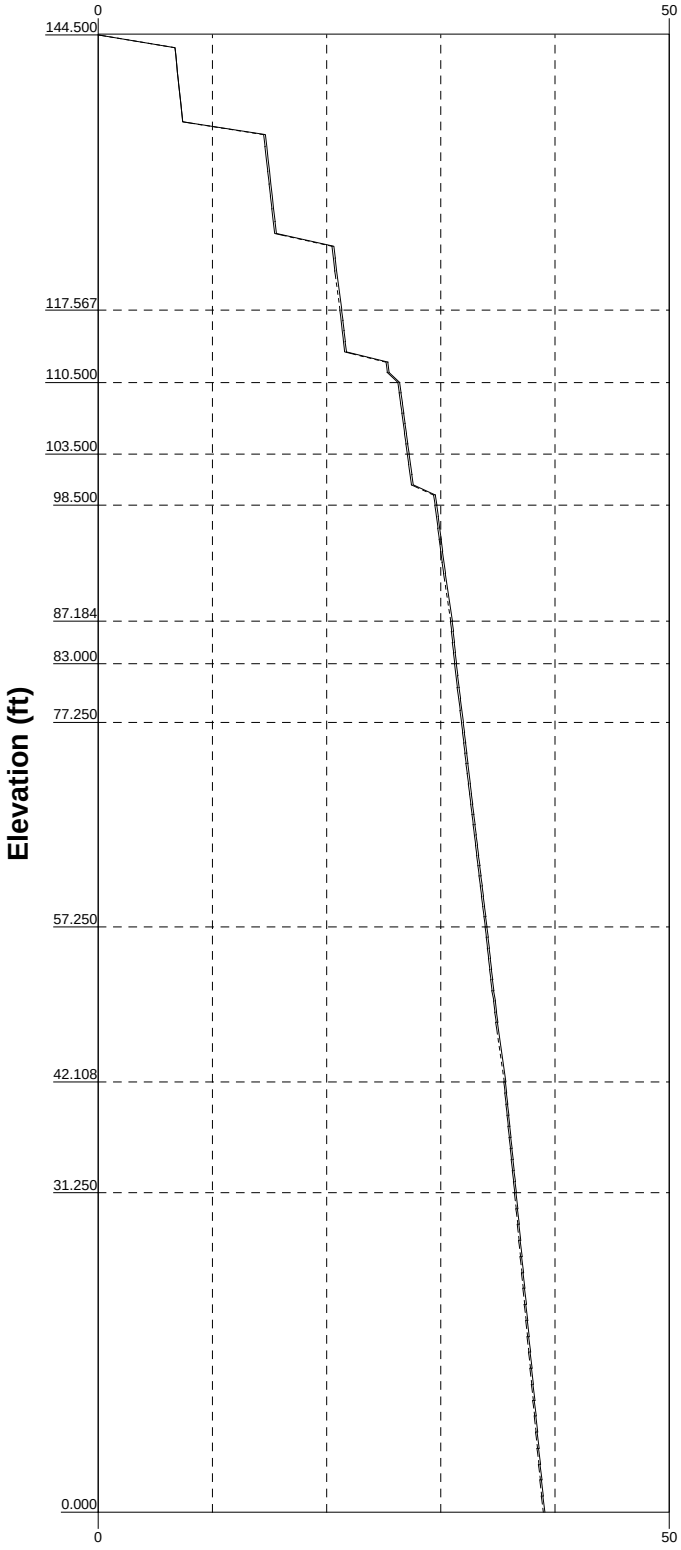
TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Vx Vz

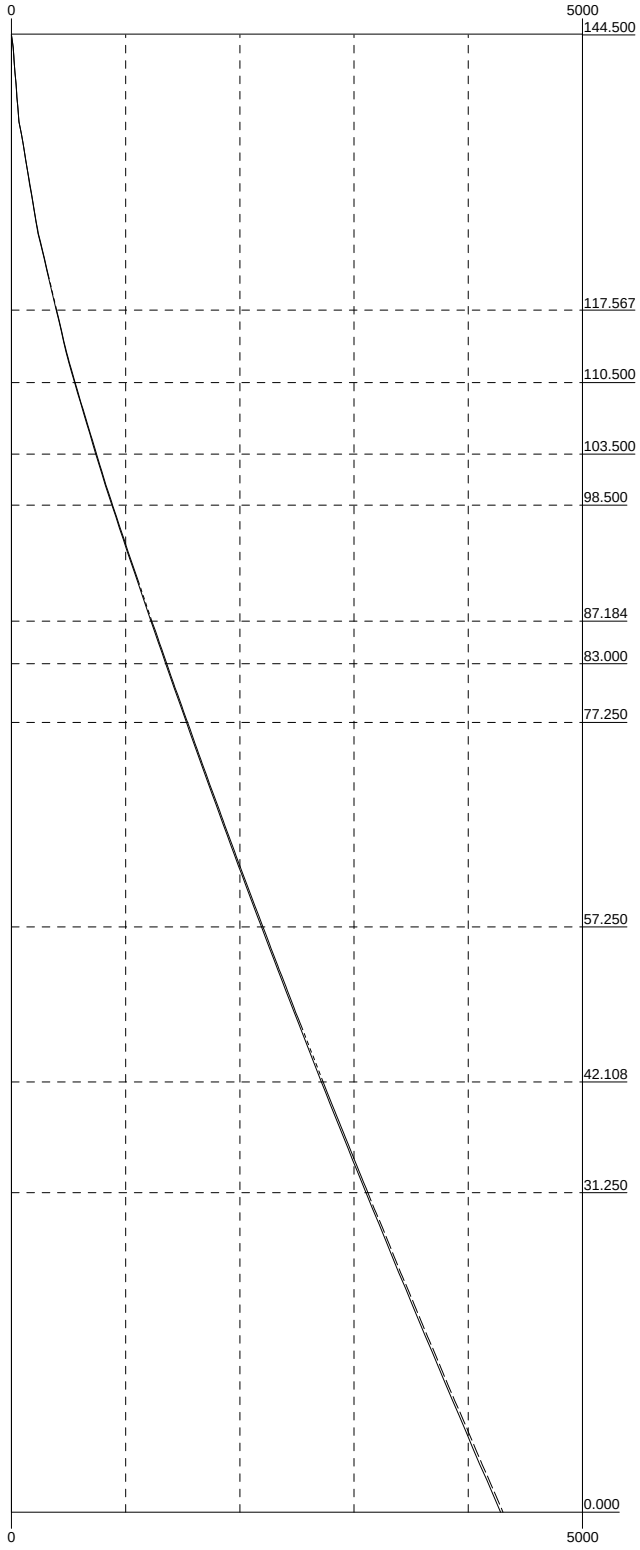
Maximum Values

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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FAX: (918) 587-4630

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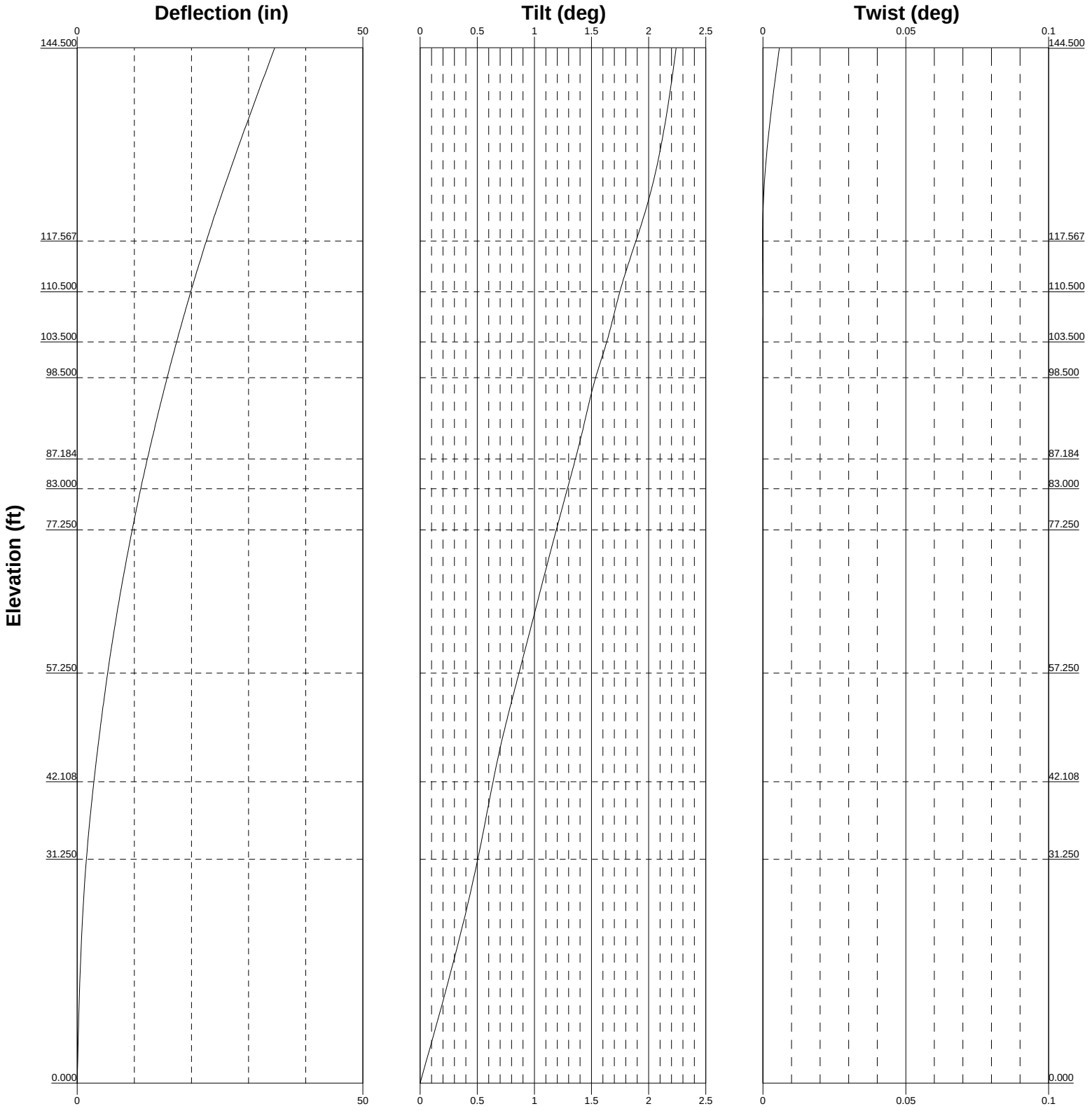
Project:			
Client: Crown Castle	Drawn by: APatil	App'd:	
Code: TIA/EIA-222-F	Date: 10/12/15	Scale: NTS	
Path:		Dwg No. E-4	

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

Maximum Values



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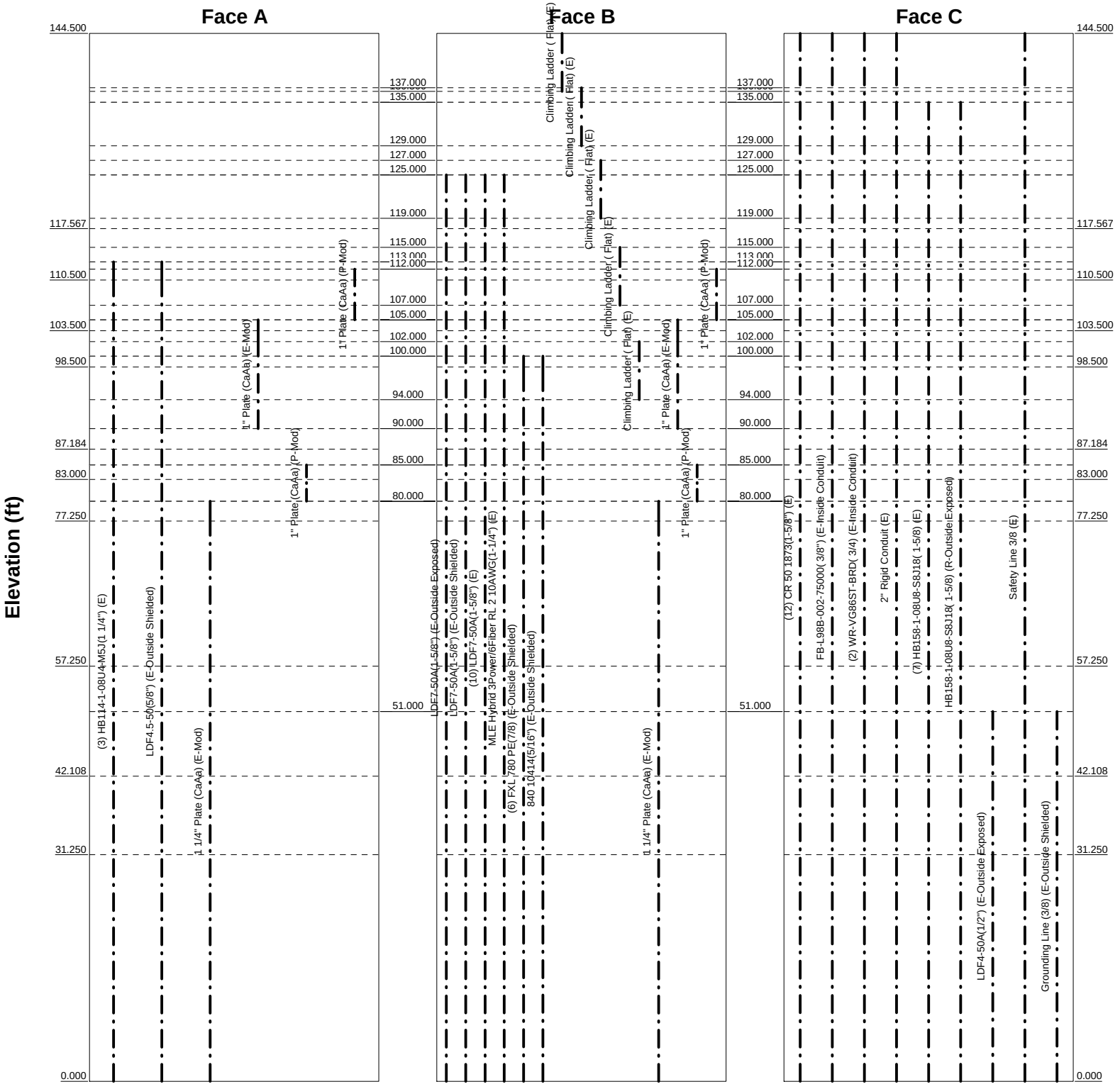
Project:			
Client: Crown Castle		Drawn by: APatil	App'd:
Code: TIA/EIA-222-F		Date: 10/12/15	Scale: NTS
Path:			Dwg No. E-5

Feed Line Distribution Chart
0' - 144'6"

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



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Project:			
Client: Crown Castle	Drawn by: APatil	App'd:	
Code: TIA/EIA-222-F	Date: 10/12/15	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

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

Tower is located in New London County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	144.500-117.567	26.933	3.857	18	21.000	26.875	0.188	0.750	A572-65 (65 ksi)
L2	117.567-110.500	10.924	0.000	18	25.659	28.001	0.250	1.000	A572-65 (65 ksi)
L3	110.500-103.500	7.000	0.000	18	28.001	29.502	0.414	1.657	46.121824ksi (46 ksi)
L4	103.500-98.500	5.000	0.000	18	29.502	30.574	0.408	1.630	46.174906ksi (46 ksi)
L5	98.500-87.184	11.316	4.625	18	30.574	33.000	0.554	2.214	46.240546ksi (46 ksi)
L6	87.184-83.000	8.809	0.000	18	31.508	33.407	0.375	1.500	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L7	83.000-77.250	5.750	0.000	18	33.407	34.646	0.563	2.250	50.959679ksi (51 ksi)
L8	77.250-57.250	20.000	0.000	18	34.646	38.956	0.601	2.403	51.758335ksi (52 ksi)
L9	57.250-42.108	15.142	5.776	18	38.956	42.219	0.588	2.351	51.837723ksi (52 ksi)
L10	42.108-31.250	16.634	0.000	18	40.224	43.794	0.636	2.545	51.936717ksi (52 ksi)
L11	31.250-0.000	31.250		18	43.794	50.500	0.562	2.250	57.502545ksi (58 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	21.324	12.386	677.826	7.388	10.668	63.538	1356.544	6.194	3.366	17.952
	27.290	15.882	1429.122	9.474	13.653	104.678	2860.125	7.943	4.400	23.467
L2	26.894	20.162	1644.484	9.020	13.035	126.163	3291.131	10.083	4.076	16.304
	28.433	22.020	2142.464	9.852	14.224	150.619	4287.747	11.012	4.488	17.953
L3	28.433	36.272	3487.463	9.793	14.224	245.174	6979.516	18.140	4.199	10.136
	29.957	38.246	4088.203	10.326	14.987	272.786	8181.785	19.127	4.463	10.774
L4	29.957	37.636	4024.853	10.328	14.987	268.559	8055.002	18.821	4.475	10.98
	31.045	39.023	4486.364	10.709	15.531	288.856	8978.630	19.515	4.664	11.443
L5	31.045	52.749	6005.865	10.657	15.531	386.690	12019.632	26.379	4.407	7.96
	33.509	57.012	7582.917	11.518	16.764	452.333	15175.811	28.511	4.834	8.731
L6	33.006	37.056	4537.887	11.052	16.006	283.507	9081.745	18.532	4.885	13.028
	33.922	39.316	5419.604	11.726	16.971	319.353	10846.339	19.662	5.220	13.919
L7	33.922	58.640	7991.848	11.660	16.971	470.923	15994.212	29.326	4.890	8.692
	35.180	60.852	8930.926	12.100	17.600	507.437	17873.603	30.432	5.108	9.08
L8	35.180	64.924	9507.149	12.086	17.600	540.177	19026.807	32.468	5.040	8.389
	39.557	73.143	13594.232	13.616	19.790	686.941	27206.352	36.579	5.799	9.651
L9	39.557	71.585	13313.644	13.621	19.790	672.763	26644.807	35.799	5.822	9.904
	42.870	77.673	17007.566	14.779	21.447	792.999	34037.512	38.844	6.396	10.881
L10	42.103	79.934	15826.802	14.054	20.434	774.539	31674.429	39.974	5.960	9.369
	44.469	87.141	20505.780	15.321	22.247	921.723	41038.542	43.579	6.588	10.356
L11	44.469	77.174	18222.386	15.347	22.247	819.086	36468.750	38.594	6.718	11.944
	51.279	89.146	28086.142	17.728	25.654	1094.806	56209.240	44.581	7.898	14.043

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 144.500-117.567				1	1	1		
L2 117.567-110.500				1	1	1		
L3 110.500-103.500				1	1	0.96059		
L4 103.500-98.500				1	1	0.963295		

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L5 98.500-87.184				1	1	0.945314		
L6 87.184-83.000				1	1	1		
L7 83.000-77.250				1	1	0.966646		
L8 77.250-57.250				1	1	0.961697		
L9 57.250-42.108				1	1	0.965444		
L10 42.108-31.250				1	1	0.971175		
L11 31.250-0.000				1	1	1.13817		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
144.5										
CR 50 1873(1-5/8") (E)	C	No	Inside Pole	144.500 - 0.000	0.000	0	12	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
FB-L98B-002-75000(3/8") (E-Inside Conduit)	C	No	Inside Pole	144.500 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4) (E-Inside Conduit)	C	No	Inside Pole	144.500 - 0.000	0.000	0	2	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
2" Rigid Conduit (E)	C	No	Inside Pole	144.500 - 0.000	0.000	0	1	No Ice	0.000	0.003
								1/2" Ice	0.000	0.003
								1" Ice	0.000	0.003
								2" Ice	0.000	0.003
								4" Ice	0.000	0.003
135										
HB158-1-08U8-S8J18(1-5/8) (E)	C	No	Inside Pole	135.000 - 0.000	0.000	0	7	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
								4" Ice	0.000	0.001
HB158-1-08U8-S8J18(1-5/8)(R-Outside Exposed)	C	No	CaAa (Out Of Face)	135.000 - 0.000	0.000	0	1	No Ice	0.198	0.001
								1/2" Ice	0.298	0.003
								1" Ice	0.398	0.005
								2" Ice	0.598	0.011
								4" Ice	0.998	0.031
125										
LDF7-50A(1-5/8")(E-Outside Exposed)	B	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	1	No Ice	0.198	0.001
								1/2" Ice	0.298	0.002
								1" Ice	0.398	0.004
								2" Ice	0.598	0.011
								4" Ice	0.998	0.030
LDF7-50A(1-5/8")(E-Outside Shielded)	B	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	1	No Ice	0.000	0.001
								1/2" Ice	0.000	0.002
								1" Ice	0.000	0.004
								2" Ice	0.000	0.011
								4" Ice	0.000	0.030
LDF7-50A(1-5/8")(E)	B	No	Inside Pole	125.000 - 0.000	0.000	0	10	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
MLE Hybrid 3Power/6Fiber RL 2 10AWG(1-1/4'')(E)	B	No	Inside Pole	125.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
113										
HB114-1-08U4-M5J(1 1/4")(E)	A	No	Inside Pole	113.000 - 0.000	0.000	0	3	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
LDF4.5-50(5/8")(E-Outside Shielded)	A	No	CaAa (Out Of Face)	113.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.002
								2" Ice	0.000	0.007
								4" Ice	0.000	0.024
100										
FXL 780 PE(7/8)(E-Outside Shielded)	B	No	CaAa (Out Of Face)	100.000 - 0.000	0.000	0	6	No Ice	0.000	0.000
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.003
								2" Ice	0.000	0.008
								4" Ice	0.000	0.025
840 10414(5/16")(E-Outside Shielded)	B	No	CaAa (Out Of Face)	100.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.002
								2" Ice	0.000	0.006
								4" Ice	0.000	0.021
51										
LDF4-50A(1/2")(E-Outside Exposed)	C	No	CaAa (Out Of Face)	51.000 - 0.000	0.000	0	1	No Ice	0.063	0.000
								1/2" Ice	0.163	0.001
								1" Ice	0.263	0.002
								2" Ice	0.463	0.007
								4" Ice	0.863	0.023
Climbing Cable										
Safety Line 3/8(E)	C	No	CaAa (Out Of Face)	144.500 - 0.000	0.000	0	1	No Ice	0.037	0.000
								1/2" Ice	0.137	0.001
								1" Ice	0.238	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
								2" Ice	0.437	0.002
								4" Ice	0.838	0.004
51										
Grounding Line (3/8) (E-Outside Shielded)	C	No	CaAa (Out Of Face)	51.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.002
								4" Ice	0.000	0.004
Ladder										
Climbing Ladder (Flat) (E)	B	No	CaAa (Out Of Face)	144.500 - 136.500	36.000	0	1	No Ice	0.584	0.005
								1/2" Ice	1.030	0.007
								1" Ice	1.476	0.010
								2" Ice	2.368	0.020
								4" Ice	4.151	0.049
Climbing Ladder (Flat) (E)	B	No	CaAa (Out Of Face)	137.000 - 129.000	36.000	0	1	No Ice	0.584	0.005
								1/2" Ice	1.030	0.007
								1" Ice	1.476	0.010
								2" Ice	2.368	0.020
								4" Ice	4.151	0.049
Climbing Ladder (Flat) (E)	B	No	CaAa (Out Of Face)	127.000 - 119.000	36.000	0	1	No Ice	0.584	0.005
								1/2" Ice	1.030	0.007
								1" Ice	1.476	0.010
								2" Ice	2.368	0.020
								4" Ice	4.151	0.049
Climbing Ladder (Flat) (E)	B	No	CaAa (Out Of Face)	115.000 - 107.000	36.000	0	1	No Ice	0.584	0.005
								1/2" Ice	1.030	0.007
								1" Ice	1.476	0.010
								2" Ice	2.368	0.020
								4" Ice	4.151	0.049
Climbing Ladder (Flat) (E)	B	No	CaAa (Out Of Face)	102.000 - 94.000	36.000	0	1	No Ice	0.584	0.005
								1/2" Ice	1.030	0.007
								1" Ice	1.476	0.010
								2" Ice	2.368	0.020
								4" Ice	4.151	0.049
@										
1 1/4" Plate (CaAa) (E-Mod)	A	No	CaAa (Out Of Face)	80.000 - 0.000	0.000	0	1	No Ice	0.208	0.000
								1/2" Ice	0.292	0.000
								1" Ice	0.375	0.000
								2" Ice	0.542	0.000
								4" Ice	0.875	0.000
1" Plate (CaAa) (E-Mod)	A	No	CaAa (Out Of Face)	105.000 - 90.000	0.000	0	1	No Ice	0.167	0.000
								1/2" Ice	0.250	0.000
								1" Ice	0.333	0.000
								2" Ice	0.500	0.000
								4" Ice	0.833	0.000
**										
1 1/4" Plate (CaAa) (E-Mod)	B	No	CaAa (Out Of Face)	80.000 - 0.000	0.000	0	1	No Ice	0.208	0.000
								1/2" Ice	0.292	0.000
								1" Ice	0.375	0.000
								2" Ice	0.542	0.000
								4" Ice	0.875	0.000
1" Plate (CaAa) (E-Mod)	B	No	CaAa (Out Of Face)	105.000 - 90.000	0.000	0	1	No Ice	0.167	0.000
								1/2" Ice	0.250	0.000
								1" Ice	0.333	0.000
								2" Ice	0.500	0.000
								4" Ice	0.833	0.000
@										
1" Plate (CaAa) (P-Mod)	A	No	CaAa (Out Of Face)	85.000 - 80.000	0.000	0	1	No Ice	0.167	0.000
								1/2" Ice	0.250	0.000
								1" Ice	0.333	0.000
								2" Ice	0.500	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
								4" Ice	0.833	0.000
1" Plate (CaAa) (P-Mod)	A	No	CaAa (Out Of Face)	112.000 - 105.000	0.000	0	1	No Ice	0.167	0.000
								1/2" Ice	0.250	0.000
								1" Ice	0.333	0.000
								2" Ice	0.500	0.000
								4" Ice	0.833	0.000
**										
1" Plate (CaAa) (P-Mod)	B	No	CaAa (Out Of Face)	85.000 - 80.000	0.000	0	1	No Ice	0.167	0.000
								1/2" Ice	0.250	0.000
								1" Ice	0.333	0.000
								2" Ice	0.500	0.000
								4" Ice	0.833	0.000
1" Plate (CaAa) (P-Mod)	B	No	CaAa (Out Of Face)	112.000 - 105.000	0.000	0	1	No Ice	0.167	0.000
								1/2" Ice	0.250	0.000
								1" Ice	0.333	0.000
								2" Ice	0.500	0.000
								4" Ice	0.833	0.000
@										

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	144.500-117.567	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	15.497	0.192
		C	0.000	0.000	0.000	4.462	0.564
L2	117.567-110.500	A	0.000	0.000	0.000	0.250	0.008
		B	0.000	0.000	0.000	4.279	0.094
		C	0.000	0.000	0.000	1.664	0.174
L3	110.500-103.500	A	0.000	0.000	0.000	1.167	0.024
		B	0.000	0.000	0.000	4.598	0.089
		C	0.000	0.000	0.000	1.649	0.172
L4	103.500-98.500	A	0.000	0.000	0.000	0.833	0.017
		B	0.000	0.000	0.000	3.869	0.071
		C	0.000	0.000	0.000	1.178	0.123
L5	98.500-87.184	A	0.000	0.000	0.000	1.417	0.038
		B	0.000	0.000	0.000	6.287	0.156
		C	0.000	0.000	0.000	2.665	0.279
L6	87.184-83.000	A	0.000	0.000	0.000	0.333	0.014
		B	0.000	0.000	0.000	1.162	0.050
		C	0.000	0.000	0.000	0.985	0.103
L7	83.000-77.250	A	0.000	0.000	0.000	1.073	0.019
		B	0.000	0.000	0.000	2.211	0.068
		C	0.000	0.000	0.000	1.354	0.142
L8	77.250-57.250	A	0.000	0.000	0.000	4.167	0.068
		B	0.000	0.000	0.000	8.127	0.237
		C	0.000	0.000	0.000	4.710	0.492
L9	57.250-42.108	A	0.000	0.000	0.000	3.155	0.051
		B	0.000	0.000	0.000	6.153	0.180
		C	0.000	0.000	0.000	4.126	0.376
L10	42.108-31.250	A	0.000	0.000	0.000	2.262	0.037
		B	0.000	0.000	0.000	4.412	0.129
		C	0.000	0.000	0.000	3.241	0.271
L11	31.250-0.000	A	0.000	0.000	0.000	6.510	0.106
		B	0.000	0.000	0.000	12.698	0.371
		C	0.000	0.000	0.000	9.328	0.781

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	144.500-117.567	A	0.885	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	35.738	0.354
		C		0.000	0.000	0.000	12.310	0.644
L2	117.567-110.500	A	0.870	0.000	0.000	0.000	0.471	0.013
		B		0.000	0.000	0.000	9.299	0.161
		C		0.000	0.000	0.000	4.165	0.203
L3	110.500-103.500	A	0.864	0.000	0.000	0.000	2.174	0.037
		B		0.000	0.000	0.000	9.510	0.148
		C		0.000	0.000	0.000	4.067	0.200
L4	103.500-98.500	A	0.858	0.000	0.000	0.000	1.548	0.026
		B		0.000	0.000	0.000	8.118	0.138
		C		0.000	0.000	0.000	2.893	0.143
L5	98.500-87.184	A	0.849	0.000	0.000	0.000	2.619	0.059
		B		0.000	0.000	0.000	12.818	0.400
		C		0.000	0.000	0.000	6.508	0.323
L6	87.184-83.000	A	0.840	0.000	0.000	0.000	0.616	0.022
		B		0.000	0.000	0.000	2.155	0.132
		C		0.000	0.000	0.000	2.406	0.119
L7	83.000-77.250	A	0.834	0.000	0.000	0.000	1.872	0.030
		B		0.000	0.000	0.000	3.970	0.179
		C		0.000	0.000	0.000	3.273	0.164
L8	77.250-57.250	A	0.817	0.000	0.000	0.000	6.889	0.103
		B		0.000	0.000	0.000	14.115	0.612
		C		0.000	0.000	0.000	11.243	0.567
L9	57.250-42.108	A	0.788	0.000	0.000	0.000	5.142	0.077
		B		0.000	0.000	0.000	10.525	0.451
		C		0.000	0.000	0.000	10.297	0.450
L10	42.108-31.250	A	0.759	0.000	0.000	0.000	3.687	0.055
		B		0.000	0.000	0.000	7.547	0.323
		C		0.000	0.000	0.000	8.372	0.335
L11	31.250-0.000	A	0.750	0.000	0.000	0.000	10.417	0.155
		B		0.000	0.000	0.000	21.292	0.895
		C		0.000	0.000	0.000	23.391	0.953

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	144.500-117.567	0.382	0.408	0.565	0.682
L2	117.567-110.500	0.351	0.418	0.495	0.690
L3	110.500-103.500	0.376	0.289	0.500	0.491
L4	103.500-98.500	0.478	0.346	0.662	0.578
L5	98.500-87.184	0.303	0.299	0.395	0.519
L6	87.184-83.000	0.046	0.218	-0.051	0.397
L7	83.000-77.250	0.151	0.144	0.098	0.284
L8	77.250-57.250	0.174	0.132	0.119	0.277
L9	57.250-42.108	0.137	0.156	0.011	0.339
L10	42.108-31.250	0.111	0.172	-0.064	0.382
L11	31.250-0.000	0.114	0.175	-0.059	0.387

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8" x 5'	C	None		0.000	147.000	No Ice	0.313	0.313	0.031
(E)						1/2" Ice	0.826	0.826	0.035
						1" Ice	1.322	1.322	0.041
						2" Ice	1.957	1.957	0.065
						4" Ice	3.338	3.338	0.159
Strobe	C	None		0.000	149.500	No Ice	5.250	3.500	0.020
(E)						1/2" Ice	5.565	3.777	0.058
						1" Ice	5.890	4.062	0.100
						2" Ice	6.564	4.658	0.198
						4" Ice	8.015	5.954	0.450
5' x 2" Pipe Mount	C	None		0.000	147.000	No Ice	1.000	1.000	0.029
(E-For Strobe)						1/2" Ice	1.393	1.393	0.037
						1" Ice	1.703	1.703	0.048
						2" Ice	2.351	2.351	0.082
						4" Ice	3.778	3.778	0.196
Top Hat	C	None		0.000	146.000	No Ice	3.000	3.000	0.081
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
145									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	145.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			1.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	145.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			1.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	145.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			1.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) LGP21401	A	From Leg	4.000	0.000	145.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			1.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	B	From Leg	4.000	0.000	145.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			1.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	C	From Leg	4.000	0.000	145.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			1.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) 782-10250	A	From Leg	4.000	0.000	145.000	No Ice	0.524	0.267	0.006
(E)			0.000			1/2" Ice	0.631	0.359	0.010
			1.000			1" Ice	0.747	0.460	0.015

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	1.005	0.686	0.030
						4" Ice	1.625	1.244	0.085
(2) 782-10250	B	From Leg	4.000	0.000	145.000	No Ice	0.524	0.267	0.006
(E)			0.000			1/2" Ice	0.631	0.359	0.010
			1.000			1" Ice	0.747	0.460	0.015
						2" Ice	1.005	0.686	0.030
						4" Ice	1.625	1.244	0.085
(2) 782-10250	C	From Leg	4.000	0.000	145.000	No Ice	0.524	0.267	0.006
(E)			0.000			1/2" Ice	0.631	0.359	0.010
			1.000			1" Ice	0.747	0.460	0.015
						2" Ice	1.005	0.686	0.030
						4" Ice	1.625	1.244	0.085
(4) 7020.00	A	From Leg	4.000	0.000	145.000	No Ice	0.119	0.204	0.002
(E)			0.000			1/2" Ice	0.171	0.279	0.005
			1.000			1" Ice	0.232	0.363	0.009
						2" Ice	0.380	0.556	0.022
						4" Ice	0.779	1.046	0.071
(4) 7020.00	B	From Leg	4.000	0.000	145.000	No Ice	0.119	0.204	0.002
(E)			0.000			1/2" Ice	0.171	0.279	0.005
			1.000			1" Ice	0.232	0.363	0.009
						2" Ice	0.380	0.556	0.022
						4" Ice	0.779	1.046	0.071
(4) 7020.00	C	From Leg	4.000	0.000	145.000	No Ice	0.119	0.204	0.002
(E)			0.000			1/2" Ice	0.171	0.279	0.005
			1.000			1" Ice	0.232	0.363	0.009
						2" Ice	0.380	0.556	0.022
						4" Ice	0.779	1.046	0.071
RRUS 11	A	From Leg	4.000	90.000	145.000	No Ice	3.249	1.373	0.048
(E-Azimuth per photo)			0.000			1/2" Ice	3.491	1.551	0.068
			0.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS 11	B	From Leg	4.000	90.000	145.000	No Ice	3.249	1.373	0.048
(E-Azimuth per photo)			0.000			1/2" Ice	3.491	1.551	0.068
			0.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS 11	C	From Leg	4.000	90.000	145.000	No Ice	3.249	1.373	0.048
(E-Azimuth per photo)			0.000			1/2" Ice	3.491	1.551	0.068
			0.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
HPA-65R-BUU-H8 w/	A	From Leg	4.000	0.000	145.000	No Ice	13.533	9.582	0.100
Mount Pipe			0.000			1/2" Ice	14.335	11.052	0.196
(R)			0.000			1" Ice	15.143	12.496	0.303
						2" Ice	16.708	14.752	0.550
						4" Ice	19.954	19.462	1.219
HPA-65R-BUU-H8 w/	B	From Leg	4.000	0.000	145.000	No Ice	13.533	9.582	0.100
Mount Pipe			0.000			1/2" Ice	14.335	11.052	0.196
(R)			0.000			1" Ice	15.143	12.496	0.303
						2" Ice	16.708	14.752	0.550
						4" Ice	19.954	19.462	1.219
HPA-65R-BUU-H8 w/	C	From Leg	4.000	0.000	145.000	No Ice	13.533	9.582	0.100
Mount Pipe			0.000			1/2" Ice	14.335	11.052	0.196
(R)			0.000			1" Ice	15.143	12.496	0.303
						2" Ice	16.708	14.752	0.550
						4" Ice	19.954	19.462	1.219

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS A2	A	From Leg	4.000	0.000	145.000	No Ice	2.411	0.533	0.022
(R)			0.000			1/2" Ice	2.619	0.665	0.035
			0.000			1" Ice	2.837	0.806	0.050
						2" Ice	3.297	1.114	0.088
						4" Ice	4.322	1.833	0.203
RRUS A2	B	From Leg	4.000	0.000	145.000	No Ice	2.411	0.533	0.022
(R)			0.000			1/2" Ice	2.619	0.665	0.035
			0.000			1" Ice	2.837	0.806	0.050
						2" Ice	3.297	1.114	0.088
						4" Ice	4.322	1.833	0.203
RRUS A2	C	From Leg	4.000	0.000	145.000	No Ice	2.411	0.533	0.022
(R)			0.000			1/2" Ice	2.619	0.665	0.035
			0.000			1" Ice	2.837	0.806	0.050
						2" Ice	3.297	1.114	0.088
						4" Ice	4.322	1.833	0.203
RRUS 11 B4	A	From Leg	4.000	0.000	145.000	No Ice	3.306	1.361	0.051
(R)			0.000			1/2" Ice	3.550	1.540	0.072
			0.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
RRUS 11 B4	B	From Leg	4.000	0.000	145.000	No Ice	3.306	1.361	0.051
(R)			0.000			1/2" Ice	3.550	1.540	0.072
			0.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
RRUS 11 B4	C	From Leg	4.000	0.000	145.000	No Ice	3.306	1.361	0.051
(R)			0.000			1/2" Ice	3.550	1.540	0.072
			0.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
8'x2" Antenna Mount Pipe	A	From Leg	4.000	0.000	145.000	No Ice	1.900	1.900	0.030
(E)			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.064
						2" Ice	4.396	4.396	0.120
						4" Ice	6.498	6.498	0.301
8'x2" Antenna Mount Pipe	B	From Leg	4.000	0.000	145.000	No Ice	1.900	1.900	0.030
(E)			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.064
						2" Ice	4.396	4.396	0.120
						4" Ice	6.498	6.498	0.301
8'x2" Antenna Mount Pipe	C	From Leg	4.000	0.000	145.000	No Ice	1.900	1.900	0.030
(E)			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.064
						2" Ice	4.396	4.396	0.120
						4" Ice	6.498	6.498	0.301
Platform Mount [LP 712-1]	C	None		0.000	145.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
135									
LNX-6512DS-VTM w/ Mount Pipe	A	From Leg	4.000	0.000	135.000	No Ice	5.791	4.501	0.039
(E)			0.000			1/2" Ice	6.245	5.170	0.087
			2.000			1" Ice	6.709	5.852	0.140
						2" Ice	7.667	7.269	0.269
						4" Ice	9.720	10.366	0.637
LNX-6512DS-VTM w/	B	From Leg	4.000	0.000	135.000	No Ice	5.791	4.501	0.039

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount Pipe			0.000			1/2" Ice	6.245	5.170	0.087
(E)			2.000			1" Ice	6.709	5.852	0.140
						2" Ice	7.667	7.269	0.269
						4" Ice	9.720	10.366	0.637
LNX-6512DS-VTM w/	C	From Leg	4.000	0.000	135.000	No Ice	5.791	4.501	0.039
Mount Pipe			0.000			1/2" Ice	6.245	5.170	0.087
(E)			2.000			1" Ice	6.709	5.852	0.140
						2" Ice	7.667	7.269	0.269
						4" Ice	9.720	10.366	0.637
(2) FD9R6004/2C-3L	A	From Leg	4.000	0.000	135.000	No Ice	0.367	0.085	0.003
(E)			0.000			1/2" Ice	0.451	0.136	0.005
			2.000			1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L	B	From Leg	4.000	0.000	135.000	No Ice	0.367	0.085	0.003
(E)			0.000			1/2" Ice	0.451	0.136	0.005
			2.000			1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L	C	From Leg	4.000	0.000	135.000	No Ice	0.367	0.085	0.003
(E)			0.000			1/2" Ice	0.451	0.136	0.005
			2.000			1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
DB-T1-6Z-8AB-0Z	B	From Leg	4.000	0.000	135.000	No Ice	5.600	2.333	0.044
(E)			0.000			1/2" Ice	5.915	2.558	0.080
			2.000			1" Ice	6.240	2.791	0.120
						2" Ice	6.914	3.284	0.213
						4" Ice	8.365	4.373	0.455
LNX-6514DS-AIM w/ Mount	A	From Leg	4.000	0.000	135.000	No Ice	8.648	7.082	0.065
Pipe			0.000			1/2" Ice	9.305	8.273	0.134
(R)			2.000			1" Ice	9.930	9.185	0.211
						2" Ice	11.204	11.023	0.393
						4" Ice	13.872	15.063	0.902
LNX-6514DS-AIM w/ Mount	B	From Leg	4.000	0.000	135.000	No Ice	8.648	7.082	0.065
Pipe			0.000			1/2" Ice	9.305	8.273	0.134
(R)			2.000			1" Ice	9.930	9.185	0.211
						2" Ice	11.204	11.023	0.393
						4" Ice	13.872	15.063	0.902
LNX-6514DS-AIM w/ Mount	C	From Leg	4.000	0.000	135.000	No Ice	8.648	7.082	0.065
Pipe			0.000			1/2" Ice	9.305	8.273	0.134
(R)			2.000			1" Ice	9.930	9.185	0.211
						2" Ice	11.204	11.023	0.393
						4" Ice	13.872	15.063	0.902
(2) HBXX-6517DS-A2M w/	A	From Leg	4.000	0.000	135.000	No Ice	8.976	6.963	0.067
Mount Pipe			0.000			1/2" Ice	9.647	8.182	0.137
(R)			2.000			1" Ice	10.291	9.144	0.215
						2" Ice	11.595	11.022	0.398
						4" Ice	14.321	15.027	0.914
(2) HBXX-6517DS-A2M w/	B	From Leg	4.000	0.000	135.000	No Ice	8.976	6.963	0.067
Mount Pipe			0.000			1/2" Ice	9.647	8.182	0.137
(R)			2.000			1" Ice	10.291	9.144	0.215
						2" Ice	11.595	11.022	0.398
						4" Ice	14.321	15.027	0.914
(2) HBXX-6517DS-A2M w/	C	From Leg	4.000	0.000	135.000	No Ice	8.976	6.963	0.067
Mount Pipe			0.000			1/2" Ice	9.647	8.182	0.137
(R)			2.000			1" Ice	10.291	9.144	0.215

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	11.595	11.022	0.398
						4" Ice	14.321	15.027	0.914
RRH2x60-700 (R)	A	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2x60-700 (R)	B	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2x60-700 (R)	C	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2X60-PCS (R)	A	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.791 3.025 3.517 4.606	2.011 2.218 2.435 2.894 3.915	0.055 0.075 0.099 0.155 0.313
RRH2X60-PCS (R)	B	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.791 3.025 3.517 4.606	2.011 2.218 2.435 2.894 3.915	0.055 0.075 0.099 0.155 0.313
RRH2X60-PCS (R)	C	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.791 3.025 3.517 4.606	2.011 2.218 2.435 2.894 3.915	0.055 0.075 0.099 0.155 0.313
RRH2X60-AWS (R)	A	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2X60-AWS (R)	B	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2X60-AWS (R)	C	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
DB-T1-6Z-8AB-0Z (R)	B	From Leg	4.000 0.000 2.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.600 5.915 6.240 6.914 8.365	2.333 2.558 2.791 3.284 4.373	0.044 0.080 0.120 0.213 0.455
Platform Mount [LP 712-1] (E)	C	None		0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.530 29.940 35.350 46.170 67.810	24.530 29.940 35.350 46.170 67.810	1.335 1.646 1.956 2.577 3.820

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
125									
ERICSSON AIR 21 B2A	A	From Leg	4.000	0.000	125.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(E)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	B	From Leg	4.000	0.000	125.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(E)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	C	From Leg	4.000	0.000	125.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(E)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	A	From Leg	4.000	0.000	125.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(E)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	B	From Leg	4.000	0.000	125.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(E)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	C	From Leg	4.000	0.000	125.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(E)			1.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
KRY 112 144/1	A	From Leg	4.000	0.000	125.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			1.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	B	From Leg	4.000	0.000	125.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			1.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	C	From Leg	4.000	0.000	125.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			1.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
LNX-6515DS-A1M w/	A	From Leg	4.000	0.000	125.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(P)			1.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-A1M w/	B	From Leg	4.000	0.000	125.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(P)			1.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-A1M w/	C	From Leg	4.000	0.000	125.000	No Ice	11.683	9.842	0.083

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
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(P)			1.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
RRUS 11 B12	A	From Leg	4.000	0.000	125.000	No Ice	3.306	1.361	0.051
(P)			0.000			1/2" Ice	3.550	1.540	0.072
			1.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
RRUS 11 B12	B	From Leg	4.000	0.000	125.000	No Ice	3.306	1.361	0.051
(P)			0.000			1/2" Ice	3.550	1.540	0.072
			1.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
RRUS 11 B12	C	From Leg	4.000	0.000	125.000	No Ice	3.306	1.361	0.051
(P)			0.000			1/2" Ice	3.550	1.540	0.072
			1.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
Platform Mount [LP 712-1]	C	None		0.000	125.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
113									
APXVSPP18-C-A20 w/	A	From Leg	4.000	0.000	113.000	No Ice	8.498	6.946	0.083
Mount Pipe			0.000			1/2" Ice	9.149	8.127	0.151
(E)			0.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVSPP18-C-A20 w/	B	From Leg	4.000	0.000	113.000	No Ice	8.498	6.946	0.083
Mount Pipe			0.000			1/2" Ice	9.149	8.127	0.151
(E)			0.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVSPP18-C-A20 w/	C	From Leg	4.000	0.000	113.000	No Ice	8.498	6.946	0.083
Mount Pipe			0.000			1/2" Ice	9.149	8.127	0.151
(E)			0.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVTM14-C-120 w/	A	From Leg	4.000	0.000	113.000	No Ice	7.134	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.662	5.754	0.132
(E)			0.000			1" Ice	8.183	6.472	0.193
						2" Ice	9.256	8.010	0.339
						4" Ice	11.526	11.412	0.753
APXVTM14-C-120 w/	B	From Leg	4.000	0.000	113.000	No Ice	7.134	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.662	5.754	0.132
(E)			0.000			1" Ice	8.183	6.472	0.193
						2" Ice	9.256	8.010	0.339
						4" Ice	11.526	11.412	0.753
APXVTM14-C-120 w/	C	From Leg	4.000	0.000	113.000	No Ice	7.134	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.662	5.754	0.132
(E)			0.000			1" Ice	8.183	6.472	0.193
						2" Ice	9.256	8.010	0.339
						4" Ice	11.526	11.412	0.753
TD-RRH8x20-25	A	From Leg	4.000	0.000	113.000	No Ice	4.720	1.703	0.070
(E)			0.000			1/2" Ice	5.014	1.920	0.097

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	5.316	2.145	0.128
						2" Ice	5.948	2.622	0.201
						4" Ice	7.314	3.680	0.397
TD-RRH8x20-25	B	From Leg	4.000	0.000	113.000	No Ice	4.720	1.703	0.070
(E)			0.000			1/2" Ice	5.014	1.920	0.097
			0.000			1" Ice	5.316	2.145	0.128
						2" Ice	5.948	2.622	0.201
						4" Ice	7.314	3.680	0.397
TD-RRH8x20-25	C	From Leg	4.000	0.000	113.000	No Ice	4.720	1.703	0.070
(E)			0.000			1/2" Ice	5.014	1.920	0.097
			0.000			1" Ice	5.316	2.145	0.128
						2" Ice	5.948	2.622	0.201
						4" Ice	7.314	3.680	0.397
Platform Mount [LP 712-1]	C	None		0.000	113.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
111									
PCS 1900MHz	A	From Leg	1.000	0.000	111.000	No Ice	2.709	2.611	0.060
4x45W-65MHz			0.000			1/2" Ice	2.948	2.847	0.083
(E)			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
PCS 1900MHz	B	From Leg	1.000	0.000	111.000	No Ice	2.709	2.611	0.060
4x45W-65MHz			0.000			1/2" Ice	2.948	2.847	0.083
(E)			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
PCS 1900MHz	C	From Leg	1.000	0.000	111.000	No Ice	2.709	2.611	0.060
4x45W-65MHz			0.000			1/2" Ice	2.948	2.847	0.083
(E)			0.000			1" Ice	3.195	3.092	0.110
						2" Ice	3.716	3.608	0.173
						4" Ice	4.862	4.744	0.347
800MHz 2X50W RRH	A	From Leg	1.000	0.000	111.000	No Ice	2.401	2.254	0.064
W/FILTER			0.000			1/2" Ice	2.613	2.460	0.086
(E)			-2.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
800MHz 2X50W RRH	B	From Leg	1.000	0.000	111.000	No Ice	2.401	2.254	0.064
W/FILTER			0.000			1/2" Ice	2.613	2.460	0.086
(E)			-2.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
800MHz 2X50W RRH	C	From Leg	1.000	0.000	111.000	No Ice	2.401	2.254	0.064
W/FILTER			0.000			1/2" Ice	2.613	2.460	0.086
(E)			-2.000			1" Ice	2.833	2.675	0.111
						2" Ice	3.300	3.132	0.172
						4" Ice	4.337	4.148	0.338
Side Arm Mount [SO 102-3]	C	None		0.000	111.000	No Ice	3.000	3.000	0.081
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
100									
800 10504 w/ Mount Pipe	A	From Leg	4.000	0.000	100.000	No Ice	3.589	3.178	0.038
(E)			0.000			1/2" Ice	4.007	3.905	0.070

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.000			1" Ice	4.422	4.581	0.109
						2" Ice	5.339	5.982	0.207
						4" Ice	7.385	8.983	0.514
800 10504 w/ Mount Pipe	B	From Leg	4.000	0.000	100.000	No Ice	3.589	3.178	0.038
(E)			0.000			1/2" Ice	4.007	3.905	0.070
			2.000			1" Ice	4.422	4.581	0.109
						2" Ice	5.339	5.982	0.207
						4" Ice	7.385	8.983	0.514
800 10504 w/ Mount Pipe	C	From Leg	4.000	0.000	100.000	No Ice	3.589	3.178	0.038
(E)			0.000			1/2" Ice	4.007	3.905	0.070
			2.000			1" Ice	4.422	4.581	0.109
						2" Ice	5.339	5.982	0.207
						4" Ice	7.385	8.983	0.514
7'x2" Antenna Mount Pipe	A	From Leg	4.000	0.000	100.000	No Ice	1.663	1.663	0.026
(E)			0.000			1/2" Ice	2.391	2.391	0.039
			0.000			1" Ice	2.825	2.825	0.056
						2" Ice	3.706	3.706	0.105
						4" Ice	5.578	5.578	0.266
7'x2" Antenna Mount Pipe	B	From Leg	4.000	0.000	100.000	No Ice	1.663	1.663	0.026
(E)			0.000			1/2" Ice	2.391	2.391	0.039
			0.000			1" Ice	2.825	2.825	0.056
						2" Ice	3.706	3.706	0.105
						4" Ice	5.578	5.578	0.266
7'x2" Antenna Mount Pipe	C	From Leg	4.000	0.000	100.000	No Ice	1.663	1.663	0.026
(E)			0.000			1/2" Ice	2.391	2.391	0.039
			0.000			1" Ice	2.825	2.825	0.056
						2" Ice	3.706	3.706	0.105
						4" Ice	5.578	5.578	0.266
Platform Mount [LP 712-1]	C	None		0.000	100.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
51									
KS24019-L112A	C	From Leg	3.000	0.000	51.000	No Ice	0.156	0.156	0.005
(E)			0.000			1/2" Ice	0.225	0.225	0.007
			1.000			1" Ice	0.302	0.302	0.009
						2" Ice	0.484	0.484	0.018
						4" Ice	0.951	0.951	0.056
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	51.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
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Load Combinations

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	144.5 - 117.567	34.540	31	2.239	0.004
L2	121.424 - 110.5	24.168	31	1.963	0.002
L3	110.5 - 103.5	19.882	31	1.750	0.002
L4	103.5 - 98.5	17.403	31	1.631	0.001
L5	98.5 - 87.184	15.744	31	1.536	0.001
L6	91.809 - 83	13.663	31	1.434	0.001
L7	83 - 77.25	11.122	31	1.287	0.001
L8	77.25 - 57.25	9.631	31	1.189	0.001
L9	57.25 - 42.108	5.327	31	0.866	0.000
L10	47.884 - 31.25	3.778	31	0.714	0.000
L11	31.25 - 0	1.612	31	0.502	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.500	Strobe	31	34.540	2.239	0.004	12784
147.000	Lightning Rod 5/8" x 5'	31	34.540	2.239	0.004	12784
146.000	Top Hat	31	34.540	2.239	0.004	12784
145.000	(2) 7770.00 w/ Mount Pipe	31	34.540	2.239	0.004	12784
135.000	LNX-6512DS-VTM w/ Mount Pipe	31	30.138	2.149	0.004	6728
125.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	31	25.682	2.022	0.003	3280
113.000	APXVSPP18-C-A20 w/ Mount Pipe	31	20.818	1.797	0.002	2772
111.000	PCS 1900MHz 4x45W-65MHz	31	20.067	1.759	0.002	2807
100.000	800 10504 w/ Mount Pipe	31	16.232	1.563	0.001	3243
51.000	KS24019-L112A	31	4.267	0.762	0.000	4741

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	144.5 - 117.567	99.310	6	6.442	0.012
L2	121.424 - 110.5	69.556	6	5.650	0.007
L3	110.5 - 103.5	57.244	6	5.041	0.005
L4	103.5 - 98.5	50.115	6	4.698	0.004
L5	98.5 - 87.184	45.346	6	4.424	0.004
L6	91.809 - 83	39.358	6	4.133	0.003
L7	83 - 77.25	32.046	6	3.708	0.003
L8	77.25 - 57.25	27.754	6	3.427	0.002
L9	57.25 - 42.108	15.358	6	2.497	0.001
L10	47.884 - 31.25	10.893	6	2.059	0.001
L11	31.25 - 0	4.649	6	1.447	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.500	Strobe	6	99.310	6.442	0.012	4573
147.000	Lightning Rod 5/8" x 5'	6	99.310	6.442	0.012	4573
146.000	Top Hat	6	99.310	6.442	0.012	4573
145.000	(2) 7770.00 w/ Mount Pipe	6	99.310	6.442	0.012	4573
135.000	LNX-6512DS-VTM w/ Mount Pipe	6	86.687	6.185	0.010	2406
125.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	6	73.903	5.822	0.008	1171
113.000	APXVSPP18-C-A20 w/ Mount Pipe	6	59.932	5.175	0.005	982
111.000	PCS 1900MHz 4x45W-65MHz	6	57.776	5.067	0.005	994
100.000	800 10504 w/ Mount Pipe	6	46.749	4.504	0.004	1143
51.000	KS24019-L112A	6	12.302	2.198	0.001	1651

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	144.5 - 117.567 (1)	TP26.875x21x0.188	26.933	0.000	0.0	39.000	15.382	-7.542	599.886	0.013
L2	117.567 - 110.5 (2)	TP28.001x25.659x0.25	10.924	0.000	0.0	39.000	22.020	-11.135	858.792	0.013
L3	110.5 - 103.5 (3)	TP29.502x28.001x0.414	7.000	0.000	0.0	27.673	38.246	-12.366	1058.380	0.012
L4	103.5 - 98.5 (4)	TP30.574x29.502x0.408 H1-3+VT (1.35 CR) - 4	5.000	0.000	0.0	27.705	39.023	-14.675	1081.120	0.014
L5	98.5 - 87.184 (5)	TP33x30.574x0.554	11.316	0.000	0.0	27.744	55.270	-16.213	1533.420	0.011
L6	87.184 - 83 (6)	TP33.407x31.508x0.375	8.809	0.000	0.0	39.000	39.316	-18.706	1533.320	0.012
L7	83 - 77.25 (7)	TP34.646x33.407x0.563	5.750	0.000	0.0	30.576	60.852	-20.185	1860.610	0.011
L8	77.25 - 57.25 (8)	TP38.956x34.646x0.601	20.000	0.000	0.0	31.055	73.143	-25.920	2271.470	0.011
L9	57.25 - 42.108 (9)	TP42.219x38.956x0.588	15.142	0.000	0.0	31.103	75.351	-28.846	2343.610	0.012
L10	42.108 - 31.25 (10)	TP43.794x40.224x0.636	16.634	0.000	0.0	31.162	87.141	-35.883	2715.500	0.013
L11	31.25 - 0 (11)	TP50.5x43.794x0.562 H1-3+VT (1.39 CR) - 11	31.250	0.000	0.0	34.502	89.146	-48.113	3075.660	0.016

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	144.5 - 117.567 (1)	TP26.875x21x0.188	315.287	38.544	39.000	0.988	0.000	0.000	39.000	0.000
L2	117.567 - 110.5 (2)	TP28.001x25.659x0.25	559.407	44.569	39.000	1.143	0.000	0.000	39.000	0.000
L3	110.5 - 103.5 (3)	TP29.502x28.001x0.414	747.665	32.890	27.673	1.189	0.000	0.000	27.673	0.000
L4	103.5 - 98.5 (4)	TP30.574x29.502x0.408	889.325	36.945	27.705	1.334	0.000	0.000	27.705	0.000
L5	98.5 - 87.184 (5)	TP33x30.574x0.554	1090.800	30.808	27.744	1.110	0.000	0.000	27.744	0.000
L6	87.184 - 83 (6)	TP33.407x31.508x0.375	1364.025	51.255	39.000	1.314	0.000	0.000	39.000	0.000
L7	83 - 77.25 (7)	TP34.646x33.407x0.563	1546.575	36.574	30.576	1.196	0.000	0.000	30.576	0.000
L8	77.25 - 57.25 (8)	TP38.956x34.646x0.601	2208.142	38.573	31.055	1.242	0.000	0.000	31.055	0.000
L9	57.25 - 42.108 (9)	TP42.219x38.956x0.588	2532.000	40.731	31.103	1.310	0.000	0.000	31.103	0.000
L10	42.108 - 31.25 (10)	TP43.794x40.224x0.636	3129.992	40.750	31.162	1.308	0.000	0.000	31.162	0.000
L11	31.25 - 0 (11)	TP50.5x43.794x0.562	4315.550	47.302	34.502	1.371	0.000	0.000	34.502	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	144.5 - 117.567 (1)	TP26.875x21x0.188	20.961	1.363	26.000	0.105	0.029	0.002	26.000	0.000
L2	117.567 - 110.5 (2)	TP28.001x25.659x0.25	26.487	1.203	26.000	0.093	0.045	0.002	26.000	0.000
L3	110.5 - 103.5 (3)	TP29.502x28.001x0.414	27.310	0.714	18.449	0.077	0.049	0.001	18.449	0.000
L4	103.5 - 98.5 (4)	TP30.574x29.502x0.408	29.735	0.762	18.470	0.082	0.052	0.001	18.470	0.000
L5	98.5 - 87.184 (5)	TP33x30.574x0.554	30.492	0.552	18.496	0.060	0.059	0.001	18.496	0.000
L6	87.184 - 83 (6)	TP33.407x31.508x0.375	31.457	0.800	26.000	0.062	0.069	0.001	26.000	0.000
L7	83 - 77.25 (7)	TP34.646x33.407x0.563	32.056	0.527	20.384	0.052	0.072	0.001	20.384	0.000
L8	77.25 - 57.25 (8)	TP38.956x34.646x0.601	34.131	0.467	20.703	0.045	0.076	0.001	20.703	0.000
L9	57.25 - 42.108 (9)	TP42.219x38.956x0.588	35.086	0.466	20.735	0.045	0.274	0.002	20.735	0.000
L10	42.108 - 31.25 (10)	TP43.794x40.224x0.636	36.716	0.421	20.775	0.041	0.286	0.002	20.775	0.000
L11	31.25 - 0 (11)	TP50.5x43.794x0.562	39.198	0.440	23.001	0.038	0.313	0.002	23.001	0.000

Pole Interaction Design Data

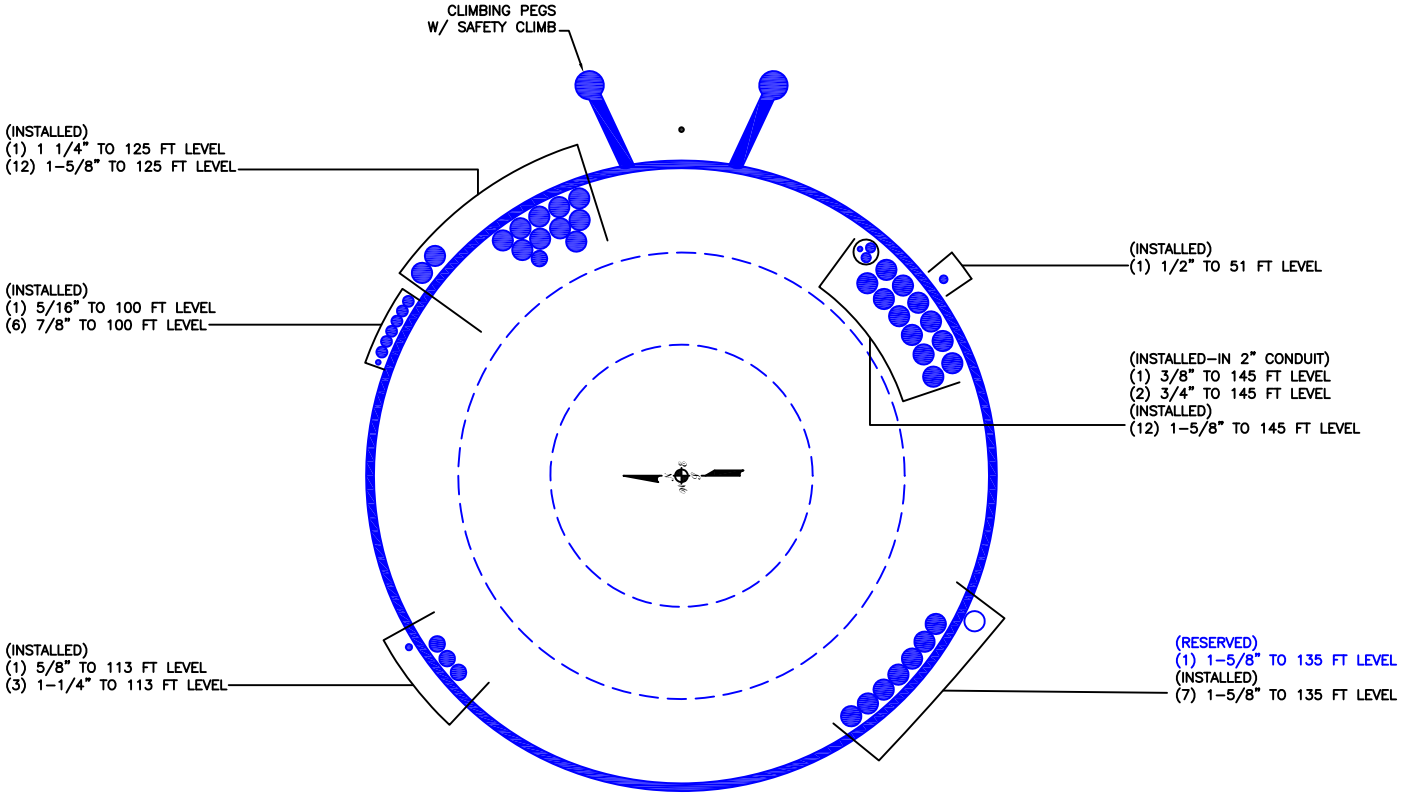
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	144.5 - 117.567 (1)	0.013	0.988	0.000	0.105	0.000	1.004 ✔	1.333	H1-3+VT ✔
L2	117.567 - 110.5 (2)	0.013	1.143	0.000	0.093	0.000	1.158 ✔	1.333	H1-3+VT ✔
L3	110.5 - 103.5 (3)	0.012	1.189	0.000	0.077	0.000	1.202 ✔	1.333	H1-3+VT ✔
L4	103.5 - 98.5 (4)	0.014	1.334	0.000	0.082	0.000	**1.349** ✘	1.333	H1-3+VT ✘
L5	98.5 - 87.184 (5)	0.011	1.110	0.000	0.060	0.000	1.122 ✔	1.333	H1-3+VT ✔
L6	87.184 - 83 (6)	0.012	1.314	0.000	0.062	0.000	1.327 ✔	1.333	H1-3+VT ✔
L7	83 - 77.25 (7)	0.011	1.196	0.000	0.052	0.000	1.208 ✔	1.333	H1-3+VT ✔
L8	77.25 - 57.25 (8)	0.011	1.242	0.000	0.045	0.000	1.254 ✔	1.333	H1-3+VT ✔
L9	57.25 - 42.108 (9)	0.012	1.310	0.000	0.045	0.000	1.322 ✔	1.333	H1-3+VT ✔
L10	42.108 - 31.25 (10)	0.013	1.308	0.000	0.041	0.000	1.321 ✔	1.333	H1-3+VT ✔
L11	31.25 - 0 (11)	0.016	1.371	0.000	0.038	0.000	**1.387** ✘	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	144.5 - 117.567	Pole	TP26.875x21x0.188	1	-7.542	799.648	75.0	Pass
L2	117.567 - 110.5	Pole	TP28.001x25.659x0.25	2	-11.135	1144.770	86.6	Pass
L3	110.5 - 103.5	Pole	TP29.502x28.001x0.414	3	-12.366	1410.820	87.8	Pass
L4	103.5 - 98.5	Pole	TP30.574x29.502x0.408	4	-14.675	1441.133	98.5	Pass
L5	98.5 - 87.184	Pole	TP33x30.574x0.554	5	-16.213	2044.049	82.0	Pass
L6	87.184 - 83	Pole	TP33.407x31.508x0.375	6	-18.706	2043.915	99.4	Pass
L7	83 - 77.25	Pole	TP34.646x33.407x0.563	7	-20.185	2480.193	88.3	Pass
L8	77.25 - 57.25	Pole	TP38.956x34.646x0.601	8	-25.920	3027.869	91.7	Pass
L9	57.25 - 42.108	Pole	TP42.219x38.956x0.588	9	-28.846	3124.032	96.7	Pass
L10	42.108 - 31.25	Pole	TP43.794x40.224x0.636	10	-35.883	3619.761	96.6	Pass
L11	31.25 - 0	Pole	TP50.5x43.794x0.562	11	-48.113	4099.855	97.2	Pass
							Summary	
						Pole (L6)	99.4	Pass
						RATING =	**99.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 881533 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Reinforced Pole Stress and Effective Thickness Check

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

Section		Loads				Pole															Unreinforced Pole - Rev. F						Reinforced Pole						Rev. F	Reinforcement 1								Reinforcement 2								Composite							
Section	Elevation (ft)	Moment (ft-kip)	Compression (kip)	Shear (kip)	Torsion (kip-ft)	Number of Sides	OD (in)	Thickness (in)	Yield Strength (ksi)	Flat Width (in)	Area (in^2)	Moment of Inertia (in^4)	Percent of Composite Moment of Inertia	Angle Offset to Pole Flat	Distance to Extreme Fiber (in)	Section Modulus (in^3)	Torsion Constant (in^4)	Polygonal Compact Criterion	Allowable Bending Stress (ksi)	Allowable Bending Moment Strength (ft-kip)	Allowable Axial Stress (ksi)	Allowable Shear Stress (ksi)	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Torsion Shear Stress (ksi)	**Stress Ratio**	Moment in Pole when Reinforced	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Torsion Shear Stress (ksi)	**Reinforced Pole Stress Ratio**	Qty	**Model**	Position (F-Flat, C-Corner)	Gap Between Pole and Back of Rein. (in)	Tension only or Tension & Comp.	Total Moment of Inertia (in^4)	Axial Force (kip)	**Stress Ratio**	Qty	**Model**	Position (F-Flat, C-Corner)	Gap Between Pole and Back of Rein. (in)	Tension only or Tension & Comp.	Total Moment of Inertia (in^4)	Axial Force (kip)	**Stress Ratio**	Centroid Offset (in)	Area (in^2)	Moment of Inertia (in^4)	**Controlling Stress Ratio**	**Thickness (in)**	**Weight Multiplier**	**Derated Yield Stress (ksi)**	**% Error in Derated Yield Stress**
Section	*Elevation*	*Moment*	*Compression*	*Shear*	*Torsion*	*PoleSides*	*PoleOD*	*PoleT*	*PoleFy*	*PoleW*	*PoleA*	*PoleI*	*PoleIPer*	*PoleCPoint*	*PoleC*	*PoleS*	*PoleJ*	*PoleWTf*	*PoleFb*	*PoleMall*	*PoleFa*	*PoleFv*	*PoleFbAct*	*PoleFaAct*	*PoleFvAct*	*PoleFvtAct*	***PoleSR***	*PoleMoment*	*RPoleFbAct*	*RPoleFaAct*	*RPoleFvAct*	*RPoleFvtAct*	***RPoleSR***	*Rein1Qty*	***Rein1Model***	*Rein1Pos*	*Rein1Gap*	*Rein1TC*	*Rein1Total*	*Rein1P*	***Rein1SR***	*Rein2Qty*	***Rein2Model***	*Rein2Pos*	*Rein2Gap*	*Rein2TC*	*Rein2Total*	*Rein2P*	***Rein2SR***	*CompYBar*	*CompA*	*CompI*	***CompSR***	***EPoleT***	***EPoleWM***	***EDPoleFy***	***EDPoleSRCheck***
1	144.5	0.0	0.0	0.0	0.0	18	21.0000	0.1875	65	3.37	12.4	677	100%	TRUE	10.65	64	1342	145	52.0	275.5	52.0	34.7	0.0	0.00	0.00	0.00	**0.000**	0.0	0.0	0.00	0.00	0.00	**0.000**																		0.000	12.4	677	**0.000**	**0.1875**	**1.00**	**65.0**	**178.3%**
2	121.424	315.2	7.5	21.0	0.0	18	26.0337	0.1875	65	4.26	15.4	1297	100%	TRUE	13.20	98	2570	183	52.0	425.5	52.0	34.7	38.5	0.49	0.00	0.00	**0.750**	315.2	38.5	0.49	0.00	0.00	**0.750**																		0.000	15.4	1297	**0.750**	**0.1875**	**1.00**	**65.0**	**0.8%**
3	117.567	397.0	8.2	21.4	0.0	18	26.8750	0.4375	65	3.97	36.7	3236	100%	TRUE	13.61	238	6421	73	52.0	1029.9	52.0	34.7	20.0	0.22	0.00	0.00	**0.390**	397.0	20.0	0.22	0.00	0.00	**0.390**																		0.000	36.7	3236	**0.390**	**0.4375**	**1.00**	**65.0**	**0.6%**
4	110.5	559.4	11.1	26.5	0.0	18	28.0009	0.2500	65	4.50	22.0	2140	100%	TRUE	14.20	151	4242	145	52.0	653.0	52.0	34.7	44.5	0.51	0.00	0.00	**0.866**	559.4	44.5	0.51	0.00	0.00	**0.866**																		0.000	22.0	2140	**0.866**	**0.2500**	**1.00**	**65.0**	**0.5%**
5	103.5	747.7	12.4	27.3	0.0	18	29.5017	0.2500	65	4.76	23.2	2506	61%	0	14.75	170	4968	154	52.0	736.1	52.0	34.7	52.8	0.53	0.00	0.00	**0.633**	458.4	32.4	0.53	0.00	0.00	**0.633**																		0.000	36.7	4088	**0.878**	**0.4143**	**0.96**	**46.1**	**2.8%**
6	98.5	889.3	14.7	29.7	0.1	18	30.5738	0.2500	65	4.95	24.0	2792	62%	0	15.29	183	5535	160	52.0	791.3	52.0	34.7	58.4	0.61	0.00	0.00	**1.136**	553.5	36.4	0.61	0.00	0.00	**0.711**								**3**	**CCI-1x4.5**	**F**	0	T&C	1694	169.0	**0.985**	0.000	37.5	4486	**0.985**	**0.4076**	**0.96**	**46.2**	**2.9%**
7	91.809	1090.8	16.2	30.5	0.1	18	32.0084	0.2500	65	5.20	25.2	3208	46%	0	16.00	200	6358	168	52.0	868.3	52.0	34.7	65.3	0.64	0.00	0.00	**1.269**	506.4	30.3	0.64	0.00	0.00	**0.596**	**3**	**CCI-1x4.5**	**F**	0	T&C	1851	132.4	**0.820**	**3**	**CCI-1x4.5**	**F**	0	T&C	1851	132.4	**0.771**	0.000	52.2	6909	**0.820**	**0.5536**	**0.95**	**46.2**	**2.7%**
8	91.5	1100.3	16.3	30.5	0.1	18	32.0746	0.6250	65	4.55	62.3	7779	68%	TRUE	16.24	479	15444	59	52.0	2075.6	52.0	34.7	27.6	0.26	0.00	0.00	**0.535**	744.6	18.6	0.26	0.00	0.00	**0.364**	**3**	**CCI-1x4.5**	**F**	0	T&C	1858	80.4	**0.469**	**3**	**CCI-1x4.5**	**F**	0	T&C	1858	80.4	**0.469**	0.000	89.3	11495	**0.469**	**0.9508**	**0.95**	**46.8**	**7.9%**
9	87.184	1233.1	17.9	31.1	0.1	18	33.0000	0.6250	65	4.72	64.1	8487	100%	TRUE	16.71	508	16848	61	52.0	2200.7	52.0	34.7	29.1	0.28	0.00	0.00	**0.566**	1233.1	29.1	0.28	0.00	0.00	**0.566**																		0.000	64.1	8487	**0.566**	**0.6250**	**1.00**	**65.0**	**0.3%**
10	83	1364.0	18.7	31.5	0.1	18	33.4067	0.3750	65	5.23	39.3	5412	100%	TRUE	16.93	320	10733	112	52.0	1384.7	52.0	34.7	51.2	0.48	0.00	0.00	**0.994**	1364.0	51.2	0.48	0.00	0.00	**0.994**																		0.000	39.3	5412	**0.994**	**0.3750**	**1.00**	**65.0**	**0.2%**
11	77.25	1546.6	20.2	32.1	0.1	18	34.6458	0.3750	65	5.45	40.7	6044	68%	0	17.32	349	11986	117	52.0	1511.6	52.0	34.7	53.2	0.50	0.00	0.00	**1.033**	1046.7	36.0	0.50	0.00	0.00	**0.702**																		0.000	58.7	8931	**0.883**	**0.5625**	**0.97**	**51.0**	**2.6%**
12	57.25	2208.1	25.9	34.1	0.1	18	38.9557	0.3750	65	6.21	45.9	8625	63%	0	19.48	443	17100	133	52.0	1918.3	52.0	34.7	59.8	0.56	0.00	0.00	**1.162**	1400.9	38.0	0.56	0.00	0.00	**0.741**								**3**	**CCI-1.25x6.5**	**F**	0	T&C	4970	318.5	**0.917**	0.000	70.3	13594	**0.917**	**0.6008**	**0.96**	**51.8**	**2.6%**
13	47.884	2531.9	28.8	35.1	0.3	18	40.9741	0.3750	65	6.56	48.3	10051	65%	0	20.49	491	19926	141	52.0	2125.3	52.0	34.7	61.9	0.60	0.00	0.00	**1.203**	1638.8	40.1	0.60	0.00	0.00	**0.783**								**3**	**CCI-1.25x6.5**	**F**	0	T&C	5477	335.7	**0.967**	0.000	72.7	15527	**0.967**	**0.5878**	**0.97**	**51.8**	**2.6%**
14	42.108	2736.7	32.2	35.7	0.3	18	42.2188	0.8125	65	6.01	106.6	23080	80%	0	21.11	1093	45820	60	52.0	4736.7	52.0	34.7	30.0	0.30	0.00	0.00	**0.584**	2186.9	24.0	0.30	0.00	0.00	**0.468**								**3**	**CCI-1.25x6.5**	**F**	0	T&C	5802	200.8	**0.579**	0.000	131.0	28882	**0.579**	**1.0308**	**0.97**	**51.9**	**2.6%**
15	31.25	3130.0	35.9	36.7	0.3	18	43.7937	0.4375	65	6.95	60.1	14279	70%	0	21.90	652	28313	128	52.0	2825.2	52.0	34.7	57.6	0.60	0.00	0.00	**1.119**	2179.6	40.1	0.60	0.00	0.00	**0.783**								**3**	**CCI-1.25x6.5**	**F**	0	T&C	6226	335.3	**0.966**	0.000	84.5	20506	**0.966**	**0.6362**	**0.97**	**51.9**	**2.7%**
16	0	4315.5	48.1	39.2	0.3	18	50.5000	0.4375	65	8.13	69.5	22126	79%	10	27.03	819	43585	150	52.0	3546.7	52.0	34.7	63.3	0.69	0.00	0.00	**1.230**	3399.8	49.8	0.69	0.00	0.00	**0.972**								**3**	**CCI-1.25x8.5**	**F**	0	T&C	5960	412.6	**0.882**	-1.422	101.3	28086	**0.972**	**0.5624**	**1.14**	**57.5**	**7.1%**
																										1.269						**0.994**						**0.820**								**0.985**				**0.994**				

Rein1

Bottom	Top	Qty	Model	Position	T or T&C
91.5	98.5	3	CCI-1x4.5	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

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

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

Rein2

Bottom	Top	Qty	Model	Position	T or T&C
0	31.25	3	CI-1.25x8.5	F	T&C
31.25	57.25	3	CI-1.25x6.5	F	T&C
57.25	77.25	3	CI-1.25x6.5	F	T&C
91.5	103.5	3	CCI-1x4.5	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

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

Rein3

Bottom	Top	Qty	Model	Position	T or T&C
77.25	83	3	CCI-1x6	F	T&C
103.5	110.5	3	CCI-1x4.5	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

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

Reinforcement Capacity

AeroSolutions LLC
Optimizing Your Tower Infrastructure

5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
CCI-1x4.5	15.3	4.50	0.38	7.59	0.5	0	1	4.5	0	0	1.21875	65	80	0.80	20	1.00	20	128.8	171.7	Rupture	193.1	Rupture
CCI-1x6	20.4	6.00	0.50	18.00	0.5	0	1	6	0	0	1.21875	65	80	0.80	16	1.00	16	188.8	251.7	Rupture	283.1	Rupture
CCI-1.25x6.5	27.6	8.13	1.06	28.61	0.625	0	1.25	6.5	0	0	1.21875	65	80	0.80	19	1.00	19	260.4	347.2	Compress.	391.4	Rupture
CCI-1.25x8.5	36.2	10.63	1.38	63.97	0.625	0	1.25	8.5	0	0	1.21875	65	80	0.80	17	1.00	17	350.9	467.9	Compress.	541.4	Rupture

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

Site Information	
ID:	881533
Name:	GROTON TOWER
App. #:	309455; Revision # 3

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Base Reactions		
Moment:	4316	ft-kip
Axial:	48	kip
Shear:	39	kip
Base Plate Type:	Circular	

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

Original Anchor Rod Data		
Quantity:	16	
Diameter:	2.25	in
Material:	A615 GR 75	
Bolt Circle:	59.0	in
Bolt Spacing:		in
Bolt Group Area:	63.62	in^2
Bolt Group MOIx:	27698	in^4

Reactions Seen by Original AR Group		
Moment:	3377.3	kip-ft
Axial:	48.1	kip
Shear:	39.2	kip

Original AR Capacity Check		
Tension Load:	168.4	kip
Allowable load:	194.8	kip
AR Capacity:	86.5%	**Pass**

First Added Anchor Rod Data		
Quantity:	7	
Diameter:	1.75	in
Material:	A615 GR 75	
Bolt Circle:	62.6	in
Bolt Group Area:	16.84	in^2
Bolt Group MOIx:	7695	in^4

Reactions Seen by First Added AR Group		
Moment:	938.3	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

First Added AR Capacity Check		
Tension Load:	112.0	kip
Allowable load:	113.9	kip
AR Capacity:	98.3%	**Pass**

Second Added Anchor Rod Data		
Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group		
Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check		
Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Third Added Anchor Rod Data		
Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group		
Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check		
Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

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

TIA Rev F

Site Data

BU#:	*881533*
Site Name:	*GROTON TOWER*
App #:	*309455; Revision # 3*
Pole Manufacturer:	*Other*

Reactions		
Moment:	3371	ft-kips
Axial:	48	kips
Shear:	39	kips

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	59	in

Plate Data		
Diam:	65	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	10.02	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.625	in
Fillet V. Weld:	0.375	in
Width:	6.75	in
Height:	17.75	in
Thick:	0.625	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	50.5	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

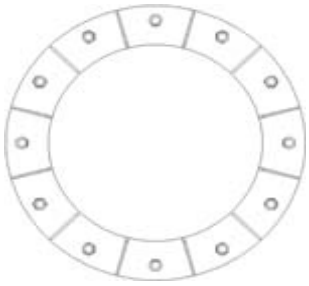
If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results		Stiffened
Maximum Rod Tension:	168.4 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	86.4% **Pass**	

Base Plate Results	Flexural Check	Stiffened
Base Plate Stress:	44.1 ksi	Service, ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	73.5% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results	
Horizontal Weld :	66.7% **Pass**
Vertical Weld:	43.7% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	24.6% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	71.8% **Pass**
Plate Comp. (AISC Bracket):	77.3% **Pass**

Pole Results	
Pole Punching Shear Check:	11.1% **Pass**



* 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

PROJECT	**92739.005.01 - GROTON TOWER, CT**				
SUBJECT	**Foundation Analysis**				
DATE	**10/12/15**	PAGE	1	OF	1

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

Monopole Pad & Pier Foundation Analysis

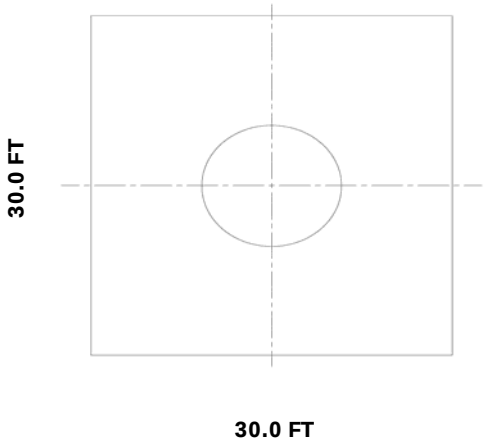
Rev. Type: F

Design Loads:

	Input unfactored loads	
Shear:	39.0	kips
Moment:	4,316.0	ft-kips
Tower Height:	144.5	ft
Tower Weight:	48.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	50.50	in
Bearing Depth:	5.0	ft
Pad Width:	30.0	ft
Neglected Depth:	3.3	ft
Thickness:	5.0	ft
Pier Diameter:	0.0	ft
Pier Height Above Grade:	0.0	ft
BP Dist. Above Pier:	0.0	in
Clear Cover:	3.0	in
Pad Rebar Size:	8	
Pad Rebar Quanity:	44	
Rebar Yield Strength:	60000	psi
Concrete Strength:	4000	psi
Concrete Unit Weight:	0.15	kcf



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.120	kcf
Ult. Bearing Capacity:	24.000	ksf
Angle of Friction:	30.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.200	

** Notes:

Summary of Results

Overturning	63.4%
Shear Capacity	53.9%
Bearing	11.8%
Pad Shear - 1-way	30.7%
Pad Moment Capacity	37.1%

APPENDIX D

TOWER MODIFICATION DRAWINGS

TOWER MODIFICATION DRAWINGS PREPARED FOR: CROWN CASTLE

SITE NAME: GROTON TOWER
BU NUMBER: 881533

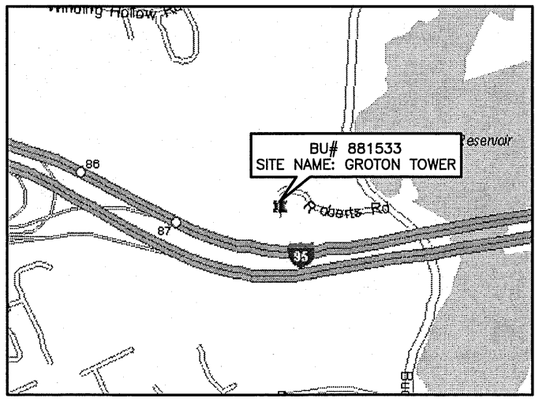
SITE ADDRESS:
75 ROBERTS ROAD
GROTON, CT 06340
NEW LONDON COUNTY, USA

PROJECT CONTACTS:

1. CROWN PROJECT MANAGER
   WENDY URQUIZA
   (949) 885-8838
   WENDY.URQUIZA.CONTRACTOR@CROWNCASTLE.COM

2. CROWN CONSTRUCTION MANAGER
   JASON D'AMICO
   (860) 209-0104
   JASON.D'AMICO.VENDOR@CROWNCASTLE.COM

3. B+T GROUP RFI CONTACT
   ROBBIE FRAZIER
   (918) 587-4630
   RFRAZIER@BTGRP.COM
   MODDWGS@BTGRP.COM
   1717 S BOULDER AVENUE, SUITE 300
   TULSA, OK 74119



MAP

DIRECTIONS

95 N TO 117 S TO BUDDINGTON RD. RIGHT ON BUDDINGTON TO ROBERTS RD. LEFT ON ROBERTS RD TO TOP OF HILL. *NOTE* ZAKJAK PLOWS SITE

TOWER INFORMATION

TOWER MANUFACTURER / DWG #:	EEI / GS52968
TOWER HEIGHT / TYPE:	144.5' MONOPOLE
TOWER LOCATION:	LAT. 41° 21' 36.8"
DATUM: (NAD 1983)	LONG. -72° 2' 55.1"
	ELEV. 125 FT AMSL
STRUCTURAL DESIGN DRAWING REPORT:	B+T GROUP / WO. # 1133289
STRUCTURAL ANALYSIS REPORT:	SSOE GROUP / WO. # 1128598
STRUCTURAL ANALYSIS DATE:	09/29/15
APPLICATION ID / REVISION #:	309455 / 3
CCISITES DOCUMENT ID:	5916747

CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS PERFORMED IN ACCORDANCE WITH THE TIA/EIA-222-F STANDARD AND 2005 CT STATE BUILDING CODE WITH 2009 AMENDMENT BASED UPON A WIND SPEED OF 85 MPH FASTEST MILE.

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, NG2 BOLT NOTES AND DETAIL
S4	FORGBOLT NOTES AND DETAILS
S5	TOWER ELEV., SCHEDULE AND TX LINE DIST. DIAGRAM
S6	TOWER SECTIONS (75'–85' AND 102'–112')

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800–788–7011.

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

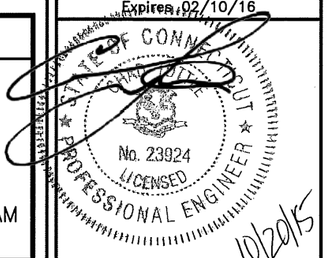
CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	10/20/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	92739.005.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	VAT / GLS
CHECKED BY:	SSC

B+T ENGINEERING, INC.
PEC.0001564
Expires: 02/10/16



GROTON TOWER
881533

75 ROBERTS ROAD
GROTON, CT

EXISTING 144.5' MONOPOLE

SHEET TITLE
TITLE SHEET

SHEET NUMBER:	REVISION:
S1	0

MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVAL	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS AS NECESSARY FOR NON-STANDARD PARTS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION BY A CWI OF A PORTION OF WELDING ON THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING (PER ENG-STD-10069) ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION (PERFORMED BY CONTRACTOR)
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS.
N/A	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH CROWN ENG-PRC-10012 FOR INCLUSION IN THE MI REPORT.
N/A	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. CWI SHALL FOLLOW ALL THE PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS ENG-SOW-10066, ENG-STD-10069 AND SRV-STD-10159. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. FULL PENETRATION WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
N/A	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH ENG-BUL-10149.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE AS PART OF PLUMB AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD.
		POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH ENG-PRC-10119 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		
NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT AND N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT		

MODIFICATION INSPECTION NOTES:

GENERAL

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

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

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

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

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

MI INSPECTOR

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

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

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

GENERAL CONTRACTOR

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

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

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

RECOMMENDATIONS

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

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

CANCELLATION OR DELAYS IN SCHEDULED MI

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

CORRECTION OF FAILING MI'S

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

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

MI VERIFICATION INSPECTIONS

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

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

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

REQUIRED PHOTOS

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

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

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

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

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

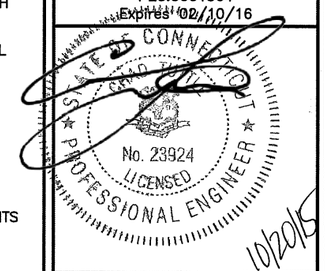
CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	10/20/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	92739.005.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	VAT / GLS
CHECKED BY:	SSC

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/16



GROTON TOWER
881533

75 ROBERTS ROAD
GROTON, CT

EXISTING 144.5' MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

SHEET NUMBER:	REVISION:
S2	0

PART NUMBER	BOLT LENGTH	SLEEVE LENGTH	MIN. GRIP RANGE	MAX. GRIP RANGE
M20x36	M20x95	11/16"	15/16"	1 7/16"
M20x48	M20x95	1 7/8"	1 7/16"	1 7/8"
M20x57	M20x95	1 5/8"	1/7/8"	2 1/4"
M20x68	M20x135	2"	2 1/4"	2 11/16"
M20x96	M20x135	2 7/16"	2 11/16"	3 3/4"
M20x127	M20x165	3"	3 3/4"	5"
M20x212	M20x250	4"	5"	8 5/16"

NEXGEN2 BLIND BOLT ASSEMBLY
- PATENT PENDING -

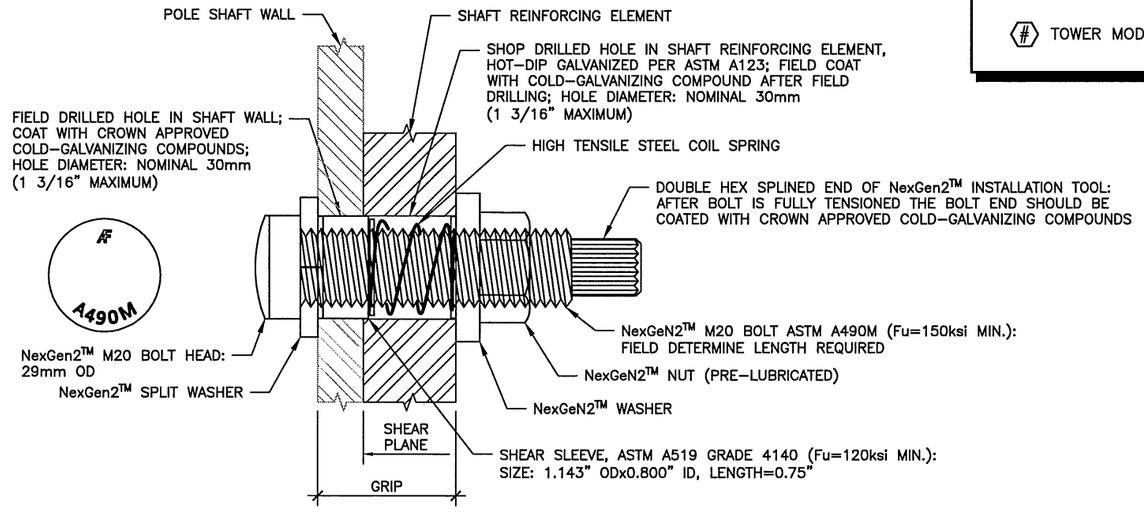
INTERIOR OF POLE SHAFT	EXTERIOR OF POLE SHAFT

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRE-TENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
3. ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30mm DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1 3/16".
4. NexGen2™ COMPLETE ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AS APPROPRIATE.
5. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

MANUFACTURER:

ALLFASTENERS
15401 COMMERCE PARK DRIVE
BROOKPARK, OH 444142
PHONE: 440-232-6060
WEBSITE: WWW.ALLFASTENERS.COM



TYPICAL NG2™ BOLT DETAIL

1 TYPICAL NG2 BOLT DETAIL
SCALE: N.T.S.

GENERAL NOTES

1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-222-F STANDARD AS WELL AS ANY OTHER GOVERNING BUILDING CODES.
1.2 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.
1.3 A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.
1.4 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.
1.5 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.
1.6 ALL CONSTRUCTION MEANS AND METHODS: INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

FABRICATION

2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

	YIELD	ASTM SPECS
A. STEEL SHAPES AND PLATES, U.N.O.	65ksi	A572

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E80 SERIES.
2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B+T GROUP 5 DAYS PRIOR TO FABRICATION.

KEY NOTES

(#) TOWER MODIFICATION I.D.

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

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	10/20/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	92739.005.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	VAT / GLS
CHECKED BY:	SSC

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/16

STATE OF CONNECTICUT ★ GARY THOMAS ★ No. 23924 LICENSED PROFESSIONAL ENGINEER
10/20/15

GROTON TOWER
881533

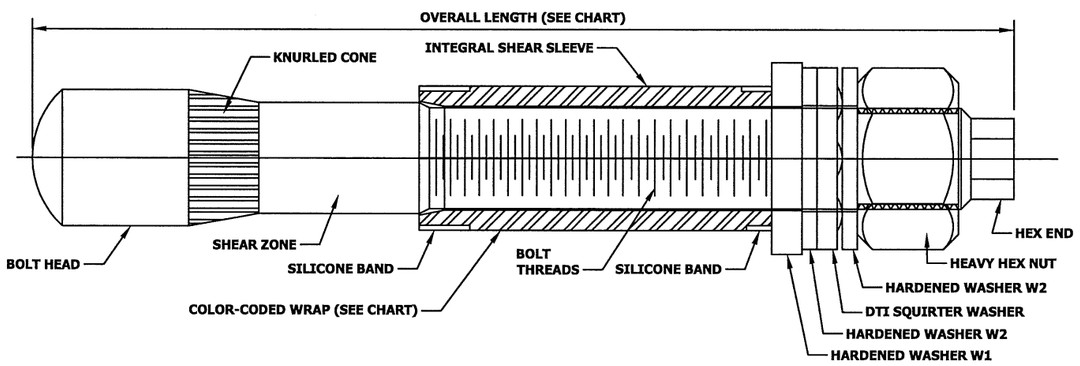
75 ROBERTS ROAD
GROTON, CT

EXISTING 144.5' MONOPOLE

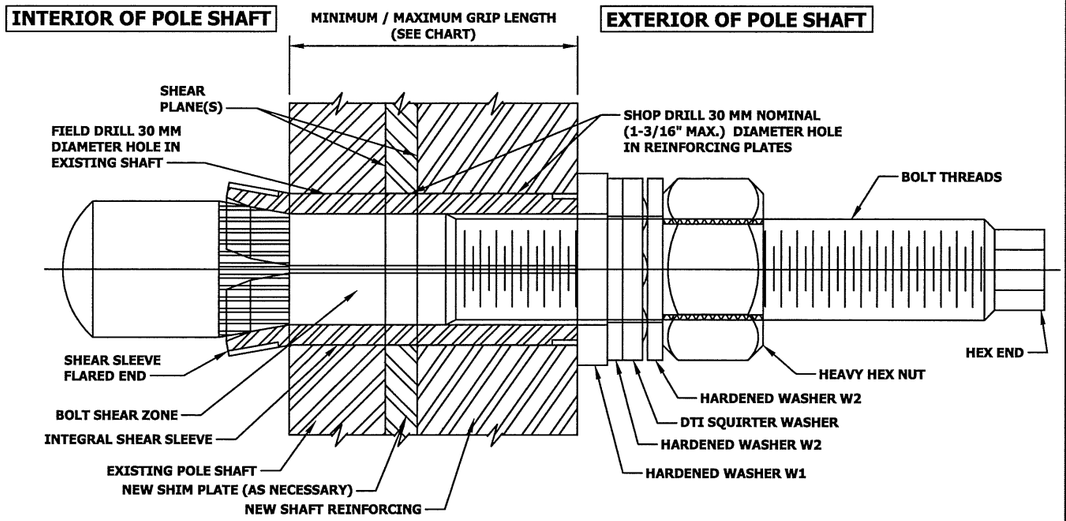
SHEET TITLE
GENERAL NOTES, NG2 BOLT NOTES AND DETAIL

SHEET NUMBER:	REVISION:
S3	0

NOTES:
1. **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.**
2. **ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.**



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2

BOLT HOLE NOTES:

1. **ALL SHOP-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM SHOP-DRILLED HOLE DIAMETER PERMITTED IS 1-3/16".**
2. **ALL FIELD-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM FIELD-DRILLED HOLE DIAMETER PERMITTED IS 30 MM.**

DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
PHONE: **888-926-4857**
EMAIL: info@precisiontowerproducts.com
WEB: www.precisiontowerproducts.com

CONTAINS PROPRIETARY INFORMATION
PATENT PENDING

FORGBolt™

AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)

GROUP A		FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8	1	**135**	5.31	1.3	3/8" to 1"	--	**RED**
	2	**160**	6.30	1.6	3/4" to 1-1/2"	--	**GREEN**
	3	**195**	7.68	1.9	1-1/4" to 2-1/4"	--	**BLUE**
	4	**260**	10.24	2.6	2" to 3-1/2"	Splice Bolt	**YELLOW**
	5	**365**	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	**ORANGE**
	6	**440**	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	**BLACK**
DTI Note		Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FORGBolt™ Installation

Follow all Manufacturer/Distributer Recommendations for Installation, Tightening, and Inspection.

1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

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

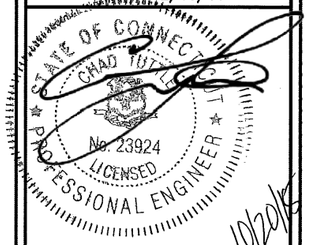
CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	10/20/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	92739.005.01
PROJECT ENG:	ROBBIE FRAZIER
DRAWN BY:	VAT / GLS
CHECKED BY:	SSC

B+T ENGINEERING, INC.
PEC.0001564
Expires 02/10/16



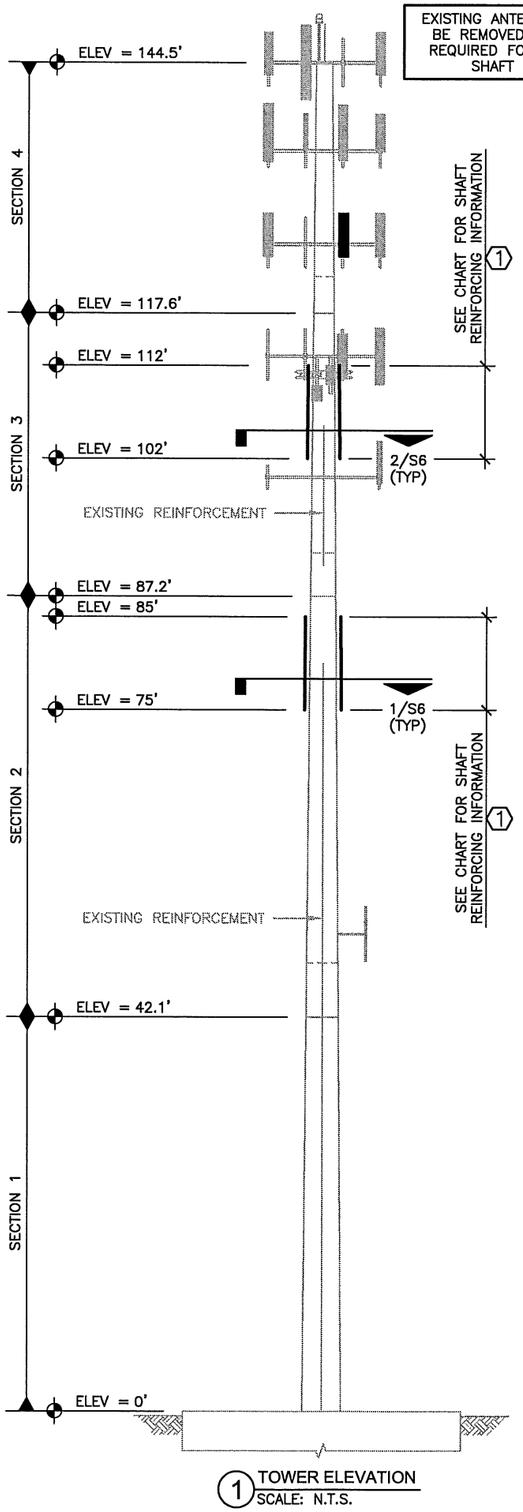
GROTON TOWER
881533

75 ROBERTS ROAD
GROTON, CT

EXISTING 144.5' MONOPOLE

SHEET TITLE
FORGBOLT NOTES AND DETAILS

SHEET NUMBER:	REVISION:
S4	0



1 TOWER ELEVATION
SCALE: N.T.S.

EXISTING ANTENNA MOUNTS SHALL BE REMOVED AND MODIFIED AS REQUIRED FOR INSTALLATION OF SHAFT REINFORCIING.

CCI: FLAT PLATE-BILL OF MATERIALS (65KSI)

BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION*	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	FLAT #	BOLTS PER PLATE	TOTAL BOLT QTY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	TOTAL STEEL WEIGHT	
75'	85'	CCI-SFP-06010010	10'-0"	3	2, 8 & 14	20	60	8	8	16"	612	LBS.
102'	112'	CCI-SFP-04510010	10'-0"	3	2, 8 & 14	16	48	6	6	20"	459	LBS.
							108				1071	LBS.

ALL BOLTS SHALL BE PRE-APPROVED BLIND M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

EXISTING MEMBER SCHEDULE

SECTION	NUMBER OF SIDES	THICKNESS	BOTTOM DIAMETER	TOP DIAMETER	LAP SPLICE
1	18	0.438"	50.500"	40.224"	69"
2	18	0.375"	42.219"	31.508"	56"
3	18	0.250"	33.000"	25.659"	46"
4	18	0.188"	26.875"	21.000"	---

NOTES:
1. ALL THE PARTS STARTING WITH "CCI-" DESIGNATION - REFER TO "CROWN CASTLE APPROVED REINFORCEMENT COMPONENTS CATALOGUE EDITION 1" FOR PART DETAILS.
2. BLIND BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH SPECIFIED STEEL GRADE.
3. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATOR IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS. 1-800-831-3275 FOR PRODUCT INFORMATION.
4. ALL SHIMS SHALL BE ASTM A36.
5. HOLES FOR BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
6. SHOP WELDS ARE ASSUMED E80XX OR GREATER, PER STANDARD SPLICE DETAIL.
7. IF SCOPE OF MODIFICATION REQUIRES REMOVAL OF TOWER ID TAG, IT MUST BE REPLACED.
8. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD OR TOWER OWNER.
9. WHERE POSSIBLE, CLIMBING HARDWARE SHOULD REMAIN IN-LINE ALONG THE POLE. IF AN OBSTRUCTION CAUSES A LATERAL OFFSET OF 2'-0" OR MORE, CLIMBING ANCHORS SHALL BE PROVIDED AT EACH CHANGE IN ALIGNMENT. IF NEW REINFORCEMENT REQUIRES STEP BOLT BRACKETS, INSTALL PRIOR TO GALVANIZATION OF STEEL.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER FITTING OF REINFORCEMENT ON MONOPOLES. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.

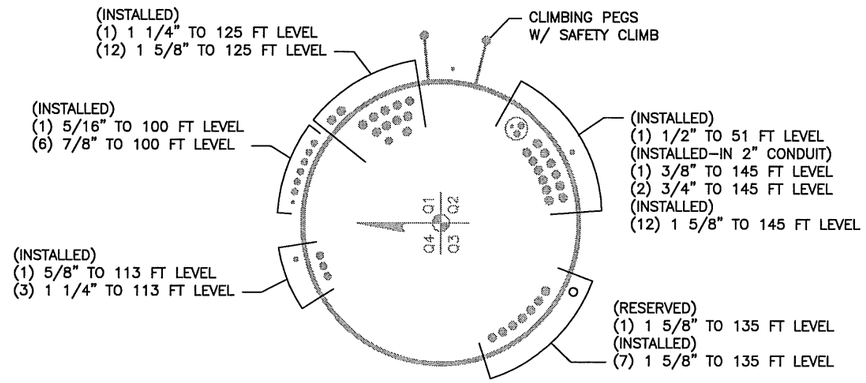
TOWER MODIFICATIONS:

1 INSTALL NEW REINFORCING ELEMENTS
RE: SHEET S6.

* CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
** THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S5.
*** CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.
**** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED

REFERENCE DRAWINGS BY:	DATE
WALKER ENGINEERING INCORPORATED	08/01/07
VERTICAL STRUCTURES, INC.	11/25/08
CROWN CASTLE	02/25/14
B+T GROUP	07/23/15



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

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

CROWN CASTLE

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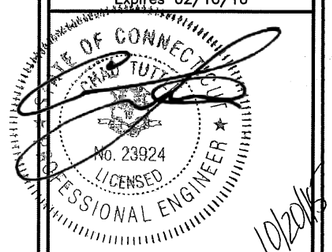


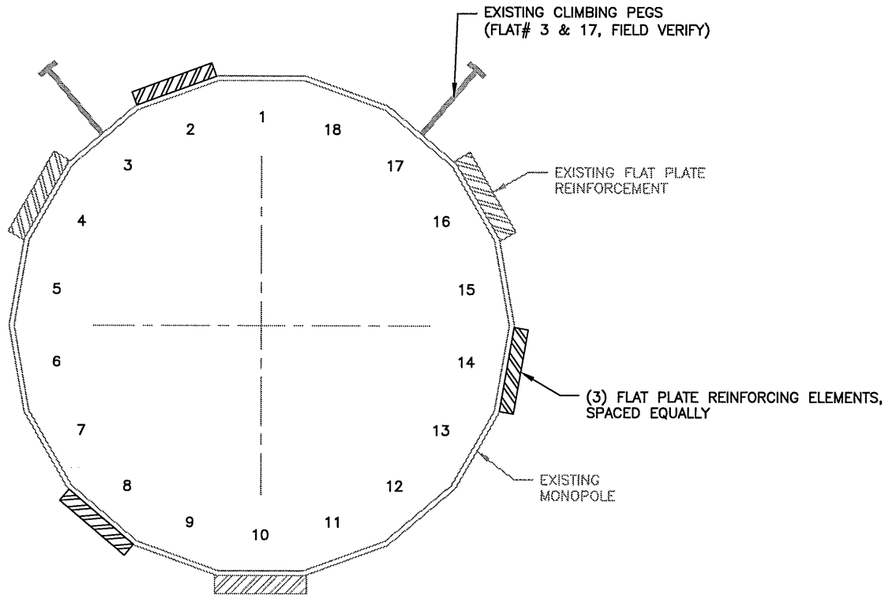
GROTON TOWER
881533

75 ROBERTS ROAD
GROTON, CT

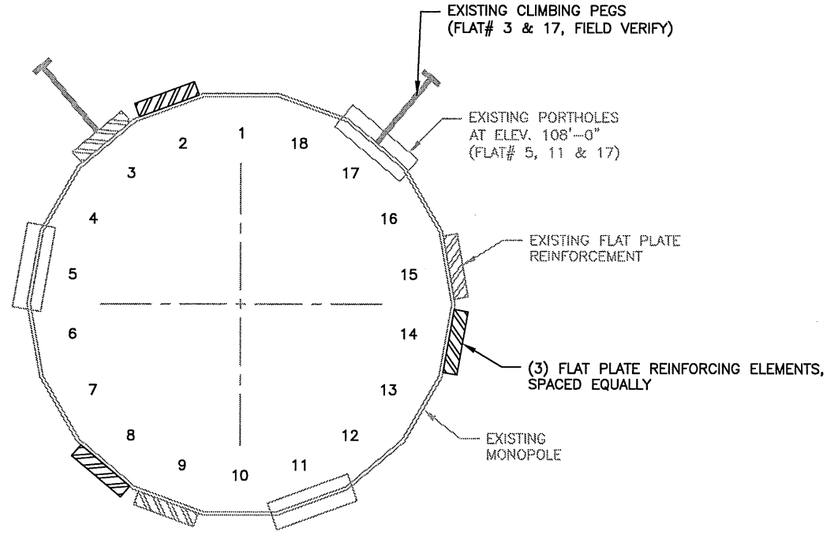
EXISTING 144.5' MONOPOLE

SHEET TITLE
TOWER ELEV., SCHEDULE AND TX LINE DIST. DIAGRAM

SHEET NUMBER: S5
REVISION: 0



1 TOWER SECTION (75'-85')
SCALE: N.T.S.



2 TOWER SECTION (102'-112')
SCALE: N.T.S.

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CROWN CASTLE

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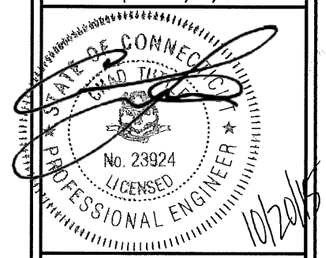


GROTON TOWER
881533

75 ROBERTS ROAD
GROTON, CT

EXISTING 144.5' MONOPOLE

SHEET TITLE
TOWER SECTIONS
(75'-85' AND 102'-112')

SHEET NUMBER: S6

REVISION: 0

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: CT11428A

Groton/I-95/Buddington Rd
75 Roberts Road
Groton, CT 06340

October 16, 2015

EBI Project Number: 6215005191

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	9.36 %

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

EBI Consulting
environmental | engineering | due diligence

October 16, 2015

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

Emissions Analysis for Site: **CT11428A – Groton/I-95/Buddington Rd**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **75 Roberts Road, Groton, 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 $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the PCS and AWS bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **75 Roberts Road, Groton, 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, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of 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 / UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

5) 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.

6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** & **B2A/B4P)** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** & **B2A/B4P)** have a maximum gain of **15.9 dBd** at their main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **126 feet** above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

EBI Consulting
environmental | engineering | due diligence

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	126	Height (AGL):	126	Height (AGL):	126
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.17	Antenna B1 MPE%	1.17	Antenna C1 MPE%	1.17
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	126	Height (AGL):	126	Height (AGL):	126
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	1.17	Antenna B2 MPE%	1.17	Antenna C2 MPE%	1.17
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	126	Height (AGL):	126	Height (AGL):	126
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.46	Antenna B3 MPE%	0.46	Antenna C3 MPE%	0.46

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.79 %**
Sprint	1.37 %
MetroPCS	0.75 %
AT&T	1.61 %
Verizon Wireless	2.84 %
Site Total MPE %:	**9.36 %**

T-Mobile Sector 1 Total:	2.79 %
T-Mobile Sector 2 Total:	2.79 %
T-Mobile Sector 3 Total:	2.79 %
Site Total:	9.36 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**2334.27**	**126**	**11.17**	**2100**	**1000**	**1.17 %**
T-Mobile 700 MHz LTE	**1**	**865.21**	**126**	**2.16**	**700**	**467**	**0.46%**
T-Mobile 1900 MHz (PCS) GSM/UMTS	**2**	**1167.14**	**126**	**5.83**	**1900**	**1000**	**0.58 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**1167.14**	**126**	**5.83**	**2100**	**1000**	**0.58 %**
						Total:	**2.79%**

EBI Consulting
environmental | engineering | due diligence

Summary

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

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	2.79 %
Sector 2:	2.79 %
Sector 3 :	2.79 %
T-Mobile Per Sector Maximum:	2.79 %
Site Total:	9.36 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **9.36%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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

December 3, 2015

Kimberly Myl
1200 MacArthur Boulevard
Suite 200
Mahwah, New Jersey 07430

RE: **EM-T-MOBILE-059T-151124** - T-Mobile notice of intent to modify an existing telecommunications facility located at 75 Roberts Road, Groton, Connecticut.

Dear Ms. Myl:

The Connecticut Siting Council (Council) received a notice of intent to modify the above-referenced facility on November 24, 2015.

Council staff has identified the following discrepancies:

- The decision in which the facility was approved and the conditions of approval are not given, and so it is unclear whether this modification would violate the municipality's conditions of approval.

The rationale for the request for information regarding municipal conditions of approval originates from the FCC Wireless Infrastructure Report and Order for eligible facilities requests to comply with any conditions of the original approval for an existing tower.

Therefore, the notice of intent to modify an existing telecommunications facility is incomplete at this time. This notice of incompletion shall have the effect of tolling the Federal Communications Commission (FCC) 60-day timeframe in accordance with Paragraph 217 of the FCC Wireless Infrastructure Report and Order issued on October 21, 2014 (FCC 14-153).

The Council recommends that T-Mobile provide information to clarify or fulfill the deficiency noted above.

Thank you for your attention to this matter. Should you have any questions, please feel free to contact me at 860-827-2951.

Very truly yours,

Melanie Bachman
Acting Executive Director

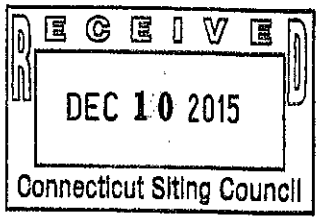
MAB/CH

c: The Honorable Rita M. Schmidt, Mayor, Town of Groton
Mark Oefinger, Town Manager, Town of Groton
Jonathan J. Reiner, AICP, Director of Planning, Town of Groton

Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

Cm-t-mobile-054T-151124

December 9, 2015



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

RE: **Notice of Exempt Modification for T-Mobile/L700 Crown Site BU: 881533**
Customer Site ID: CT11428A
75 Roberts Road, Groton, CT 06340
Latitude: 41° 21' 36.8" / Longitude: -72° 2' 55.1"

Dear Ms. Bachman:

T-Mobile currently maintains 9 antennas at the 126 foot level of the existing 145 foot monopole at 75 Roberts Road, Groton, CT. The tower is owned by Crown Castle. The property is owned by Crown Castle. T-Mobile now intends to install three (3) new antennas and three (3) new RRU's. These antennas would be installed at the 126- foot level of the tower.

This facility was approved by the Town of Groton Planning Commission Number: 00-7 / Planning Commission Plan File No: XOO # 5 on February 22, 2000. This approval included the condition(s) that:

1. Applicant shall meet the requirements of Groton Utilities for the site.
2. A note shall be added to the plans for the maintenance and normal surface repair of Roberts Road, including snot and debris removal.
3. Technical items raised by staff be addressed.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Rita M. Schmidt, Mayor for the Town of Groton of Groton, as well as the property owner and the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that 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: Kimberly Myl.

Sincerely,

Kimberly Myl
Real Estate Specialist
1200 MacArthur Boulevard, Suite 200, Mahwah, New Jersey 07430
201-236-9069
kimberly.myl@crowncastle.com

Attachments:

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: Rita M. Schmidt, Mayor
Town of Groton
12 Bank Street
Mystic, CT 06355

Crown Castle (Both Property Owner and Tower Owner)
1200 MacArthur Boulevard, Suite 200
Mahwah, New Jersey 07430

TOWN OF GROTON

PLANNING AND DEVELOPMENT SERVICES
Planning Department

134 Groton Long Point Road
Groton, Connecticut 06340-4873
Telephone (860) 446-5970
Fax (860) 446-5978

March 1, 2000

Gerald Longobardi
Candid Communications of Groton, LLC
110 Washington Avenue
North Haven, Connecticut 06473

Dear Mr. Longobardi:

The Town of Groton Planning Commission, at its meeting on February 22, 2000, approved with modifications your site plan entitled Candid Communications Telecommunications Tower and Facilities, Roberts Road (see attachment).

If your plan was approved with modifications, you should submit two paper check prints of the revised plan for final review to insure compliance with the Commission's approval. Following this review, two mylars and eight paper prints of the entire plan must be submitted for the Chairman's signature.

Please note that this plan, after being signed by the Chairman of the Commission, must be filed by you or your representative in the Land Records Office at Town Hall, **and until such filing has been done, no building permit can be issued and no construction shall commence.** Please note as per the Zoning Regulations, "any approved site plan for which construction has not commenced or which is not otherwise put into effect within a period of one year shall become null and void, unless an extension of time is applied for by the applicant and granted by the Planning Commission."

If a building permit is involved, "Post Site Plan Approval Requirements and Procedures" and "Contractor's Punch List for Site Work" have been enclosed to assist you in the construction phase of your project.

Please note that any modification to this plan subsequent to Planning Commission approval requires resubmission of an application for site plan modification approval in the same manner as the original application. Failure to submit requisite modification applications could result in delays in issuance of Certificates of Site Plan Compliance and Certificates of Occupancy.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Michael J. Murphy, AICP
Assistant Director of
Planning and Development

COPY

MJM:nb
Certified # Z 414 682 282

MOTION: To approve the Candid Communications Telecommunications Tower and Facilities, Roberts Road, with the following modifications:

1. Applicant shall meet the requirements of Groton Utilities for the site.

2. A note shall be added to the plans for the maintenance and normal surface repair of Roberts Road, including snow and debris removal.

3. Technical items raised by staff be addressed.

Motion made by Sherrard, seconded by Roper, so voted unanimously.

Technical Items

1. Correct spelling of Fire Marshal on Note 15, Sheet Z-2.

2. Add a note containing a written description of the proposed use on the plans.

TOWN OF GROTON PLANNING COMMISSION

NOTICE OF ACTION

NO: 00-7 DATE OF APPROVAL: 2/22/00

SUBDIVISION

Name of Subdivision: _____
Location: _____
No. of Lots: _____
Planning Commission Plan File No: _____

_____
Assistant Director of Planning and Development

COMMERCIAL, INDUSTRIAL, APARTMENT SITE PLAN

Name of Plan: Candid Communications Telecommunications Tower and Facilities
Location: 75 Roberts Road
Planning Commission Plan File No: X00 #5

Michael J. Murphy
Assistant Director of Planning and Development

ACTION BY TOWN CLERK

Plan Recorded: 9-15-2000 (Date) Janet L. Downs, Deputy (Town Clerk)

522-16 to 522-20

ACTION BY BUILDING INSPECTOR

Building Permit Issued: 9-26-2000 (Date) _____ (Building Inspector)