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

December 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: 876378**
T-Mobile Site ID: CT11122B
15 Kluge Road, Prospect, CT 06712
Latitude: 41° 28' 16.05" / Longitude: -72° 58' 20.55"

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 180 foot level of the existing 190 foot monopole at 15 Kluge Road in Prospect, CT. The tower is owned by Crown Castle and the property is owned by Marie J. Kluge (Executor of the Estate of David Kluge). T-Mobile now intends to replace three (3) antennas and add three (3) antennas, install six (6) additional coax, install three (3) Bias T's 700MHz antennas. These antennas would be installed at the 180 foot level of the tower and replace one (1) cabinet.

This facility was approved by the Town of Prospect on June 16, 1999. This approval included the nine (9) conditions outlined in the attached **Notice of Approval** and 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 The Honorable Robert Chatfield, Mayor for the Town of Prospect and Marie J. Kluge (Executor of the Estate of David Kluge) as the property 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.

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
Crown Castle
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: The Honorable Robert Chatfield, Mayor, Town of Prospect
Town of Prospect
Town Hall
36 Center Street
Prospect, CT 06712

Marie J. Kluge
Executor of the Estate of David Kluge
15 Kluge Road
Prospect, CT 06712

NOTICE OF APPROVAL

Property Owner: **David T. Kluge**
Property Location: **15 Kluge Road**
Date of Approval: **June 16, 1999**
Date of Notice: **June 21, 1999**

RESOLVED TO APPROVE, request for Special Permit under Section 300 for a Telecommunications Monopole and supporting equipment within a 100' x 100' parcel of land on property located at **15 Kluge Road** in a residential zone and accessed from Kluge Road. Owner: David T. Kluge. Authorized agent: Sprint Spectrum LP, Crossroads Corporate Center, One International Blvd., Suite 800, Mahwah, NJ 07495

PROVIDED THAT:

1. The height of the monopole will be approximately 190 feet above ground level. Antennae or other mounted equipment can exceed the 190-foot height, but may not exceed 200 feet above ground elevation.

2. The monopole and any attached antennae exceeding the tower's height must be located a distance from the property line at least equal to the tower's height, including attached antennae. No structure, other than those associated with this installation, may be placed within the fall radius of the monopole and monopole attachments.

3. Utility connections from the property line to the proposed installation will be below ground.

4. The monopole will meet the design standards of the National Standards Institute and meet all pertinent FCC requirements.

5. Prior to the initiation of any construction activity all erosion and sedimentation control measures shall be properly installed and fully functioning, and said measures shall be maintained in effective condition throughout the construction process.

6. An accessway at least 12 feet wide and secured by a gate and/or other means shall be maintained for passage of police, fire or other emergency equipment. Additional security fencing will be installed at the facility. Town officials must have a means to access the property in the event of an emergency.

7. On-site storage of fuel or chemicals for any reason is prohibited.

8. All future tenant occupants must apply for and receive a Zoning Permit from the Land Use Inspector prior to their installation of equipment cabinets and antennas. Installation plans must also be submitted to Prospect's Building Official for approval.

9. The above-listed agent will be responsible for, and ensure his facility and his tenants, comply with all FCC standards and guidelines for wireless facilities. Upon termination of the lease, or should the agent abandon use of the facility, Sprint Spectrum LP as agent, shall remove all apparatus and above-ground structures from the site and restore the leased space to its original condition.

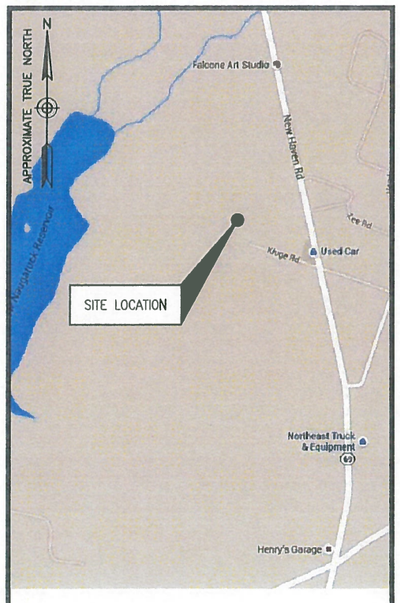
Reasons: In granting the above Special Permit, the Planning & Zoning Commission of the Town of Prospect wishes to state upon its records that in the Commission's judgement, the subject project complies with Prospect's zoning regulations, provides an acceptable facility for additional wireless communications providers to co-locate onto and will not exert a detrimental effect on the development of the area nor on the value of nearby properties.

Edward Miller

Edward Miller, Chairman
Planning & Zoning Commission

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11122B
CROWN CASTLE BU #: 876378
SITE NAME: N. BETHANY / DAVID KLUDGE
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY



VICINITY MAP

FROM BLOOMFIELD, CT:

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TURN RIGHT ONTO DAY HILL RD. USE THE RIGHT LANE TO MERGE ONTO I-91 S VIA THE RAMP TO HARTFORD. MERGE ONTO I-91 S. TAKE EXIT 32A-32B FOR I-84 W TOWARD WATERBURY. MERGE ONTO I-84. KEEP LEFT TO STAY ON I-84. TAKE EXIT 26 FOR CT-70 TOWARD CHESHIRE/PROSPECT. TURN LEFT ONTO CT-70 E/STATE HWY 801. TURN RIGHT ONTO SUMMIT RD. TURN LEFT ONTO CT-69 S. TURN RIGHT ONTO KLUGE RD. SITE WILL BE ON THE LEFT.

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, CT 12065

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

CONSULTANT TEAM

SITE NAME:
N. BETHANY / DAVID KLUDGE

SITE NUMBER:
CT11122B

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

APPLICANT/DEVELOPER:
T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

COORDINATES:
LATITUDE: 41°-28'-16.05" N (NAD83)
LONGITUDE: 72°-58'-20.55" W (NADB3)
(PER CROWN CASTLE)

CONFIGURATION
704E

PROJECT SUMMARY

SITE ADDRESS:
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

PROJECT DIRECTORY

- REMOVE AND REPLACE (3) EXISTING ANTENNAS WITH (6) NEW ANTENNAS.
- REMOVE AND REPLACE (6) EXISTING TMA'S WITH (6) NEW TMA'S.
- INSTALL (3) NEW BIAS TEES.
- INSTALL (6) NEW LINES OF COAX.
- REMOVE AND REPLACE (1) EXISTING EQUIPMENT CABINET WITH (1) NEW EQUIPMENT CABINET AT GRADE.

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
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE
3 CORPORATE PARK DR., SUITE 101
CLIFTON PARK, NY 12065

CT11122B
N. BETHANY / DAVID KLUDGE

CONSTRUCTION DRAWINGS

3	12/07/15	ISSUED AS FINAL
2	11/03/15	REVISED PER COMMENTS
1	08/14/15	REVISED PER COMMENTS
0	05/21/15	ISSUED AS FINAL
A	05/20/15	ISSUED FOR REVIEW

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
REGISTERED PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074602
SITE ADDRESS:	

15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN 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.

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CT11122B
N. BETHANY / DAVID KLUDGE

CONSTRUCTION DRAWINGS

3	12/07/15	ISSUED AS FINAL
2	11/03/15	REVISED PER COMMENTS
1	08/14/15	REVISED PER COMMENTS
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A	05/20/15	ISSUED FOR REVIEW

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STATE OF CONNECTICUT
JIANG YU
No. 29222
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:	50074602
SITE ADDRESS:	

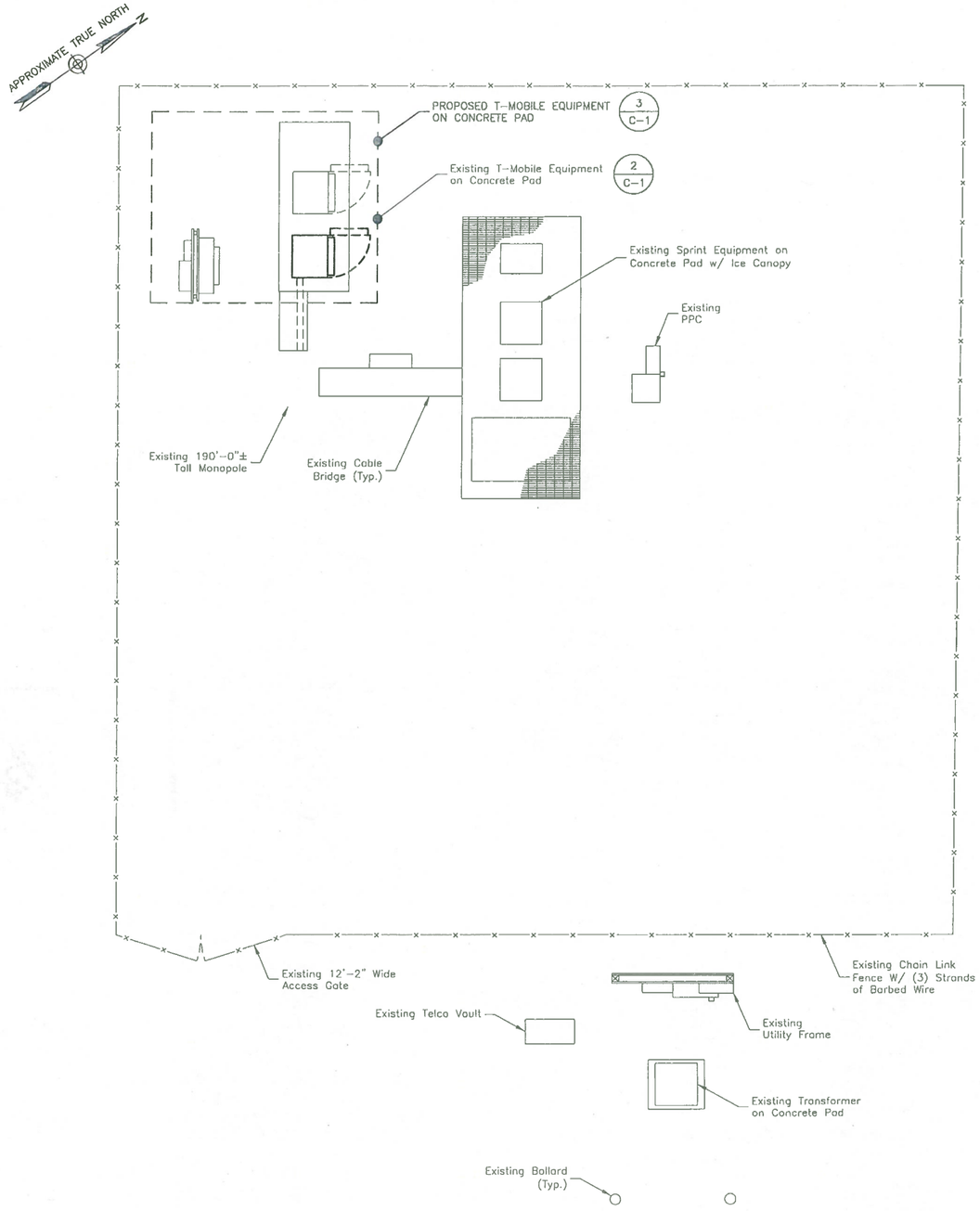
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

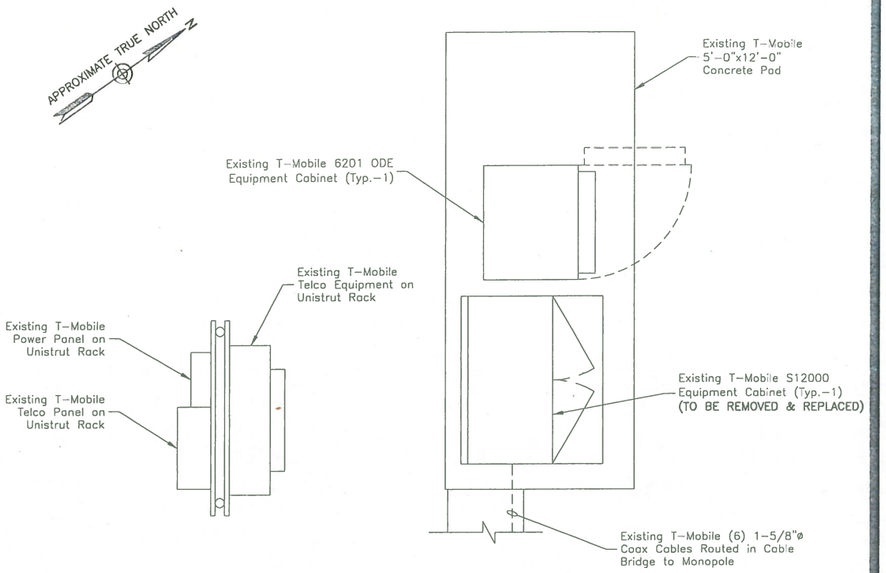
G–1



COMPOUND PLAN 1

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

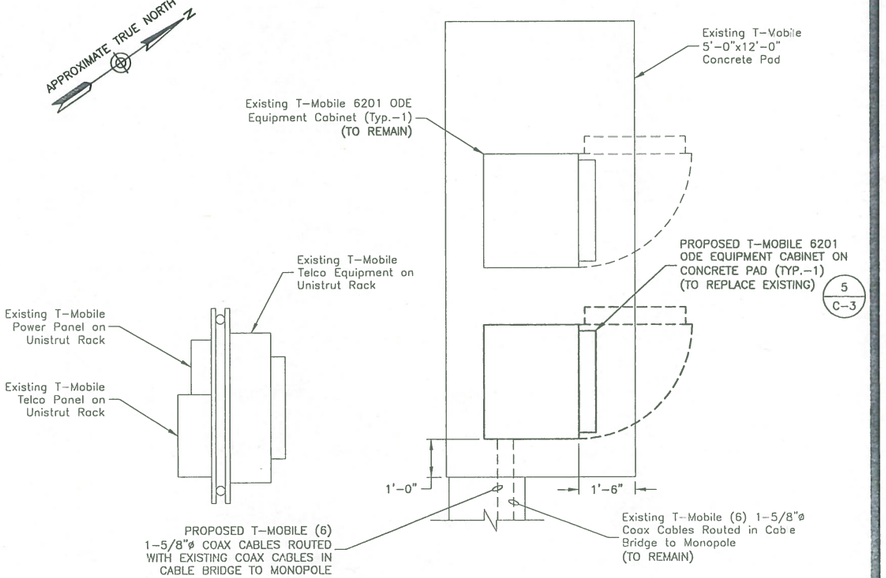
0' 5' 10'



EXISTING EQUIPMENT PLAN 2

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'



PROPOSED EQUIPMENT PLAN 3

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY CROWN CASTLE DATED APRIL 9, 2015 & TOWER MODIFICATION DRAWINGS BY CROWN CASTLE DATED APRIL 30, 2015.

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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:	CHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074602
SITE ADDRESS:	

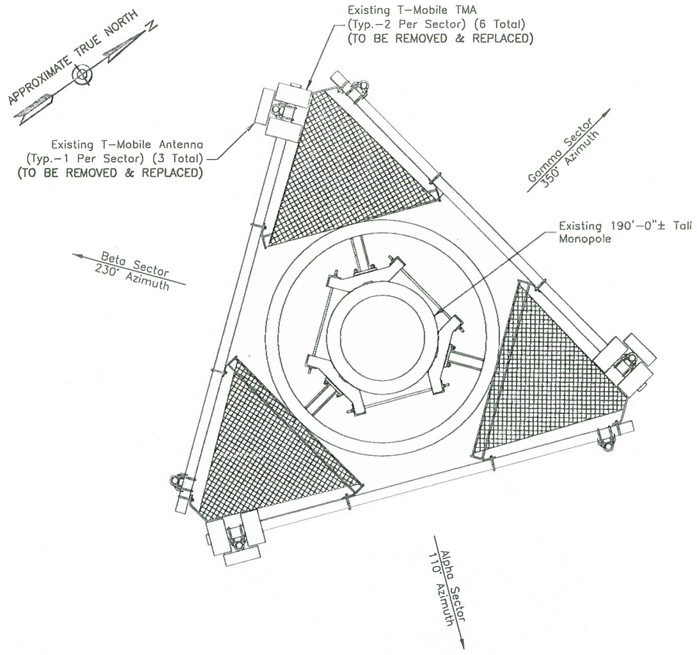
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

SHEET NUMBER

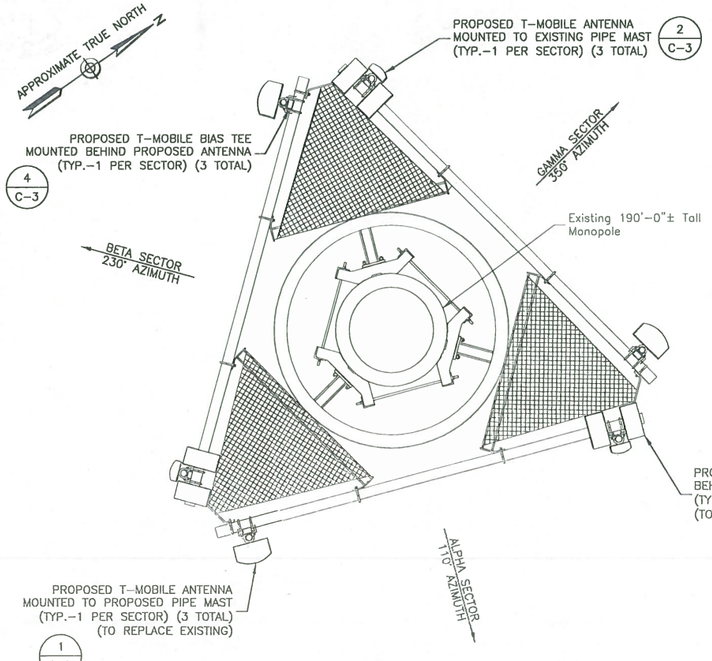
C-1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

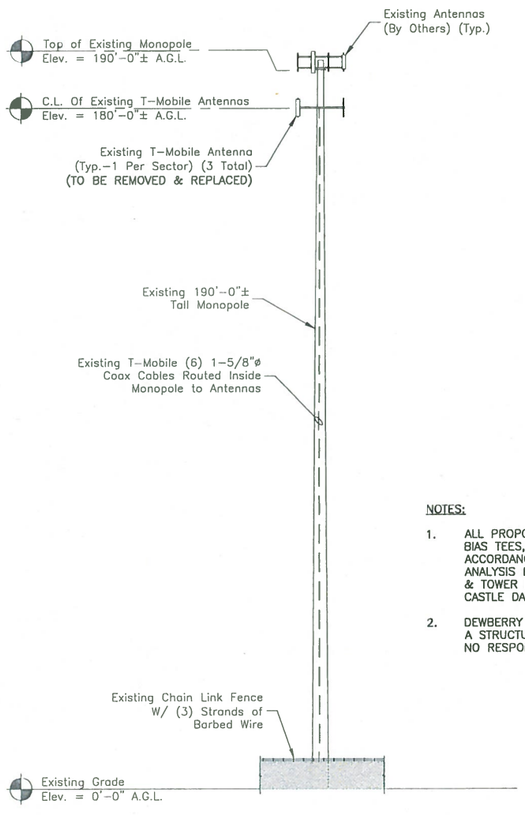
1



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

2

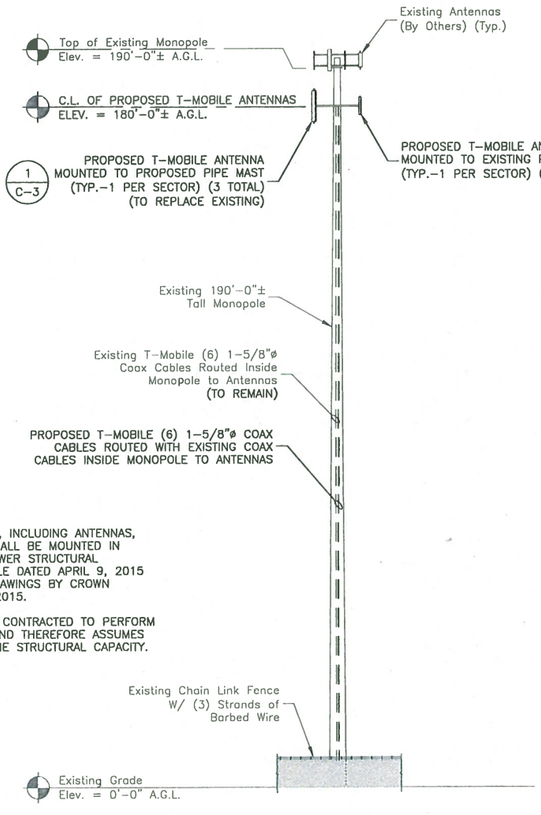


EXISTING ELEVATION

SCALE: 1"=40' FOR 11"x17"
1"=20' FOR 22"x34"

3

0' 20' 40'



PROPOSED ELEVATION

SCALE: 1"=40' FOR 11"x17"
1"=20' FOR 22"x34"

4

0' 20' 40'

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY CROWN CASTLE DATED APRIL 9, 2015 & TOWER MODIFICATION DRAWINGS BY CROWN CASTLE DATED APRIL 30, 2015.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.

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STATE OF CONNECTICUT
JIANG YU
LICENSED PROFESSIONAL ENGINEER
22

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074602
SITE ADDRESS:	

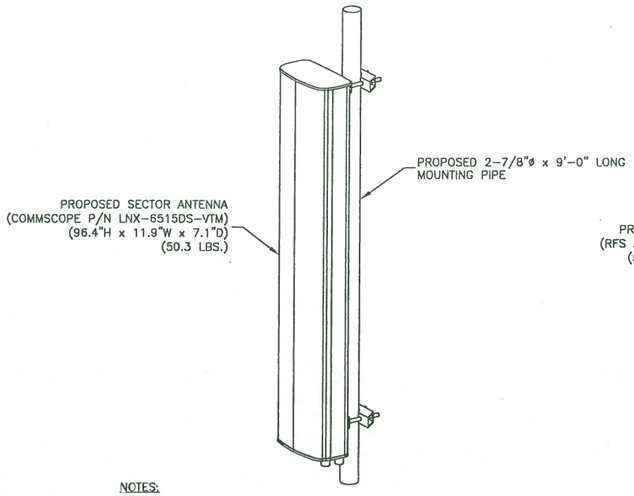
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

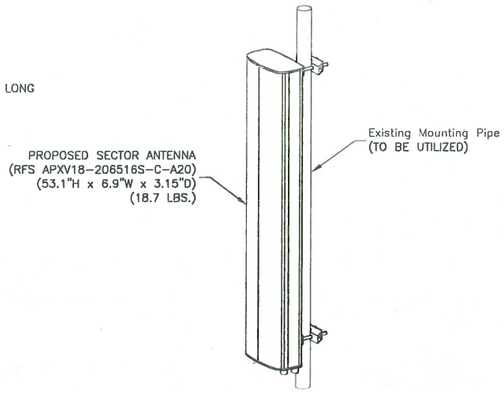
C-2



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.

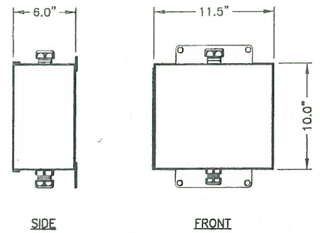
ISOMETRIC ANTENNA DETAIL 1
SCALE: N.T.S.



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 2
SCALE: N.T.S.

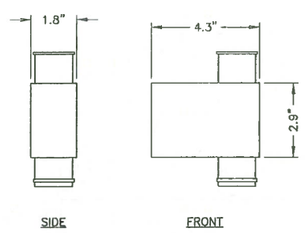


RFS ATM19801712-0

NOTES:

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

TMA DETAIL 3
SCALE: N.T.S.

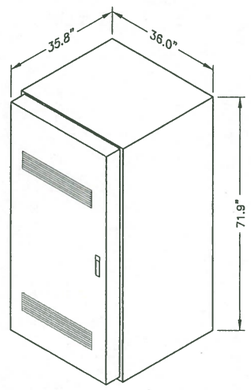


ANDREW ATBT-BOTTOM-24V

NOTES:

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

BIAS TEE DETAIL 4
SCALE: N.T.S.



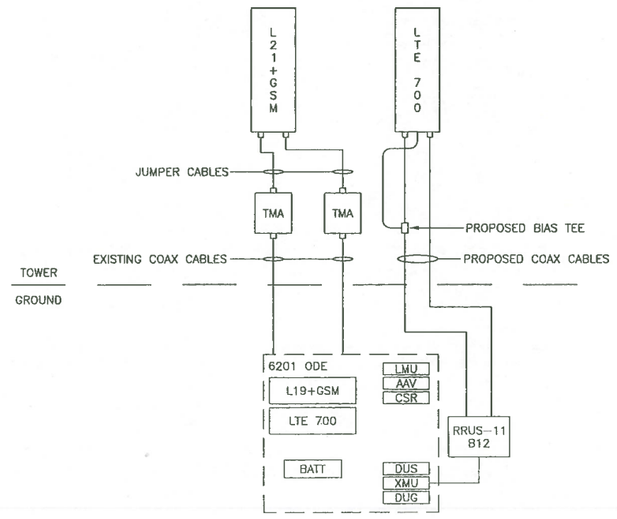
COMMSCOPE ODE6201 OUTDOOR ENCLOSURE

MATERIAL:	ANCHOR:
CONCRETE	3/8"ø HILTI KWIK BOLT 3 W/2-1/2" MIN. EMBED.
STRUCTURAL STEEL	1/2"ø STRUCTURAL BOLTS

NOTE:

1. CONTRACTOR SHALL ANCHOR CABINET IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

6201 OUTDOOR CABINET DETAIL 5
SCALE: N.T.S.



SITE CONFIGURATION 704E 6
SCALE: N.T.S

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH
	EXISTING	PROPOSED	EXISTING	PROPOSED	
ALPHA	–	RFS APXV18-206516S-C-A20	(2) 1-5/8"ø	(2) 1-5/8"ø	230'-0"
	EMS DR65-19-02DPQ	COMMSCOPE LNX-6515DS-VTM			
BETA	–	RFS APXV18-206516S-C-A20	(2) 1-5/8"ø	(2) 1-5/8"ø	230'-0"
	EMS DR65-19-02DPQ	COMMSCOPE LNX-6515DS-VTM			
GAMMA	–	RFS APXV18-206516S-C-A20	(2) 1-5/8"ø	(2) 1-5/8"ø	230'-0"
	EMS DR65-19-02DPQ	COMMSCOPE LNX-6515DS-VTM			

T-Mobile

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

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SITE ADDRESS:	

15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

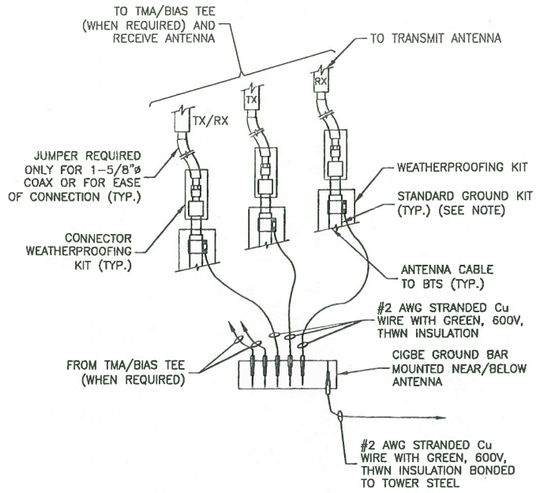
CONSTRUCTION DETAILS

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.

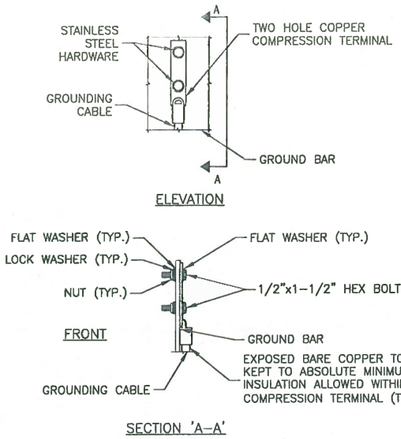


NOTE:

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.

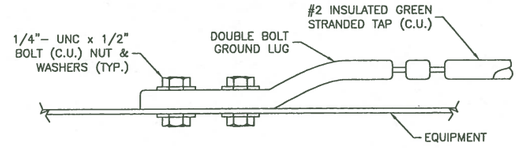


NOTES:

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

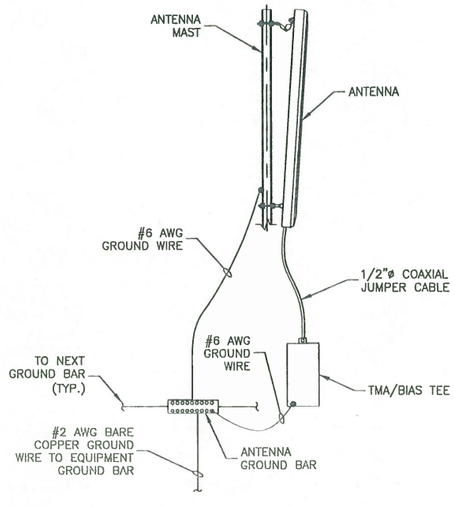
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL — 2

SCALE: N.T.S.



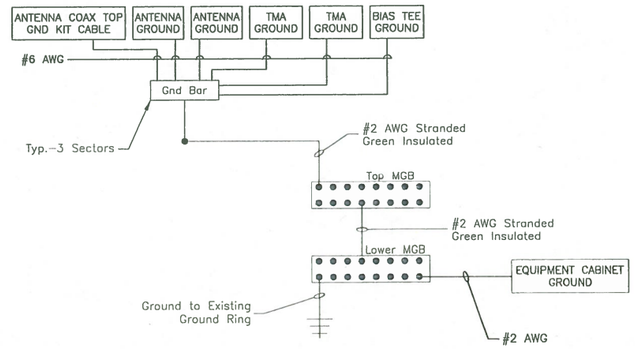
CONNECTION TO EQUIPMENT DETAIL — 3

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL — 4

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 — 5

SCALE: N.T.S.

T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE
3 CORPORATE PARK DR., SUITE 101
CLIFTON PARK, NY 12065

CT11122B
N. BETHANY / DAVID KLUDGE

CONSTRUCTION DRAWINGS

3	12/07/15	ISSUED AS FINAL
2	11/03/15	REVISED PER COMMENTS
1	08/14/15	REVISED PER COMMENTS
0	05/21/15	ISSUED AS FINAL
A	05/20/15	ISSUED FOR REVIEW

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 — 0023222 — PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074602
SITE ADDRESS:	

15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

Date: **November 04, 2015**

Timothy Howell
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11122B
	Carrier Site Name:	Prospect/Jct Rt 68 & 69
Crown Castle Designation:	**Crown Castle BU Number:**	876378
	Crown Castle Site Name:	N. BETHANY / DAVID KLUDGE
	Crown Castle JDE Job Number:	350761
	Crown Castle Work Order Number:	1145349
	Crown Castle Application Number:	315694 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	1135900
Site Data:	**15 Kluge Road, PROSPECT, New Haven County, CT** **Latitude *41° 28' 16.05"*, Longitude *-72° 58' 20.55"*** **190 Foot - Monopole Tower**	

Dear Timothy Howell,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1145349, in accordance with application 315694, revision 0.

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

LC4.5: Existing + Proposed for current applicant with proposed modifications **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

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

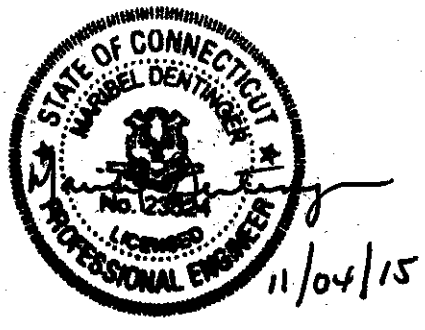
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Structural analysis prepared by: Ian Miller, E.I.T. / SRL

Respectfully submitted by:

Maribel Dentinger, P.E.
Sr. Project Engineer



11/04/15

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 190 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in July of 1999. The tower was originally designed for a wind speed of 89 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 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
180.0	180.0	3	commscope	ATBT-BOTTOM-24V	6	1-5/8	-
		3	commscope	LNX-6515DS-VTM w/ Mount Pipe			
		3	rfs celwave	APXV18-206516S-C-A20 w/ Mount Pipe			

Table 2 - Existing 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
190.0	192.0	3	alcatel lucent	1900MHz RRH (65MHz)	4	1-1/4	1
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		3	alcatel lucent	TD-RRH8x20-25			
		9	rfs celwave	ACU-A20-N			
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe			
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
	190.0	1	tower mounts	Platform Mount [LP 602-1]			
180.0	180.0	6	rfs celwave	ATM19801712-0	6	1-5/8	1
		1	tower mounts	Platform Mount [LP 305-1]			
		3	ems wireless	DR65-19-02DPQ w/ Mount Pipe	-	-	2

Notes:
1) Existing Equipment
2) Existing Equipment To Be Removed; Not Considered in this Analysis

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)
190	190	12	decibel	DB 980	-	-
180	180	12	decibel	DB 980	-	-
170	170	12	decibel	DB 980	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH (Mapping)	2192530	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI	2051620	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI	2051615	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Crown Castle	5657025	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	190 - 163.221	Pole	TP24.453x19.5x0.188	1	-4.128	730.375	60.0	Pass
L2	163.221 - 126.831	Pole	TP30.714x23.42x0.25	2	-7.459	1224.026	88.8	Pass
L3	126.831 - 86.3984	Pole	TP37.602x29.422x0.313	3	-13.073	1873.825	91.9	Pass
L4	86.3984 - 42.9401	Pole	TP44.927x36.027x0.375	4	-21.625	2687.554	87.7	Pass
L5	42.9401 - 0	Pole	TP52x43.058x0.438	5	-34.999	3722.322	81.6	Pass
							Summary	
						Pole (L3)	91.9	Pass
						Rating =	91.9	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC4.5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	79.1	Pass
	Base Plate		66.1	Pass
	Plate Stiffeners		56.7	Pass
	Pole Punching Shear		8.2	Pass
1	Base Foundation	0	71.6	Pass
	Base Foundation – Soil Interaction		86.4	Pass

Structure Rating (max from all components) =	91.9%

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

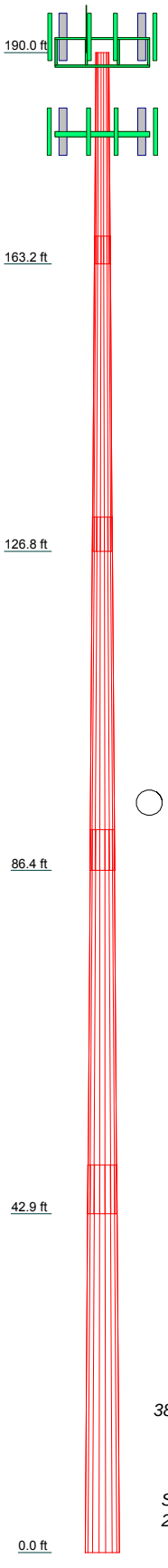
4.1) Recommendations

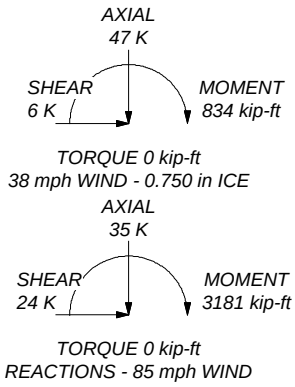
The tower and its foundation have sufficient capacity to carry the existing, and proposed loads once the proposed modifications are installed.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	26'9-11/32"	18	0.188	36'-11/16"	19.500	24.453		1.2
2	39'11-3/8"	18	0.250	4'4-1/16"	23.420	30.714		2.9
3	44'9-1/4"	18	0.313	52'-13/32"	29.422	37.602	A572-65	5.0
4	48'7-29/32"	18	0.375	6'1-3/8"	36.027	44.927		7.9
5	49'21/32"	18	0.438		43.058	52.000		10.9
								27.9





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8" x 6'	190	1900MHz RRH (65MHz)	190
APXVTM14-C-120 w/ Mount Pipe	190	5' x 2" Pipe Mount	190
APXVTM14-C-120 w/ Mount Pipe	190	5' x 2" Pipe Mount	190
APXVTM14-C-120 w/ Mount Pipe	190	5' x 2" Pipe Mount	190
APXVSPP18-C-A20 w/ Mount Pipe	190	Platform Mount [LP 602-1]	190
APXV9ERR18-C-A20 w/ Mount Pipe	190	(2) ATM19801712-0	180
APXVSPP18-C-A20 w/ Mount Pipe	190	(2) ATM19801712-0	180
TD-RRH8x20-25	190	(2) ATM19801712-0	180
TD-RRH8x20-25	190	APXV18-206516S-C-A20 w/ Mount Pipe	180
TD-RRH8x20-25	190		
800MHZ RRH	190	APXV18-206516S-C-A20 w/ Mount Pipe	180
800MHZ RRH	190		
800MHZ RRH	190	APXV18-206516S-C-A20 w/ Mount Pipe	180
800 EXTERNAL NOTCH FILTER	190		
800 EXTERNAL NOTCH FILTER	190	LNX-6515DS-VTM w/ Mount Pipe	180
800 EXTERNAL NOTCH FILTER	190	LNX-6515DS-VTM w/ Mount Pipe	180
(3) ACU-A20-N	190	LNX-6515DS-VTM w/ Mount Pipe	180
(3) ACU-A20-N	190	ATBT-BOTTOM-24V	180
(3) ACU-A20-N	190	ATBT-BOTTOM-24V	180
1900MHz RRH (65MHz)	190	ATBT-BOTTOM-24V	180
1900MHz RRH (65MHz)	190	Platform Mount [LP 305-1]	180

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven 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: 91.9%

CROWN CASTLE
The Foundation for a Wireless World

Crown Castle
2000 Corporate Drive
Canonsburg, PA15317
Phone: (724) 416-2000
FAX: (724) 416-2254

Job: ***BU# 876378***			
Project:			
Client: Crown Castle	Drawn by: slong		App'd:
Code: TIA/EIA-222-F	Date: 11/04/15		Scale: NTS
Path: \\CCICUSCAD1\Data\ENG Work Area\IMiller\2. QA\876378 WO 1145349\QA-SRL\876378.eri			Dwg No. E-1

Tower Input Data

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

3) Tower is located in New Haven County, Connecticut.
4) Basic wind speed of 85 mph.
5) Nominal ice thickness of 0.750 in.
6) Ice thickness is considered to increase with height.
7) Ice density of 56.000 pcf.
8) A wind speed of 38 mph is used in combination with ice.
9) Temperature drop of 50.000 °F.
10) Deflections calculated using a wind speed of 50 mph.
11) A non-linear (P-delta) analysis was used.
12) Pressures are calculated at each section.
13) Stress ratio used in pole design is 1.333.
14) 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*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	190'-163'2-21/32"	26'9-11/32"	3'6-11/16"	18	19.500	24.453	0.188	0.750	A572-65 (65 ksi)
L2	163'2-21/32"-126'9-31/32"	39'11-3/8"	4'4-1/16"	18	23.420	30.714	0.250	1.000	A572-65 (65 ksi)
L3	126'9-31/32"-86'4-25/32"	44'9-1/4"	5'2-13/32"	18	29.422	37.602	0.313	1.250	A572-65 (65 ksi)
L4	86'4-25/32"-42'11-9/32"	48'7-29/32"	6'1-3/8"	18	36.027	44.927	0.375	1.500	A572-65 (65 ksi)
L5	42'11-9/32"-0'	49'21/32"		18	43.058	52.000	0.438	1.750	A572-65 (65 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	19.801	11.493	541.578	6.856	9.906	54.672	1083.869	5.748	3.102	16.544
	24.830	14.441	1074.203	8.614	12.422	86.477	2149.820	7.222	3.974	21.193
L2	24.441	18.385	1246.925	8.225	11.897	104.809	2495.491	9.194	3.682	14.727
	31.188	24.174	2834.407	10.815	15.603	181.659	5672.544	12.089	4.966	19.863
L3	30.681	28.873	3091.045	10.334	14.946	206.808	6186.157	14.439	4.628	14.811
	38.182	36.986	6497.564	13.238	19.102	340.155	13003.678	18.497	6.068	19.417
L4	37.548	42.434	6814.253	12.656	18.302	372.331	13637.472	21.221	5.681	15.149
	45.620	53.028	13297.543	15.816	22.823	582.643	26612.583	26.519	7.247	19.326
L5	44.854	59.184	13582.830	15.130	21.874	620.967	27183.532	29.598	6.808	15.562
	52.802	71.601	24050.512	18.305	26.416	910.452	48132.670	35.807	8.382	19.159

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 190'-163'2-21/32"				1	1	1		
L2 163'2-21/32"-126'9-31/32"				1	1	1		
L3 126'9-31/32"-86'4-25/32"				1	1	1		
L4 86'4-25/32"-42'11-9/32"				1	1	1		
L5 42'11-9/32"-0'				1	1	1		

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
Climbing Ladder (Flat)	C	No	CaAa (Out Of Face)	190' - 182'	30.000	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
5/8 rod/step	A	No	CaAa (Out Of Face)	190' - 0'	0.000	0	1	No Ice	0.020	0.000
								1/2" Ice	0.120	0.001
								1" Ice	0.220	0.002
								2" Ice	0.420	0.006
								4" Ice	0.820	0.021
Safety Line 3/8	A	No	CaAa (Out Of Face)	190' - 0'	0.000	0	1	No Ice	0.037	0.000
								1/2" Ice	0.137	0.001
								1" Ice	0.238	0.001
								2" Ice	0.437	0.002
								4" Ice	0.838	0.004
*										
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	190' - 0'	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

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
HB114-21U3M12-XXXF(1-1/4")	C	No	Inside Pole	190' - 0'	0.000	0	1	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
*										
LDF7-50A(1-5/8")	C	No	Inside Pole	180' - 0'	0.000	0	6	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
AVA7-50(1-5/8)	C	No	Inside Pole	180' - 0'	0.000	0	6	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
*										
*										

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	190'-163'2-21/32"	A	0.000	0.000	0.000	1.540	0.013
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	4.675	0.321
L2	163'2-21/32"-126'9-31/32"	A	0.000	0.000	0.000	2.092	0.018
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.507
L3	126'9-31/32"-86'4-25/32"	A	0.000	0.000	0.000	2.325	0.020
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.564
L4	86'4-25/32"-42'11-9/32"	A	0.000	0.000	0.000	2.499	0.021
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.606
L5	42'11-9/32"-0'	A	0.000	0.000	0.000	2.469	0.021
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.599

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	190'-163'2-21/32"	A	0.917	0.000	0.000	0.000	11.361	0.074
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	11.215	0.361
L2	163'2-21/32"-126'9-31/32"	A	0.895	0.000	0.000	0.000	15.439	0.100
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.507
L3	126'9-31/32"-86'4-25/32"	A	0.863	0.000	0.000	0.000	16.806	0.109
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.564
L4	86'4-25/32"-42'11-9/32"	A	0.813	0.000	0.000	0.000	17.499	0.113
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.606
L5	42'11-9/32"-0'	A	0.750	0.000	0.000	0.000	16.430	0.104
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.599

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	190'-163'2-21/32"	-0.185	0.030	-0.325	-0.225
L2	163'2-21/32"-126'9-31/32"	0.000	-0.084	0.000	-0.508
L3	126'9-31/32"-86'4-25/32"	0.000	-0.085	0.000	-0.520
L4	86'4-25/32"-42'11-9/32"	0.000	-0.085	0.000	-0.521
L5	42'11-9/32"-0'	0.000	-0.085	0.000	-0.508

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
Lightning Rod 5/8" x 6' *	C	From Leg	1.500 0' 3'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.375 0.989 1.619 2.464 4.076	0.375 0.989 1.619 2.464 4.076	0.310 0.314 0.322 0.351 0.461
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.074 0.128 0.190 0.335 0.749
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.074 0.128 0.190 0.335 0.749
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.074 0.128 0.190 0.335 0.749
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
APXV9ERR18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	7.471 8.656 9.556 11.388 15.527	0.088 0.158 0.237 0.421 0.935
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
TD-RRH8x20-25	A	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
TD-RRH8x20-25	B	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
TD-RRH8x20-25	C	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
800MHZ RRH	A	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
800MHZ RRH	B	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
800MHZ RRH	C	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
800 EXTERNAL NOTCH FILTER	A	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.770 0.890 1.018 1.301 1.970	0.375 0.465 0.563 0.787 1.337	0.011 0.017 0.024 0.045 0.114
800 EXTERNAL NOTCH FILTER	B	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.770 0.890 1.018 1.301 1.970	0.375 0.465 0.563 0.787 1.337	0.011 0.017 0.024 0.045 0.114
800 EXTERNAL NOTCH FILTER	C	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.770 0.890 1.018 1.301 1.970	0.375 0.465 0.563 0.787 1.337	0.011 0.017 0.024 0.045 0.114
(3) ACU-A20-N	A	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.078 0.121 0.173 0.302 0.665	0.136 0.189 0.251 0.400 0.802	0.001 0.002 0.004 0.012 0.045
(3) ACU-A20-N	B	From Leg	4.000 0' 2'	0.000	190'	No Ice 1/2" Ice 1" Ice	0.078 0.121 0.173 0.302	0.136 0.189 0.251 0.400	0.001 0.002 0.004 0.012

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	0.665	0.802	0.045
						4" Ice			
(3) ACU-A20-N	C	From Leg	4.000 0' 2'	0.000	190'	No Ice	0.078	0.136	0.001
						1/2" Ice	0.121	0.189	0.002
						1" Ice	0.173	0.251	0.004
						2" Ice	0.302	0.400	0.012
						4" Ice	0.665	0.802	0.045
1900MHz RRH (65MHz)	A	From Leg	4.000 0' 2'	0.000	190'	No Ice	2.698	2.771	0.060
						1/2" Ice	2.936	3.011	0.084
						1" Ice	3.183	3.260	0.111
						2" Ice	3.703	3.784	0.176
						4" Ice	4.846	4.935	0.354
1900MHz RRH (65MHz)	B	From Leg	4.000 0' 2'	0.000	190'	No Ice	2.698	2.771	0.060
						1/2" Ice	2.936	3.011	0.084
						1" Ice	3.183	3.260	0.111
						2" Ice	3.703	3.784	0.176
						4" Ice	4.846	4.935	0.354
1900MHz RRH (65MHz)	C	From Leg	4.000 0' 2'	0.000	190'	No Ice	2.698	2.771	0.060
						1/2" Ice	2.936	3.011	0.084
						1" Ice	3.183	3.260	0.111
						2" Ice	3.703	3.784	0.176
						4" Ice	4.846	4.935	0.354
5' x 2" Pipe Mount	A	From Leg	4.000 0' 2'	0.000	190'	No Ice	1.188	1.188	0.029
						1/2" Ice	1.496	1.496	0.038
						1" Ice	1.807	1.807	0.051
						2" Ice	2.458	2.458	0.087
						4" Ice	3.919	3.919	0.207
5' x 2" Pipe Mount	B	From Leg	4.000 0' 2'	0.000	190'	No Ice	1.188	1.188	0.029
						1/2" Ice	1.496	1.496	0.038
						1" Ice	1.807	1.807	0.051
						2" Ice	2.458	2.458	0.087
						4" Ice	3.919	3.919	0.207
5' x 2" Pipe Mount	C	From Leg	4.000 0' 2'	0.000	190'	No Ice	1.188	1.188	0.029
						1/2" Ice	1.496	1.496	0.038
						1" Ice	1.807	1.807	0.051
						2" Ice	2.458	2.458	0.087
						4" Ice	3.919	3.919	0.207
Platform Mount [LP 602-1]	C	None		0.000	190'	No Ice	32.030	32.030	1.343
						1/2" Ice	38.710	38.710	1.800
						1" Ice	45.390	45.390	2.257
						2" Ice	58.750	58.750	3.170
						4" Ice	85.470	85.470	4.998
*									
(2) ATM19801712-0	A	From Leg	4.000 0' 0'	0.000	180'	No Ice	1.118	0.583	0.019
						1/2" Ice	1.262	0.691	0.028
						1" Ice	1.414	0.808	0.039
						2" Ice	1.745	1.067	0.067
						4" Ice	2.509	1.690	0.156
(2) ATM19801712-0	B	From Leg	4.000 0' 0'	0.000	180'	No Ice	1.118	0.583	0.019
						1/2" Ice	1.262	0.691	0.028
						1" Ice	1.414	0.808	0.039
						2" Ice	1.745	1.067	0.067
						4" Ice	2.509	1.690	0.156
(2) ATM19801712-0	C	From Leg	4.000 0'	0.000	180'	No Ice	1.118	0.583	0.019
						1/2" Ice	1.262	0.691	0.028

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			Ice	1.414	0.808	0.039
						1" Ice	1.745	1.067	0.067
						2" Ice	2.509	1.690	0.156
						4" Ice			
APXV18-206516S-C-A20 w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	180'	No Ice	3.859	3.296	0.039
						1/2" Ice	4.274	4.004	0.073
						1" Ice	4.727	4.672	0.113
						2" Ice	5.686	6.056	0.215
						4" Ice	7.727	9.038	0.528
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	180'	No Ice	3.859	3.296	0.039
						1/2" Ice	4.274	4.004	0.073
						1" Ice	4.727	4.672	0.113
						2" Ice	5.686	6.056	0.215
						4" Ice	7.727	9.038	0.528
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	180'	No Ice	3.859	3.296	0.039
						1/2" Ice	4.274	4.004	0.073
						1" Ice	4.727	4.672	0.113
						2" Ice	5.686	6.056	0.215
						4" Ice	7.727	9.038	0.528
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.000 0' 0'	0.000	180'	No Ice	11.683	9.842	0.083
						1/2" Ice	12.404	11.366	0.173
						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-VTM w/ Mount Pipe	B	From Leg	4.000 0' 0'	0.000	180'	No Ice	11.683	9.842	0.083
						1/2" Ice	12.404	11.366	0.173
						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-VTM w/ Mount Pipe	C	From Leg	4.000 0' 0'	0.000	180'	No Ice	11.683	9.842	0.083
						1/2" Ice	12.404	11.366	0.173
						1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
ATBT-BOTTOM-24V	A	From Leg	4.000 0' 0'	0.000	180'	No Ice	0.121	0.075	0.003
						1/2" Ice	0.172	0.119	0.004
						1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
ATBT-BOTTOM-24V	B	From Leg	4.000 0' 0'	0.000	180'	No Ice	0.121	0.075	0.003
						1/2" Ice	0.172	0.119	0.004
						1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
ATBT-BOTTOM-24V	C	From Leg	4.000 0' 0'	0.000	180'	No Ice	0.121	0.075	0.003
						1/2" Ice	0.172	0.119	0.004
						1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
Platform Mount [LP 305-1]	C	None		0.000	180'	No Ice	18.010	18.010	1.121
						1/2" Ice	23.330	23.330	1.352
						1" Ice	28.650	28.650	1.584
						2" Ice	39.290	39.290	2.046
						4" Ice	60.570	60.570	2.972

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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
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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 Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	190 - 163.221	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-9.796	0.680	-0.375
			Max. Mx	11	-4.133	210.060	-0.678
			Max. My	8	-4.130	0.948	-210.157
			Max. Vy	11	-11.146	210.060	-0.678

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	11.160	0.948	-210.157
			Max. Torque	12			0.151
L2	163.221 - 126.831	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-14.307	0.700	-0.273
			Max. Mx	11	-7.464	656.733	-1.125
			Max. My	8	-7.461	1.419	-657.310
			Max. Vy	11	-13.925	656.733	-1.125
			Max. Vx	8	13.939	1.419	-657.310
			Max. Torque	12			0.154
L3	126.831 - 86.3984	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-21.290	0.700	-0.126
			Max. Mx	11	-13.076	1272.953	-1.610
			Max. My	8	-13.074	1.936	-1274.067
			Max. Vy	11	-17.199	1272.953	-1.610
			Max. Vx	8	17.213	1.936	-1274.067
			Max. Torque	6			-0.137
L4	86.3984 - 42.9401	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-31.428	0.700	0.059
			Max. Mx	11	-21.627	2079.774	-2.114
			Max. My	8	-21.626	2.480	-2081.459
			Max. Vy	11	-20.634	2079.774	-2.114
			Max. Vx	8	20.648	2.480	-2081.459
			Max. Torque	6			-0.116
L5	42.9401 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-46.712	0.700	0.295
			Max. Mx	11	-34.999	3177.255	-2.663
			Max. My	8	-34.999	3.079	-3179.574
			Max. Vy	11	-24.035	3177.255	-2.663
			Max. Vx	8	24.049	3.079	-3179.574
			Max. Torque	17			0.110

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	46.712	5.949	-0.002
	Max. H_x	11	35.017	24.009	-0.012
	Max. H_z	2	35.017	-0.012	24.023
	Max. M_x	2	3179.022	-0.012	24.023
	Max. M_z	5	3175.885	-24.009	0.012
	Max. Torsion	17	0.110	-5.153	2.978
	Min. Vert	1	35.017	0.000	0.000
	Min. H_x	5	35.017	-24.009	0.012
	Min. H_z	8	35.017	0.012	-24.023
	Min. M_x	8	-3179.574	0.012	-24.023
	Min. M_z	11	-3177.255	24.009	-0.012
	Min. Torsion	23	-0.110	5.153	-2.978

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	35.017	0.000	0.000	0.259	0.650	-0.000
Dead+Wind 0 deg - No Ice	35.017	0.012	-24.023	-3179.022	-1.685	-0.047
Dead+Wind 30 deg - No Ice	35.017	12.015	-20.810	-2754.263	-1589.640	-0.016
Dead+Wind 60 deg - No Ice	35.017	20.798	-12.022	-1591.438	-2751.477	0.019

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 90 deg - No Ice	35.017	24.009	-0.012	-2.101	-3175.885	0.051
Dead+Wind 120 deg - No Ice	35.017	20.787	12.001	1587.888	-2749.120	0.071
Dead+Wind 150 deg - No Ice	35.017	11.994	20.798	2752.465	-1585.527	0.072
Dead+Wind 180 deg - No Ice	35.017	-0.012	24.023	3179.574	3.079	0.052
Dead+Wind 210 deg - No Ice	35.017	-12.015	20.810	2754.807	1591.024	0.016
Dead+Wind 240 deg - No Ice	35.017	-20.798	12.022	1591.987	2752.849	-0.025
Dead+Wind 270 deg - No Ice	35.017	-24.009	0.012	2.663	3177.255	-0.056
Dead+Wind 300 deg - No Ice	35.017	-20.787	-12.001	-1587.319	2750.500	-0.071
Dead+Wind 330 deg - No Ice	35.017	-11.994	-20.798	-2751.900	1586.919	-0.067
Dead+Ice+Temp	46.712	-0.000	0.000	-0.295	0.700	-0.000
Dead+Wind 0 deg+Ice+Temp	46.712	0.002	-5.952	-833.566	0.290	-0.049
Dead+Wind 30 deg+Ice+Temp	46.712	2.976	-5.155	-722.180	-415.999	-0.092
Dead+Wind 60 deg+Ice+Temp	46.712	5.153	-2.978	-417.359	-720.612	-0.110
Dead+Wind 90 deg+Ice+Temp	46.712	5.949	-0.002	-0.785	-831.922	-0.099
Dead+Wind 120 deg+Ice+Temp	46.712	5.151	2.974	415.920	-720.120	-0.061
Dead+Wind 150 deg+Ice+Temp	46.712	2.972	5.153	721.101	-415.146	-0.007
Dead+Wind 180 deg+Ice+Temp	46.712	-0.002	5.952	832.979	1.275	0.049
Dead+Wind 210 deg+Ice+Temp	46.712	-2.976	5.155	721.593	417.563	0.092
Dead+Wind 240 deg+Ice+Temp	46.712	-5.153	2.978	416.773	722.175	0.110
Dead+Wind 270 deg+Ice+Temp	46.712	-5.949	0.002	0.200	833.485	0.098
Dead+Wind 300 deg+Ice+Temp	46.712	-5.151	-2.974	-416.505	721.683	0.061
Dead+Wind 330 deg+Ice+Temp	46.712	-2.972	-5.153	-721.687	416.710	0.007
Dead+Wind 0 deg - Service	35.017	0.004	-8.312	-1102.915	-0.130	-0.017
Dead+Wind 30 deg - Service	35.017	4.157	-7.201	-955.539	-551.146	-0.005
Dead+Wind 60 deg - Service	35.017	7.197	-4.160	-552.039	-954.297	0.008
Dead+Wind 90 deg - Service	35.017	8.308	-0.004	-0.545	-1101.546	0.019
Dead+Wind 120 deg - Service	35.017	7.193	4.153	551.171	-953.470	0.026
Dead+Wind 150 deg - Service	35.017	4.150	7.197	955.276	-549.713	0.025
Dead+Wind 180 deg - Service	35.017	-0.004	8.312	1103.479	1.525	0.018
Dead+Wind 210 deg - Service	35.017	-4.157	7.201	956.101	552.540	0.005
Dead+Wind 240 deg - Service	35.017	-7.197	4.160	552.602	955.690	-0.009
Dead+Wind 270 deg - Service	35.017	-8.308	0.004	1.110	1102.939	-0.020
Dead+Wind 300 deg - Service	35.017	-7.193	-4.153	-550.606	954.864	-0.026
Dead+Wind 330 deg - Service	35.017	-4.150	-7.197	-954.711	551.108	-0.025

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-35.017	0.000	0.000	35.017	0.000	0.000%
2	0.012	-35.017	-24.023	-0.012	35.017	24.023	0.000%
3	12.015	-35.017	-20.810	-12.015	35.017	20.810	0.000%
4	20.798	-35.017	-12.022	-20.798	35.017	12.022	0.000%
5	24.009	-35.017	-0.012	-24.009	35.017	0.012	0.000%
6	20.787	-35.017	12.001	-20.787	35.017	-12.001	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
7	11.994	-35.017	20.798	-11.994	35.017	-20.798	0.000%
8	-0.012	-35.017	24.023	0.012	35.017	-24.023	0.000%
9	-12.015	-35.017	20.810	12.015	35.017	-20.810	0.000%
10	-20.798	-35.017	12.022	20.798	35.017	-12.022	0.000%
11	-24.009	-35.017	0.012	24.009	35.017	-0.012	0.000%
12	-20.787	-35.017	-12.001	20.787	35.017	12.001	0.000%
13	-11.994	-35.017	-20.798	11.994	35.017	20.798	0.000%
14	0.000	-46.712	0.000	0.000	46.712	-0.000	0.000%
15	0.002	-46.712	-5.951	-0.002	46.712	5.952	0.000%
16	2.976	-46.712	-5.155	-2.976	46.712	5.155	0.000%
17	5.153	-46.712	-2.978	-5.153	46.712	2.978	0.000%
18	5.949	-46.712	-0.002	-5.949	46.712	0.002	0.000%
19	5.151	-46.712	2.974	-5.151	46.712	-2.974	0.000%
20	2.972	-46.712	5.153	-2.972	46.712	-5.153	0.000%
21	-0.002	-46.712	5.951	0.002	46.712	-5.952	0.000%
22	-2.976	-46.712	5.155	2.976	46.712	-5.155	0.000%
23	-5.153	-46.712	2.978	5.153	46.712	-2.978	0.000%
24	-5.949	-46.712	0.002	5.949	46.712	-0.002	0.000%
25	-5.151	-46.712	-2.974	5.151	46.712	2.974	0.000%
26	-2.972	-46.712	-5.153	2.972	46.712	5.153	0.000%
27	0.004	-35.017	-8.312	-0.004	35.017	8.312	0.000%
28	4.157	-35.017	-7.201	-4.157	35.017	7.201	0.000%
29	7.197	-35.017	-4.160	-7.197	35.017	4.160	0.000%
30	8.308	-35.017	-0.004	-8.308	35.017	0.004	0.000%
31	7.193	-35.017	4.153	-7.193	35.017	-4.153	0.000%
32	4.150	-35.017	7.197	-4.150	35.017	-7.197	0.000%
33	-0.004	-35.017	8.312	0.004	35.017	-8.312	0.000%
34	-4.157	-35.017	7.201	4.157	35.017	-7.201	0.000%
35	-7.197	-35.017	4.160	7.197	35.017	-4.160	0.000%
36	-8.308	-35.017	0.004	8.308	35.017	-0.004	0.000%
37	-7.193	-35.017	-4.153	7.193	35.017	4.153	0.000%
38	-4.150	-35.017	-7.197	4.150	35.017	7.197	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00001143
3	Yes	6	0.00000001	0.00029749
4	Yes	6	0.00000001	0.00029649
5	Yes	5	0.00000001	0.00001797
6	Yes	6	0.00000001	0.00029787
7	Yes	6	0.00000001	0.00029666
8	Yes	5	0.00000001	0.00003561
9	Yes	6	0.00000001	0.00029781
10	Yes	6	0.00000001	0.00029865
11	Yes	5	0.00000001	0.00004693
12	Yes	6	0.00000001	0.00029657
13	Yes	6	0.00000001	0.00029794
14	Yes	4	0.00000001	0.00000738
15	Yes	5	0.00000001	0.00062564
16	Yes	6	0.00000001	0.00013497
17	Yes	6	0.00000001	0.00013558
18	Yes	5	0.00000001	0.00062378
19	Yes	6	0.00000001	0.00013554
20	Yes	6	0.00000001	0.00013483
21	Yes	5	0.00000001	0.00062646
22	Yes	6	0.00000001	0.00013737
23	Yes	6	0.00000001	0.00013669
24	Yes	5	0.00000001	0.00062680
25	Yes	6	0.00000001	0.00013581
26	Yes	6	0.00000001	0.00013659
27	Yes	4	0.00000001	0.00035805
28	Yes	5	0.00000001	0.00059113

29	Yes	5	0.00000001	0.00058826
30	Yes	4	0.00000001	0.00036531
31	Yes	5	0.00000001	0.00059263
32	Yes	5	0.00000001	0.00058784
33	Yes	4	0.00000001	0.00036670
34	Yes	5	0.00000001	0.00059828
35	Yes	5	0.00000001	0.00060052
36	Yes	4	0.00000001	0.00037962
37	Yes	5	0.00000001	0.00058923
38	Yes	5	0.00000001	0.00059468

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 163.221	61.397	34	3.194	0.001
L2	166.779 - 126.831	46.357	34	2.919	0.000
L3	131.169 - 86.3984	27.175	34	2.157	0.000
L4	91.599 - 42.9401	12.475	34	1.355	0.000
L5	49.0547 - 0	3.437	34	0.648	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190'	Lightning Rod 5/8" x 6'	34	61.397	3.194	0.001	13556
180'	(2) ATM19801712-0	34	54.791	3.092	0.001	6778

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 163.221	175.847	8	9.147	0.003
L2	166.779 - 126.831	132.924	8	8.370	0.001
L3	131.169 - 86.3984	78.040	8	6.197	0.001
L4	91.599 - 42.9401	35.881	9	3.896	0.000
L5	49.0547 - 0	9.894	9	1.865	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190'	Lightning Rod 5/8" x 6'	8	175.847	9.147	0.003	4988
180'	(2) ATM19801712-0	8	156.997	8.861	0.002	2492

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	190 - 163.221 (1)	TP24.453x19.5x0.188	26'9-11/32"	0'	0.0	39.000	14.049	-4.128	547.918	0.008
L2	163.221 - 126.831 (2)	TP30.714x23.42x0.25	39'11-3/8"	0'	0.0	39.000	23.545	-7.459	918.249	0.008
L3	126.831 - 86.3984 (3)	TP37.602x29.422x0.313	44'9-1/4"	0'	0.0	39.000	36.044	-13.073	1405.720	0.009
L4	86.3984 - 42.9401 (4)	TP44.927x36.027x0.375	48'7-29/32"	0'	0.0	39.000	51.697	-21.625	2016.170	0.011
L5	42.9401 - 0 (5)	TP52x43.058x0.438	49'21/32"	0'	0.0	39.000	71.601	-34.999	2792.440	0.013

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	190 - 163.221 (1)	TP24.453x19.5x0.188	210.600	30.882	39.000	0.792	0.000	0.000	39.000	0.000
L2	163.221 - 126.831 (2)	TP30.714x23.42x0.25	658.018	45.829	39.000	1.175	0.000	0.000	39.000	0.000
L3	126.831 - 86.3984 (3)	TP37.602x29.422x0.313	1275.067	47.375	39.000	1.215	0.000	0.000	39.000	0.000
L4	86.3984 - 42.9401 (4)	TP44.927x36.027x0.375	2082.775	45.144	39.000	1.158	0.000	0.000	39.000	0.000
L5	42.9401 - 0 (5)	TP52x43.058x0.438	3181.242	41.930	39.000	1.075	0.000	0.000	39.000	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	190 - 163.221 (1)	TP24.453x19.5x0.188	11.168	0.795	26.000	0.061	0.036	0.003	26.000	0.000
L2	163.221 - 126.831 (2)	TP30.714x23.42x0.25	13.947	0.592	26.000	0.046	0.024	0.001	26.000	0.000
L3	126.831 - 86.3984 (3)	TP37.602x29.422x0.313	17.220	0.478	26.000	0.037	0.012	0.000	26.000	0.000
L4	86.3984 - 42.9401 (4)	TP44.927x36.027x0.375	20.656	0.400	26.000	0.031	0.001	0.000	26.000	0.000
L5	42.9401 - 0 (5)	TP52x43.058x0.438	24.056	0.336	26.000	0.026	0.016	0.000	26.000	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

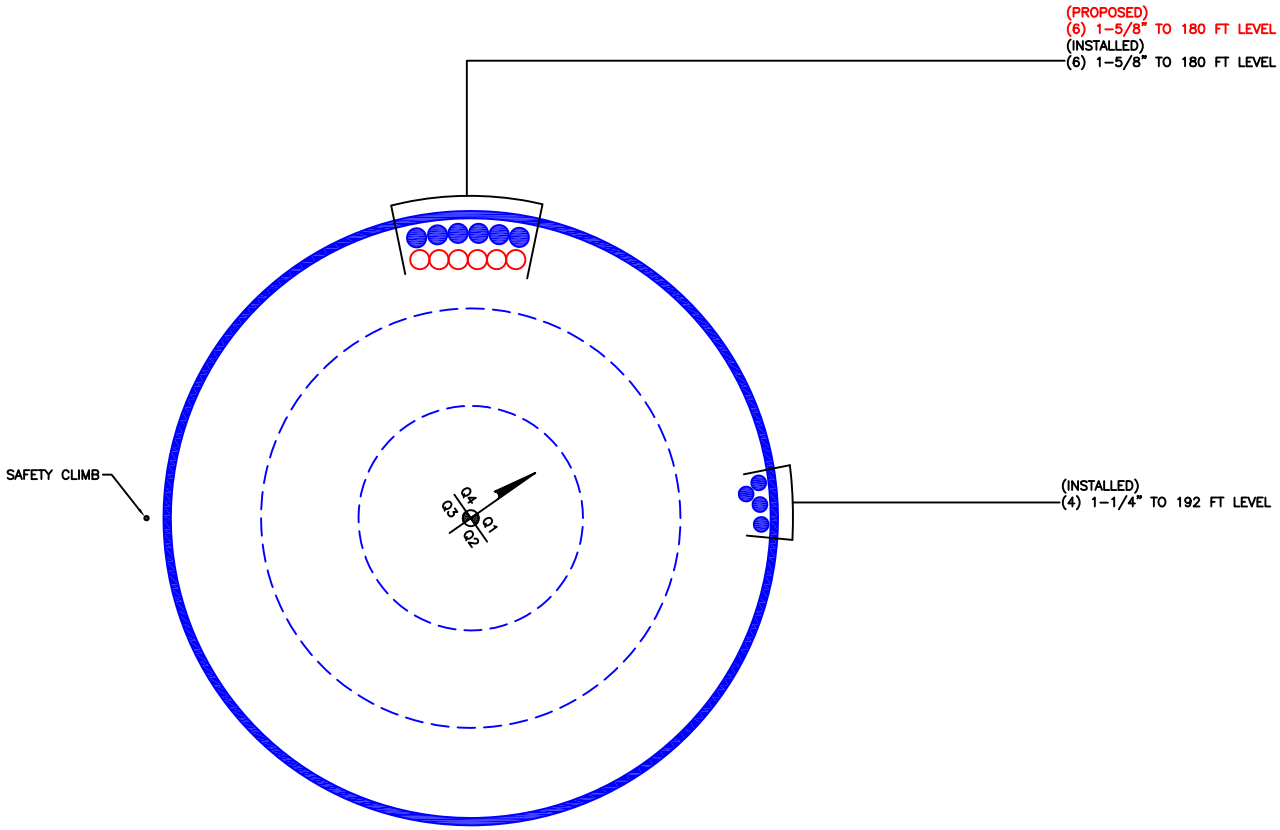
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	190 - 163.221 (1)	0.008	0.792	0.000	0.061	0.000	0.800 ✔	1.333	H1-3+VT ✔
L2	163.221 - 126.831 (2)	0.008	1.175	0.000	0.046	0.000	1.184 ✔	1.333	H1-3+VT ✔
L3	126.831 - 86.3984 (3)	0.009	1.215	0.000	0.037	0.000	1.224 ✔	1.333	H1-3+VT ✔
L4	86.3984 - 42.9401 (4)	0.011	1.158	0.000	0.031	0.000	1.168 ✔	1.333	H1-3+VT ✔
L5	42.9401 - 0 (5)	0.013	1.075	0.000	0.026	0.000	1.088 ✔	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	190 - 163.221	Pole	TP24.453x19.5x0.188	1	-4.128	730.375	60.0	Pass
L2	163.221 - 126.831	Pole	TP30.714x23.42x0.25	2	-7.459	1224.026	88.8	Pass
L3	126.831 - 86.3984	Pole	TP37.602x29.422x0.313	3	-13.073	1873.825	91.9	Pass
L4	86.3984 - 42.9401	Pole	TP44.927x36.027x0.375	4	-21.625	2687.554	87.7	Pass
L5	42.9401 - 0	Pole	TP52x43.058x0.438	5	-34.999	3722.322	81.6	Pass
							Summary	
						Pole (L3)	91.9	Pass
						RATING =	**91.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876378 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#:	*876378*
Site Name:	*N. BETHANY / DAVID KLUI*
App #:	*315694 Rev. 0*
Pole Manufacturer:	*Other*

Reactions		
Moment:	3181	ft-kips
Axial:	35	kips
Shear:	24	kips

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	61	in

Plate Data		
Diam:	67	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	10.32	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Both	
Groove Depth:	0.375	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	7	in
Height:	21	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	52	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:	154.3 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	79.1% **Pass**	

Base Plate Results

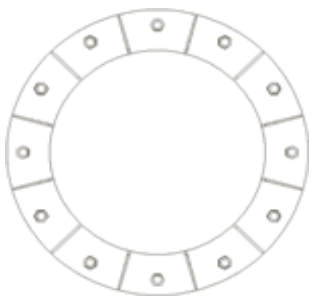
	Flexural Check	Stiffened
Base Plate Stress:	39.7 ksi	Service, ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	66.1% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	54.0% **Pass**
Vertical Weld:	53.1% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	13.6% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	54.4% **Pass**
Plate Comp. (AISC Bracket):	56.7% **Pass**

Pole Results

Pole Punching Shear Check:	8.2% **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

Monopole Pier and Pad Foundation

BU # : 876378
Site Name: N. BETHANY / DAVID KLUD
App. Number: 315694 Rev. 0

TIA-222 Revision: F

Design Reactions		
Shear, **S**:	24	kips
Moment, **M**:	3181	ft-kips
Tower Height, **H**:	190	ft
Tower Weight, **Wt**:	35	kips
Base Diameter, **BD**:	4.33	ft

Foundation Dimensions		
Depth, **D**:	5	ft
Pad Width, **W**:	24.5	ft
Neglected Depth, **N**:	3.5	ft
Thickness, **T**:	2.50	ft
Pier Diameter, **Pd**:	7.00	ft
Ext. Above Grade, **E**:	1.00	ft
BP Dist. Above Pier:	3	in.
Clear Cover, **Cc**:	3.0	in

Soil Properties		
Soil Unit Weight, **γ**:	0.130	kcf
Ult. Bearing Capacity, Bc:	15.0	ksf
Angle of Friction, **Φ**:	39	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	ksf
Base Friction, **μ**:	0.30	

Material Properties		
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	4000	psi
Concrete Unit Weight, **δc**:	0.150	kcf
Seismic Zone, **z**:	1	

Rebar Properties		
Pier Rebar Size, **Sp**:	8	
Pier Rebar Quanity, **mp**:	46	36
Pad Rebar Size, **Spad**:	8	
Pad Rebar Quanity, **mpad**:	40	15
Pier Tie Size, **St**:	4	3
Tie Quanity, **mt**:	4	5

Design Checks	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	7	5.833	**OK**
Overturning (ft-kips)	3680.07	3181.00	**86.4%**
Shear Capacity (kips)	74.53	24.00	**32.2%**
Bearing (ksf)	11.25	3.22	**28.6%**
Pad Shear - 1-way (kips)	739.12	407.41	**55.1%**
Pad Shear - 2-way (kips)	1745.46	90.53	**5.2%**
Pad Moment Capacity (k-ft)	3633.44	1508.89	**41.5%**
Pier Moment Capacity (k-ft)	4562.00	3265.00	**71.6%**

Maximum Allowable Moment of a Circular Pier

Axial Load (Negative for Compression) = -35.00 kips

Pier Properties

Concrete:

Pier Diameter = 7.0 ft

Concrete Area = 5541.8 in^2

Reinforcement:

Clear Cover = 3.00 in

Cage Diameter = 6.42 ft

Bar Size = 8

Bar Diameter = 1.00 in

Bar Area = 0.79 in^2

Number of Bars = 46

Material Properties

Concrete compressive strength = 4000 psi

Reinforcement yield strength = 60000 psi

Modulus of elasticity = 29000 ksi

Reinforcement yield strain = 0.00207

Limiting compressive strain = 0.003

Seismic Properties

Seismic Zone = 1

Minimum Area of Steel

Required area of steel = 27.71 in^2

Provided area of steel = 36.34 in^2 **OK**

Axial Loading

Load factor = 1.3

Reduction factor = 0.9

Factored axial load = -50.5556 kips

Neutral Axis

Distance from extreme edge to neutral axis = 12.25 in

Equivalent compression zone factor = 0.85

Distance from extreme edge to equivalent compression zone factor = 10.41 in

Distance from centroid to neutral axis = 29.75 in

Compression Zone

Area of steel in compression zone = 6.32 in^2

Angle from centroid of pier to intersection of equivalent compression zone and edge of pier = 41.22 deg

Area of concrete in compression = 394.79 in^2

Force in concrete = 0.85 * f`c * Acc = 1342.29 kips

Total reinforcement forces = -1291.73 kips

Factored axial load = -50.56 kips

Force in concrete = -1342.29 kips

Sum of the forces in concrete = 0.00 kips **OK**

Maximum Moment

First moment of the concrete area in compression about the centoid = 14134.30 in^3

Distance between centroid of concrete in compression and centroid of pier = 35.80 in

Moment of concrete in compression = 48056.62 in-kips

Total reinforcement moment = 31018.00 in-kips

Nominal moment strength of column = 79074.61 in-kips

Factored moment strength of column = 54743.96 in-kips

Maximum Allowable Moment = 4562.00 ft-kips

Individual Bars

Bar #	Angle from first bar (deg)	Distance to centroid (in)	Distance to neutral axis (in)	Distance to equivalent comp. zone (in)	Strain	Area of steel in compression (in^2)	Stress (ksi)	Axial force (kips)
1	0.00	0.00	-29.75	-31.59	-0.0072889	0.00	-60.00	-47.40
2	7.83	5.24	-24.51	-26.35	-0.0060046	0.00	-60.00	-47.40
3	15.65	10.39	-19.37	-21.20	-0.0047443	0.00	-60.00	-47.40
4	23.48	15.34	-14.42	-16.25	-0.0035314	0.00	-60.00	-47.40
5	31.30	20.00	-9.75	-11.59	-0.0023884	0.00	-60.00	-47.40
6	39.13	24.30	-5.46	-7.29	-0.0013368	0.00	-38.77	-30.63
7	46.96	28.14	-1.62	-3.45	-0.000396	0.00	-11.48	-9.07
8	54.78	31.45	1.70	-0.14	0.0004163	0.00	12.07	9.54
9	62.61	34.18	4.43	2.59	0.0010852	0.79	31.47	22.18
10	70.43	36.28	6.52	4.69	0.001598	0.79	46.34	33.92
11	78.26	37.69	7.94	6.10	0.0019453	0.79	56.41	41.88
12	86.09	38.41	8.66	6.82	0.0021206	0.79	60.00	44.71
13	93.91	38.41	8.66	6.82	0.0021206	0.79	60.00	44.71
14	101.74	37.69	7.94	6.10	0.0019453	0.79	56.41	41.88
15	109.57	36.28	6.52	4.69	0.001598	0.79	46.34	33.92
16	117.39	34.18	4.43	2.59	0.0010852	0.79	31.47	22.18
17	125.22	31.45	1.70	-0.14	0.0004163	0.00	12.07	9.54
18	133.04	28.14	-1.62	-3.45	-0.000396	0.00	-11.48	-9.07
19	140.87	24.30	-5.46	-7.29	-0.0013368	0.00	-38.77	-30.63
20	148.70	20.00	-9.75	-11.59	-0.0023884	0.00	-60.00	-47.40
21	156.52	15.34	-14.42	-16.25	-0.0035314	0.00	-60.00	-47.40
22	164.35	10.39	-19.37	-21.20	-0.0047443	0.00	-60.00	-47.40
23	172.17	5.24	-24.51	-26.35	-0.0060046	0.00	-60.00	-47.40
24	180.00	0.00	-29.75	-31.59	-0.0072889	0.00	-60.00	-47.40
25	187.83	-5.24	-35.00	-36.83	-0.0085732	0.00	-60.00	-47.40
26	195.65	-10.39	-40.14	-41.98	-0.0098335	0.00	-60.00	-47.40
27	203.48	-15.34	-45.09	-46.93	-0.0110464	0.00	-60.00	-47.40
28	211.30	-20.00	-49.76	-51.59	-0.0121893	0.00	-60.00	-47.40
29	219.13	-24.30	-54.05	-55.89	-0.013241	0.00	-60.00	-47.40
30	226.96	-28.14	-57.89	-59.73	-0.0141818	0.00	-60.00	-47.40
31	234.78	-31.45	-61.21	-63.04	-0.0149941	0.00	-60.00	-47.40
32	242.61	-34.18	-63.94	-65.77	-0.015663	0.00	-60.00	-47.40
33	250.43	-36.28	-66.03	-67.87	-0.0161758	0.00	-60.00	-47.40
34	258.26	-37.69	-67.45	-69.29	-0.0165231	0.00	-60.00	-47.40
35	266.09	-38.41	-68.16	-70.00	-0.0166984	0.00	-60.00	-47.40
36	273.91	-38.41	-68.16	-70.00	-0.0166984	0.00	-60.00	-47.40
37	281.74	-37.69	-67.45	-69.29	-0.0165231	0.00	-60.00	-47.40
38	289.57	-36.28	-66.03	-67.87	-0.0161758	0.00	-60.00	-47.40
39	297.39	-34.18	-63.94	-65.77	-0.015663	0.00	-60.00	-47.40
40	305.22	-31.45	-61.21	-63.04	-0.0149941	0.00	-60.00	-47.40
41	313.04	-28.14	-57.89	-59.73	-0.0141818	0.00	-60.00	-47.40
42	320.87	-24.30	-54.05	-55.89	-0.013241	0.00	-60.00	-47.40
43	328.70	-20.00	-49.76	-51.59	-0.0121893	0.00	-60.00	-47.40
44	336.52	-15.34	-45.09	-46.93	-0.0110464	0.00	-60.00	-47.40
45	344.35	-10.39	-40.14	-41.98	-0.0098335	0.00	-60.00	-47.40
46	352.17	-5.24	-35.00	-36.83	-0.0085732	0.00	-60.00	-47.40

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: *876378*
Site Name: *N. BETHANY / DAVID KLUDGE*
App #: *315694 Rev. 0*

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	12	in
Pad Bearing Depth, D:	5	ft
Pad Thickness, T:	2.50	ft
Pad Width=Length, L:	24.5	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	7.00	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	38.48	ft^2
Pier Height:	3.50	ft
Soil (above pad) Height:	2.50	ft

Soil Parameters		
Unit Weight, γ:	130.0	pcf
Ultimate Bearing Capacity, qn:	15.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	39.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	11.25	ksf
Passive Pres. Coeff., Kp	4.40	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	32.4	kips
Pad Force Location Above D:	1.11	ft
ϕ(Passive Pressure Moment):	36.00	ft-kips
Factored O.T. M(WL), "1.6W":	4496.9	ft-kips
Factored OT (MW-Msoil), M1	4460.85	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	2.02	ft
Sum of Soil Wedges Wt:	22.71	kips
Soil Wedges ecc, K1:	6.18	ft
Ftg+Soil above Pad wt:	427.9	kips
Unfactored (Total ftg-soil Wt):	450.59	kips
1.2D. **No Soil Wedges**.	555.45	kips
0.9D. **With Soil Wedges**	437.03	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	35	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	24	kips
Unfactored WL Moment, M:	3181	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	42	kips
0.90	0.9D+1.6W, Pu:	31.5	kips
1.35	Vu:	32.4	kips
	Mu:	4294.35	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	555.45	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	4460.85	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	8.03	ft
Orthogonal qu=	2.69	ksf
qu/ϕ*qn Ratio=	**23.88%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	5.68	ft
Diagonal qu=	3.22	ksf
qu/ϕ*qn Ratio=	**28.58%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	437.03	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	4334.54	ft-kips

Orthogonal ecc3 = M2/P2 =	9.92	ft
Ortho Non Bearing Length,NBL=	19.84	ft
Orthogonal qu=	3.82	ksf
Diagonal qu=	3.98	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	3181.00		
M Orthogonal:	3680.07	**86.44%**	**Pass**
M Diagonal:	3680.07	**86.44%**	**Pass**

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

T-Mobile Existing Facility

Site ID: CT11122B

Prospect/Jct Rt 68 & 69
15 Kluge Road
Prospect, CT 06712

November 4, 2015

EBI Project Number: 6215002876

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	1.23 %

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

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November 4, 2015

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

Emissions Analysis for Site: **CT11122B – Prospect/Jct Rt 68 & 69**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **15 Kluge Road, Prospect, 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 **15 Kluge Road, Prospect, 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) Since the radios are ground mounted there are additional cabling losses accounted for. For each RF path the following losses were calculated. 1.07 dB of additional cable loss for all 700 MHz Channels, 1.96 dB of additional cable loss for all 1900 MHz channels and 2.01 dB of additional cable loss at 700 MHz. This is based on manufacturers Specifications for 190 feet of 1-5/8” coax cable on each path.

6) 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.

7) 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.

8) The antennas used in this modeling are the **RFS APXV18-206516S-C-A20** 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 **RFS APXV18-206516S-C-A20** has a maximum gain of **16.3 dBd** at their main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. 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.

9) The antenna mounting height centerline of the proposed antennas is **180 feet** above ground level (AGL).

10) 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.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	180	Height (AGL):	180	Height (AGL):	180
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	6	Channel Count	6	# PCS Channels:	6
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	6,463.48	ERP (W):	6,463.48	ERP (W):	6,463.48
Antenna A1 MPE%	0.77	Antenna B1 MPE%	0.77	Antenna C1 MPE%	0.77
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
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):	180	Height (AGL):	180	Height (AGL):	180
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):	676.27	ERP (W):	676.27	ERP (W):	676.27
Antenna A2 MPE%	0.17	Antenna B2 MPE%	0.17	Antenna C2 MPE%	0.17

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**0.94 %**
Sprint	0.29 %
Site Total MPE %:	**1.23 %**

T-Mobile Sector 1 Total:	0.94 %
T-Mobile Sector 2 Total:	0.94 %
T-Mobile Sector 3 Total:	0.94 %
Site Total:	1.23 %

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**	**1611.21**	**180**	**3.83**	**2100**	**1000**	**0.38 %**
T-Mobile 1900 MHz (PCS) GSM/UMTS	**2**	**814.93**	**180**	**1.94**	**1900**	**1000**	**0.19 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**805.60**	**180**	**1.91**	**2100**	**1000**	**0.19 %**
T-Mobile 700 MHz LTE	**1**	**676.27**	**180**	**2.06**	**700**	**467**	**0.17 %**
						Total:	**0.94 %**

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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:	0.94 %
Sector 2:	0.94 %
Sector 3 :	0.94 %
T-Mobile Per Sector Maximum:	0.94 %
Site Total:	1.23 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **1.23%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

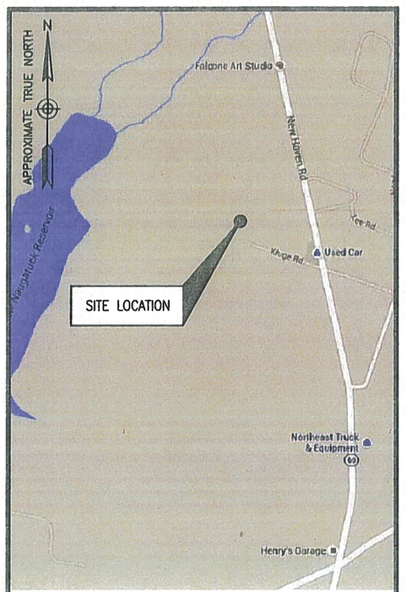
FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100%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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11122B
CROWN CASTLE BU #: 876378
SITE NAME: N. BETHANY / DAVID KLUDGE
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY



VICINITY MAP

FROM BLOOMFIELD, CT:

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TURN RIGHT ONTO DAY HILL RD. USE THE RIGHT LANE TO MERGE ONTO I-91 S VIA THE RAMP TO HARTFORD. MERGE ONTO I-91 S. TAKE EXIT 32A-32B FOR I-84 W TOWARD WATERBURY. MERGE ONTO I-84. KEEP LEFT TO STAY ON I-84. TAKE EXIT 26 FOR CT-70 TOWARD CHESHIRE/PROSPECT. TURN LEFT ONTO CT-70 E/STATE HWY 801. TURN RIGHT ONTO SUMMIT RD. TURN LEFT ONTO CT-69 S. TURN RIGHT ONTO KLUGE RD. SITE WILL BE ON THE LEFT.

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, CT 12065

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

CONSULTANT TEAM

SITE NAME:
N. BETHANY / DAVID KLUDGE

SITE NUMBER:
CT11122B

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

APPLICANT/DEVELOPER:
T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

COORDINATES:
LATITUDE: 41°-28'-16.05" N (NAD83)
LONGITUDE: 72°-58'-20.55" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
704E

PROJECT SUMMARY

SITE ADDRESS:
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

PROJECT DIRECTORY

- REMOVE AND REPLACE (3) EXISTING ANTENNAS WITH (6) NEW ANTENNAS.
- REMOVE AND REPLACE (6) EXISTING TMA'S WITH (6) NEW TMA'S.
- INSTALL (3) NEW BIAS TEES.
- INSTALL (6) NEW LINES OF COAX.
- REMOVE AND REPLACE (1) EXISTING EQUIPMENT CABINET WITH (1) NEW EQUIPMENT CABINET AT GRADE.

SCOPE OF WORK

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
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE
3 CORPORATE PARK DR., SUITE 101
CLIFTON PARK, NY 12065

CT11122B
N. BETHANY / DAVID KLUDGE

CONSTRUCTION DRAWINGS

4	01/06/16	ISSUED AS FINAL
3	12/07/15	ISSUED AS FINAL
2	11/03/15	REVISED PER COMMENTS
1	08/14/15	REVISED PER COMMENTS
0	05/21/15	ISSUED AS FINAL
A	05/20/15	ISSUED FOR REVIEW

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. 29222
PROFESSIONAL ENGINEER
JIANG YU
CONNECTICUT LICENSE NO. 0029222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074602
SITE ADDRESS:	

15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN 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·

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CROWN CASTLE

CROWN CASTLE
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CLIFTON PARK, NY 12065

CT11122B
N. BETHANY /
DAVID KLUDGE

CONSTRUCTION DRAWINGS

4	01/06/16	ISSUED AS FINAL
3	12/07/15	ISSUED AS FINAL
2	11/03/15	REVISED PER COMMENTS
1	08/14/15	REVISED PER COMMENTS
0	05/21/15	ISSUED AS FINAL
A	05/20/15	ISSUED FOR REVIEW

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STATE OF CONNECTICUT
JIANG YU
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:	50074602
SITE ADDRESS:	

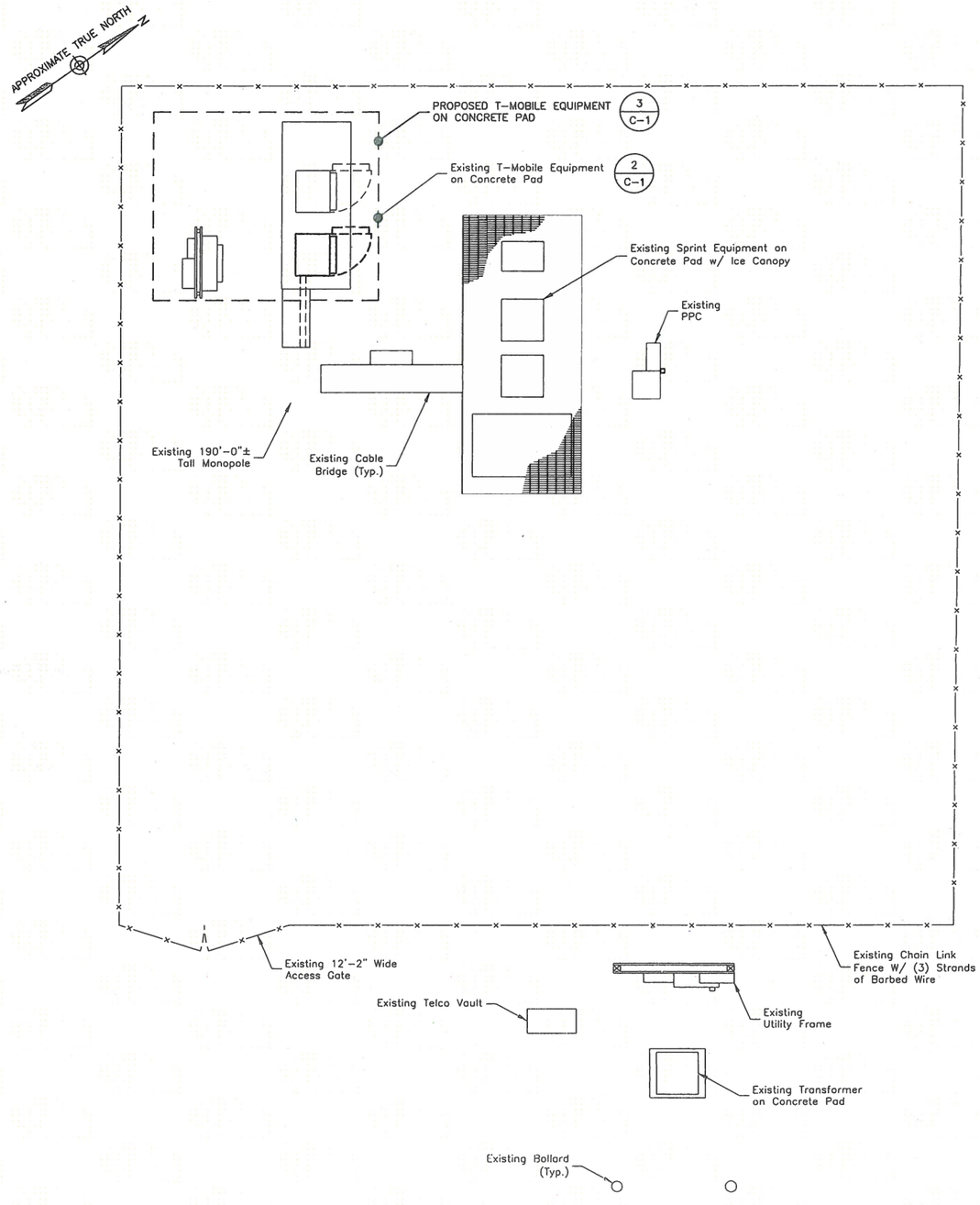
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G–1



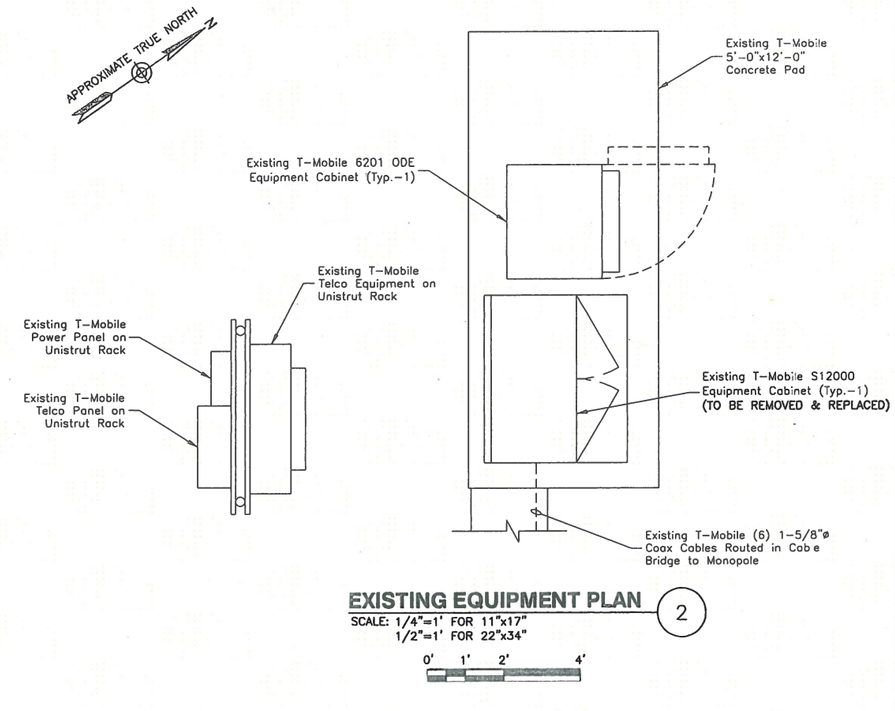
COMPOUND PLAN 1

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

0' 5' 10'

NOTES:

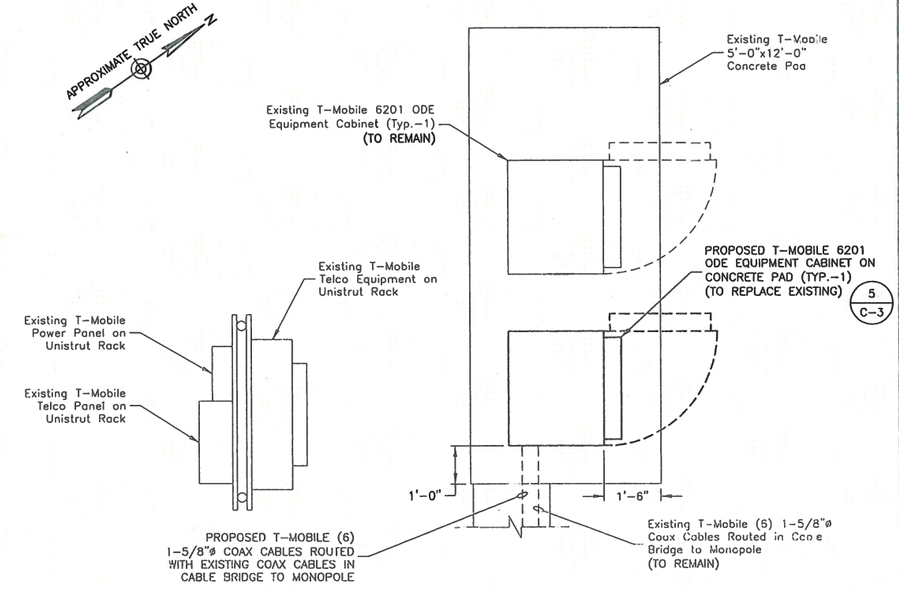
1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, DIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY CROWN CASTLE DATED NOVEMBER 4, 2015 & TOWER MODIFICATION DRAWINGS BY CROWN CASTLE DATED APRIL 30, 2015.



EXISTING EQUIPMENT PLAN 2

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'



PROPOSED EQUIPMENT PLAN 3

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'

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CT11122B
N. BETHANY / DAVID KLUDGE

CONSTRUCTION DRAWINGS

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0	05/21/15	ISSUED AS FINAL
A	05/20/15	ISSUED FOR REVIEW

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STATE OF CONNECTICUT
JIANG YU
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:	50074602
SITE ADDRESS:	

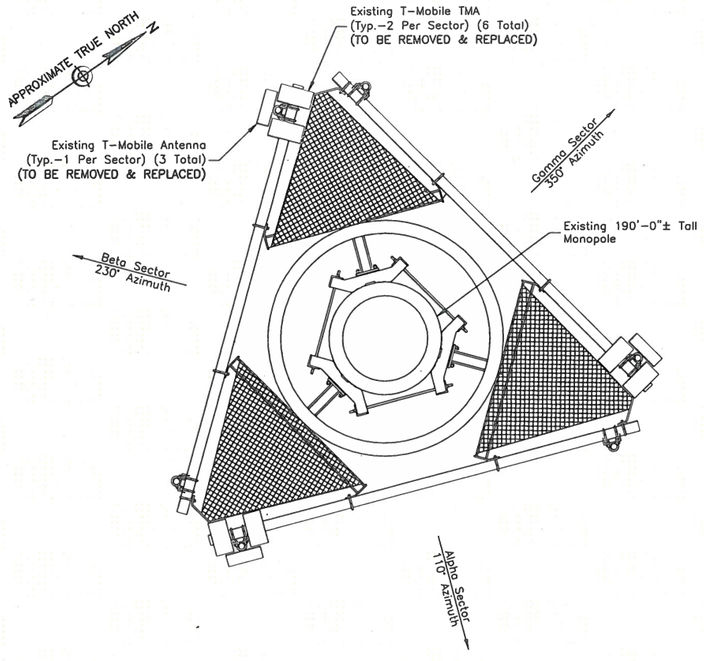
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

SHEET NUMBER

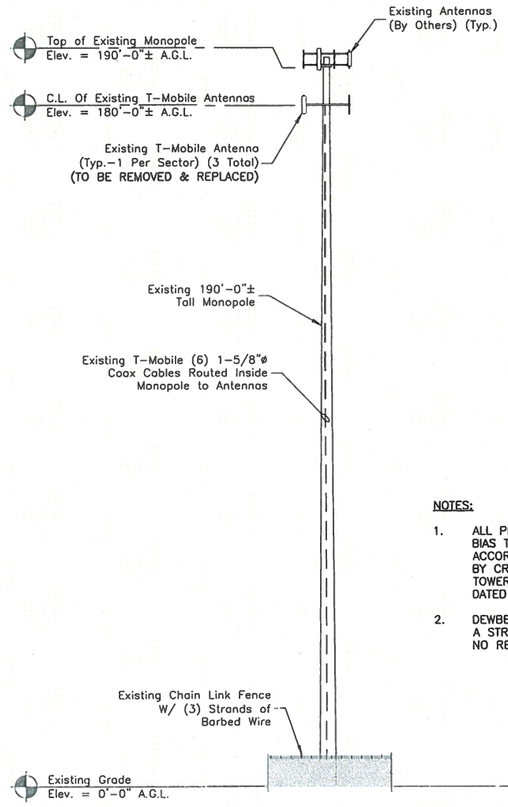
C-1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

1

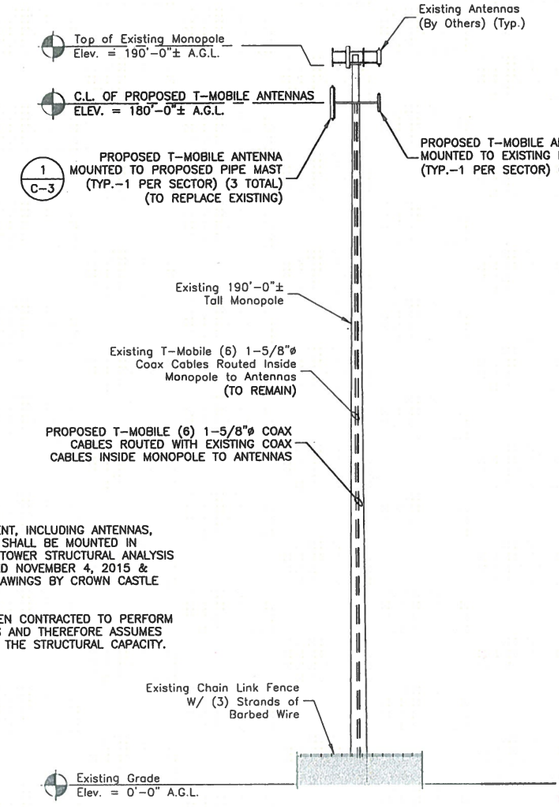


EXISTING ELEVATION

SCALE: 1"=40' FOR 11"x17"
1"=20' FOR 22"x34"

0' 20' 40'

3



PROPOSED ELEVATION

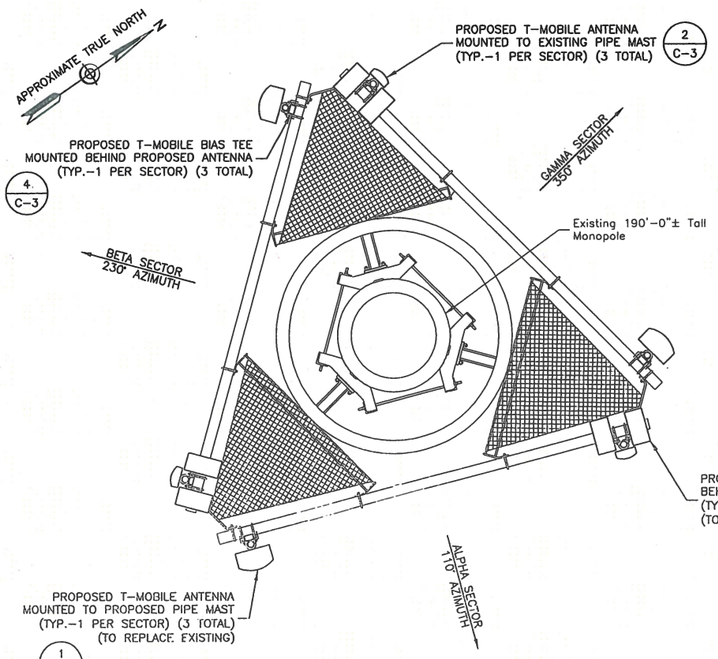
SCALE: 1"=40' FOR 11"x17"
1"=20' FOR 22"x34"

0' 20' 40'

4

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY CROWN CASTLE DATED NOVEMBER 4, 2015 & TOWER MODIFICATION DRAWINGS BY CROWN CASTLE DATED APRIL 30, 2015.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

2

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CLIFTON PARK, NY 12065

CT11122B
N. BETHANY / DAVID KLUDGE

CONSTRUCTION DRAWINGS

4	01/06/16	ISSUED AS FINAL
3	12/07/15	ISSUED AS FINAL
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1	09/14/15	REVISED PER COMMENTS
0	05/21/15	ISSUED AS FINAL
A	05/20/15	ISSUED FOR REVIEW

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
PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074602
SITE ADDRESS:	

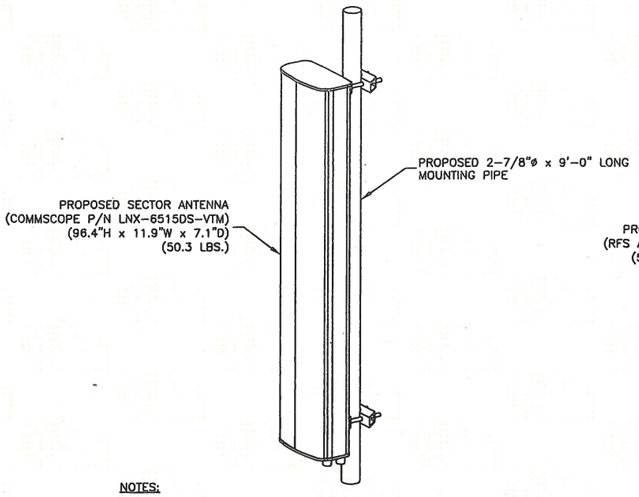
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

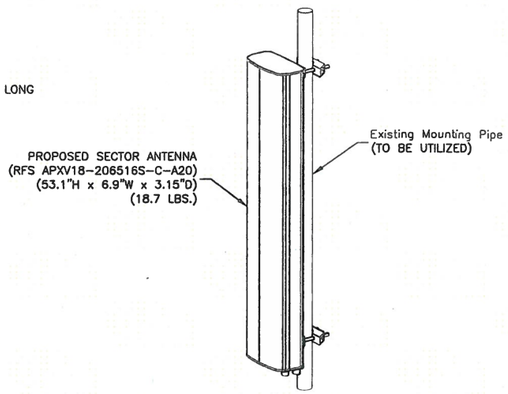
C-2



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.

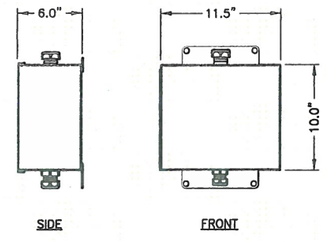
ISOMETRIC ANTENNA DETAIL 1
SCALE: N.T.S.



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 2
SCALE: N.T.S.

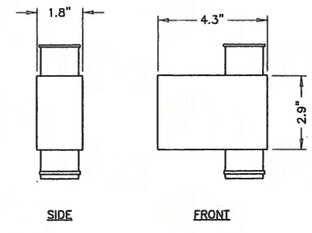


RFS ATM19801712-0

NOTES:

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

TMA DETAIL 3
SCALE: N.T.S.

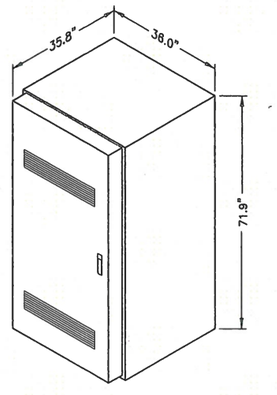


ANDREW ATBT-BOTTOM-24V

NOTES:

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

BIAS TEE DETAIL 4
SCALE: N.T.S.



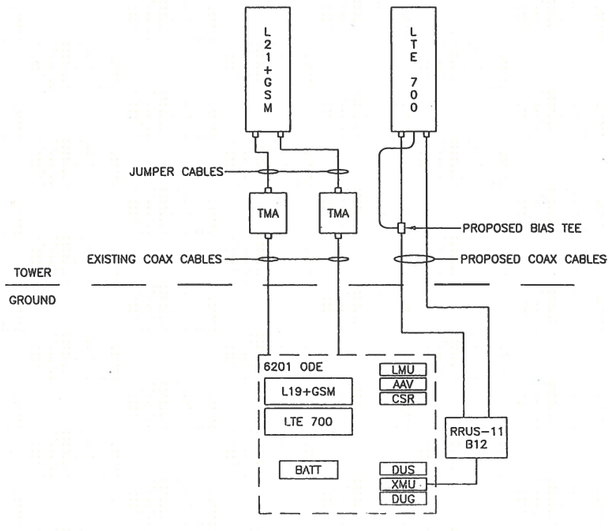
COMMSCOPE ODE6201 OUTDOOR ENCLOSURE

MATERIAL:	ANCHOR:
CONCRETE	3/8"ø HILTI KWIK BOLT 3 W/2-1/2" MIN. EMBED.
STRUCTURAL STEEL	1/2"ø STRUCTURAL BOLTS

NOTE:

1. CONTRACTOR SHALL ANCHOR CABINET IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

6201 OUTDOOR CABINET DETAIL 5
SCALE: N.T.S.



SITE CONFIGURATION 704E 6
SCALE: N.T.S

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH
	EXISTING	PROPOSED	EXISTING	PROPOSED	
ALPHA	–	RFS APXV18-206516S-C-A20	(2) 1-5/8"ø	(2) 1-5/8"ø	230'-0"
	EMS DR65-19-02DPQ	COMMSCOPE LNX-6515DS-VTM			
BETA	–	RFS APXV18-206516S-C-A20	(2) 1-5/8"ø	(2) 1-5/8"ø	230'-0"
	EMS DR65-19-02DPQ	COMMSCOPE LNX-6515DS-VTM			
GAMMA	–	RFS APXV18-206516S-C-A20	(2) 1-5/8"ø	(2) 1-5/8"ø	230'-0"
	EMS DR65-19-02DPQ	COMMSCOPE LNX-6515DS-VTM			

T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DR., SUITE 101
CLIFTON PARK, NY 12065

CT11122B
N. BETHANY / DAVID KLUDGE

CONSTRUCTION DRAWINGS

4	01/06/16	ISSUED AS FINAL
3	12/07/15	ISSUED AS FINAL
2	11/03/15	REVISED PER COMMENTS
1	08/14/15	REVISED PER COMMENTS
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STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER
JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
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PROJECT NUMBER:	50066258
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SITE ADDRESS:

15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

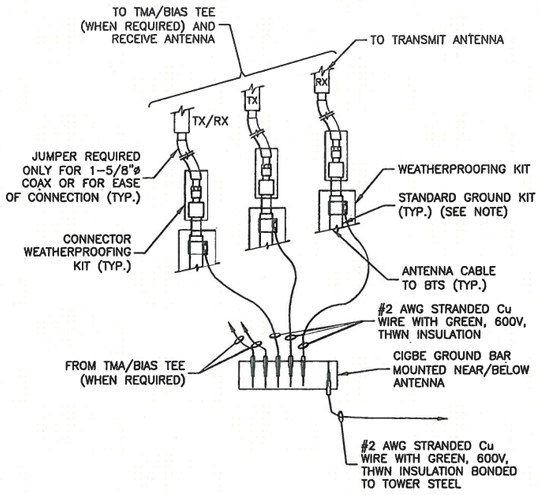
CONSTRUCTION DETAILS

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.

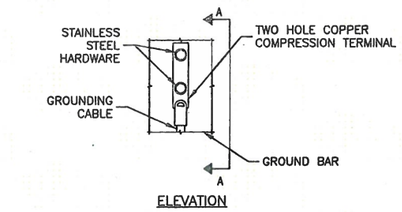


NOTE:

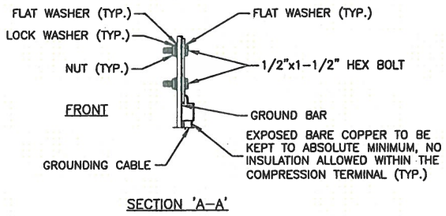
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) 1

SCALE: N.T.S.



ELEVATION



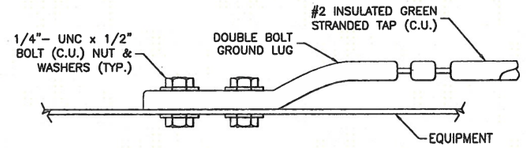
SECTION 'A-A'

NOTES:

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

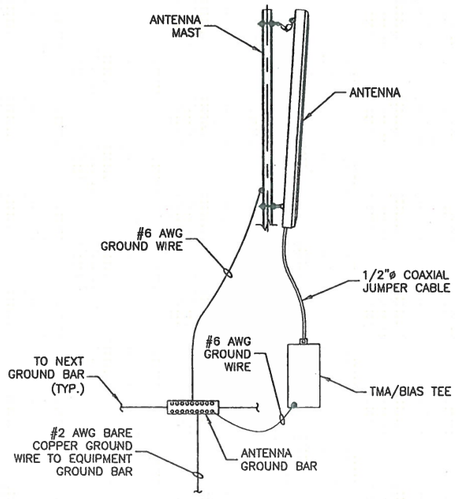
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 2

SCALE: N.T.S.



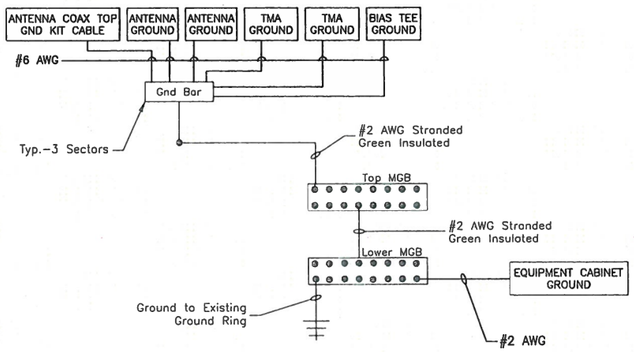
CONNECTION TO EQUIPMENT DETAIL 3

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL 4

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 5

SCALE: N.T.S.

T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DR., SUITE 101
CLIFTON PARK, NY 12065

CT11122B
N. BETHANY / DAVID KLUDGE

CONSTRUCTION DRAWINGS		
4	01/06/16	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
0023222
PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
REVIEWED BY:	BSH
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SITE ADDRESS:	

15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

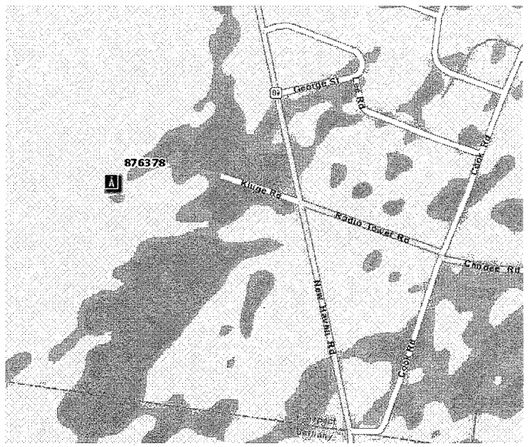
E-1

CROWN CASTLE

TOWER MODIFICATION DRAWINGS

SITE NAME: N. BETHANY/DAVID KLUDGE
BU NUMBER: 876378

SITE ADDRESS:
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY, USA



84 EXIT 23 (69 SOUTH) GO PAST ROUTE 68 RADIO TOWER RD. ON RIGHT APPROX. 3-5 MILES PAST ROUTE 68. MONOPOLE AT END OF ROAD ON LEFT.

PROJECT CONTACTS:

1. CROWN PROJECT MANAGER
   JOHN MCGEE
   (704) 877-8397
   JOHN.MCGEE@CROWNCASTLE.COM
   3530 TORINGDON WAY, SUITE 300
   CHARLOTTE, NC 28277
2. CROWN CONSTRUCTION MANAGER
   JASON D'AMICO
   (860) 209-0104
   JASON.D'AMICO.CONTRACTOR@CROWNCASTLE.COM
   1200 MACARTHUR BLVD., SUITE 200
   MAHWAH, NJ 07430
3. CROWN EOR APPROVAL
   (724) 416-9627
   EORAPPROVAL@CROWNCASTLE.COM
   2000 CORPORATE DRIVE
   CANONSBURG, PA 15317

TOWER INFORMATION

TOWER MANUFACTURER / DWG #:	EEI / DWG # GS51559
TOWER HEIGHT / TYPE:	190 FT MONOPOLE TOWER
TOWER LOCATION:	LAT 41° 28' 16.05"
DATUM: (NAD 1983)	LONG -72° 58' 20.55"
	ELEV 791 FT AMSL
STRUCTURAL DESIGN DRAWING:	CCI / WO # 1036414
STRUCTURAL ANALYSIS REPORT:	CCI / WO # 1014060
STRUCTURAL ANALYSIS DATE:	02/26/15
APPLICATION ID:	283721 REV # 1
CCISITES DOCUMENT ID:	5578097

CODE COMPLIANCE

THIS MODIFICATION DESIGN IS BASED ON THE REQUIREMENTS OF TIA/EIA-222-F STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES AND THE 2005 CT STATE BUILDING CODE WITH 2009 AMENDMENT 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.

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

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S-1	TITLE PAGE
S-2	MODIFICATION INSPECTION CHECKLIST
S-3	NOTES
S-4	POLE MODIFICATION SCHEDULE

NO.	DATE	DESCRIPTION	BY
1	04/30/15	CHANGE TO S-4	EJB

REVISIONS

STATE OF CONNECTICUT
AARON C. POOT
No. 25050
LICENSED PROFESSIONAL ENGINEER
4/30/15

SITE NAME: N. BETHANY/DAVID KLUDGE
BU NUMBER: 876378
WO NUMBER: 1036414
SITE ADDRESS:
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY, USA

ENG/QA BY: MB DATE: 04/20/15
DFT BY: EJB DATE: 04/21/15
DFT/QA BY: SL DATE: 4/30/15
APRV'D BY: CC DATE: 4/30/15
SCALE: N.T.S.

TITLE PAGE

S-1 REV 1

MODIFICATION INSPECTION NOTES

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOR APPROVAL
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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 CROWN ENG-BUL-10173, "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 PURCHASE ORDER (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 CROWN 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 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 CROWN ENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN 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 THE 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, NOR 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 AN 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 CROWN 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
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

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

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

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
AARON C. POOT
No. 25050
LICENSED PROFESSIONAL ENGINEER
4/30/15

SITE NAME: N. BETHANY/DAVID KLUDGE

BU NUMBER: 876378

WO NUMBER: 1036414

SITE ADDRESS:
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY, USA

ENG/QA BY: **MB** DATE: **04/20/15**

DFT BY: **EJB** DATE: **04/21/15**

DFT/QA BY: SL DATE: 4/30/15

APRV'D BY: CL DATE: 4/30/15

SCALE: N.T.S.

MODIFICATION INSPECTION CHECKLIST

S-2 REV **0**

GENERAL NOTES

1. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH IT IS TO BE PERFORMED.
2. THE GENERAL NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE STRUCTURE AND SHALL BE READ IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS.
3. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
5. ERECT GUARDS AND BARRIERS PER APPLICABLE LABOR AND CONSTRUCTION SAFETY REGULATIONS.
6. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, POSSIBLE INTERFERENCES, AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO THE CROWN CASTLE ENGINEER OF RECORD (EOR) AND CROWN CASTLE FIELD PERSONNEL IMMEDIATELY. ANY AND ALL FIELD CHANGES SHALL BE APPROVED AND DOCUMENTED BY THE EOR PRIOR TO FIELD IMPLEMENTATION.
7. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR TWO (2) YEARS FROM THE DATE OF COMPLETED CONSTRUCTION.
8. USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS, UNO.
9. ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH ANSI, ASTM, ACI, TIA, AND AISC STANDARDS AS REFERENCED IN THE APPLICABLE CODE.
10. STRUCTURAL ELEMENTS SHOWN ON THESE DRAWINGS ARE DESIGNED IN ACCORDANCE WITH APPLICABLE BUILDING CODES/STANDARDS. ALL CONSTRUCTION, EXCEPT WHERE NOTED OTHERWISE, SHALL COMPLY WITH THOSE CODES/STANDARDS.
11. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE DRAWINGS. ANY AND ALL SUBSTITUTIONS MUST BE DULY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
12. ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES MEET THE REQUIREMENTS OF OSHA, THE OWNER, AND ALL OTHER APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS.
14. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS, WITH THE RESIDENT LEASING AGENT.
15. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARILY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK.
16. STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.
17. DO NOT SCALE DRAWINGS.
18. THE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF CROWN CASTLE. THEY MAY NOT BE REPRODUCED IN ANY FORM WITHOUT THE EXPRESSED WRITTEN CONSENT/PERMISSION OF CROWN CASTLE.
19. FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY
20. MODIFICATION WORK SHALL BE COMPLETED IN CALM WIND CONDITIONS / OR APPROPRIATE WIND SPEED FOR THE TYPE OF MODIFICATION WORK TO BE INSTALLED.
21. 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.

STRUCTURAL STEEL NOTES

1. DESIGN, FABRICATION, ERECTION, ALTERATION AND MAINTENANCE SHALL CONFORM TO THE FOLLOWING, UNLESS NOTED OTHERWISE (UNO).
   A. TIA-222: STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
   B. TIA-1019-A: INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
   C. AISC: MANUAL OF STEEL CONSTRUCTION
2. ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS, UNO.
   A. STRUCTURAL STEEL, ASTM A572 GRADE 65 (FY = 65KSI).
   B. ALL BOLTS, ASTM A325 TYPE 1 GALVANIZED HIGH STRENGTH BOLTS.
   C. ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS.
   D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS.
3. HOLES SHALL NOT BE FLAME CUT THRU STEEL UNLESS APPROVED BY THE ENGINEER OF RECORD.
4. ALL FASTENERS SHALL NOT BE REUSED.
5. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED ASTM A325 BOLTS.
6. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
7. HOT-DIP GALVANIZE ALL ITEMS, UNO.
   GALVANIZE PER ASTM A123, ASTM A153/A153M OR ASTM A653 G90, AS APPLICABLE.
8. FOR A LIST OF CROWN APPROVED COLD GALVANIZING COMPOUNDS, REFER TO CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN".
9. AFTER FINAL INSPECTION, ALL EXPOSED STRUCTURAL STEEL AS THE RESULT OF THIS SCOPE OF WORK INCLUDING WELDS, FIELD DRILLED HOLES, AND SHAFT INTERIORS (WHERE ACCESSIBLE), SHALL BE CLEANED AND COLD GALVANIZING APPLIED BY BRUSH IN ACCORDANCE WITH CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN". PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR.

WELDING NOTES

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE-STEEL".
2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
3. ALL ARC WELDING ON CROWN STRUCTURES SHALL BE DONE IN ACCORDANCE WITH THE CROWN ENG-PLN-10015, "CUTTING AND WELDING SAFETY PLAN" AND AWS D1.1 (LATEST EDITION). THIS SHALL INCLUDE A CERTIFIED WELDING INSPECTOR (CWI) FOR ACCEPTANCE OR REJECTION OF ALL WELDING OPERATIONS, PRE-DURING-POST, USING THE ACCEPTANCE CRITERIA OF AWS D1.1. THE CWI SHALL WORK WITH THE GC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE WELDING INSPECTION. THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.
4. FOR ALL WELDING, USE E70XX ELECTRODES FOR SMAW PROCESS AND E7XT-XX ELECTRODES FOR FCAW PROCESS, UNO.
5. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING.
6. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0° F. WHEN THE TEMPERATURE IS BETWEEN 0° F AND 32° F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70° F DURING THE WELDING PROCESS.
7. DO NOT WELD ON WET OR FROST-COVERED SURFACES & PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
8. FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1.
9. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.

DETAIL DRAWINGS SHALL GOVERN OVER ANY VARIANCE FROM THIS SHEET

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
AARON C. POOT
No. 25050
LICENSED PROFESSIONAL ENGINEER
4/30/15

CROWN CASTLE

SITE NAME: N. BETHANY/DAVID KLUDGE

BU NUMBER: 876378

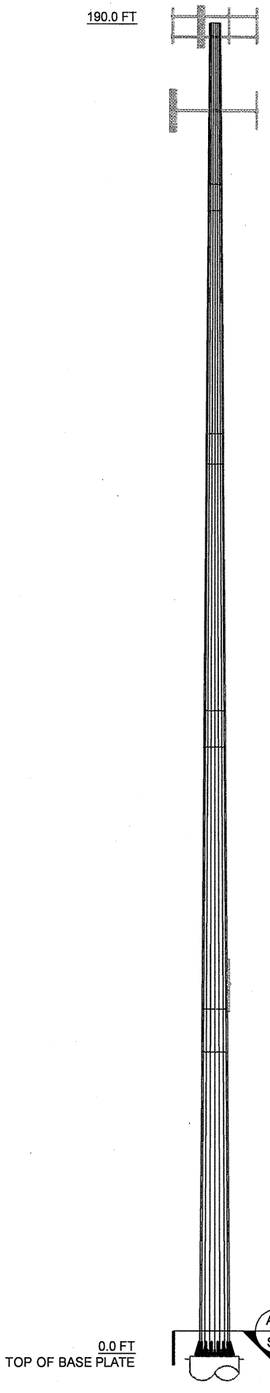
WO NUMBER: 1036414

SITE ADDRESS:
15 KLUGE ROAD
PROSPECT, CT 06712
NEW HAVEN COUNTY, USA

ENG/QA BY: MB	DATE: 04/20/15
DFT BY: EJB	DATE: 04/21/15
DFT/QA BY: SL	DATE: 4/30/15
APRV'D BY: CC	DATE: 4/30/15
SCALE: N.T.S.	

NOTES

S-3 REV 0



POLE ELEVATION

POLE SPECIFICATIONS

POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.18600 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL STEEL:	ASTM A871 (60 KSI)
ANCHOR RODS:	2 1/4"Ø #18J ASTM A615 GRADE 75

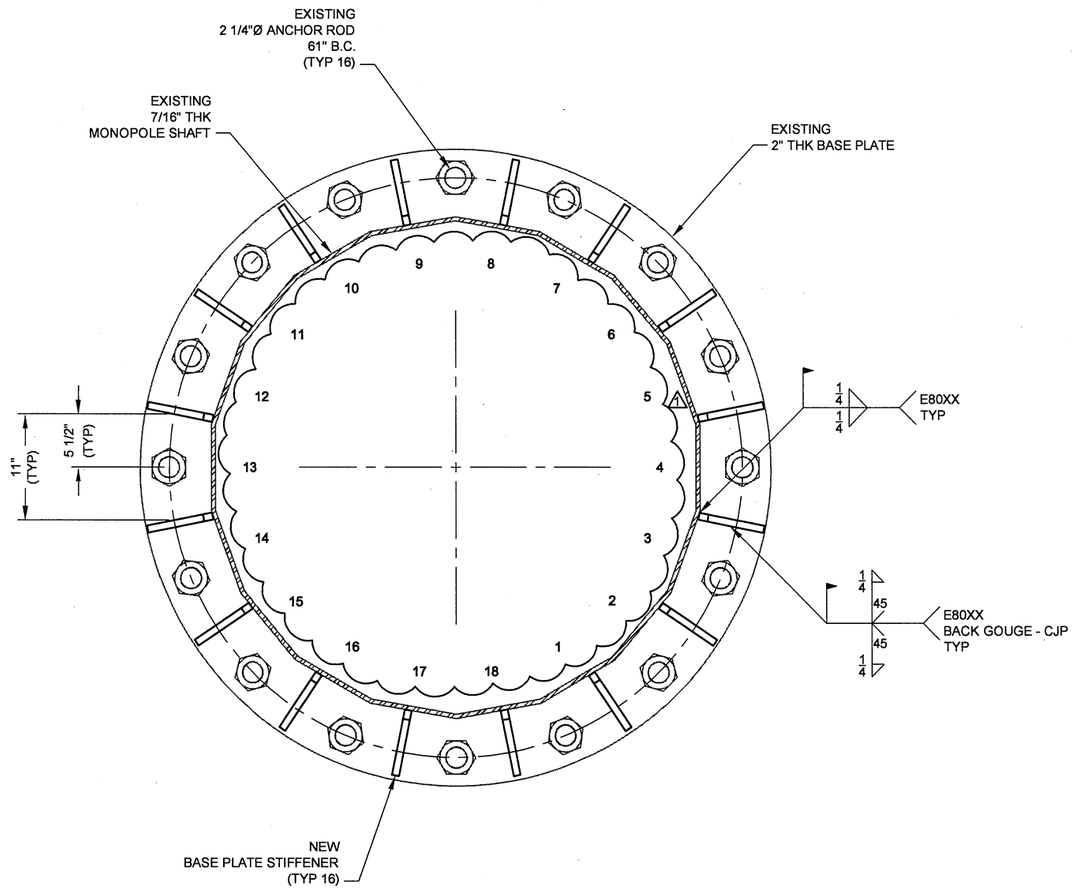
POLE MODIFICATION SCHEDULE

	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A	0	**ADD (16) 3/4" THK BASE PLATE STIFFENERS**	S-4

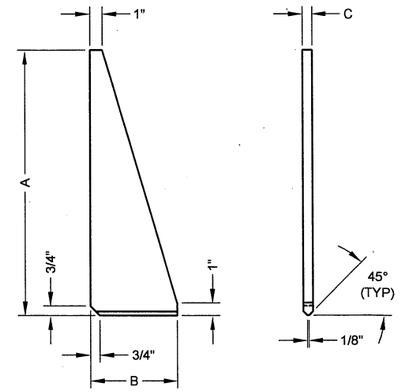
SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN) @ TOP	DIAMETER ACROSS FLATS (IN) @ BOTTOM
1	26.79	0.1875	43	19.500	24.470
2	40.00	0.2500	53	23.430	30.730
3	44.83	0.3125	63	29.424	37.600
4	48.71	0.3750	74	36.018	44.910
5	49.09	0.4375		43.034	52.000

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES



A-A / S-4 TOWER SECTION



BASE PLATE STIFFENER

WEIGHT (#)	A (in)	B (in)	C (in)	STEEL GRADE
18.4	21	7	3/4	A572-50

NO.	DATE	DESCRIPTION	BY
1	04/30/15	CHANGED FLAT NUMBERING	EJB

REVISIONS

STATE OF CONNECTICUT
AARON C. PCOT
No. 25050
LICENSED PROFESSIONAL ENGINEER
4/30/15

CROWN CASTLE

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POLE MODIFICATION SCHEDULE

S-4 REV 1