Crown Castle
3530 Toringdon Way Suite 300
Charlotte NC 28277

Tel (704) 405-6600

March 30, 2015

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

RE: **T-Mobile-Exempt Modification - Crown Site BU: 801485**
T-Mobile Site ID: CT11545A
Located at: 2715 Mountain Road, Suffield, CT 06093

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of T-Mobile. T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement their 700MHz technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Honorable Edward G. McAnaney, First Selectman for the Town of Suffield, the Town of Suffield is the Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **2715 Mountain Road, Suffield, CT 06093**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile's operations at the site (Exhibit-3).

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

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

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

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

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

5. A Structural Modification Report confirming that the tower and foundation can support T-Mobile's proposed modifications is included as Exhibit-2.

For the foregoing reasons, T-Mobile respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Jerry Feathers
Real Estate Specialist

Enclosure

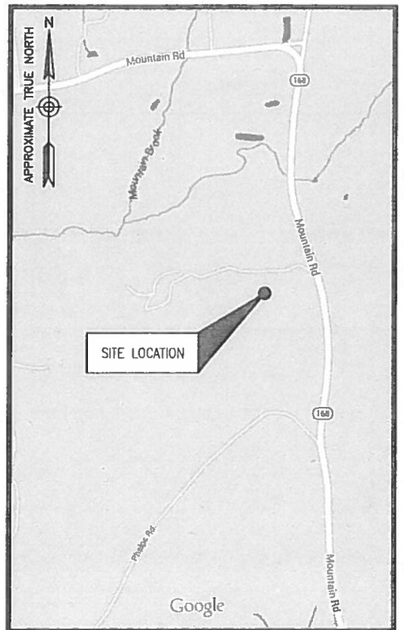
Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Edward G. McAnaney, First Selectman
Suffield Town Hall
83 Mountain Road
Suffield, CT 06078

Town of Suffield attn: First Selectman
c/o First Selectman
83 Mountain Road
Suffield, CT 06078

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11545A
CROWN CASTLE BU #: 801485
SITE NAME: CT SUFFIELD 1 CAC
2715 MOUNTAIN ROAD
SUFFIELD, CT 06093
HARTFORD COUNTY



VICINITY MAP

FROM PARSIPPANY, NJ:

DEPART SYLVAN WAY TOWARD CENTURY DR. TURN RIGHT ONTO US-202/LITTLETON RD. CONTINUE ONTO LITTLETON ROAD AND GET ON RAMP TO I-287 N. TAKE THE I-87 S/I-287/NEW YORK THRUWAY EXIT TOWARD TAPPAN ZEE BRIDGE. MERGE ONTO I-287 E/I-87 S. FOLLOW SIGNS FOR WHITE PLAINS/RYE. TAKE EXIT 9N-9S FOR HUTCHINSON PKWY TOWARD WHITESTONE BRIDGE/MERRIT PKWY. MERGE ONTO WESTCHESTER AVE E. MERGE ONTO HUTCHINSON RIVER PKWY N. CONTINUE ONTO CT-15 N. TAKE EXIT 68 N-E TO MERGE ONTO I-91 N TOWARD HARTFORD/MIDDLETOWN. STAY ON I-91 N. TAKE EXIT 40 FOR CT-20 TOWARD BRADLEY INTERNATIONAL AIRPORT. CONTINUE ONTO CT-20 W. TURN RIGHT ONTO CT-187 N. CONTINUE ONTO S STONE ST. TURN LEFT ONTO CT-168 W. TURN LEFT ONTO MOUNTAIN 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
500 WEST CUMMINGS PARK, SUITE 3600
WOBURN, MA 01801

CONTACT: WARREN KELLEHER
PHONE #: (781) 970-0055

CONSULTANT TEAM

SITE NAME:
CT SUFFIELD 1 CAC

SITE NUMBER:
CT11545A

TOWER OWNER:
CROWN CASTLE
500 WEST CUMMINGS PARK, SUITE 3600
WOBURN, MA 01801

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

COORDINATES:
LATITUDE: 42°-00'-41.8" N (NAD83)
LONGITUDE: 72°-43'-43.6" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
704G

PROJECT SUMMARY

SITE ADDRESS:
2715 MOUNTAIN ROAD
SUFFIELD, CT 06093
HARTFORD COUNTY

PROJECT DIRECTORY

- INSTALL (3) NEW ANTENNAS.
- INSTALL (3) NEW BIAS TEES.
- INSTALL (6) NEW LINES OF COAX.
- INSTALL (1) NEW BBU CABINET AT GRADE.
- INSTALL (3) NEW RRU'S ON A UNISTRUT RACK 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

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

CROWN CASTLE

CROWN CASTLE
500 WEST CUMMINGS PARK, SUITE 3600
WOBURN, MA 01801

CT11545A
CT SUFFIELD 1 CAC

CONSTRUCTION DRAWINGS

0	03/27/15	ISSUED AS FINAL
A	03/25/15	ISSUED FOR REVIEW

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

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:	50071476
SITE ADDRESS:	

2715 MTN. ROAD
SUFFIELD, CT 06093
HARTFORD 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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WOBURN, MA 01801

CT11545A
CT SUFFIELD 1 CAC

CONSTRUCTION DRAWINGS		
0	03/27/15	ISSUED AS FINAL
A	03/25/15	ISSUED FOR REVIEW

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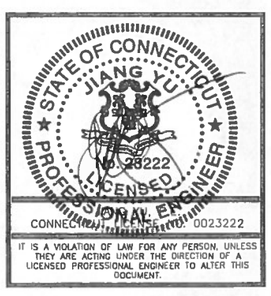


IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071476
SITE ADDRESS:	

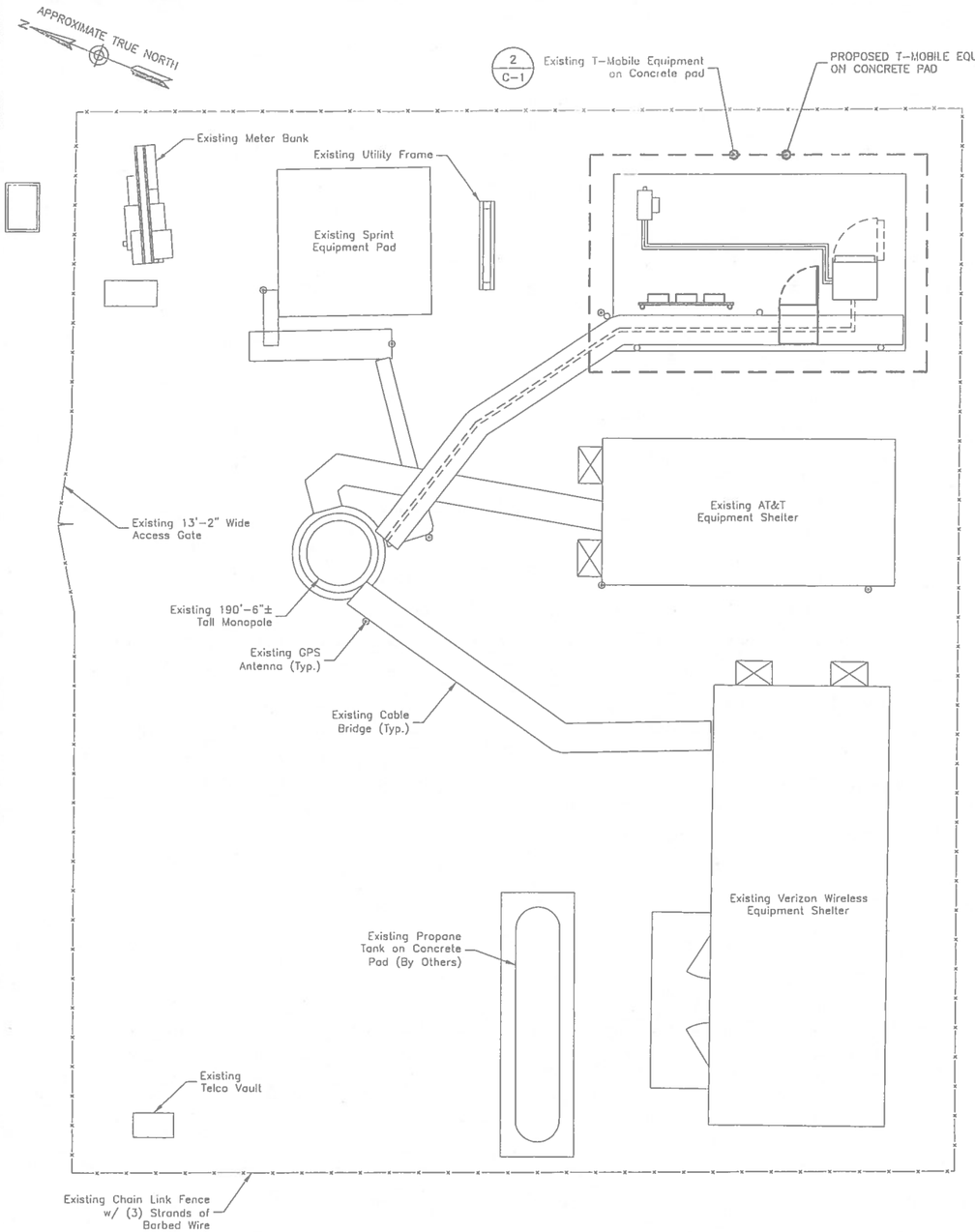
2715 MTN. ROAD
SUFFIELD, CT 06093
HARTFORD COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

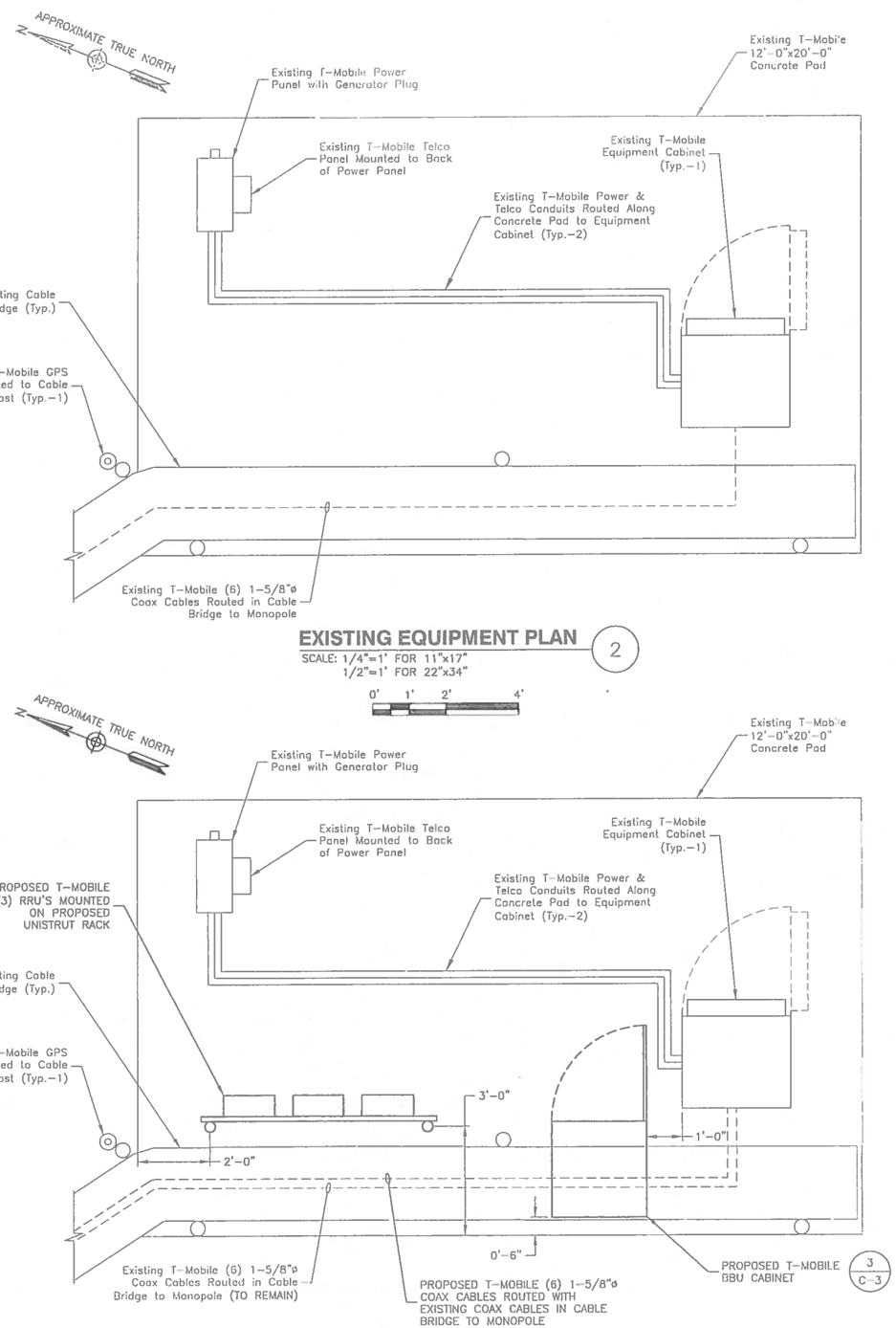
G–1



COMPOUND PLAN 1

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

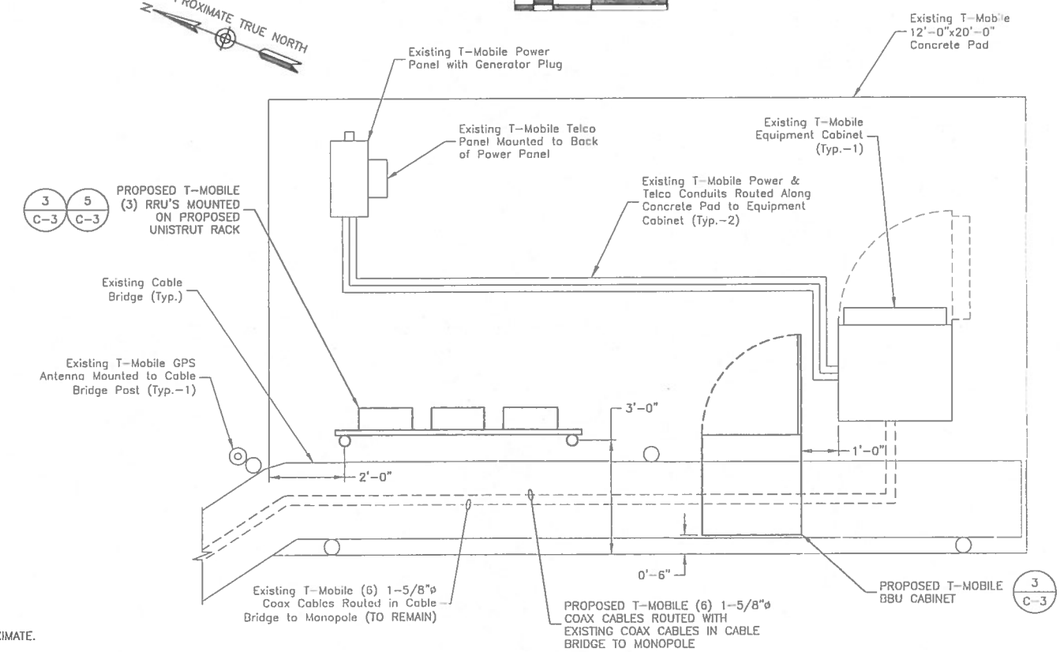
0' 5' 10'



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 B+T GROUP DATED MARCH 2, 2015.

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CT11545A
CT SUFFIELD 1 CAC

CONSTRUCTION DRAWINGS

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A	03/25/15	ISSUED FOR REVIEW

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PHONE: 973.739.9400
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STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER
FINAL
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071476
SITE ADDRESS:	

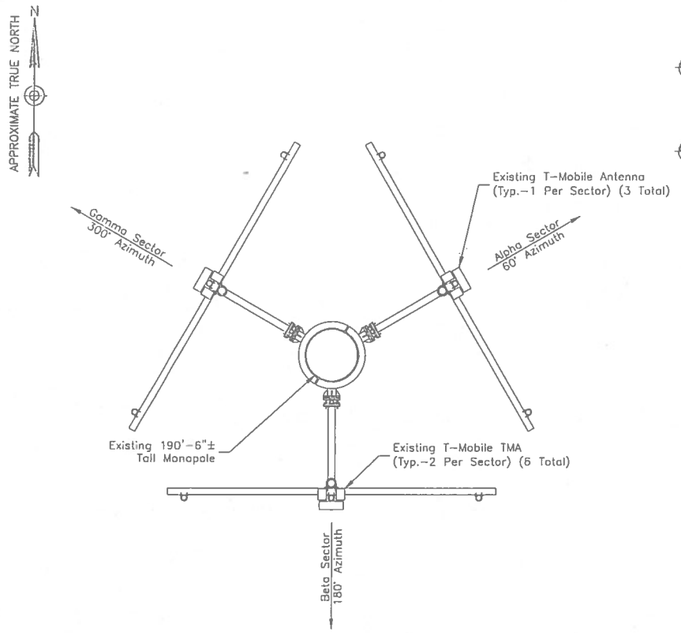
2715 MTN. ROAD
SUFFIELD, CT 06093
HARTFORD COUNTY

SHEET TITLE

COMPOUND PLAN &
EQUIPMENT PLANS

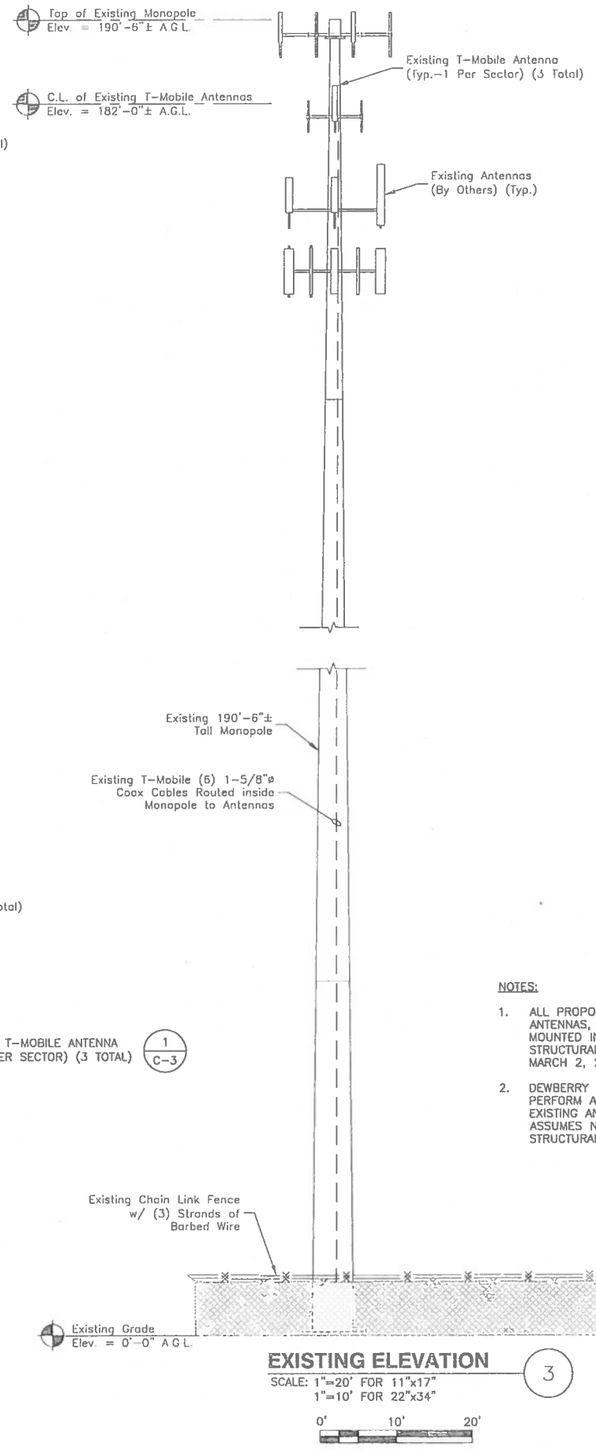
SHEET NUMBER

C-1



EXISTING ANTENNA LAYOUT (1)

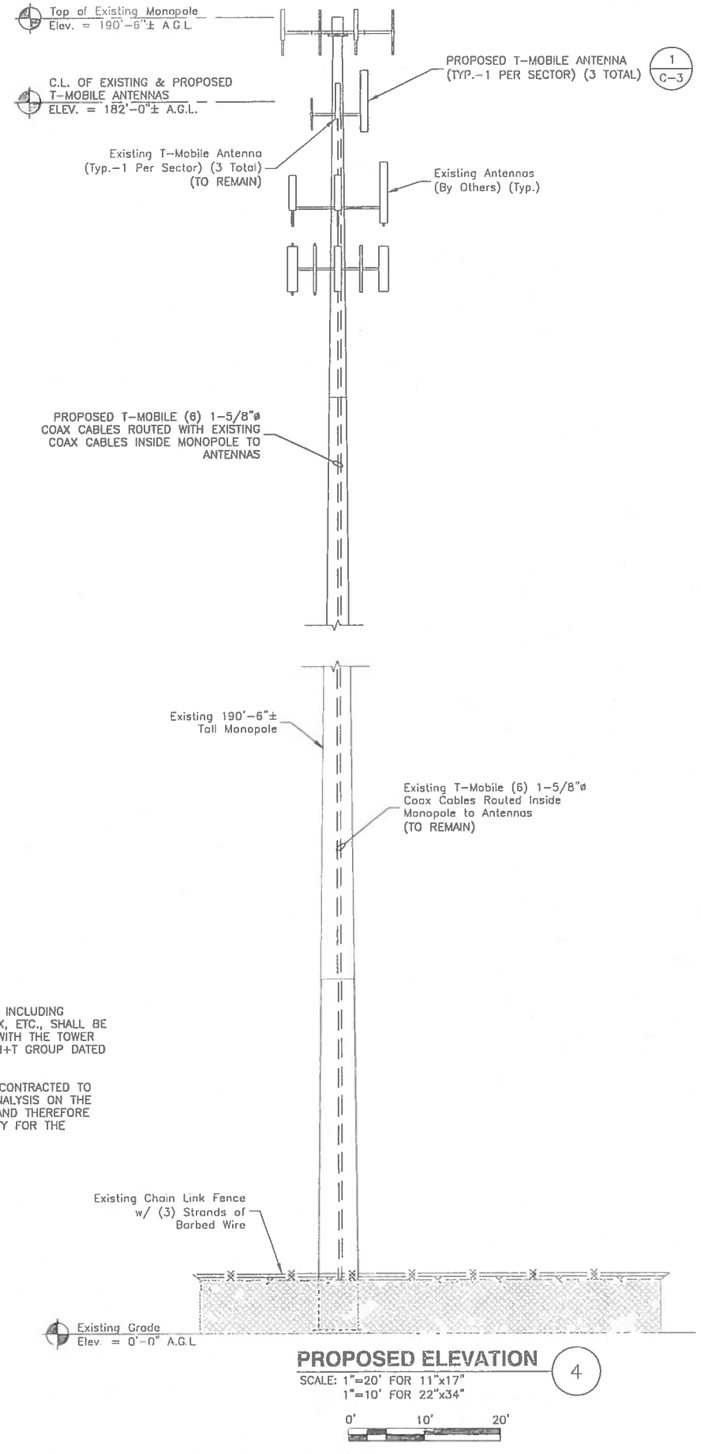
SCALE: N.T.S.



EXISTING ELEVATION (3)

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

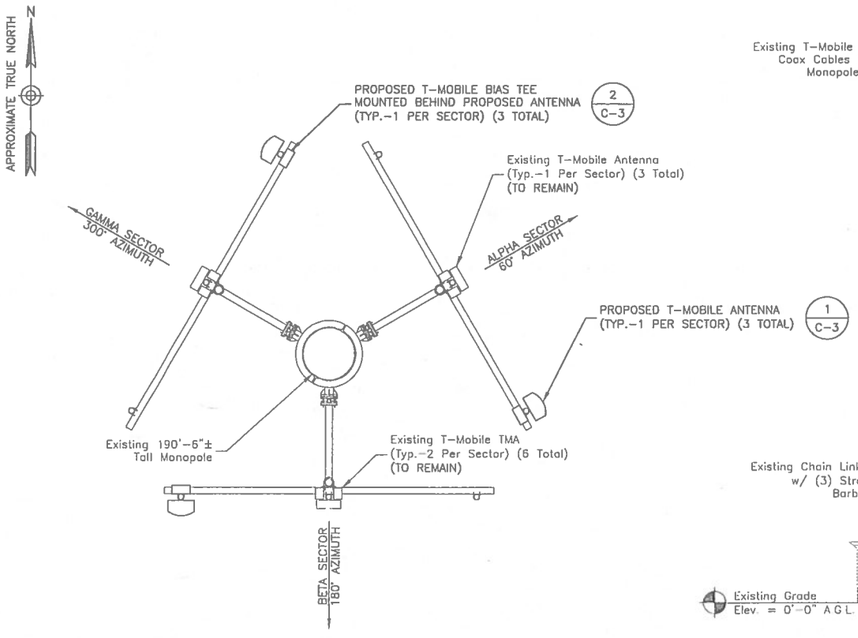
0' 10' 20'



PROPOSED ELEVATION (4)

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

0' 10' 20'



PROPOSED ANTENNA LAYOUT (2)

SCALE: N.T.S.

NOTES:

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

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CT SUFFIELD 1 CAC

CONSTRUCTION DRAWINGS

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

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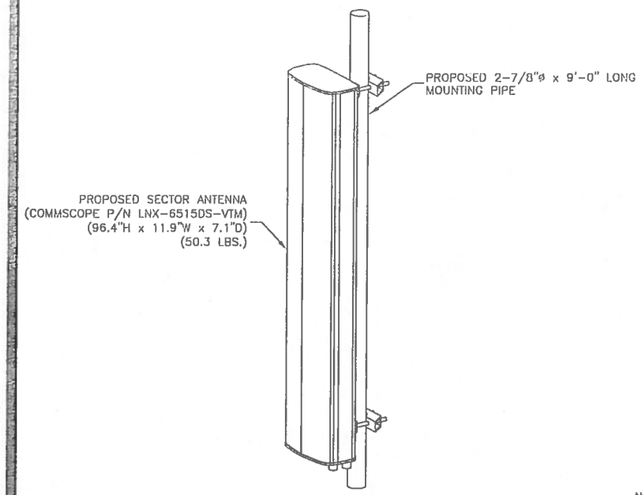
2715 MTN. ROAD
SUFFIELD, CT 06093
HARTFORD COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

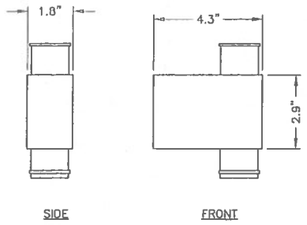
C-2



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.

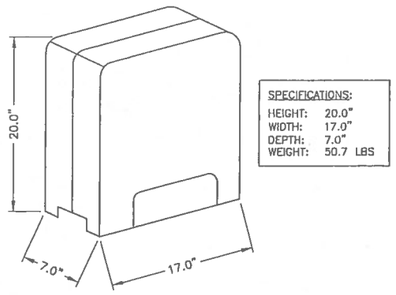


ANDREW ATBT-BOTTOM-24V

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 (2)
SCALE: N.T.S.

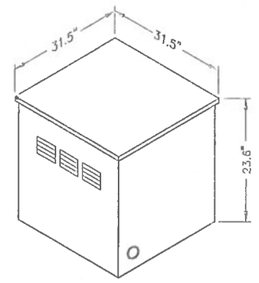


ERICSSON RRUS-11 B12

RRU 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.

RRUS-11 - REMOTE RADIO UNIT (3)
SCALE: N.T.S.



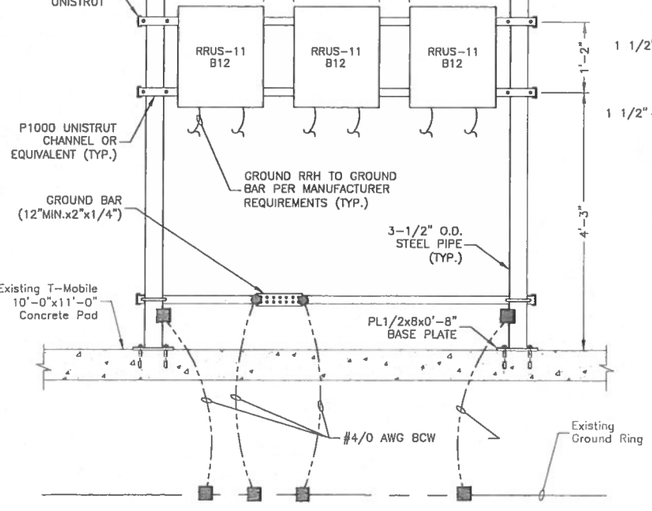
ALCATEL-LUCENT EZBFo BATTERY BACKUP SYSTEM

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.

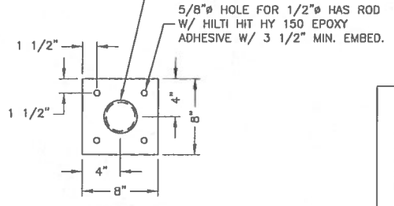
BBU CABINET DETAIL (4)
SCALE: N.T.S.



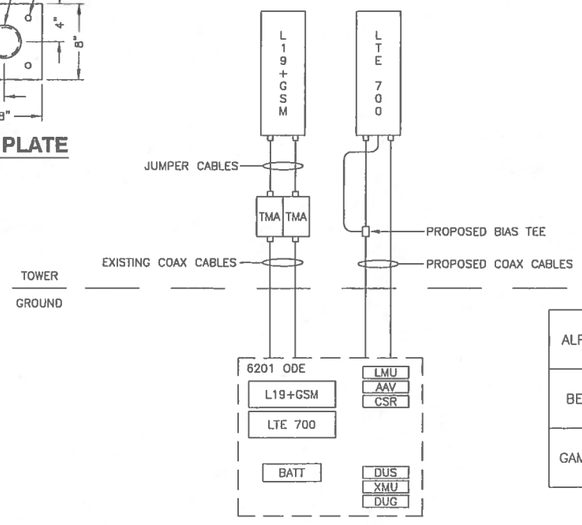
NOTES:

1. CONTRACTOR SHALL SUPPLY AND INSTALL UNISTRUT (OR EQUIVALENT) MOUNTING CHANNELS.
2. CONTRACTOR SHALL SUPPLY (BUT NOT INSTALL) 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER RRU. CONTRACTOR SHALL BAG THE BOLTING HARDWARE AND HANG FROM INSTALLED UNISTRUT FRAME.
3. SPACING MAY VARY BASED ON SELECTED EQUIPMENT. ADJUSTMENTS TO SPACING WILL BE MADE BY RRU INSTALLER.
4. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

RRU RACK DETAIL (5)
SCALE: N.T.S



BASE PLATE



SITE CONFIGURATION 704G (6)
SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH
	EXISTING	PROPOSED	EXISTING	PROPOSED	
ALPHA	EMS RR90-17-02DP	EXISTING TO REMAIN	(2) 1-5/8"ø	(2) 1-5/8"ø	232'-0"
	–	COMMSCOPE LNX-6515DS-VTM			
BETA	EMS RR90-17-02DP	EXISTING TO REMAIN	(2) 1-5/8"ø	(2) 1-5/8"ø	232'-0"
	–	COMMSCOPE LNX-6515DS-VTM			
GAMMA	EMS RR90-17-02DP	EXISTING TO REMAIN	(2) 1-5/8"ø	(2) 1-5/8"ø	232'-0"
	–	COMMSCOPE LNX-6515DS-VTM			

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CT11545A
CT SUFFIELD 1 CAC

CONSTRUCTION DRAWINGS

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A	03/25/15	ISSUED FOR REVIEW

Dewberry

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CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
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PROJECT NUMBER:	50066258
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SITE ADDRESS:	

2715 MTN. ROAD
SUFFIELD, CT 06093
HARTFORD COUNTY

SHEET TITLE

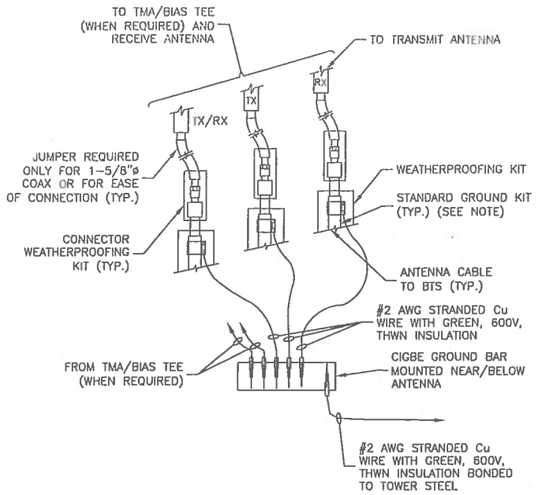
CONSTRUCTION DETAILS

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.

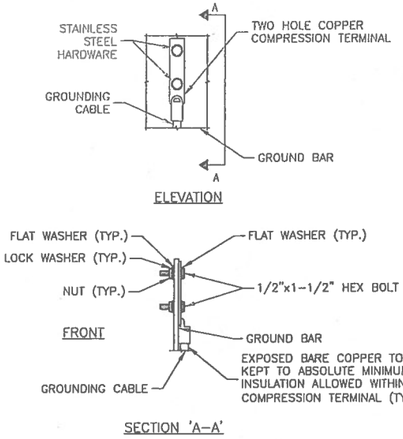


NOTE:

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.

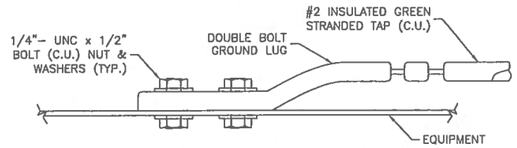


NOTES:

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

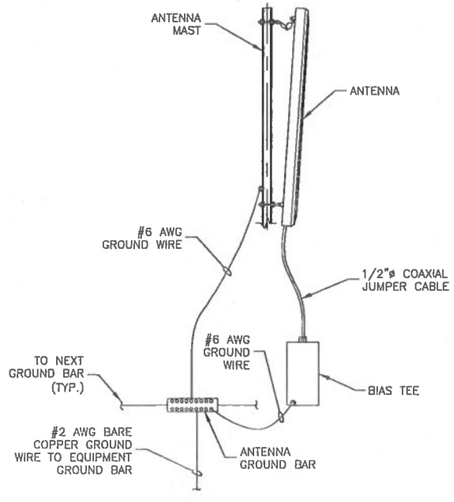
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 2

SCALE: N.T.S.



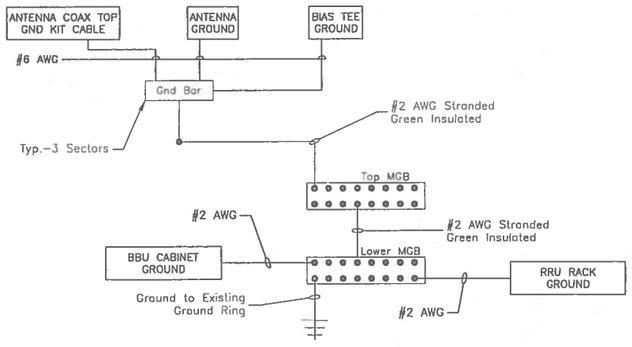
CONNECTION TO EQUIPMENT DETAIL 3

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

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

CROWN CASTLE

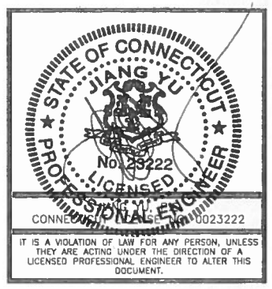
CROWN CASTLE
500 WEST CUMMINGS PARK, SUITE 3600
WOBURN, MA 01801

CT11545A
CT SUFFIELD 1 CAC

CONSTRUCTION DRAWINGS		
0	03/27/15	ISSUED AS FINAL
A	03/25/15	ISSUED FOR REVIEW

Dewberry

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



DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071476
SITE ADDRESS:	

2715 MTN. ROAD
SUFFIELD, CT 06093
HARTFORD COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

March 2, 2015

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6607

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11545A
	Carrier Site Name:	CT545/Crown Suffield
Crown Castle Designation:	**Crown Castle BU Number:**	801485
	Crown Castle Site Name:	Ct Suffield 1 Cac 801485
	Crown Castle JDE Job Number:	324168
	Crown Castle Work Order Number:	1014306
	Crown Castle Application Number:	284765 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	84855.005.01
Site Data:	**2715 Mountain Rd., Suffield, Hartford County, CT** **Latitude *42° 0' 41.8"*, Longitude *-72° 43' 43.6"*** **190.5 Foot - Monopole Tower**	

Dear Charles McGuirt,

B+T Group 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 759851, in accordance with application 284765, revision 1.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

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

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

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

Respectfully submitted by:
B+T Engineering, Inc.

Maurizio Benedetti, E.I.
Project Engineer

Chad E. Tuttle, P.E.
President

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
3/2/15

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 190.5 ft Monopole tower designed by FWT INC. in May of 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F. Modifications were designed by B+T Group in July 2012 and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180.0	182.0	3	Commscope	ATBT-BOTTOM-24V	6	1 5/8	--
		3	Commscope	LNX-6515DS-VTM			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
191.0	192.0	12	Decibel	DB844H90-XY	12	1-5/8	3
	191.0	1	--	Platform Mount [LP 712-1]	--	--	1
180.0	182.0	6	Decibel	PCS 1900 TMA DUAL DUP	6	1-5/8	1
		3	Ems Wireless	RR90-17-02DP			
	180.0	1	--	T-Arm Mount [TA 701-3]			
168.0	171.0	3	Ericsson	RRUS-11	12 1 2	1-5/8 3/8 3/4	1
		2	Powerwave Tech.	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
	170.0	1	Kmw Communications	AM-X-CD-14-65-00T-RET			
		6	Powerwave Technologies	7770.00			
		4	Powerwave Technologies	LGP21401			
		6	Powerwave Technologies	LGP21901			
		2	Powerwave Technologies	P65-17-XLH-RR			
	168.0	1	--	Platform Mount [LP 303-1]			
160.0	160.0	3	Alcatel Lucent	RRH2X40-AWS	1	1-5/8	2
		1	Rfs Celwave	DB-T1-6Z-8AB-0Z			
		6	Kathrein	742 213			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	160.0	1	Antel	BXA-70063-6CF-2	18	1-5/8	1
		2	Antel	BXA-70063-6CF-EDIN-0			
		4	Antel	LPA-80063-6CF-EDIN			
		2	Antel	LPA-80063-6CF-EDIN-5			
		1	--	Platform Mount [LP 601-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Abandoned Equipment Considered in the 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)
192	192	1	Generic	12' LPS Mount w/service Grating	--	--
		12	Swedcom	ALP-9011-E-DIN		
182	182	1	Generic	12' LPS Mount w/service Grating	--	--
		12	Swedcom	ALP-9212-N		
172	172	1	Generic	12' LPS Mount w/service Grating	--	--
		12	Swedcom	ALP-9212-N		
162	162	1	Generic	12' LPS Mount w/service Grating	--	--
		12	Swedcom	ALP-9212-N		
152	152	1	Generic	12' LPS Mount w/service Grating	--	--
		12	Swedcom	ALP-9212-N		
142	142	1	Generic	12' LPS Mount w/service Grating	--	--
		12	Swedcom	ALP-9212-N		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	T-Mobile Co-Locate Revision # 1	284765	CCI Sites
Tower Manufacturer Drawing	FWT Inc., Job No. 21281000	942443	CCI Sites
Tower Modification Drawing	B+T Group, Project No. 84855.001	3268394	CCI Sites
Post Modification Inspection	TEP, Project No. 127143	3770639	CCI Sites
Foundation Drawing	FWT Inc. Job No. 21281000	1118796	CCI Sites
Geotech Report	Clough, Harbour & Associates LLP,CHA Project No. 8961.07.06	2240855	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 02/24/2015	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	190.5 - 143.17	Pole	TP27.778x14.75x0.25	1	-8.738	1094.926	91.1	Pass
L2	143.17 - 93.75	Pole	TP40.88x26.293x0.375	2	-18.160	2415.569	86.2	Pass
L3	93.75 - 46.08	Pole	TP53.251x38.663x0.375	3	-23.929	2729.851	90.6	Pass
L4	46.08 - 0	Pole	TP65.185x50.596x0.375	4	-47.592	3748.329	94.1	Pass
							Summary	
						Pole (L4)	94.1	Pass
						Rating =	94.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	78.2	Pass
1	Base Plate	Base	44.5	Pass
1	Base Foundation	Base	77.0	Pass

Structure Rating (max from all components) =	94.1%

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

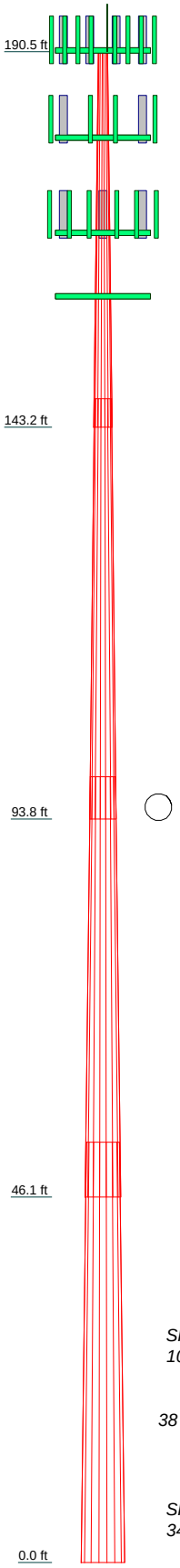
4.1) Recommendations

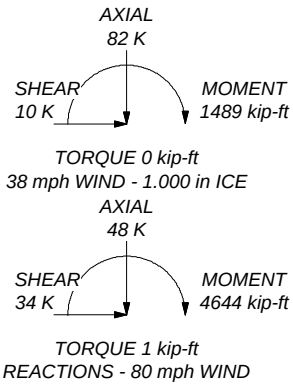
The tower and its foundation have sufficient capacity to carry the existing, reserved and proposed loads. No modifications are required at this time.

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	47.330	18	0.250	3.580	14.750	27.778		2.7
2	53.000	18	0.375	5.330	26.293	40.880		7.1
3	53.000	18	0.375	6.920	38.663	53.251		9.8
4	53.000	18	0.375		50.596	65.185		12.3
							A572-65	31.9





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(4) DB844H90-XY w/ Mount Pipe (AB)	191	(2) LGP21901 (E)	168
(4) DB844H90-XY w/ Mount Pipe (AB)	191	(2) LGP21901 (E)	168
(4) DB844H90-XY w/ Mount Pipe (AB)	191	(2) LGP21401 (E)	168
Platform Mount [LP 712-1] (E)	191	(2) LGP21401 (E)	168
Lightning Rod 5/8" x 6' (E)	190.5	(2) LGP21401 (E)	168
RR90-17-02DP w/ Mount Pipe (E)	180	RRUS-11 (E)	168
RR90-17-02DP w/ Mount Pipe (E)	180	RRUS-11 (E)	168
RR90-17-02DP w/ Mount Pipe (E)	180	RRUS-11 (E)	168
(2) PCS 1900 TMA DUAL DUP (E)	180	DC6-48-60-18-8F (E)	168
(2) PCS 1900 TMA DUAL DUP (E)	180	Platform Mount [LP 303-1] (E)	168
(2) PCS 1900 TMA DUAL DUP (E)	180	(2) LPA-80063-6CF-EDIN w/ Mount Pipe (E)	160
ATBT-BOTTOM-24V (P)	180		
ATBT-BOTTOM-24V (P)	180	(2) LPA-80063-6CF-EDIN w/ Mount Pipe (E)	160
ATBT-BOTTOM-24V (P)	180		
LNX-6515DS-VTM w/ Mount Pipe (P)	180	(2) LPA-80063-6CF-EDIN-5 w/ Mount Pipe (E)	160
LNX-6515DS-VTM w/ Mount Pipe (P)	180		
LNX-6515DS-VTM w/ Mount Pipe (P)	180	BXA-70063-6CF-EDIN-0 w/ Mount Pipe (E)	160
6' x 2" Mount Pipe (E)	180		
6' x 2" Mount Pipe (E)	180	BXA-70063-6CF-EDIN-0 w/ Mount Pipe (E)	160
6' x 2" Mount Pipe (E)	180		
T-Arm Mount [TA 701-3] (E)	180	BXA-70063-6CF-2 w/ Mount Pipe (E)	160
(2) 7770.00 w/ Mount Pipe (E)	168	(2) 742 213 w/ Mount Pipe (R)	160
(2) 7770.00 w/ Mount Pipe (E)	168	(2) 742 213 w/ Mount Pipe (R)	160
(2) 7770.00 w/ Mount Pipe (E)	168	(2) 742 213 w/ Mount Pipe (R)	160
(2) 7770.00 w/ Mount Pipe (E)	168	RRH2X40-AWS (R)	160
P65-17-XLH-RR w/ Mount Pipe (E)	168	RRH2X40-AWS (R)	160
P65-17-XLH-RR w/ Mount Pipe (E)	168	RRH2X40-AWS (R)	160
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	168	DB-T1-6Z-8AB-0Z (R)	160
		Platform Mount [LP 601-1] (E)	160
(2) LGP21901 (E)	168		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 94.1%

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 84855.005.01 - CT SUFFIELD 1 CAC 801485, CT (BU# 80148			
Project:			
Client: Crown Castle	Drawn by: M. Benedetti	App'd:	
Code: TIA/EIA-222-F	Date: 02/26/15	Scale: NTS	
Path: S:\Projects\Crown Castle\84855_801485_Suffield\Engineering\tnxTower\84855_005_01_CT SUFFIELD 1 CAC 801485_CT.eri		Dwg No. E-1	

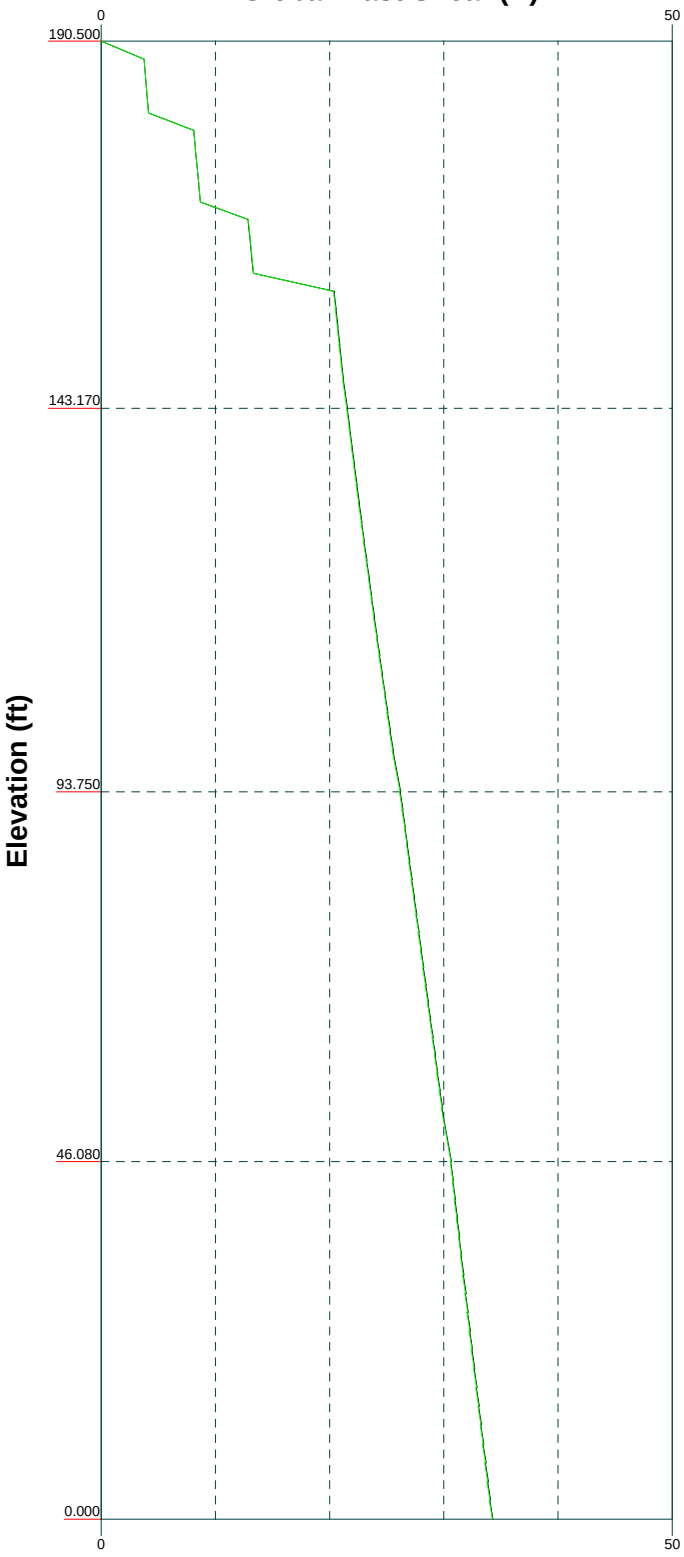
TIA/EIA-222-F - 80 mph/38 mph 1.000 in Ice

Vx Vz

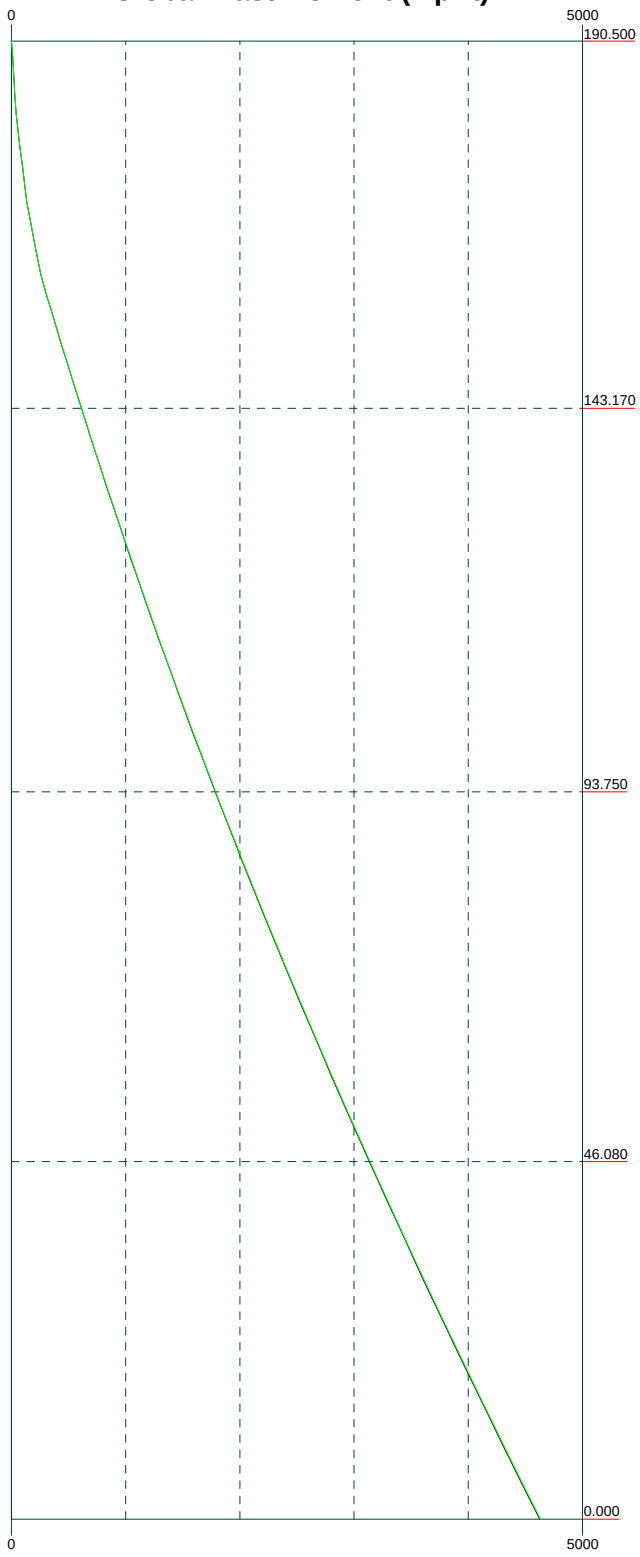
Maximum Values

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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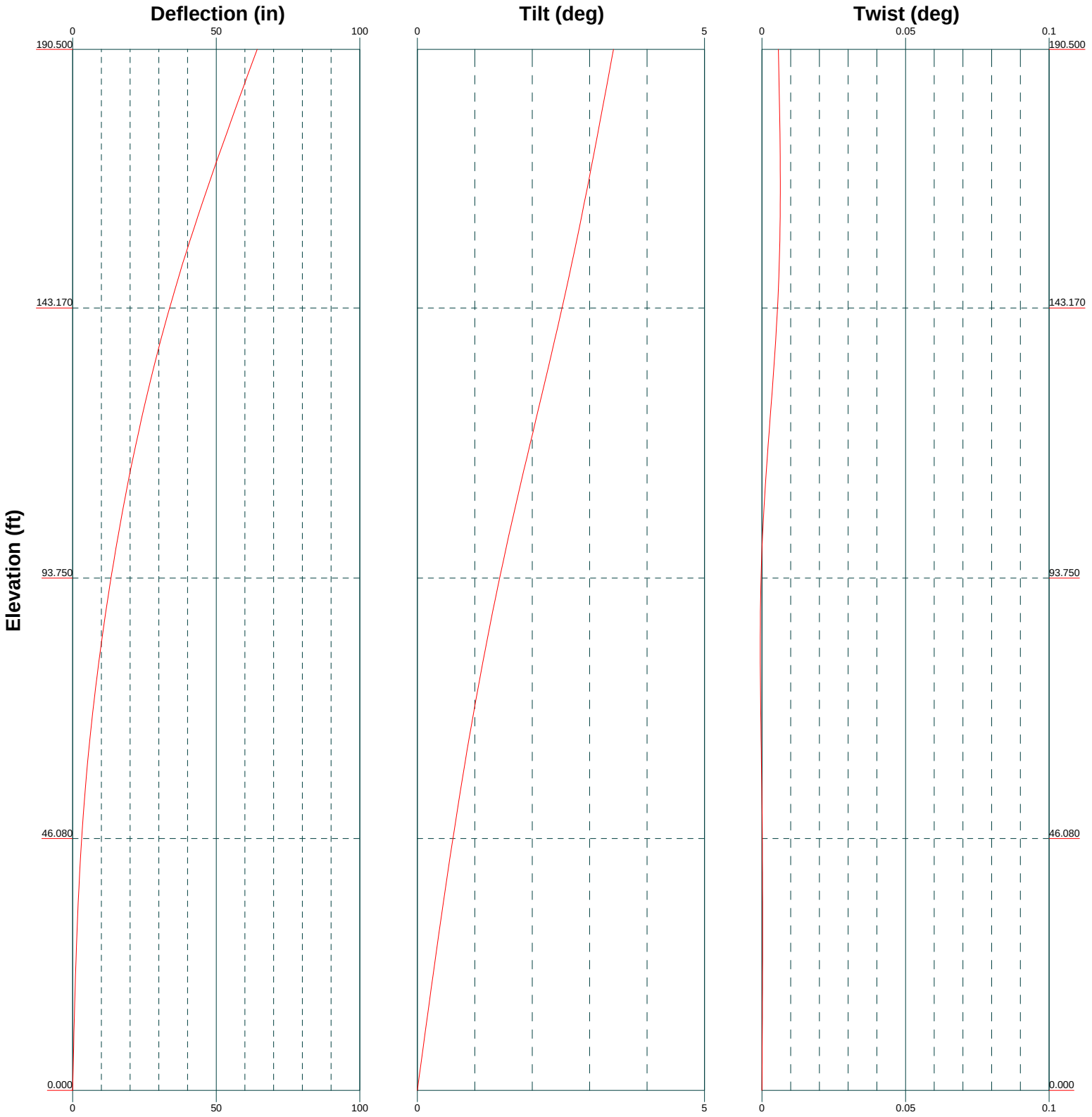
FAX: (918) 295-0265

Job: ***84855.005.01 - CT SUFFIELD 1 CAC 801485, CT (BU# 80148***		
Project:		
Client: Crown Castle	Drawn by: M. Benedetti	App'd:
Code: TIA/EIA-222-F	Date: 02/26/15	Scale: NTS
Path: S:\Projects\Crown Castle\84855_801485_Suffield\Engineering\tnxTower\84855_005_01_CT SUFFIELD 1 CAC 801485_CT.eri		Dwg No. E-4

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

Maximum Values



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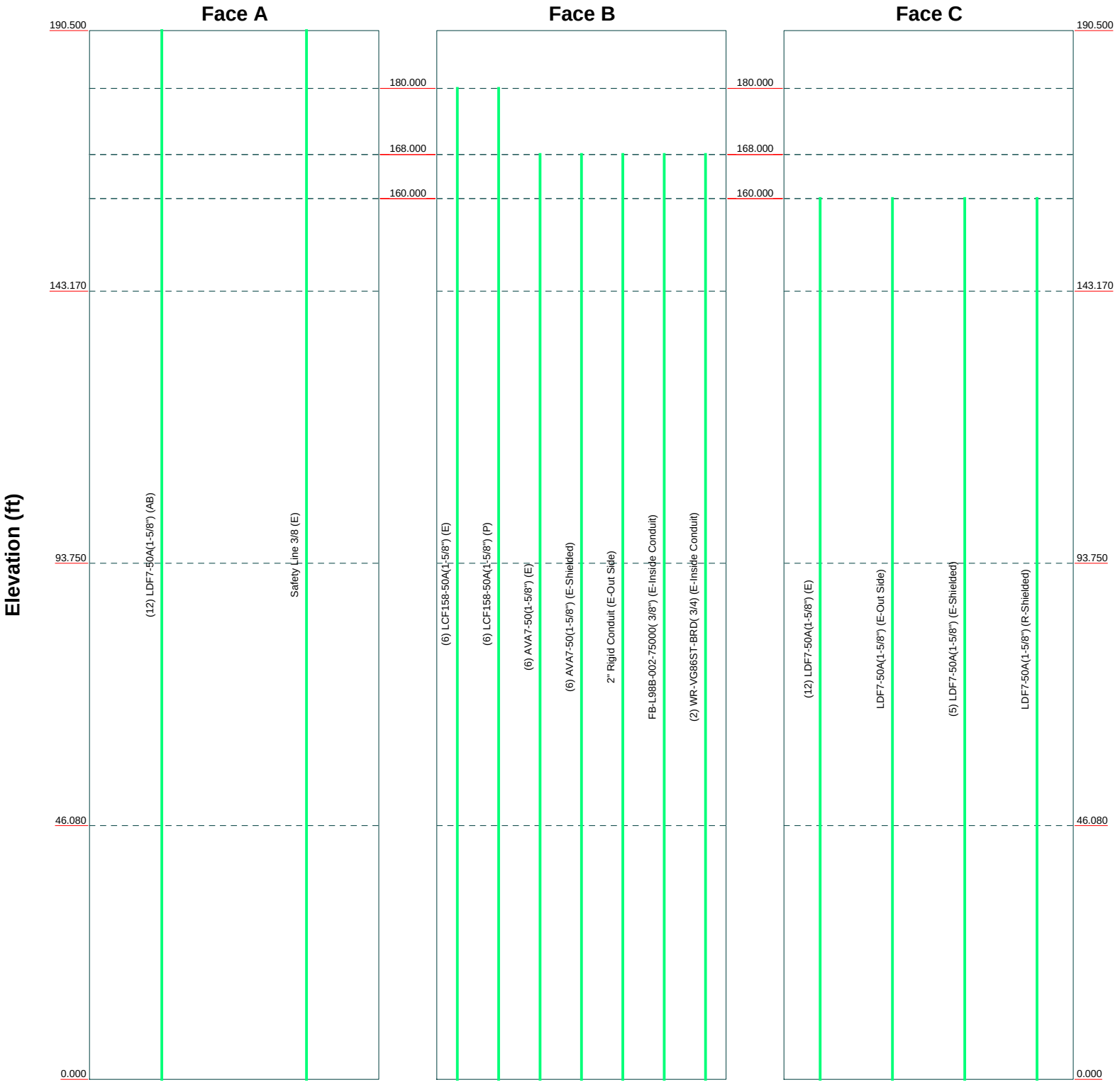
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 84855.005.01 - CT SUFFIELD 1 CAC 801485, CT (BU# 80148		
Project:		
Client: Crown Castle	Drawn by: M. Benedetti	App'd:
Code: TIA/EIA-222-F	Date: 02/26/15	Scale: NTS
Path: S:\Projects\Crown Castle\84855_801485_Suffield\Engineering\tnxTower\84855_005_01_CT SUFFIELD 1 CAC 801485_CT.eri		Dwg No. E-5

Feed Line Distribution Chart
0' - 190'6"

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



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1717 S. Boulder, Suite 300
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FAX: (918) 295-0265

Job: 84855.005.01 - CT SUFFIELD 1 CAC 801485, CT (BU# 80148		
Project:		
Client: Crown Castle	Drawn by: M. Benedetti	App'd:
Code: TIA/EIA-222-F	Date: 02/26/15	Scale: NTS
Path: S:\Projects\Crown Castle\84855_801485_Suffield\Engineering\tnxTower\84855_005_01_CT SUFFIELD 1 CAC 801485_CT.eri		Dwg No. E-7

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	190.500-143.170	47.330	3.580	18	14.750	27.778	0.250	1.000	A572-65 (65 ksi)
L2	143.170-93.750	53.000	5.330	18	26.293	40.880	0.375	1.500	A572-65 (65 ksi)
L3	93.750-46.080	53.000	6.920	18	38.663	53.251	0.375	1.500	A572-65 (65 ksi)
L4	46.080-0.000	53.000		18	50.596	65.185	0.375	1.500	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	14.978	11.506	305.625	5.148	7.493	40.788	611.651	5.754	2.156	8.624
	28.207	21.843	2091.262	9.772	14.111	148.198	4185.275	10.924	4.449	17.796
L2	27.699	30.848	2617.934	9.201	13.357	196.003	5239.312	15.427	3.967	10.58
	41.511	48.211	9993.130	14.379	20.767	481.201	19999.410	24.110	6.535	17.426
L3	40.749	45.572	8440.413	13.592	19.641	429.739	16891.932	22.790	6.145	16.386
	54.072	62.936	22230.612	18.771	27.052	821.788	44490.476	31.474	8.712	23.232
L4	53.311	59.776	19047.570	17.829	25.703	741.066	38120.203	29.894	8.245	21.987
	66.191	77.140	40935.651	23.008	33.114	1236.205	81925.167	38.577	10.813	28.833

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 190.500-143.170				1	1	1		
L2 143.170-93.750				1	1	1		
L3 93.750-46.080				1	1	1		
L4 46.080-0.000				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	Total Number		C_AA_A ft^2/ft	Weight klf
LDF7-50A(1-5/8") (AB)	A	No	Inside Pole	190.500 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
/>								
LCF158-50A(1-5/8") (E)	B	No	Inside Pole	180.000 - 0.000	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
LCF158-50A(1-5/8") (P)	B	No	Inside Pole	180.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
/>								
AVA7-50(1-5/8") (E)	B	No	Inside Pole	168.000 - 0.000	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") (E-Shielded)	B	No	CaAa (Out Of Face)	168.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.030
2" Rigid Conduit (E-Out Side)	B	No	CaAa (Out Of Face)	168.000 - 0.000	1	No Ice	0.200	0.003
						1/2" Ice	0.300	0.004
						1" Ice	0.400	0.006
						2" Ice	0.600	0.013
						4" Ice	1.000	0.032
FB-L98B-002-75000(3/8") (E-Inside Conduit)	B	No	CaAa (Out Of Face)	168.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4) (E-Inside Conduit)	B	No	CaAa (Out Of Face)	168.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.007
						4" Ice	0.000	0.024
/>								
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	160.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
LDF7-50A(1-5/8") (E-Out Side)	C	No	CaAa (Out Of Face)	160.000 - 0.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
						2" Ice	0.598	0.011
						4" Ice	0.998	0.030
LDF7-50A(1-5/8") (E-Shielded)	C	No	CaAa (Out Of Face)	160.000 - 0.000	5	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.011
						4" Ice	0.000	0.030
LDF7-50A(1-5/8") (R-Shielded)	C	No	CaAa (Out Of Face)	160.000 - 0.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.011
						4" Ice	0.000	0.030
/>								
Safety Line 3/8 (E)	A	No	CaAa (Out Of Face)	190.500 - 0.000	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
/>								

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	190.500-143.170	A	0.000	0.000	0.000	1.775	0.476
		B	0.000	0.000	0.000	4.966	0.662
		C	0.000	0.000	0.000	3.332	0.262
L2	143.170-93.750	A	0.000	0.000	0.000	1.853	0.497
		B	0.000	0.000	0.000	9.884	1.089
		C	0.000	0.000	0.000	9.785	0.770
L3	93.750-46.080	A	0.000	0.000	0.000	1.788	0.480
		B	0.000	0.000	0.000	9.534	1.051
		C	0.000	0.000	0.000	9.439	0.743
L4	46.080-0.000	A	0.000	0.000	0.000	1.728	0.464
		B	0.000	0.000	0.000	9.216	1.016
		C	0.000	0.000	0.000	9.124	0.718

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	190.500-143.170	A	1.213	0.000	0.000	0.000	13.255	0.537
		B		0.000	0.000	0.000	10.988	1.682
		C		0.000	0.000	0.000	7.414	0.844
L2	143.170-93.750	A	1.164	0.000	0.000	0.000	13.840	0.561
		B		0.000	0.000	0.000	21.871	3.119
		C		0.000	0.000	0.000	21.772	2.477
L3	93.750-46.080	A	1.093	0.000	0.000	0.000	12.887	0.538
		B		0.000	0.000	0.000	20.634	2.888
		C		0.000	0.000	0.000	20.539	2.291
L4	46.080-0.000	A	1.000	0.000	0.000	0.000	11.804	0.517
		B		0.000	0.000	0.000	19.292	2.622
		C		0.000	0.000	0.000	19.200	2.075

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	190.500-143.170	0.042	0.087	0.068	-0.054
L2	143.170-93.750	0.002	0.210	0.002	0.164
L3	93.750-46.080	0.002	0.218	0.002	0.181
L4	46.080-0.000	0.002	0.222	0.002	0.192

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert ft / ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8" x 6'	B	From Leg	0.000	0.000	190.500	No Ice	0.375	0.375	0.033
(E)			0.000			1/2" Ice	0.989	0.989	0.037
			3.000			1" Ice	1.619	1.619	0.045
						2" Ice	2.464	2.464	0.074
						4" Ice	4.076	4.076	0.184
/>									
(4) DB844H90-XY w/ Mount Pipe	A	From Leg	4.000	0.000	191.000	No Ice	3.104	5.154	0.028
(AB)			0.000			1/2" Ice	3.476	5.833	0.068
			1.000			1" Ice	3.879	6.523	0.113
						2" Ice	4.761	7.959	0.224
						4" Ice	6.660	11.092	0.552
(4) DB844H90-XY w/ Mount Pipe	B	From Leg	4.000	0.000	191.000	No Ice	3.104	5.154	0.028
(AB)			0.000			1/2" Ice	3.476	5.833	0.068
			1.000			1" Ice	3.879	6.523	0.113
						2" Ice	4.761	7.959	0.224
						4" Ice	6.660	11.092	0.552
(4) DB844H90-XY w/ Mount Pipe	C	From Leg	4.000	0.000	191.000	No Ice	3.104	5.154	0.028
(AB)			0.000			1/2" Ice	3.476	5.833	0.068
			1.000			1" Ice	3.879	6.523	0.113
						2" Ice	4.761	7.959	0.224
						4" Ice	6.660	11.092	0.552
Platform Mount [LP 712-1]	C	None		0.000	191.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
/>									
RR90-17-02DP w/ Mount Pipe	A	From Leg	4.000	0.000	180.000	No Ice	4.593	3.319	0.034
(E)			0.000			1/2" Ice	5.088	4.089	0.072
			2.000			1" Ice	5.578	4.784	0.115
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
RR90-17-02DP w/ Mount Pipe	B	From Leg	4.000	0.000	180.000	No Ice	4.593	3.319	0.034
(E)			0.000			1/2" Ice	5.088	4.089	0.072
			2.000			1" Ice	5.578	4.784	0.115
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
RR90-17-02DP w/ Mount Pipe	C	From Leg	4.000	0.000	180.000	No Ice	4.593	3.319	0.034
(E)			0.000			1/2" Ice	5.088	4.089	0.072
			2.000			1" Ice	5.578	4.784	0.115
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
(2) PCS 1900 TMA DUAL DUP	A	From Leg	4.000	0.000	180.000	No Ice	0.628	0.617	0.018
(E)			0.000			1/2" Ice	0.744	0.732	0.023
			2.000			1" Ice	0.869	0.856	0.031
						2" Ice	1.145	1.131	0.052
						4" Ice	1.799	1.783	0.122
(2) PCS 1900 TMA DUAL DUP	B	From Leg	4.000	0.000	180.000	No Ice	0.628	0.617	0.018
(E)			0.000			1/2" Ice	0.744	0.732	0.023
			2.000			1" Ice	0.869	0.856	0.031
						2" Ice	1.145	1.131	0.052
						4" Ice	1.799	1.783	0.122
(2) PCS 1900 TMA DUAL DUP	C	From Leg	4.000	0.000	180.000	No Ice	0.628	0.617	0.018
			0.000			1/2" Ice	0.744	0.732	0.023

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			2.000			1" Ice	0.869	0.856	0.031
						2" Ice	1.145	1.131	0.052
						4" Ice	1.799	1.783	0.122
ATBT-BOTTOM-24V	A	From Leg	4.000	0.000	180.000	No Ice	0.121	0.075	0.003
(P)			0.000			1/2" Ice	0.172	0.119	0.004
			2.000			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	0.000	180.000	No Ice	0.121	0.075	0.003
(P)			0.000			1/2" Ice	0.172	0.119	0.004
			2.000			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	0.000	180.000	No Ice	0.121	0.075	0.003
(P)			0.000			1/2" Ice	0.172	0.119	0.004
			2.000			1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.000	0.000	180.000	No Ice	11.683	9.842	0.083
			0.000			1/2" Ice	12.404	11.366	0.173
(P)			2.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.000	0.000	180.000	No Ice	11.683	9.842	0.083
			0.000			1/2" Ice	12.404	11.366	0.173
(P)			2.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.000	0.000	180.000	No Ice	11.683	9.842	0.083
			0.000			1/2" Ice	12.404	11.366	0.173
(P)			2.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	180.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	180.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	180.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
T-Arm Mount [TA 701-3]	C	None		0.000	180.000	No Ice	27.950	27.950	1.092
(E)						1/2" Ice	37.260	37.260	1.407
						1" Ice	46.570	46.570	1.722
						2" Ice	65.190	65.190	2.352
						4" Ice	102.430	102.430	3.612
/>									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	168.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			2.000			1" Ice	7.128	5.711	0.157

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	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	0.055 0.103 0.157 0.287 0.665
(2) 7770.00 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	0.055 0.103 0.157 0.287 0.665
P65-17-XLH-RR w/ Mount Pipe (E)	A	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.704 12.424 13.153 14.639 17.906	8.938 10.450 11.986 14.313 19.144	0.092 0.178 0.273 0.498 1.126
P65-17-XLH-RR w/ Mount Pipe (E)	B	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.704 12.424 13.153 14.639 17.906	8.938 10.450 11.986 14.313 19.144	0.092 0.178 0.273 0.498 1.126
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	C	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.744 6.198 6.661 7.618 9.668	4.015 4.633 5.276 6.678 9.744	0.035 0.080 0.131 0.254 0.610
(2) LGP21901 (E)	A	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.270 0.343 0.425 0.616 1.101	0.184 0.248 0.322 0.494 0.943	0.006 0.008 0.011 0.022 0.066
(2) LGP21901 (E)	B	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.270 0.343 0.425 0.616 1.101	0.184 0.248 0.322 0.494 0.943	0.006 0.008 0.011 0.022 0.066
(2) LGP21901 (E)	C	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.270 0.343 0.425 0.616 1.101	0.184 0.248 0.322 0.494 0.943	0.006 0.008 0.011 0.022 0.066
(2) LGP21401 (E)	A	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.233 0.313 0.403 0.608 1.121	0.014 0.021 0.030 0.055 0.135
(2) LGP21401 (E)	B	From Leg	4.000 0.000 3.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.233 0.313 0.403 0.608 1.121	0.014 0.021 0.030 0.055 0.135
(2) LGP21401 (E)	C	From Leg	4.000 0.000 2.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.233 0.313 0.403 0.608 1.121	0.014 0.021 0.030 0.055 0.135

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
RRUS-11	A	From Leg	4.000	0.000	168.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			3.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS-11	B	From Leg	4.000	0.000	168.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			3.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS-11	C	From Leg	4.000	0.000	168.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			3.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
DC6-48-60-18-8F	A	From Leg	4.000	0.000	168.000	No Ice	1.266	1.266	0.020
(E)			0.000			1/2" Ice	1.456	1.456	0.035
			3.000			1" Ice	1.658	1.658	0.053
						2" Ice	2.093	2.093	0.095
						4" Ice	3.098	3.098	0.215
Platform Mount [LP 303-1]	C	None		0.000	168.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
						2" Ice	31.500	31.500	2.175
						4" Ice	48.340	48.340	3.101
/>									
(2) LPA-80063-6CF-EDIN	A	From Leg	4.000	0.000	160.000	No Ice	10.745	10.700	0.052
w/ Mount Pipe			0.000			1/2" Ice	11.412	11.967	0.145
(E)			0.000			1" Ice	12.045	12.948	0.247
						2" Ice	13.341	14.963	0.480
						4" Ice	16.054	19.208	1.095
(2) LPA-80063-6CF-EDIN	B	From Leg	4.000	0.000	160.000	No Ice	10.745	10.700	0.052
w/ Mount Pipe			0.000			1/2" Ice	11.412	11.967	0.145
(E)			0.000			1" Ice	12.045	12.948	0.247
						2" Ice	13.341	14.963	0.480
						4" Ice	16.054	19.208	1.095
(2) LPA-80063-6CF-EDIN-5	C	From Leg	4.000	0.000	160.000	No Ice	10.745	10.700	0.052
w/ Mount Pipe			0.000			1/2" Ice	11.412	11.967	0.145
(E)			0.000			1" Ice	12.045	12.948	0.247
						2" Ice	13.341	14.963	0.480
						4" Ice	16.054	19.208	1.095
BXA-70063-6CF-EDIN-0 w/	A	From Leg	4.000	0.000	160.000	No Ice	7.969	5.801	0.042
Mount Pipe			0.000			1/2" Ice	8.609	6.953	0.103
(E)			0.000			1" Ice	9.216	7.819	0.171
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.804
BXA-70063-6CF-EDIN-0 w/	B	From Leg	4.000	0.000	160.000	No Ice	7.969	5.801	0.042
Mount Pipe			0.000			1/2" Ice	8.609	6.953	0.103
(E)			0.000			1" Ice	9.216	7.819	0.171
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.804
BXA-70063-6CF-2 w/ Mount	C	From Leg	4.000	0.000	160.000	No Ice	7.969	5.801	0.042
Pipe			0.000			1/2" Ice	8.609	6.953	0.103
(E)			0.000			1" Ice	9.216	7.819	0.171
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.804
(2) 742 213 w/ Mount Pipe	A	From Leg	4.000	0.000	160.000	No Ice	5.373	4.620	0.049

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(R)			0.000			1/2" Ice	5.950	6.000	0.094
			0.000			1" Ice	6.501	6.982	0.146
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.683
(2) 742 213 w/ Mount Pipe	B	From Leg	4.000	0.000	160.000	No Ice	5.373	4.620	0.049
(R)			0.000			1/2" Ice	5.950	6.000	0.094
			0.000			1" Ice	6.501	6.982	0.146
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.683
(2) 742 213 w/ Mount Pipe	C	From Leg	4.000	0.000	160.000	No Ice	5.373	4.620	0.049
(R)			0.000			1/2" Ice	5.950	6.000	0.094
			0.000			1" Ice	6.501	6.982	0.146
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.683
RRH2X40-AWS	A	From Leg	4.000	0.000	160.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2X40-AWS	B	From Leg	4.000	0.000	160.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2X40-AWS	C	From Leg	4.000	0.000	160.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
DB-T1-6Z-8AB-0Z	B	From Leg	4.000	0.000	160.000	No Ice	5.600	2.333	0.044
(R)			0.000			1/2" Ice	5.915	2.558	0.080
			0.000			1" Ice	6.240	2.791	0.120
						2" Ice	6.914	3.284	0.213
						4" Ice	8.365	4.373	0.455
Platform Mount [LP 601-1]	C	None		0.000	160.000	No Ice	28.470	28.470	1.122
(E)						1/2" Ice	33.590	33.590	1.514
						1" Ice	38.710	38.710	1.905
						2" Ice	48.950	48.950	2.689
						4" Ice	69.430	69.430	4.255
/>									

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

Comb. No.	Description
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	190.5 - 143.17	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-24.527	-1.897	-0.683
			Max. Mx	5	-8.751	-537.200	-1.484
			Max. My	8	-8.761	-1.866	-536.194
			Max. Vy	5	21.229	-537.200	-1.484
			Max. Vx	8	21.179	-1.866	-536.194
			Max. Torque	13			-1.437
L2	143.17 - 93.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-39.318	-2.606	-3.799
			Max. Mx	5	-18.169	-1649.998	-5.994
			Max. My	8	-18.175	-6.170	-1646.906
			Max. Vy	5	25.584	-1649.998	-5.994
			Max. Vx	8	25.534	-6.170	-1646.906
			Max. Torque	13			-1.433
L3	93.75 - 46.08	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-57.299	-3.367	-7.648
			Max. Mx	5	-30.320	-2930.105	-10.527
			Max. My	8	-30.323	-10.326	-2925.112
			Max. Vy	5	29.898	-2930.105	-10.527
			Max. Vx	8	29.848	-10.326	-2925.112
			Max. Torque	13			-1.385
L4	46.08 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-81.506	-4.239	-12.467
			Max. Mx	5	-47.592	-4633.169	-15.808

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	8	-47.592	-15.020	-4626.161
			Max. Vy	5	34.302	-4633.169	-15.808
			Max. Vx	8	34.254	-15.020	-4626.161
			Max. Torque	2			-1.344

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	21	81.506	-0.013	-10.170
	Max. H_x	11	47.615	34.270	0.081
	Max. H_z	2	47.615	0.081	34.221
	Max. M_x	2	4622.234	0.081	34.221
	Max. M_z	5	4633.169	-34.270	-0.081
	Max. Torsion	8	1.339	-0.081	-34.221
	Min. Vert	1	47.615	0.000	0.000
	Min. H_x	5	47.615	-34.270	-0.081
	Min. H_z	8	47.615	-0.081	-34.221
	Min. M_x	8	-4626.161	-0.081	-34.221
	Min. M_z	11	-4630.788	34.270	0.081
	Min. Torsion	2	-1.344	0.081	34.221

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	47.615	0.000	0.000	1.897	-1.135	0.000
Dead+Wind 0 deg - No Ice	47.615	-0.081	-34.221	-4622.234	12.660	1.344
Dead+Wind 30 deg - No Ice	47.615	17.064	-29.596	-3995.854	-2305.248	1.031
Dead+Wind 60 deg - No Ice	47.615	29.638	-17.040	-2298.175	-4005.765	0.442
Dead+Wind 90 deg - No Ice	47.615	34.270	0.081	15.808	-4633.169	-0.263
Dead+Wind 120 deg - No Ice	47.615	29.719	17.181	2326.013	-4019.483	-0.896
Dead+Wind 150 deg - No Ice	47.615	17.205	29.677	4013.501	-2329.144	-1.289
Dead+Wind 180 deg - No Ice	47.615	0.081	34.221	4626.161	-15.020	-1.339
Dead+Wind 210 deg - No Ice	47.615	-17.064	29.596	3999.761	2302.870	-1.031
Dead+Wind 240 deg - No Ice	47.615	-29.638	17.040	2302.096	4003.377	-0.448
Dead+Wind 270 deg - No Ice	47.615	-34.270	-0.081	-11.871	4630.788	0.258
Dead+Wind 300 deg - No Ice	47.615	-29.719	-17.181	-2322.074	4017.120	0.896
Dead+Wind 330 deg - No Ice	47.615	-17.205	-29.677	-4009.576	2326.791	1.294
Dead+Ice+Temp	81.506	0.000	0.000	12.467	-4.239	0.000
Dead+Wind 0 deg+Ice+Temp	81.506	-0.013	-10.170	-1460.721	-1.985	0.416
Dead+Wind 30 deg+Ice+Temp	81.506	5.082	-8.801	-1262.169	-740.594	0.301
Dead+Wind 60 deg+Ice+Temp	81.506	8.816	-5.073	-722.029	-1281.910	0.106
Dead+Wind 90 deg+Ice+Temp	81.506	10.188	0.013	14.965	-1480.887	-0.117
Dead+Wind 120 deg+Ice+Temp	81.506	8.830	5.096	751.333	-1284.215	-0.309
Dead+Wind 150 deg+Ice+Temp	81.506	5.105	8.814	1289.769	-744.595	-0.418
Dead+Wind 180 deg+Ice+Temp	81.506	0.013	10.170	1486.004	-6.614	-0.415
Dead+Wind 210 deg+Ice+Temp	81.506	-5.082	8.801	1287.456	731.987	-0.301
Dead+Wind 240 deg+Ice+Temp	81.506	-8.816	5.073	747.325	1273.303	-0.107
Dead+Wind 270 deg+Ice+Temp	81.506	-10.188	-0.013	10.335	1472.287	0.117
Dead+Wind 300 deg+Ice+Temp	81.506	-8.830	-5.096	-726.037	1275.622	0.309

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 330 deg+Ice+Temp	81.506	-5.105	-8.814	-1264.481	736.002	0.418
Dead+Wind 0 deg - Service	47.615	-0.032	-13.368	-1808.254	4.215	0.535
Dead+Wind 30 deg - Service	47.615	6.666	-11.561	-1563.035	-903.160	0.410
Dead+Wind 60 deg - Service	47.615	11.577	-6.656	-898.459	-1568.856	0.176
Dead+Wind 90 deg - Service	47.615	13.387	0.032	7.383	-1814.484	-0.106
Dead+Wind 120 deg - Service	47.615	11.609	6.711	911.769	-1574.265	-0.359
Dead+Wind 150 deg - Service	47.615	6.721	11.593	1572.373	-912.539	-0.516
Dead+Wind 180 deg - Service	47.615	0.032	13.368	1812.180	-6.621	-0.534
Dead+Wind 210 deg - Service	47.615	-6.666	11.561	1566.960	900.751	-0.410
Dead+Wind 240 deg - Service	47.615	-11.577	6.656	902.387	1566.445	-0.176
Dead+Wind 270 deg - Service	47.615	-13.387	-0.032	-3.453	1812.074	0.105
Dead+Wind 300 deg - Service	47.615	-11.609	-6.711	-907.839	1571.858	0.359
Dead+Wind 330 deg - Service	47.615	-6.721	-11.593	-1568.445	910.134	0.516

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	-47.615	0.000	0.000	47.615	0.000	0.000%
2	-0.081	-47.615	-34.221	0.081	47.615	34.221	0.000%
3	17.064	-47.615	-29.596	-17.064	47.615	29.596	0.000%
4	29.638	-47.615	-17.040	-29.638	47.615	17.040	0.000%
5	34.270	-47.615	0.081	-34.270	47.615	-0.081	0.000%
6	29.719	-47.615	17.181	-29.719	47.615	-17.181	0.000%
7	17.205	-47.615	29.677	-17.205	47.615	-29.677	0.000%
8	0.081	-47.615	34.221	-0.081	47.615	-34.221	0.000%
9	-17.064	-47.615	29.596	17.064	47.615	-29.596	0.000%
10	-29.638	-47.615	17.040	29.638	47.615	-17.040	0.000%
11	-34.270	-47.615	-0.081	34.270	47.615	0.081	0.000%
12	-29.719	-47.615	-17.181	29.719	47.615	17.181	0.000%
13	-17.205	-47.615	-29.677	17.205	47.615	29.677	0.000%
14	0.000	-81.506	0.000	-0.000	81.506	-0.000	0.000%
15	-0.013	-81.506	-10.169	0.013	81.506	10.170	0.000%
16	5.082	-81.506	-8.800	-5.082	81.506	8.801	0.000%
17	8.816	-81.506	-5.073	-8.816	81.506	5.073	0.000%
18	10.188	-81.506	0.013	-10.188	81.506	-0.013	0.000%
19	8.829	-81.506	5.096	-8.830	81.506	-5.096	0.000%
20	5.105	-81.506	8.814	-5.105	81.506	-8.814	0.000%
21	0.013	-81.506	10.169	-0.013	81.506	-10.170	0.000%
22	-5.082	-81.506	8.800	5.082	81.506	-8.801	0.000%
23	-8.816	-81.506	5.073	8.816	81.506	-5.073	0.000%
24	-10.188	-81.506	-0.013	10.188	81.506	0.013	0.000%
25	-8.829	-81.506	-5.096	8.830	81.506	5.096	0.000%
26	-5.105	-81.506	-8.814	5.105	81.506	8.814	0.000%
27	-0.032	-47.615	-13.368	0.032	47.615	13.368	0.000%
28	6.666	-47.615	-11.561	-6.666	47.615	11.561	0.000%
29	11.577	-47.615	-6.656	-11.577	47.615	6.656	0.000%
30	13.387	-47.615	0.032	-13.387	47.615	-0.032	0.000%
31	11.609	-47.615	6.711	-11.609	47.615	-6.711	0.000%
32	6.721	-47.615	11.593	-6.721	47.615	-11.593	0.000%
33	0.032	-47.615	13.368	-0.032	47.615	-13.368	0.000%
34	-6.666	-47.615	11.561	6.666	47.615	-11.561	0.000%
35	-11.577	-47.615	6.656	11.577	47.615	-6.656	0.000%
36	-13.387	-47.615	-0.032	13.387	47.615	0.032	0.000%
37	-11.609	-47.615	-6.711	11.609	47.615	6.711	0.000%
38	-6.721	-47.615	-11.593	6.721	47.615	11.593	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	4	0.00000001	0.00072822
3	Yes	6	0.00000001	0.00005222
4	Yes	6	0.00000001	0.00005131
5	Yes	4	0.00000001	0.00054940
6	Yes	6	0.00000001	0.00005115
7	Yes	6	0.00000001	0.00005295
8	Yes	5	0.00000001	0.00004301
9	Yes	6	0.00000001	0.00005085
10	Yes	6	0.00000001	0.00005175
11	Yes	4	0.00000001	0.00068213
12	Yes	6	0.00000001	0.00005264
13	Yes	6	0.00000001	0.00005085
14	Yes	4	0.00000001	0.00004166
15	Yes	5	0.00000001	0.00051527
16	Yes	5	0.00000001	0.00082890
17	Yes	5	0.00000001	0.00082120
18	Yes	5	0.00000001	0.00052170
19	Yes	5	0.00000001	0.00084086
20	Yes	5	0.00000001	0.00085164
21	Yes	5	0.00000001	0.00052283
22	Yes	5	0.00000001	0.00082386
23	Yes	5	0.00000001	0.00083248
24	Yes	5	0.00000001	0.00051694
25	Yes	5	0.00000001	0.00082353
26	Yes	5	0.00000001	0.00081228
27	Yes	4	0.00000001	0.00022625
28	Yes	5	0.00000001	0.00014710
29	Yes	5	0.00000001	0.00014300
30	Yes	4	0.00000001	0.00017812
31	Yes	5	0.00000001	0.00014385
32	Yes	5	0.00000001	0.00015175
33	Yes	4	0.00000001	0.00025277
34	Yes	5	0.00000001	0.00014073
35	Yes	5	0.00000001	0.00014484
36	Yes	4	0.00000001	0.00018730
37	Yes	5	0.00000001	0.00014953
38	Yes	5	0.00000001	0.00014164

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190.5 - 143.17	64.251	31	3.414	0.006
L2	146.75 - 93.75	35.716	31	2.594	0.003
L3	99.08 - 46.08	15.044	31	1.541	0.001
L4	53 - 0	4.075	31	0.722	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.000	(4) DB844H90-XY w/ Mount Pipe	31	64.251	3.414	0.006	16995
190.500	Lightning Rod 5/8" x 6'	31	64.251	3.414	0.006	16995
180.000	RR90-17-02DP w/ Mount Pipe	31	56.955	3.228	0.005	8092
168.000	(2) 7770.00 w/ Mount Pipe	31	48.827	3.010	0.004	3775
160.000	(2) LPA-80063-6CF-EDIN w/ Mount Pipe	31	43.649	2.860	0.004	2784

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190.5 - 143.17	163.159	6	8.683	0.015
L2	146.75 - 93.75	90.902	6	6.605	0.007
L3	99.08 - 46.08	38.350	6	3.928	0.002
L4	53 - 0	10.396	6	1.842	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.000	(4) DB844H90-XY w/ Mount Pipe	6	163.159	8.683	0.016	6932
190.500	Lightning Rod 5/8" x 6'	6	163.159	8.683	0.016	6932
180.000	RR90-17-02DP w/ Mount Pipe	6	144.693	8.212	0.014	3299
168.000	(2) 7770.00 w/ Mount Pipe	6	124.119	7.661	0.011	1536
160.000	(2) LPA-80063-6CF-EDIN w/ Mount Pipe	6	111.005	7.279	0.010	1130

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	190.5 - 143.17 (1)	TP27.778x14.75x0.25	47.330	0.000	0.0	39.000	21.062	-8.738	821.400	0.011
L2	143.17 - 93.75 (2)	TP40.88x26.293x0.375	53.000	0.000	0.0	39.000	46.465	-18.160	1812.130	0.010
L3	93.75 - 46.08 (3)	TP53.251x38.663x0.375	53.000	0.000	0.0	39.000	52.510	-23.929	2047.900	0.012
L4	46.08 - 0 (4)	TP65.185x50.596x0.375	53.000	0.000	0.0	36.453	77.140	-47.592	2811.950	0.017

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	190.5 - 143.17 (1)	TP27.778x14.75x0.25	538.223	46.893	39.000	1.202	0.000	0.000	39.000	0.000
L2	143.17 - 93.75 (2)	TP40.88x26.293x0.375	1654.142	44.424	39.000	1.139	0.000	0.000	39.000	0.000
L3	93.75 - 46.08 (3)	TP53.251x38.663x0.375	2219.908	46.630	39.000	1.196	0.000	0.000	39.000	0.000
L4	46.08 - 0 (4)	TP65.185x50.596x0.375	4643.983	45.080	36.453	1.237	0.000	0.000	36.453	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	190.5 - 143.17 (1)	TP27.778x14.75x0.25	21.290	1.011	26.000	0.078	1.126	0.048	26.000	0.002
L2	143.17 - 93.75 (2)	TP40.88x26.293x0.375	25.646	0.552	26.000	0.042	1.062	0.014	26.000	0.001
L3	93.75 - 46.08 (3)	TP53.251x38.663x0.375	27.900	0.531	26.000	0.040	1.024	0.010	26.000	0.000
L4	46.08 - 0 (4)	TP65.185x50.596x0.375	34.361	0.445	26.000	0.034	0.900	0.004	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
L1	190.5 - 143.17 (1)	0.011	1.202	0.000	0.078	0.002	1.215 ✔	1.333	H1-3+VT ✔
L2	143.17 - 93.75 (2)	0.010	1.139	0.000	0.042	0.001	1.150 ✔	1.333	H1-3+VT ✔
L3	93.75 - 46.08 (3)	0.012	1.196	0.000	0.040	0.000	1.208 ✔	1.333	H1-3+VT ✔
L4	46.08 - 0 (4)	0.017	1.237	0.000	0.034	0.000	1.254 ✔	1.333	H1-3+VT ✔

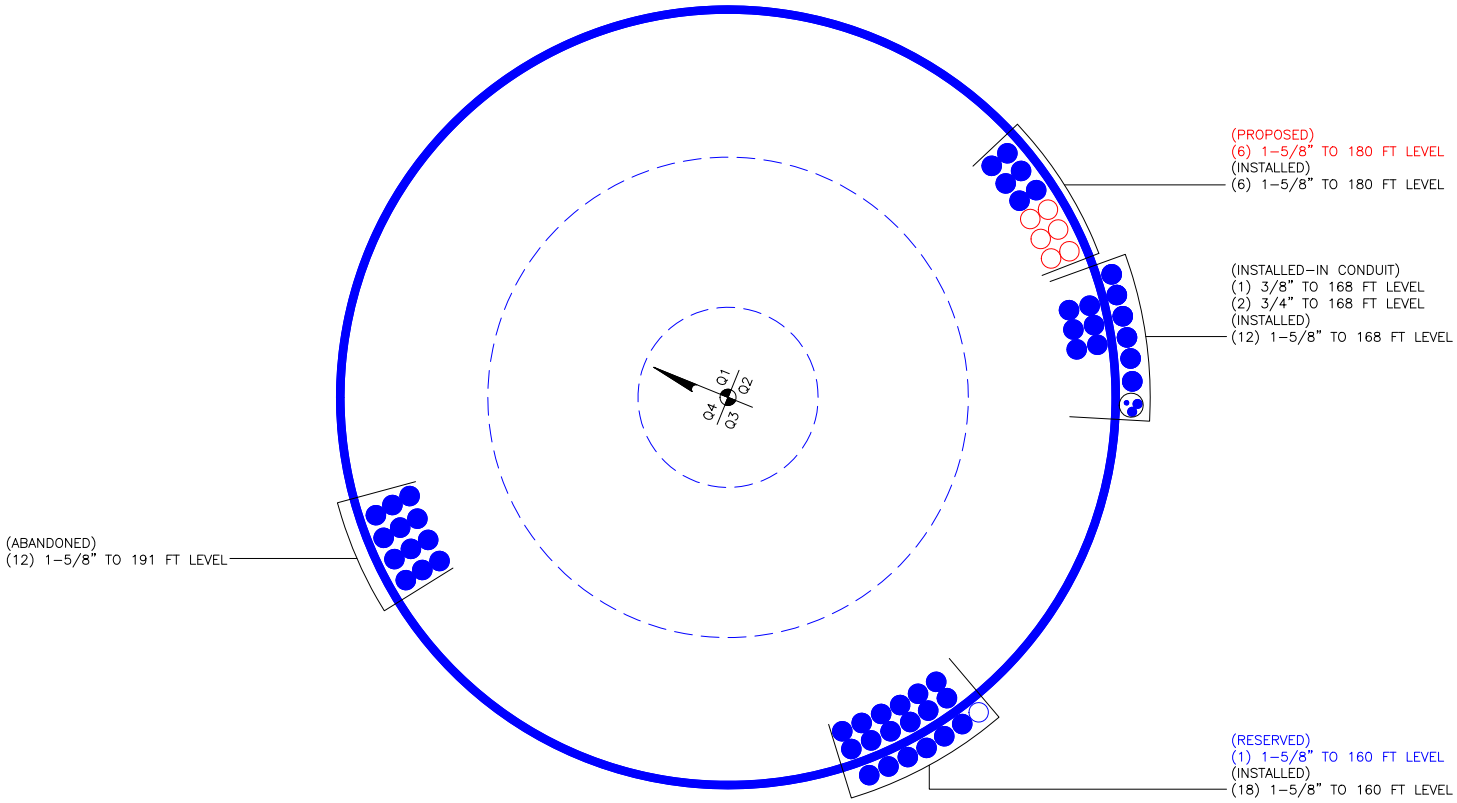
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	190.5 - 143.17	Pole	TP27.778x14.75x0.25	1	-8.738	1094.926	91.1	Pass
L2	143.17 - 93.75	Pole	TP40.88x26.293x0.375	2	-18.160	2415.569	86.2	Pass
L3	93.75 - 46.08	Pole	TP53.251x38.663x0.375	3	-23.929	2729.851	90.6	Pass
L4	46.08 - 0	Pole	TP65.185x50.596x0.375	4	-47.592	3748.329	94.1	Pass
							Summary	
						Pole (L4)	94.1	Pass
						RATING =	**94.1**	**Pass**

Program Version 6.1.4.1

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 801485

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *801485*
Site Name: *CT SUFFIELD 1 CAC 8014*
App #: *284765 Revision # 1*
Pole Manufacturer: *Other*

Reactions		
Moment:	4644	ft-kips
Axial:	48	kips
Shear:	34	kips

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

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	72	in

Anchor Rod Results

Maximum Rod Tension:	152.4 Kips	Rigid
Allowable Tension:	195.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	78.2% **Pass**	Fty*ASIF

Plate Data		
Diam:	78	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	10.34	in

Base Plate Results Flexural Check

Base Plate Stress:	26.7 ksi	Rigid
Allowable Plate Stress:	60.0 ksi	Service ASD
Base Plate Stress Ratio:	44.5% **Pass**	0.75*Fy*ASIF
		Y.L. Length: 30.58

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

n/a

Stiffener Results

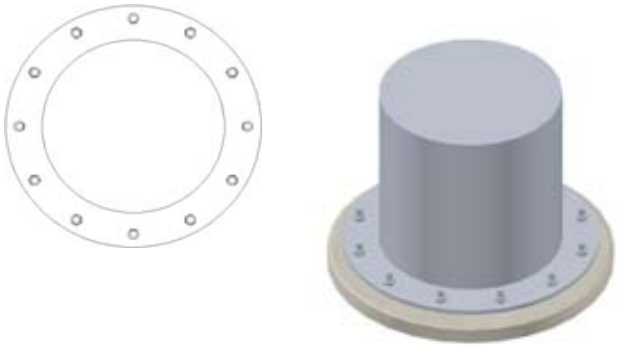
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	65.185	in
Thick:	0.375	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	



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

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

PROJECT	**801485 - CT SUFFIELD 1 CAC 801485. CT**				
SUBJECT	**Foundation Analysis**				
DATE	**02/26/15**	PAGE	1	OF	1

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

Monopole Pad & Pier Foundation Analysis

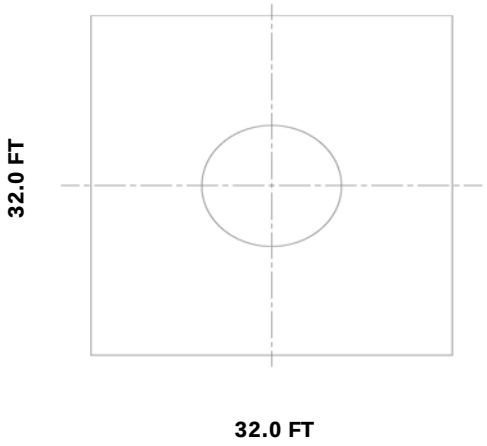
Rev. Type: F

Design Loads:

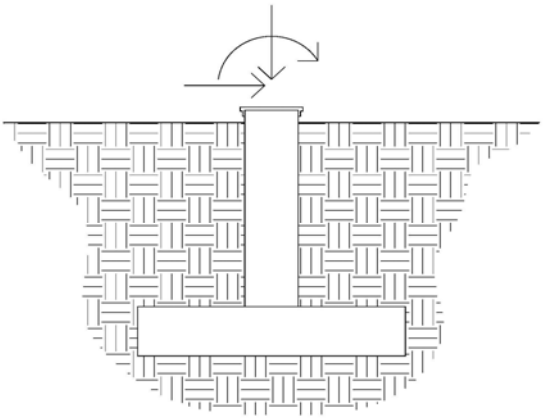
	Input unfactored loads	
Shear:	34.0	kips
Moment:	4,644.0	ft-kips
Tower Height:	190.5	ft
Tower Weight:	48.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	65.18	in
Bearing Depth:	6.5	ft
Pad Width:	32.0	ft
Neglected Depth:	2.0	ft
Thickness:	5.0	ft
Pier Diameter:	8.0	ft
Pier Height Above Grade:	0.5	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	9	
Pier Rebar Quanity:	43	
Pad Rebar Size:	9	
Pad Rebar Quanity:	34	
Pier Tie Size:	5	
Tie Quanity:	9	
Rebar Yield Strength:	60000	psi
Concrete Strength:	3000	psi
Concrete Unit Weight:	0.15	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.120	kcf
Ult. Bearing Capacity:	6.000	ksf
Angle of Friction:	30.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.300	

Summary of Results

Req'd Pier Diam.	OK
Overturning	55.7%
Shear Capacity	22.3%
Bearing	45.2%
Pad Shear - 1-way	28.7%
Pad Shear - 2-way	3.0%
Pad Moment Capacity	25.4%
Pier Moment Capacity	77.0%

** Notes:

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

T-Mobile Existing Facility

Site ID: CT11545A

Crown Suffield
2715 Mountain Road
Suffield, CT 06093

March 18, 2015

EBI Project Number: 6215001499

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	36.47 %

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

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March 18, 2015

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

Emissions Analysis for Site: **CT11545A – Crown Suffield**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **2715 Mountain Road, Suffield, 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 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 **2715 Mountain Road, Suffield, 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 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 (PCS Band - 1900 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 (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

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

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

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

7) The antennas used in this modeling are the **EMS RR90_17_02DP** for 1900 MHz (PCS) 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 **EMS RR90_17_02DP** has a maximum gain of **14.4 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **182 feet** above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	EMS RR90_17_02DP	Make / Model:	EMS RR90_17_02DP	Make / Model:	EMS RR90_17_02DP
Gain:	14.4 dBd	Gain:	14.4 dBd	Gain:	14.4 dBd
Height (AGL):	182	Height (AGL):	182	Height (AGL):	182
Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)
Channel Count	6	Channel Count	6	# PCS Channels:	6
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	6,610.15	ERP (W):	6,610.15	ERP (W):	6,610.15
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):	182	Height (AGL):	182	Height (AGL):	182
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A2 MPE%	0.22	Antenna B2 MPE%	0.22	Antenna C2 MPE%	0.22

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**2.95**
AT&T	11.89 %
Nextel	1.55 %
Verizon Wireless	20.08 %
Site Total MPE %:	**36.47 %**

T-Mobile Sector 1 Total:	0.98 %
T-Mobile Sector 2 Total:	0.98 %
T-Mobile Sector 3 Total:	0.98 %
Site Total:	36.47 %

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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:	0.98 %
Sector 2:	0.98 %
Sector 3 :	0.98 %
T-Mobile Total:	2.95 %
Site Total:	36.47 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **36.47%** 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

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Burlington, MA 01803