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

October 15, 2015

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

RE: **T-Mobile - Exempt Modification - Crown Site BU: 803175**
T-Mobile Site ID: CT11783B
Located at: 167 Lester Road, New Britain, CT 06050

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 Erin Stewart, Mayor, City of New Britain and Crown Castle is both the tower owner and property owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **167 Lester Road, New Britain, CT**. 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 additional 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. A Structural Modification Report confirming that the tower and foundation can support T-Mobile's proposed modifications is included as Exhibit-2.

5. The operation of the additional 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.

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

Sincerely,

Kimberly Myl
Real Estate Specialist

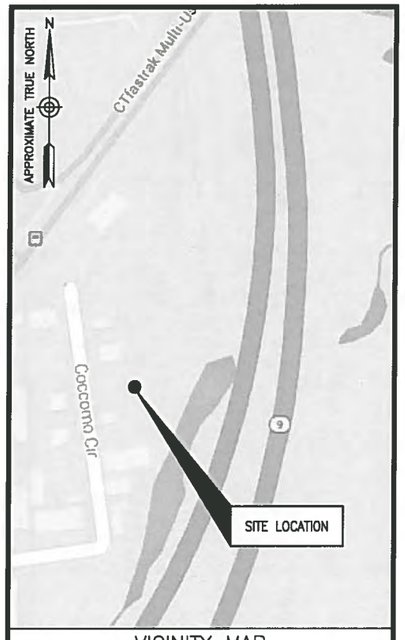
Enclosures

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

cc: The Honorable Erin Stewart, Mayor, City of New Britain
City of New Britain
27 West Main Street
New Britain, CT 06051

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11783B
CROWN CASTLE BU #: 803175
SITE NAME: CT NEW BRITAIN 3 CAC 803175
167 LESTER ROAD
NEW BRITAIN, CT 06050
HARTFORD COUNTY



VICINITY MAP

FROM PARSIPPANY, NJ:

DEPART SYLVAN WAY AND TAKE I-287 N TOWARD ALBANY. USE THE RIGHT 2 LANES TO MERGE ONTO I-287 E/I-87 S TOWARD TAPPAN ZEE BR. CONTINUE ON I-87 S AND FOLLOW SIGNS FOR SAW MILL PKWY S. TAKE EXIT 8A FOR NY-119/SAW MILL PKWY N TOWARD ELMSFORD. MERGE ONTO SAW MILL PKWY N. KEEP LEFT, FOLLOW SIGNS FOR I-684/BREWSTER AND MERGE ONTO I-684 N. TAKE EXIT 9E FOR I-84 E TOWARD DANBURY. TAKE EXIT 9 FOR CT-71 TOWARD MAIN ST. TURN LEFT ONTO CT-71 N. TURN RIGHT ONTO ALLEN ST. TURN RIGHT ONTO ST CLAIR AVE. TURN SLIGHT LEFT TO COCCOMO CIR/LESTER ST. SITE WILL BE ON THE RIGHT.

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

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

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

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

CONSULTANT TEAM

SITE NAME:
CT NEW BRITAIN 3 CAC 803175

SITE NUMBER:
CT11783B

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

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

COORDINATES:
LATITUDE: 41°-41'-11.8" N (NAD83)
LONGITUDE: 72°-45'-27.8" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
702Cu

PROJECT SUMMARY

SITE ADDRESS:
167 LESTER ROAD
NEW BRITAIN, CT 06050
HARTFORD COUNTY

PROJECT DIRECTORY

- INSTALL (3) NEW ANTENNAS.
- INSTALL (3) NEW RRU'S.
- REMOVE (1) EXISTING LINE OF COAX.

SCOPE OF WORK

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

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

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

SHEET INDEX

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

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

CT11783B
CT NEW BRITAIN 3
CAC 803175

CONSTRUCTION DRAWINGS

0	10/15/15	ISSUED AS FINAL
A	10/14/15	ISSUED FOR REVIEW

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

STATE OF CONNECTICUT
JIANG YU
LICENSED PROFESSIONAL ENGINEER

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

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074611
SITE ADDRESS:	

167 LESTER ROAD
NEW BRITAIN, CT 06050
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.

REGULATORY NOTE:

1. AM NEEDED IS NOTIFICATION LETTER AND POST REPORT. ALL SHIELDS ON ANY NEW METALLIC CABLES REQUIRED FOR THIS CO–LOCATION MUST BE BONDED TO THE TOWER EVERY 50 FEET TO PREVENT DEGRADATION OF THE AM DETUNING SYSTEM. TRADITIONAL COAX CABLE GROUNDING KITS ARE VERY GOOD FOR THIS PURPOSE FOR MOST TYPES OF ALL SHIELDED CABLES. THE TAILS OF THESE GROUND KITS SHOULD BE BONDED DIRECTLY TO THE TOWER OR AS AN ALTERNATE TO AN APPURTENANCE ELECTRICALLY CONNECTED TO THE TOWER. AS AN EXAMPLE: A CABLE CLAMP MOUNTING BOLT THAT IS BANDED TO THE TOWER. THIS IS IN ADDITION TO THE NORMALLY REQUIRED CABLE GROUNDING KITS PROVIDED AT THE ANTENNAS AND AT THE BASE OF THE TOWER FOR STANDARD LIGHTNING PROTECTION. UNSHIELDED METALLIC CABLES ARE NEVER RECOMMENDED TO BE USED ON DETUNED TOWERS

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CT11783B
CT NEW BRITAIN 3
CAC 803175

CONSTRUCTION DRAWINGS

0	10/15/15	ISSUED AS FINAL
A	10/14/15	ISSUED FOR REVIEW

Dewberry
Dewberry Engineers Inc.
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STATE OF CONNECTICUT
JIANG YU
No. 27232
LICENSED PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074611
SITE ADDRESS:	

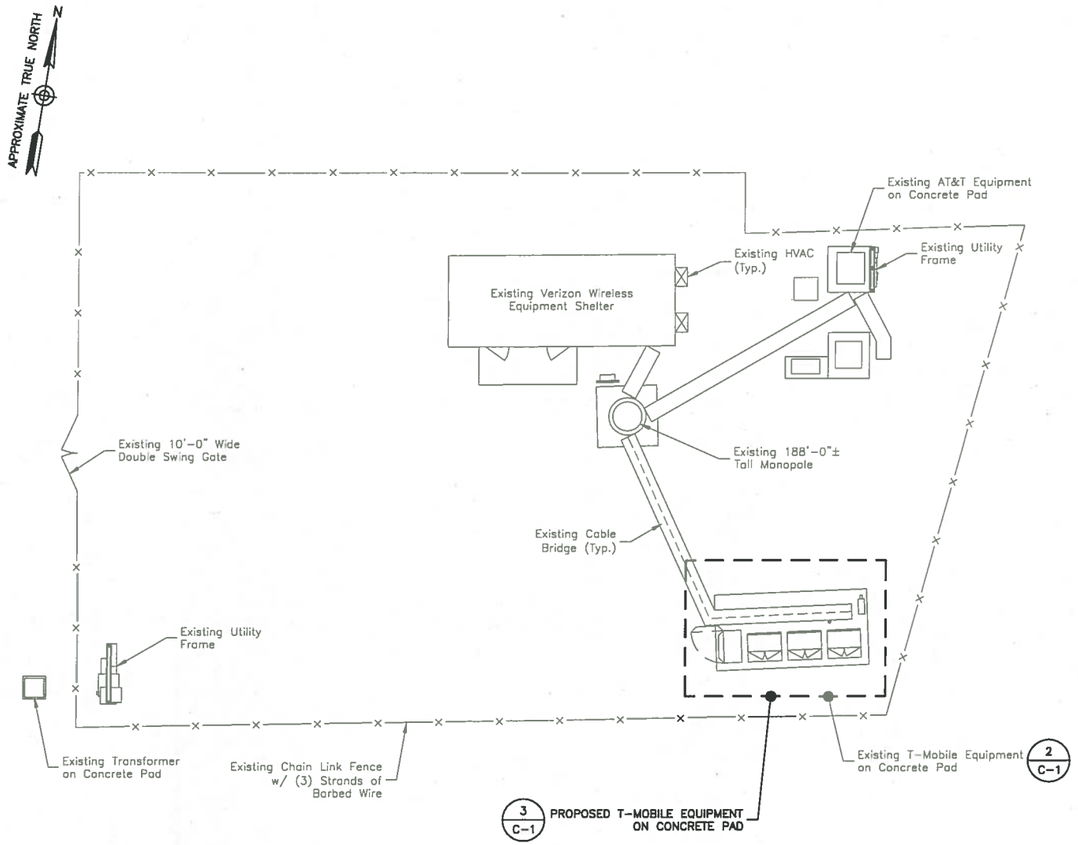
167 LESTER ROAD
NEW BRITAIN, CT 06050
HARTFORD COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G–1

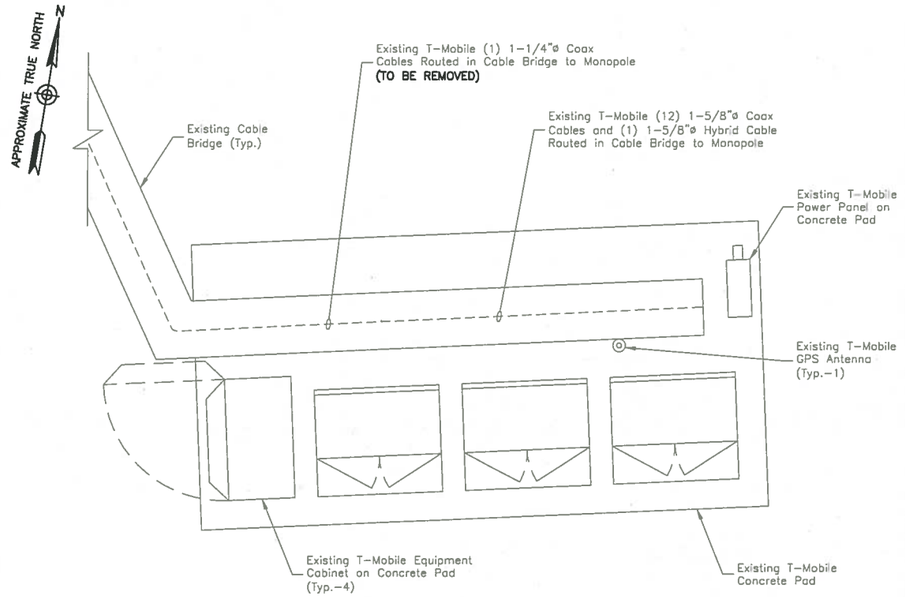


COMPOUND PLAN

1

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

0' 10' 20'

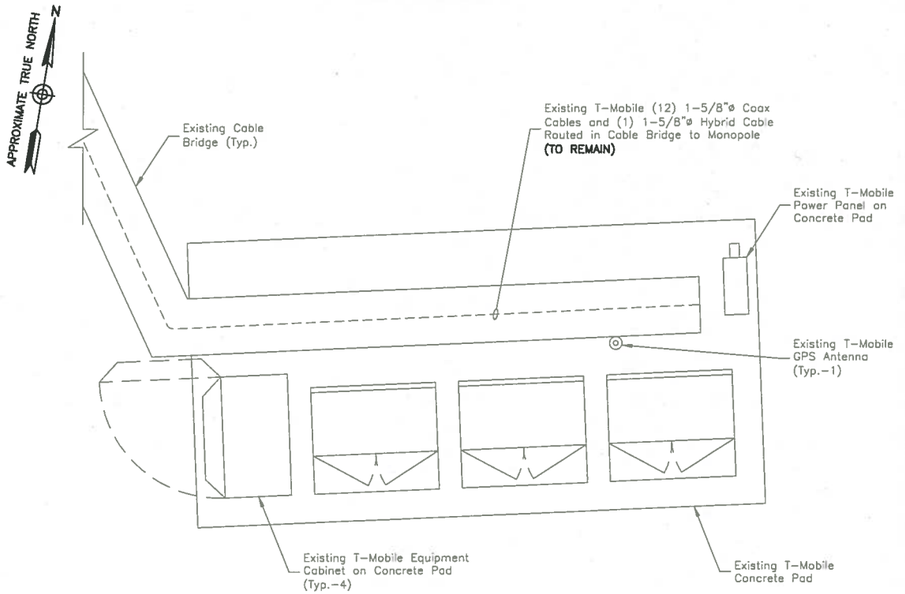


EXISTING EQUIPMENT PLAN

2

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

0' 2' 4' 6'



NOTE:

1. NO EQUIPMENT IS PROPOSED AT GRADE.

PROPOSED EQUIPMENT PLAN

3

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

0' 2' 4' 6'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY SSOE GROUP DATED SEPTEMBER 22, 2015.

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CT NEW BRITAIN 3
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CONSTRUCTION DRAWINGS

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JIANG YU
LICENSED PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074611
SITE ADDRESS:	

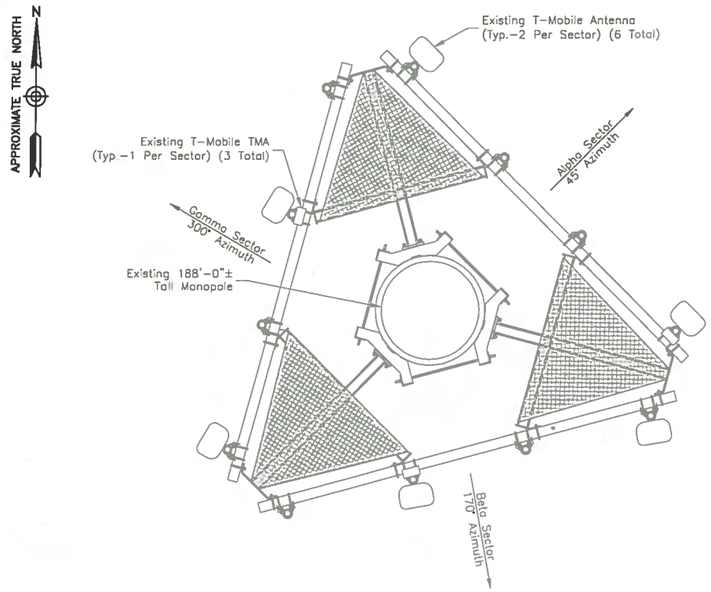
167 LESTER ROAD
NEW BRITAIN, CT 06050
HARTFORD COUNTY

SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

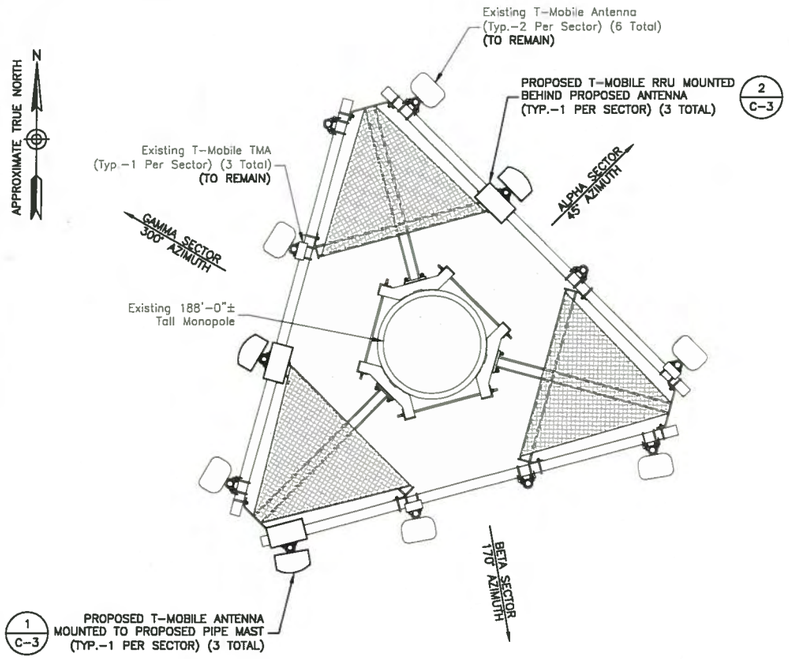
SHEET NUMBER

C-1



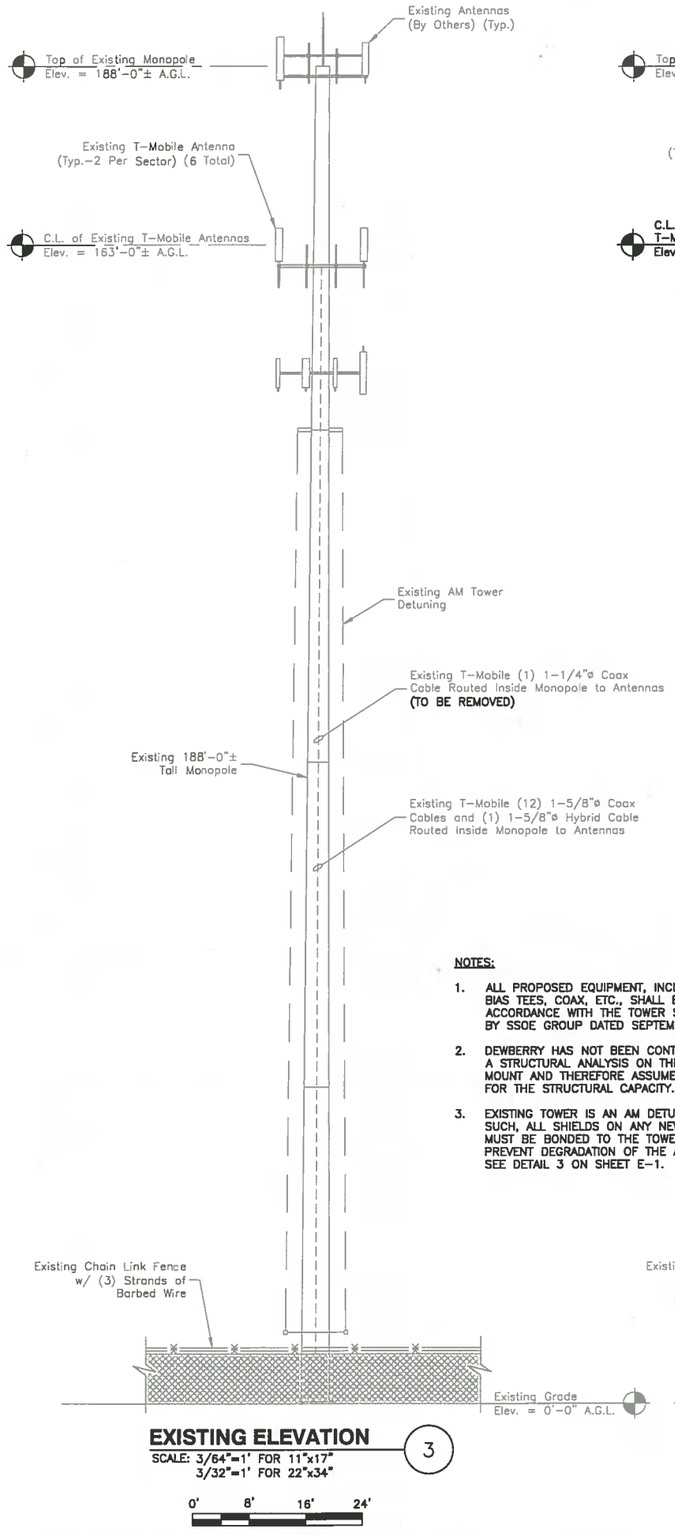
EXISTING ANTENNA LAYOUT (1)

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT (2)

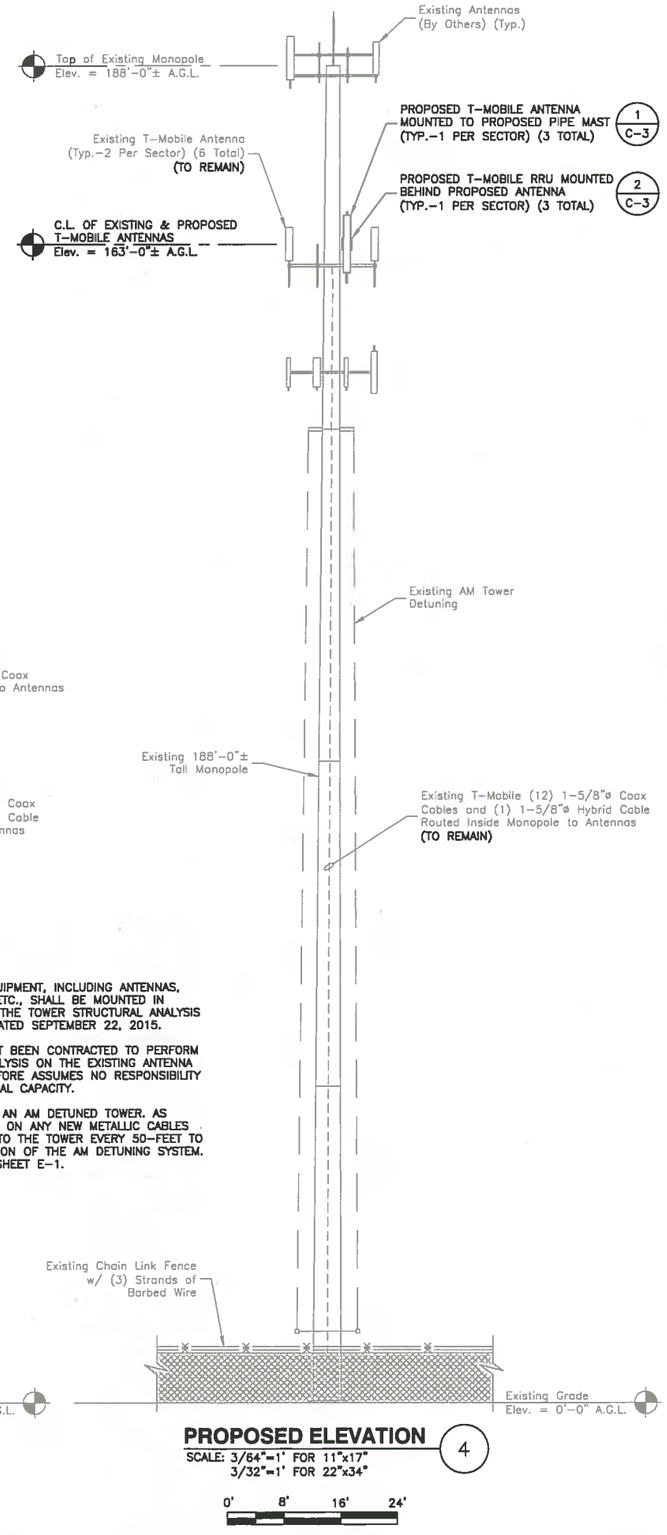
SCALE: N.T.S.



EXISTING ELEVATION (3)

SCALE: 3/64"=1' FOR 11"x17"
3/32"=1' FOR 22"x34"

0' 8' 16' 24'



PROPOSED ELEVATION (4)

SCALE: 3/64"=1' FOR 11"x17"
3/32"=1' FOR 22"x34"

0' 8' 16' 24'

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY SSOE GROUP DATED SEPTEMBER 22, 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.
3. EXISTING TOWER IS AN AM DETUNED TOWER. AS SUCH, ALL SHIELDS ON ANY NEW METALLIC CABLES MUST BE BONDED TO THE TOWER EVERY 50-FEET TO PREVENT DEGRADATION OF THE AM DETUNING SYSTEM. SEE DETAIL 3 ON SHEET E-1.

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

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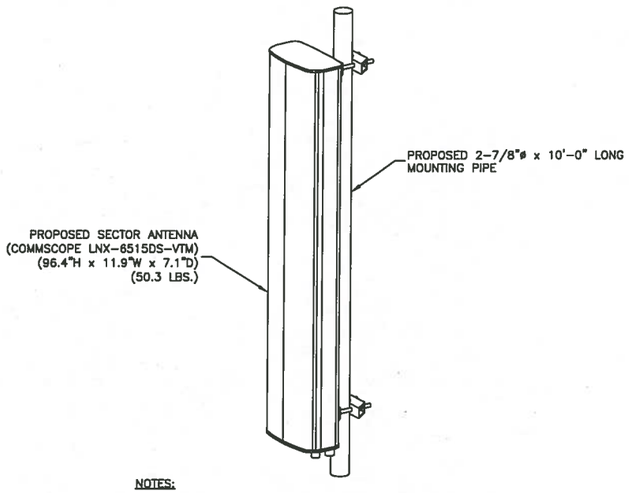
167 LESTER ROAD
NEW BRITAIN, CT 06050
HARTFORD COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

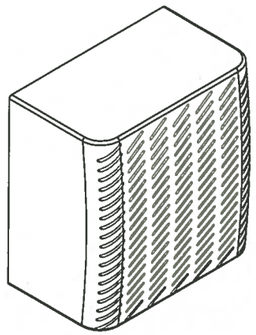
C-2



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.



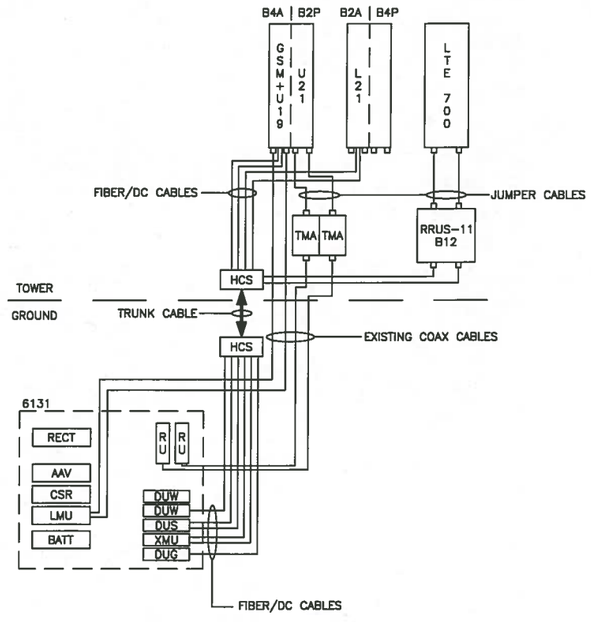
SPECIFICATIONS:
HEIGHT: 20.0"
WIDTH: 17.0"
DEPTH: 7.0"
WEIGHT: 50.7 LBS

ERICSSON RRUS-11 B12

RRU NOTES:

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

RRUS-11 - REMOTE RADIO UNIT 2
SCALE: N.T.S.



SITE CONFIGURATION 702Cu 3
SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH	EXISTING HYBRID	RRH	
	EXISTING	PROPOSED	EXISTING	PROPOSED			EXISTING	PROPOSED
ALPHA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"ø	–	230'-0"	(1) 1-5/8"ø @ 230'-0"	–	–
	–	COMMSCOPE LNX-6515DS-VTM					–	RRUS-11 B12
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN					–	–
BETA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"ø, (1) 1-1/4"ø	(1) 1-1/4"ø TO BE REMOVED	230'-0"		–	–
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN					–	–
	–	COMMSCOPE LNX-6515DS-VTM					–	RRUS-11 B12
GAMMA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 1-5/8"ø	–	230'-0"		–	–
	–	COMMSCOPE LNX-6515DS-VTM					–	RRUS-11 B12
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN					–	–

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STATE OF CONNECTICUT
JIANG YU
NO. 23222
LICENSED
PROFESSIONAL ENGINEER

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

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REVIEWED BY:	BSH
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167 LESTER ROAD
NEW BRITAIN, CT 06050
HARTFORD COUNTY

SHEET TITLE

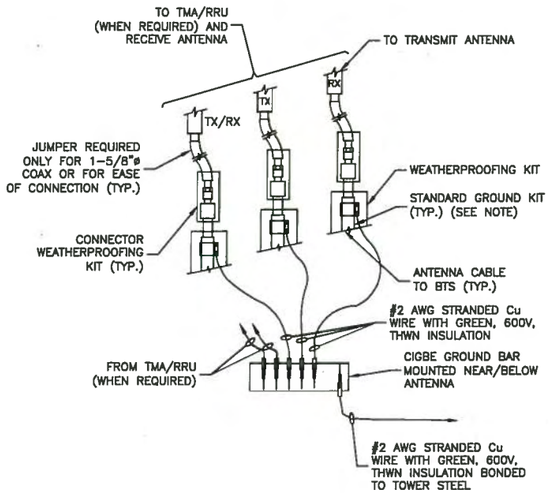
CONSTRUCTION DETAILS

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.

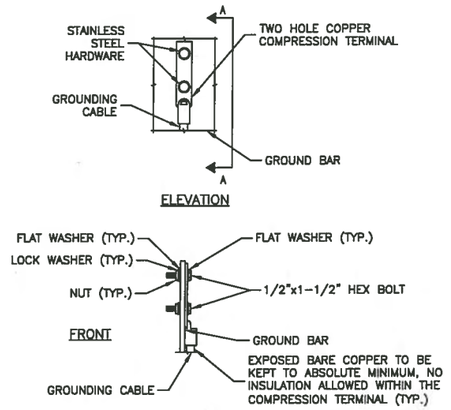


NOTE:

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.

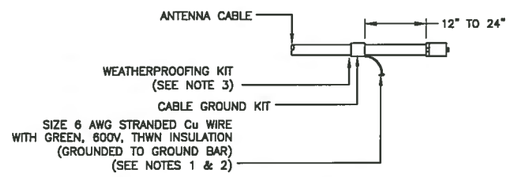


NOTES:

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.

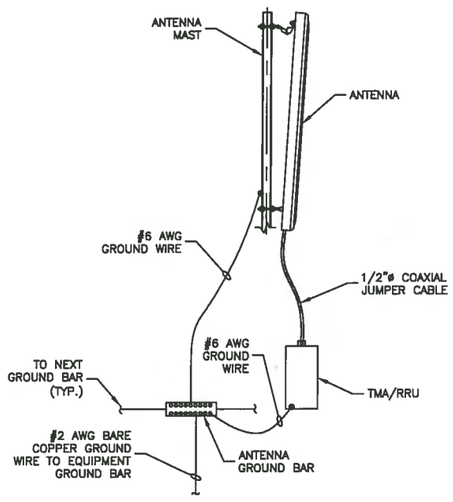


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE (TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.)
4. BOND NEW CABLES TO THE TOWER EVERY 50 FEET.

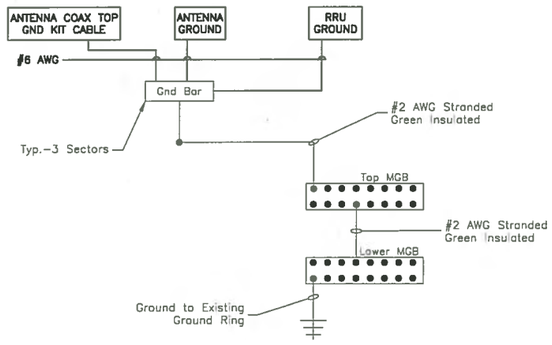
GROUND KIT CONNECTION DETAIL 3

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.

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STATE OF CONNECTICUT
JIANG YU
PROFESSIONAL ENGINEER
LICENSED
NOV 2015
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SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

Date: **September 22, 2015**

Sean Dempsey
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(704) 405-6565

SSOE Group
1001 Madison Avenue
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(419) 255-3830
jlau@ssoe.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11783B
	Carrier Site Name:	Crown Comm. Monopole
Crown Castle Designation:	**Crown Castle BU Number:**	803175
	Crown Castle Site Name:	CT New Britain 3 CAC 803175
	Crown Castle JDE Job Number:	347081
	Crown Castle Work Order Number:	1120527
	Crown Castle Application Number:	310462 Rev. 0
Engineering Firm Designation:	**SSOE Group Project Number:**	015-00428-00 BC 1100
Site Data:	**Lester Road, New Britain, CT 06050, Hartford County** **Latitude *41° 41' 11.8"*, Longitude *-72° 45' 27.8"*** **188 Foot – Summit Monopole Tower**	

Dear Mr. Sean Dempsey,

SSOE 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 827031, in accordance with application 310462, revision 0.

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

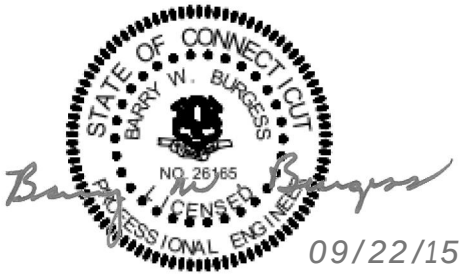
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

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

We at *SSOE 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.

Structural analysis prepared by: Joshua Lau, EI

Respectfully submitted by:



Barry W. Burgess, PE
Section Manager

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1) INTRODUCTION

The existing 188' monopole has eighteen sides and is evenly tapered from 59.61" (flat-flat) at the base to 22.00" (flat-flat) at the top. It has four major sections, connected with slip joints. The structure is galvanized and has no tower lighting.

The tower was originally designed for Crown Castle by Summit Manufacturing of West Hazleton, PA for an 85 mph wind speed with 0.5" radial ice in accordance with TIA/EIA-222-F 1996.

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 using a fastest mile wind speed of 80 mph with no ice, 28 mph with 1" 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
160.0	163.0	3	Commscope	LNX-6515DS-VTM w/ Mount Pipe			
		3	Ericsson	RRUS 11 B12			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
188.0	189.0	6	Ericsson	RRUS-11	1 2 7	3/8 3/4 1-5/8	
		3	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	Powerwave Technologies	7770.00 w/ Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
	188.0	1		Miscellaneous [NA 510-2]			
		1		Platform Mount [LP 1201-1]			
177.0	177.0	1		Platform Mount [LP 601-1]			1
160.0	163.0	3	Ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	
		3	Ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
	160.0	3	RFS Celwave	ATMAA1412D-1A20			
		1		Platform Mount [LP 601-1]			
					1	1/4	2

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
145.0	150.0	1	GPS	GPS_A	1 13	1/2 1-5/8	
	145.0	2	Andrew	LNX-6512DS-T4M w/ Mount Pipe			
		3	Antel	BXA-80063/6 w/ Mount Pipe			
		3	Alcatel Lucent	RRH2X60-AWS	1	1-5/8	3
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		6	Andrew	SBNHH-1D65B w/ Mount Pipe			
		1	Kathrein	800 10735V01 w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		1		Platform Mount [LP 601-1]			

Notes:
1) Empty mount
2) Equipment to be removed; not considered in this analysis.
3) Reserved equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
188.0	188.0	12	Generic	1’ x 5’ x 3” Panel Antenna	-	-
		1		14’ Platform	-	-
177.0	177.0	12	Generic	1’ x 5’ x 3” Panel Antenna	-	-
		1		14’ Platform	-	-
162.0	162.0	12	Generic	1’ x 5’ x 3” Panel Antenna	-	-
		1		14’ Platform	-	-
147.0	147.0	12	Generic	1’ x 5’ x 3” Panel Antenna	-	-
		1		14’ Platform	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	Summit Job #: 12481, dated 12/11/00	Doc ID#: 679659	Crown DMZ
Foundation Drawings	Summit Job #: 12481, dated 12/11/00	Doc ID#: 679660	Crown DMZ
Foundation Mapping	Tower Engineering Professionals Project #: 100063, dated 1/7/10	Doc ID#: 679660	Crown DMZ
Geotechnical Reports	Clough, Harbour & Associates Project #: 8961.07.46, dated 10/26/00	Doc ID#: 679661	Crown DMZ

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) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
2) No foundation reinforcement steel information was available; therefore, the minimum allowable steel per code has been assumed for this analysis.
3) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package, dated 5/28/15 with any adjustments as noted below.
   a. Per the application and PCR drawing, (1) 1/4" coax to the 160' level is to be removed. The base level drawing has been updated.

This analysis may be affected if any assumptions are not valid or have been made in error. SSOE 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	188 - 137	Pole	TP32.711x22x0.25	1	-11.52	1302.25	62.0	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-19.37	2094.29	92.5	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-30.31	3048.94	92.5	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-48.60	4876.78	75.6	Pass
							Summary	
						Pole (L3)	92.5	Pass
						Rating =	**92.5**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Plate		80.2%	Pass
1	Anchor Rods		80.0%	Pass
1	Foundation (Structural)		68.7%	Pass
1	Foundation (Soil Interaction)		94.7%	Pass

Structure Rating (max from all components) =	**94.7%**

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

4.1) Recommendations

The existing tower and its foundations are sufficient for the proposed loads and do not require modifications.

5) DISCLAIMER OF WARRANTIES

SSOE Group has not performed a site visit to the tower to verify member sizes or antenna/coax loading. SSOE Group shall be contacted immediately if the existing conditions are not as represented on the tower elevation contained in this report in order to evaluate the significance of the discrepancy. SSOE Group has not performed a condition assessment of the tower foundation. This report does not replace a full tower inspection

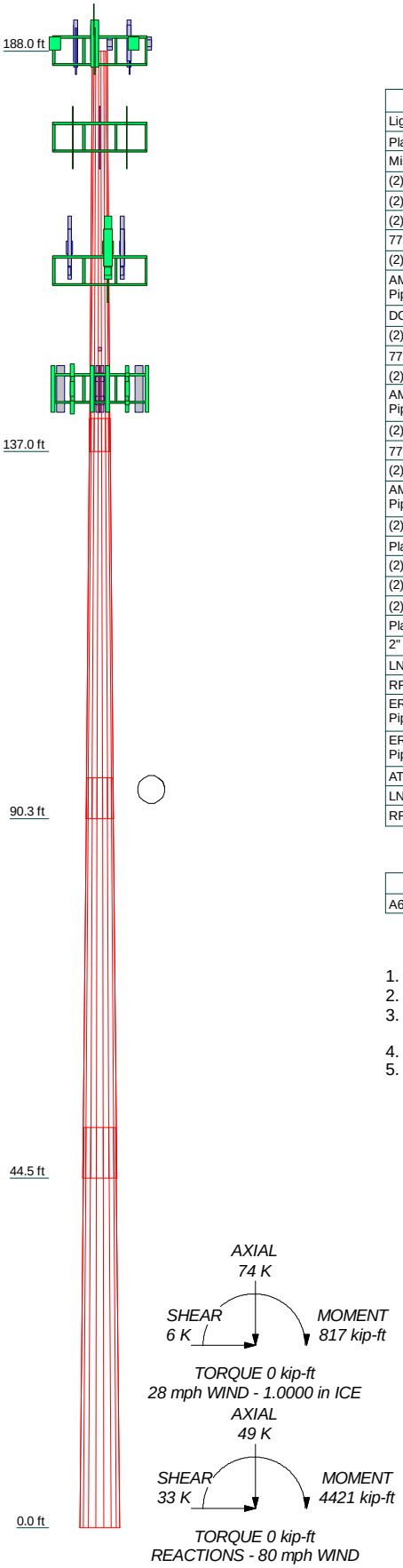
The engineering services rendered by SSOE Group in connection with this structural analysis are limited to an analysis of the tower structure and theoretical capacity of its main structural members. Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable tower manufacturer.

SSOE Group makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. SSOE Group will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data contained in this report. The maximum liability of SSOE Group pursuant to this report will be limited to the total fee received for preparation of this report.

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	51.00	18	0.2500	4.25	22.0000	32.7110	A607-65	3.7
2	51.00	18	0.3125	5.25	31.3184	42.0300		6.3
3	51.00	18	0.3750	6.50	40.3023	51.0140		9.4
4	51.00	18	0.5000		48.8988	59.6100		14.8
								34.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 3/4" x 8'	188	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160
Platform Mount [LP 1201-1]	188	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160
Miscellaneous [NA 510-2]	188	ATMAA1412D-1A20	160
(2) 2" x 6' Mount Pipe	188	LNX-6515DS-VTM w/ Mount Pipe	160
(2) 2" x 6' Mount Pipe	188	RRUS 11 B12	160
(2) 2" x 6' Mount Pipe	188	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160
7770.00 w/ Mount Pipe	188	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160
(2) LGP21401	188	ATMAA1412D-1A20	160
AM-X-CD-16-65-00T-RET w/ Mount Pipe	188	Platform Mount [LP 601-1]	145
DC6-48-60-18-8F	188	2" x 6' Mount Pipe	145
(2) RRUS-11	188	2" x 6' Mount Pipe	145
7770.00 w/ Mount Pipe	188	2" x 6' Mount Pipe	145
(2) LGP21401	188	GPS_A	145
AM-X-CD-16-65-00T-RET w/ Mount Pipe	188	BXA-80063/6 w/ Mount Pipe	145
(2) RRUS-11	188	LNX-6512DS-T4M w/ Mount Pipe	145
7770.00 w/ Mount Pipe	188	(2) SBNHH-1D65B w/ Mount Pipe	145
(2) LGP21401	188	RRH2X60-AWS	145
AM-X-CD-16-65-00T-RET w/ Mount Pipe	188	DB-T1-6Z-8AB-0Z	145
(2) RRUS-11	188	RRH2x60-700	145
Platform Mount [LP 601-1]	177	RRH2X60-PCS	145
(2) 2" x 8' Mount Pipe	177	BXA-80063/6 w/ Mount Pipe	145
(2) 2" x 8' Mount Pipe	177	LNX-6512DS-T4M w/ Mount Pipe	145
(2) 2" x 8' Mount Pipe	177	(2) SBNHH-1D65B w/ Mount Pipe	145
Platform Mount [LP 601-1]	160	RRH2X60-AWS	145
2" x 8' Mount Pipe	160	RRH2x60-700	145
LNX-6515DS-VTM w/ Mount Pipe	160	RRH2X60-PCS	145
RRUS 11 B12	160	BXA-80063/6 w/ Mount Pipe	145
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	(2) SBNHH-1D65B w/ Mount Pipe	145
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	800 10735V01 w/ Mount Pipe	145
ATMAA1412D-1A20	160	RRH2X60-AWS	145
LNX-6515DS-VTM w/ Mount Pipe	160	RRH2x60-700	145
RRUS 11 B12	160	RRH2X60-PCS	145

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	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 28 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: 92.5%

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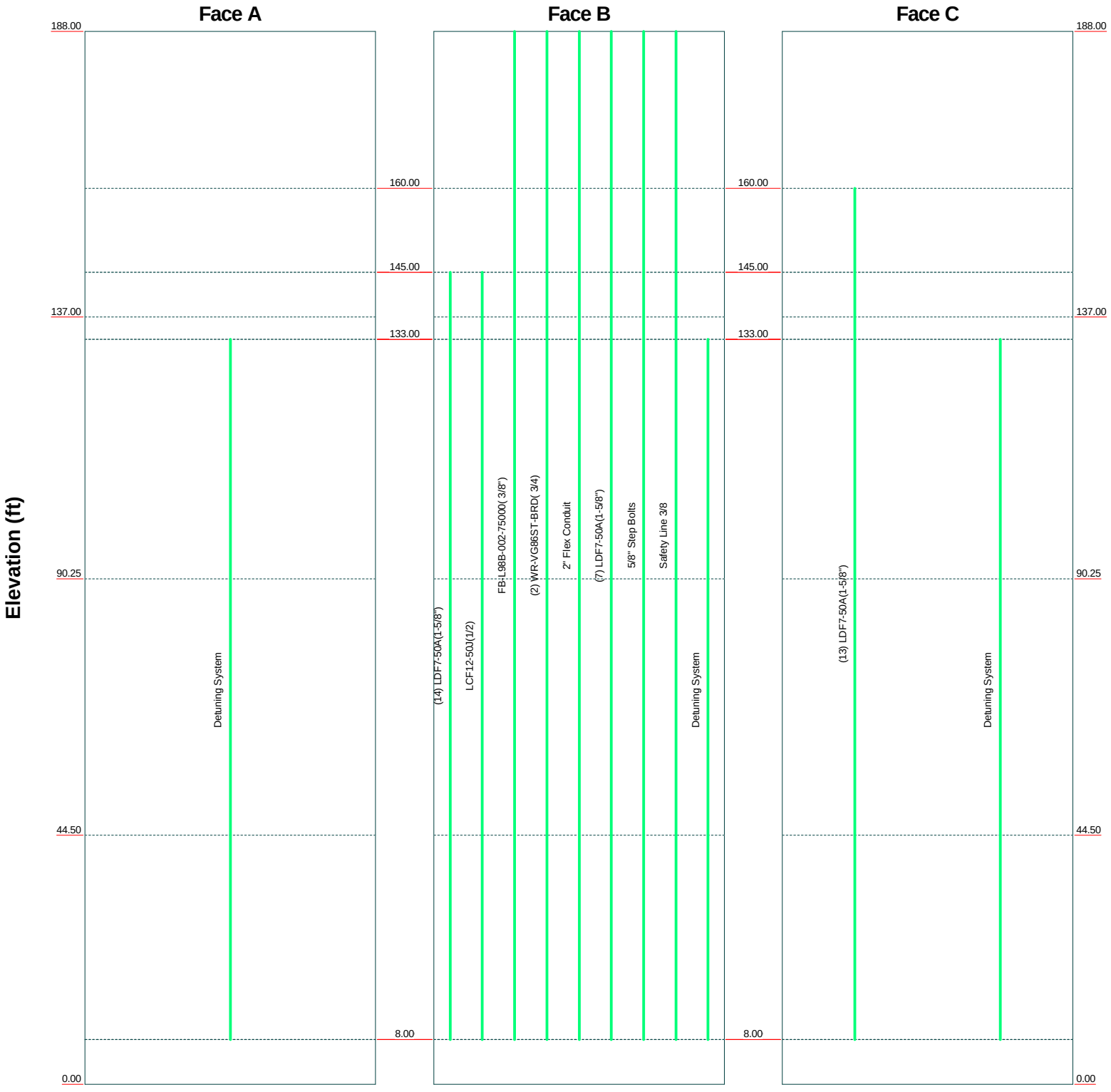
SSOE Group
1001 Madison Avenue
Toledo, OH 43604
Phone: (419) 255-3830
FAX: (419) 255-6101

Job: ***BU 803175***			
Project: ***015-00428-00***			
Client: CCI	Drawn by: 15455	App'd:	
Code: TIA/EIA-222-F	Date: 09/22/15	Scale: NTS	
Path: c:\dgn\d1681590\803175.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 188'

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



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Project: ***015-00428-00***			
Client: CCI	Drawn by: 15455	App'd:	
Code: TIA/EIA-222-F	Date: 09/22/15	Scale: NTS	
Path: c:\dgn\d1681590\803175.eri		Dwg No. E-7	

SSOE Group
1001 Madison Avenue
Toledo, OH 43604
Phone: (419) 255-3830
FAX: (419) 255-6101

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 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 28 mph is used in combination with ice.
Temperature drop of 50 °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	188.00-137.00	51.00	4.25	18	22.0000	32.7110	0.2500	1.0000	A607-65 (65 ksi)
L2	137.00-90.25	51.00	5.25	18	31.3184	42.0300	0.3125	1.2500	A607-65 (65 ksi)
L3	90.25-44.50	51.00	6.50	18	40.3023	51.0140	0.3750	1.5000	A607-65 (65 ksi)
L4	44.50-0.00	51.00		18	48.8988	59.6100	0.5000	2.0000	A607-65 (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	22.3394	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	33.2156	25.7578	3429.0204	11.5237	16.6172	206.3538	6862.5527	12.8813	5.3171	21.269
L2	32.7080	30.7540	3735.3228	11.0071	15.9098	234.7819	7475.5606	15.3799	4.9620	15.879
	42.6784	41.3785	9098.0688	14.8097	21.3512	426.1143	18208.1091	20.6932	6.8473	21.911
L3	42.0437	47.5235	9571.6471	14.1742	20.4736	467.5120	19155.8887	23.7663	6.4332	17.155
	51.8010	60.2731	19526.7966	17.9768	25.9151	753.4907	39079.2871	30.1423	8.3185	22.183
L4	51.0393	76.8089	22730.9630	17.1816	24.8406	915.0736	45491.8360	38.4117	7.7262	15.452
	60.5296	93.8076	41409.2395	20.9841	30.2819	1367.4593	82872.9664	46.9127	9.6114	19.223

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 188.00-137.00				1	1	1		
L2 137.00-90.25				1	1	1		
L3 90.25-44.50				1	1	1		
L4 44.50-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	B	No	Inside Pole	145.00 - 8.00	14	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LCF12-50J(1/2)	B	No	Inside Pole	145.00 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
FB-L98B-002-75000(3/8")	B	No	Inside Pole	188.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	B	No	Inside Pole	188.00 - 8.00	2	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
						2" Ice	0.00	0.59
						4" Ice	0.00	0.59
2" Flex Conduit	B	No	Inside Pole	188.00 - 8.00	1	No Ice	0.00	0.32
						1/2" Ice	0.00	0.32
						1" Ice	0.00	0.32
						2" Ice	0.00	0.32
						4" Ice	0.00	0.32
LDF7-50A(1-5/8")	B	No	Inside Pole	188.00 - 8.00	7	No Ice	0.00	0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	C	No	Inside Pole	160.00 - 8.00	13	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
5/8" Step Bolts	B	No	CaAa (Out Of Face)	188.00 - 8.00	1	No Ice	0.04	1.00
						1/2" Ice	0.14	1.56
						1" Ice	0.24	2.73
						2" Ice	0.44	6.91
						4" Ice	0.84	22.58
Safety Line 3/8	B	No	CaAa (Out Of Face)	188.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
Detuning System	A	No	CaAa (Out Of Face)	133.00 - 8.00	1	No Ice	0.05	0.37
						1/2" Ice	0.30	1.90
						1" Ice	0.40	4.03
						2" Ice	0.60	10.14
						4" Ice	1.00	29.69
Detuning System	B	No	CaAa (Out Of Face)	133.00 - 8.00	1	No Ice	0.05	0.37
						1/2" Ice	0.30	1.90
						1" Ice	0.40	4.03
						2" Ice	0.60	10.14
						4" Ice	1.00	29.69
Detuning System	C	No	CaAa (Out Of Face)	133.00 - 8.00	1	No Ice	0.05	0.37
						1/2" Ice	0.30	1.90
						1" Ice	0.40	4.03
						2" Ice	0.60	10.14
						4" Ice	1.00	29.69

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	188.00-137.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	4.037	0.53
		C	0.000	0.000	0.000	0.000	0.25
L2	137.00-90.25	A	0.000	0.000	0.000	1.958	0.02
		B	0.000	0.000	0.000	5.659	0.96
		C	0.000	0.000	0.000	1.958	0.51
L3	90.25-44.50	A	0.000	0.000	0.000	2.096	0.02
		B	0.000	0.000	0.000	5.717	0.94
		C	0.000	0.000	0.000	2.096	0.50
L4	44.50-0.00	A	0.000	0.000	0.000	1.672	0.01
		B	0.000	0.000	0.000	4.561	0.75
		C	0.000	0.000	0.000	1.672	0.40

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	188.00-137.00	A	1.210	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	28.713	0.73
		C		0.000	0.000	0.000	0.000	0.25
L2	137.00-90.25	A	1.159	0.000	0.000	0.000	18.892	0.23
		B		0.000	0.000	0.000	45.212	1.35
		C		0.000	0.000	0.000	18.892	0.73
L3	90.25-44.50	A	1.089	0.000	0.000	0.000	19.756	0.23
		B		0.000	0.000	0.000	44.589	1.32
		C		0.000	0.000	0.000	19.756	0.72
L4	44.50-0.00	A	1.000	0.000	0.000	0.000	15.249	0.17
		B		0.000	0.000	0.000	34.038	1.02
		C		0.000	0.000	0.000	15.249	0.56

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	188.00-137.00	0.0994	0.0574	0.5477	0.3162
L2	137.00-90.25	0.0965	0.0557	0.4462	0.2576
L3	90.25-44.50	0.0974	0.0562	0.4616	0.2665
L4	44.50-0.00	0.0800	0.0462	0.3982	0.2299

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 3/4" x 8'	C	From Leg	0.00 0.00 4.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.41 2.25 3.67 5.74	1.00 1.41 2.25 3.67 5.74	0.11 0.11 0.13 0.16 0.31
Platform Mount [LP 1201-1]	C	None		0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.10 26.80 30.50 37.90 52.70	23.10 26.80 30.50 37.90 52.70	2.10 2.50 2.90 3.70 5.30
Miscellaneous [NA 510-2]	C	None		0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.00 17.90 22.80 32.60 52.20	13.00 17.90 22.80 32.60 52.20	0.46 0.63 0.81 1.15 1.84
(2) 2" x 6' Mount Pipe	A	From Centroid-Face	3.94 0.69 0.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.03 0.04 0.05 0.09 0.23

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) 2" x 6' Mount Pipe	B	From Centroid-Face	3.94 0.69 0.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.03 0.04 0.05 0.09 0.23
(2) 2" x 6' Mount Pipe	C	From Centroid-Face	3.94 0.69 0.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.03 0.04 0.05 0.09 0.23
7770.00 w/ Mount Pipe	B	From Centroid-Face	3.94 0.69 1.00	10.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	0.06 0.11 0.16 0.29 0.68
(2) LGP21401	B	From Centroid-Face	3.94 0.69 1.00	10.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Centroid-Face	3.94 0.69 1.00	10.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
DC6-48-60-18-8F	B	From Centroid-Face	3.94 0.69 1.00	10.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.22 2.44 2.66 3.15 4.21	2.22 2.44 2.66 3.15 4.21	0.02 0.04 0.06 0.12 0.27
(2) RRUS-11	B	From Centroid-Face	3.94 0.69 1.00	10.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
7770.00 w/ Mount Pipe	C	From Centroid-Face	3.94 0.69 1.00	20.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	0.06 0.11 0.16 0.29 0.68
(2) LGP21401	C	From Centroid-Face	3.94 0.69 1.00	20.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Centroid-Face	3.94 0.69 1.00	20.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
(2) RRUS-11	C	From Centroid-Face	3.94 0.69 1.00	20.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
7770.00 w/ Mount Pipe	A	From Centroid-Face	3.94 0.69	20.0000	188.00	No Ice 1/2" Ice	6.22 6.77	4.35 5.20	0.06 0.11

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
		ce	1.00			1" Ice	7.30	5.92	0.16
						2" Ice	8.38	7.41	0.29
						4" Ice	10.69	10.76	0.68
(2) LGP21401	A	From Centroid-Fa	3.94 0.69	20.0000	188.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	0.01 0.02
		ce	1.00			1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Fa	3.94 0.69	20.0000	188.00	No Ice 1/2" Ice	8.50 9.15	6.30 7.48	0.07 0.14
		ce	1.00			1" Ice	9.77	8.37	0.21
						2" Ice	11.03	10.18	0.38
						4" Ice	13.68	14.02	0.87
(2) RRUS-11	A	From Centroid-Fa	3.94 0.69	20.0000	188.00	No Ice 1/2" Ice	3.25 3.49	1.37 1.55	0.05 0.07
		ce	1.00			1" Ice	3.74	1.74	0.09
						2" Ice	4.27	2.14	0.15
						4" Ice	5.43	3.04	0.31
Platform Mount [LP 601-1]	C	None		0.0000	177.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
						2" Ice	48.95	48.95	2.69
						4" Ice	69.43	69.43	4.26
(2) 2" x 8' Mount Pipe	A	From Centroid-Le	4.00 0.00	0.0000	177.00	No Ice 1/2" Ice	1.60 2.42	1.60 2.42	0.03 0.04
		g	0.00			1" Ice	3.24	3.24	0.06
						2" Ice	4.23	4.23	0.11
						4" Ice	6.32	6.32	0.28
(2) 2" x 8' Mount Pipe	B	From Centroid-Le	4.00 0.00	0.0000	177.00	No Ice 1/2" Ice	1.60 2.42	1.60 2.42	0.03 0.04
		g	0.00			1" Ice	3.24	3.24	0.06
						2" Ice	4.23	4.23	0.11
						4" Ice	6.32	6.32	0.28
(2) 2" x 8' Mount Pipe	C	From Centroid-Le	4.00 0.00	0.0000	177.00	No Ice 1/2" Ice	1.60 2.42	1.60 2.42	0.03 0.04
		g	0.00			1" Ice	3.24	3.24	0.06
						2" Ice	4.23	4.23	0.11
						4" Ice	6.32	6.32	0.28
Platform Mount [LP 601-1]	C	None		0.0000	160.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
						2" Ice	48.95	48.95	2.69
						4" Ice	69.43	69.43	4.26
2" x 8' Mount Pipe	C	From Centroid-Fa	3.86 -1.04	0.0000	160.00	No Ice 1/2" Ice	1.60 2.42	1.60 2.42	0.03 0.04
		ce	0.00			1" Ice	3.24	3.24	0.06
						2" Ice	4.23	4.23	0.11
						4" Ice	6.32	6.32	0.28
LNX-6515DS-VTM w/ Mount Pipe	B	From Centroid-Fa	3.86 -1.04	-15.0000	160.00	No Ice 1/2" Ice	11.68 12.40	9.84 11.37	0.08 0.17
		ce	3.00			1" Ice	13.14	12.91	0.27
						2" Ice	14.60	15.27	0.51
						4" Ice	17.87	20.14	1.15
RRUS 11 B12	B	From Centroid-Fa	3.86 -1.04	-15.0000	160.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	0.05 0.07
		ce	3.00			1" Ice	3.80	1.73	0.10
						2" Ice	4.33	2.13	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	5.50	3.04	0.31
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Centroid-Face	3.86 -1.04 3.00	-15.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Centroid-Face	3.86 -1.04 3.00	-15.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ATMAA1412D-1A20	B	From Centroid-Face	3.86 -1.04 0.00	-15.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.47 1.81 2.58	0.47 0.57 0.69 0.95 1.57	0.01 0.02 0.03 0.06 0.14
LNX-6515DS-VTM w/ Mount Pipe	C	From Centroid-Face	3.86 -1.04 3.00	-10.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15
RRUS 11 B12	C	From Centroid-Face	3.86 -1.04 3.00	-10.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Centroid-Face	3.86 -1.04 3.00	-10.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Centroid-Face	3.86 -1.04 3.00	-10.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ATMAA1412D-1A20	C	From Centroid-Face	3.86 -1.04 0.00	-10.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.47 1.81 2.58	0.47 0.57 0.69 0.95 1.57	0.01 0.02 0.03 0.06 0.14
LNX-6515DS-VTM w/ Mount Pipe	A	From Centroid-Face	3.86 -1.04 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15
RRUS 11 B12	A	From Centroid-Face	3.86 -1.04 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Centroid-Face	3.86 -1.04 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A	A	From	3.86	0.0000	160.00	No Ice	6.83	5.64	0.11

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
B2P w/ Mount Pipe		Centroid-Face	-1.04 3.00			1/2" Ice 1" Ice 2" Ice 4" Ice	7.35 7.86 8.93 11.18	6.48 7.26 8.86 12.29	0.17 0.23 0.38 0.81
ATMAA1412D-1A20	A	From Centroid-Face	3.86 -1.04 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.47 1.81 2.58	0.47 0.57 0.69 0.95 1.57	0.01 0.02 0.03 0.06 0.14
Platform Mount [LP 601-1]	C	None		0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.47 33.59 38.71 48.95 69.43	28.47 33.59 38.71 48.95 69.43	1.12 1.51 1.91 2.69 4.26
2" x 6' Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.03 0.04 0.05 0.09 0.23
2" x 6' Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.03 0.04 0.05 0.09 0.23
2" x 6' Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.03 0.04 0.05 0.09 0.23
GPS_A	A	From Centroid-Leg	4.00 0.00 5.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
BXA-80063/6 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.98 8.62 9.23 10.47 13.08	5.41 6.56 7.42 9.20 12.95	0.04 0.10 0.17 0.33 0.79
LNX-6512DS-T4M w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.85 6.31 6.77 7.74 9.80	4.55 5.23 5.91 7.34 10.46	0.05 0.09 0.15 0.28 0.65
(2) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.40 8.95 9.51 10.66 13.06	6.82 7.78 8.61 10.33 14.12	0.06 0.13 0.20 0.38 0.86
RRH2X60-AWS	A	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.96 4.27 4.60 5.27 6.72	1.82 2.08 2.36 2.96 4.25	0.06 0.08 0.11 0.17 0.35
DB-T1-6Z-8AB-0Z	A	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice 1/2" Ice 1" Ice	5.60 5.92 6.24	2.33 2.56 2.79	0.04 0.08 0.12

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	6.91	3.28	0.21
						4" Ice	8.37	4.37	0.45
RRH2x60-700	A	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	3.96	1.82	0.06
						1/2" Ice	4.27	2.08	0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2X60-PCS	A	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	2.57	2.01	0.06
						1/2" Ice	2.79	2.22	0.08
						1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
BXA-80063/6 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	7.98	5.41	0.04
						1/2" Ice	8.62	6.56	0.10
						1" Ice	9.23	7.42	0.17
						2" Ice	10.47	9.20	0.33
						4" Ice	13.08	12.95	0.79
LNX-6512DS-T4M w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	5.85	4.55	0.05
						1/2" Ice	6.31	5.23	0.09
						1" Ice	6.77	5.91	0.15
						2" Ice	7.74	7.34	0.28
						4" Ice	9.80	10.46	0.65
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	8.40	6.82	0.06
						1/2" Ice	8.95	7.78	0.13
						1" Ice	9.51	8.61	0.20
						2" Ice	10.66	10.33	0.38
						4" Ice	13.06	14.12	0.86
RRH2X60-AWS	B	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	3.96	1.82	0.06
						1/2" Ice	4.27	2.08	0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	B	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	3.96	1.82	0.06
						1/2" Ice	4.27	2.08	0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2X60-PCS	B	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	2.57	2.01	0.06
						1/2" Ice	2.79	2.22	0.08
						1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
BXA-80063/6 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	7.98	5.41	0.04
						1/2" Ice	8.62	6.56	0.10
						1" Ice	9.23	7.42	0.17
						2" Ice	10.47	9.20	0.33
						4" Ice	13.08	12.95	0.79
(2) SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	8.40	6.82	0.06
						1/2" Ice	8.95	7.78	0.13
						1" Ice	9.51	8.61	0.20
						2" Ice	10.66	10.33	0.38
						4" Ice	13.06	14.12	0.86
800 10735V01 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	9.04	5.49	0.06
						1/2" Ice	9.72	6.71	0.12
						1" Ice	10.37	7.69	0.19
						2" Ice	11.69	9.56	0.36
						4" Ice	14.45	13.51	0.85

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
RRH2X60-AWS	C	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	3.96	1.82	0.06
						1/2" Ice	4.27	2.08	0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	C	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	3.96	1.82	0.06
						1/2" Ice	4.27	2.08	0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2X60-PCS	C	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice	2.57	2.01	0.06
						1/2" Ice	2.79	2.22	0.08
						1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31

Load Combinations

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

Comb. No.	Description
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	188 - 137	Pole	Max Tension	14	0.00	0.00	0.00
			Max. Compression	14	-26.64	-0.31	0.13
			Max. Mx	5	-11.57	-508.00	2.98
			Max. My	8	-11.53	2.94	-514.75
			Max. Vy	5	21.55	-508.00	2.98
			Max. Vx	8	21.74	2.94	-514.75
			Max. Torque	10			0.84
L2	137 - 90.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37.35	-0.61	-0.04
			Max. Mx	5	-19.40	-1582.83	7.61
			Max. My	8	-19.37	7.56	-1598.46
			Max. Vy	5	25.44	-1582.83	7.61
			Max. Vx	8	25.64	7.56	-1598.46
			Max. Torque	11			0.44
L3	90.25 - 44.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51.43	-0.96	-0.25
			Max. Mx	5	-30.32	-2799.64	12.07
			Max. My	8	-30.31	11.98	-2823.83
			Max. Vy	5	29.13	-2799.64	12.07
			Max. Vx	8	29.32	11.98	-2823.83
			Max. Torque	11			0.46
L4	44.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-73.55	-1.34	-0.46
			Max. Mx	5	-48.60	-4381.39	17.05
			Max. My	8	-48.60	16.92	-4415.13
			Max. Vy	5	32.80	-4381.39	17.05
			Max. Vx	8	32.98	16.92	-4415.13
			Max. Torque	10			0.48

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	16	73.55	-2.98	5.17
	Max. H_x	11	48.62	32.77	-0.10
	Max. H_z	2	48.62	-0.10	32.95
	Max. M_x	2	4414.76	-0.10	32.95
	Max. M_z	5	4381.39	-32.77	0.10
	Max. Torsion	10	0.48	28.43	-16.56
	Min. Vert	1	48.62	0.00	0.00
	Min. H_x	5	48.62	-32.77	0.10

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_z	8	48.62	0.10	-32.95
	Min. M_x	8	-4415.13	0.10	-32.95
	Min. M_z	11	-4380.76	32.77	-0.10
	Min. Torsion	4	-0.48	-28.43	16.56

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	48.62	0.00	0.00	0.18	-0.30	0.00
Dead+Wind 0 deg - No Ice	48.62	0.10	-32.95	-4414.76	-17.55	0.17
Dead+Wind 30 deg - No Ice	48.62	16.47	-28.59	-3831.86	-2205.68	0.38
Dead+Wind 60 deg - No Ice	48.62	28.43	-16.56	-2222.24	-3802.96	0.48
Dead+Wind 90 deg - No Ice	48.62	32.77	-0.10	-17.05	-4381.39	0.45
Dead+Wind 120 deg - No Ice	48.62	28.33	16.39	2192.82	-3785.85	0.31
Dead+Wind 150 deg - No Ice	48.62	16.30	28.49	3815.12	-2175.91	0.10
Dead+Wind 180 deg - No Ice	48.62	-0.10	32.95	4415.13	16.92	-0.14
Dead+Wind 210 deg - No Ice	48.62	-16.47	28.59	3832.23	2205.05	-0.36
Dead+Wind 240 deg - No Ice	48.62	-28.43	16.56	2222.60	3802.33	-0.48
Dead+Wind 270 deg - No Ice	48.62	-32.77	0.10	17.41	4380.76	-0.48
Dead+Wind 300 deg - No Ice	48.62	-28.33	-16.39	-2192.46	3785.21	-0.33
Dead+Wind 330 deg - No Ice	48.62	-16.30	-28.49	-3814.75	2175.27	-0.09
Dead+Ice+Temp	73.55	0.00	0.00	0.46	-1.34	0.00
Dead+Wind 0 deg+Ice+Temp	73.55	0.01	-5.96	-814.72	-3.91	0.12
Dead+Wind 30 deg+Ice+Temp	73.55	2.98	-5.17	-706.72	-409.47	0.17
Dead+Wind 60 deg+Ice+Temp	73.55	5.16	-2.99	-409.23	-705.71	0.17
Dead+Wind 90 deg+Ice+Temp	73.55	5.95	-0.01	-1.96	-813.24	0.13
Dead+Wind 120 deg+Ice+Temp	73.55	5.14	2.97	405.97	-703.26	0.05
Dead+Wind 150 deg+Ice+Temp	73.55	2.96	5.16	705.26	-405.24	-0.04
Dead+Wind 180 deg+Ice+Temp	73.55	-0.01	5.96	815.69	0.97	-0.12
Dead+Wind 210 deg+Ice+Temp	73.55	-2.98	5.17	707.70	406.53	-0.17
Dead+Wind 240 deg+Ice+Temp	73.55	-5.16	2.99	410.21	702.76	-0.17
Dead+Wind 270 deg+Ice+Temp	73.55	-5.95	0.01	2.93	810.30	-0.13
Dead+Wind 300 deg+Ice+Temp	73.55	-5.14	-2.97	-405.00	700.32	-0.05
Dead+Wind 330 deg+Ice+Temp	73.55	-2.96	-5.16	-704.28	402.30	0.04
Dead+Wind 0 deg - Service	48.62	0.04	-12.87	-1727.25	-7.06	0.06
Dead+Wind 30 deg - Service	48.62	6.43	-11.17	-1499.19	-863.22	0.15
Dead+Wind 60 deg - Service	48.62	11.10	-6.47	-869.38	-1488.16	0.19
Dead+Wind 90 deg - Service	48.62	12.80	-0.04	-6.56	-1714.44	0.18
Dead+Wind 120 deg - Service	48.62	11.07	6.40	858.07	-1481.42	0.13
Dead+Wind 150 deg - Service	48.62	6.37	11.13	1492.83	-851.54	0.04
Dead+Wind 180 deg - Service	48.62	-0.04	12.87	1727.62	6.43	-0.06
Dead+Wind 210 deg - Service	48.62	-6.43	11.17	1499.56	862.58	-0.14
Dead+Wind 240 deg - Service	48.62	-11.10	6.47	869.75	1487.53	-0.19
Dead+Wind 270 deg - Service	48.62	-12.80	0.04	6.93	1713.81	-0.19
Dead+Wind 300 deg - Service	48.62	-11.07	-6.40	-857.70	1480.79	-0.13
Dead+Wind 330 deg - Service	48.62	-6.37	-11.13	-1492.45	850.90	-0.04

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-48.62	0.00	0.00	48.62	0.00	0.000%
2	0.10	-48.62	-32.95	-0.10	48.62	32.95	0.000%
3	16.47	-48.62	-28.59	-16.47	48.62	28.59	0.000%
4	28.43	-48.62	-16.56	-28.43	48.62	16.56	0.000%
5	32.77	-48.62	-0.10	-32.77	48.62	0.10	0.000%
6	28.33	-48.62	16.39	-28.33	48.62	-16.39	0.000%
7	16.30	-48.62	28.49	-16.30	48.62	-28.49	0.000%
8	-0.10	-48.62	32.95	0.10	48.62	-32.95	0.000%
9	-16.47	-48.62	28.59	16.47	48.62	-28.59	0.000%
10	-28.43	-48.62	16.56	28.43	48.62	-16.56	0.000%
11	-32.77	-48.62	0.10	32.77	48.62	-0.10	0.000%
12	-28.33	-48.62	-16.39	28.33	48.62	16.39	0.000%
13	-16.30	-48.62	-28.49	16.30	48.62	28.49	0.000%
14	0.00	-73.55	0.00	0.00	73.55	0.00	0.000%
15	0.01	-73.55	-5.96	-0.01	73.55	5.96	0.000%
16	2.98	-73.55	-5.17	-2.98	73.55	5.17	0.000%
17	5.16	-73.55	-2.99	-5.16	73.55	2.99	0.000%
18	5.95	-73.55	-0.01	-5.95	73.55	0.01	0.000%
19	5.14	-73.55	2.97	-5.14	73.55	-2.97	0.000%
20	2.96	-73.55	5.16	-2.96	73.55	-5.16	0.000%
21	-0.01	-73.55	5.96	0.01	73.55	-5.96	0.000%
22	-2.98	-73.55	5.17	2.98	73.55	-5.17	0.000%
23	-5.16	-73.55	2.99	5.16	73.55	-2.99	0.000%
24	-5.95	-73.55	0.01	5.95	73.55	-0.01	0.000%
25	-5.14	-73.55	-2.97	5.14	73.55	2.97	0.000%
26	-2.96	-73.55	-5.16	2.96	73.55	5.16	0.000%
27	0.04	-48.62	-12.87	-0.04	48.62	12.87	0.000%
28	6.43	-48.62	-11.17	-6.43	48.62	11.17	0.000%
29	11.10	-48.62	-6.47	-11.10	48.62	6.47	0.000%
30	12.80	-48.62	-0.04	-12.80	48.62	0.04	0.000%
31	11.07	-48.62	6.40	-11.07	48.62	-6.40	0.000%
32	6.37	-48.62	11.13	-6.37	48.62	-11.13	0.000%
33	-0.04	-48.62	12.87	0.04	48.62	-12.87	0.000%
34	-6.43	-48.62	11.17	6.43	48.62	-11.17	0.000%
35	-11.10	-48.62	6.47	11.10	48.62	-6.47	0.000%
36	-12.80	-48.62	0.04	12.80	48.62	-0.04	0.000%
37	-11.07	-48.62	-6.40	11.07	48.62	6.40	0.000%
38	-6.37	-48.62	-11.13	6.37	48.62	11.13	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00002362
3	Yes	6	0.00000001	0.00006933
4	Yes	6	0.00000001	0.00006835
5	Yes	5	0.00000001	0.00000930
6	Yes	6	0.00000001	0.00006819
7	Yes	6	0.00000001	0.00006792
8	Yes	5	0.00000001	0.00001452
9	Yes	6	0.00000001	0.00006859
10	Yes	6	0.00000001	0.00006928
11	Yes	5	0.00000001	0.00003219
12	Yes	6	0.00000001	0.00006754
13	Yes	6	0.00000001	0.00006808

14	Yes	4	0.00000001	0.00000001
15	Yes	6	0.00000001	0.00002721
16	Yes	6	0.00000001	0.00003184
17	Yes	6	0.00000001	0.00003170
18	Yes	6	0.00000001	0.00002715
19	Yes	6	0.00000001	0.00003150
20	Yes	6	0.00000001	0.00003155
21	Yes	6	0.00000001	0.00002723
22	Yes	6	0.00000001	0.00003164
23	Yes	6	0.00000001	0.00003166
24	Yes	6	0.00000001	0.00002702
25	Yes	6	0.00000001	0.00003130
26	Yes	6	0.00000001	0.00003137
27	Yes	5	0.00000001	0.00000586
28	Yes	6	0.00000001	0.00000873
29	Yes	6	0.00000001	0.00000850
30	Yes	5	0.00000001	0.00000544
31	Yes	6	0.00000001	0.00000846
32	Yes	6	0.00000001	0.00000840
33	Yes	5	0.00000001	0.00000511
34	Yes	6	0.00000001	0.00000856
35	Yes	6	0.00000001	0.00000871
36	Yes	5	0.00000001	0.00000718
37	Yes	6	0.00000001	0.00000830
38	Yes	6	0.00000001	0.00000843

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	188 - 137 (1)	TP32.711x22x0.25	51.00	0.00	0.0	39.000	25.0495	-11.52	976.93	0.012
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	51.00	0.00	0.0	39.000	40.2848	-19.37	1571.11	0.012
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	51.00	0.00	0.0	39.000	58.6481	-30.31	2287.28	0.013
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	51.00	0.00	0.0	39.000	93.8076	-48.60	3658.50	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	188 - 137 (1)	TP32.711x22x0.25	515.59	31.709	39.000	0.813	0.00	0.000	39.000	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	1601.07	47.579	39.000	1.220	0.00	0.000	39.000	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	2828.13	47.581	39.000	1.220	0.00	0.000	39.000	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	4421.34	38.799	39.000	0.995	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	188 - 137 (1)	TP32.711x22x0.25	21.78	0.869	26.000	0.067	0.25	0.008	26.000	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	25.68	0.637	26.000	0.049	0.29	0.004	26.000	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	29.36	0.501	26.000	0.039	0.32	0.003	26.000	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	33.02	0.352	26.000	0.027	0.36	0.002	26.000	0.000

Pole Interaction Design Data

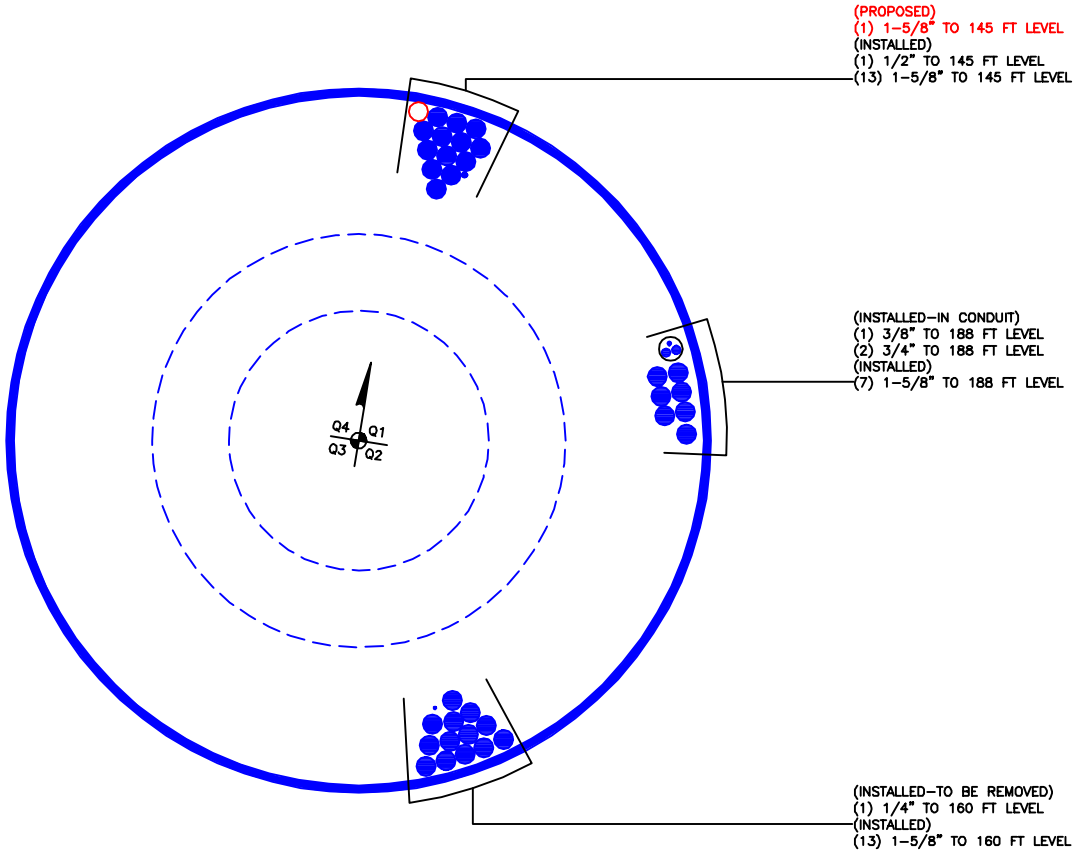
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	188 - 137 (1)	0.012	0.813	0.000	0.067	0.000	0.826 ✔	1.333	H1-3+VT ✔
L2	137 - 90.25 (2)	0.012	1.220	0.000	0.049	0.000	1.233 ✔	1.333	H1-3+VT ✔
L3	90.25 - 44.5 (3)	0.013	1.220	0.000	0.039	0.000	1.234 ✔	1.333	H1-3+VT ✔
L4	44.5 - 0 (4)	0.013	0.995	0.000	0.027	0.000	1.008 ✔	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	188 - 137	Pole	TP32.711x22x0.25	1	-11.52	1302.25	62.0	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-19.37	2094.29	92.5	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-30.31	3048.94	92.5	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-48.60	4876.78	75.6	Pass
						Summary	ELC:	Existing/Proposed/Reserved
						Pole (L3)	92.5	Pass
						Rating =	92.5	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 803175 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *803175*
Site Name: *CT New Britain 3CAC*
App #: *310462 Rev. 0*

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	67	in
Anchor Spacing:	6.125	in

Plate Data		
W=Side:	66	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	14	in

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

Pole Data		
Diam:	59.61	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	4421	ft-kips
Unfactored Axial, P:	49	kips
Unfactored Shear, V:	33	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	155.9 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	80.0% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	40.1 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	80.2% **Pass**

PL Ref. Data
Yield Line (in):
33.73
Max PL Length:
33.73

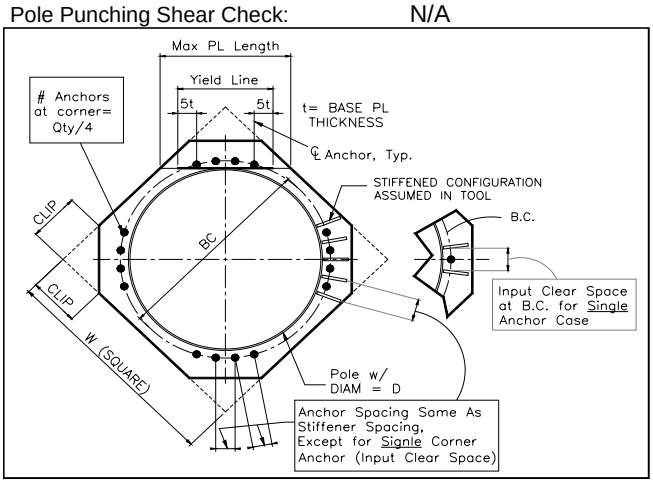
N/A - Unstiffened

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

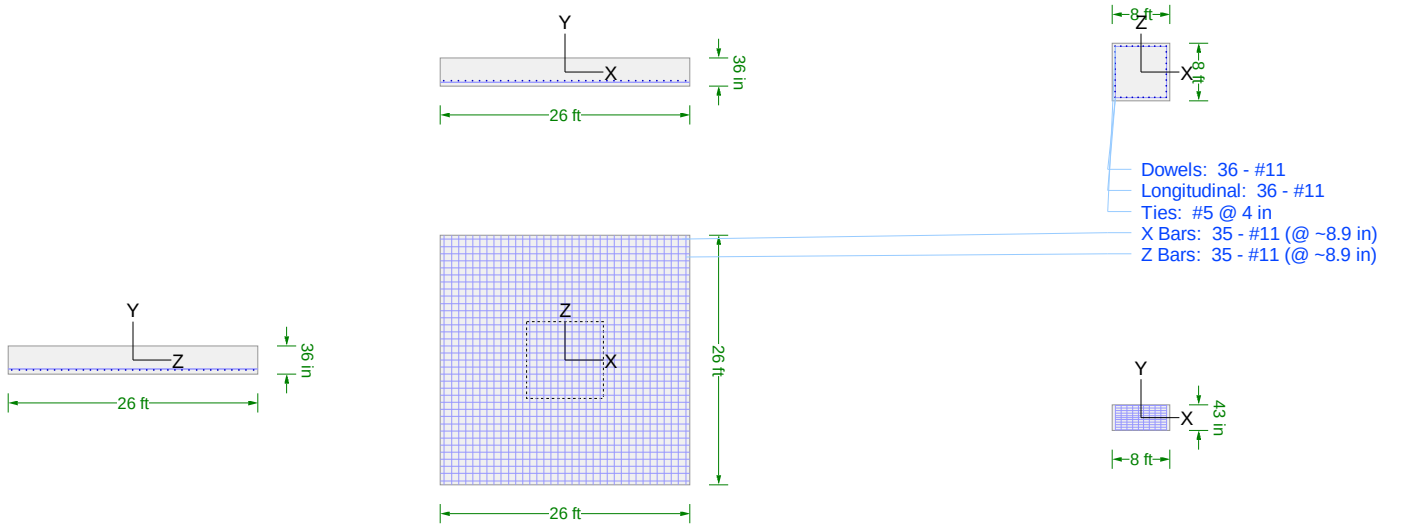
Pole Results

Pole Punching Shear Check: N/A



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

Design Detail



Check Summary

Ratio	Check	Provided	Required	Combination
----- Footing -----				
✓ 0.138	X Flexure (-Z)	6837 ft·k	940.3 ft·k	
✓ 0.138	X Flexure (+Z)	6837 ft·k	940.3 ft·k	
✓ 0.503	Z Flexure (-X)	7183 ft·k	3611 ft·k	
✓ 0.503	Z Flexure (+X)	7183 ft·k	3611 ft·k	
✓ 0.197	Shear (-Z)	766.1 k	151.1 k	
✓ 0.197	Shear (+Z)	766.1 k	151.1 k	
✓ 0.000	Shear (-X)	802.2 k	0 k	
✓ 0.687	Shear (+X)	802.2 k	551.5 k	
✓ 0.298	Punching Shear	164.3 psi	49.02 psi	
----- Pedestal -----				
✓ 0.007	Axial	13898 k	103 k	
✓ 0.521	Biaxial Bending	0.521	1.000	
✓ 0.032	Shear X	1352 k	43 k	
✓ 0.000	Shear Z	1352 k	0 k	

Criteria

Building Code	IBC 2006
Strength Load Combinations	IBC 2006 (Strength)
Stability Load Combinations	ASCE 7-05 (ASD)

Loads Summary (Prefactored Loads)

Load Set	Combination	Type	P	Mx	Mz	Vx	Vz	Overburden	Footing Weight
Tower Reactions		Strength	103 k	0 ft·k	5747 ft·k	43 k	0 k	321 psf	304.2 k

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

Site Data

BU#: *803175*
Site Name: *CT New Britain 3 CAC*
App #: *310462 Rev. 0*

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

Pad & Pier Data		
Base PL Dist. Above Pier:	3.75	in
Pier Dist. Above Grade:	8	in
Pad Bearing Depth, D:	5.92	ft
Pad Thickness, T:	3	ft
Pad Width=Length, L:	26	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	8	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	64.00	ft^2
Pier Height:	3.59	ft
Soil (above pad) Height:	2.92	ft

Soil Parameters		
Unit Weight, γ:	110.0	pcf
Ultimate Bearing Capacity, qn:	12.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	9.00	ksf
Passive Pres. Coeff., Kp	3.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	44.6	kips
Pad Force Location Above D:	1.33	ft
ϕ(Passive Pressure Moment):	59.27	ft-kips
Factored O.T. M(WL), "1.6W":	6275.7	ft-kips
Factored OT (MW-Msoil), M1	6216.44	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	1.69	ft
Sum of Soil Wedges Wt:	19.81	kips
Soil Wedges ecc, K1:	6.33	ft
Ftg+Soil above Pad wt:	535.2	kips
Unfactored (Total ftg-soil Wt):	555.01	kips
1.2D. **No Soil Wedges**.	701.05	kips
0.9D. **With Soil Wedges**	543.61	kips

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

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	49	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	33	kips
Unfactored WL Moment, M:	4421	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	58.8	kips
0.90	0.9D+1.6W, Pu:	44.1	kips
1.35	Vu:	44.55	kips
	Mu:	5968.35	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	701.05	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	6216.44	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	8.87	ft
Orthogonal qu=	3.26	ksf
qu/ϕ*qn Ratio=	**36.25%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	6.27	ft
Diagonal qu=	3.87	ksf
qu/ϕ*qn Ratio=	**42.98%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	543.61	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	6103.66	ft-kips

Orthogonal ecc3 = M2/P2 =	11.23	ft
Ortho Non Bearing Length,NBL=	22.46	ft
Orthogonal qu=	5.90	ksf
Diagonal qu=	5.31	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	4421.00		
M Orthogonal:	4667.09	**94.73%**	**Pass**
M Diagonal:	4667.09	**94.73%**	**Pass**

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

T-Mobile Existing Facility

Site ID: CT11783

Crown Comm. Monopole
167 Lester Street
New Britain, CT 06051

October 2, 2015

EBI Project Number: 6215004934

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	5.79 %

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October 2, 2015

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

Emissions Analysis for Site: **CT11783 – Crown Comm. Monopole**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **167 Lester Street, New Britain, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **167 Lester Street, New Britain, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM / UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

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

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

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

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

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

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

8) The antenna mounting height centerline of the proposed antennas is **163 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.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	163	Height (AGL):	163	Height (AGL):	163
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	0.68	Antenna B1 MPE%	0.68	Antenna C1 MPE%	0.68
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	163	Height (AGL):	163	Height (AGL):	163
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	0.68	Antenna B2 MPE%	0.68	Antenna C2 MPE%	0.68
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	163	Height (AGL):	163	Height (AGL):	163
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.27	Antenna B3 MPE%	0.27	Antenna C3 MPE%	0.27

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**1.63 %**
AT&T	0.98 %
Verizon Wireless	3.18 %
Site Total MPE %:	**5.79 %**

T-Mobile Sector 1 Total:	1.63 %
T-Mobile Sector 2 Total:	1.63 %
T-Mobile Sector 3 Total:	1.63 %
Site Total:	5.79 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**2334.27**	**163**	**6.81**	**2100**	**1000**	**0.68 %**
T-Mobile 700 MHz LTE	**1**	**865.21**	**163**	**1.26**	**700**	**467**	**0.27 %**
T-Mobile 1900 MHz (PCS) GSM/UMTS	**2**	**1167.14**	**163**	**3.40**	**1900**	**1000**	**0.34 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**1167.14**	**163**	**3.40**	**2100**	**1000**	**0.34 %**
						Total:	**1.63%**

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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:	1.63 %
Sector 2:	1.63 %
Sector 3 :	1.63 %
T-Mobile Per Sector Maximum:	1.63 %
Site Total:	5.79 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.79%** 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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