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

October 26, 2015

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

RE: **T-Mobile - Exempt Modification - Crown Site BU: 876319**
T-Mobile Site ID: CTNH312A
Located at: 280 Elm Street, Naugatuck, CT 06770

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 Robert A. Mezzo, Mayor, Borough of Naugatuck and J. Sabatino, Uniroyal Chemical Company as Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **280 Elm Street, Naugatuck, 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

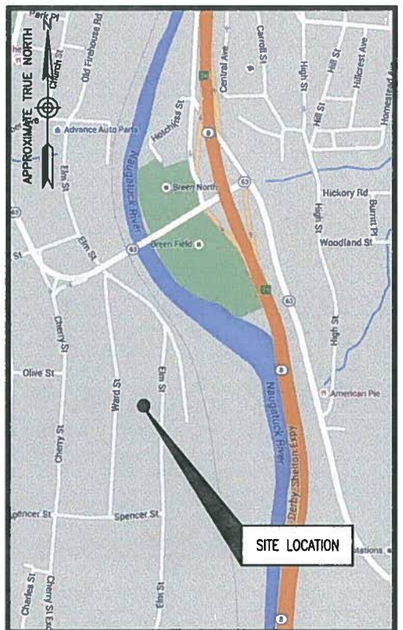
Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Robert A. Mezzo, Mayor, Borough of Naugatuck
Borough of Naugatuck
229 Church Street
4th Floor
Naugatuck, CT 06770

Uniroyal Chemical Company
Attn: J. Sabatino, Treasury Dept.
199 Benson Road
Middlebury, CT 06749

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CTNH312A
CROWN CASTLE BU #: 876319
SITE NAME: NAUGATUCK 2 UNIROYAL
280 ELM STREET
NAUGATUCK, CT 06770
NEW HAVEN COUNTY



VICINITY MAP

FROM PARSIPPANY, NJ:

START OUT GOING WEST ON SYLVAN WAY TOWARD CENTURY DR. MERGE ONTO I-80 E. MERGE ONTO I-287 N VIA EXIT 43 TOWARD MAHWAH/BOONTON (CROSSING INTO NEW YORK). MERGE ONTO I-87 S/I-287 E/NEW YORK TRWY S TOWARD I-87 S/TAPPAN ZEE BRG/NEW YORK CITY (PORTIONS TOLL). TAKE THE I-87 S EXIT TOWARD SAW MILL PKWY S/NEW YORK CITY. TAKE THE NY-119/SAW MILL PKWY N EXIT, EXIT 8A, TOWARD ELMSFORD. MERGE ONTO SAW MILL RIVER PKWY N VIA THE RAMP ON THE LEFT TOWARD KATONAH. MERGE ONTO I-684 N VIA THE EXIT ON THE LEFT. MERGE ONTO I-84 E VIA EXIT 9E TOWARD DANBURY (CROSSING INTO CONNECTICUT). TAKE THE CT-63 EXIT, EXIT 17, TOWARD NAUGATUCK/WATERTOWN. MERGE ONTO CT-63 TOWARD NAUGATUCK/POST UNIV. STAY STRAIGHT TO GO ONTO MEADOW ST. MEADOW ST BECOMES CHERRY ST/CT-63. TURN LEFT ONTO SCOTT ST. TURN RIGHT ONTO ELM ST. SITE WILL BE ON THE LEFT.

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

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

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

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

CONSULTANT TEAM

SITE NAME:
NAUGATUCK 2 UNIROYAL

SITE NUMBER:
CTNH312A

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°-28'-52.72" N (NAD83)
LONGITUDE: 73°-03'-13.47" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
702Cu

PROJECT SUMMARY

SITE ADDRESS:
280 ELM STREET
NAUGATUCK, CT 06770
NEW HAVEN COUNTY

PROJECT DIRECTORY

- REMOVED AND REPLACE (6) EXISTING ANTENNAS WITH (9) NEW ANTENNAS.
- REMOVED AND REPLACE (6) EXISTING TMA'S WITH (3) NEW ANTENNAS.
- INSTALL (3) NEW RRU'S.
- INSTALL (1) NEW HYBRID CABLE.
- REMOVE (6) EXISTING LINES OF COAX.
- REMOVE EXISTING METROPCS ANTENNA MOUNTS & CABLES AT A CENTERLINE ELEVATION OF 142'-0"± A.G.L.

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

CTNH312A
NAUGATUCK 2
UNIROYAL

CONSTRUCTION DRAWINGS		
0	10/26/15	ISSUED AS FINAL
A	10/20/15	ISSUED FOR REVIEW

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

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

DRAWN BY:	NRK
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074619
SITE ADDRESS:	

280 ELM STREET
NAUGATUCK, CT 06770
NEW HAVEN COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL NOTES:

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

SITE WORK GENERAL NOTES:

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

ELECTRICAL INSTALLATION NOTES:

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

CONCRETE AND REINFORCING STEEL NOTES:

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

   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER .....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.

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

STRUCTURAL STEEL NOTES:

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

CONSTRUCTION NOTES:

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

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CTNH312A
NAUGATUCK 2
UNIROYAL

CONSTRUCTION DRAWINGS		
0	10/26/15	ISSUED AS FINAL
A	10/20/15	ISSUED FOR REVIEW

Dewberry

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

STATE OF CONNECTICUT
JIANG YU
No. 23222
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:	NRK
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074619
SITE ADDRESS:	

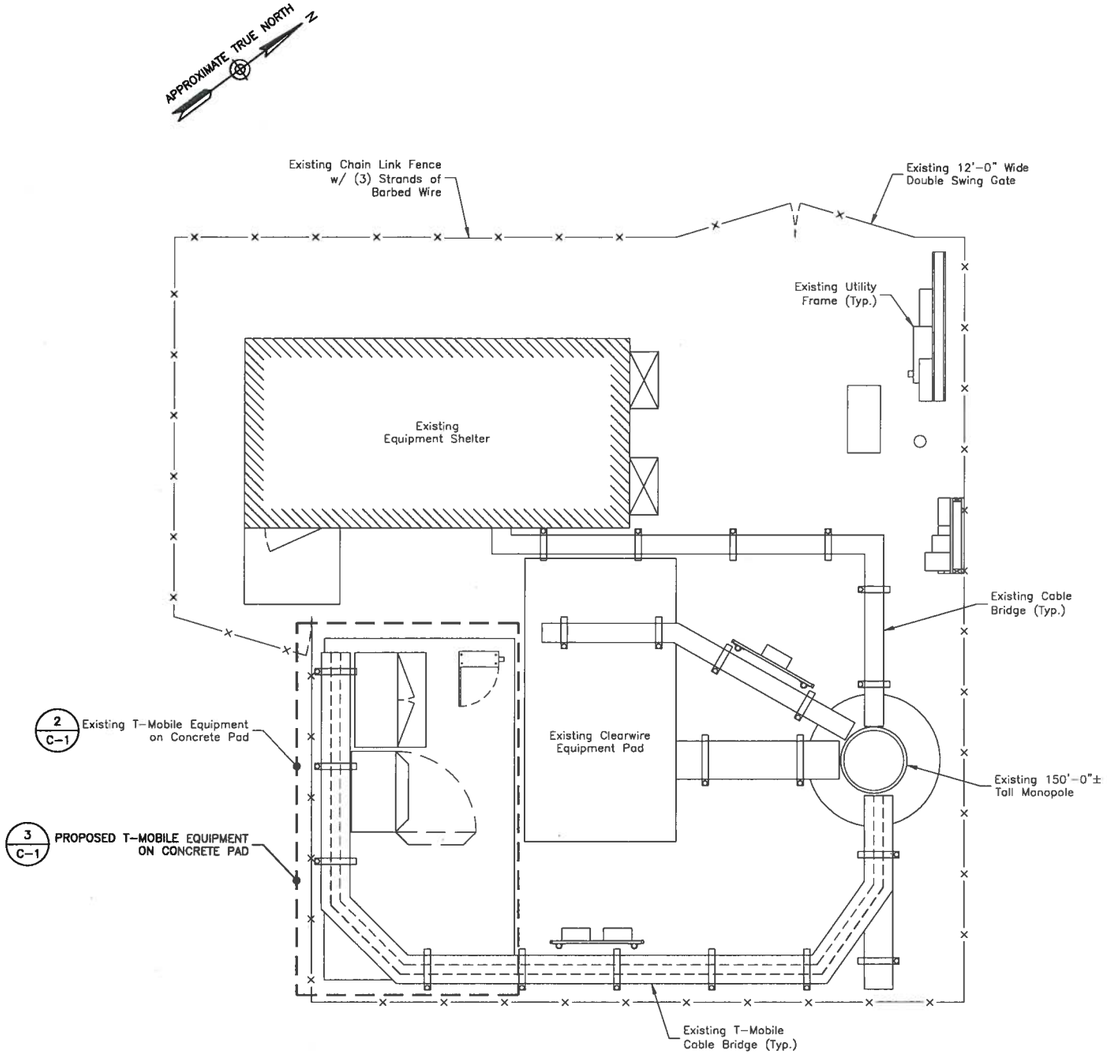
280 ELM STREET
NAUGATUCK, CT 06770
NEW HAVEN COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

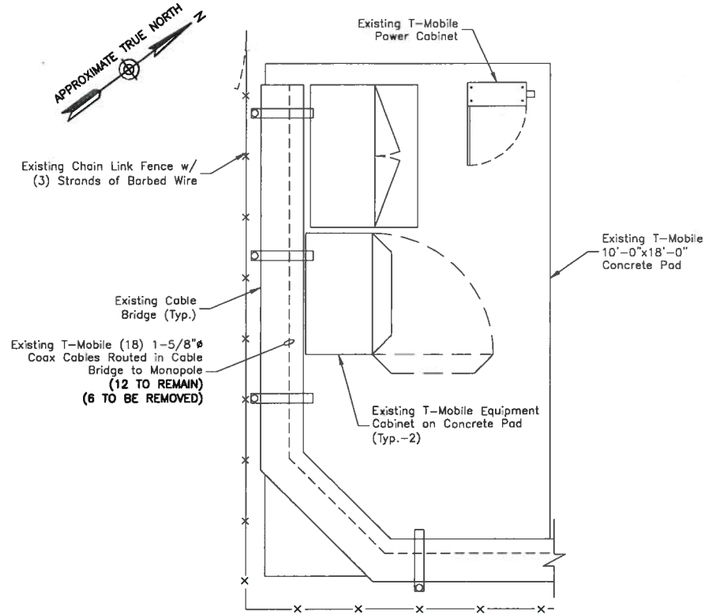
G–1



COMPOUND PLAN 1

SCALE: 1/8"=1' FOR 11"x17"
1/4"=1' FOR 22"x34"

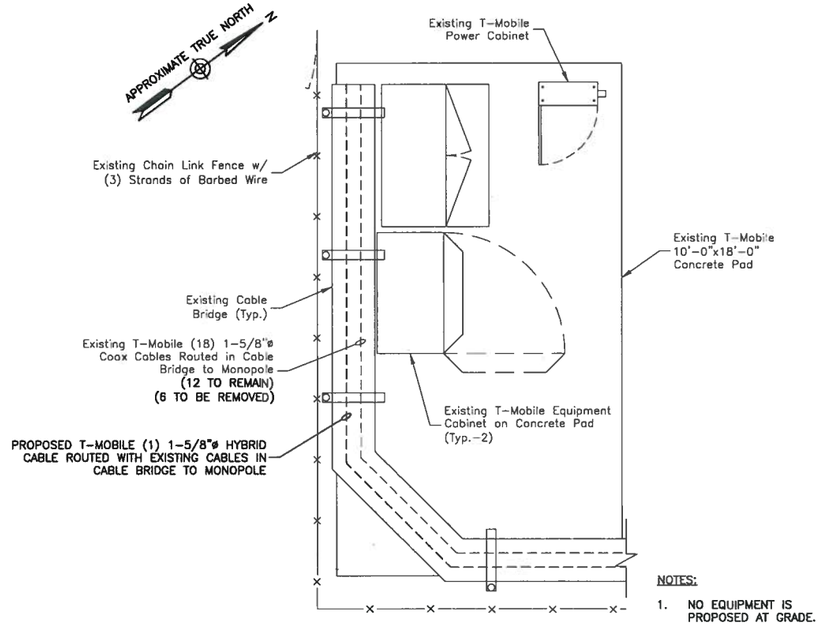
0' 2' 4' 8'



EXISTING EQUIPMENT PLAN 2

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

0' 2' 4' 6'



NOTES:

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 DESTEK ENGINEERING, LLC. DATED OCTOBER 1, 2015.

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NAUGATUCK 2
UNIROYAL

CONSTRUCTION DRAWINGS		
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STATE OF CONNECTICUT
JIANG YU
22222
LICENSED PROFESSIONAL ENGINEER

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

DRAWN BY:	NRK
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074619
SITE ADDRESS:	

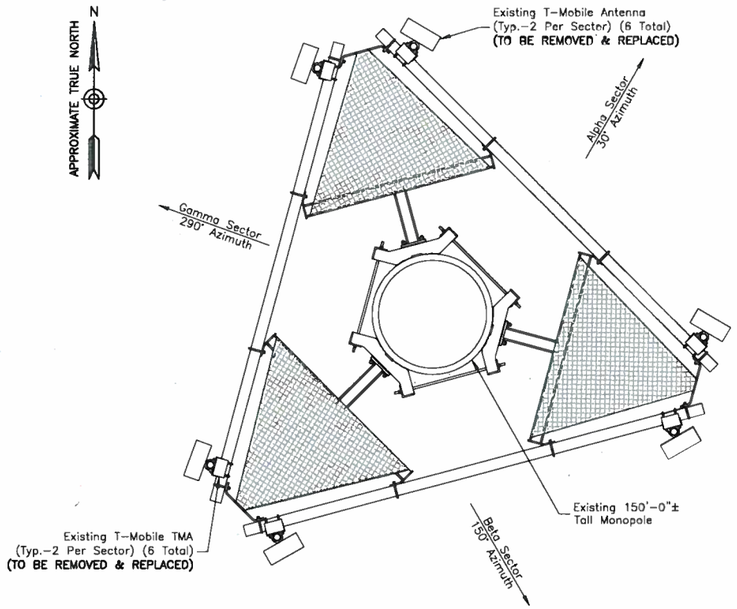
280 ELM STREET
NAUGATUCK, CT 06770
NEW HAVEN COUNTY

SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

SHEET NUMBER

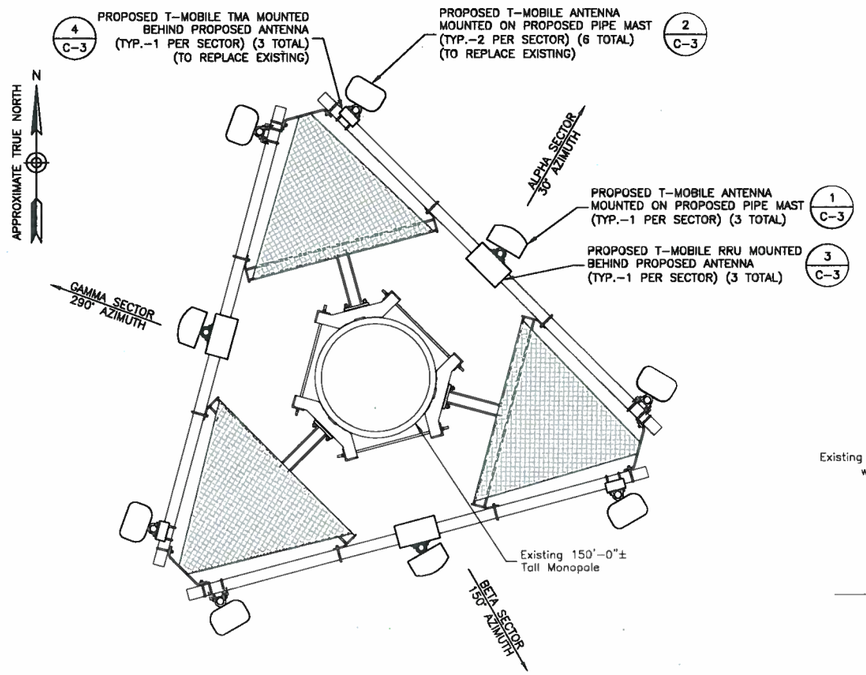
C-1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

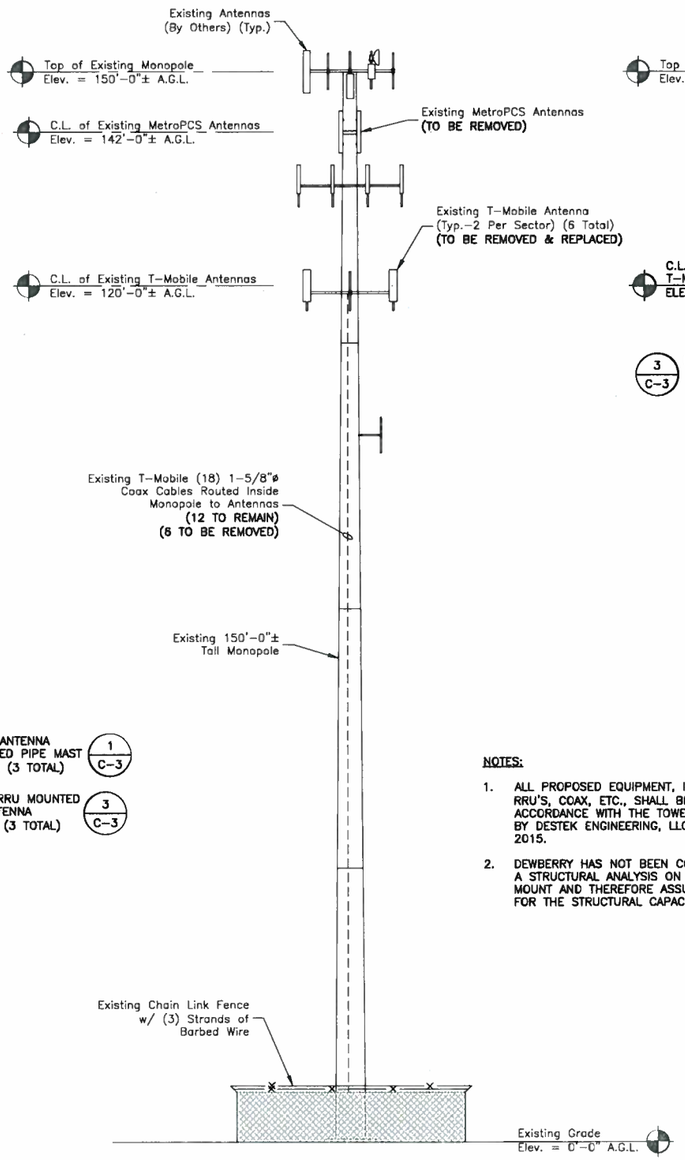
1



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

2

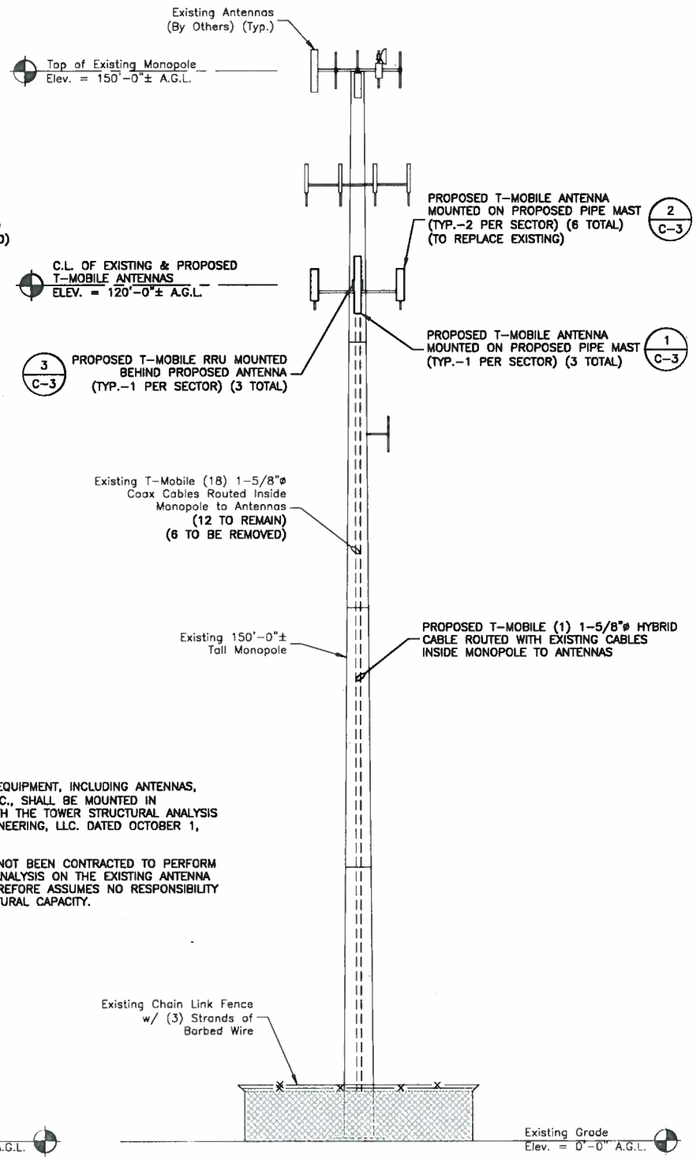


EXISTING ELEVATION

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

3

0' 8' 16' 24'



PROPOSED ELEVATION

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

4

0' 8' 16' 24'

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY DESTEK ENGINEERING, LLC. DATED OCTOBER 1, 2015.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING ANTENNA MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.

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STATE OF CONNECTICUT
JIANG YU
LICENSED
PROFESSIONAL ENGINEER

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

DRAWN BY:	NRK
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074619
SITE ADDRESS:	

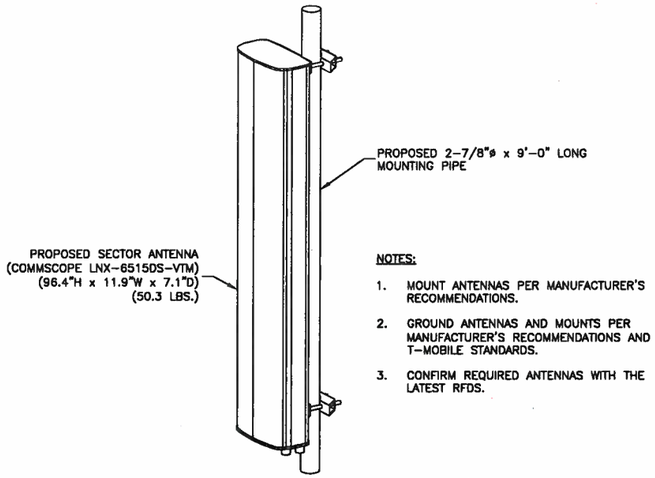
280 ELM STREET
NAUGATUCK, CT 06770
NEW HAVEN COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

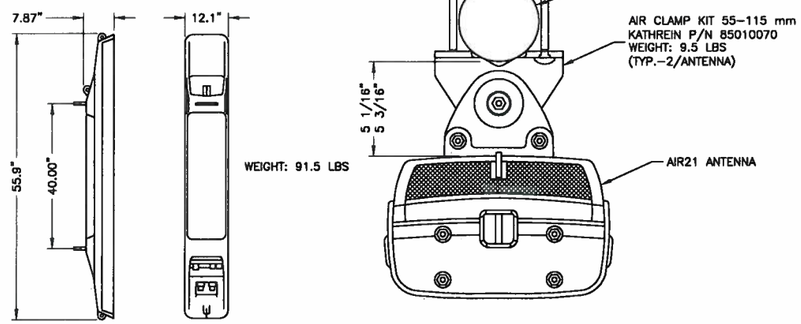
C-2



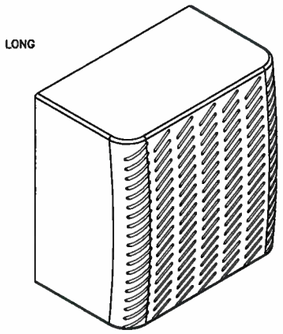
NOTES:

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

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



AIR21 ANTENNA DETAIL 2
SCALE: N.T.S.



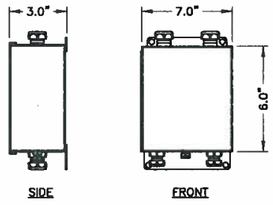
MANUF:	ERICSSON
MODEL:	RRUS-11 B12
HEIGHT:	20.0"
WIDTH:	17.0"
DEPTH:	7.0"
WEIGHT:	50.7 LBS

ERICSSON RRUS-11 B12

RRU NOTES:

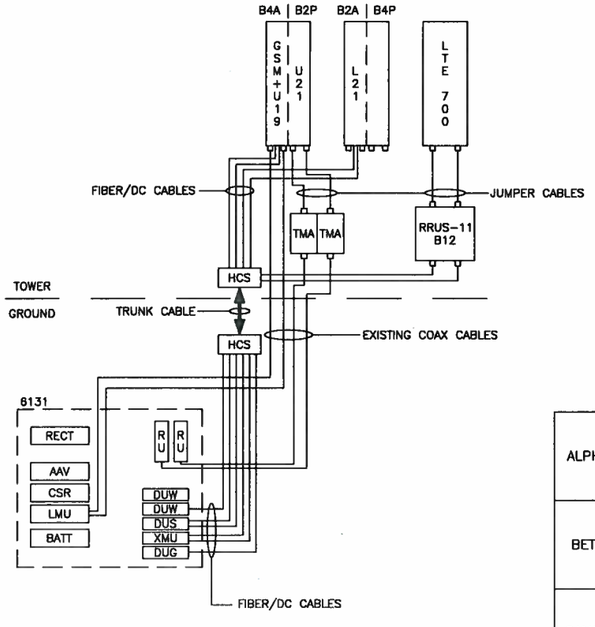
1. MOUNT EQUIPMENT WITH MANUFACTURER PROVIDED MOUNTING BRACKETS.
2. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED EQUIPMENT WITH THE LATEST RFDS.

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



ERICSSON KRY 122 144/1

DUAL-PORT TMA DETAIL 4
SCALE: N.T.S.



SITE CONFIGURATION 702Cu 5
SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		HYBRID	CABLE LENGTHS	RRU		TMA	
	EXISTING	PROPOSED	EXISTING	PROPOSED	PROPOSED		EXISTING	PROPOSED	EXISTING	PROPOSED
ALPHA	REPLACE EXISTING	ERICSSON AIR 21 B2A B4P	(6) 1-5/8"ø	(2) 1-5/8"ø TO BE REMOVED	(1) 1-5/8"ø	170'-0"	–	–	KRY 112 71	KRY 112 144/1
	–	COMMSCOPE LNX-6515DS-VTM					–	RRUS-11 B12	–	–
	REPLACE EXISTING	ERICSSON AIR 21 B4A B2P					–	–	KRY 112 71	–
BETA	REPLACE EXISTING	ERICSSON AIR 21 B2A B4P	(6) 1-5/8"ø	(2) 1-5/8"ø TO BE REMOVED		170'-0"	–	–	KRY 112 71	KRY 112 144/1
	–	COMMSCOPE LNX-6515DS-VTM					–	RRUS-11 B12	–	–
	REPLACE EXISTING	ERICSSON AIR 21 B4A B2P					–	–	KRY 112 71	–
GAMMA	REPLACE EXISTING	ERICSSON AIR 21 B2A B4P	(6) 1-5/8"ø	(2) 1-5/8"ø TO BE REMOVED		170'-0"	–	–	KRY 112 71	KRY 112 144/1
	–	COMMSCOPE LNX-6515DS-VTM					–	RRUS-11 B12	–	–
	REPLACE EXISTING	ERICSSON AIR 21 B4A B2P					–	–	KRY 112 71	–

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CLIFTON PARK, NY 12065

CTNH312A
NAUGATUCK 2
UNIROYAL

CONSTRUCTION DRAWINGS

0	10/26/15	ISSUED AS FINAL
A	10/20/15	ISSUED FOR REVIEW

Dewberry
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STATE OF CONNECTICUT
JIANG YU
REGISTERED
PROFESSIONAL ENGINEER

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

DRAWN BY:	NRK
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074619
SITE ADDRESS:	

280 ELM STREET
NAUGATUCK, CT 06770
NEW HAVEN COUNTY

SHEET TITLE

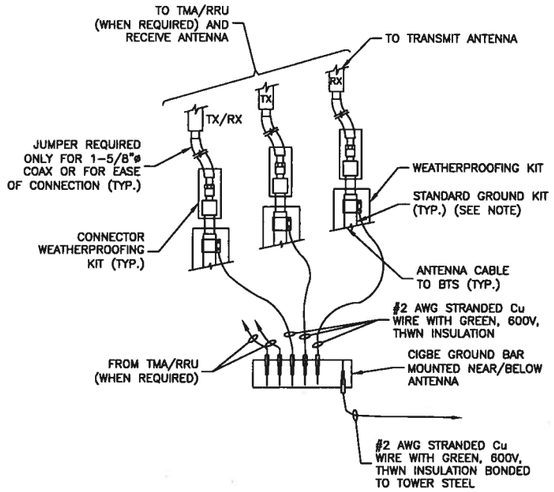
CONSTRUCTION DETAILS

SHEET NUMBER

C-3

GROUNDING NOTES:

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

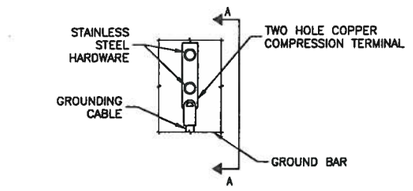


NOTE:

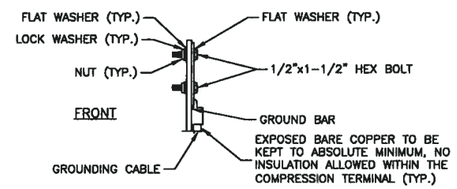
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) — 1

SCALE: N.T.S.



ELEVATION



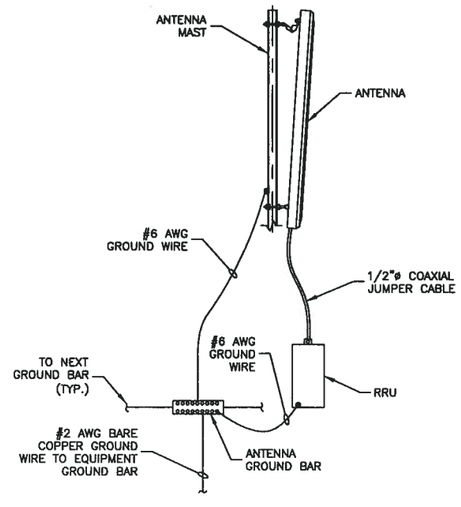
SECTION 'A-A'

NOTES:

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

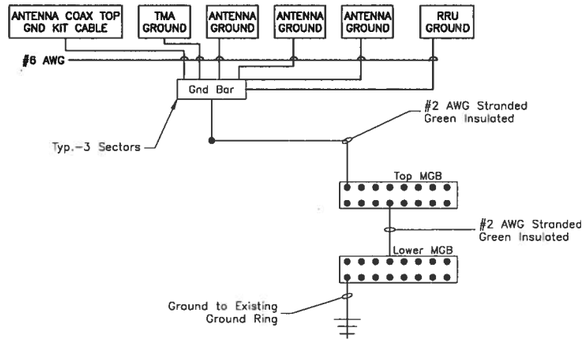
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL — 2

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL — 3

SCALE: N.T.S



NOTES:

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

SCHEMATIC GROUNDING DIAGRAM — 4

SCALE: N.T.S.

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STATE OF CONNECTICUT — JIANG YU — 0023222 — REGISTERED PROFESSIONAL ENGINEER

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

DRAWN BY:	NRK
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50074619
SITE ADDRESS:	

280 ELM STREET
NAUGATUCK, CT 06770
NEW HAVEN COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

Date: **October 01, 2015**

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

Destek Engineering, LLC
1281 Kennestone Circle, Suite 100
Marietta, GA 30066
(770) 693-0835

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CTNH312A
	Carrier Site Name:	280 Elm St., Naugatuck, CT 067
Crown Castle Designation:	**Crown Castle BU Number:**	876319
	Crown Castle Site Name:	NAUGATUCK 2 UNIROYAL
	Crown Castle JDE Job Number:	347085
	Crown Castle Work Order Number:	1128768
	Crown Castle Application Number:	309961 Rev. 3
Engineering Firm Designation:	**Destek Engineering, LLC Project Number:**	1502368
Site Data:	**280 Elm Street, NAUGATUCK, New Haven County, CT** **Latitude *41° 28' 52.72"*, Longitude *-73° 3' 13.47"*** **150 Foot - Monopole Tower**	

Dear Sean Dempsey,

Destek Engineering, LLC 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 831012, in accordance with application 309961, revision 3.

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

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

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

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

We at *Destek Engineering, LLC.* 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: Wade Baxter, EIT

Respectfully submitted by: 10/01/2015

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN 27057
LICENSED
PROFESSIONAL ENGINEER

Ahmet Colakoglu, PE
President

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by SUMMIT in August of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 38 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
119.0	120.0	3	andrew	LNX-6515DS-VTM w/ Mount Pipe	1	1-5/8	-
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
	119.0	3	ericsson	KRY 112 144/1			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	153.0	1	dragonwave	A-ANT-23G-1-C	3	1-1/4	1
	152.0	3	dragonwave	A-ANT-23G-2-C			
	150.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	2
		3	alcatel lucent	TME-1900MHz RRH (65MHz)	3	1/4	1
		9	rfs celwave	ACU-A20-N	3	5/16	
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1/2	
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe	-	-	2
		1	tower mounts	Platform Mount [LP 1201-1]			1
	148.0	3	argus technologies	LLPX310R w/ Mount Pipe			
		3	samsung telecommunications	FDD_R6_RRH			
142.0	142.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	3

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
134.0	135.0	12	decibel	844G90VTA-SX w/ Mount Pipe	12	1-1/4	1
	134.0	1	tower mounts	Platform Mount [LP 1201-1]			
119.0	120.0	6	ericsson	KRY 112 71	-	-	3
		6	rfs celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe			
	119.0	1	tower mounts	Platform Mount [LP 303-1]	18	1-5/8	1
99.0	100.0	1	lucent	KS24019-L112A	1	1/2	1
	99.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

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)
150	150	1	-	14' Low Profile Mount	-	-
		1	-	5/8" Lighning Rod		
		12	-	DB980H PCS		
130	130	1	-	14' Low Profile Mount	-	-
		12	-	DB980H PCS		
110	110	1	-	14' Low Profile Mount	-	-
		12	-	DB980H PCS		
100	100	1	-	GPS Antenna with Mount	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, PE, PC, Dated: 06/22/1997	1529732	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit, Job# 2249, Dated: 08/14/1997	1447037	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, Job# 2249, Dated: 08/14/1997	1446973	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Destek Engineering, LLC. 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	150 - 108	Pole	TP30.401x22x0.25	1	-10.29	1135.77	68.0	Pass
L2	108 - 69.75	Pole	TP37.553x29.1509x0.3125	2	-16.51	1752.38	97.6	Pass
L3	69.75 - 32.5	Pole	TP44.379x35.9778x0.375	3	-24.98	2693.26	94.2	Pass
L4	32.5 - 0	Pole	TP50.13x42.5288x0.4375	4	-36.53	3639.32	91.6	Pass
							Summary	
						Pole (L2)	97.6	Pass
						Rating =	97.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	87.3	Pass
1	Base Plate	0	94.6	Pass
1	Base Foundation	0	60.2	Pass
1	Base Foundation Soil Interaction	0	53.1	Pass

Structure Rating (max from all components) =	97.6%

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

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. In order for the results of this analysis to be considered valid, the loading modification listed below must be completed.

Loading Changes:

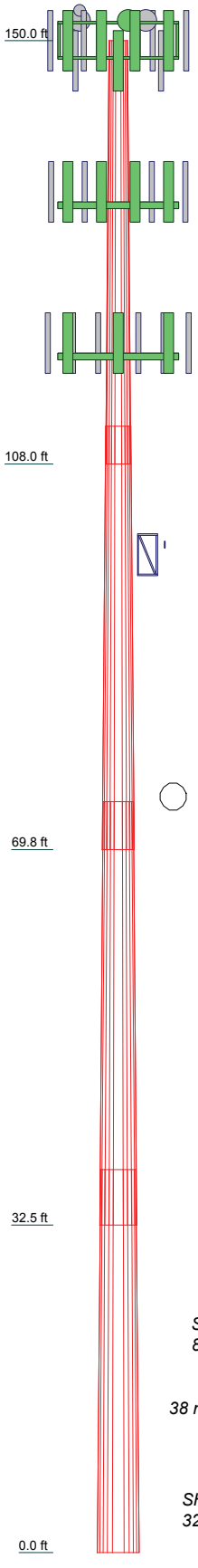
1.) All antennas and equipment, mounts, and feedlines associated with Metro PCS's installation at 142' AGL are to be removed from the tower prior to proceeding with the proposed changes.

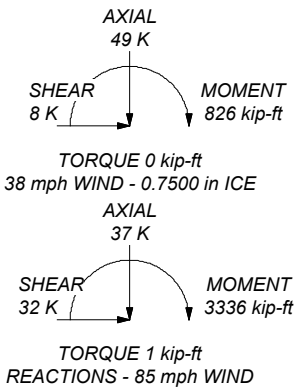
No additional structural modifications are required at this time, provided that the above listed changes are implemented.

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	42.00	12	0.2500	3.75	22.0000	30.4010	A607-60	3.0
2	42.00	12	0.3125	4.75	29.1509	37.5530		4.8
3	42.00	12	0.3750	5.50	35.9778	44.3790		6.9
4	38.00	12	0.4375		42.5288	50.1300	A607-65	8.4
								23.0





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 1201-1]	150	A-ANT-23G-2-C	150
(2) 6' x 2" Mount Pipe	150	A-ANT-23G-2-C	150
(2) 6' x 2" Mount Pipe	150	A-ANT-23G-2-C	150
(2) 6' x 2" Mount Pipe	150	Platform Mount [LP 1201-1]	134
APXVTM14-C-120 w/ Mount Pipe	150	(4) 844G90VTA-SX w/ Mount Pipe	134
APXVTM14-C-120 w/ Mount Pipe	150	(4) 844G90VTA-SX w/ Mount Pipe	134
APXVTM14-C-120 w/ Mount Pipe	150	(4) 844G90VTA-SX w/ Mount Pipe	134
TD-RRH8x20-25	150	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	119
TD-RRH8x20-25	150	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	119
TD-RRH8x20-25	150	LNX-6515DS-VTM w/ Mount Pipe	119
APXVSPP18-C-A20 w/ Mount Pipe	150	LNX-6515DS-VTM w/ Mount Pipe	119
APXVSPP18-C-A20 w/ Mount Pipe	150	LNX-6515DS-VTM w/ Mount Pipe	119
APXVSPP18-C-A20 w/ Mount Pipe	150	KRY 112 144/1	119
TME-1900MHz RRH (65MHz)	150	KRY 112 144/1	119
TME-1900MHz RRH (65MHz)	150	KRY 112 144/1	119
TME-1900MHz RRH (65MHz)	150	RRUS 11 B12	119
(3) ACU-A20-N	150	RRUS 11 B12	119
(3) ACU-A20-N	150	RRUS 11 B12	119
(3) ACU-A20-N	150	Platform Mount [LP 303-1]	119
800 EXTERNAL NOTCH FILTER	150	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	119
800 EXTERNAL NOTCH FILTER	150	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	119
800 EXTERNAL NOTCH FILTER	150	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	119
800MHZ RRH	150	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	119
800MHZ RRH	150	KS24019-L112A	99
800MHZ RRH	150	Side Arm Mount [SO 701-1]	99
LLPX310R w/ Mount Pipe	150		
LLPX310R w/ Mount Pipe	150		
LLPX310R w/ Mount Pipe	150		
FDD_R6_RRH	150		
FDD_R6_RRH	150		
FDD_R6_RRH	150		
A-ANT-23G-1-C	150		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.6%

DESTEK ENGINEERING
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Marietta, GA 30066
Phone: (770) 693-0835
FAX:

Job: ***BU 876319 NAUGATUCK 2 UNIROYAL***			
Project: ***1502368***			
Client: Crown Castle	Drawn by: Ahmet Colakoglu		App'd:
Code: TIA/EIA-222-F	Date: 10/01/15		Scale: NTS
Path: Y:\2015\02 - Crown\1502368 - 876319 Naugatuck 2 Uniroyal (2) WO\WO 1128768\TNXTower\876319.eri			Dwg No. E-1

Tower Input Data

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

1) Tower is located in New Haven County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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	150.00-108.00	42.00	3.75	12	22.0000	30.4010	0.2500	1.0000	A607-60 (60 ksi)
L2	108.00-69.75	42.00	4.75	12	29.1509	37.5530	0.3125	1.2500	A607-60 (60 ksi)
L3	69.75-32.50	42.00	5.50	12	35.9778	44.3790	0.3750	1.5000	A607-65 (65 ksi)
L4	32.50-0.00	38.00		12	42.5288	50.1300	0.4375	1.7500	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	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	31.4734	24.2716	2816.3524	10.7941	15.7477	178.8419	5706.6935	11.9457	7.4775	29.91

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
L2	30.9559	29.0187	3080.3908	10.3242	15.1002	203.9971	6241.7070	14.2821	6.9749	22.32
	38.8777	37.4733	6633.4331	13.3321	19.4525	341.0075	13441.1339	18.4432	9.2267	29.525
L3	38.2306	42.9903	6955.4340	12.7458	18.6365	373.2160	14093.5951	21.1585	8.6370	23.032
	45.9445	53.1348	13132.5650	15.7534	22.9883	571.2711	26610.1370	26.1513	10.8886	29.036
L4	45.1681	59.2962	13409.0519	15.0687	22.0299	608.6741	27170.3746	29.1838	10.2252	23.372
	51.8984	70.0043	22064.4151	17.7899	25.9673	849.6987	44708.4869	34.4540	12.2623	28.028

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 150.00-108.00				1	1	1		
L2 108.00-69.75				1	1	1		
L3 69.75-32.50				1	1	1		
L4 32.50-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	B	Surface Ar (CaAa)	150.00 - 8.00	1	1	0.000 0.000	0.5800		0.22
Step Pegs (3/4" Diameter)	B	Surface Ar (CaAa)	150.00 - 8.00	1	1	0.000 0.000	0.3300		1.50
***									

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
***								
7983A(1/2")	A	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
9207(5/16")	A	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
						2" Ice	0.00	0.60
						4" Ice	0.00	0.60
9258(1/4)	A	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	0.04
						1/2" Ice	0.00	0.04
						1" Ice	0.00	0.04
						2" Ice	0.00	0.04
						4" Ice	0.00	0.04
HB114-1-0813U4-M5J(1 1/4")	A	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
						2" Ice	0.00	1.20
						4" Ice	0.00	1.20

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
HB114-21U3M12-XXXF(1-1/4")	A	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
						2" Ice	0.00	1.22
						4" Ice	0.00	1.22
2" Rigid Conduit	A	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
						2" Ice	0.00	2.80
						4" Ice	0.00	2.80
***								
***								
LDF6-50A(1-1/4")	B	No	Inside Pole	134.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	119.00 - 0.00	18	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
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	Inside Pole	119.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07
						2" Ice	0.00	1.07
						4" Ice	0.00	1.07
***								
LDF4-50A(1/2")	A	No	Inside Pole	99.00 - 0.00	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
***								

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	150.00-108.00	A	0.000	0.000	0.000	0.000	0.53
		B	0.000	0.000	3.822	0.000	0.28
		C	0.000	0.000	0.000	0.000	0.17
L2	108.00-69.75	A	0.000	0.000	0.000	0.000	0.49
		B	0.000	0.000	3.481	0.000	0.37
		C	0.000	0.000	0.000	0.000	0.61
L3	69.75-32.50	A	0.000	0.000	0.000	0.000	0.47
		B	0.000	0.000	3.390	0.000	0.36
		C	0.000	0.000	0.000	0.000	0.59
L4	32.50-0.00	A	0.000	0.000	0.000	0.000	0.41
		B	0.000	0.000	2.229	0.000	0.30
		C	0.000	0.000	0.000	0.000	0.51

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	150.00-108.00	A	0.883	0.000	0.000	0.000	0.000	0.53
		B		0.000	0.000	18.649	0.000	0.40
		C		0.000	0.000	0.000	0.000	0.17
L2	108.00-69.75	A	0.844	0.000	0.000	0.000	0.000	0.49

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
		B		0.000	0.000	16.984	0.000	0.48
		C		0.000	0.000	0.000	0.000	0.61
L3	69.75-32.50	A	0.790	0.000	0.000	0.000	0.000	0.47
		B		0.000	0.000	15.968	0.000	0.46
		C		0.000	0.000	0.000	0.000	0.59
L4	32.50-0.00	A	0.750	0.000	0.000	0.000	0.000	0.41
		B		0.000	0.000	9.975	0.000	0.36
		C		0.000	0.000	0.000	0.000	0.51

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-108.00	0.1156	-0.0667	0.4619	-0.2667
L2	108.00-69.75	0.1162	-0.0671	0.4831	-0.2789
L3	69.75-32.50	0.1165	-0.0673	0.4822	-0.2784
L4	32.50-0.00	0.0870	-0.0502	0.3559	-0.2055

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
**********									
Platform Mount [LP 1201-1]	C	None		0.0000	150.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
						2" Ice	37.90	37.90	3.70
						4" Ice	52.70	52.70	5.30
(2) 6' x 2" Mount Pipe	A	From Face	4.00 0.00 0.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" Mount Pipe	B	From Face	4.00 0.00 0.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" Mount Pipe	C	From Face	4.00 0.00 0.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Face	4.00 0.00 0.00	5.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Face	4.00 0.00	-15.0000	150.00	No Ice	7.13 7.66	4.96 5.75	0.08 0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	8.18 9.26	6.47 8.01	0.19 0.34
						1" Ice	11.53	11.41	0.75
						2" Ice			
						4" Ice			
APXVTM14-C-120 w/ Mount Pipe	C	From Face	4.00 0.00 0.00	-10.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
TD-RRH8x20-25	A	From Face	4.00 0.00 0.00	5.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	B	From Face	4.00 0.00 0.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Face	4.00 0.00 0.00	-10.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.00 0.00 0.00	5.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.00 0.00 0.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.00 0.00 0.00	-10.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
TME-1900MHz RRH (65MHz)	A	From Face	4.00 0.00 0.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
TME-1900MHz RRH (65MHz)	B	From Face	4.00 0.00 0.00	-35.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
TME-1900MHz RRH (65MHz)	C	From Face	4.00 0.00 0.00	-10.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35

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
(3) ACU-A20-N	A	From Face	4.00 0.00 0.00	5.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	B	From Face	4.00 0.00 0.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	C	From Face	4.00 0.00 0.00	-10.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
800 EXTERNAL NOTCH FILTER	A	From Face	4.00 0.00 0.00	5.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	B	From Face	4.00 0.00 0.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	C	From Face	4.00 0.00 0.00	-10.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800MHZ RRH	A	From Face	4.00 0.00 0.00	5.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
800MHZ RRH	B	From Face	4.00 0.00 0.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
800MHZ RRH	C	From Face	4.00 0.00 0.00	-10.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
***									
LLPX310R w/ Mount Pipe	A	From Face	4.00 0.00 -2.00	5.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.07 5.48 5.91 6.79 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
LLPX310R w/ Mount Pipe	B	From Face	4.00 0.00 -2.00	-15.0000	150.00	No Ice 1/2" Ice 1" Ice	5.07 5.48 5.91 6.79	2.98 3.53 4.09 5.31	0.05 0.08 0.13 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" Ice	8.70	8.13	0.54
						4" Ice			
LLPX310R w/ Mount Pipe	C	From Face	4.00 0.00 -2.00	-10.0000	150.00	No Ice	5.07	2.98	0.05
						1/2" Ice	5.48	3.53	0.08
						1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23
						4" Ice	8.70	8.13	0.54
FDD_R6_RRH	A	From Face	4.00 0.00 -2.00	5.0000	150.00	No Ice	1.79	0.78	0.03
						1/2" Ice	1.97	0.92	0.04
						1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
FDD_R6_RRH	B	From Face	4.00 0.00 -2.00	-15.0000	150.00	No Ice	1.79	0.78	0.03
						1/2" Ice	1.97	0.92	0.04
						1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
FDD_R6_RRH	C	From Face	4.00 0.00 -2.00	-10.0000	150.00	No Ice	1.79	0.78	0.03
						1/2" Ice	1.97	0.92	0.04
						1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
***									
***									
Platform Mount [LP 1201-1]	C	None		0.0000	134.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
						2" Ice	37.90	37.90	3.70
						4" Ice	52.70	52.70	5.30
(4) 844G90VTA-SX w/ Mount Pipe	A	From Face	3.76 0.00 1.00	-20.0000	134.00	No Ice	3.30	4.92	0.03
						1/2" Ice	3.69	5.60	0.07
						1" Ice	4.12	6.28	0.11
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.55
(4) 844G90VTA-SX w/ Mount Pipe	B	From Face	3.76 0.00 1.00	-20.0000	134.00	No Ice	3.30	4.92	0.03
						1/2" Ice	3.69	5.60	0.07
						1" Ice	4.12	6.28	0.11
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.55
(4) 844G90VTA-SX w/ Mount Pipe	C	From Face	3.76 0.00 1.00	-20.0000	134.00	No Ice	3.30	4.92	0.03
						1/2" Ice	3.69	5.60	0.07
						1" Ice	4.12	6.28	0.11
						2" Ice	5.01	7.71	0.23
						4" Ice	6.92	10.83	0.55
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	119.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	119.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81

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
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	119.00	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	A	From Face	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.81 7.33 7.85 8.91 11.16	5.63 6.47 7.24 8.85 12.27	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.81 7.33 7.85 8.91 11.16	5.63 6.47 7.24 8.85 12.27	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.81 7.33 7.85 8.91 11.16	5.63 6.47 7.24 8.85 12.27	0.11 0.17 0.23 0.38 0.81
LNX-6515DS-VTM w/ Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.65 12.37 13.10 14.56 17.83	9.84 11.37 12.92 15.27 20.14	0.08 0.17 0.27 0.51 1.15
LNX-6515DS-VTM w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.65 12.37 13.10 14.56 17.83	9.84 11.37 12.92 15.27 20.14	0.08 0.17 0.27 0.51 1.15
LNX-6515DS-VTM w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.65 12.37 13.10 14.56 17.83	9.84 11.37 12.92 15.27 20.14	0.08 0.17 0.27 0.51 1.15
KRY 112 144/1	A	From Face	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	B	From Face	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Face	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
RRUS 11 B12	A	From Face	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" 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

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 11 B12	B	From Face	4.00	0.00	0.0000	119.00	4" Ice 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
RRUS 11 B12	C	From Face	4.00	0.00	0.0000	119.00	4" Ice 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
Platform Mount [LP 303-1]	C	None			0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.66 18.87 23.08 31.50 48.34	14.66 18.87 23.08 31.50 48.34	1.25 1.48 1.71 2.18 3.10
***										
KS24019-L112A	B	From Face	4.00	0.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06
Side Arm Mount [SO 701-1]	B	From Face	2.00	0.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-23G-1-C	A	Paraboloid w/Shroud (HP)	From Centroid-Face	3.86	-1.04 3.00	5.0000		150.00	1.27	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.28 1.45 1.63 2.03 2.96	0.02 0.02 0.04 0.08 0.19
A-ANT-23G-2-C	A	Paraboloid w/o Radome	From Centroid-Face	3.86	-1.04 2.00	5.0000		150.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19
A-ANT-23G-2-C	B	Paraboloid w/o Radome	From Centroid-Face	3.86	-1.04 2.00	-15.0000		150.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19
A-ANT-23G-2-C	C	Paraboloid w/o Radome	From Centroid-Face	3.86	-1.04 2.00	-10.0000		150.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice	3.72 4.01 4.30 4.88	0.03 0.05 0.07 0.11

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
									4" Ice	6.04	0.19

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 108	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.99	-0.03	0.13
			Max. Mx	5	-10.37	-438.43	-12.94
			Max. My	8	-10.29	-5.77	-455.38
			Max. Vy	5	18.58	-438.43	-12.94
			Max. Vx	8	19.03	-5.77	-455.38
			Max. Torque	6			-1.18
L2	108 - 69.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.49	-0.53	0.42
			Max. Mx	5	-16.57	-1216.66	-25.67
			Max. My	8	-16.51	-11.98	-1250.41

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	5	23.18	-1216.66	-25.67
			Max. Vx	8	23.64	-11.98	-1250.41
			Max. Torque	6			-1.12
L3	69.75 - 32.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.14	-0.77	0.56
			Max. Mx	5	-25.01	-2143.39	-38.27
			Max. My	8	-24.98	-18.02	-2193.97
			Max. Vy	5	27.49	-2143.39	-38.27
			Max. Vx	8	27.95	-18.02	-2193.97
			Max. Torque	5			-0.93
L4	32.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-48.92	-0.97	0.68
			Max. Mx	5	-36.53	-3268.04	-51.03
			Max. My	8	-36.53	-24.13	-3335.75
			Max. Vy	5	31.67	-3268.04	-51.03
			Max. Vx	8	32.11	-24.13	-3335.75
			Max. Torque	4			-0.91

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	21	48.92	-0.03	-7.63
	Max. H_x	11	36.55	31.64	0.04
	Max. H_z	2	36.55	0.18	32.02
	Max. M_x	2	3324.53	0.18	32.02
	Max. M_z	5	3268.04	-31.65	-0.33
	Max. Torsion	10	0.67	27.34	-15.97
	Min. Vert	1	36.55	0.00	0.00
	Min. H_x	5	36.55	-31.65	-0.33
	Min. H_z	8	36.55	-0.16	-32.09
	Min. M_x	8	-3335.75	-0.16	-32.09
	Min. M_z	11	-3266.62	31.64	0.04
	Min. Torsion	4	-0.91	-27.42	15.89

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	36.55	0.00	0.00	-0.32	-0.45	0.00
Dead+Wind 0 deg - No Ice	36.55	-0.18	-32.02	-3324.53	27.25	0.07
Dead+Wind 30 deg - No Ice	36.55	15.55	-27.74	-2881.89	-1592.15	0.20
Dead+Wind 60 deg - No Ice	36.55	27.42	-15.89	-1644.19	-2833.20	0.91
Dead+Wind 90 deg - No Ice	36.55	31.65	0.33	51.03	-3268.04	0.89
Dead+Wind 120 deg - No Ice	36.55	27.51	16.07	1671.17	-2845.52	0.76
Dead+Wind 150 deg - No Ice	36.55	15.93	27.83	2893.89	-1650.17	0.33
Dead+Wind 180 deg - No Ice	36.55	0.16	32.09	3335.75	-24.13	0.15
Dead+Wind 210 deg - No Ice	36.55	-15.76	27.63	2863.97	1623.98	-0.30
Dead+Wind 240 deg - No Ice	36.55	-27.34	15.97	1656.80	2818.78	-0.67
Dead+Wind 270 deg - No Ice	36.55	-31.64	-0.04	-5.57	3266.62	-0.59
Dead+Wind 300 deg - No Ice	36.55	-27.48	-16.14	-1682.34	2839.76	-0.12
Dead+Wind 330 deg - No Ice	36.55	-15.81	-27.84	-2897.38	1630.08	-0.06
Dead+Ice+Temp	48.92	0.00	0.00	-0.68	-0.97	0.00
Dead+Wind 0 deg+Ice+Temp	48.92	-0.04	-7.62	-824.22	5.17	0.16
Dead+Wind 30 deg+Ice+Temp	48.92	3.71	-6.60	-714.68	-397.67	0.12
Dead+Wind 60 deg+Ice+Temp	48.92	6.54	-3.78	-408.40	-705.52	0.18

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+Wind 90 deg+Ice+Temp	48.92	7.55	0.07	11.02	-813.50	0.08
Dead+Wind 120 deg+Ice+Temp	48.92	6.56	3.82	412.95	-708.08	0.00
Dead+Wind 150 deg+Ice+Temp	48.92	3.80	6.62	715.90	-410.77	-0.11
Dead+Wind 180 deg+Ice+Temp	48.92	0.03	7.63	825.58	-6.34	-0.11
Dead+Wind 210 deg+Ice+Temp	48.92	-3.76	6.57	709.17	403.28	-0.14
Dead+Wind 240 deg+Ice+Temp	48.92	-6.52	3.80	410.08	700.26	-0.12
Dead+Wind 270 deg+Ice+Temp	48.92	-7.54	-0.01	-1.66	811.27	-0.01
Dead+Wind 300 deg+Ice+Temp	48.92	-6.55	-3.84	-416.83	704.84	0.15
Dead+Wind 330 deg+Ice+Temp	48.92	-3.77	-6.62	-717.97	404.17	0.17
Dead+Wind 0 deg - Service	36.55	-0.06	-11.08	-1152.34	9.14	0.03
Dead+Wind 30 deg - Service	36.55	5.38	-9.60	-998.91	-552.04	0.08
Dead+Wind 60 deg - Service	36.55	9.49	-5.50	-569.98	-982.10	0.32
Dead+Wind 90 deg - Service	36.55	10.95	0.11	17.47	-1132.77	0.30
Dead+Wind 120 deg - Service	36.55	9.52	5.56	578.91	-986.39	0.27
Dead+Wind 150 deg - Service	36.55	5.51	9.63	1002.67	-572.18	0.12
Dead+Wind 180 deg - Service	36.55	0.05	11.10	1155.81	-8.67	0.06
Dead+Wind 210 deg - Service	36.55	-5.45	9.56	992.26	562.46	-0.11
Dead+Wind 240 deg - Service	36.55	-9.46	5.53	573.91	976.48	-0.23
Dead+Wind 270 deg - Service	36.55	-10.95	-0.01	-2.15	1131.66	-0.20
Dead+Wind 300 deg - Service	36.55	-9.51	-5.58	-583.23	983.79	-0.05
Dead+Wind 330 deg - Service	36.55	-5.47	-9.63	-1004.32	564.59	-0.03

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-36.55	0.00	0.00	36.55	0.00	0.000%
2	-0.18	-36.55	-32.02	0.18	36.55	32.02	0.000%
3	15.55	-36.55	-27.74	-15.55	36.55	27.74	0.000%
4	27.42	-36.55	-15.89	-27.42	36.55	15.89	0.000%
5	31.65	-36.55	0.33	-31.65	36.55	-0.33	0.000%
6	27.51	-36.55	16.07	-27.51	36.55	-16.07	0.000%
7	15.93	-36.55	27.83	-15.93	36.55	-27.83	0.000%
8	0.16	-36.55	32.09	-0.16	36.55	-32.09	0.000%
9	-15.76	-36.55	27.63	15.76	36.55	-27.63	0.000%
10	-27.34	-36.55	15.97	27.34	36.55	-15.97	0.000%
11	-31.64	-36.55	-0.04	31.64	36.55	0.04	0.000%
12	-27.48	-36.55	-16.14	27.48	36.55	16.14	0.000%
13	-15.81	-36.55	-27.84	15.81	36.55	27.84	0.000%
14	0.00	-48.92	0.00	0.00	48.92	0.00	0.000%
15	-0.04	-48.92	-7.62	0.04	48.92	7.62	0.000%
16	3.71	-48.92	-6.60	-3.71	48.92	6.60	0.000%
17	6.54	-48.92	-3.78	-6.54	48.92	3.78	0.000%
18	7.55	-48.92	0.07	-7.55	48.92	-0.07	0.000%
19	6.56	-48.92	3.82	-6.56	48.92	-3.82	0.000%
20	3.80	-48.92	6.62	-3.80	48.92	-6.62	0.000%
21	0.03	-48.92	7.63	-0.03	48.92	-7.63	0.000%
22	-3.76	-48.92	6.57	3.76	48.92	-6.57	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
23	-6.52	-48.92	3.80	6.52	48.92	-3.80	0.000%
24	-7.54	-48.92	-0.01	7.54	48.92	0.01	0.000%
25	-6.55	-48.92	-3.84	6.55	48.92	3.84	0.000%
26	-3.77	-48.92	-6.62	3.77	48.92	6.62	0.000%
27	-0.06	-36.55	-11.08	0.06	36.55	11.08	0.000%
28	5.38	-36.55	-9.60	-5.38	36.55	9.60	0.000%
29	9.49	-36.55	-5.50	-9.49	36.55	5.50	0.000%
30	10.95	-36.55	0.11	-10.95	36.55	-0.11	0.000%
31	9.52	-36.55	5.56	-9.52	36.55	-5.56	0.000%
32	5.51	-36.55	9.63	-5.51	36.55	-9.63	0.000%
33	0.05	-36.55	11.10	-0.05	36.55	-11.10	0.000%
34	-5.45	-36.55	9.56	5.45	36.55	-9.56	0.000%
35	-9.46	-36.55	5.53	9.46	36.55	-5.53	0.000%
36	-10.95	-36.55	-0.01	10.95	36.55	0.01	0.000%
37	-9.51	-36.55	-5.58	9.51	36.55	5.58	0.000%
38	-5.47	-36.55	-9.63	5.47	36.55	9.63	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00065535
3	Yes	5	0.00000001	0.00092353
4	Yes	5	0.00000001	0.00091495
5	Yes	5	0.00000001	0.00007221
6	Yes	5	0.00000001	0.00096329
7	Yes	5	0.00000001	0.00094870
8	Yes	4	0.00000001	0.00041117
9	Yes	5	0.00000001	0.00092731
10	Yes	5	0.00000001	0.00094107
11	Yes	4	0.00000001	0.00045884
12	Yes	5	0.00000001	0.00094763
13	Yes	5	0.00000001	0.00095166
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00020557
16	Yes	5	0.00000001	0.00025791
17	Yes	5	0.00000001	0.00025783
18	Yes	5	0.00000001	0.00020260
19	Yes	5	0.00000001	0.00026175
20	Yes	5	0.00000001	0.00026344
21	Yes	5	0.00000001	0.00020594
22	Yes	5	0.00000001	0.00025740
23	Yes	5	0.00000001	0.00025774
24	Yes	5	0.00000001	0.00020176
25	Yes	5	0.00000001	0.00026199
26	Yes	5	0.00000001	0.00026125
27	Yes	4	0.00000001	0.00010490
28	Yes	5	0.00000001	0.00007496
29	Yes	5	0.00000001	0.00007282
30	Yes	4	0.00000001	0.00020191
31	Yes	5	0.00000001	0.00008039
32	Yes	5	0.00000001	0.00007744
33	Yes	4	0.00000001	0.00009766
34	Yes	5	0.00000001	0.00007474
35	Yes	5	0.00000001	0.00007712
36	Yes	4	0.00000001	0.00012056
37	Yes	5	0.00000001	0.00007729
38	Yes	5	0.00000001	0.00007848

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 108	37.168	33	2.1612	0.0049
L2	111.75 - 69.75	20.816	33	1.8141	0.0016
L3	74.5 - 32.5	8.979	33	1.1644	0.0007
L4	38 - 0	2.298	33	0.5492	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	A-ANT-23G-1-C	33	37.168	2.1612	0.0049	26496
152.00	A-ANT-23G-2-C	33	37.168	2.1612	0.0049	26496
150.00	Platform Mount [LP 1201-1]	33	37.168	2.1612	0.0049	26496
134.00	Platform Mount [LP 1201-1]	33	30.036	2.0460	0.0033	8279
119.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	33	23.680	1.9040	0.0020	4272
99.00	KS24019-L112A	33	16.214	1.6157	0.0011	3417

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 108	107.046	8	6.2280	0.0132
L2	111.75 - 69.75	59.994	8	5.2292	0.0047
L3	74.5 - 32.5	25.897	8	3.3580	0.0019
L4	38 - 0	6.630	8	1.5846	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	A-ANT-23G-1-C	8	107.046	6.2280	0.0132	9385
152.00	A-ANT-23G-2-C	8	107.046	6.2280	0.0132	9385
150.00	Platform Mount [LP 1201-1]	8	107.046	6.2280	0.0132	9385
134.00	Platform Mount [LP 1201-1]	8	86.527	5.8965	0.0089	2930
119.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	8	68.238	5.4881	0.0058	1509
99.00	KS24019-L112A	8	46.741	4.6581	0.0033	1201

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	150 - 108 (1)	TP30.401x22x0.25	42.00	0.00	0.0	36.000	23.6677	-10.29	852.04	0.012
L2	108 - 69.75 (2)	TP37.553x29.1509x0.3125	42.00	0.00	0.0	36.000	36.5171	-16.51	1314.61	0.013
L3	69.75 - 32.5 (3)	TP44.379x35.9778x0.375	42.00	0.00	0.0	39.000	51.8064	-24.98	2020.45	0.012
L4	32.5 - 0 (4)	TP50.13x42.5288x0.4375	38.00	0.00	0.0	39.000	70.0043	-36.53	2730.17	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	150 - 108 (1)	TP30.401x22x0.25	455.41	32.143	36.000	0.893	0.00	0.000	36.000	0.000
L2	108 - 69.75 (2)	TP37.553x29.1509x0.3125	1250.47	46.348	36.000	1.287	0.00	0.000	36.000	0.000
L3	69.75 - 32.5 (3)	TP44.379x35.9778x0.375	2194.05	48.492	39.000	1.243	0.00	0.000	39.000	0.000
L4	32.5 - 0 (4)	TP50.13x42.5288x0.4375	3335.84	47.111	39.000	1.208	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	150 - 108 (1)	TP30.401x22x0.25	19.03	0.804	24.000	0.068	0.51	0.017	24.000	0.001
L2	108 - 69.75 (2)	TP37.553x29.1509x0.3125	23.64	0.647	24.000	0.055	0.23	0.004	24.000	0.000
L3	69.75 - 32.5 (3)	TP44.379x35.9778x0.375	27.96	0.540	26.000	0.042	0.18	0.002	26.000	0.000
L4	32.5 - 0 (4)	TP50.13x42.5288x0.4375	32.11	0.459	26.000	0.036	0.15	0.001	26.000	0.000

Pole Interaction Design Data

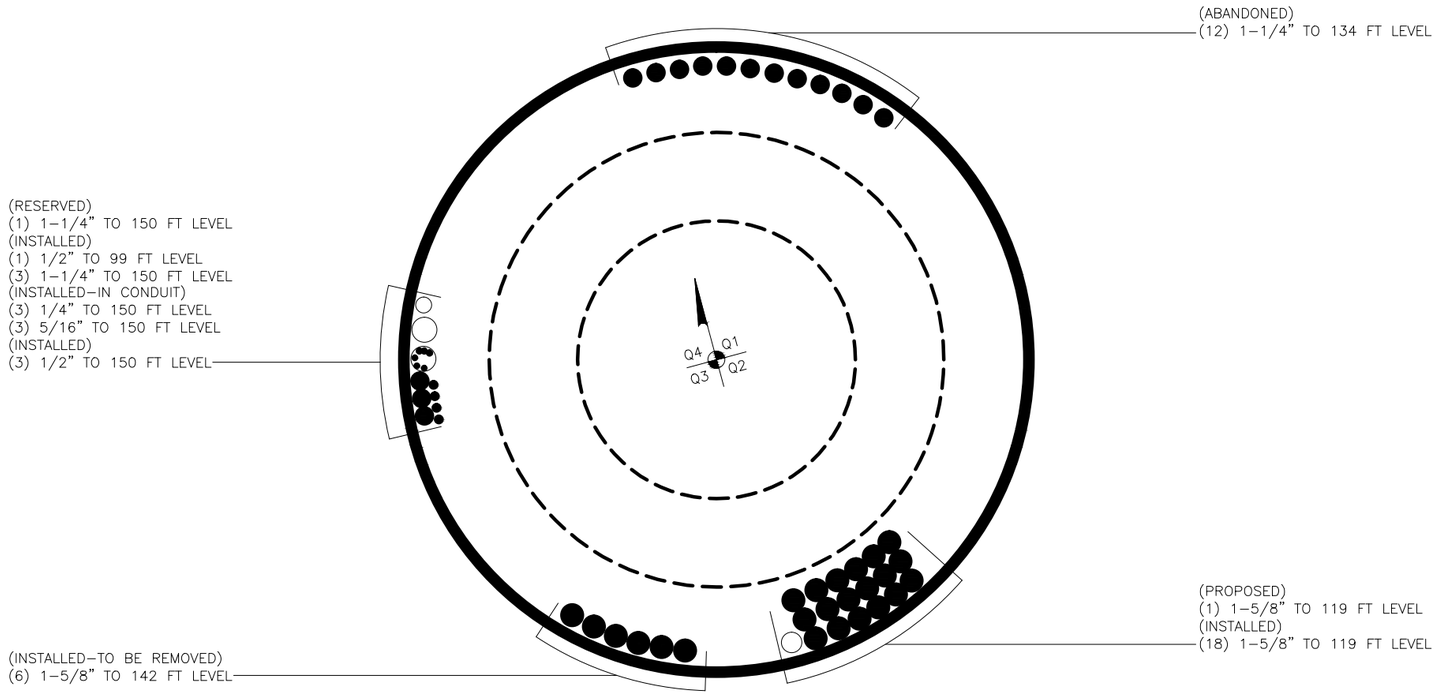
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 108 (1)	0.012	0.893	0.000	0.068	0.001	0.906 ✔	1.333	H1-3+VT ✔
L2	108 - 69.75 (2)	0.013	1.287	0.000	0.055	0.000	1.301 ✔	1.333	H1-3+VT ✔
L3	69.75 - 32.5 (3)	0.012	1.243	0.000	0.042	0.000	1.256 ✔	1.333	H1-3+VT ✔
L4	32.5 - 0 (4)	0.013	1.208	0.000	0.036	0.000	1.222 ✔	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	150 - 108	Pole	TP30.401x22x0.25	1	-10.29	1135.77	68.0	Pass
L2	108 - 69.75	Pole	TP37.553x29.1509x0.3125	2	-16.51	1752.38	97.6	Pass
L3	69.75 - 32.5	Pole	TP44.379x35.9778x0.375	3	-24.98	2693.26	94.2	Pass
L4	32.5 - 0	Pole	TP50.13x42.5288x0.4375	4	-36.53	3639.32	91.6	Pass
							Summary	
						Pole (L2)	97.6	Pass
						RATING =	**97.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876319 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#: *876319*
Site Name: *Naugatuck 2 Uniroyal*
App #: *309961*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	58	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	57	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	7	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:	50.13	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	3336	ft-kips
Unfactored Axial, P:	37	kips
Unfactored Shear, V:	32	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	170.2 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	87.3% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	47.3 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	94.6% **Pass**

PL Ref. Data	
Yield Line (in):	30.48
Max PL Length:	30.48

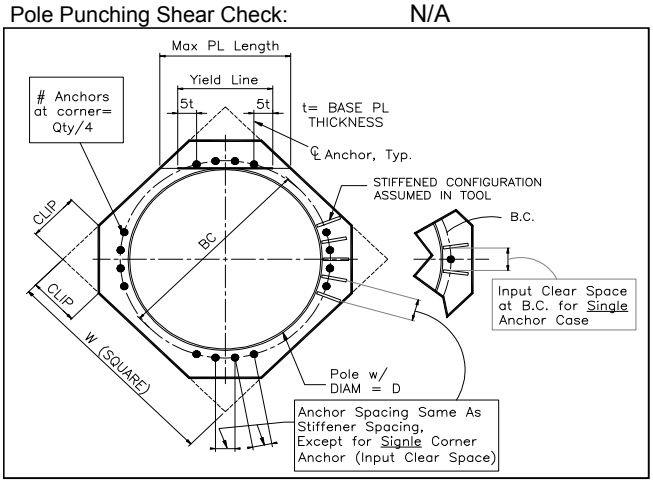
N/A - Unstiffened

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

CCI Foundation Tool Suite - Monopole Pier

CCIFTS 1.2.108.14286 - Phase 1-2 Date: 10/1/2015

BU:	876319
Site Name:	Naugatuck 2 Uniroyal
App Number:	309961
Work Order:	112YTCY

Monopole Drilled Pier

Input

Criteria

TIA Revision:	F
ACI 318 Revision:	2002
Seismic Category:	B

Forces

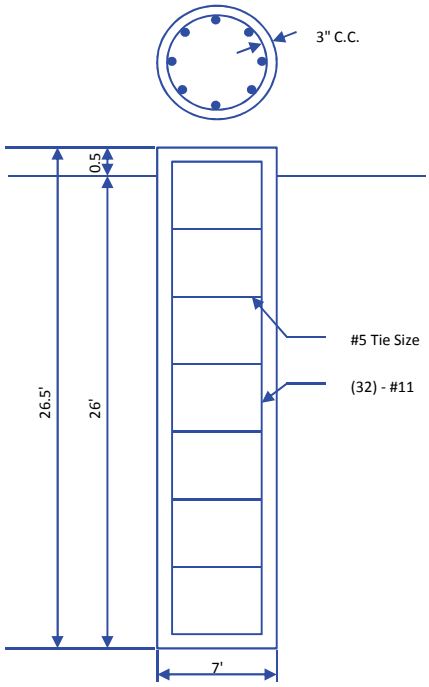
Compression	37	kips
Shear	32	kips
Moment	3336	k-ft
Swelling Force	0	kips

Foundation Dimensions

Pier Diameter:	7	ft
Ext. above grade:	0.5	ft
Depth below grade:	26	ft

Material Properties

Number of Rebar:	32	
Rebar Size:	11	
Tie Size	5	
Rebar tensile strength:	60	ksi
Concrete Strength:	3000	psi
Ultimate Concrete Strain	0.003	in/in
Clear Cover to Ties:	3	in



Soil Profile: 876319

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3.5	0	3.5	125	0	0	0	0	0	
2	4.5	3.5	8	125	0	34	0	0	0	
3	15	8	23	125	0	34	0	0	0	
4	3	23	26	62	0	34	0	0		57

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	6.19	ft
Max Moment, Mu:	3509.83	k-ft
Soil Safety Factor:	3.77	
Safety Factor Req'd:	2	
RATING:	53.1%	

Soil Axial Capacity

Skin Friction (k):	0.00	kips
End Bearing (k):	595.41	kips
Comp. Capacity (k), ϕCn:	595.41	kips
Comp. (k), Cu:	48.10	kips
RATING:	8.1%	

Concrete/Steel Check

Mu (from soil analysis)	4562.78	k-ft
ϕMn	7581.46	k-ft
RATING:	60.2%	

rho provided	0.90	
rho required	0.33	OK

Rebar Spacing	5.99	
Spacing required	22.56	OK

Dev. Length required	19.56	
Dev. Length provided	61.78	OK

Overall Foundation Rating: 60.2%

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

T-Mobile Existing Facility

Site ID: CTNH312A

280 Elm Street_Naugatuck
280 Elm St
Naugatuck, CT 06770

October 8, 2015

EBI Project Number: 6215005053

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	5.20 %

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October 8, 2015

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

Emissions Analysis for Site: **CTNH312A – 280 Elm Street_Naugatuck**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **280 Elm St, Naugatuck, 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 **280 Elm St, Naugatuck, 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 **120 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):	120	Height (AGL):	120	Height (AGL):	120
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.29	Antenna B1 MPE%	1.29	Antenna C1 MPE%	1.29
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):	120	Height (AGL):	120	Height (AGL):	120
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	1.29	Antenna B2 MPE%	1.29	Antenna C2 MPE%	1.29
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):	120	Height (AGL):	120	Height (AGL):	120
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%	0.51	Antenna B3 MPE%	0.51	Antenna C3 MPE%	0.51

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**3.10 %**
Nextel	0.34 %
Verizon Wireless	0.97 %
MetroPCS	0.35 %
Clearwire	0.08 %
Sprint	0.36 %
Site Total MPE %:	**5.20 %**

T-Mobile Sector 1 Total:	3.10 %
T-Mobile Sector 2 Total:	3.10 %
T-Mobile Sector 3 Total:	3.10 %
Site Total:	5.20 %

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**	**120**	**12.91**	**2100**	**1000**	**1.29 %**
T-Mobile 700 MHz LTE	**1**	**865.21**	**120**	**2.39**	**700**	**467**	**0.51 %**
T-Mobile 1900 MHz (PCS) GSM/UMTS	**2**	**1167.14**	**120**	**6.46**	**1900**	**1000**	**0.65 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**1167.14**	**120**	**6.46**	**2100**	**1000**	**0.65 %**
						Total:	**3.10%**

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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:	3.10 %
Sector 2:	3.10 %
Sector 3 :	3.10 %
T-Mobile Per Sector Maximum:	3.10 %
Site Total:	5.20 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.20%** 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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