Crown Castle
3530 Toringdon Way Suite 300
Charlotte NC 28277

Tel (704) 405-6600

March 11, 2015

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

RE: **T-Mobile-Exempt Modification - Crown Site BU: 842869**
T-Mobile Site ID: CT11733B
Located at: 450 West Main Street, Meriden, CT 06451

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 Manuel A. Santos, Mayor for the City of Meriden and Hunter's Ambulance Service, Inc., Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **450 West Main Street, Meriden, CT 06451**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile's operations at the site (Exhibit-3).

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

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

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

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

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

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

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

Sincerely,

Jerry Feathers
Real Estate Specialist

Enclosure

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

cc: The Honorable Manuel A. Santos, Mayor
142 East Main Street
Meriden CT, 06450

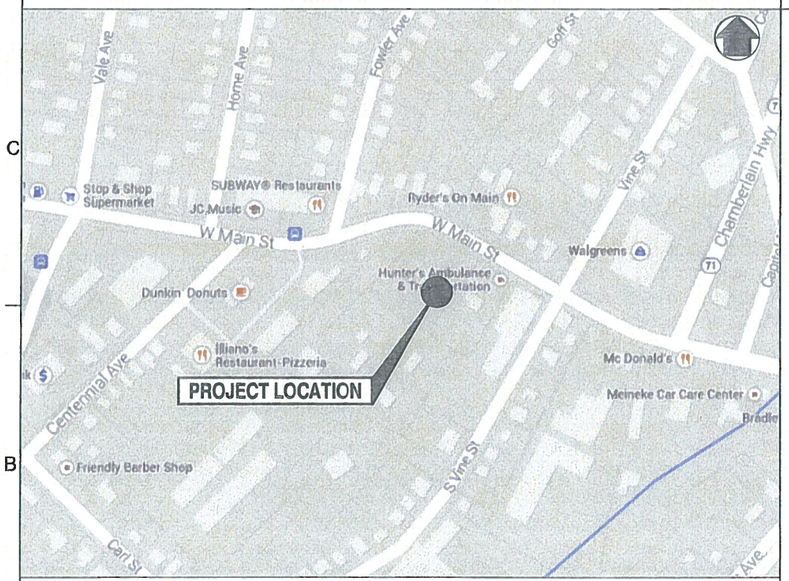
cc: Hunter's Ambulance Service, Inc.
450 West Main Street
Meriden, CT 06451

T-Mobile®

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11733B
CROWN CASTLE BU #: 842869
SITE NAME: MERIDEN WEST CENTRAL
450-478 WEST MAIN STREET
MERIDEN, CT 06451
NEW HAVEN COUNTY

SITE INFORMATION



KEY MAP
N.T.S.

DIRECTIONS: (FROM PARSIPPANY):

HEAD NORTHWEST ON SYLVAN WAY. TURN RIGHT ONTO US-202 N. CONTINUE STRAIGHT ONTO LITTLETON RD. TAKE THE RAMP ONTO I-287 N. TAKE THE I-87 S/I-287/NEW YORK THRUWAY EXIT TOWARD TAPPAN ZEE BR/NEW YORK CITY. MERGE ONTO I-287 E/I-87 S. KEEP RIGHT AT THE FORK TO CONTINUE ON I-87 S, FOLLOW SIGNS FOR SAW MILL PKWY S/NEW YORK CITY. TAKE EXIT 8A FOR NY-119/SAW MILL PKWY N TOWARD ELMSFORD. KEEP LEFT, FOLLOW SIGNS FOR SAW MILL RIVER PKWY N/KATONAH AND MERGE ONTO NEW YORK STATE REFERENCE RTE 987D N/SAW MILL RIVER PARKWAY N. KEEP LEFT, FOLLOW SIGNS FOR I-684/BREWSTER AND MERGE ONTO I-684 N. TAKE EXIT 9E FOR INTERSTATE 84 E TOWARD DANBURY. MERGE ONTO I-84 E. TAKE EXIT 27 FOR I-691 E TOWARD MERIDEN. CONTINUE ONTO I-691 E. TAKE EXIT 4 FOR W MAIN ST. TURN RIGHT ONTO MERIDEN-WATERBURY TURNPIKE. CONTINUE ONTO W MAIN ST. SITE WILL BE ON THE RIGHT.

PROJECT INFORMATION

T-MOBILE SITE #:	CT11733B
CROWN CASTLE BU #:	842869
SITE ADDRESS:	450-478 WEST MAIN STREET MERIDEN, CT 06451 NEW HAVEN COUNTY
LATITUDE:	N 41° 32' 24.24"
LONGITUDE:	W 72° 49' 9.06"
TOWER OWNER:	CROWN CASTLE 1200 MACARTHUR BLVD., SUITE 200 MAHWAH, NJ 07430
CONTACT:	WARREN KELLEHER (781) 970-0055
APPLICANT:	T-MOBILE NORTHEAST, LLC 4 SYLVAN WAY PARSIPPANY, NJ 07054
CONTACT:	PHONE #: (973) 397-4800 FAX #: (973) 292-8893
ENGINEER:	DEWBERRY ENGINEERS INC. 600 PARSIPPANY ROAD, SUITE 301 PARSIPPANY, NJ 07054
CONTACT:	GREG NAWROTZKI (973) 576-9653
SCOPE OF WORK:	(6) EXISTING ANTENNA, (3) TO REMAIN, (3) TO BE SWAPPED OUT WITH NEW ANTENNA, ADD (3) NEW RRU'S

CONFIGURATION
702Cc

SHEET INDEX

SHEET NO.	SHEET 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

APPROVALS

T-MOBILE — DATE

OWNER/ LANDLORD — DATE

RF ENGINEER — DATE

ZONING — DATE

CONSTRUCTION — DATE

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

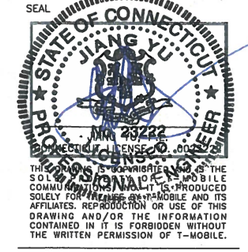
T-Mobile
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054
PHONE: (973) 397-4800
FAX: (973) 292-8893

MERIDEN WEST CENTRAL

CT11733B

450-478 WEST MAIN STREET
MERIDEN, CT 06451
NEW HAVEN COUNTY

SEAL



SCALE
AS SHOWN

REV.	DATE	BY	DESCRIPTION
1	03/04/15	FG	ISSUED AS FINAL
0	11/18/14	FG	ISSUED AS FINAL
A	11/11/14	FG	ISSUED FOR REVIEW

REVISIONS

DRAWN BY FG
CHECKED BY BSH
APPROVED BY GHN
DATE 10/30/14
TITLE

TITLE SHEET

PROJECT NO. 50066258/50072412

T-1

SHEET NO.

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.

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

T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054
PHONE: (973) 397-4600
FAX: (973) 292-8893

MERIDEN WEST CENTRAL

CT11733B

450-478 WEST MAIN STREET
MERIDEN, CT 06451
NEW HAVEN COUNTY

SEAL

SCALE
AS SHOWN

REV.	DATE	BY	DESCRIPTION
1	03/04/15	FG	ISSUED AS FINAL
0	11/18/14	FG	ISSUED AS FINAL
A	11/11/14	FG	ISSUED FOR REVIEW

REVISIONS

DRAWN BY FG
CHECKED BY BSH
APPROVED BY GHN
DATE 10/30/14

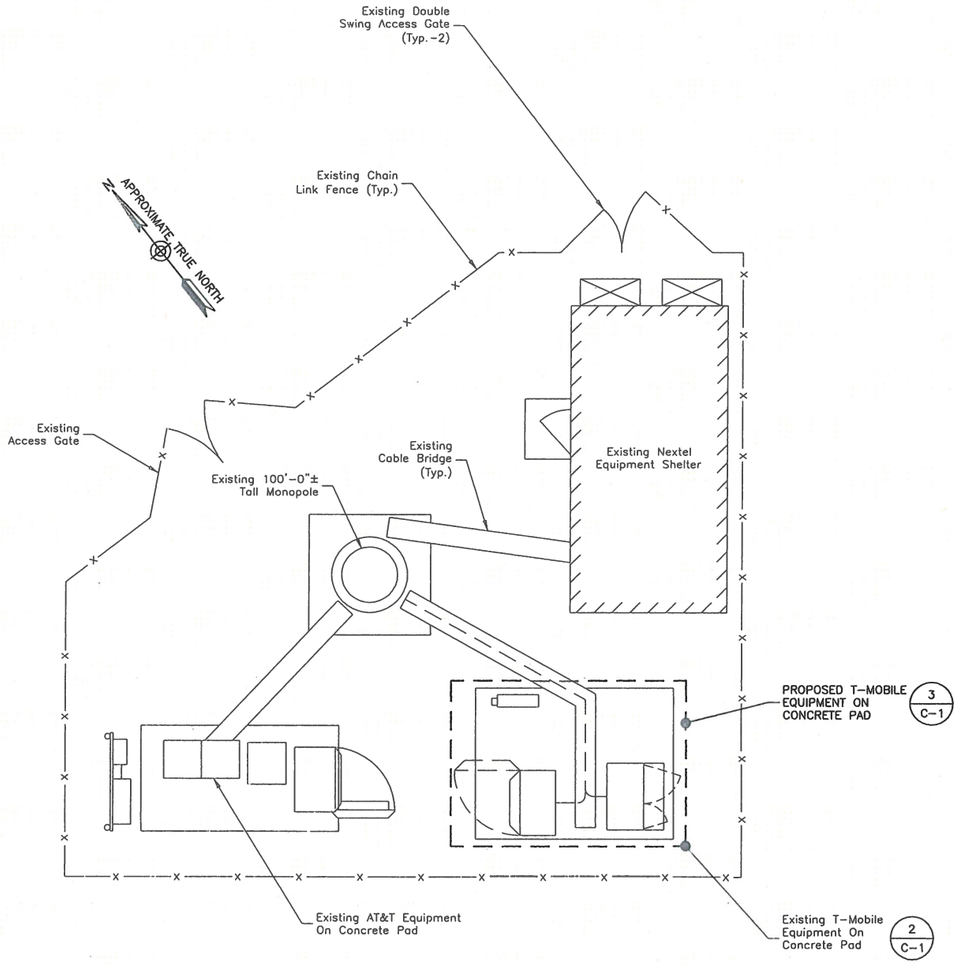
TITLE

GENERAL NOTES

PROJECT NO. 50066258/50072412

G - 1

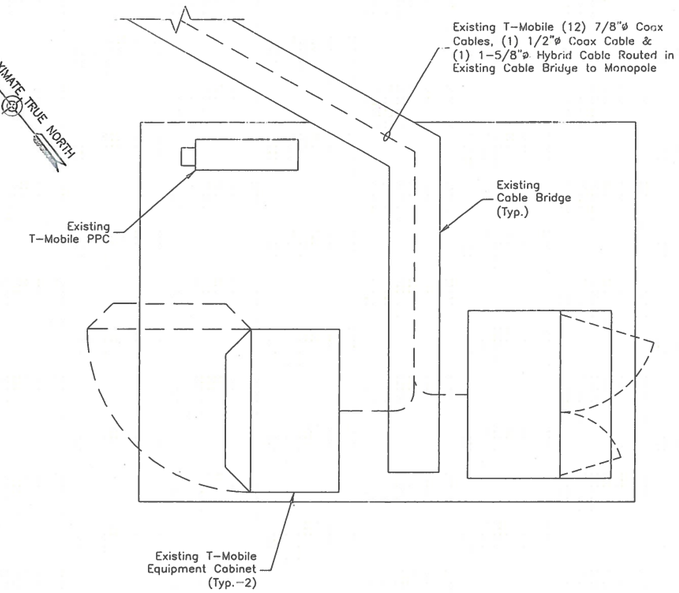
SHEET NO.



COMPOUND PLAN 1

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

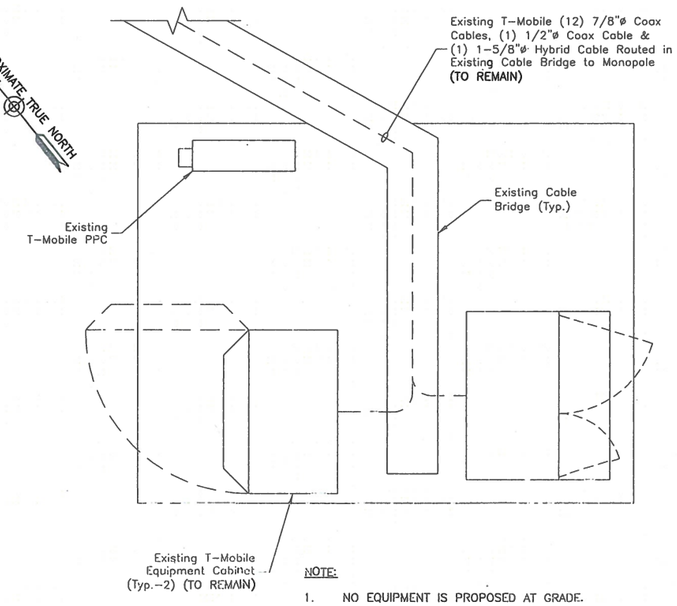
0' 5' 10'



EXISTING EQUIPMENT PLAN 2

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

0 2 4



NOTE:

1. NO EQUIPMENT IS PROPOSED AT GRADE.

PROPOSED EQUIPMENT PLAN 3

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

0 2 4

NOTES:

1. NORTH 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 MORRISON HERSHFIELD DATED FEBRUARY 24, 2015.

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

T-Mobile
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054
PHONE: (973) 397-6800
FAX: (973) 292-8893

MERIDEN WEST CENTRAL

CT11733B

450-478 WEST MAIN STREET
MERIDEN, CT 06451
NEW HAVEN COUNTY

SEAL

STATE OF CONNECTICUT
JIANG YU
No. 23822
PROFESSIONAL ENGINEER
JIANG YU, P.E.
CONNECTICUT LICENSE NO. 023822

SCALE
AS SHOWN

REV.	DATE	BY	DESCRIPTION
1	03/04/15	FG	ISSUED AS FINAL
0	11/18/14	FG	ISSUED AS FINAL
A	11/11/14	FG	ISSUED FOR REVIEW

REVISIONS

DRAWN BY FG
CHECKED BY BSH
APPROVED BY GHN
DATE 10/30/14

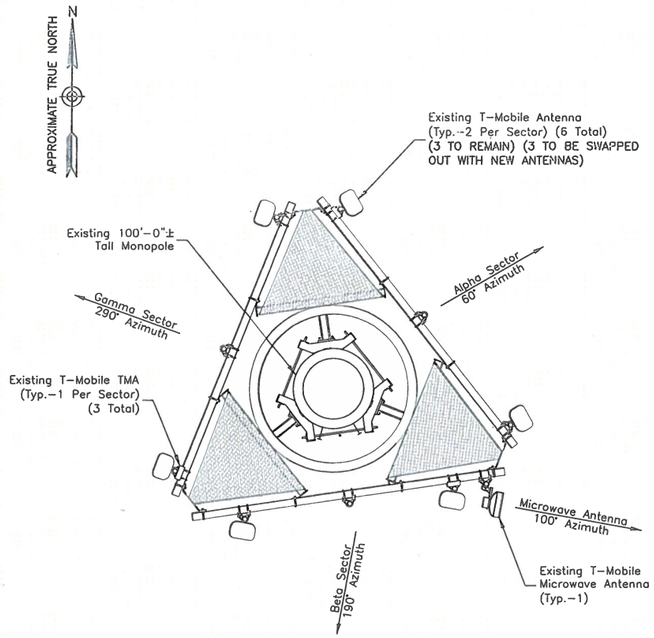
TITLE

COMPOUND PLAN & EQUIPMENT PLANS

PROJECT NO. 50066258/50072412

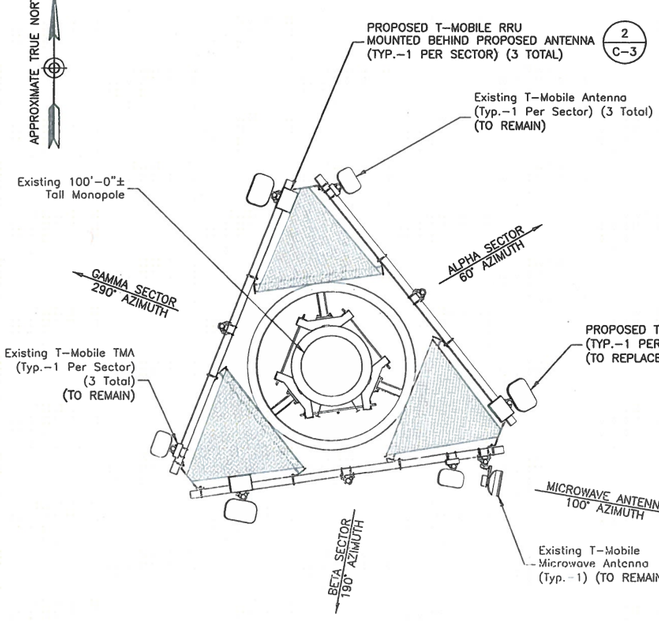
C - 1

SHEET NO.



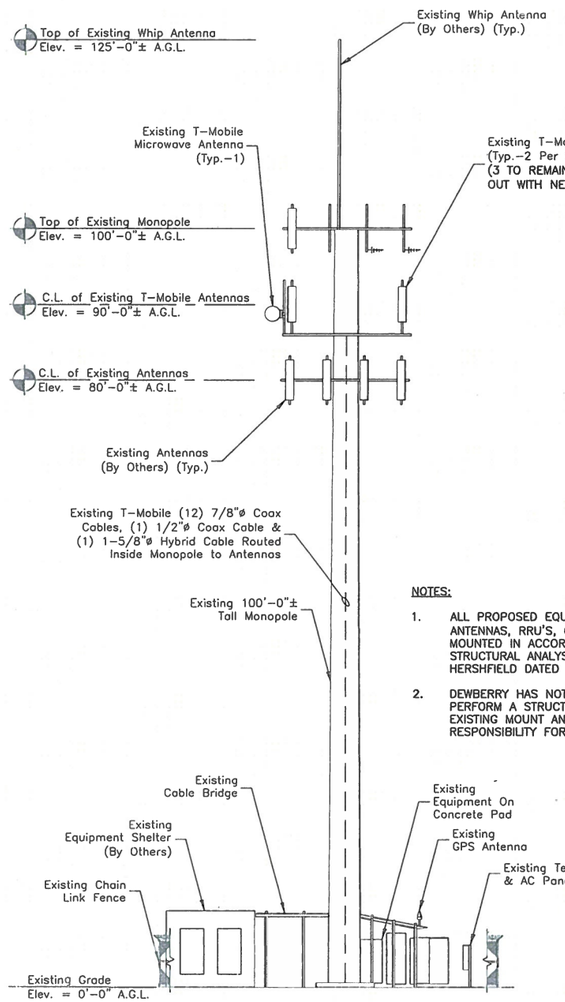
EXISTING ANTENNA LAYOUT (1)

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT (2)

SCALE: N.T.S.

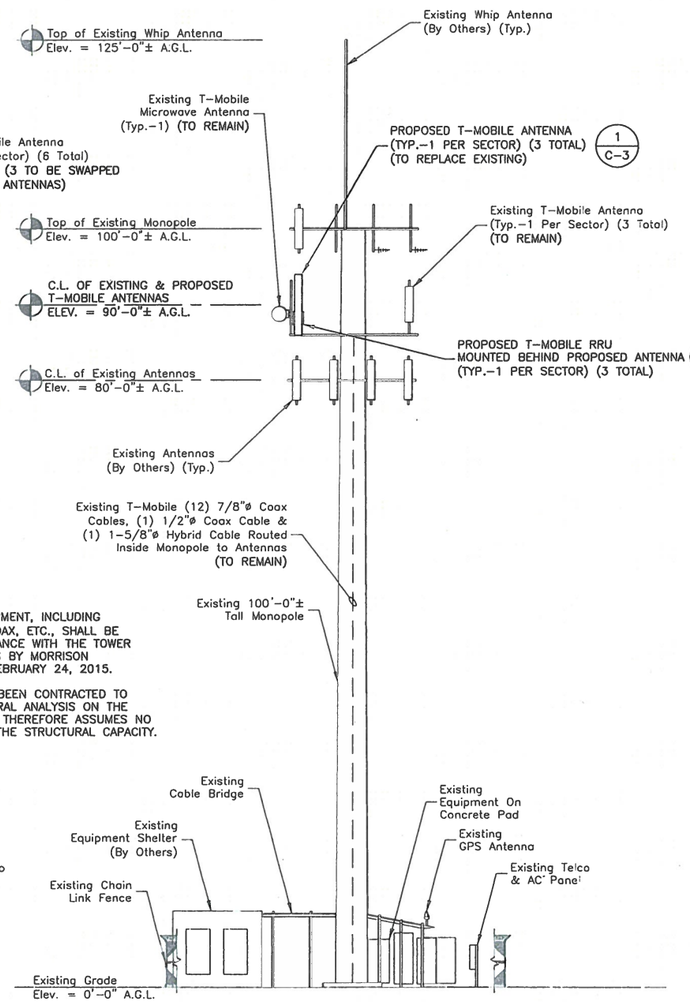


NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY MORRISON HERSHFIELD DATED FEBRUARY 24, 2015.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.

EXISTING ELEVATION (3)

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"
0' 10' 20'



PROPOSED ELEVATION (4)

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"
0' 10' 20'

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

T-Mobile
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054
PHONE: (973) 397-4800
FAX: (973) 292-8893

MERIDEN WEST CENTRAL

CT11733B

450-478 WEST MAIN STREET
MERIDEN, CT 06451
NEW HAVEN COUNTY

SEAL

SCALE
AS SHOWN

REV.	DATE	BY	DESCRIPTION
1	03/04/15	FG	ISSUED AS FINAL
0	11/18/14	FG	ISSUED AS FINAL
A	11/11/14	FG	ISSUED FOR REVIEW

REVISIONS

DRAWN BY FG
CHECKED BY BSH
APPROVED BY GHN
DATE 10/30/14

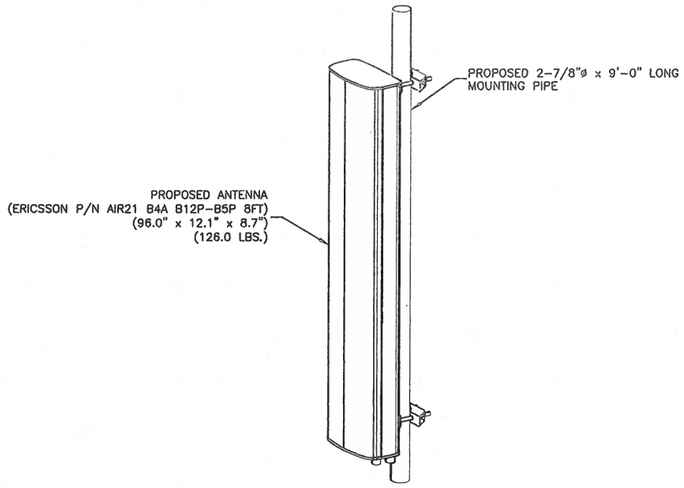
TITLE

ANTENNA LAYOUTS & ELEVATIONS

PROJECT NO. 50066258/50072412

C - 2

SHEET NO.

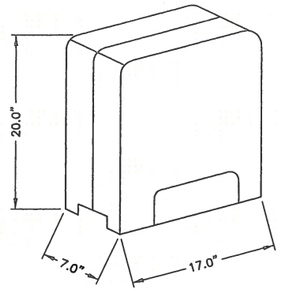


NOTES:

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

ISOMETRIC ANTENNA DETAIL 1

SCALE: N.T.S.



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

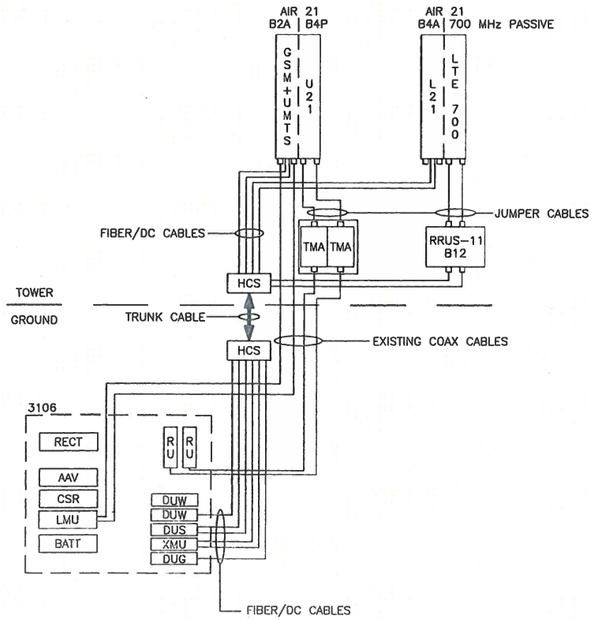
ERICSSON RRUS-11 B12

RRU NOTES:

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

RRUS-11 - REMOTE RADIO UNIT 2

SCALE: N.T.S.



SITE CONFIGURATION 702Cc 3

SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH	EXISTING HCS
	EXISTING	PROPOSED	EXISTING	PROPOSED		
ALPHA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 7/8"ø	–	140'-0"	(1) 1-5/8"ø @ 140'-0"
	ERICSSON AIR21 B4A B2P	ERICSSON AIR21 B4A B12P-B5P 8FT				
MW	ANDREW VHLP1-23	EXISTING TO REMAIN	(1) 1/2"ø	–	136'-0"	
BETA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 7/8"ø	–	140'-0"	
	ERICSSON AIR21 B4A B2P	ERICSSON AIR21 B4A B12P-B5P 8FT				
GAMMA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(4) 7/8"ø	–	140'-0"	
	ERICSSON AIR21 B4A B2P	ERICSSON AIR21 B4A B12P-B5P 8FT				

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

T-Mobile
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054
PHONE: (973) 397-4600
FAX: (973) 292-8893

MERIDEN WEST CENTRAL

CT11733B

450-478 WEST MAIN STREET
MERIDEN, CT 06451
NEW HAVEN COUNTY

SEAL

STATE OF CONNECTICUT
JIANG YU
No. 28222
JIANG YU, P.E.
CONNECTICUT LICENSE NO.
PROFESSIONAL ENGINEER

SCALE
AS SHOWN

REV.	DATE	BY	DESCRIPTION
1	03/04/15	FG	ISSUED AS FINAL
0	11/18/14	FG	ISSUED AS FINAL
A	11/11/14	FG	ISSUED FOR REVIEW

REVISIONS

DRAWN BY FG
CHECKED BY BSH
APPROVED BY GHN
DATE 10/30/14

TITLE

CONSTRUCTION DETAILS

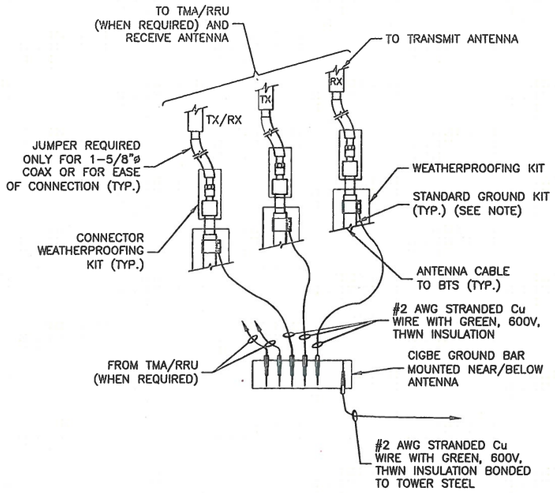
PROJECT NO. 50066258/50072412

C - 3

SHEET NO.

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.

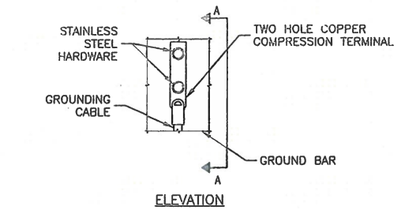


NOTE:

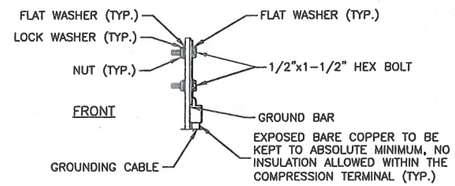
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE)

SCALE: N.T.S. — 1



ELEVATION



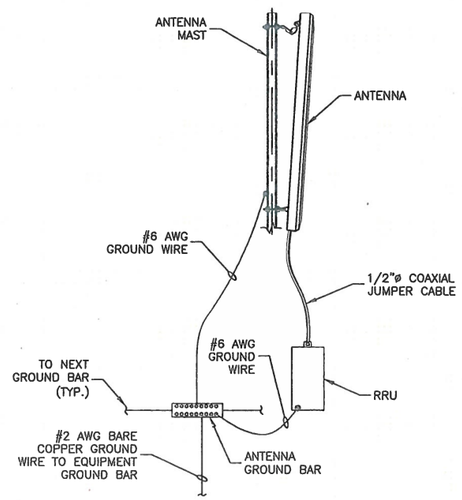
SECTION 'A-A'

NOTES:

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

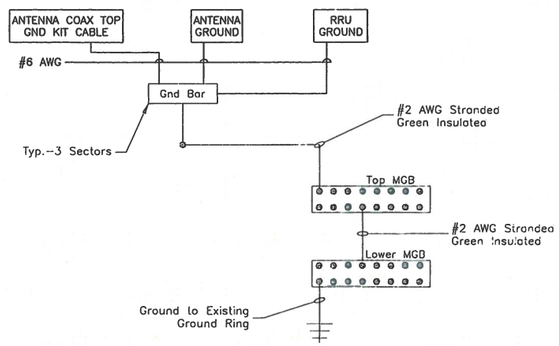
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL

SCALE: N.T.S. — 2



TYPICAL ANTENNA GROUNDING DETAIL

SCALE: N.T.S — 3



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

SCALE: N.T.S. — 4

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

T-Mobile
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054
PHONE: (973) 397-4600
FAX: (973) 292-8893

MERIDEN WEST CENTRAL

CT11733B

450-478 WEST MAIN STREET
MERIDEN, CT 06451
NEW HAVEN COUNTY

SEAL

SCALE

AS SHOWN

REV.	DATE	BY	DESCRIPTION
1	03/04/15	FG	ISSUED AS FINAL
0	11/18/14	FG	ISSUED AS FINAL
A	11/11/14	FG	ISSUED FOR REVIEW

REVISIONS

DRAWN BY FG
CHECKED BY BSH
APPROVED BY GHN
DATE 10/30/14

TITLE

GROUNDING NOTES & DETAILS

PROJECT NO. 50066258/50072412

E - 1

SHEET NO.

Date: **February 24, 2015**

MORRISON HERSHFIELD

Ms. Marianne Dunst
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Morrison Hershfield
1455 Lincoln Parkway, Suite 500
Atlanta, GA
770-379-8500

Subject: Structural Analysis Report

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11733B
	Carrier Site Name:	CT733/AT&THntr Amblnce FT
Crown Castle Designation:	**Crown Castle BU Number:**	842869
	Crown Castle Site Name:	Meriden West Central
	Crown Castle JDE Job Number:	313426
	Crown Castle Work Order Number:	1010257
	Crown Castle Application Number:	270002 Rev. 13
Engineering Firm Designation:	**Morrison Hershfield Project Number:**	CN4-064R2 / 6150003
Site Data:	**450-478 West Main Street, Meriden, New Haven County, CT** **Latitude *41° 32' 24.24"*, Longitude *-72° 49' 9.06"*** **100 Foot - Monopole Tower**	

Dear Ms. Dunst,

Morrison Hershfield 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 757260, in accordance with application 270002, revision 13.

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 + Proposed for all applicants **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.

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

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)
Senior Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 100 ft Monopole tower designed by Glen Martin Engineering in December of 2003. The tower was originally designed for a wind speed of 85 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
86.0	90.0	3	Ericsson	AIR 21 B4A/B12P-B5P w/ pipe mount	-	-	-
		3	Ericsson	RRUS 11 B12			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
100.0	103.0	1	Raycap	DC6-48-60-18-8F	-	-	1
	101.0	3	Communication Components, Inc.	HPA-65R-BUU-H8 w/ pipe mount	2 1	3/4 3/8	2
	100.0	1	Commscope	MTC 3607			
		6	Communication Components, Inc.	HPA-65R-BUU-H8 w/ pipe mount			
		3	Ericsson	RRUS 11-700	-	-	1
		3	Ericsson	RRUS A2 Module			2
		3	Ericsson	RRUS-11 1900 MHz			
		3	KMW	AM-X-CD-16-65-00T-RET w/ pipe mount			1
		1	Raycap	DC6-48-60-18-8F			2
86.0	90.0	1	Andrew	VHLP2-13	6 1	7/8 1/2	3
		6	CSS	CSS-DTMA-BRS			
		3	Ericsson	AIR 21 B2A B4P w/ pipe mount			1
		3	Ericsson	AIR 21 B4A B2P w/ pipe mount			3
		3	Ericsson	KRY 112 71/2	1 12 1	1-5/8 7/8 1/2	1
	86.0	1	-	Platform Mount [LP 305-1]			
		1	Andrew	VHLP1-23			
78.0	78.0	3	-	Side Arm Mount [SO 102-1]	-	-	1
		3	Alcatel Lucent	1900MHz RRH			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER			
		3	Alcatel Lucent	TME-800MHZ RRH			
76.0	79.0	3	Alcatel Lucent	TD-RRH8x20-25	3 1	5/16 1-1/4	2
		3	RFS	APXVSPP18-C-A20 w/ pipe mount	3	1-1/4	1
		3	RFS	APXVTM14-C-120 w/ pipe mount	-	-	2
	76.0	1	-	Platform Mount [LP 303-1]			1
65.0	65.0	1	-	Platform Mount [LP 303-1]	2	1-5/8	2
		1	Alcatel Lucent	RRH2X40-AWS			
		3	Alcatel Lucent	RRH2x40 700			
		2	Alcatel Lucent	RRH2x40-AWS			
		6	Antel	BXA-171063/12CF w/ pipe mount			
		6	Antel	BXA-70063/6CF w/ pipe mount			
		2	RFS	DB-T1-6Z-8AB-0Z			

Notes:
1) Existing equipment that is to remain on the tower.
2) Reserved equipment that has been considered in this analysis.
3) Existing equipment that is to be removed from the tower and has not been considered in this analysis.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
99	99	6	Allgon	7920	12	1-5/8
89	89	9	-	4' Panel Antenna	9	1-5/8
79	79	9	-	4' Panel Antenna	9	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Tectonic, W.O. 2650.CT378, Dated 08/28/2002	4529388	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Glen Martin Engineering, Inc., Site #: CT-378. Dated 12/15/2003	4529387	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Glen Martin Engineering, Inc., Site #: CT-378. Dated 06/04/2003	4713237	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Morrison Hershfield, Project No. CN4-064R1 / 6150003, Dated 11/07/2014	5390531	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) The tower and structures were built in accordance with the manufacturer's specifications and applicable ANSI/TIA/EIA standards.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) The foundation was properly designed and constructed for the original design loads.

This analysis may be affected if any assumptions are not valid or have been made in error. Morrison Hershfield 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	100 - 47	Pole	TP40.72x28x0.3125	1	-16.17	2019.47	50.4	Pass
L2	47 - 0	Pole	TP51.37x38.655x0.375	2	-28.26	3171.35	70.3	Pass
							Summary	
						Pole (L2)	70.3	Pass
						Rating =	70.3	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	65.6	Pass
1	Base Plate	0	50.4	Pass
1	Foundation Overturning	0	75.5	Pass
1	Foundation Bearing	0	34.5	Pass

Structure Rating (max from all components) =	75.5%

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

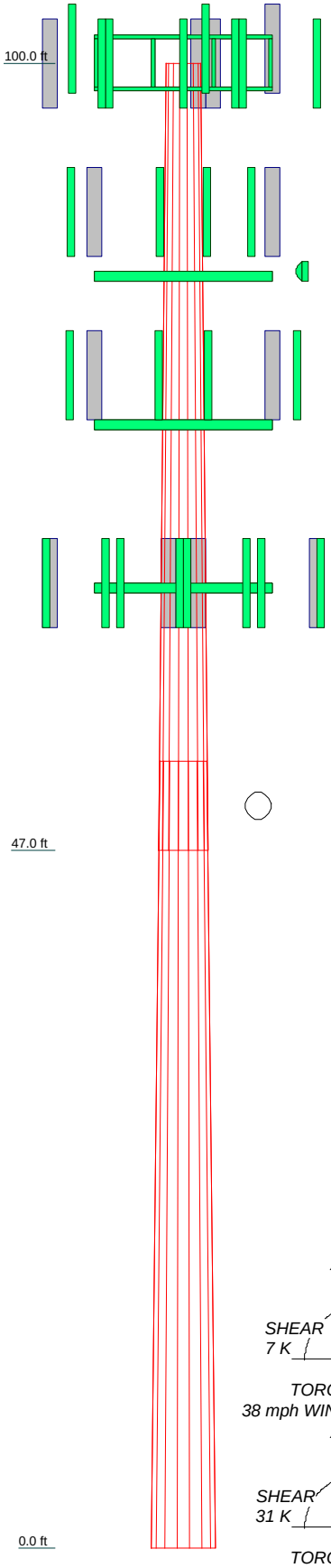
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	53'	16	0.3125	6'	28.0000	40.7200	A572-65	6.1
2	53'	16	0.3750		38.6550	51.3700		9.6
								15.8



AXIAL
41 K

SHEAR
7 K

MOMENT
564 kip-ft

TORQUE 0 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
28 K

SHEAR
31 K

MOMENT
2298 kip-ft

TORQUE 1 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
AM-X-CD-16-65-00T-RET w/ pipe mount	100	TME-800MHZ RRH	78
AM-X-CD-16-65-00T-RET w/ pipe mount	100	1900MHz RRH	78
AM-X-CD-16-65-00T-RET w/ pipe mount	100	1900MHz RRH	78
RRUS 11-700	100	1900MHz RRH	78
RRUS 11-700	100	800 EXTERNAL NOTCH FILTER	78
RRUS 11-700	100	800 EXTERNAL NOTCH FILTER	78
DC6-48-60-18-8F	100	800 EXTERNAL NOTCH FILTER	78
(2) HPA-65R-BUU-H8 w/ pipe mount	100	6' x 2" Mount Pipe	78
(2) HPA-65R-BUU-H8 w/ pipe mount	100	6' x 2" Mount Pipe	78
(2) HPA-65R-BUU-H8 w/ pipe mount	100	6' x 2" Mount Pipe	78
HPA-65R-BUU-H8 w/ pipe mount	100	Side Arm Mount [SO 102-1]	78
HPA-65R-BUU-H8 w/ pipe mount	100	Side Arm Mount [SO 102-1]	78
HPA-65R-BUU-H8 w/ pipe mount	100	Side Arm Mount [SO 102-1]	78
RRUS-11 1900 MHz	100	TME-800MHZ RRH	78
RRUS-11 1900 MHz	100	APXVSPP18-C-A20 w/ pipe mount	76
RRUS-11 1900 MHz	100	APXVSPP18-C-A20 w/ pipe mount	76
RRUS A2 Module	100	Platform Mount [LP 303-1]	76
RRUS A2 Module	100	APXVTM14-C-120 w/ pipe mount	76
RRUS A2 Module	100	APXVTM14-C-120 w/ pipe mount	76
DC6-48-60-18-8F	100	APXVTM14-C-120 w/ pipe mount	76
MTC 3607	100	TD-RRH8x20-25	76
AIR 21 B2A B4P w/ pipe mount	86	TD-RRH8x20-25	76
AIR 21 B2A B4P w/ pipe mount	86	TD-RRH8x20-25	76
AIR 21 B2A B4P w/ pipe mount	86	APXVSPP18-C-A20 w/ pipe mount	76
KRY 112 71/2	86	(2) BXA-70063/6CF w/ pipe mount	65
KRY 112 71/2	86	(2) BXA-70063/6CF w/ pipe mount	65
KRY 112 71/2	86	(2) BXA-171063/12CF w/ pipe mount	65
6' x 2" Mount Pipe	86	(2) BXA-171063/12CF w/ pipe mount	65
Platform Mount [LP 305-1]	86	(2) BXA-171063/12CF w/ pipe mount	65
AIR 21 B4A/B12P-B5P w/ pipe mount	86	RRH2x40 700	65
AIR 21 B4A/B12P-B5P w/ pipe mount	86	RRH2x40 700	65
AIR 21 B4A/B12P-B5P w/ pipe mount	86	RRH2x40 700	65
RRUS 11 B12	86	RRH2x40-AWS	65
RRUS 11 B12	86	RRH2x40-AWS	65
RRUS 11 B12	86	RRH2X40-AWS	65
VHLP1-23	86	DB-T1-6Z-8AB-0Z	65
TME-800MHZ RRH	78	DB-T1-6Z-8AB-0Z	65
		Platform Mount [LP 303-1]	65
		(2) BXA-70063/6CF w/ pipe mount	65

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 70.3%

Morrison Hershfield Corp
1455 Lincoln Parkway, Suite 500
Atlanta, GA
Phone: 770-379-8500
FAX: 770-379-8501
Consulting Engineers

Job: CN4-064R2 / 6150003			
Project: 842869 / Meriden West Central			
Client: Crown Castle USA	Drawn by: EMR	App'd:	
Code: TIA/EIA-222-F	Date: 02/24/15	Scale: NTS	
Path: P:\Projects\Tower Projects\Crown-Analyses-4\CN4-064 - 842869 - MERIDEN WEST CENTRAL\CN4-064R2.SA\Analysis\CN4-064R2.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:

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

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	100'-47'	53'	6'	16	28.0000	40.7200	0.3125	1.2500	A572-65 (65 ksi)
L2	47'-0'	53'		16	38.6550	51.3700	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	28.5486	27.6010	2673.0452	9.8567	14.2800	187.1880	5386.5635	13.6472	4.9501	15.84
	41.5178	40.2812	8308.8518	14.3851	20.7672	400.0949	16743.5097	19.9169	7.4814	23.94
L2	40.8799	45.7925	8477.1936	13.6277	19.7141	430.0077	17082.7422	22.6420	6.9461	18.523
	52.3764	61.0028	20040.9868	18.1542	26.1987	764.9611	40385.4186	30.1627	9.4764	25.27

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
L1 100'-47'				1	1	1		
L2 47'-0'				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C_AA_A	Weight
				ft			ft^2/ft	plf
Safety Line 3/8"	C	No	CaAa (Out Of Face)	100' - 8'	1	No Ice	0.0375	0.22
						1/2" Ice	0.1375	0.75
						1" Ice	0.2375	1.28
						2" Ice	0.4375	2.34
						4" Ice	0.8375	4.46
Climbing Rungs	C	No	CaAa (Out Of Face)	100' - 8'	1	No Ice	0.0705	1.80
						1/2" Ice	0.1705	2.54
						1" Ice	0.2705	3.89
						2" Ice	0.4705	8.41
						4" Ice	0.8705	24.80
*****								
LDF6-50A(1-1/4")	A	No	Inside Pole	100' - 10'	6	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
						2" Ice	0.0000	0.66
						4" Ice	0.0000	0.66
2" Conduit	A	No	Inside Pole	100' - 10'	1	No Ice	0.0000	2.80
						1/2" Ice	0.0000	2.80
						1" Ice	0.0000	2.80
						2" Ice	0.0000	2.80
						4" Ice	0.0000	2.80
FB-L98B-034-XXXXXX(3/8")	A	No	Inside Pole	100' - 10'	1	No Ice	0.0000	0.05
						1/2" Ice	0.0000	0.05
						1" Ice	0.0000	0.05
						2" Ice	0.0000	0.05
						4" Ice	0.0000	0.05
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	100' - 10'	2	No Ice	0.0000	0.58
						1/2" Ice	0.0000	0.58
						1" Ice	0.0000	0.58
						2" Ice	0.0000	0.58
						4" Ice	0.0000	0.58
FB-L98B-034-XXXXXX(3/8")	A	No	Inside Pole	100' - 10'	1	No Ice	0.0000	0.05
						1/2" Ice	0.0000	0.05
						1" Ice	0.0000	0.05
						2" Ice	0.0000	0.05
						4" Ice	0.0000	0.05
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	100' - 10'	2	No Ice	0.0000	0.58
						1/2" Ice	0.0000	0.58
						1" Ice	0.0000	0.58
						2" Ice	0.0000	0.58
						4" Ice	0.0000	0.58
*****								
LDF4-50A(1/2")	C	No	Inside Pole	86' - 8'	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
						2" Ice	0.0000	0.15
						4" Ice	0.0000	0.15
LDF5-50A(7/8")	C	No	Inside Pole	86' - 8'	12	No Ice	0.0000	0.33
						1/2" Ice	0.0000	0.33
						1" Ice	0.0000	0.33
						2" Ice	0.0000	0.33
						4" Ice	0.0000	0.33
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	Inside Pole	86' - 8'	1	No Ice	0.0000	1.07
						1/2" Ice	0.0000	1.07
						1" Ice	0.0000	1.07
						2" Ice	0.0000	1.07
						4" Ice	0.0000	1.07

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*****								
HB114-13U3M12-XXXF(1-1/4")	B	No	Inside Pole	76' - 10'	3	No Ice	0.0000	0.99
						1/2" Ice	0.0000	0.99
						1" Ice	0.0000	0.99
						2" Ice	0.0000	0.99
						4" Ice	0.0000	0.99
ATCB-B01-006(5/16")	B	No	Inside Pole	76' - 10'	3	No Ice	0.0000	0.07
						1/2" Ice	0.0000	0.07
						1" Ice	0.0000	0.07
						2" Ice	0.0000	0.07
						4" Ice	0.0000	0.07
HB114-13U3M12-XXXF(1-1/4")	B	No	Inside Pole	76' - 10'	1	No Ice	0.0000	0.99
						1/2" Ice	0.0000	0.99
						1" Ice	0.0000	0.99
						2" Ice	0.0000	0.99
						4" Ice	0.0000	0.99
*****								
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	B	No	Inside Pole	65' - 8'	2	No Ice	0.0000	1.07
						1/2" Ice	0.0000	1.07
						1" Ice	0.0000	1.07
						2" Ice	0.0000	1.07
						4" Ice	0.0000	1.07

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	100'-47'	A	0.000	0.000	0.000	0.000	0.49
		B	0.000	0.000	0.000	0.000	0.16
		C	0.000	0.000	0.000	5.724	0.31
L2	47'-0'	A	0.000	0.000	0.000	0.000	0.34
		B	0.000	0.000	0.000	0.000	0.24
		C	0.000	0.000	0.000	4.212	0.28

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	100'-47'	A	0.824	0.000	0.000	0.000	0.000	0.49
		B		0.000	0.000	0.000	0.000	0.16
		C		0.000	0.000	0.000	23.201	0.44
L2	47'-0'	A	0.750	0.000	0.000	0.000	0.000	0.34
		B		0.000	0.000	0.000	0.000	0.24
		C		0.000	0.000	0.000	17.072	0.38

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	100'-47'	-0.1352	0.0781	-0.4735	0.2734
L2	47'-0'	-0.1114	0.0643	-0.4083	0.2357

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AM-X-CD-16-65-00T-RET w/ pipe mount	A	From Leg	4.0000 2' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.3042 7.4790 8.3676 10.1785 14.0237	0.08 0.15 0.22 0.39 0.88
AM-X-CD-16-65-00T-RET w/ pipe mount	B	From Leg	4.0000 2' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.3042 7.4790 8.3676 10.1785 14.0237	0.08 0.15 0.22 0.39 0.88
AM-X-CD-16-65-00T-RET w/ pipe mount	C	From Leg	4.0000 2' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.3042 7.4790 8.3676 10.1785 14.0237	0.08 0.15 0.22 0.39 0.88
RRUS 11-700	A	From Leg	4.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9419 3.1718 3.4103 3.9133 5.0229	1.2460 1.4124 1.5874 1.9633 2.8188	0.06 0.07 0.10 0.15 0.30
RRUS 11-700	B	From Leg	4.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9419 3.1718 3.4103 3.9133 5.0229	1.2460 1.4124 1.5874 1.9633 2.8188	0.06 0.07 0.10 0.15 0.30
RRUS 11-700	C	From Leg	4.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9419 3.1718 3.4103 3.9133 5.0229	1.2460 1.4124 1.5874 1.9633 2.8188	0.06 0.07 0.10 0.15 0.30
DC6-48-60-18-8F	C	From Leg	1.0000 0' 3'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.6000 1.8056 2.0222 2.4889 3.5556	1.6000 1.8056 2.0222 2.4889 3.5556	0.03 0.05 0.07 0.13 0.27
(2) HPA-65R-BUU-H8 w/ pipe mount	A	From Leg	4.0000 -4' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.6041 14.4373 15.2815 16.8849 20.2083	9.6536 11.1529 12.6764 14.9767 19.7562	0.11 0.21 0.32 0.56 1.24
(2) HPA-65R-BUU-H8 w/ pipe mount	B	From Leg	4.0000 -4' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.6041 14.4373 15.2815 16.8849 20.2083	9.6536 11.1529 12.6764 14.9767 19.7562	0.11 0.21 0.32 0.56 1.24
(2) HPA-65R-BUU-H8 w/ pipe mount	C	From Leg	4.0000 -4' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.6041 14.4373 15.2815 16.8849 20.2083	9.6536 11.1529 12.6764 14.9767 19.7562	0.11 0.21 0.32 0.56 1.24
HPA-65R-BUU-H8 w/ pipe mount	A	From Leg	4.0000 6'	0.0000	100'	No Ice	13.6041 14.4373	9.6536 11.1529	0.11 0.21

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		C_AA_A *Front*	C_AA_A *Side*	*Weight*
			ft	°	*ft*		ft^2	ft^2	*K*
			1'			1/2" Ice	15.2815	12.6764	0.32
						1" Ice	16.8849	14.9767	0.56
						2" Ice	20.2083	19.7562	1.24
						4" Ice			
HPA-65R-BUU-H8 w/ pipe mount	B	From Leg	4.0000 6' 1'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.6041 14.4373 15.2815 16.8849 20.2083	9.6536 11.1529 12.6764 14.9767 19.7562	0.11 0.21 0.32 0.56 1.24
HPA-65R-BUU-H8 w/ pipe mount	C	From Leg	4.0000 6' 1'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.6041 14.4373 15.2815 16.8849 20.2083	9.6536 11.1529 12.6764 14.9767 19.7562	0.11 0.21 0.32 0.56 1.24
RRUS-11 1900 MHz	A	From Leg	4.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9419 3.1718 3.4103 3.9133 5.0229	1.1900 1.3512 1.5210 1.8865 2.7214	0.04 0.06 0.09 0.14 0.29
RRUS-11 1900 MHz	B	From Leg	4.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9419 3.1718 3.4103 3.9133 5.0229	1.1900 1.3512 1.5210 1.8865 2.7214	0.04 0.06 0.09 0.14 0.29
RRUS-11 1900 MHz	C	From Leg	4.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9419 3.1718 3.4103 3.9133 5.0229	1.1900 1.3512 1.5210 1.8865 2.7214	0.04 0.06 0.09 0.14 0.29
RRUS A2 Module	A	From Leg	4.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.8667 2.0512 2.2443 2.6565 3.5847	0.4231 0.5324 0.6504 0.9122 1.5397	0.02 0.03 0.04 0.08 0.18
RRUS A2 Module	B	From Leg	4.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.8667 2.0512 2.2443 2.6565 3.5847	0.4231 0.5324 0.6504 0.9122 1.5397	0.02 0.03 0.04 0.08 0.18
RRUS A2 Module	C	From Leg	4.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.8667 2.0512 2.2443 2.6565 3.5847	0.4231 0.5324 0.6504 0.9122 1.5397	0.02 0.03 0.04 0.08 0.18
DC6-48-60-18-8F	C	From Leg	1.0000 0' 0'	0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.6000 1.8056 2.0222 2.4889 3.5556	1.6000 1.8056 2.0222 2.4889 3.5556	0.03 0.05 0.07 0.13 0.27
MTC 3607	C	None		0.0000	100'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	51.7000 62.7000 73.7000 95.7000 139.7000	51.7000 62.7000 73.7000 95.7000 139.7000	2.26 2.94 3.61 4.95 7.65

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
*****									
AIR 21 B2A B4P w/ pipe mount	A	From Leg	4.0000 -6' 4'	0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.9044 7.4613 7.9976 9.1024 11.4404	5.7352 6.6446 7.4407 9.0866 12.5931	0.12 0.18 0.24 0.40 0.83
AIR 21 B2A B4P w/ pipe mount	B	From Leg	4.0000 0' 4'	0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.9044 7.4613 7.9976 9.1024 11.4404	5.7352 6.6446 7.4407 9.0866 12.5931	0.12 0.18 0.24 0.40 0.83
AIR 21 B2A B4P w/ pipe mount	C	From Leg	4.0000 -6' 4'	0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.9044 7.4613 7.9976 9.1024 11.4404	5.7352 6.6446 7.4407 9.0866 12.5931	0.12 0.18 0.24 0.40 0.83
KRY 112 71/2	A	From Leg	4.0000 0' 4'	0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6806 0.8022 0.9325 1.2190 1.8956	0.4497 0.5590 0.6769 0.9388 1.5662	0.01 0.02 0.03 0.04 0.11
KRY 112 71/2	B	From Leg	4.0000 0' 4'	0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6806 0.8022 0.9325 1.2190 1.8956	0.4497 0.5590 0.6769 0.9388 1.5662	0.01 0.02 0.03 0.04 0.11
KRY 112 71/2	C	From Leg	4.0000 0' 4'	0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6806 0.8022 0.9325 1.2190 1.8956	0.4497 0.5590 0.6769 0.9388 1.5662	0.01 0.02 0.03 0.04 0.11
6' x 2" Mount Pipe	B	From Leg	4.0000 -6' 0'	0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
Platform Mount [LP 305-1]	C	None		0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	18.0100 23.3300 28.6500 39.2900 60.5700	18.0100 23.3300 28.6500 39.2900 60.5700	1.12 1.35 1.58 2.05 2.97
AIR 21 B4A/B12P-B5P w/ pipe mount	A	From Leg	4.0000 6' 4'	0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.5444 12.1617 12.7863 14.1651 17.1751	10.7689 12.1956 13.4744 15.7041 20.3633	0.16 0.25 0.36 0.59 1.24
AIR 21 B4A/B12P-B5P w/ pipe mount	B	From Leg	4.0000 6' 4'	0.0000	86'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.5444 12.1617 12.7863 14.1651 17.1751	10.7689 12.1956 13.4744 15.7041 20.3633	0.16 0.25 0.36 0.59 1.24
AIR 21 B4A/B12P-B5P w/ pipe mount	C	From Leg	4.0000 6' 4'	0.0000	86'	No Ice 1/2" Ice 1" Ice	11.5444 12.1617 12.7863 14.1651	10.7689 12.1956 13.4744 15.7041	0.16 0.25 0.36 0.59

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	17.1751	20.3633	1.24
						4" Ice			
RRUS 11 B12	A	From Leg	4.0000	0.0000	86'	No Ice	2.9419	1.2460	0.06
			0'			1/2"	3.1718	1.4124	0.07
			4'			Ice	3.4103	1.5874	0.10
						1" Ice	3.9133	1.9633	0.15
						2" Ice	5.0229	2.8188	0.30
						4" Ice			
RRUS 11 B12	B	From Leg	4.0000	0.0000	86'	No Ice	2.9419	1.2460	0.06
			0'			1/2"	3.1718	1.4124	0.07
			4'			Ice	3.4103	1.5874	0.10
						1" Ice	3.9133	1.9633	0.15
						2" Ice	5.0229	2.8188	0.30
						4" Ice			
RRUS 11 B12	C	From Leg	4.0000	0.0000	86'	No Ice	2.9419	1.2460	0.06
			0'			1/2"	3.1718	1.4124	0.07
			4'			Ice	3.4103	1.5874	0.10
						1" Ice	3.9133	1.9633	0.15
						2" Ice	5.0229	2.8188	0.30
						4" Ice			
*****									
TME-800MHZ RRH	A	From Leg	2.0000	0.0000	78'	No Ice	2.4899	2.0685	0.05
			0'			1/2"	2.7061	2.2705	0.07
			0'			Ice	2.9310	2.4812	0.10
						1" Ice	3.4068	2.9284	0.16
						2" Ice	4.4620	3.9265	0.32
						4" Ice			
TME-800MHZ RRH	B	From Leg	2.0000	0.0000	78'	No Ice	2.4899	2.0685	0.05
			0'			1/2"	2.7061	2.2705	0.07
			0'			Ice	2.9310	2.4812	0.10
						1" Ice	3.4068	2.9284	0.16
						2" Ice	4.4620	3.9265	0.32
						4" Ice			
TME-800MHZ RRH	C	From Leg	2.0000	0.0000	78'	No Ice	2.4899	2.0685	0.05
			0'			1/2"	2.7061	2.2705	0.07
			0'			Ice	2.9310	2.4812	0.10
						1" Ice	3.4068	2.9284	0.16
						2" Ice	4.4620	3.9265	0.32
						4" Ice			
1900MHz RRH	A	From Leg	2.0000	0.0000	78'	No Ice	2.9069	3.8014	0.04
			0'			1/2"	3.1446	4.0650	0.08
			0'			Ice	3.3909	4.3372	0.11
						1" Ice	3.9094	4.9076	0.19
						2" Ice	5.0502	6.1520	0.41
						4" Ice			
1900MHz RRH	B	From Leg	2.0000	0.0000	78'	No Ice	2.9069	3.8014	0.04
			0'			1/2"	3.1446	4.0650	0.08
			0'			Ice	3.3909	4.3372	0.11
						1" Ice	3.9094	4.9076	0.19
						2" Ice	5.0502	6.1520	0.41
						4" Ice			
1900MHz RRH	C	From Leg	2.0000	0.0000	78'	No Ice	2.9069	3.8014	0.04
			0'			1/2"	3.1446	4.0650	0.08
			0'			Ice	3.3909	4.3372	0.11
						1" Ice	3.9094	4.9076	0.19
						2" Ice	5.0502	6.1520	0.41
						4" Ice			
800 EXTERNAL NOTCH FILTER	A	From Leg	2.0000	0.0000	78'	No Ice	0.7701	0.3747	0.01
			0'			1/2"	0.8898	0.4647	0.02
			0'			Ice	1.0181	0.5634	0.02
						1" Ice	1.3007	0.7868	0.04
						2" Ice	1.9696	1.3372	0.11
						4" Ice			
800 EXTERNAL NOTCH FILTER	B	From Leg	2.0000	0.0000	78'	No Ice	0.7701	0.3747	0.01
			0'				0.8898	0.4647	0.02

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'			1/2" Ice	1.0181	0.5634	0.02
						1" Ice	1.3007	0.7868	0.04
						2" Ice	1.9696	1.3372	0.11
						4" Ice			
800 EXTERNAL NOTCH FILTER	C	From Leg	2.0000 0' 0'	0.0000	78'	No Ice	0.7701	0.3747	0.01
						1/2" Ice	0.8898	0.4647	0.02
						1" Ice	1.0181	0.5634	0.02
						2" Ice	1.3007	0.7868	0.04
						4" Ice	1.9696	1.3372	0.11
6' x 2" Mount Pipe	A	From Leg	2.0000 0' 0'	0.0000	78'	No Ice	1.4250	1.4250	0.02
						1/2" Ice	1.9250	1.9250	0.03
						1" Ice	2.2939	2.2939	0.05
						2" Ice	3.0596	3.0596	0.09
						4" Ice	4.7022	4.7022	0.23
6' x 2" Mount Pipe	B	From Leg	2.0000 0' 0'	0.0000	78'	No Ice	1.4250	1.4250	0.02
						1/2" Ice	1.9250	1.9250	0.03
						1" Ice	2.2939	2.2939	0.05
						2" Ice	3.0596	3.0596	0.09
						4" Ice	4.7022	4.7022	0.23
6' x 2" Mount Pipe	C	From Leg	2.0000 0' 0'	0.0000	78'	No Ice	1.4250	1.4250	0.02
						1/2" Ice	1.9250	1.9250	0.03
						1" Ice	2.2939	2.2939	0.05
						2" Ice	3.0596	3.0596	0.09
						4" Ice	4.7022	4.7022	0.23
Side Arm Mount [SO 102-1]	A	From Leg	0.5000 0' 0'	0.0000	78'	No Ice	1.5000	1.5000	0.03
						1/2" Ice	1.7400	1.7500	0.04
						1" Ice	1.9800	2.0000	0.04
						2" Ice	2.4600	2.5000	0.07
						4" Ice	3.4200	3.5000	0.11
Side Arm Mount [SO 102-1]	B	From Leg	0.5000 0' 0'	0.0000	78'	No Ice	1.5000	1.5000	0.03
						1/2" Ice	1.7400	1.7500	0.04
						1" Ice	1.9800	2.0000	0.04
						2" Ice	2.4600	2.5000	0.07
						4" Ice	3.4200	3.5000	0.11
Side Arm Mount [SO 102-1]	C	From Leg	0.5000 0' 0'	0.0000	78'	No Ice	1.5000	1.5000	0.03
						1/2" Ice	1.7400	1.7500	0.04
						1" Ice	1.9800	2.0000	0.04
						2" Ice	2.4600	2.5000	0.07
						4" Ice	3.4200	3.5000	0.11
*****									
APXVSPP18-C-A20 w/ pipe mount	A	From Leg	4.0000 -6' 3'	0.0000	76'	No Ice	8.4975	6.9458	0.09
						1/2" Ice	9.1490	8.1266	0.16
						1" Ice	9.7672	9.0212	0.23
						2" Ice	11.0311	10.8440	0.41
						4" Ice	13.6786	14.8507	0.92
APXVSPP18-C-A20 w/ pipe mount	B	From Leg	4.0000 -6' 3'	0.0000	76'	No Ice	8.4975	6.9458	0.09
						1/2" Ice	9.1490	8.1266	0.16
						1" Ice	9.7672	9.0212	0.23
						2" Ice	11.0311	10.8440	0.41
						4" Ice	13.6786	14.8507	0.92
APXVSPP18-C-A20 w/ pipe mount	C	From Leg	4.0000 -6' 3'	0.0000	76'	No Ice	8.4975	6.9458	0.09
						1/2" Ice	9.1490	8.1266	0.16
						1" Ice	9.7672	9.0212	0.23
						2" Ice	11.0311	10.8440	0.41
						4" Ice	13.6786	14.8507	0.92

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
						4" Ice			
Platform Mount [LP 303-1]	C	None		0.0000	76'	No Ice	14.6600	14.6600	1.25
						1/2" Ice	18.8700	18.8700	1.48
						1" Ice	23.0800	23.0800	1.71
						2" Ice	31.5000	31.5000	2.18
						4" Ice	48.3400	48.3400	3.10
APXVTM14-C-120 w/ pipe mount	A	From Leg	4.0000 6' 3'	0.0000	76'	No Ice	7.2075	5.0324	0.09
						1/2" Ice	7.7674	5.8915	0.15
						1" Ice	8.3074	6.6271	0.21
						2" Ice	9.4194	8.2001	0.36
						4" Ice	11.7712	11.6730	0.78
APXVTM14-C-120 w/ pipe mount	B	From Leg	4.0000 6' 3'	0.0000	76'	No Ice	7.2075	5.0324	0.09
						1/2" Ice	7.7674	5.8915	0.15
						1" Ice	8.3074	6.6271	0.21
						2" Ice	9.4194	8.2001	0.36
						4" Ice	11.7712	11.6730	0.78
APXVTM14-C-120 w/ pipe mount	C	From Leg	4.0000 6' 3'	0.0000	76'	No Ice	7.2075	5.0324	0.09
						1/2" Ice	7.7674	5.8915	0.15
						1" Ice	8.3074	6.6271	0.21
						2" Ice	9.4194	8.2001	0.36
						4" Ice	11.7712	11.6730	0.78
TD-RRH8x20-25	A	From Leg	4.0000 0' 3'	0.0000	76'	No Ice	4.3215	1.4076	0.07
						1/2" Ice	4.6039	1.6135	0.09
						1" Ice	4.8949	1.8280	0.12
						2" Ice	5.5029	2.2830	0.18
						4" Ice	6.8225	3.2967	0.36
TD-RRH8x20-25	B	From Leg	4.0000 0' 3'	0.0000	76'	No Ice	4.3215	1.4076	0.07
						1/2" Ice	4.6039	1.6135	0.09
						1" Ice	4.8949	1.8280	0.12
						2" Ice	5.5029	2.2830	0.18
						4" Ice	6.8225	3.2967	0.36
TD-RRH8x20-25	C	From Leg	4.0000 0' 3'	0.0000	76'	No Ice	4.3215	1.4076	0.07
						1/2" Ice	4.6039	1.6135	0.09
						1" Ice	4.8949	1.8280	0.12
						2" Ice	5.5029	2.2830	0.18
						4" Ice	6.8225	3.2967	0.36
*****									
(2) BXA-70063/6CF w/ pipe mount	A	From Leg	4.0000 -4' 0'	0.0000	65'	No Ice	7.7509	5.1804	0.04
						1/2" Ice	8.2949	6.1138	0.10
						1" Ice	8.8458	6.9236	0.16
						2" Ice	9.9739	8.5932	0.32
						4" Ice	12.3352	12.1323	0.76
(2) BXA-70063/6CF w/ pipe mount	B	From Leg	4.0000 -4' 0'	0.0000	65'	No Ice	7.7509	5.1804	0.04
						1/2" Ice	8.2949	6.1138	0.10
						1" Ice	8.8458	6.9236	0.16
						2" Ice	9.9739	8.5932	0.32
						4" Ice	12.3352	12.1323	0.76
(2) BXA-70063/6CF w/ pipe mount	C	From Leg	4.0000 -4' 0'	0.0000	65'	No Ice	7.7509	5.1804	0.04
						1/2" Ice	8.2949	6.1138	0.10
						1" Ice	8.8458	6.9236	0.16
						2" Ice	9.9739	8.5932	0.32
						4" Ice	12.3352	12.1323	0.76
(2) BXA-171063/12CF w/ pipe mount	A	From Leg	4.0000 4' 0'	0.0000	65'	No Ice	5.2586	5.5183	0.05
						1/2" Ice	5.9122	6.7857	0.10
							6.5350	7.9051	0.16

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
						1" Ice	7.7168	9.8160	0.30
						2" Ice	10.2381	13.8377	0.72
						4" Ice			
(2) BXA-171063/12CF w/ pipe mount	B	From Leg	4.0000 4' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.2586 5.9122 6.5350 7.7168 10.2381	5.5183 6.7857 7.9051 9.8160 13.8377	0.05 0.10 0.16 0.30 0.72
(2) BXA-171063/12CF w/ pipe mount	C	From Leg	4.0000 4' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.2586 5.9122 6.5350 7.7168 10.2381	5.5183 6.7857 7.9051 9.8160 13.8377	0.05 0.10 0.16 0.30 0.72
RRH2x40 700	A	From Leg	4.0000 0' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.2896 2.4929 2.7048 3.1546 4.1580	1.2059 1.3631 1.5291 1.8868 2.7061	0.05 0.07 0.09 0.13 0.27
RRH2x40 700	B	From Leg	4.0000 0' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.2896 2.4929 2.7048 3.1546 4.1580	1.2059 1.3631 1.5291 1.8868 2.7061	0.05 0.07 0.09 0.13 0.27
RRH2x40 700	C	From Leg	4.0000 0' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.2896 2.4929 2.7048 3.1546 4.1580	1.2059 1.3631 1.5291 1.8868 2.7061	0.05 0.07 0.09 0.13 0.27
RRH2x40-AWS	A	From Leg	4.0000 0' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5217 2.7530 2.9930 3.4990 4.6146	1.5894 1.7953 2.0098 2.4648 3.4785	0.05 0.07 0.09 0.14 0.28
RRH2x40-AWS	B	From Leg	4.0000 0' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5217 2.7530 2.9930 3.4990 4.6146	1.5894 1.7953 2.0098 2.4648 3.4785	0.05 0.07 0.09 0.14 0.28
RRH2X40-AWS	C	From Leg	4.0000 0' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5217 2.7530 2.9930 3.4990 4.6146	1.5894 1.7953 2.0098 2.4648 3.4785	0.05 0.07 0.09 0.14 0.28
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000 0' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.6000 5.9154 6.2395 6.9136 8.3654	2.3333 2.5580 2.7914 3.2839 4.3728	0.04 0.08 0.12 0.21 0.45
DB-T1-6Z-8AB-0Z	C	From Leg	4.0000 0' 0'	0.0000	65'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.6000 5.9154 6.2395 6.9136 8.3654	2.3333 2.5580 2.7914 3.2839 4.3728	0.04 0.08 0.12 0.21 0.45
Platform Mount [LP 303-1]	C	None		0.0000	65'	No Ice	14.6600 18.8700	14.6600 18.8700	1.25 1.48

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
						1/2" Ice	23.0800	23.0800	1.71
						1" Ice	31.5000	31.5000	2.18
						2" Ice	48.3400	48.3400	3.10
						4" Ice			

Dishes

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
VHLP1-23	B	Paraboloid w/Shroud (HP)	From Leg	4.0000 -6' 0'	20.0000		86'	1.2750	No Ice	1.2800	0.01
									1/2" Ice	1.4500	0.02
									1" Ice	1.6200	0.03
									2" Ice	1.9700	0.04
									4" Ice	2.6600	0.07

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	100 - 47	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.87	1.16	-0.99
			Max. Mx	11	-16.18	798.25	-0.11
			Max. My	8	-16.17	0.47	-798.91
			Max. Vy	11	-25.21	798.25	-0.11
			Max. Vx	2	-25.28	0.83	798.11
			Max. Torque	6			-1.33
L2	47 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.90	1.48	-1.18
			Max. Mx	11	-28.26	2292.61	-1.28
			Max. My	8	-28.26	2.30	-2296.33
			Max. Vy	11	-31.22	2292.61	-1.28
			Max. Vx	2	-31.29	-0.40	2295.93
			Max. Torque	6			-1.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	22	40.90	3.74	-6.49
	Max. H_x	11	28.28	31.20	-0.02
	Max. H_z	2	28.28	-0.03	31.27
	Max. M_x	2	2295.93	-0.03	31.27
	Max. M_z	5	2290.55	-31.19	0.03
	Max. Torsion	12	1.28	27.00	15.61
	Min. Vert	1	28.28	0.00	0.00
	Min. H_x	5	28.28	-31.19	0.03
	Min. H_z	8	28.28	0.03	-31.26
	Min. M_x	8	-2296.33	0.03	-31.26
	Min. M_z	11	-2292.61	31.20	-0.02
	Min. Torsion	6	-1.39	-26.99	-15.59

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	28.28	0.00	0.00	0.65	0.70	0.00
Dead+Wind 0 deg - No Ice	28.28	0.03	-31.27	-2295.93	-0.40	-0.73
Dead+Wind 30 deg - No Ice	28.28	15.62	-27.10	-1989.54	-1145.85	-0.07
Dead+Wind 60 deg - No Ice	28.28	27.04	-15.66	-1148.81	-1985.33	0.49
Dead+Wind 90 deg - No Ice	28.28	31.19	-0.03	-0.76	-2290.55	1.03
Dead+Wind 120 deg - No Ice	28.28	26.99	15.59	1146.44	-1982.06	1.39
Dead+Wind 150 deg - No Ice	28.28	15.56	27.05	1987.37	-1142.64	1.31
Dead+Wind 180 deg - No Ice	28.28	-0.03	31.26	2296.33	2.30	0.82
Dead+Wind 210 deg - No Ice	28.28	-15.63	27.10	1990.57	1147.86	0.10
Dead+Wind 240 deg - No Ice	28.28	-27.04	15.66	1150.33	1986.47	-0.51
Dead+Wind 270 deg - No Ice	28.28	-31.20	0.02	1.28	2292.61	-0.93
Dead+Wind 300 deg - No Ice	28.28	-27.00	-15.61	-1146.01	1984.40	-1.28
Dead+Wind 330 deg - No Ice	28.28	-15.57	-27.06	-1986.97	1144.85	-1.21
Dead+Ice+Temp	40.90	0.00	0.00	1.18	1.48	0.00
Dead+Wind 0 deg+Ice+Temp	40.90	0.00	-7.49	-560.54	1.39	-0.20
Dead+Wind 30 deg+Ice+Temp	40.90	3.74	-6.49	-485.54	-278.89	-0.03
Dead+Wind 60 deg+Ice+Temp	40.90	6.47	-3.75	-279.84	-484.33	0.11
Dead+Wind 90 deg+Ice+Temp	40.90	7.47	-0.01	1.00	-559.07	0.26

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 120 deg+Ice+Temp	40.90	6.46	3.74	281.60	-483.65	0.36
Dead+Wind 150 deg+Ice+Temp	40.90	3.73	6.48	487.25	-278.32	0.34
Dead+Wind 180 deg+Ice+Temp	40.90	-0.01	7.48	562.76	1.79	0.22
Dead+Wind 210 deg+Ice+Temp	40.90	-3.74	6.49	487.91	282.09	0.04
Dead+Wind 240 deg+Ice+Temp	40.90	-6.47	3.75	282.33	487.32	-0.12
Dead+Wind 270 deg+Ice+Temp	40.90	-7.47	0.00	1.25	562.29	-0.23
Dead+Wind 300 deg+Ice+Temp	40.90	-6.47	-3.74	-279.37	486.94	-0.33
Dead+Wind 330 deg+Ice+Temp	40.90	-3.73	-6.48	-485.03	281.57	-0.32
Dead+Wind 0 deg - Service	28.28	0.01	-10.82	-794.22	0.33	-0.25
Dead+Wind 30 deg - Service	28.28	5.40	-9.38	-688.17	-396.13	-0.02
Dead+Wind 60 deg - Service	28.28	9.36	-5.42	-397.18	-686.69	0.17
Dead+Wind 90 deg - Service	28.28	10.79	-0.01	0.17	-792.33	0.36
Dead+Wind 120 deg - Service	28.28	9.34	5.40	397.24	-685.56	0.48
Dead+Wind 150 deg - Service	28.28	5.38	9.36	688.29	-395.02	0.45
Dead+Wind 180 deg - Service	28.28	-0.01	10.82	795.23	1.26	0.28
Dead+Wind 210 deg - Service	28.28	-5.41	9.38	689.40	397.76	0.04
Dead+Wind 240 deg - Service	28.28	-9.36	5.42	398.58	688.01	-0.18
Dead+Wind 270 deg - Service	28.28	-10.80	0.01	0.88	793.97	-0.32
Dead+Wind 300 deg - Service	28.28	-9.34	-5.40	-396.21	687.29	-0.44
Dead+Wind 330 deg - Service	28.28	-5.39	-9.36	-687.28	396.71	-0.42

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-28.28	0.00	0.00	28.28	0.00	0.000%
2	0.03	-28.28	-31.27	-0.03	28.28	31.27	0.000%
3	15.62	-28.28	-27.10	-15.62	28.28	27.10	0.000%
4	27.04	-28.28	-15.66	-27.04	28.28	15.66	0.000%
5	31.19	-28.28	-0.03	-31.19	28.28	0.03	0.000%
6	26.99	-28.28	15.59	-26.99	28.28	-15.59	0.000%
7	15.56	-28.28	27.05	-15.56	28.28	-27.05	0.000%
8	-0.03	-28.28	31.26	0.03	28.28	-31.26	0.000%
9	-15.63	-28.28	27.10	15.63	28.28	-27.10	0.000%
10	-27.04	-28.28	15.66	27.04	28.28	-15.66	0.000%
11	-31.20	-28.28	0.02	31.20	28.28	-0.02	0.000%
12	-27.00	-28.28	-15.61	27.00	28.28	15.61	0.000%
13	-15.57	-28.28	-27.06	15.57	28.28	27.06	0.000%
14	0.00	-40.90	0.00	0.00	40.90	0.00	0.000%
15	0.00	-40.90	-7.49	-0.00	40.90	7.49	0.000%
16	3.74	-40.90	-6.49	-3.74	40.90	6.49	0.000%
17	6.47	-40.90	-3.75	-6.47	40.90	3.75	0.000%
18	7.47	-40.90	-0.01	-7.47	40.90	0.01	0.000%
19	6.46	-40.90	3.74	-6.46	40.90	-3.74	0.000%
20	3.73	-40.90	6.48	-3.73	40.90	-6.48	0.000%
21	-0.01	-40.90	7.48	0.01	40.90	-7.48	0.000%
22	-3.74	-40.90	6.49	3.74	40.90	-6.49	0.000%
23	-6.47	-40.90	3.75	6.47	40.90	-3.75	0.000%
24	-7.47	-40.90	0.00	7.47	40.90	-0.00	0.000%
25	-6.47	-40.90	-3.74	6.47	40.90	3.74	0.000%
26	-3.73	-40.90	-6.48	3.73	40.90	6.48	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
27	0.01	-28.28	-10.82	-0.01	28.28	10.82	0.000%
28	5.40	-28.28	-9.38	-5.40	28.28	9.38	0.000%
29	9.36	-28.28	-5.42	-9.36	28.28	5.42	0.000%
30	10.79	-28.28	-0.01	-10.79	28.28	0.01	0.000%
31	9.34	-28.28	5.40	-9.34	28.28	-5.40	0.000%
32	5.38	-28.28	9.36	-5.38	28.28	-9.36	0.000%
33	-0.01	-28.28	10.82	0.01	28.28	-10.82	0.000%
34	-5.41	-28.28	9.38	5.41	28.28	-9.38	0.000%
35	-9.36	-28.28	5.42	9.36	28.28	-5.42	0.000%
36	-10.80	-28.28	0.01	10.80	28.28	-0.01	0.000%
37	-9.34	-28.28	-5.40	9.34	28.28	5.40	0.000%
38	-5.39	-28.28	-9.36	5.39	28.28	9.36	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 47	10.389	34	0.8197	0.0018
L2	53 - 0	3.255	34	0.5466	0.0007

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100'	AM-X-CD-16-65-00T-RET w/ pipe mount	34	10.389	0.8197	0.0018	41628
86'	VHLP1-23	34	7.993	0.7519	0.0014	14867
78'	TME-800MHZ RRH	34	6.685	0.7100	0.0012	9460
76'	APXVSPP18-C-A20 w/ pipe mount	34	6.370	0.6990	0.0012	8672
65'	(2) BXA-70063/6CF w/ pipe mount	34	4.746	0.6328	0.0009	5946

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 47	29.962	9	2.3634	0.0053
L2	53 - 0	9.395	9	1.5772	0.0019

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100'	AM-X-CD-16-65-00T-RET w/ pipe mount	9	29.962	2.3634	0.0053	14480
86'	VHLP1-23	9	23.055	2.1683	0.0042	5171
78'	TME-800MHZ RRH	9	19.284	2.0480	0.0035	3290
76'	APXVSPP18-C-A20 w/ pipe mount	9	18.374	2.0163	0.0034	3015
65'	(2) BXA-70063/6CF w/ pipe mount	9	13.692	1.8257	0.0026	2067

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	100 - 47 (1)	TP40.72x28x0.3125	53'	0'	0.0	39.000	38.8457	-16.17	1514.98	0.011
L2	47 - 0 (2)	TP51.37x38.655x0.375	53'	0'	0.0	39.000	61.0028	-28.26	2379.11	0.012

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	100 - 47 (1)	TP40.72x28x0.3125	799.18	25.781	39.000	0.661	0.00	0.000	39.000	0.000
L2	47 - 0 (2)	TP51.37x38.655x0.375	2297.81	36.046	39.000	0.924	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	100 - 47 (1)	TP40.72x28x0.3125	25.29	0.651	26.000	0.051	0.07	0.001	26.000	0.000
L2	47 - 0 (2)	TP51.37x38.655x0.375	31.30	0.513	26.000	0.040	0.10	0.001	26.000	0.000

Pole Interaction Design Data

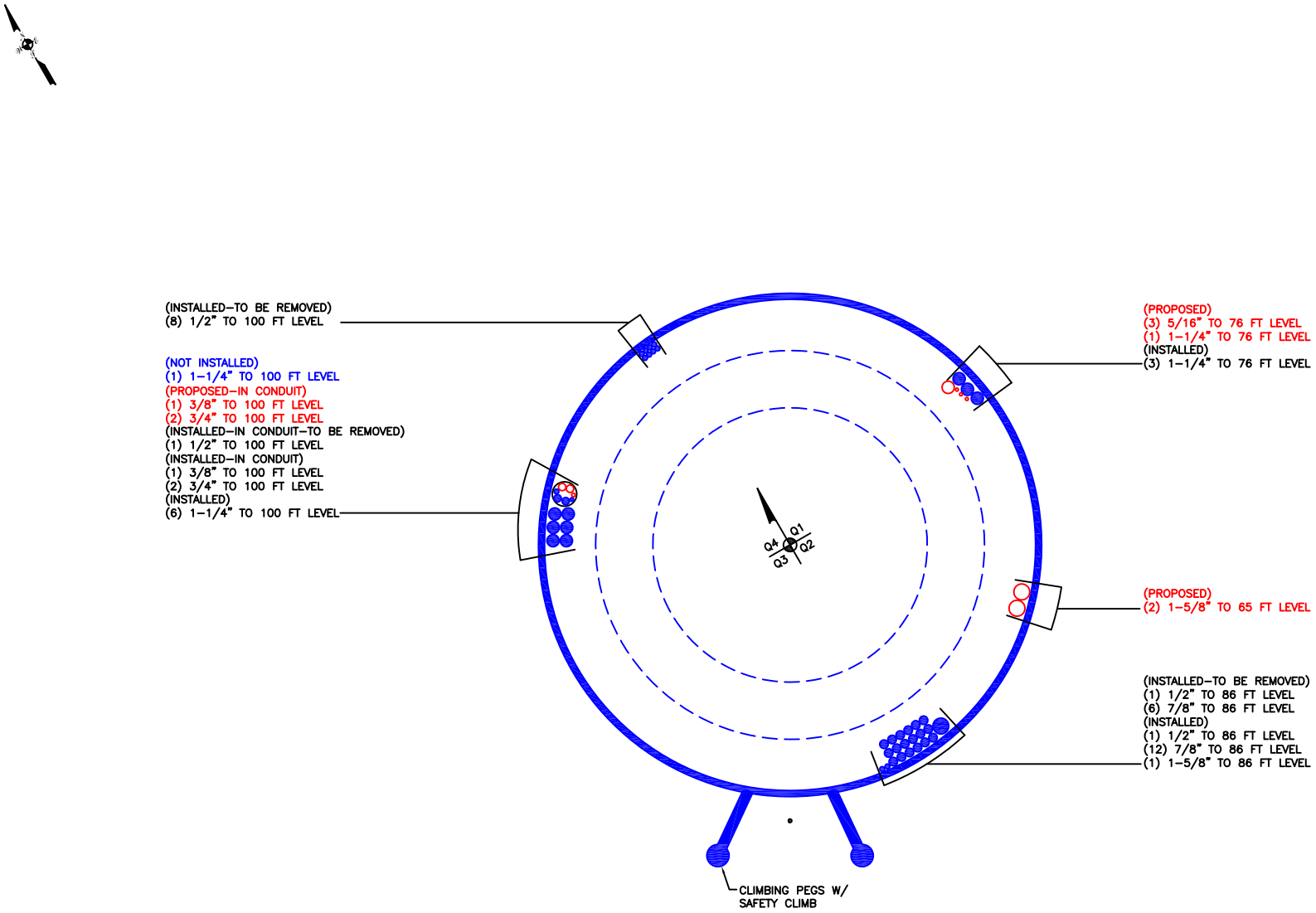
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	100 - 47 (1)	0.011	0.661	0.000	0.051	0.000	0.672 ✔	1.333	H1-3+VT ✔
L2	47 - 0 (2)	0.012	0.924	0.000	0.040	0.000	0.937 ✔	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	100 - 47	Pole	TP40.72x28x0.3125	1	-16.17	2019.47	50.4	Pass
L2	47 - 0	Pole	TP51.37x38.655x0.375	2	-28.26	3171.35	70.3	Pass
						Summary		
						Pole (L2)	70.3	Pass
						RATING =	**70.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 842869 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *842869*
Site Name: *Meriden West Central*
App #: *270002 Rev. 13*
Pole Manufacturer: *Other*

Reactions		
Moment:	2298	ft-kips
Axial:	28	kips
Shear:	31	kips

Anchor Rod Data		
Qty:	20	
Diam:	2.5	in
Rod Material:	Other	
Strength (Fu):	65	ksi
Yield (Fy):	50	ksi
Bolt Circle:	59	in

Plate Data		
Diam:	69	in
Thick:	3	in
Grade:	36	ksi
Single-Rod B-eff:	8.17	in

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

Pole Data		
Diam:	51.37	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	16	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

Maximum Rod Tension:	92.1	Kips	Rigid
Allowable Tension:	140.4	Kips	Service, ASD
Anchor Rod Stress Ratio:	65.6%	**Pass**	Fty*ASIF

Base Plate Results Flexural Check

Base Plate Stress:	18.2	ksi	Rigid
Allowable Plate Stress:	36.0	ksi	Service ASD
Base Plate Stress Ratio:	50.4%	**Pass**	0.75*Fy*ASIF
			Y.L. Length: 29.02

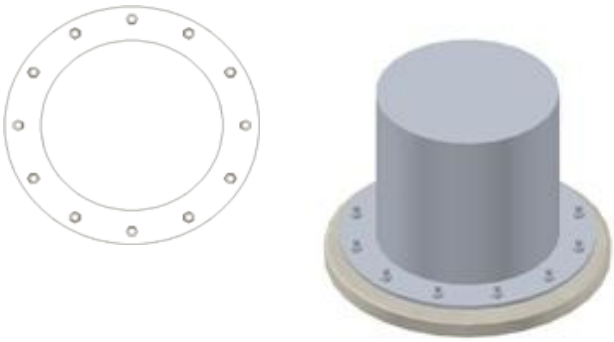
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



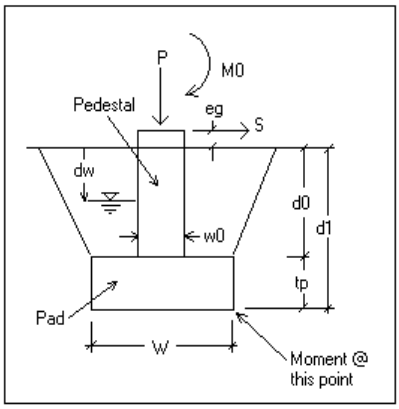
* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

ANALYSIS OF SPREAD FOOTING: OVERTURNING / BEARING

Engr = "EMR"

JobDescription = "CN4-064R2"



$P = 28 \cdot kip$ Compression load on foundation; does not include soil or concrete weight

$M_0 = 2.298 \times 10^3 \cdot kip \cdot ft$ Moment load on foundation

$S = 31 \cdot kip$ Shear load on foundation

$\sigma_b = 8000 \cdot psf$ Allowable bearing pressure

$inet = 0$ For allw. bearing(0=Gross, 1=Net); Net ignores fdn and soil weight for computed bearing pressure.

$FOS_{REQ} = 1.5$ Required FOS against overturning

INPUT:

$w_0 = 8\,ft$ Pedestal width

$iped = 1$ Pedestal type (0=round, 1=square)

$d_0 = 5\,ft$ Depth to top of pad

$d_s = 5\,ft$ Depth to soil uplift cone (0=no cone, normally d0)

$d_n = 0$ Depth of water to neglect for passive pr.

$d_w = 8.5\,ft$ Depth of water; 0 = no water

$e_g = 1\,ft$ Extension above grade

$t_p = 2.5\,ft$ Pad thickness

$W = 20\,ft$ Pad width (W x W)

$\gamma_c = 150 \cdot pcf$ Concrete density

$\gamma_s = 110 \cdot pcf$ Soil density

$\phi_s = 30 \cdot deg$ Soil angle of friction

RESULTS

$W_{s1} = 184.80 \cdot kip$ Weight of soil directly above pad

$W_c = 207.60 \cdot kip$ Total weight of foundation

$M_r = 5090.3 \cdot kip \cdot ft$ Total resisting moment

$M_t = 2.562 \times 10^3 \cdot kip \cdot ft$ Total applied moment

$q_{avg} = 1.793 \cdot ksf$ Average bearing pressure

$q_{max} = 3.587 \cdot ksf$ Maximum edge bearing pressure

FOS = 1.99 Factor of safety against overturning

Result = "Foundation is OK for overturning"

result1 = "Edge bearing pressure is OK."

result2 = "Average bearing pressure is OK"

$$\frac{(M_t \cdot FOS_{REQ})}{M_r} = 75.5 \cdot \%$$

$$\frac{q_{max}}{\sigma_{bE}} = 34.5 \cdot \%$$

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11733B

Meriden West Central
450 - 478 West Main Street
Meriden, CT 06451

March 6, 2015

EBI Project Number: 6215001356

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	90.28 %

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

EBI Consulting
environmental | engineering | due diligence

March 6, 2015

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

Emissions Analysis for Site: **CT11733B – Meriden West Central**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **450 - 478 West Main Street, Meriden, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **450 - 478 West Main Street, Meriden, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

2) 2 UMTS channels (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 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Ericsson AIR21 B4A/B12P** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe for 1900 MHz and 2100 MHz. The **Ericsson AIR21 B4A/B12P** has a maximum gain of **15.9 dBd** at its main lobe for 2100 MHz at its main lobe and has a maximum gain of **13.6 dBd** at its main lobe for 700 MHz 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 **90 feet** above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	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):	90	Height (AGL):	90	Height (AGL):	90
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	# PCS Channels:	4
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%	2.38	Antenna B1 MPE%	2.38	Antenna C1 MPE%	2.38
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):	90	Height (AGL):	90	Height (AGL):	90
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	3	Channel Count	3	Channel Count	3
Total TX Power:	150	Total TX Power:	150	Total TX Power:	150
ERP (W):	5,355.80	ERP (W):	5,355.80	ERP (W):	5,355.80
Antenna A2 MPE%	2.73	Antenna B2 MPE%	2.73	Antenna C2 MPE%	2.73

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**16.52**
Hunter Yagi 1	7.53 %
Hunter Yagi 2	7.43 %
Hunter Yagi 3	22.28 %
Hunter whip	7.43 %
AT&T	3.61 %
Sprint	10.89 %
Verizon Wireless	14.59 %
Site Total MPE %:	**90.28 %**

T-Mobile Sector 1 Total:	5.51 %
T-Mobile Sector 2 Total:	5.51 %
T-Mobile Sector 3 Total:	5.51 %
Site Total:	90.28 %

EBI Consulting
environmental | engineering | due diligence

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	5.51 %
Sector 2:	5.51 %
Sector 3 :	5.51 %
T-Mobile Total:	16.52 %
Site Total:	90.28 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **90.28%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803