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

March 28, 2016

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

RE: **Notice of Exempt Modification for T-Mobile / L700 Crown Site BU: 806953**
T-Mobile Site ID: CT11071E
69 Guinea Road, Stamford, CT 06903
Latitude: 41° 6' 6.35" / Longitude: -73° 35' 41.45"

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 118 foot level of the existing 160 foot monopole at 69 Guinea Road in Stamford, CT. Both the tower and property is owned by Crown Castle. T-Mobile now intends to keep all installed and propose to install three (3) new antennas and three (3) RRU's to their existing mount.

This facility was approved by the Connecticut Siting Council in Docket No. 180 on April 2, 1998. This approval included the conditions outlined below:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services and not exceed a height of 160 ft.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 of the Regulations of CT State Agencies.
3. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
4. The Certificate Holder shall provide the council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. If the facility does not initially provide, or permanently ceases to provide cellular services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapplication for any continued or new use shall be made to the Council before any such use is made.

7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.
8. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable David Martin, Mayor for the City of Stamford.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

Sincerely,

Kimberly Myl

Kimberly Myl
Real Estate Specialist
Crown Castle
1200 MacArthur Boulevard, Suite 200
Mahwah, New Jersey 07430
201-236-9069
kimberly.myl@crowncastle.com

Attachments:

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

cc: The Honorable David Martin, Mayor for the City of Stamford
Stamford Government Center
888 Washington Boulevard
Stamford, CT 06901

DOCKET NO. 180 - Cellco Partnership d/b/a Bell Atlantic Mobile application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications tower and associated equipment located immediately north of the Merritt Parkway off Guinea Road (prime and alternate one sites), or 141 Den Road (alternate two site) in Stamford, Connecticut.	}	Connecticut Siting Council April 2, 1998

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications tower and equipment buildings at the proposed prime site in Stamford, Connecticut, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Bell Atlantic Mobile (BAM) for the construction, operation, and maintenance of a telecommunications tower, associated equipment, and buildings at the proposed prime site, located within a 28-acre parcel at Guinea Road, Stamford, Connecticut. We find the effects on scenic resources and adjacent land uses of the first alternate site and second alternate site to be significant, and therefore deny certification of these sites.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of BAM, Springwich Cellular Limited Partnership (Springwich), Sprint PCS (Sprint), and Nextel Communications of the Mid-Atlantic, Inc. (Nextel); and such tower shall not exceed a height of 160 feet above ground level (AGL).

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include: adjustment of the tower location within the leased parcel to protect a nearby stream and minimize grade; a final site plan(s) for site development to include the location and specifications for the tower foundation, antennas, equipment buildings, emergency generator and fuel tank, security fence, access road, and utility line; construction plans for site clearing, tree trimming, water drainage, and erosion and sedimentation controls consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended; provisions for the tower finish that may include painting; and provisions for the prevention and containment of spills and/or other discharge into surface water and ground water bodies.

3. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

4. The Certificate Holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. If the facility does not initially provide, or permanently ceases to provide cellular services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapplication for any continued or new use shall be made to the Council before any such use is made.

7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant and Stamford Advocate.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

APPLICANT	**ITS REPRESENTATIVE**
Bell Atlantic Mobile	Kenneth C. Baldwin, Esq. Brian C. S. Freeman, Esq. Robinson & Cole One Commercial Plaza Hartford, CT 06103-3597 Mr. David S. Malko, P.E. Jennifer Young Gaudet Bell Atlantic Mobile 20 Alexander Drive Wallingford, CT 06492

INTERVENORS	ITS REPRESENTATIVE
Sprint Spectrum, L.P. d/b/a Sprint PCS	Elias A. Alexiades John W. Knuff Harris, Beach & Wilcox, LLP 147 North Broad Street Milford, CT 06460
Nextel Communications of the Mid-Atlantic, Inc. d/b/a Nextel Communications	Christopher B. Fisher, Esq. Cuddy, Feder & Worby, Esq. 90 Maple Avenue White Plains, NY 10601
Springwich Cellular Limited Partnership	Peter J. Tyrrell, Esq. General Counsel 500 Enterprise Drive Rocky Hill, CT 06067-3900

PARTIES	ITS REPRESENTATIVE
Charles H. Nobs, Maurice Lucas, and Ben and Myrna Raphan	Jeffrey J. Mirman, Esq. Levy & Droney, P.C. P.O. Box 887 Farmington, CT 06034

CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in Docket No. 180 - an application of Cellco Partnership d/b/a Bell Atlantic Mobile for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a telecommunications tower and associated equipment located immediately north of the Merritt Parkway off Guinea Road (prime and alternate one sites) or 141 Den Road (alternate two site) in Stamford, Connecticut, and voted as follows to approve the proposed prime site and deny the first and second alternate sites:

Council Members	Vote Cast
Mortimer A. Gelston, Chairman	Yes
Commissioner Donald W. Downes Designee: Gerald J. Heffernan	Yes
Commissioner Arthur J. Rocque, Jr. Designee: Brian J. Emerick	Yes
Albert E. Gary	Absent
Pamela B. Katz	No
Daniel P. Lynch, Jr.	Yes
William H. Smith	Yes
Colin C. Tait	Abstain
Edward S. Wilensky	Absent

Dated at New Britain, Connecticut April 2, 1998.

STATE OF CONNECTICUT)

ss. New Britain, Connecticut :

COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the Findings of Fact, Opinion, and Decision and Order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Joel M. Rinebold
Executive Director
Connecticut Siting Council

I certify that a copy of the Findings of Fact, Opinion, and Decision and Order in Docket No. 180 have been forwarded by Certified First Class Return Receipt Requested mail on April 6, 1998, to all parties and intervenors of record as listed on the attached service list, dated December 10, 1997.

ATTEST:

Sharon L. Gdovin
Secretary II
Connecticut Siting Council

8390

CROWN CASTLE - ETA PROPERTY
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

32-61-1110

DATE 3/28/16

PAY TO THE ORDER OF Connecticut Siting Council $ 625.00/100

Six Hundred Twenty Five 00/100 DOLLARS

Security Features Included Details on Back

CHASE
JPMorgan Chase Bank, N.A.
www.Chase.com

VALID FOR 180 DAYS

FOR 806953-CT11071E-322229

MP

⑈008390⑈ ⑆111000614⑆ 464638118⑈

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11071E
CROWN CASTLE BU #: 806953
SITE NAME: BRG 2044 (A) 943097
69 GUINEA RD
STAMFORD, CT 06903
FAIRFIELD COUNTY

VICINITY MAP

FROM BLOOMFIELD, CT:

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TURN RIGHT ONTO DAY HILL RD. USE THE RIGHT LANE TO MERGE ONTO I-91 S VIA THE RAMP TO HARTFORD. MERGE ONTO I-91 S. TAKE EXIT 32A-32B FOR I-84 W TOWARD WATERBURY. MERGE ONTO I-84. KEEP LEFT TO STAY ON I-84. TAKE EXIT 16 FOR CT-188 TOWARD SOUTHBURY. TURN LEFT ONTO CT-188 S. TURN LEFT ONTO CT-188 S/CT-67 S. SHARP RIGHT ONTO THE RAMP TO S 8 E/BRIDGEPORT S. MERGE ONTO CT-8 S/HWY 8 S. TAKE EXIT 10 TO MERGE ONTO CT-15 S/MERRITT PKWY. TURN RIGHT ONTO DEN RD (SIGNS FOR DEN ROAD). TURN LEFT ONTO BANGALL RD. TURN RIGHT ONTO RIVERBANK RD. TURN LEFT ONTO JUNE RD. TURN LEFT ONTO GUINEA RD. SITE WILL BE ON THE RIGHT.

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

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

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

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

CONSULTANT TEAM

SITE NAME:
BRG 2044 (A) 943097

SITE NUMBER:
CT11071E

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

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

COORDINATES:
LATITUDE: 41°-06'-06.35" N (NAD83)
LONGITUDE: 73°-35'-41.45" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
702Cu

PROJECT SUMMARY

SITE ADDRESS:
69 GUINEA RD
STAMFORD, CT 06903
FAIRFIELD COUNTY

PROJECT DIRECTORY

- INSTALL (3) NEW ANTENNAS.
- INSTALL (3) NEW RRU'S.

SCOPE OF WORK

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

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

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

SHEET INDEX

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

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

CT11071E
BRG 2044 (A) 943097

CONSTRUCTION DRAWINGS

0	03/24/16	ISSUED AS FINAL

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

CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071484
SITE ADDRESS:	

69 GUINEA RD
STAMFORD, CT 06903
FAIRFIELD COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL NOTES:

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

SITE WORK GENERAL NOTES:

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

ELECTRICAL INSTALLATION NOTES:

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

CONCRETE AND REINFORCING STEEL NOTES:

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

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

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

STRUCTURAL STEEL NOTES:

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

CONSTRUCTION NOTES:

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

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CONSTRUCTION DRAWINGS		
0	03/24/16	ISSUED AS FINAL

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STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071484
SITE ADDRESS:	

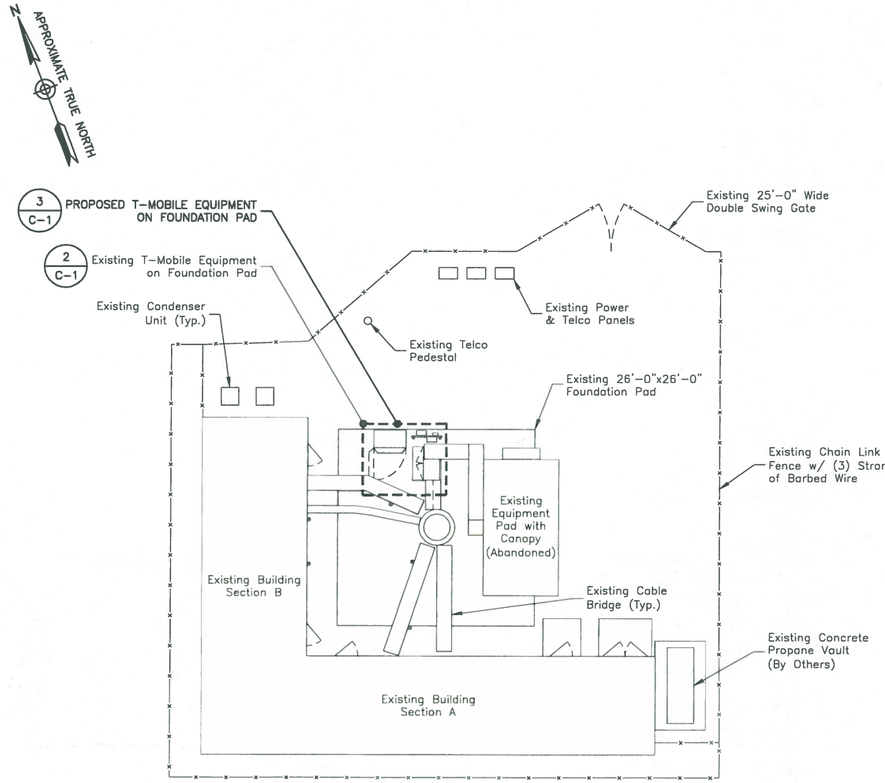
69 GUINEA RD
STAMFORD, CT 06903
FAIRFIELD COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

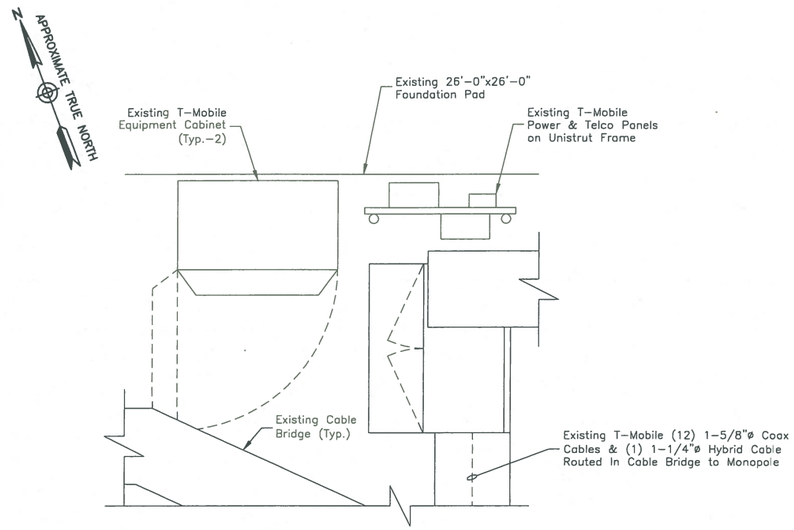
G–1



COMPOUND PLAN 1

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

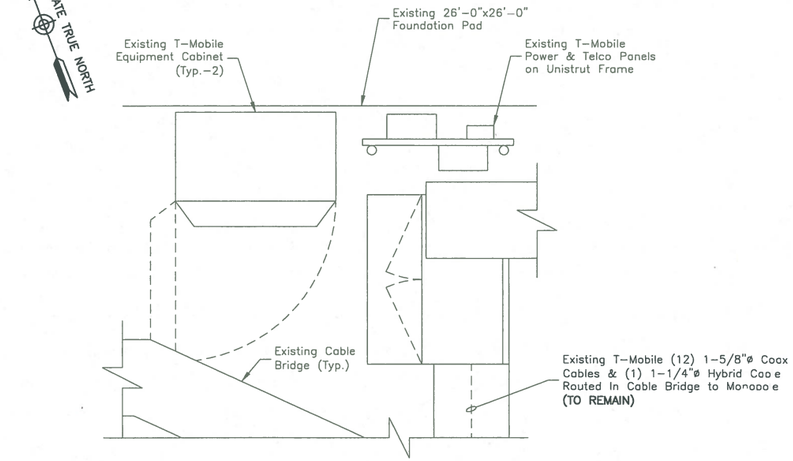
0' 10' 20'



EXISTING EQUIPMENT PLAN 2

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

0' 1' 2' 4'



PROPOSED EQUIPMENT PLAN 3

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

0' 1' 2' 4'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY PAUL J. FORD AND COMPANY DATED MARCH 08, 2016.

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CONSTRUCTION DRAWINGS

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STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071484
SITE ADDRESS:	

69 GUINEA RD
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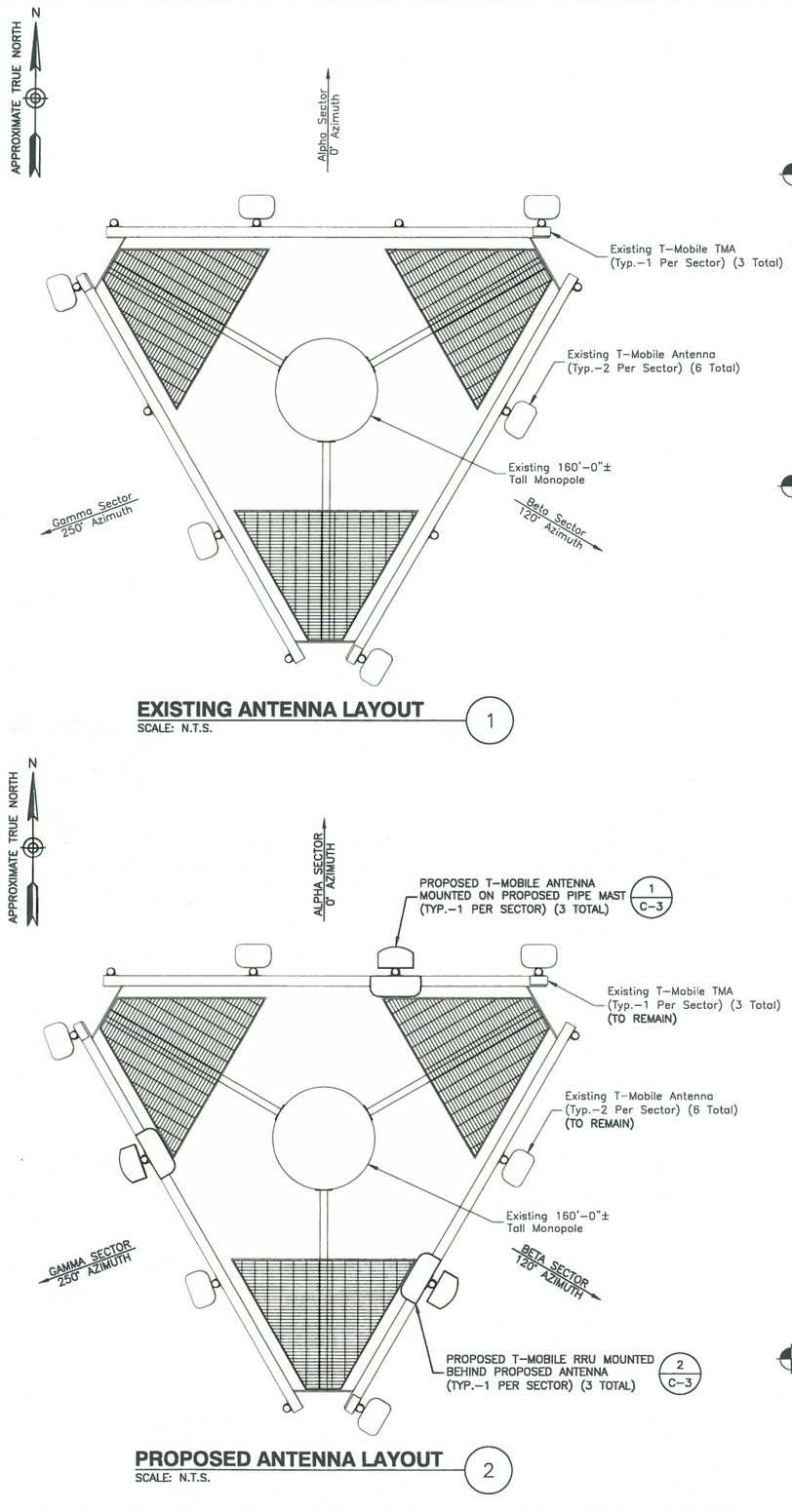
FAIRFIELD COUNTY

SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

SHEET NUMBER

C-1



EXISTING ANTENNA LAYOUT

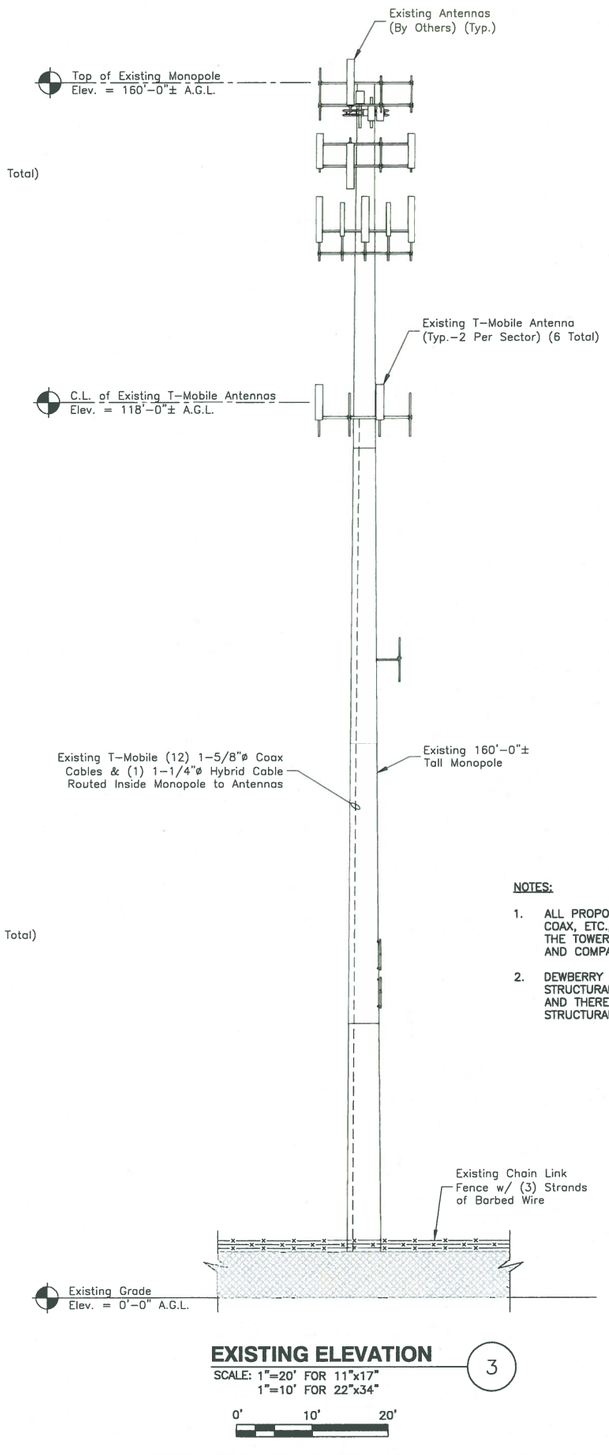
SCALE: N.T.S.

1

PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

2

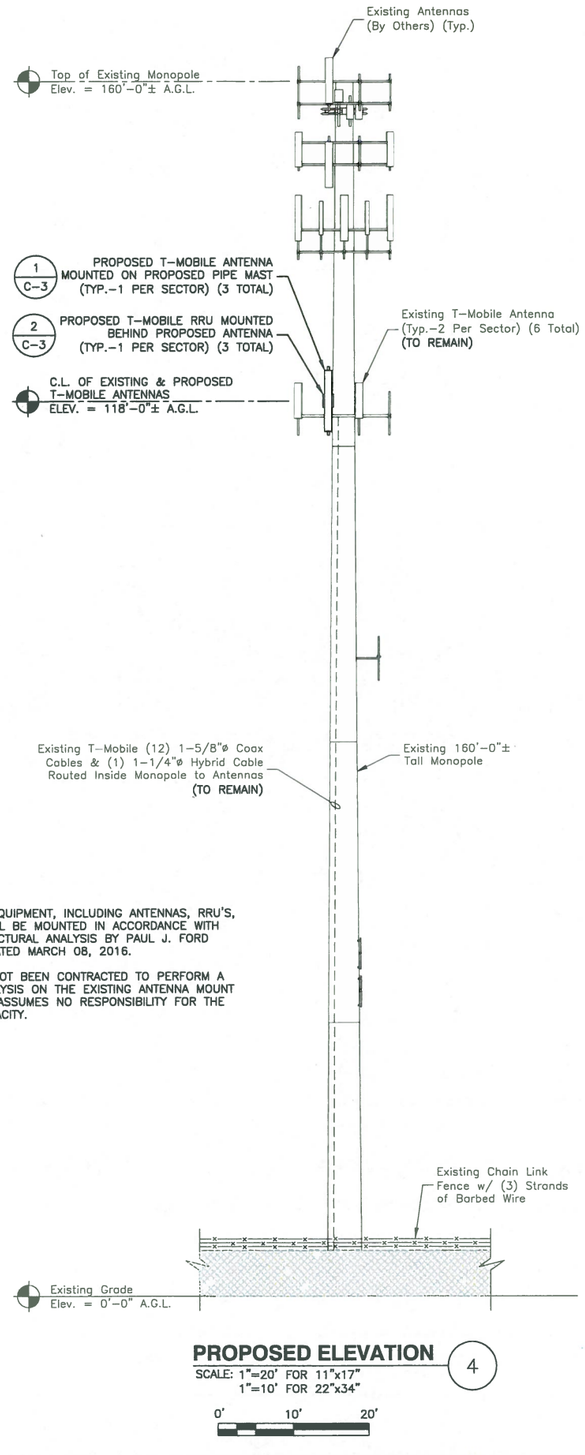


EXISTING ELEVATION

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

0' 10' 20'

3



PROPOSED ELEVATION

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

0' 10' 20'

4

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY PAUL J. FORD AND COMPANY DATED MARCH 08, 2016.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING ANTENNA MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.

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CONSTRUCTION DRAWINGS

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JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071484
SITE ADDRESS:	

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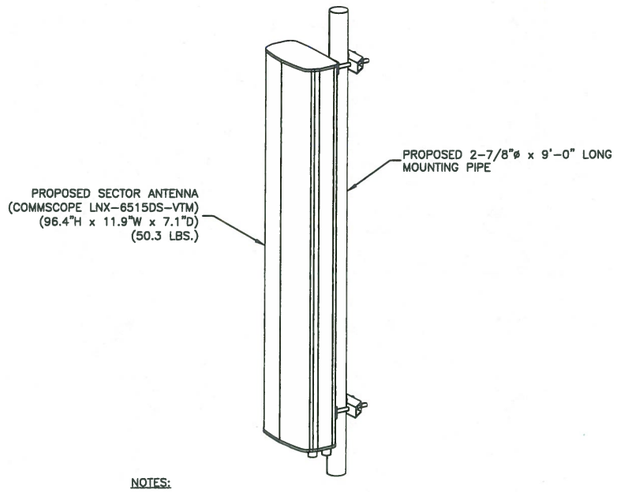
STAMFORD, CT 06903
FAIRFIELD COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

C-2

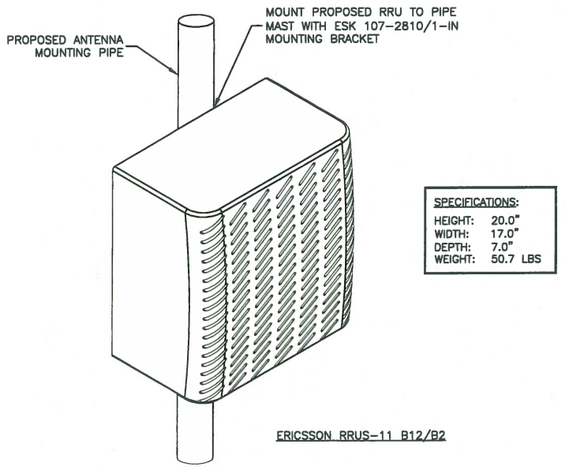


NOTES:

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

ISOMETRIC ANTENNA DETAIL (1)

SCALE: N.T.S.

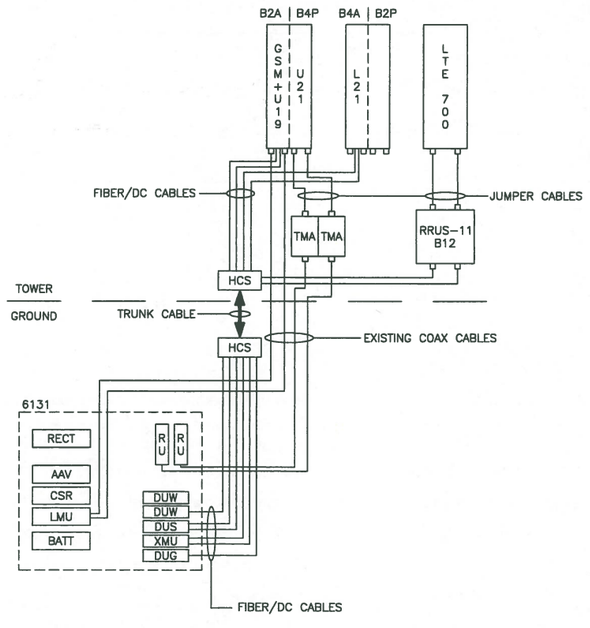


RRU NOTES:

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 702Cu (3)

SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		HYBRID	COAX/HYBRID LENGTH	TMA	RRU
	EXISTING	PROPOSED	EXISTING	PROPOSED	PROPOSED		EXISTING	PROPOSED
ALPHA	ERICSSON AIR 21 B4A B2P	EXISTING TO REMAIN	(4) 1-5/8"ø	–	(1) 1-1/4"ø	168'-0"	–	–
	–	COMMSCOPE LNX-6515DS-VTM					–	(1) RRUS-11 B12
	ERICSSON AIR 21 B2A B4P	EXISTING TO REMAIN					(1) KRY 112 144/1	–
BETA	ERICSSON AIR 21 B4A B2P	EXISTING TO REMAIN	(4) 1-5/8"ø	–		168'-0"	–	–
	–	COMMSCOPE LNX-6515DS-VTM					–	(1) RRUS-11 B12
	ERICSSON AIR 21 B2A B4P	EXISTING TO REMAIN					(1) KRY 112 144/1	–
GAMMA	ERICSSON AIR 21 B4A B2P	EXISTING TO REMAIN	(4) 1-5/8"ø	–		168'-0"	–	–
	–	COMMSCOPE LNX-6515DS-VTM					–	(1) RRUS-11 B12
	ERICSSON AIR 21 B2A B4P	EXISTING TO REMAIN					(1) KRY 112 144/1	–

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CONSTRUCTION DRAWINGS

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FAIRFIELD COUNTY

SHEET TITLE

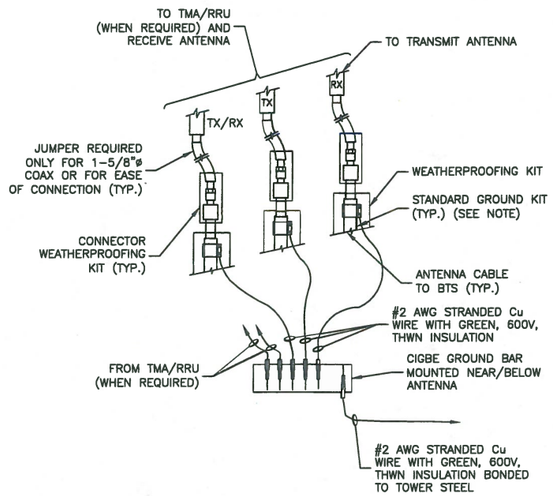
CONSTRUCTION DETAILS

SHEET NUMBER

C-3

GROUNDING NOTES:

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

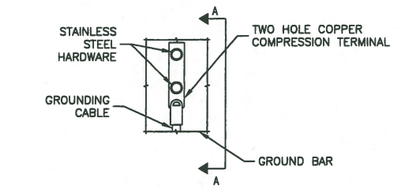


NOTE:

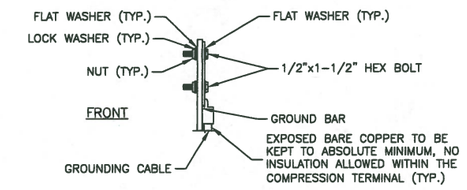
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) 1

SCALE: N.T.S.



ELEVATION



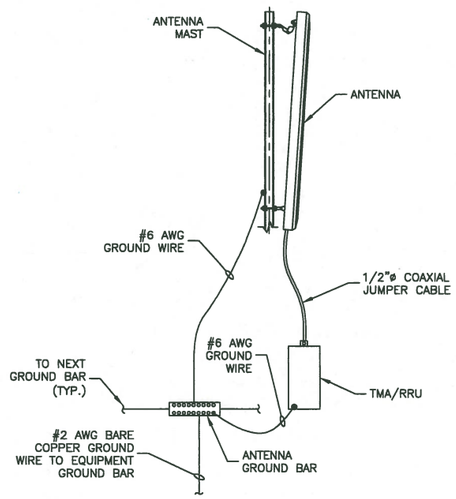
SECTION 'A-A'

NOTES:

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

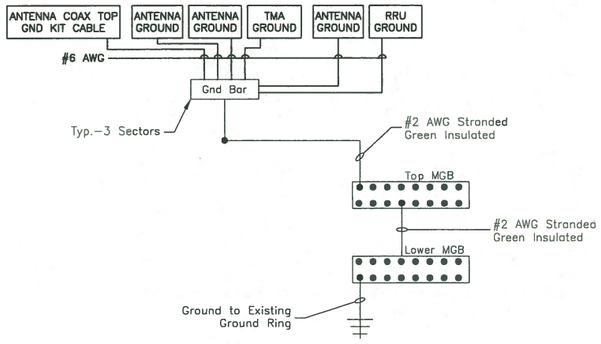
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 2

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL 3

SCALE: N.T.S



NOTES:

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

SCHEMATIC GROUNDING DIAGRAM 4

SCALE: N.T.S.

T-Mobile

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

CROWN CASTLE

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

CT11071E
BRG 2044 (A) 943097

CONSTRUCTION DRAWINGS		
0	03/24/16	ISSUED AS FINAL

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

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071484
SITE ADDRESS:	

69 GUINEA RD
STAMFORD, CT 06903
FAIRFIELD COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

PJF PAUL J. FORD & COMPANY | 50 Years 1965 - 2015

Date: **March 8, 2016**

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

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
mscroggy@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11071E
	Carrier Site Name:	Stamford/ MP X32/ Den Rd.
Crown Castle Designation:	**Crown Castle BU Number:**	806953
	Crown Castle Site Name:	BRG 2044 (A) 943097
	Crown Castle JDE Job Number:	322229
	Crown Castle Work Order Number:	1194774
	Crown Castle Application Number:	282545 Rev. 0
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37516-0250.003.7805R1 (Building Code Reference)
Site Data:	**69 GUINEA RD(CAMP ROCKY CRAIG), STAMFORD, Fairfield County, CT: Latitude *41° 6' 6.35"*, Longitude *-73° 35' 41.45"*** **160 Foot - Monopole Tower**	

Dear Mitchell Abbott,

Paul J. Ford and Company 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 873271, in accordance with application 282545, revision 0.

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

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/ loading, respectively.

This analysis has been performed in accordance with the TIA-222-G, as allowed by Sections 104.10 and 104.11 of the 2005 Connecticut Building Code and the 2012 International Building Code based upon an ultimate 3-second gust wind speed of 117 mph converted to a nominal 3-second gust wind speed of 91 mph per section 1609.3.1 as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category B and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

We at *Paul J. Ford and Company* 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:

Morgan Scroggy, E.I.
Structural Designer

tnxTower Report - version 7.0.5.1

3-8-16

PAUL J. FORD & COMPANY

Date: **March 8, 2016**

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

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
mscroggy@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11071E
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1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by VALMONT in August of 1999. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the TIA-222-G, as allowed by Sections 104.10 and 104.11 of the 2005 Connecticut Building Code and the 2012 International Building Code based upon an ultimate 3-second gust wind speed of 117 mph converted to a nominal 3-second gust wind speed of 91 mph per section 1609.3.1 as required for use in the ANSI/TIA-222-G-2005 Standard, “Structural Standard for Antenna Supporting Structures and Antennas”, with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category B and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

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
116.0	118.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	-	-	-
		3	ericsson	RRUS 11 B12			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
157.0	158.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	1 3	5/8 1-1/4	1
		3	alcatel lucent	TD-RRH8x20-25			
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
	157.0	1	tower mounts	Platform Mount [LP 713-1]			
156.0	158.0	3	alcatel lucent	TME-800MHz RRH	-	-	1
	156.0	3	alcatel lucent	TME-1900MHz RRH (65 MHz)			
		2	tower mounts	Pipe Mount [PM 601-3]			
149.0	151.0	6	powerwave technologies	7770.00 w/ Mount Pipe	12 2 1	1-5/8 3/8 5/8	1
		6		LGP21401			
		6		LGP21901			
	149.0	3	ericsson	RRUS-11			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 713-1]			
139.0	142.0	3	alcatel lucent	RRH2X40-AWS	12 1 1	1-5/8 1-1/4 1/2	1
		6	andrew	DB846F65ZAXY w/ Mount Pipe			
		3	powerwave technologies	P65.16.XL.2 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/2C-3L			
		3	rymsa wireless	MG D3-800TV w/ Mount Pipe			
		3	rymsa wireless	MG D3-800Tx w/ Mount Pipe			
	139.0	1	tower mounts	Platform Mount [LP 713-1]			
116.0	118.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Pipe	1 12	1-1/4 1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Pipe			
	116.0	3	ericsson	KRY 112 144/1			
		1	tower mounts	Platform Mount [LP 712-1]			
84.0	84.0	1	gps	GPS_A	-	-	1
		1	tower mounts	Side Arm Mount [SO 701-1]			
45.0	45.0	1	tower mounts	Pipe Mount [PM 601-1]	-	-	1
		1	trimble	BULLET III			
40.0	40.0	1	andrew	GPS-QBW-20N	-	-	1
		1	tower mounts	Pipe Mount [PM 601-1]			

Notes:
1) Existing Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-	-	-	-	-	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 7/20/98	1104116	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Towerkraft, 2622, 7/30/98	1104113	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont, 18917-69, 8/5/99	823122	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 1210025, 8/10/2013	4015064	CCISITES
4-POST-MODIFICATION INSPECTION	SGS, 140526, 8/13/2014	5577141	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 41705-162, 8/30/2009	1251715	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), 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) Monopole was fabricated and installed in accordance with the manufacturer's specifications.
2) Monopole has been properly maintained in accordance with manufacturer's specifications.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Monopole was modified in conformance with the referenced modification drawings.
5) The existing monopole shaft has been reinforced using a Crown-approved system in accordance with the above referenced documents. However, in this analysis we found that the existing pole shaft without modifications has adequate capacity according to TIA-222-G-2 (addendum 2) and therefore, we did not consider the existing reinforcing elements in the strength calculations.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company 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	160 - 111.33	Pole	TP31.29x19.6x0.25	1	-12.93	1568.58	53.7	Pass
L2	111.33 - 73.25	Pole	TP39.912x29.6683x0.3438	2	-23.50	2848.48	60.8	Pass
L3	73.25 - 36.33	Pole	TP48.088x37.8467x0.4063	3	-34.53	4024.95	61.1	Pass
L4	36.33 - 0	Pole	TP56x45.6746x0.4375	4	-51.16	4947.02	65.2	Pass
							Summary	
						Pole (L4)	65.2	Pass
						Rating =	65.2	Pass

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	53.7	Pass
1	Base Plate	0	47.0	Pass
1	Base Foundation – Steel	0	40.8	Pass
1	Base Foundation Soil Interaction	0	58.4	Pass

Structure Rating (max from all components) =	65.2%

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

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1. Tower is located in Fairfield County, Connecticut.
2. ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3. Basic wind speed of 91 mph.
4. Structure Class II.
5. Exposure Category B.
6. Topographic Category 1.
7. Crest Height 0.0000 ft.
8. Nominal ice thickness of 0.7500 in.
9. Ice thickness is considered to increase with height.
10. Ice density of 56.00 pcf.
11. A wind speed of 50 mph is used in combination with ice.
12. Temperature drop of 50 °F.
13. Deflections calculated using a wind speed of 60 mph.
14. A non-linear (P-delta) analysis was used.
15. Pressures are calculated at each section.
16. Stress ratio used in pole design is 1.
17. 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		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

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	160.0000-111.3300	48.6700	4.67	12	19.6000	31.2900	0.2500	1.0000	A572-65 (65 ksi)
L2	111.3300-73.2500	42.7500	5.75	12	29.6683	39.9120	0.3438	1.3750	A572-65 (65 ksi)
L3	73.2500-36.3300	42.6700	6.67	12	37.8467	48.0880	0.4063	1.6250	A572-65 (65 ksi)
L4	36.3300-0.0000	43.0000		12	45.6746	56.0000	0.4375	1.7500	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	20.2914	15.5768	744.4315	6.9273	10.1528	73.3228	1508.4200	7.6664	4.5828	18.331
	32.3938	24.9872	3072.8897	11.1123	16.2082	189.5883	6226.5076	12.2979	7.7157	30.863
L2	31.8734	32.4586	3562.7009	10.4982	15.3682	231.8231	7218.9979	15.9752	7.0299	20.45
	41.3199	43.7971	8752.3577	14.1654	20.6744	423.3424	17734.6495	21.5556	9.7752	28.437
L3	40.6105	48.9768	8763.1086	13.4037	19.6046	446.9927	17756.4337	24.1049	9.0542	22.287
	49.7844	62.3737	18100.5493	17.0701	24.9096	726.6500	36676.6202	30.6984	11.7988	29.043
L4	48.9440	63.7278	16645.8031	16.1949	23.6595	703.5582	33728.9099	31.3649	11.0683	25.299
	57.9755	78.2737	30843.6108	19.8914	29.0080	1063.2795	62497.5176	38.5239	13.8355	31.624

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
HB058-M12-XXXF(5/8")	A	No	CaAa (Out Of Face)	157.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
HB114-1-0813U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	157.0000 - 0.0000	1	No Ice	0.1540	0.00
						1/2" Ice	0.2540	0.00
						1" Ice	0.3540	0.00
HB114-1-0813U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	157.0000 - 0.0000	2	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
***								
LCF158-50JA-A0(1 5/8")	C	No	Inside Pole	149.0000 - 0.0000	12	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
FB-L98B-002-75000(3/8")	C	No	Inside Pole	149.0000 - 0.0000	2	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
WR-VG82ST-BRDA(5/8")	C	No	Inside Pole	149.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
2" (Nominal) Conduit	C	No	Inside Pole	149.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
***								
561(1-5/8")	B	No	Inside Pole	139.0000 - 0.0000	12	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
LDF6-50A(1-1/4")	C	No	CaAa (Out Of Face)	139.0000 - 0.0000	1	No Ice	0.1550	0.00
						1/2" Ice	0.2550	0.00
						1" Ice	0.3550	0.00
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	139.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
***								
MLE Hybrid 3Power/6Fiber RL 2(1 1/4")	A	No	Inside Pole	116.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
LDF7-50A(1-5/8")	A	No	Inside Pole	116.0000 - 0.0000	12	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
***								
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	12.2500 - 1.7500	1	No Ice	0.1250	0.00
						1/2" Ice	0.2361	0.00
						1" Ice	0.3472	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	78.5000 - 77.0000	1	No Ice	0.1250	0.00
						1/2" Ice	0.2361	0.00
						1" Ice	0.3472	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	52.2500 - 12.2500	1	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	88.5000 - 78.5000	1	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVTM14-C-120 w/ Mount Pipe	A	From Face	4.0000	0.00	0.00	157.0000	No Ice	6.5799	4.9591	0.08
			0.00				1/2" Ice	7.0306	5.7544	0.13
			1.00				1" Ice	7.4733	6.4723	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Face	4.0000	0.00	0.00	157.0000	No Ice	6.5799	4.9591	0.08
			0.00				1/2" Ice	7.0306	5.7544	0.13
			1.00				1" Ice	7.4733	6.4723	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Face	4.0000	0.00	0.00	157.0000	No Ice	6.5799	4.9591	0.08
			0.00				1/2" Ice	7.0306	5.7544	0.13
			1.00				1" Ice	7.4733	6.4723	0.19
TD-RRH8x20-25	A	From Face	4.0000	0.00	0.00	157.0000	No Ice	4.0455	1.5345	0.07
			0.00				1/2" Ice	4.2975	1.7142	0.10
			1.00				1" Ice	4.5570	1.9008	0.13
TD-RRH8x20-25	B	From Face	4.0000	0.00	0.00	157.0000	No Ice	4.0455	1.5345	0.07
			0.00				1/2" Ice	4.2975	1.7142	0.10
			1.00				1" Ice	4.5570	1.9008	0.13
TD-RRH8x20-25	C	From Face	4.0000	0.00	0.00	157.0000	No Ice	4.0455	1.5345	0.07
			0.00				1/2" Ice	4.2975	1.7142	0.10
			1.00				1" Ice	4.5570	1.9008	0.13
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.0000	0.00	0.00	157.0000	No Ice	8.2619	6.9458	0.08
			0.00				1/2" Ice	8.8215	8.1266	0.15
			1.00				1" Ice	9.3462	9.0212	0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.0000	0.00	0.00	157.0000	No Ice	8.2619	6.9458	0.08
			0.00				1/2" Ice	8.8215	8.1266	0.15
			1.00				1" Ice	9.3462	9.0212	0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.0000	0.00	0.00	157.0000	No Ice	8.2619	6.9458	0.08
			0.00				1/2" Ice	8.8215	8.1266	0.15
			1.00				1" Ice	9.3462	9.0212	0.23
800 EXTERNAL NOTCH FILTER	A	From Face	4.0000	0.00	0.00	157.0000	No Ice	0.6601	0.3211	0.01
			0.00				1/2" Ice	0.7627	0.3983	0.02
			1.00				1" Ice	0.8727	0.4830	0.02
800 EXTERNAL NOTCH FILTER	B	From Face	4.0000	0.00	0.00	157.0000	No Ice	0.6601	0.3211	0.01
			0.00				1/2" Ice	0.7627	0.3983	0.02
			1.00				1" Ice	0.8727	0.4830	0.02
800 EXTERNAL NOTCH FILTER	C	From Face	4.0000	0.00	0.00	157.0000	No Ice	0.6601	0.3211	0.01
			0.00				1/2" Ice	0.7627	0.3983	0.02
			1.00				1" Ice	0.8727	0.4830	0.02
(3) ACU-A20-N	A	From Face	4.0000	0.00	0.00	157.0000	No Ice	0.0667	0.1167	0.00
			0.00				1/2" Ice	0.1037	0.1620	0.00
			1.00				1" Ice	0.1481	0.2148	0.00

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			
(3) ACU-A20-N	B	From Face	4.0000 0.00 1.00	0.00	157.0000	No Ice 1/2" Ice 1" Ice	0.0667 0.1037 0.1481	0.1167 0.1620 0.2148	0.00 0.00 0.00
(3) ACU-A20-N	C	From Face	4.0000 0.00 1.00	0.00	157.0000	No Ice 1/2" Ice 1" Ice	0.0667 0.1037 0.1481	0.1167 0.1620 0.2148	0.00 0.00 0.00
(2) 4' x 2'' Pipe Mount	A	From Face	4.0000 0.00 0.00	0.00	157.0000	No Ice 1/2" Ice 1" Ice	0.7852 1.0284 1.2809	0.7852 1.0284 1.2809	0.03 0.04 0.04
(2) 4' x 2'' Pipe Mount	B	From Face	4.0000 0.00 0.00	0.00	157.0000	No Ice 1/2" Ice 1" Ice	0.7852 1.0284 1.2809	0.7852 1.0284 1.2809	0.03 0.04 0.04
(2) 4' x 2'' Pipe Mount	C	From Face	4.0000 0.00 0.00	0.00	157.0000	No Ice 1/2" Ice 1" Ice	0.7852 1.0284 1.2809	0.7852 1.0284 1.2809	0.03 0.04 0.04
Platform Mount [LP 713-1]	A	None		0.00	157.0000	No Ice 1/2" Ice 1" Ice	31.2700 39.6800 48.0900	31.2700 39.6800 48.0900	1.51 1.93 2.35
***									
TME-800MHz RRH	A	From Face	2.0000 0.00 2.00	0.00	156.0000	No Ice 1/2" Ice 1" Ice	2.1342 2.3195 2.5123	1.7730 1.9461 2.1267	0.05 0.07 0.10
TME-800MHz RRH	B	From Face	2.0000 0.00 2.00	0.00	156.0000	No Ice 1/2" Ice 1" Ice	2.1342 2.3195 2.5123	1.7730 1.9461 2.1267	0.05 0.07 0.10
TME-800MHz RRH	C	From Face	2.0000 0.00 2.00	0.00	156.0000	No Ice 1/2" Ice 1" Ice	2.1342 2.3195 2.5123	1.7730 1.9461 2.1267	0.05 0.07 0.10
TME-1900MHz RRH (65 MHz)	A	From Face	2.0000 0.00 0.00	0.00	156.0000	No Ice 1/2" Ice 1" Ice	2.3125 2.5168 2.7284	2.3750 2.5809 2.7943	0.06 0.08 0.11
TME-1900MHz RRH (65 MHz)	B	From Face	2.0000 0.00 0.00	0.00	156.0000	No Ice 1/2" Ice 1" Ice	2.3125 2.5168 2.7284	2.3750 2.5809 2.7943	0.06 0.08 0.11
TME-1900MHz RRH (65 MHz)	C	From Face	2.0000 0.00 0.00	0.00	156.0000	No Ice 1/2" Ice 1" Ice	2.3125 2.5168 2.7284	2.3750 2.5809 2.7943	0.06 0.08 0.11
(2) Pipe Mount [PM 601-3]	C	None		0.00	156.0000	No Ice 1/2" Ice 1" Ice	4.3900 5.4800 6.5700	4.3900 5.4800 6.5700	0.20 0.24 0.28
*****									
(2) 7770.00 w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	149.0000	No Ice 1/2" Ice 1" Ice	5.8474 6.2677 6.6966	4.8204 5.5082 6.2127	0.09 0.14 0.21
(2) 7770.00 w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	149.0000	No Ice 1/2" Ice 1" Ice	5.8474 6.2677 6.6966	4.8204 5.5082 6.2127	0.09 0.14 0.21
(2) 7770.00 w/ Mount Pipe	C	From Face	4.0000 0.00	0.00	149.0000	No Ice 1/2"	5.8474 6.2677	4.8204 5.5082	0.09 0.14

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
			2.00			Ice	6.6966	6.2127	0.21
						1" Ice			
(2) LGP21401	A	From Face	4.0000	0.00	149.0000	No Ice	1.1040	0.3471	0.01
			0.00			1/2"	1.2388	0.4422	0.02
			2.00			Ice	1.3810	0.5444	0.03
						1" Ice			
(2) LGP21401	B	From Face	4.0000	0.00	149.0000	No Ice	1.1040	0.3471	0.01
			0.00			1/2"	1.2388	0.4422	0.02
			2.00			Ice	1.3810	0.5444	0.03
						1" Ice			
(2) LGP21401	C	From Face	4.0000	0.00	149.0000	No Ice	1.1040	0.3471	0.01
			0.00			1/2"	1.2388	0.4422	0.02
			2.00			Ice	1.3810	0.5444	0.03
						1" Ice			
(2) LGP21901	A	From Face	4.0000	0.00	149.0000	No Ice	0.2310	0.1575	0.01
			0.00			1/2"	0.2941	0.2129	0.01
			2.00			Ice	0.3647	0.2756	0.01
						1" Ice			
(2) LGP21901	B	From Face	4.0000	0.00	149.0000	No Ice	0.2310	0.1575	0.01
			0.00			1/2"	0.2941	0.2129	0.01
			2.00			Ice	0.3647	0.2756	0.01
						1" Ice			
(2) LGP21901	C	From Face	4.0000	0.00	149.0000	No Ice	0.2310	0.1575	0.01
			0.00			1/2"	0.2941	0.2129	0.01
			2.00			Ice	0.3647	0.2756	0.01
						1" Ice			
P65-16-XLH-RR w/ Mount Pipe	A	From Face	4.0000	0.00	149.0000	No Ice	8.3708	6.3625	0.08
			0.00			1/2"	8.9314	7.5378	0.14
			0.00			Ice	9.4571	8.4270	0.22
						1" Ice			
P65-16-XLH-RR w/ Mount Pipe	B	From Face	4.0000	0.00	149.0000	No Ice	8.3708	6.3625	0.08
			0.00			1/2"	8.9314	7.5378	0.14
			0.00			Ice	9.4571	8.4270	0.22
						1" Ice			
P65-16-XLH-RR w/ Mount Pipe	C	From Face	4.0000	0.00	149.0000	No Ice	8.3708	6.3625	0.08
			0.00			1/2"	8.9314	7.5378	0.14
			0.00			Ice	9.4571	8.4270	0.22
						1" Ice			
RRUS-11	A	From Face	4.0000	0.00	149.0000	No Ice	2.7845	1.1872	0.05
			0.00			1/2"	2.9919	1.3342	0.07
			0.00			Ice	3.2066	1.4897	0.09
						1" Ice			
RRUS-11	B	From Face	4.0000	0.00	149.0000	No Ice	2.7845	1.1872	0.05
			0.00			1/2"	2.9919	1.3342	0.07
			0.00			Ice	3.2066	1.4897	0.09
						1" Ice			
RRUS-11	C	From Face	4.0000	0.00	149.0000	No Ice	2.7845	1.1872	0.05
			0.00			1/2"	2.9919	1.3342	0.07
			0.00			Ice	3.2066	1.4897	0.09
						1" Ice			
DC6-48-60-18-8F	C	From Face	4.0000	0.00	149.0000	No Ice	0.9167	0.9167	0.02
			0.00			1/2"	1.4583	1.4583	0.04
			0.00			Ice	1.6431	1.6431	0.06
						1" Ice			
4' x 2" Pipe Mount	A	From Face	4.0000	0.00	149.0000	No Ice	0.7852	0.7852	0.03
			0.00			1/2"	1.0284	1.0284	0.04
			0.00			Ice	1.2809	1.2809	0.04
						1" Ice			
4' x 2" Pipe Mount	B	From Face	4.0000	0.00	149.0000	No Ice	0.7852	0.7852	0.03
			0.00			1/2"	1.0284	1.0284	0.04
			0.00			Ice	1.2809	1.2809	0.04
						1" Ice			
4' x 2" Pipe Mount	C	From Face	4.0000	0.00	149.0000	No Ice	0.7852	0.7852	0.03
			0.00			1/2"	1.0284	1.0284	0.04
			0.00			Ice	1.2809	1.2809	0.04

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
Platform Mount [LP 713-1]	A	None		0.00	149.0000	1" Ice No Ice 1/2" Ice 1" Ice	31.2700 39.6800 48.0900	31.2700 39.6800 48.0900	1.51 1.93 2.35
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MG D3-800TV w/ Mount Pipe	A	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	3.5703 3.9790 4.3870	3.4178 4.1193 4.7842	0.04 0.07 0.11
MG D3-800TV w/ Mount Pipe	B	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	3.5703 3.9790 4.3870	3.4178 4.1193 4.7842	0.04 0.07 0.11
MG D3-800TV w/ Mount Pipe	C	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	3.5703 3.9790 4.3870	3.4178 4.1193 4.7842	0.04 0.07 0.11
(2) DB846F65ZAXY w/ Mount Pipe	A	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	7.2708 7.8325 8.3480	7.8208 9.0097 9.9124	0.05 0.11 0.19
(2) DB846F65ZAXY w/ Mount Pipe	B	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	7.2708 7.8325 8.3480	7.8208 9.0097 9.9124	0.05 0.11 0.19
(2) DB846F65ZAXY w/ Mount Pipe	C	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	7.2708 7.8325 8.3480	7.8208 9.0097 9.9124	0.05 0.11 0.19
P65.16.XL.2 w/ Mount Pipe	A	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	8.3708 8.9314 9.4571	5.7792 6.9491 7.8329	0.06 0.12 0.19
P65.16.XL.2 w/ Mount Pipe	B	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	8.3708 8.9314 9.4571	5.7792 6.9491 7.8329	0.06 0.12 0.19
P65.16.XL.2 w/ Mount Pipe	C	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	8.3708 8.9314 9.4571	5.7792 6.9491 7.8329	0.06 0.12 0.19
MG D3-800Tx w/ Mount Pipe	A	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	3.5703 3.9790 4.3870	3.4178 4.1193 4.7842	0.03 0.07 0.11
MG D3-800Tx w/ Mount Pipe	B	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	3.5703 3.9790 4.3870	3.4178 4.1193 4.7842	0.03 0.07 0.11
MG D3-800Tx w/ Mount Pipe	C	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	3.5703 3.9790 4.3870	3.4178 4.1193 4.7842	0.03 0.07 0.11
(2) FD9R6004/2C-3L	A	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	0.3142 0.3862 0.4656	0.0762 0.1189 0.1685	0.00 0.01 0.01
(2) FD9R6004/2C-3L	B	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice 1" Ice	0.3142 0.3862 0.4656	0.0762 0.1189 0.1685	0.00 0.01 0.01
(2) FD9R6004/2C-3L	C	From Face	4.0000 0.00 3.00	0.00	139.0000	1" Ice No Ice 1/2" Ice Ice	0.3142 0.3862 0.4656	0.0762 0.1189 0.1685	0.00 0.01 0.01

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			
RRH2X40-AWS	A	From Face	4.0000 0.00 3.00	0.00	139.0000	No Ice 1/2" Ice 1" Ice	2.1614 2.3597 2.5655	1.4199 1.5903 1.7676	0.04 0.06 0.08
RRH2X40-AWS	B	From Face	4.0000 0.00 3.00	0.00	139.0000	No Ice 1/2" Ice 1" Ice	2.1614 2.3597 2.5655	1.4199 1.5903 1.7676	0.04 0.06 0.08
RRH2X40-AWS	C	From Face	4.0000 0.00 3.00	0.00	139.0000	No Ice 1/2" Ice 1" Ice	2.1614 2.3597 2.5655	1.4199 1.5903 1.7676	0.04 0.06 0.08
DB-T1-6Z-8AB-0Z	C	From Face	4.0000 0.00 3.00	0.00	139.0000	No Ice 1/2" Ice 1" Ice	4.8000 5.0704 5.3481	2.0000 2.1926 2.3926	0.04 0.08 0.12
Platform Mount [LP 713-1]	A	None		0.00	139.0000	No Ice 1/2" Ice 1" Ice	31.2700 39.6800 48.0900	31.2700 39.6800 48.0900	1.51 1.93 2.35
***									
LNX-6515DS-VTM w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	11.6828 12.4043 13.1351	9.8418 11.3657 12.9138	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	11.6828 12.4043 13.1351	9.8418 11.3657 12.9138	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	11.6828 12.4043 13.1351	9.8418 11.3657 12.9138	0.08 0.17 0.27
RRUS 11 B12	A	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	2.8333 3.0426 3.2593	1.1821 1.3299 1.4848	0.05 0.07 0.10
RRUS 11 B12	B	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	2.8333 3.0426 3.2593	1.1821 1.3299 1.4848	0.05 0.07 0.10
RRUS 11 B12	C	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	2.8333 3.0426 3.2593	1.1821 1.3299 1.4848	0.05 0.07 0.10
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	6.3292 6.7751 7.2137	5.6424 6.4259 7.1313	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	6.3292 6.7751 7.2137	5.6424 6.4259 7.1313	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	6.3292 6.7751 7.2137	5.6424 6.4259 7.1313	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	6.3186 6.7646 7.2032	5.6334 6.4160 7.1208	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice	6.3186 6.7646 7.2032	5.6334 6.4160 7.1208	0.11 0.17 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	6.3186 6.7646 7.2032	5.6334 6.4160 7.1208	0.11 0.17 0.23
KRY 112 144/1	A	From Face	4.0000 0.00 0.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	0.3500 0.4259 0.5093	0.1750 0.2343 0.3009	0.01 0.01 0.02
KRY 112 144/1	B	From Face	4.0000 0.00 0.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	0.3500 0.4259 0.5093	0.1750 0.2343 0.3009	0.01 0.01 0.02
KRY 112 144/1	C	From Face	4.0000 0.00 0.00	0.00	116.0000	No Ice 1/2" Ice 1" Ice	0.3500 0.4259 0.5093	0.1750 0.2343 0.3009	0.01 0.01 0.02
Platform Mount [LP 712-1]	A	None		0.00	116.0000	No Ice 1/2" Ice 1" Ice	24.5300 29.9400 35.3500	24.5300 29.9400 35.3500	1.34 1.65 1.96
***									
GPS_A	C	From Face	4.0000 0.00 0.00	0.00	84.0000	No Ice 1/2" Ice 1" Ice	0.2550 0.3205 0.3934	0.2550 0.3205 0.3934	0.00 0.00 0.01
Side Arm Mount [SO 701-1]	C	From Face	2.0000 0.00 0.00	0.00	84.0000	No Ice 1/2" Ice 1" Ice	0.8500 1.1400 1.4300	1.6700 2.3400 3.0100	0.07 0.08 0.09
***									
BULLET III	C	None		0.00	45.0000	No Ice 1/2" Ice 1" Ice	0.0663 0.1015 0.1440	0.0663 0.1015 0.1440	0.00 0.00 0.00
Pipe Mount [PM 601-1]	C	None		0.00	45.0000	No Ice 1/2" Ice 1" Ice	3.0000 3.7400 4.4800	0.9000 1.1200 1.3400	0.07 0.08 0.09
***									
GPS-QBW-20N	C	None		0.00	40.0000	No Ice 1/2" Ice 1" Ice	0.1292 0.1779 0.2340	0.1292 0.1779 0.2340	0.00 0.00 0.00
Pipe Mount [PM 601-1]	C	None		0.00	40.0000	No Ice 1/2" Ice 1" Ice	3.0000 3.7400 4.4800	0.9000 1.1200 1.3400	0.07 0.08 0.09
***									

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 160.0000-111.3300	134.1093	1.075	0.02	106.841	A	0.000	106.841	106.841	100.00	0.000	7.033
					B	0.000	106.841		100.00	0.000	0.000
					C	0.000	106.841		100.00	0.000	4.289
L2 111.3300-73.2500	91.7516	0.964	0.02	116.133	A	0.000	116.133	116.133	100.00	0.000	5.864
					B	0.000	116.133		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	116.133		100.00	0.000	7.757
L3 73.2500-36.3300	54.6142	0.831	0.02	139.057	A	0.000	139.057	139.057	100.00	0.000	5.686
					B	0.000	139.057		100.00	0.000	0.000
					C	0.000	139.057		100.00	0.000	8.376
L4 36.3300-0.0000	17.6535	0.7	0.01	161.849	A	0.000	161.849	161.849	100.00	0.000	5.595
					B	0.000	161.849		100.00	0.000	0.000
					C	0.000	161.849		100.00	0.000	10.957

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 160.0000-111.3300	134.1093	1.075	0.01	1.7258	120.840	A	0.000	120.840	120.840	100.00	0.000	22.797
						B	0.000	120.840		100.00	0.000	0.000
						C	0.000	120.840		100.00	0.000	13.839
L2 111.3300-73.2500	91.7516	0.964	0.01	1.6615	127.086	A	0.000	127.086	127.086	100.00	0.000	19.008
						B	0.000	127.086		100.00	0.000	0.000
						C	0.000	127.086		100.00	0.000	25.310
L3 73.2500-36.3300	54.6142	0.831	0.01	1.5775	149.281	A	0.000	149.281	149.281	100.00	0.000	17.954
						B	0.000	149.281		100.00	0.000	0.000
						C	0.000	149.281		100.00	0.000	26.522
L4 36.3300-0.0000	17.6535	0.7	0.00	1.4090	171.401	A	0.000	171.401	171.401	100.00	0.000	17.057
						B	0.000	171.401		100.00	0.000	0.000
						C	0.000	171.401		100.00	0.000	34.541

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 160.0000-111.3300	134.1093	1.075	0.01	106.841	A	0.000	106.841	106.841	100.00	0.000	7.033
					B	0.000	106.841		100.00	0.000	0.000
					C	0.000	106.841		100.00	0.000	4.289
L2 111.3300-73.2500	91.7516	0.964	0.01	116.133	A	0.000	116.133	116.133	100.00	0.000	5.864
					B	0.000	116.133		100.00	0.000	0.000
					C	0.000	116.133		100.00	0.000	7.757
L3 73.2500-36.3300	54.6142	0.831	0.01	139.057	A	0.000	139.057	139.057	100.00	0.000	5.686
					B	0.000	139.057		100.00	0.000	0.000
					C	0.000	139.057		100.00	0.000	8.376
L4 36.3300-0.0000	17.6535	0.7	0.01	161.849	A	0.000	161.849	161.849	100.00	0.000	5.595
					B	0.000	161.849		100.00	0.000	0.000
					C	0.000	161.849		100.00	0.000	10.957

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice

Comb. No.	Description
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	160 - 111.33	Pole	Max Tension	14	0.00	-0.00	0.00
			Max. Compression	26	-32.35	0.34	-0.25
			Max. Mx	20	-12.94	502.43	-0.16
			Max. My	14	-12.93	0.03	-504.96
			Max. Vy	20	-16.62	502.43	-0.16
			Max. Vx	14	16.71	0.03	-504.96
			Max. Torque	20			0.38
L2	111.33 - 73.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.24	0.92	0.52
			Max. Mx	20	-23.51	1320.62	-0.23
			Max. My	14	-23.50	0.08	-1326.39
			Max. Vy	20	-24.13	1320.62	-0.23
			Max. Vx	2	-24.19	0.08	1325.91
			Max. Torque	12			-0.61
L3	73.25 - 36.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.88	1.62	2.04
			Max. Mx	20	-34.54	2264.47	0.03
			Max. My	2	-34.53	0.13	2272.24

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-28.28	2264.47	0.03
			Max. Vx	2	-28.34	0.13	2272.24
			Max. Torque	12			-0.90
L4	36.33 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.00	2.56	4.10
			Max. Mx	20	-51.16	3579.92	0.40
			Max. My	2	-51.16	0.20	3590.61
			Max. Vy	20	-32.77	3579.92	0.40
			Max. Vx	2	-32.83	0.20	3590.61
			Max. Torque	3			1.40

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 111.33	24.06	45	1.36	0.00
L2	116 - 73.25	12.38	39	1.07	0.00
L3	79 - 36.33	5.52	39	0.68	0.00
L4	43 - 0	1.62	39	0.34	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.0000	APXVTM14-C-120 w/ Mount Pipe	45	23.20	1.35	0.00	41890
156.0000	TME-800MHz RRH	45	22.92	1.34	0.00	41890
149.0000	(2) 7770.00 w/ Mount Pipe	45	20.94	1.30	0.00	19041
139.0000	MG D3-800TV w/ Mount Pipe	45	18.18	1.24	0.00	9973
116.0000	LNX-6515DS-VTM w/ Mount Pipe	39	12.38	1.07	0.00	4876
84.0000	GPS_A	39	6.28	0.73	0.00	5895
45.0000	BULLET III	39	1.76	0.36	0.00	5403
40.0000	GPS-QBW-20N	39	1.42	0.32	0.00	5748

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 111.33	99.64	14	5.65	0.00
L2	116 - 73.25	51.28	2	4.42	0.00
L3	79 - 36.33	22.88	2	2.80	0.00
L4	43 - 0	6.69	2	1.42	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.0000	APXVTM14-C-120 w/ Mount Pipe	14	96.12	5.58	0.00	10271
156.0000	TME-800MHz RRH	14	94.94	5.56	0.00	10271
149.0000	(2) 7770.00 w/ Mount Pipe	14	86.76	5.39	0.00	4667
139.0000	MG D3-800TV w/ Mount Pipe	14	75.32	5.14	0.00	2443
116.0000	LNX-6515DS-VTM w/ Mount Pipe	2	51.28	4.42	0.00	1190
84.0000	GPS_A	2	25.99	3.02	0.00	1428

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
45.0000	BULLET III	2	7.29	1.49	0.00	1305
40.0000	GPS-QBW-20N	2	5.86	1.32	0.00	1388

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	160 - 111.33 (1)	TP31.29x19.6x0.25	48.6700	0.0000	0.0	24.0842	-12.93	1568.58	0.008
L2	111.33 - 73.25 (2)	TP39.912x29.6683x0.3438	42.7500	0.0000	0.0	42.2720	-23.50	2848.48	0.008
L3	73.25 - 36.33 (3)	TP48.088x37.8467x0.4063	42.6700	0.0000	0.0	60.2795	-34.53	4024.95	0.009
L4	36.33 - 0 (4)	TP56x45.6746x0.4375	43.0000	0.0000	0.0	78.2737	-51.16	4947.02	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	160 - 111.33 (1)	TP31.29x19.6x0.25	504.96	955.67	0.528	0.00	955.67	0.000
L2	111.33 - 73.25 (2)	TP39.912x29.6683x0.3438	1326.39	2213.87	0.599	0.00	2213.87	0.000
L3	73.25 - 36.33 (3)	TP48.088x37.8467x0.4063	2272.24	3775.24	0.602	0.00	3775.24	0.000
L4	36.33 - 0 (4)	TP56x45.6746x0.4375	3590.62	5600.07	0.641	0.00	5600.07	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	160 - 111.33 (1)	TP31.29x19.6x0.25	16.71	784.29	0.021	0.15	1937.79	0.000
L2	111.33 - 73.25 (2)	TP39.912x29.6683x0.3438	24.19	1424.24	0.017	0.45	4489.02	0.000
L3	73.25 - 36.33 (3)	TP48.088x37.8467x0.4063	28.34	2012.48	0.014	0.82	7655.00	0.000
L4	36.33 - 0 (4)	TP56x45.6746x0.4375	32.83	2473.51	0.013	1.40	11355.25	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 111.33 (1)	0.008	0.528	0.000	0.021	0.000	0.537 ✔	1.000	4.8.2 ✔
L2	111.33 - 73.25 (2)	0.008	0.599	0.000	0.017	0.000	0.608 ✔	1.000	4.8.2 ✔
L3	73.25 - 36.33 (3)	0.009	0.602	0.000	0.014	0.000	0.611 ✔	1.000	4.8.2 ✔

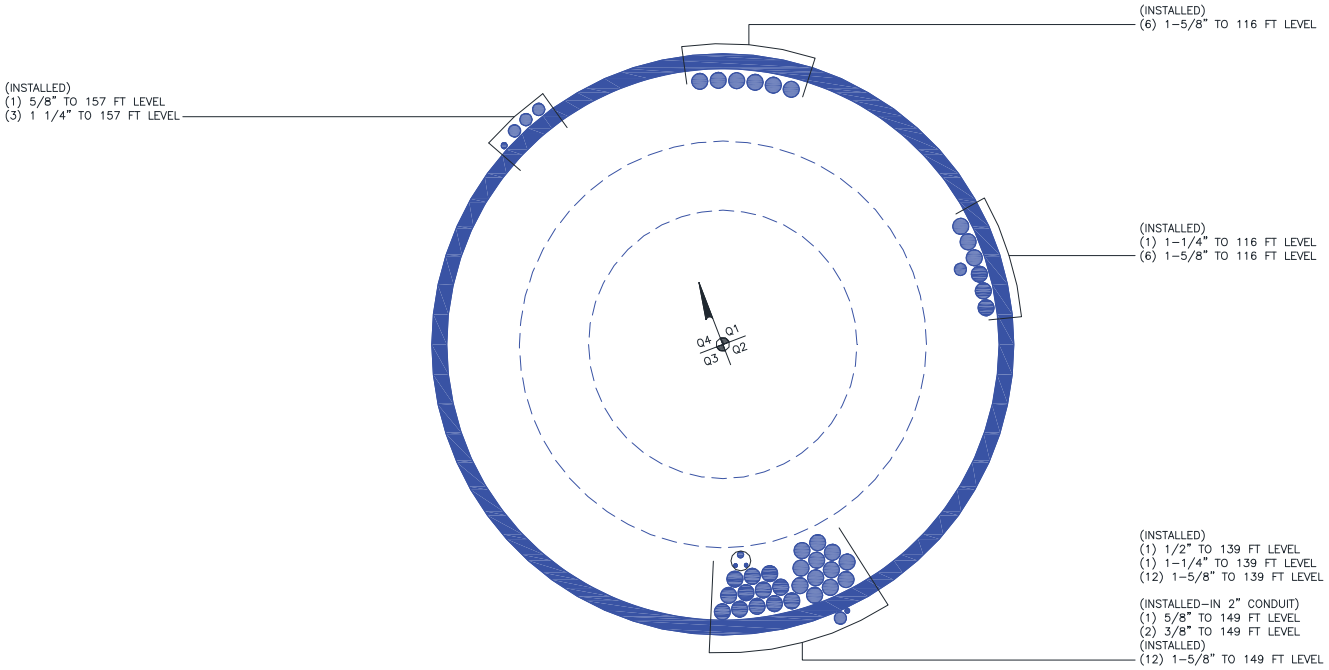
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L4	36.33 - 0 (4)	0.010	0.641	0.000	0.013	0.000	0.652 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	160 - 111.33	Pole	TP31.29x19.6x0.25	1	-12.93	1568.58	53.7	Pass
L2	111.33 - 73.25	Pole	TP39.912x29.6683x0.3438	2	-23.50	2848.48	60.8	Pass
L3	73.25 - 36.33	Pole	TP48.088x37.8467x0.4063	3	-34.53	4024.95	61.1	Pass
L4	36.33 - 0	Pole	TP56x45.6746x0.4375	4	-51.16	4947.02	65.2	Pass
						Summary		
						Pole (L4)	65.2	Pass
						RATING =	**65.2**	**Pass**

APPENDIX B

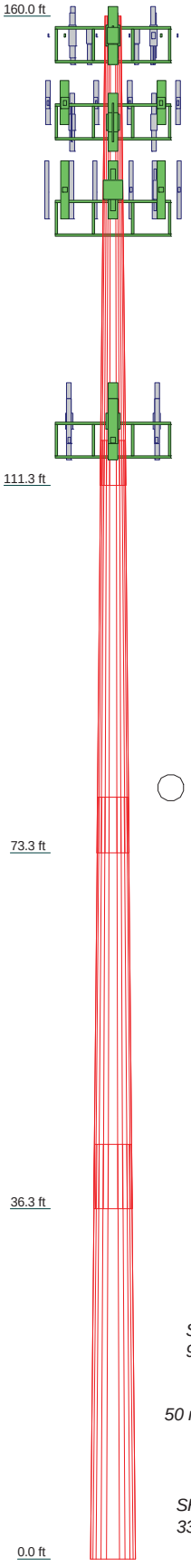
BASE LEVEL DRAWING


(INSTALLED)
(6) 1-5/8" TO 116 FT LEVEL
(INSTALLED)
(1) 5/8" TO 157 FT LEVEL
(3) 1 1/4" TO 157 FT LEVEL
(INSTALLED)
(1) 1-1/4" TO 116 FT LEVEL
(6) 1-5/8" TO 116 FT LEVEL
Q1
Q2
Q3
Q4
(INSTALLED)
(1) 1/2" TO 139 FT LEVEL
(1) 1-1/4" TO 139 FT LEVEL
(12) 1-5/8" TO 139 FT LEVEL
(INSTALLED-IN 2" CONDUIT)
(1) 5/8" TO 149 FT LEVEL
(2) 3/8" TO 149 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 149 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	48.6700	12	0.2500	4.6700	19.6000	31.2900	A572-65	3.4
2	42.7500	12	0.3438	5.7500	29.6683	39.9120		5.5
3	42.6700	12	0.4063	6.6700	37.8467	48.0880		8.1
4	43.0000	12	0.4375		45.6746	56.0000		10.4
								27.4



ALL REACTIONS ARE FACTORED

AXIAL 89 K

SHEAR 9 K

MOMENT 1110 kip-ft

TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 51 K

SHEAR 33 K

MOMENT 3591 kip-ft

TORQUE 1 kip-ft
REACTIONS - 91 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVTM14-C-120 w/ Mount Pipe	157	MG D3-800TV w/ Mount Pipe	139
APXVTM14-C-120 w/ Mount Pipe	157	MG D3-800TV w/ Mount Pipe	139
APXVTM14-C-120 w/ Mount Pipe	157	(2) DB846F65ZAXY w/ Mount Pipe	139
TD-RRH8x20-25	157	(2) DB846F65ZAXY w/ Mount Pipe	139
TD-RRH8x20-25	157	(2) DB846F65ZAXY w/ Mount Pipe	139
TD-RRH8x20-25	157	P65.16.XL.2 w/ Mount Pipe	139
APXVSPP18-C-A20 w/ Mount Pipe	157	P65.16.XL.2 w/ Mount Pipe	139
APXVSPP18-C-A20 w/ Mount Pipe	157	P65.16.XL.2 w/ Mount Pipe	139
APXVSPP18-C-A20 w/ Mount Pipe	157	MG D3-800Tx w/ Mount Pipe	139
800 EXTERNAL NOTCH FILTER	157	MG D3-800Tx w/ Mount Pipe	139
800 EXTERNAL NOTCH FILTER	157	MG D3-800Tx w/ Mount Pipe	139
800 EXTERNAL NOTCH FILTER	157	(2) FD9R6004/2C-3L	139
(3) ACU-A20-N	157	(2) FD9R6004/2C-3L	139
(3) ACU-A20-N	157	(2) FD9R6004/2C-3L	139
(3) ACU-A20-N	157	RRH2X40-AWS	139
(2) 4' x 2" Pipe Mount	157	RRH2X40-AWS	139
(2) 4' x 2" Pipe Mount	157	RRH2X40-AWS	139
(2) 4' x 2" Pipe Mount	157	DB-T1-6Z-8AB-0Z	139
Platform Mount [LP 713-1]	157	Platform Mount [LP 713-1]	139
TME-800MHz RRH	156	LNX-6515DS-VTM w/ Mount Pipe	116
TME-800MHz RRH	156	LNX-6515DS-VTM w/ Mount Pipe	116
TME-800MHz RRH	156	LNX-6515DS-VTM w/ Mount Pipe	116
TME-1900MHz RRH (65 MHz)	156	RRUS 11 B12	116
TME-1900MHz RRH (65 MHz)	156	RRUS 11 B12	116
TME-1900MHz RRH (65 MHz)	156	RRUS 11 B12	116
(2) Pipe Mount [PM 601-3]	156	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	116
(2) 7770.00 w/ Mount Pipe	149	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	116
(2) 7770.00 w/ Mount Pipe	149	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	116
(2) 7770.00 w/ Mount Pipe	149	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	116
(2) LGP21401	149	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	116
(2) LGP21401	149	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	116
(2) LGP21401	149	KRY 112 144/1	116
(2) LGP21901	149	KRY 112 144/1	116
(2) LGP21901	149	KRY 112 144/1	116
(2) LGP21901	149	Platform Mount [LP 712-1]	116
P65-16-XLH-RR w/ Mount Pipe	149	GPS_A	84
P65-16-XLH-RR w/ Mount Pipe	149	Side Arm Mount [SO 701-1]	84
P65-16-XLH-RR w/ Mount Pipe	149	BULLET III	45
RRUS-11	149	Pipe Mount [PM 601-1]	45
RRUS-11	149	GPS-QBW-20N	40
RRUS-11	149	Pipe Mount [PM 601-1]	40
DC6-48-60-18-8F	149		
4' x 2" Pipe Mount	149		
4' x 2" Pipe Mount	149		
4' x 2" Pipe Mount	149		
Platform Mount [LP 713-1]	149		
MG D3-800TV w/ Mount Pipe	139		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 91 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 65.2%

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
Phone: mscroggy@pjfweb.com
FAX: 614.448.4105

Job:	***160' MP; Stamford, CT; BRG 2044 (A) 943097***		
Project:	***PJF 37515-0482 (BU 806953)***		
Client: Crown Castle	Drawn by: Morgan Scroggy	App'd:	
Code: TIA-222-G	Date: 02/24/16	Scale: NTS	
Path:		Dwg No. E-1	

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

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data	
BU#:	
Site Name:	
App #:	
Pole Manufacturer:	*Other*

Reactions		
Mu:	3591	ft-kips
Axial, Pu:	51	kips
Shear, Vu:	33	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	64.48	in

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

Anchor Rod Results

Max Rod (Cu+ Vu/ή):	139.5	Kips
Allowable Axial, Φ*Fu*Anet:	260.0	Kips
Anchor Rod Stress Ratio:	53.7%	**Pass**

Rigid
AISC LRFD
φ*Tn

Plate Data		
Diam:	70.48	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	9.00	in

Base Plate Results Flexural Check

Base Plate Stress:	25.4	ksi
Allowable Plate Stress:	54.0	ksi
Base Plate Stress Ratio:	47.0%	**Pass**

Rigid
AISC LRFD
φ*Fy
Y.L. Length: 31.96

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Both	
Groove Depth:	0.375	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.3125	in
Width:	6	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

n/a

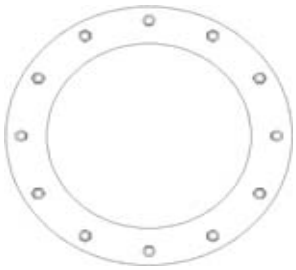
Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a

Pole Data		
Diam:	56	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



* 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

foundation loads

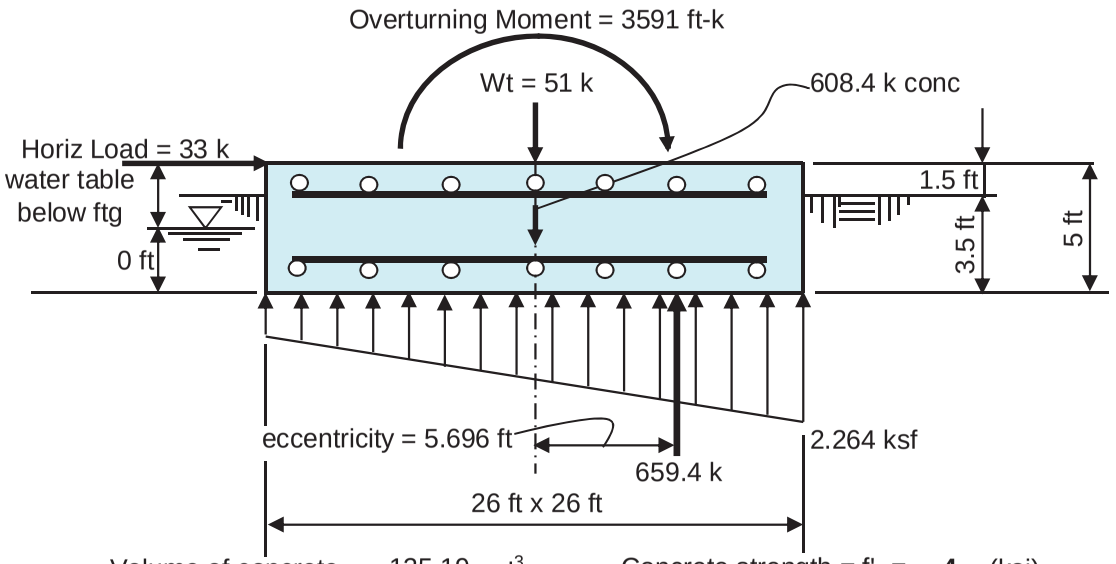
Limit states Tower or Pole Weight =	**51**	kips
limit states total horizontal force =	**33**	kips
limit states overturning moment =	**3591**	ft-kips

soil properties

Safety factor against overturning =	**1**	
Soil Density =	**125**	pcf
Ultimate soil bearing =	**20**	ksf
Depth to water table =	**99**	ft

mat dimensions

depth to bottom of footing =	**3.5**	ft
Footing thickness =	**5**	ft
Footing Width =	**26**	ft
Footing Length =	**26**	ft
Tower/Pole Center Offset =	**0**	ft



Volume of concrete = 125.19 yd^3 Concrete strength = f'_c = **4** (ksi)

Rebar = (72) #8 bars by 25.5 ft long

reinforcing steel = **(18) #8 @ 18 in o.c. ea way top and bottom**

Summary of analysis results

Overturning Moment: (Stress Ratio = 0.584) **< CONTROLLING CRITERIA**

Calculated Ultimate Overturning Moment = 3756 ft-kips

Resisting Moment = 6429.2 ft-kips

Factor of Safety against overturning = 1.712 **> 1 okay**

Rebar strength = F_y = **60** (ksi)

minimum cover over rebar = **3** inches

Soil Bearing (Stress Ratio = 0.151)

Limit States Maximum Net Soil Bearing = 15 ksf

Calculated limit states Soil Bearing Pressure = 2.264 **ksf < 15 ksf okay**

Bending Moment (Stress Ratio = 0.408)

Ultimate Bending Moment Resistance = 3526 ft-kips

Calculated Ultimate Bending Moment = 1438 **ft-kips < 3526 ft-kips okay**

Bending Shear (Stress Ratio = 0.114)

Ultimate Bending Shear Resistance = 1862 kips

Calculated Ultimate Bending Shear = 213 **kips < 1862 kips okay**

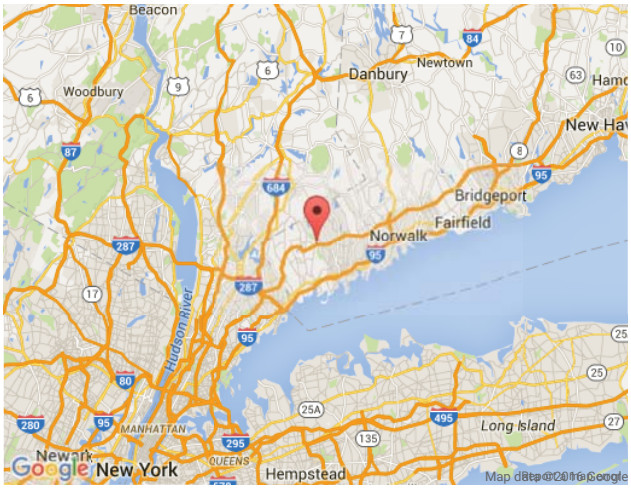
Search Results

Query Date: Wed Feb 24 2016
Latitude: 41.1018
Longitude: -73.5948

ASCE 7-10 Windspeeds
(3-sec peak gust in mph*):

Risk Category I: 107
Risk Category II: 117
Risk Category III-IV: 125
MRI 10-Year:** 76
MRI 25-Year:** 85
MRI 50-Year:** 90
MRI 100-Year:** 96

ASCE 7-05 Windspeed:
104 (3-sec peak gust in mph)
ASCE 7-93 Windspeed:
80 (fastest mile in mph)



*Miles per hour
**Mean Recurrence Interval

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

Print your results

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

T-Mobile Existing Facility

Site ID: CT11071E

Stamford/ MP X32/ Den Rd.
70 Guinea Road
Stamford, CT 06903

March 18, 2016

EBI Project Number: 6215004722

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	8.28 %

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

EBI Consulting
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March 18, 2016

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

Emissions Analysis for Site: **CT11071E – Stamford/ MP X32/ Den Rd.**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **70 Guinea Road, Stamford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **70 Guinea Road, Stamford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

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

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

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

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

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

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

8) The antenna mounting height centerline of the proposed antennas is **118 feet** above ground level (AGL).

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

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

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	118	Height (AGL):	118	Height (AGL):	118
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	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.34	Antenna B1 MPE%	1.34	Antenna C1 MPE%	1.34
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):	118	Height (AGL):	118	Height (AGL):	118
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	1.34	Antenna B2 MPE%	1.34	Antenna C2 MPE%	1.34
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	118	Height (AGL):	118	Height (AGL):	118
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.53	Antenna B3 MPE%	0.53	Antenna C3 MPE%	0.53

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**3.21 %**
Metricom	0.00 %
Sprint	0.44 %
Nextel	0.19 %
AT&T	1.42 %
Verizon Wireless	3.02 %
Site Total MPE %:	**8.28 %**

T-Mobile Sector 1 Total:	3.21 %
T-Mobile Sector 2 Total:	3.21 %
T-Mobile Sector 3 Total:	3.21 %
Site Total:	8.28 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**2334.27**	**118**	**13.38**	**2100**	**1000**	**1.34 %**
T-Mobile 1900 MHz (PCS) GSM/UMTS	**2**	**1167.14**	**118**	**6.69**	**1900**	**1000**	**0.67 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**1167.14**	**118**	**6.69**	**2100**	**1000**	**0.67 %**
T-Mobile 700 MHz LTE	**1**	**865.21**	**118**	**2.48**	**700**	**467**	**0.53 %**
						Total:	**3.21 %**

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Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	3.21 %
Sector 2:	3.21 %
Sector 3 :	3.21 %
T-Mobile Per Sector Maximum:	3.21 %
Site Total:	8.28 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **8.28%** 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

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