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

May 13, 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: 876391**
T-Mobile Site ID: CT11503A
14 Thompson Hill Road, Columbia, CT 06237
Latitude: 41° 43' 3.44" / Longitude: -72° 17' 59.09"

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 162 foot level of the existing 180 foot monopole at 14 Thompson Hill Road, Columbia, CT. The tower is owned by Crown Castle. The property is owned by Joshua & Eileen Lanati. T-Mobile now intends to remove and replace three (3) existing antennas with three (3) new antennas, remove three (3) existing TMAs and install three (3) new RRUs, remove and replace six (6) existing coax with one (1) hybrid cable and remove existing Nextel antennas, mounts and coax at 170'. These antennas would be installed at the 162 foot level of the tower.

This facility was approved by the Town of Columbia on November 30, 1999. This approval included the condition(s) that:

1. The tower shall be structurally capable of supporting six users.
2. Prior to filing the final plan in the Land Records, a bond shall be posted to assure removal of the facility according to Section 52.7.15.5. The bond amount shall be proposed by the applicant and approved by the Town Engineer. Bond form shall be cash or letter of credit.
3. The Town Planner shall be contacted one week prior to the start of any work associated with this approval, including site development and tree removal.
4. Any additional use of the site, including and not limited to additional antennas, cabinets, or other structures, and site work, requires additional permitting by the Commission.
5. The location of the tower and associated compound and the proposed driveway shall be staked out by a licensed surveyor prior to excavation or construction.
6. Clearcutting of timer shall be prohibited in a 100-foot ring around the lease area.
7. The text of this approval shall be placed on the final plan.

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 Carmen L. Vance, First Selectman, Town of Columbia.

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

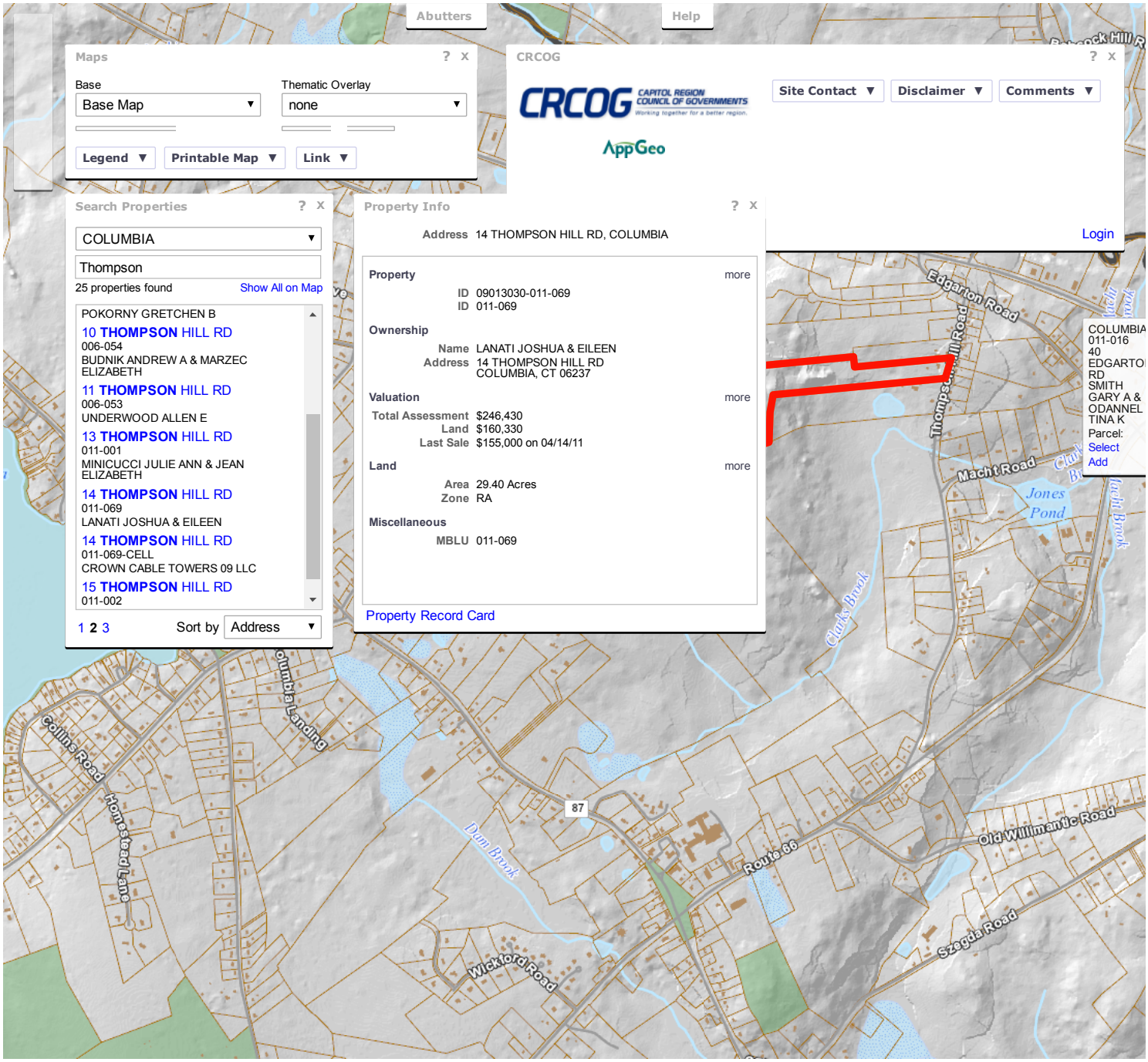
Kimberly Myl
Real Estate Specialist
Crown Castle
1200 MacArthur Boulevard, Suite 200
Mahwah, New Jersey 07430
201-236-9069
kimberly.myl@crowncastle.com

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 Carmen L. Vance, First Selectman
Columbia Town Hall
323 Route 87
Columbia, CT 06237

Joshua & Eileen Lanati
14 Thompson Hill Road
Columbia, CT 06237

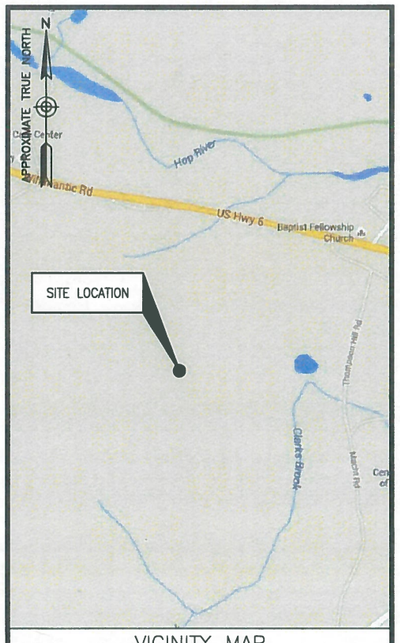


1123 ft

Base Map: CRCOG Parcels

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11503A
CROWN CASTLE BU #: 876391
SITE NAME: COLUMBIA / DEOJAY
14 THOMPSON HILL ROAD
COLUMBIA, CT 06237
TOLLAND 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 35A FOR I-291 TOWARD MANCHESTER. CONTINUE ONTO I-291 E. TAKE THE I-384 E EXIT. KEEP LEFT, FOLLOW SIGNS FOR INTERSTATE 384 E. CONTINUE ONTO I-384. CONTINUE ONTO US-44 E/US-6 E. SLIGHT RIGHT ONTO US-6 E (SIGNS FOR PROVIDENCE/WILLIMANTIC). TURN RIGHT ONTO EDGARTON RD. TURN RIGHT ONTO THOMPSON HILL 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:
COLUMBIA/DEOJAY

SITE NUMBER:
CT11503A

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°-43'-3.44" N (NAD83)
LONGITUDE: 72°-17'-59.09" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
702Cc

PROJECT SUMMARY

SITE ADDRESS:
14 THOMPSON HILL ROAD
COLUMBIA, CT 06237
TOLLAND COUNTY

PROJECT DIRECTORY

- REMOVE AND REPLACE (3) EXISTING ANTENNAS WITH (3) NEW ANTENNAS.
- REMOVE (3) EXISTING TMA'S.
- INSTALL (3) NEW RRU'S.
- REMOVE AND REPLACE (6) EXISTING LINES OF COAX WITH (1) NEW HYBRID CABLE.
- REMOVE AND REPLACE EXISTING EQUIPMENT CABINET WITH (1) NEW EQUIPMENT CABINET AT GRADE.
- REMOVE EXISTING NEXTEL ANTENNAS, MOUNTS AND COAX AT A CENTERLINE ELEVATION OF 170'-0"± A.G.L.

SCOPE OF WORK

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 I
C-4	CONSTRUCTION DETAILS II
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

CT11503A
COLUMBIA / DEOJAY

CONSTRUCTION DRAWINGS

2	05/10/16	ISSUED AS FINAL
1	04/29/16	REVISED PER COMMENTS
0	06/18/15	ISSUED AS FINAL
A	06/08/15	ISSUED FOR REVIEW

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

STATE OF CONNECTICUT
JIANG YU
LICENSED
PROFESSIONAL ENGINEER
NO. 0023222

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50078127
SITE ADDRESS:	

14 THOMPSON HILL RD
COLUMBIA, CT 06237
TOLLAND 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.

T·Mobile·

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CT11503A
COLUMBIA / DEOJAY

CONSTRUCTION DRAWINGS

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STATE OF CONNECTICUT
JIANG YU
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:	50078127
SITE ADDRESS:	

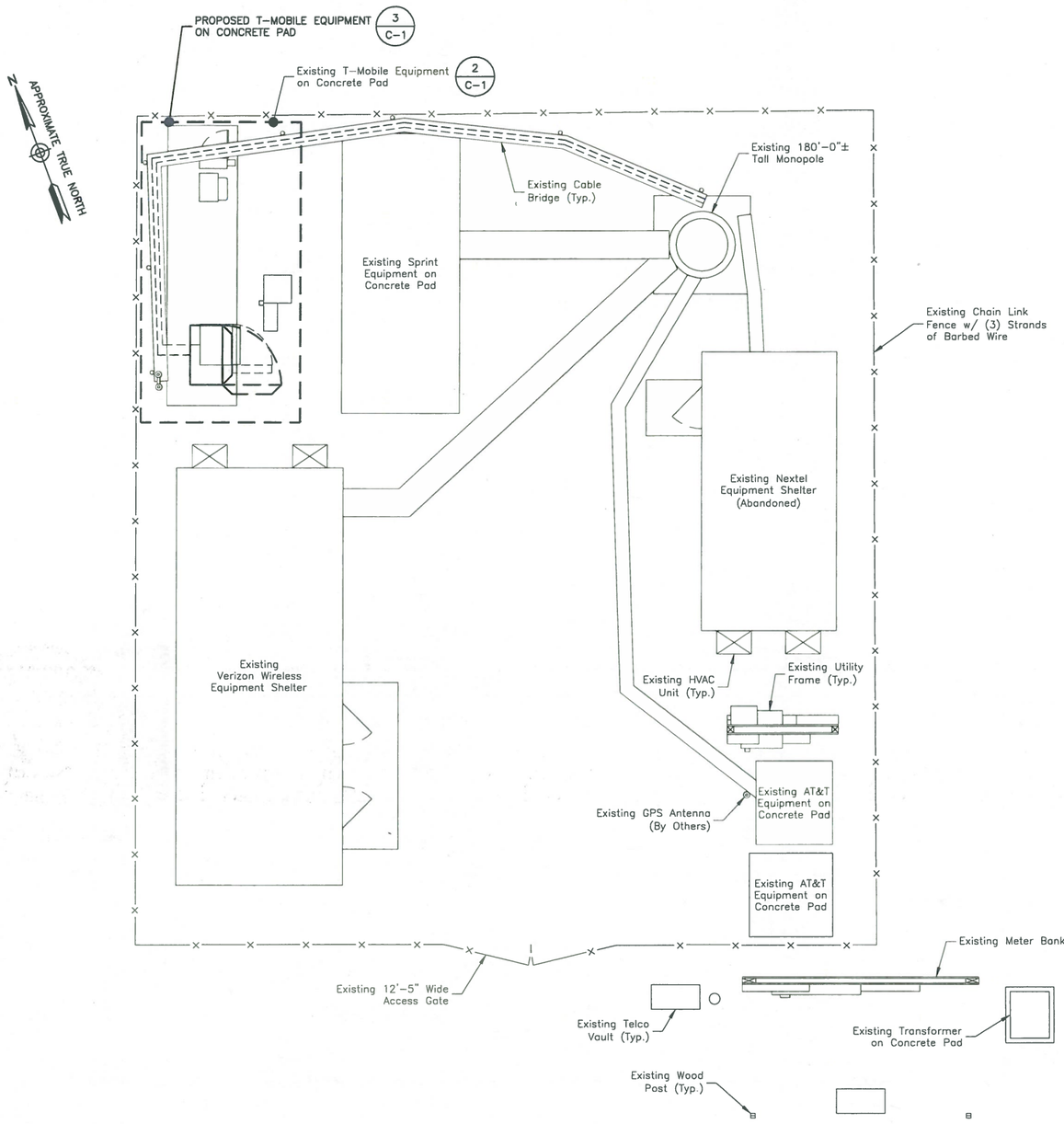
14 THOMPSON HILL RD
COLUMBIA, CT 06237
TOLLAND COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G–1



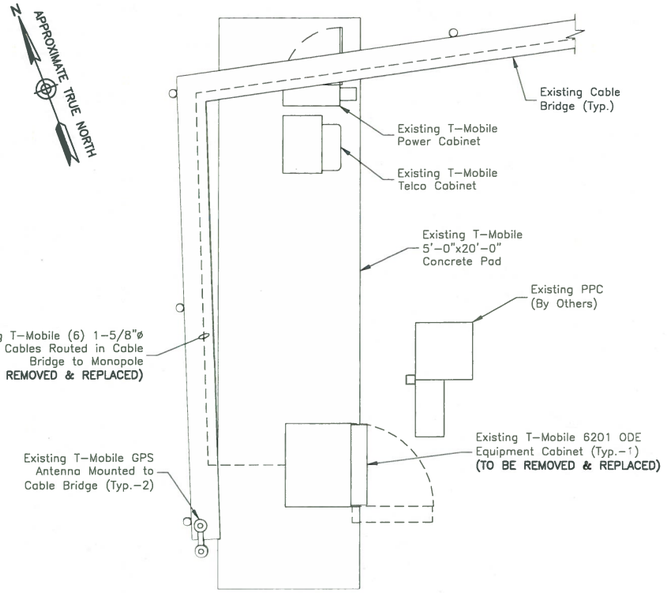
COMPOUND PLAN 1

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

0' 5' 10'

NOTES:

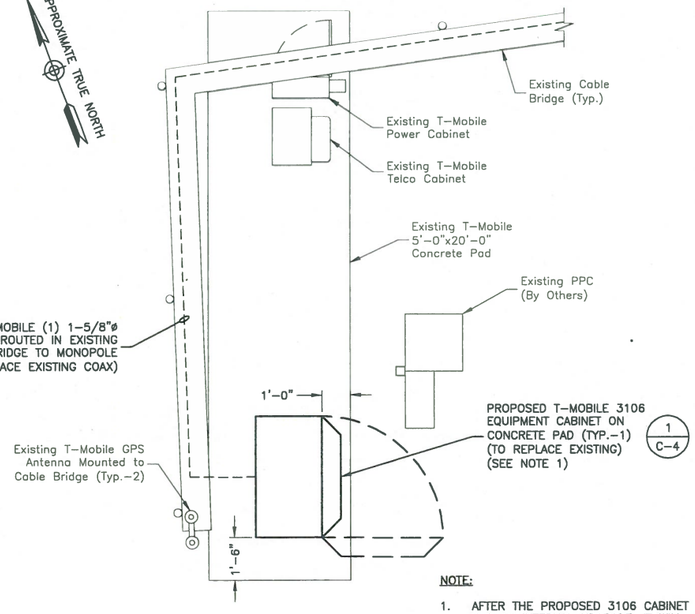
1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY PAUL J. FORD AND COMPANY DATED APRIL 11, 2016.



EXISTING EQUIPMENT PLAN 2

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

0' 2' 4' 6'



NOTE:

1. AFTER THE PROPOSED 3106 CABINET HAS AN INTERNAL UPGRADE, IT WILL BECOME A 6131 CABINET.

PROPOSED EQUIPMENT PLAN 3

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

0' 2' 4' 6'

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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:	50078127
SITE ADDRESS:	

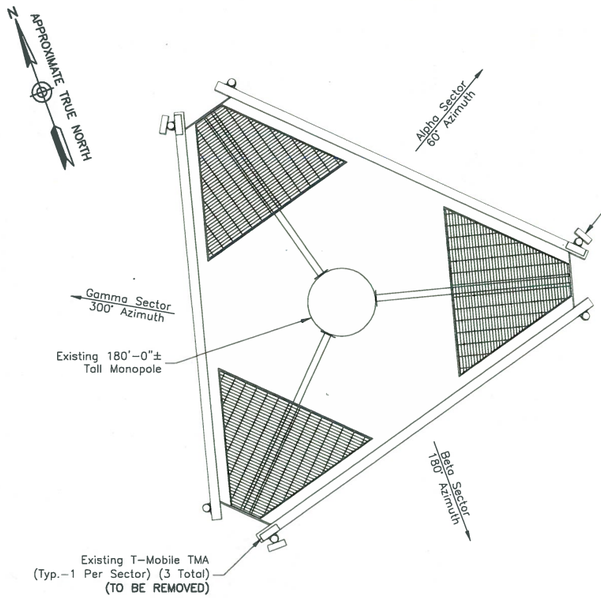
14 THOMPSON HILL RD
COLUMBIA, CT 06237
TOLLAND COUNTY

SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

SHEET NUMBER

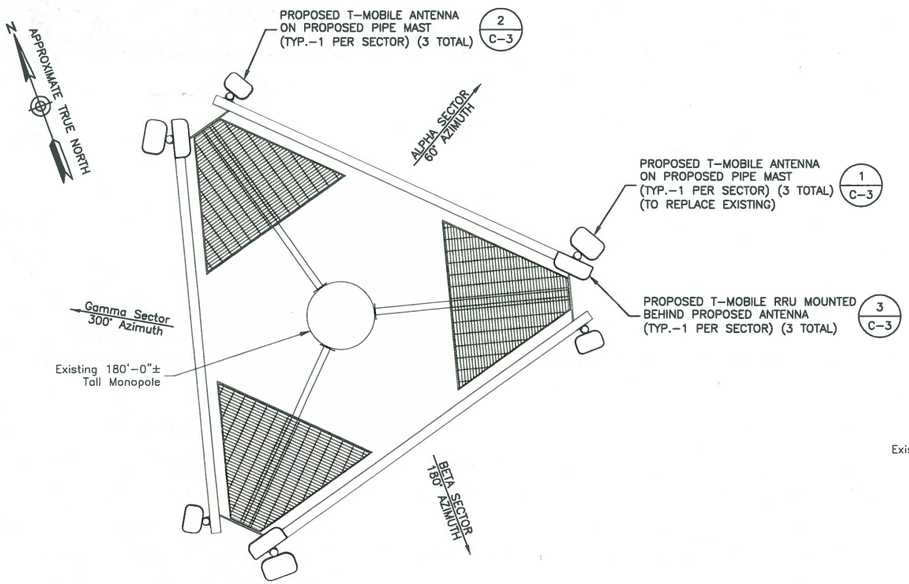
C-1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

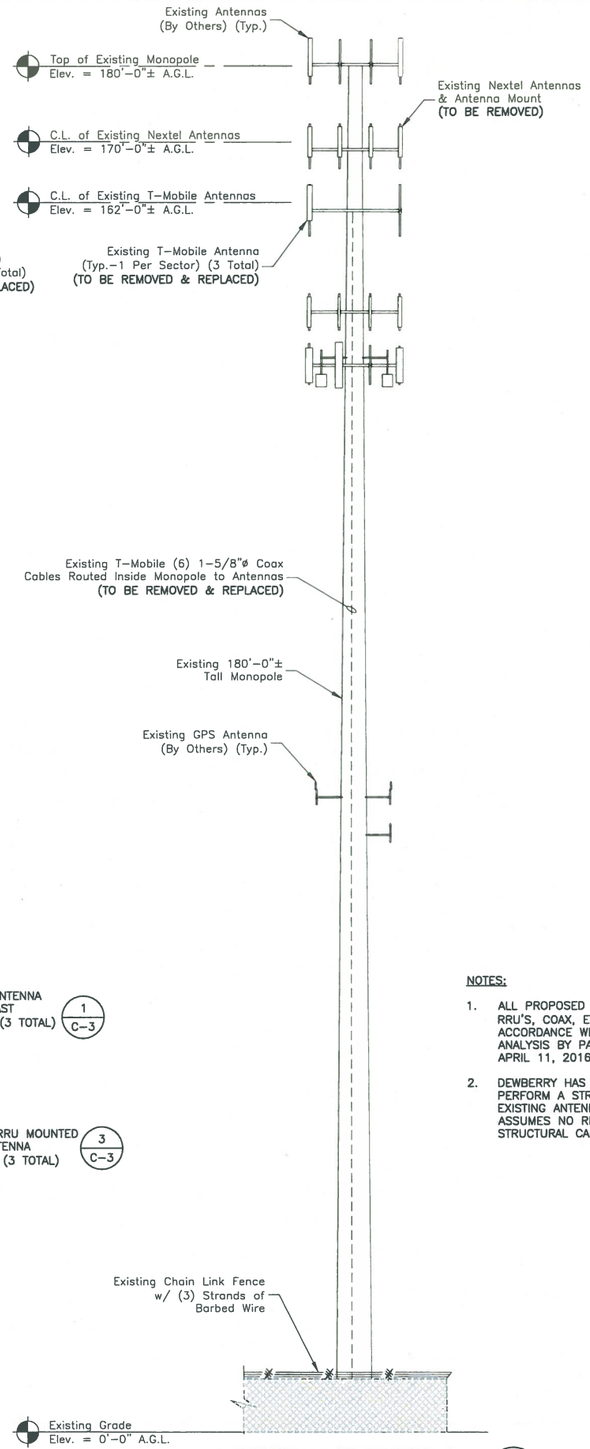
1



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

2

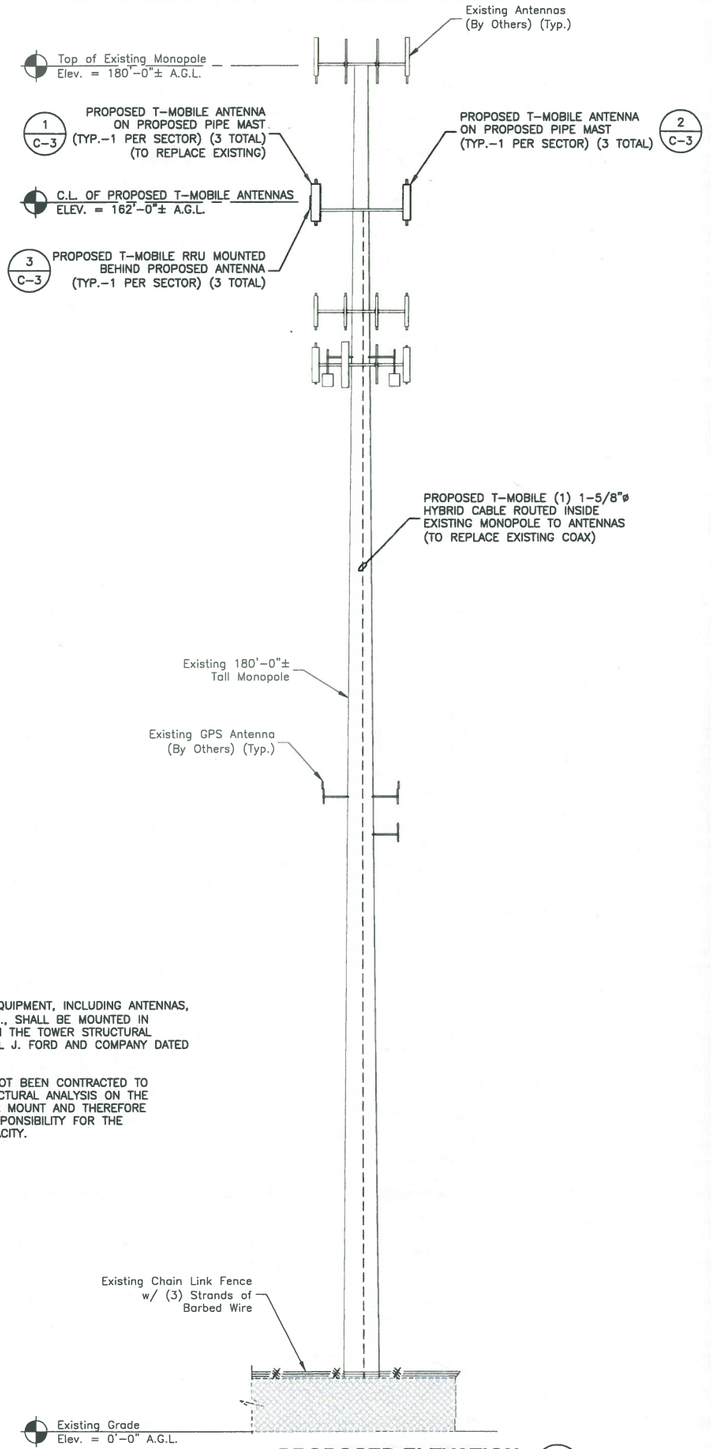


EXISTING ELEVATION

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 APRIL 11, 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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STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER

JIANG YU, P.E.
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SITE ADDRESS:	

14 THOMPSON HILL RD
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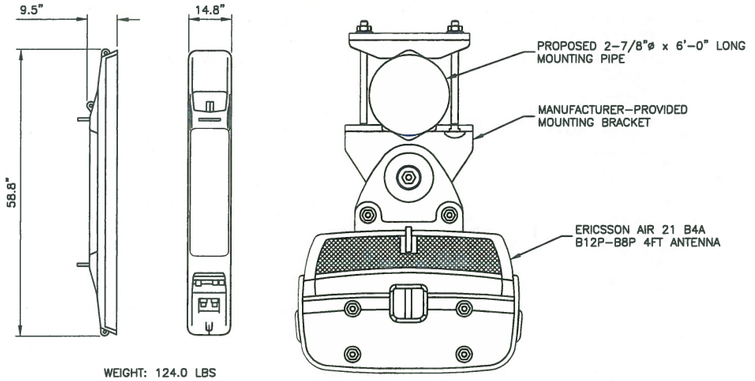
TOLLAND COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

C–2



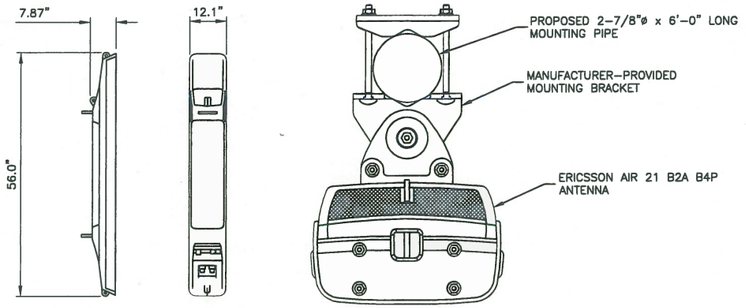
WEIGHT: 124.0 LBS

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.

ANTENNA DETAIL 1

SCALE: N.T.S.



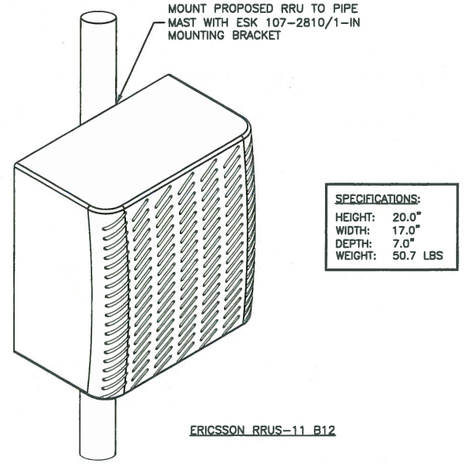
WEIGHT: 91.5 LBS

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.

ANTENNA DETAIL 2

SCALE: N.T.S.



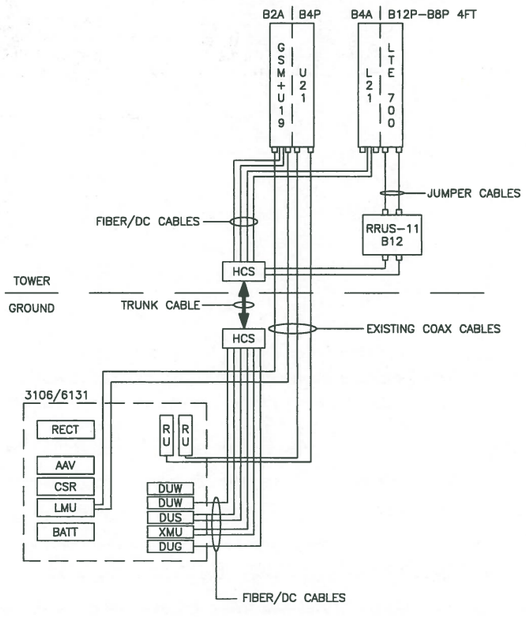
ERICSSON RRUS-11 B12

RRU NOTES:

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

RRUS-11 - REMOTE RADIO UNIT 3

SCALE: N.T.S.



SITE CONFIGURATION 702Cc 4

SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		HYBRID	HYBRID LENGTH	TMA	RRU
	EXISTING	PROPOSED	EXISTING	PROPOSED	PROPOSED		PROPOSED	PROPOSED
ALPHA	–	ERICSSON AIR 21 B2A B4P	(2) 1-5/8"ø	(2) 1-5/8"ø TO BE REMOVED	(1) 1-5/8"ø	212'-0"	–	–
	EMS RR90-17-02DP	ERICSSON AIR 21 B4A B12P-B8P 4FT					EXISTING TO BE REMOVED	(1) RRUS-11 B12
BETA	–	ERICSSON AIR 21 B2A B4P	(2) 1-5/8"ø	(2) 1-5/8"ø TO BE REMOVED		212'-0"	–	–
	EMS RR90-17-02DP	ERICSSON AIR 21 B4A B12P-B8P 4FT					EXISTING TO BE REMOVED	(1) RRUS-11 B12
GAMMA	–	ERICSSON AIR 21 B2A B4P	(2) 1-5/8"ø	(2) 1-5/8"ø TO BE REMOVED		212'-0"	–	–
	EMS RR90-17-02DP	ERICSSON AIR 21 B4A B12P-B8P 4FT					EXISTING TO BE REMOVED	(1) RRUS-11 B12

T-Mobile

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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:	50078127
SITE ADDRESS:	

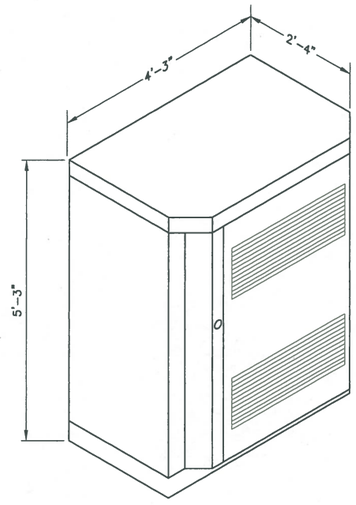
14 THOMPSON HILL RD
COLUMBIA, CT 06237
TOLLAND COUNTY

SHEET TITLE

CONSTRUCTION DETAILS I

SHEET NUMBER

C-3



ISOMETRIC

NOTES:

1. CONTRACTOR SHALL SECURE CABINET AS PER MANUFACTURER RECOMENDATIONS.
2. AFTER THE PROPOSED 3106 CABINET HAS AN INTERNAL UPGRADE, IT WILL BECOME A 6131 CABINET.

ERICSON RBS 3106 CABINET (1)

SCALE: N.T.S.

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STATE OF CONNECTICUT
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TOLLAND COUNTY

SHEET TITLE

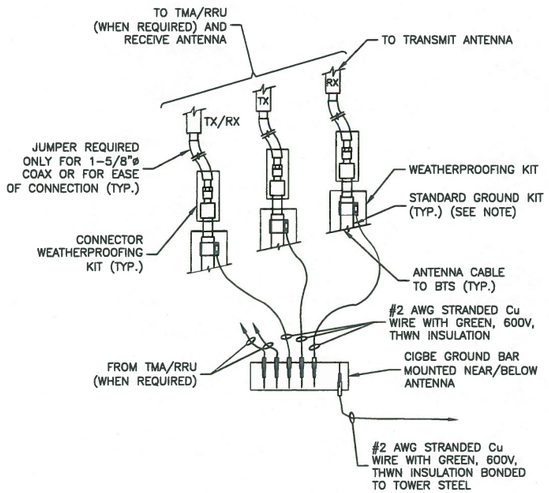
CONSTRUCTION DETAILS II

SHEET NUMBER

C-4

GROUNDING NOTES:

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

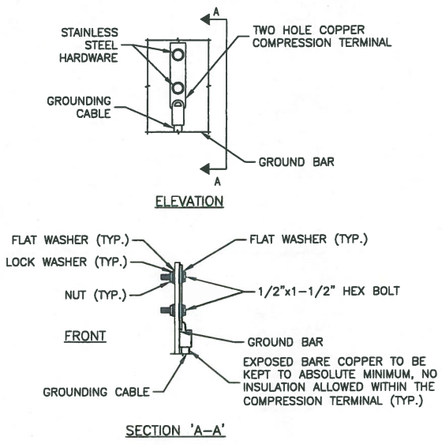


NOTE:

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

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) 1

SCALE: N.T.S.

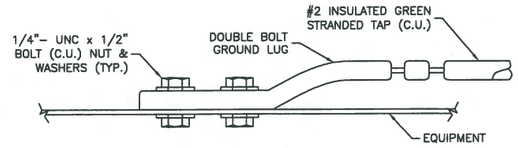


NOTES:

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

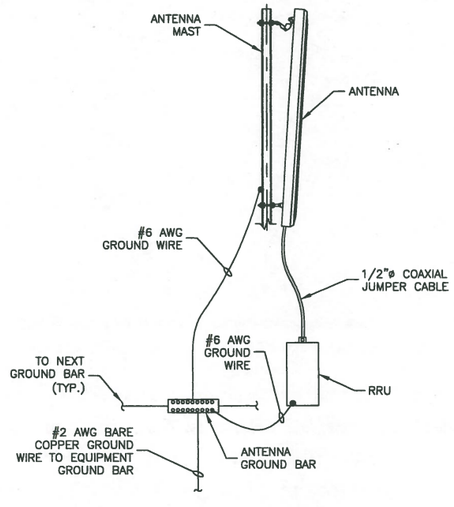
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 2

SCALE: N.T.S.



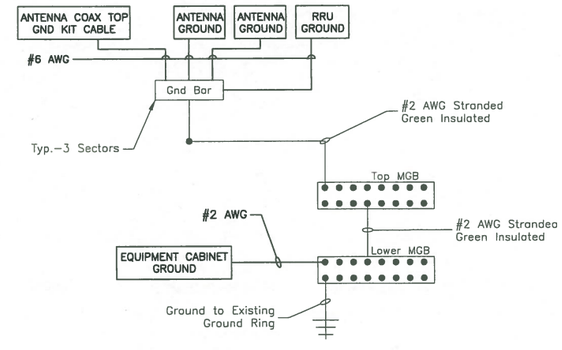
CONNECTION TO EQUIPMENT DETAIL 3

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL 4

SCALE: N.T.S



NOTES:

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

SCHEMATIC GROUNDING DIAGRAM 5

SCALE: N.T.S.

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

CROWN CASTLE

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

CT11503A
COLUMBIA / DEOJAY

CONSTRUCTION DRAWINGS		
2	05/10/16	ISSUED AS FINAL
1	04/29/16	REVISED PER COMMENTS
0	06/18/15	ISSUED AS FINAL
A	06/08/15	ISSUED FOR REVIEW

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

STATE OF CONNECTICUT
JIANG YU
No. [illegible]
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:	50078127
SITE ADDRESS:	

14 THOMPSON HILL RD
COLUMBIA, CT 06237
TOLLAND COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

PJF PAUL J. FORD & COMPANY

Date: **April 11, 2016**

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

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11503A
	Carrier Site Name:	Sprint Columbia Rt 6
Crown Castle Designation:	**Crown Castle BU Number:**	876391
	Crown Castle Site Name:	COLUMBIA / DEOJAY
	Crown Castle JDE Job Number:	325628
	Crown Castle Work Order Number:	1220704
	Crown Castle Application Number:	284768 Rev. 9
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37516-0222.002.7805
Site Data:	**14 Thompson Hill Rd, COLUMBIA, Tolland County, CT** **Latitude *41° 43' 3.44"*, Longitude *-72° 17' 59.09"*** **180 Foot - Monopole Tower**	

Dear Jay Patton,

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 891249, in accordance with application 284768, revision 9.

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

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

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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:

Christopher Poelking, E.I.
Structural Designer

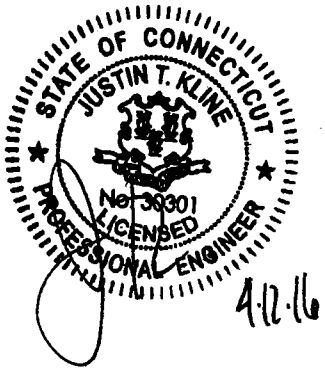


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TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180-ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in November of 1999. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
161.0	162.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1	1-5/8	-
		3	ericsson	Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180.0	181.0	2	decibel	950F65T2ZE-M w/ Mount Pipe	6	1-5/8	1
		4	decibel	DB980H90E-M w/ Mount Pipe			
	180.0	1	tower mounts	Platform Mount [LP 601-1]			
169.0	170.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4	3
	169.0	1	tower mounts	Platform Mount [LP 303-1]			
161.0	162.0	3	ems wireless	RR90-17-02DP w/ Mount Pipe	6	1-5/8	3
		3	rfs celwave	ATMPP1412D-1CWA			
	161.0	1	tower mounts	Platform Mount [LP 305-1]	-	-	1
147.0	150.0	3	alcatel lucent	RRH2X60-AWS	1 14	1/2 1-5/8	1
		3	alcatel lucent	RRH2X60-PCS			
		6	andrew	HBXX-6517DS-A2M w/ Mount Pipe			
		6	andrew	LNX-6514DS-A1M w/ Mount Pipe			
		1	lucent	KS24019-L112A			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/1C-3L			
	147.0	1	tower mounts	Platform Mount [LP 712-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
141.0	141.0	1	tower mounts	Pipe Mount [PM 601-3]	-	-	1
	138.0	3	ericsson	TME-RRUS 11 BAND 12			
140.0	140.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	-	-	2
		3	ericsson	RRUS 12			
		3	ericsson	RRUS A2			
		6	powerwave technologies	7770.00 w/ Mount Pipe	2 12 1	7/16 1-5/8 2	1
		6	powerwave technologies	LGP 17201			
		6	powerwave technologies	LGP13519			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 303-1]			
83.0	84.0	2	kathrein	OG-860/1920/GPS-A	2	1/2	1
	83.0	2	tower mounts	Side Arm Mount [SO 701-1]			
78.0	79.0	1	kathrein	OG-860/1920/GPS-A	1	1/2	1
	78.0	1	tower mounts	Side Arm Mount [SO 701-1]			

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

Table 3 - Design Antenna and Cable Information

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

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Goodkind & O'Dea, Incs., CT33XC519, 06/08/99	1613526	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI, 6151, 12/20/99	1613632	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI, 6151, 12/20/1999	1614546	CCISITES
4-TOWER MANUFACTURER DESIGN CALCULATIONS	EEI, 99-1429, 11/22/1999	1440653	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) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. 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	180 - 131.75	Pole	TP31.39x21x0.25	1	-10.29	1244.60	55.8	Pass
L2	131.75 - 86.71	Pole	TP40.46x29.921x0.375	2	-18.41	2406.90	80.1	Pass
L3	86.71 - 43.16	Pole	TP48.96x38.5229x0.4375	3	-30.00	3400.58	85.6	Pass
L4	43.16 - 0	Pole	TP57.25x46.668x0.5	4	-47.79	4682.07	83.1	Pass
							Summary	
						Pole (L3)	85.6	Pass
						Rating =	85.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	82.3	Pass
1	Base Plate	0	95.7	Pass
1	Base Foundation Structural Steel	0	89.2	Pass
1	Base Foundation Soil Interaction	0	95.0	Pass

Structure Rating (max from all components) =	95.7%

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

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Tolland County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 1.0000 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.00 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		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	180.0000-131.7500	48.2500	4.50	18	21.0000	31.3900	0.2500	1.0000	A572-65 (65 ksi)
L2	131.7500-86.7100	49.5400	5.58	18	29.9210	40.4600	0.3750	1.5000	A572-65 (65 ksi)
L3	86.7100-43.1600	49.1300	6.67	18	38.5229	48.9600	0.4375	1.7500	A572-65 (65 ksi)
L4	43.1600-0.0000	49.8300		18	46.6680	57.2500	0.5000	2.0000	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	21.3240	16.4651	895.6507	7.3663	10.6680	83.9568	1792.4800	8.2341	3.2560	13.024
	31.8742	24.7096	3027.1937	11.0547	15.9461	189.8389	6058.3706	12.3571	5.0846	20.339
L2	31.3547	35.1671	3878.5647	10.4888	15.1999	255.1711	7762.2328	17.5869	4.6061	12.283
	41.0842	47.7112	9685.4835	14.2302	20.5537	471.2287	19383.7113	23.8601	6.4610	17.229
L3	40.3209	52.8864	9691.6750	13.5203	19.5696	495.2402	19396.1025	26.4482	6.0100	13.737
	49.7153	67.3796	20042.5020	17.2255	24.8717	805.8363	40111.3765	33.6962	7.8470	17.936
L4	48.8263	73.2687	19730.5260	16.3897	23.7074	832.2531	39487.0139	36.6413	7.3336	14.667
	58.1332	90.0622	36644.7678	20.1462	29.0830	1260.0065	73337.7538	45.0397	9.1960	18.392

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180.0000-131.7500				1	1	1			
L2 131.7500-86.7100				1	1	1			
L3 86.7100-43.1600				1	1	1			
L4 43.1600-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	180.0000 - 0.0000	6	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
****								
****								
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	161.0000 - 0.0000	1	No Ice	0.1625	1.07
						1/2" Ice	0.2625	2.37
						1" Ice	0.3625	4.28
						2" Ice	0.5625	9.93
						4" Ice	0.9625	28.56
****								
LDF4-50A(1/2")	C	No	Inside Pole	147.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
						2" Ice	0.0000	0.15
						4" Ice	0.0000	0.15
LDF7-50A(1-5/8")	C	No	Inside Pole	147.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	1	No Ice	0.1980	1.30
						1/2" Ice	0.2980	2.81
						1" Ice	0.3980	4.94
						2" Ice	0.5980	11.02
						4" Ice	0.9980	30.52
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	1	No Ice	0.0000	1.30
						1/2" Ice	0.0000	2.81
						1" Ice	0.0000	4.94
						2" Ice	0.0000	11.02
						4" Ice	0.0000	30.52

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
****								
LDF7-50A(1-5/8")	C	No	Inside Pole	140.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
WR-VG122ST-BRDA(7/16)	C	No	Inside Pole	140.0000 - 0.0000	2	No Ice	0.0000	0.14
						1/2" Ice	0.0000	0.14
						1" Ice	0.0000	0.14
						2" Ice	0.0000	0.14
						4" Ice	0.0000	0.14
2" (Nominal) Conduit	C	No	Inside Pole	140.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	0.72
						1" Ice	0.0000	0.72
						2" Ice	0.0000	0.72
						4" Ice	0.0000	0.72
****								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	83.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.84
						1" Ice	0.0000	2.14
						2" Ice	0.0000	6.58
						4" Ice	0.0000	22.78
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	83.0000 - 0.0000	1	No Ice	0.0630	0.15
						1/2" Ice	0.1630	0.84
						1" Ice	0.2630	2.14
						2" Ice	0.4630	6.58
						4" Ice	0.8630	22.78
****								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	78.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.84
						1" Ice	0.0000	2.14
						2" Ice	0.0000	6.58
						4" Ice	0.0000	22.78

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.0000-131.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.773	0.55
L2	131.7500-86.7100	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	16.237	1.33
L3	86.7100-43.1600	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	18.210	1.30
L4	43.1600-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	18.278	1.29

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.0000-131.7500	A	1.204	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	18.484	0.83
L2	131.7500-86.7100	A	1.154	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	37.920	1.96
L3	86.7100-43.1600	A	1.084	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	47.498	2.18

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L4	43.1600-0.0000	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	46.354	2.11

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	180.0000-131.7500	-0.2145	0.1238	-0.4315	0.2491
L2	131.7500-86.7100	-0.4177	0.2411	-0.8097	0.4675
L3	86.7100-43.1600	-0.4885	0.2821	-1.0539	0.6085
L4	43.1600-0.0000	-0.5017	0.2897	-1.0850	0.6264

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) 950F65T2ZE-M w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.2306 4.6953 5.1456 6.0948 8.3001	4.2028 5.0707 5.8149 7.3535 10.6306	0.03 0.07 0.12 0.23 0.58
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.0361 4.4987 4.9468 5.8700 8.0460	3.6194 4.4808 5.2186 6.7442 9.9954	0.03 0.07 0.11 0.22 0.55
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.0361 4.4987 4.9468 5.8700 8.0460	3.6194 4.4808 5.2186 6.7442 9.9954	0.03 0.07 0.11 0.22 0.55
Platform Mount [LP 601-1]	C	None		0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.4700 33.5900 38.7100 48.9500 69.4300	28.4700 33.5900 38.7100 48.9500 69.4300	1.12 1.51 1.91 2.69 4.26
(2) 6' x 2'' Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
(3) 6' x 2'' Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2'' Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.6756 9.2033 9.7410 10.8459 13.1747	7.0193 7.8091 8.6169 10.2860 13.8405	0.16 0.23 0.31 0.49 0.98
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.6756 9.2033 9.7410 10.8459 13.1747	7.0193 7.8091 8.6169 10.2860 13.8405	0.16 0.23 0.31 0.49 0.98
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.6756 9.2033 9.7410 10.8459 13.1747	7.0193 7.8091 8.6169 10.2860 13.8405	0.16 0.23 0.31 0.49 0.98
RRUS 11 B12	A	From Leg	4.0000 0.00 1.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.3056 3.5497 3.8025 4.3340 5.5006	1.3611 1.5404 1.7284 2.1302 3.0377	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	B	From Leg	4.0000 0.00 1.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.3056 3.5497 3.8025 4.3340 5.5006	1.3611 1.5404 1.7284 2.1302 3.0377	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	C	From Leg	4.0000 0.00 1.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.3056 3.5497 3.8025 4.3340 5.5006	1.3611 1.5404 1.7284 2.1302 3.0377	0.05 0.07 0.10 0.15 0.31
Platform Mount [LP 305-1]	C	None		0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	18.0100 23.3300 28.6500 39.2900 60.5700	18.0100 23.3300 28.6500 39.2900 60.5700	1.12 1.35 1.58 2.05 2.97
***									
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.0000 0.00	0.00	147.0000	No Ice 1/2"	8.9758 9.6473	6.9629 8.1817	0.07 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*
			3.00			Ice	10.2909	9.1436	0.21
						1" Ice	11.5946	11.0219	0.40
						2" Ice	14.3212	15.0267	0.91
						4" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.0000	0.00	147.0000	No Ice	8.9758	6.9629	0.07
			0.00			1/2"	9.6473	8.1817	0.14
			3.00			Ice	10.2909	9.1436	0.21
						1" Ice	11.5946	11.0219	0.40
						2" Ice	14.3212	15.0267	0.91
						4" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.0000	0.00	147.0000	No Ice	8.9758	6.9629	0.07
			0.00			1/2"	9.6473	8.1817	0.14
			3.00			Ice	10.2909	9.1436	0.21
						1" Ice	11.5946	11.0219	0.40
						2" Ice	14.3212	15.0267	0.91
						4" Ice			
LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.0000	0.00	147.0000	No Ice	8.6485	7.0817	0.06
			0.00			1/2"	9.3051	8.2729	0.13
			3.00			Ice	9.9298	9.1847	0.21
						1" Ice	11.2040	11.0232	0.39
						2" Ice	13.8719	15.0629	0.90
						4" Ice			
LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.0000	0.00	147.0000	No Ice	8.6485	7.0817	0.06
			0.00			1/2"	9.3051	8.2729	0.13
			3.00			Ice	9.9298	9.1847	0.21
						1" Ice	11.2040	11.0232	0.39
						2" Ice	13.8719	15.0629	0.90
						4" Ice			
LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.0000	0.00	147.0000	No Ice	8.6485	7.0817	0.06
			0.00			1/2"	9.3051	8.2729	0.13
			3.00			Ice	9.9298	9.1847	0.21
						1" Ice	11.2040	11.0232	0.39
						2" Ice	13.8719	15.0629	0.90
						4" Ice			
LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.0000	0.00	147.0000	No Ice	8.6485	7.0817	0.06
			0.00			1/2"	9.3051	8.2729	0.13
			3.00			Ice	9.9298	9.1847	0.21
						1" Ice	11.2040	11.0232	0.39
						2" Ice	13.8719	15.0629	0.90
						4" Ice			
LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.0000	0.00	147.0000	No Ice	8.6485	7.0817	0.06
			0.00			1/2"	9.3051	8.2729	0.13
			3.00			Ice	9.9298	9.1847	0.21
						1" Ice	11.2040	11.0232	0.39
						2" Ice	13.8719	15.0629	0.90
						4" Ice			
LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.0000	0.00	147.0000	No Ice	8.6485	7.0817	0.06
			0.00			1/2"	9.3051	8.2729	0.13
			3.00			Ice	9.9298	9.1847	0.21
						1" Ice	11.2040	11.0232	0.39
						2" Ice	13.8719	15.0629	0.90
						4" Ice			
RRH2X60-AWS	A	From Leg	4.0000	0.00	147.0000	No Ice	2.1904	1.4290	0.04
			0.00			1/2"	2.3976	1.6109	0.06
			3.00			Ice	2.6134	1.8015	0.08
						1" Ice	3.0710	2.2085	0.13
						2" Ice	4.0899	3.1263	0.26
						4" Ice			
RRH2X60-AWS	B	From Leg	4.0000	0.00	147.0000	No Ice	2.1904	1.4290	0.04
			0.00			1/2"	2.3976	1.6109	0.06
			3.00			Ice	2.6134	1.8015	0.08
						1" Ice	3.0710	2.2085	0.13
						2" Ice	4.0899	3.1263	0.26
						4" Ice			
RRH2X60-AWS	C	From Leg	4.0000	0.00	147.0000	No Ice	2.1904	1.4290	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
			0.00			1/2"	2.3976	1.6109	0.06
			3.00			Ice	2.6134	1.8015	0.08
						1" Ice	3.0710	2.2085	0.13
						2" Ice	4.0899	3.1263	0.26
						4" Ice			
RRH2X60-PCS	A	From Leg	4.0000	0.00	147.0000	No Ice	2.5667	2.0106	0.06
			0.00			1/2"	2.7914	2.2184	0.08
			3.00			Ice	3.0247	2.4349	0.10
						1" Ice	3.5173	2.8938	0.16
						2" Ice	4.6062	3.9152	0.31
						4" Ice			
RRH2X60-PCS	B	From Leg	4.0000	0.00	147.0000	No Ice	2.5667	2.0106	0.06
			0.00			1/2"	2.7914	2.2184	0.08
			3.00			Ice	3.0247	2.4349	0.10
						1" Ice	3.5173	2.8938	0.16
						2" Ice	4.6062	3.9152	0.31
						4" Ice			
RRH2X60-PCS	C	From Leg	4.0000	0.00	147.0000	No Ice	2.5667	2.0106	0.06
			0.00			1/2"	2.7914	2.2184	0.08
			3.00			Ice	3.0247	2.4349	0.10
						1" Ice	3.5173	2.8938	0.16
						2" Ice	4.6062	3.9152	0.31
						4" Ice			
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000	0.00	147.0000	No Ice	5.6000	2.3333	0.04
			0.00			1/2"	5.9154	2.5580	0.08
			3.00			Ice	6.2395	2.7914	0.12
						1" Ice	6.9136	3.2840	0.21
						2" Ice	8.3654	4.3728	0.45
						4" Ice			
DB-T1-6Z-8AB-0Z	B	From Leg	4.0000	0.00	147.0000	No Ice	5.6000	2.3333	0.04
			0.00			1/2"	5.9154	2.5580	0.08
			3.00			Ice	6.2395	2.7914	0.12
						1" Ice	6.9136	3.2840	0.21
						2" Ice	8.3654	4.3728	0.45
						4" Ice			
FD9R6004/1C-3L	A	From Leg	4.0000	0.00	147.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.00
			3.00			Ice	0.5433	0.1965	0.01
						1" Ice	0.7546	0.3430	0.02
						2" Ice	1.2808	0.7396	0.06
						4" Ice			
FD9R6004/1C-3L	B	From Leg	4.0000	0.00	147.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.00
			3.00			Ice	0.5433	0.1965	0.01
						1" Ice	0.7546	0.3430	0.02
						2" Ice	1.2808	0.7396	0.06
						4" Ice			
FD9R6004/1C-3L	C	From Leg	4.0000	0.00	147.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.00
			3.00			Ice	0.5433	0.1965	0.01
						1" Ice	0.7546	0.3430	0.02
						2" Ice	1.2808	0.7396	0.06
						4" Ice			
FD9R6004/1C-3L	A	From Leg	4.0000	0.00	147.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.00
			3.00			Ice	0.5433	0.1965	0.01
						1" Ice	0.7546	0.3430	0.02
						2" Ice	1.2808	0.7396	0.06
						4" Ice			
FD9R6004/1C-3L	B	From Leg	4.0000	0.00	147.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.00
			3.00			Ice	0.5433	0.1965	0.01
						1" Ice	0.7546	0.3430	0.02
						2" Ice	1.2808	0.7396	0.06
						4" Ice			

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
FD9R6004/1C-3L	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.00 0.01 0.02 0.06
KS24019-L112A	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.1556 0.2247 0.3025 0.4840 0.9506	0.1556 0.2247 0.3025 0.4840 0.9506	0.01 0.01 0.01 0.02 0.06
Platform Mount [LP 712-1]	C	None		0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.5300 29.9400 35.3500 46.1700 67.8100	24.5300 29.9400 35.3500 46.1700 67.8100	1.34 1.65 1.96 2.58 3.82
***									
TME-RRUS 11 BAND 12	B	From Leg	1.0000 0.00 -3.00	0.00	141.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9939 3.2257 3.4661 3.9730 5.0904	1.2633 1.4303 1.6060 1.9832 2.8413	0.05 0.07 0.09 0.15 0.30
(2) TME-RRUS 11 BAND 12	C	From Leg	1.0000 0.00 -3.00	0.00	141.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9939 3.2257 3.4661 3.9730 5.0904	1.2633 1.4303 1.6060 1.9832 2.8413	0.05 0.07 0.09 0.15 0.30
Pipe Mount [PM 601-3]	C	None		0.00	141.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.3900 5.4800 6.5700 8.7500 13.1100	4.3900 5.4800 6.5700 8.7500 13.1100	0.20 0.24 0.28 0.36 0.53
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2208 6.7144 7.2182 8.2568 10.4762	4.8204 5.5082 6.2127 7.6716 11.0613	0.09 0.14 0.21 0.36 0.76
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2208 6.7144 7.2182 8.2568 10.4762	4.8204 5.5082 6.2127 7.6716 11.0613	0.09 0.14 0.21 0.36 0.76
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2208 6.7144 7.2182 8.2568 10.4762	4.8204 5.5082 6.2127 7.6716 11.0613	0.09 0.14 0.21 0.36 0.76
(2) LGP 17201	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.9460 2.1337 2.3301 2.7488 3.6900	0.5180 0.6396 0.7699 1.0564 1.7331	0.03 0.04 0.06 0.09 0.19
(2) LGP 17201	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice	1.9460 2.1337 2.3301	0.5180 0.6396 0.7699	0.03 0.04 0.06

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	2.7488	1.0564	0.09
						2" Ice	3.6900	1.7331	0.19
						4" Ice			
(2) LGP 17201	C	From Leg	4.0000	0.00	140.0000	No Ice	1.9460	0.5180	0.03
			0.00			1/2"	2.1337	0.6396	0.04
			0.00			Ice	2.3301	0.7699	0.06
						1" Ice	2.7488	1.0564	0.09
						2" Ice	3.6900	1.7331	0.19
						4" Ice			
(2) LGP13519	A	From Leg	4.0000	0.00	140.0000	No Ice	0.3379	0.2074	0.01
			0.00			1/2"	0.4220	0.2804	0.01
			0.00			Ice	0.5147	0.3621	0.01
						1" Ice	0.7260	0.5513	0.02
						2" Ice	1.2523	1.0335	0.07
						4" Ice			
(2) LGP13519	B	From Leg	4.0000	0.00	140.0000	No Ice	0.3379	0.2074	0.01
			0.00			1/2"	0.4220	0.2804	0.01
			0.00			Ice	0.5147	0.3621	0.01
						1" Ice	0.7260	0.5513	0.02
						2" Ice	1.2523	1.0335	0.07
						4" Ice			
(2) LGP13519	C	From Leg	4.0000	0.00	140.0000	No Ice	0.3379	0.2074	0.01
			0.00			1/2"	0.4220	0.2804	0.01
			0.00			Ice	0.5147	0.3621	0.01
						1" Ice	0.7260	0.5513	0.02
						2" Ice	1.2523	1.0335	0.07
						4" Ice			
DC6-48-60-18-8F	C	From Leg	4.0000	0.00	140.0000	No Ice	1.4667	1.4667	0.02
			0.00			1/2"	1.6667	1.6667	0.04
			0.00			Ice	1.8778	1.8778	0.06
						1" Ice	2.3333	2.3333	0.11
						2" Ice	3.3778	3.3778	0.24
						4" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.0000	0.00	140.0000	No Ice	10.5975	8.1125	0.08
			0.00			1/2"	11.2684	9.3041	0.16
			0.00			Ice	11.9061	10.2095	0.25
						1" Ice	13.2089	12.1748	0.46
						2" Ice	15.9341	16.3544	1.02
						4" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.0000	0.00	140.0000	No Ice	10.5975	8.1125	0.08
			0.00			1/2"	11.2684	9.3041	0.16
			0.00			Ice	11.9061	10.2095	0.25
						1" Ice	13.2089	12.1748	0.46
						2" Ice	15.9341	16.3544	1.02
						4" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.0000	0.00	140.0000	No Ice	10.5975	8.1125	0.08
			0.00			1/2"	11.2684	9.3041	0.16
			0.00			Ice	11.9061	10.2095	0.25
						1" Ice	13.2089	12.1748	0.46
						2" Ice	15.9341	16.3544	1.02
						4" Ice			
RRUS 12	A	From Leg	4.0000	0.00	140.0000	No Ice	3.6692	1.4875	0.06
			0.00			1/2"	3.9256	1.6727	0.08
			0.00			Ice	4.1907	1.8665	0.11
						1" Ice	4.7468	2.2800	0.17
						2" Ice	5.9627	3.2107	0.34
						4" Ice			
RRUS 12	B	From Leg	4.0000	0.00	140.0000	No Ice	3.6692	1.4875	0.06
			0.00			1/2"	3.9256	1.6727	0.08
			0.00			Ice	4.1907	1.8665	0.11
						1" Ice	4.7468	2.2800	0.17
						2" Ice	5.9627	3.2107	0.34
						4" Ice			
RRUS 12	C	From Leg	4.0000	0.00	140.0000	No Ice	3.6692	1.4875	0.06
			0.00			1/2"	3.9256	1.6727	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	4.1907	1.8665	0.11
						1" Ice	4.7468	2.2800	0.17
						2" Ice	5.9627	3.2107	0.34
						4" Ice			
RRUS A2	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4107 2.6193 2.8366 3.2970 4.3216	0.5345 0.6669 0.8079 1.1159 1.8356	0.02 0.03 0.05 0.09 0.20
RRUS A2	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4107 2.6193 2.8366 3.2970 4.3216	0.5345 0.6669 0.8079 1.1159 1.8356	0.02 0.03 0.05 0.09 0.20
RRUS A2	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4107 2.6193 2.8366 3.2970 4.3216	0.5345 0.6669 0.8079 1.1159 1.8356	0.02 0.03 0.05 0.09 0.20
Platform Mount [LP 303-1]	C	None		0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.6600 18.8700 23.0800 31.5000 48.3400	14.6600 18.8700 23.0800 31.5000 48.3400	1.25 1.48 1.71 2.18 3.10
***									
OG-860/1920/GPS-A	A	From Leg	4.0000 0.00 1.00	0.00	83.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3286 0.4340 0.5481 0.8022 1.4140	0.4044 0.5138 0.6317 0.8936 1.5210	0.00 0.01 0.01 0.02 0.08
OG-860/1920/GPS-A	B	From Leg	4.0000 0.00 1.00	0.00	83.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3286 0.4340 0.5481 0.8022 1.4140	0.4044 0.5138 0.6317 0.8936 1.5210	0.00 0.01 0.01 0.02 0.08
Side Arm Mount [SO 701-1]	A	None		0.00	83.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.8500 1.1400 1.4300 2.0100 3.1700	1.6700 2.3400 3.0100 4.3500 7.0300	0.07 0.08 0.09 0.12 0.18
Side Arm Mount [SO 701-1]	B	None		0.00	83.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.8500 1.1400 1.4300 2.0100 3.1700	1.6700 2.3400 3.0100 4.3500 7.0300	0.07 0.08 0.09 0.12 0.18
***									
OG-860/1920/GPS-A	B	From Leg	4.0000 0.00 1.00	0.00	78.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3286 0.4340 0.5481 0.8022 1.4140	0.4044 0.5138 0.6317 0.8936 1.5210	0.00 0.01 0.01 0.02 0.08
Side Arm Mount [SO 701-1]	B	None		0.00	78.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8500 1.1400 1.4300 2.0100 3.1700	1.6700 2.3400 3.0100 4.3500 7.0300	0.07 0.08 0.09 0.12 0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
4" Ice								

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	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 180.0000-131.7500	154.5443	1.554	28.72	105.326	A	0.000	105.326	105.326	100.00	0.000	0.000
					B	0.000	105.326		100.00	0.000	0.000
					C	0.000	105.326		100.00	0.000	7.773
L2 131.7500-86.7100	108.5534	1.405	25.94	133.878	A	0.000	133.878	133.878	100.00	0.000	0.000
					B	0.000	133.878		100.00	0.000	0.000
					C	0.000	133.878		100.00	0.000	16.237
L3 86.7100-43.1600	64.7043	1.212	22.30	160.896	A	0.000	160.896	160.896	100.00	0.000	0.000
					B	0.000	160.896		100.00	0.000	0.000
					C	0.000	160.896		100.00	0.000	18.210
L4 43.1600-0.0000	20.9541	1	18.50	189.427	A	0.000	189.427	189.427	100.00	0.000	0.000
					B	0.000	189.427		100.00	0.000	0.000
					C	0.000	189.427		100.00	0.000	18.278

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	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 180.0000-131.7500	154.5443	1.554	5.62	1.2036	115.004	A	0.000	115.004	115.004	100.00	0.000	0.000
						B	0.000	115.004		100.00	0.000	0.000
						C	0.000	115.004		100.00	0.000	18.484
L2 131.7500-86.7100	108.5534	1.405	5.08	1.1536	142.913	A	0.000	142.913	142.913	100.00	0.000	0.000
						B	0.000	142.913		100.00	0.000	0.000
						C	0.000	142.913		100.00	0.000	37.920
L3 86.7100-43.1600	64.7043	1.212	4.36	1.0842	169.269	A	0.000	169.269	169.269	100.00	0.000	0.000
						B	0.000	169.269		100.00	0.000	0.000
						C	0.000	169.269		100.00	0.000	47.498
L4 43.1600-0.0000	20.9541	1	3.62	1.0000	197.225	A	0.000	197.225	197.225	100.00	0.000	0.000
						B	0.000	197.225		100.00	0.000	0.000
						C	0.000	197.225		100.00	0.000	46.354

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	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 180.0000-131.7500	154.5443	1.554	9.94	105.326	A	0.000	105.326	105.326	100.00	0.000	0.000
					B	0.000	105.326		100.00	0.000	0.000
					C	0.000	105.326		100.00	0.000	7.773
L2 131.7500-86.7100	108.5534	1.405	8.98	133.878	A	0.000	133.878	133.878	100.00	0.000	0.000
					B	0.000	133.878		100.00	0.000	0.000
					C	0.000	133.878		100.00	0.000	16.237
L3 86.7100-	64.7043	1.212	7.72	160.89	A	0.000	160.896	160.896	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	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
43.1600				6	B	0.000	160.896		100.00	0.000	0.000
					C	0.000	160.896		100.00	0.000	18.210
L4 43.1600-0.0000	20.9541	1	6.40	189.427	A	0.000	189.427	189.427	100.00	0.000	0.000
					B	0.000	189.427		100.00	0.000	0.000
					C	0.000	189.427		100.00	0.000	18.278

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 131.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.41	-0.08	-0.42
			Max. Mx	5	-10.29	-422.79	-1.13
			Max. My	8	-10.30	-0.91	-422.03
			Max. Vy	11	-22.84	422.73	0.68
			Max. Vx	8	22.76	-0.91	-422.03
			Max. Torque	7			0.87
L2	131.75 - 86.71	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-35.16	0.85	-0.96
			Max. Mx	11	-18.41	1523.88	2.08

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	8	-18.42	-2.25	-1519.32
			Max. Vy	11	-27.29	1523.88	2.08
			Max. Vx	8	27.20	-2.25	-1519.32
			Max. Torque	2			-0.35
L3	86.71 - 43.16	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49.88	2.31	-1.87
			Max. Mx	11	-30.00	2783.56	3.30
			Max. My	8	-30.00	-3.37	-2775.23
			Max. Vy	11	-31.79	2783.56	3.30
			Max. Vx	8	31.71	-3.37	-2775.23
			Max. Torque	9			0.35
L4	43.16 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-71.39	4.47	-3.12
			Max. Mx	11	-47.79	4476.19	4.61
			Max. My	8	-47.79	-4.53	-4463.49
			Max. Vy	11	-36.02	4476.19	4.61
			Max. Vx	8	35.94	-4.53	-4463.49
			Max. Torque	11			0.36

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	71.39	0.00	-0.00
	Max. H_x	11	47.81	35.99	0.03
	Max. H_z	2	47.81	0.03	35.91
	Max. M_x	2	4462.03	0.03	35.91
	Max. M_z	5	4474.56	-35.99	-0.03
	Max. Torsion	11	0.36	35.99	0.03
	Min. Vert	11	47.81	35.99	0.03
	Min. H_x	5	47.81	-35.99	-0.03
	Min. H_z	8	47.81	-0.03	-35.91
	Min. M_x	8	-4463.49	-0.03	-35.91
	Min. M_z	11	-4476.19	35.99	0.03
	Min. Torsion	5	-0.35	-35.99	-0.03

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	47.81	-0.00	0.00	0.70	0.79	0.00
Dead+Wind 0 deg - No Ice	47.81	-0.03	-35.91	-4462.03	6.16	-0.02
Dead+Wind 30 deg - No Ice	47.81	17.97	-31.08	-3861.90	-2232.52	0.15
Dead+Wind 60 deg - No Ice	47.81	31.16	-17.93	-2226.26	-3872.76	0.29
Dead+Wind 90 deg - No Ice	47.81	35.99	0.03	6.08	-4474.56	0.35
Dead+Wind 120 deg - No Ice	47.81	31.19	17.98	2236.96	-3878.07	0.32
Dead+Wind 150 deg - No Ice	47.81	18.02	31.11	3868.67	-2241.76	0.20
Dead+Wind 180 deg - No Ice	47.81	0.03	35.91	4463.49	-4.53	0.03
Dead+Wind 210 deg - No Ice	47.81	-17.97	31.08	3863.36	2234.15	-0.16
Dead+Wind 240 deg - No Ice	47.81	-31.16	17.93	2227.72	3874.39	-0.30
Dead+Wind 270 deg - No Ice	47.81	-35.99	-0.03	-4.61	4476.19	-0.36
Dead+Wind 300 deg - No Ice	47.81	-31.19	-17.98	-2235.50	3879.70	-0.32
Dead+Wind 330 deg - No Ice	47.81	-18.02	-31.11	-3867.21	2243.39	-0.20
Dead+Ice+Temp	71.39	-0.00	0.00	3.12	4.47	0.00
Dead+Wind 0 deg+Ice+Temp	71.39	-0.01	-9.18	-1185.62	5.83	-0.13
Dead+Wind 30 deg+Ice+Temp	71.39	4.59	-7.95	-1025.77	-590.15	0.00
Dead+Wind 60 deg+Ice+Temp	71.39	7.96	-4.58	-590.17	-1026.75	0.13
Dead+Wind 90	71.39	9.20	0.01	4.45	-1186.97	0.22

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+Ice+Temp						
Dead+Wind 120 deg+Ice+Temp	71.39	7.97	4.59	598.77	-1027.88	0.26
Dead+Wind 150 deg+Ice+Temp	71.39	4.60	7.95	1033.54	-592.11	0.22
Dead+Wind 180 deg+Ice+Temp	71.39	0.01	9.18	1192.26	3.57	0.13
Dead+Wind 210 deg+Ice+Temp	71.39	-4.59	7.95	1032.41	599.56	-0.00
Dead+Wind 240 deg+Ice+Temp	71.39	-7.96	4.58	596.81	1036.16	-0.13
Dead+Wind 270 deg+Ice+Temp	71.39	-9.20	-0.01	2.19	1196.37	-0.22
Dead+Wind 300 deg+Ice+Temp	71.39	-7.97	-4.59	-592.13	1037.29	-0.26
Dead+Wind 330 deg+Ice+Temp	71.39	-4.60	-7.95	-1026.90	601.52	-0.22
Dead+Wind 0 deg - Service	47.81	-0.01	-12.42	-1545.72	2.67	-0.01
Dead+Wind 30 deg - Service	47.81	6.22	-10.75	-1337.61	-773.00	0.06
Dead+Wind 60 deg - Service	47.81	10.78	-6.20	-770.89	-1341.32	0.10
Dead+Wind 90 deg - Service	47.81	12.45	0.01	2.59	-1550.02	0.12
Dead+Wind 120 deg - Service	47.81	10.79	6.22	775.56	-1343.17	0.11
Dead+Wind 150 deg - Service	47.81	6.24	10.77	1340.92	-776.21	0.07
Dead+Wind 180 deg - Service	47.81	0.01	12.42	1547.18	-1.04	0.01
Dead+Wind 210 deg - Service	47.81	-6.22	10.75	1339.07	774.63	-0.06
Dead+Wind 240 deg - Service	47.81	-10.78	6.20	772.35	1342.95	-0.10
Dead+Wind 270 deg - Service	47.81	-12.45	-0.01	-1.12	1551.65	-0.12
Dead+Wind 300 deg - Service	47.81	-10.79	-6.22	-774.10	1344.81	-0.11
Dead+Wind 330 deg - Service	47.81	-6.24	-10.77	-1339.46	777.84	-0.07

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-47.81	0.00	0.00	47.81	-0.00	0.000%
2	-0.03	-47.81	-35.91	0.03	47.81	35.91	0.006%
3	17.97	-47.81	-31.08	-17.97	47.81	31.08	0.000%
4	31.16	-47.81	-17.93	-31.16	47.81	17.93	0.000%
5	35.99	-47.81	0.03	-35.99	47.81	-0.03	0.006%
6	31.19	-47.81	17.98	-31.19	47.81	-17.98	0.000%
7	18.02	-47.81	31.11	-18.02	47.81	-31.11	0.000%
8	0.03	-47.81	35.91	-0.03	47.81	-35.91	0.006%
9	-17.97	-47.81	31.08	17.97	47.81	-31.08	0.000%
10	-31.16	-47.81	17.93	31.16	47.81	-17.93	0.000%
11	-35.99	-47.81	-0.03	35.99	47.81	0.03	0.006%
12	-31.19	-47.81	-17.98	31.19	47.81	17.98	0.000%
13	-18.02	-47.81	-31.11	18.02	47.81	31.11	0.000%
14	0.00	-71.39	0.00	0.00	71.39	-0.00	0.000%
15	-0.01	-71.39	-9.18	0.01	71.39	9.18	0.001%
16	4.59	-71.39	-7.95	-4.59	71.39	7.95	0.001%
17	7.96	-71.39	-4.58	-7.96	71.39	4.58	0.001%
18	9.20	-71.39	0.01	-9.20	71.39	-0.01	0.001%
19	7.97	-71.39	4.59	-7.97	71.39	-4.59	0.001%
20	4.60	-71.39	7.95	-4.60	71.39	-7.95	0.001%
21	0.01	-71.39	9.18	-0.01	71.39	-9.18	0.001%
22	-4.59	-71.39	7.95	4.59	71.39	-7.95	0.001%
23	-7.96	-71.39	4.58	7.96	71.39	-4.58	0.001%
24	-9.20	-71.39	-0.01	9.20	71.39	0.01	0.001%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
25	-7.97	-71.39	-4.59	7.97	71.39	4.59	0.001%
26	-4.60	-71.39	-7.95	4.60	71.39	7.95	0.001%
27	-0.01	-47.81	-12.43	0.01	47.81	12.42	0.003%
28	6.22	-47.81	-10.76	-6.22	47.81	10.75	0.003%
29	10.78	-47.81	-6.20	-10.78	47.81	6.20	0.003%
30	12.45	-47.81	0.01	-12.45	47.81	-0.01	0.003%
31	10.79	-47.81	6.22	-10.79	47.81	-6.22	0.003%
32	6.24	-47.81	10.77	-6.24	47.81	-10.77	0.003%
33	0.01	-47.81	12.43	-0.01	47.81	-12.42	0.003%
34	-6.22	-47.81	10.76	6.22	47.81	-10.75	0.003%
35	-10.78	-47.81	6.20	10.78	47.81	-6.20	0.003%
36	-12.45	-47.81	-0.01	12.45	47.81	0.01	0.003%
37	-10.79	-47.81	-6.22	10.79	47.81	6.22	0.003%
38	-6.24	-47.81	-10.77	6.24	47.81	10.77	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	14	0.00007022	0.00009619
3	Yes	18	0.00000001	0.00007333
4	Yes	18	0.00000001	0.00007294
5	Yes	14	0.00007019	0.00009716
6	Yes	18	0.00000001	0.00007376
7	Yes	18	0.00000001	0.00007380
8	Yes	14	0.00007022	0.00009764
9	Yes	18	0.00000001	0.00007296
10	Yes	18	0.00000001	0.00007346
11	Yes	14	0.00007019	0.00009620
12	Yes	18	0.00000001	0.00007372
13	Yes	18	0.00000001	0.00007355
14	Yes	6	0.00000001	0.00000001
15	Yes	15	0.00008027	0.00008415
16	Yes	15	0.00008013	0.00011402
17	Yes	15	0.00008014	0.00011375
18	Yes	15	0.00008028	0.00008435
19	Yes	15	0.00008013	0.00011532
20	Yes	15	0.00008013	0.00011489
21	Yes	15	0.00008027	0.00008460
22	Yes	15	0.00008012	0.00011524
23	Yes	15	0.00008011	0.00011570
24	Yes	15	0.00008026	0.00008483
25	Yes	15	0.00008012	0.00011494
26	Yes	15	0.00008012	0.00011519
27	Yes	14	0.00007480	0.00004608
28	Yes	14	0.00007454	0.00010364
29	Yes	14	0.00007454	0.00010152
30	Yes	14	0.00007480	0.00004622
31	Yes	14	0.00007453	0.00010384
32	Yes	14	0.00007453	0.00010422
33	Yes	14	0.00007480	0.00004616
34	Yes	14	0.00007454	0.00010157
35	Yes	14	0.00007453	0.00010421
36	Yes	14	0.00007480	0.00004623
37	Yes	14	0.00007453	0.00010373
38	Yes	14	0.00007453	0.00010284

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 131.75	44.77	31	2.15	0.00
L2	136.25 - 86.71	25.94	37	1.86	0.00
L3	92.29 - 43.16	11.51	37	1.22	0.00

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	49.83 - 0	3.27	37	0.60	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.0000	(2) 950F65T2ZE-M w/ Mount Pipe	31	44.77	2.15	0.00	38851
161.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	37	36.29	2.06	0.00	10223
147.0000	(2) HBXX-6517DS-A2M w/ Mount Pipe	37	30.29	1.96	0.00	5885
141.0000	TME-RRUS 11 BAND 12	37	27.83	1.91	0.00	4979
140.0000	(2) 7770.00 w/ Mount Pipe	37	27.43	1.90	0.00	4856
83.0000	OG-860/1920/GPS-A	37	9.20	1.07	0.00	3754
78.0000	OG-860/1920/GPS-A	37	8.08	1.00	0.00	3709

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 131.75	128.88	11	6.20	0.00
L2	136.25 - 86.71	74.73	11	5.35	0.00
L3	92.29 - 43.16	33.18	12	3.51	0.00
L4	49.83 - 0	9.43	12	1.74	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.0000	(2) 950F65T2ZE-M w/ Mount Pipe	11	128.88	6.20	0.00	13781
161.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	11	104.49	5.92	0.00	3624
147.0000	(2) HBXX-6517DS-A2M w/ Mount Pipe	11	87.23	5.64	0.00	2083
141.0000	TME-RRUS 11 BAND 12	11	80.16	5.49	0.00	1761
140.0000	(2) 7770.00 w/ Mount Pipe	11	79.00	5.46	0.00	1717
83.0000	OG-860/1920/GPS-A	12	26.54	3.10	0.00	1311
78.0000	OG-860/1920/GPS-A	12	23.29	2.88	0.00	1294

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	180 - 131.75 (1)	TP31.39x21x0.25	48.2500	0.0000	0.0	39.00	23.9407	-10.29	933.69	0.011
L2	131.75 - 86.71 (2)	TP40.46x29.921x0.375	49.5400	0.0000	0.0	39.00	46.2983	-18.41	1805.63	0.010
L3	86.71 - 43.16 (3)	TP48.96x38.5229x0.4375	49.1300	0.0000	0.0	39.00	65.4119	-30.00	2551.07	0.012

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L4	43.16 - 0 (4)	TP57.25x46.668x0.5	49.8300	0.0000	0.0	39.00	90.0622	-47.79	3512.43	0.014

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	180 - 131.75 (1)	TP31.39x21x0.25	423.49	28.52	39.00	0.731	0.00	0.00	39.00	0.000
L2	131.75 - 86.71 (2)	TP40.46x29.921x0.375	1524.83	41.25	39.00	1.058	0.00	0.00	39.00	0.000
L3	86.71 - 43.16 (3)	TP48.96x38.5229x0.4375	2784.75	44.01	39.00	1.129	0.00	0.00	39.00	0.000
L4	43.16 - 0 (4)	TP57.25x46.668x0.5	4477.68	42.64	39.00	1.093	0.00	0.00	39.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	180 - 131.75 (1)	TP31.39x21x0.25	22.85	0.95	26.00	0.073	0.14	0.00	26.00	0.000
L2	131.75 - 86.71 (2)	TP40.46x29.921x0.375	27.30	0.59	26.00	0.045	0.01	0.00	26.00	0.000
L3	86.71 - 43.16 (3)	TP48.96x38.5229x0.4375	31.80	0.49	26.00	0.037	0.10	0.00	26.00	0.000
L4	43.16 - 0 (4)	TP57.25x46.668x0.5	36.03	0.40	26.00	0.031	0.32	0.00	26.00	0.000

Pole Interaction Design Data

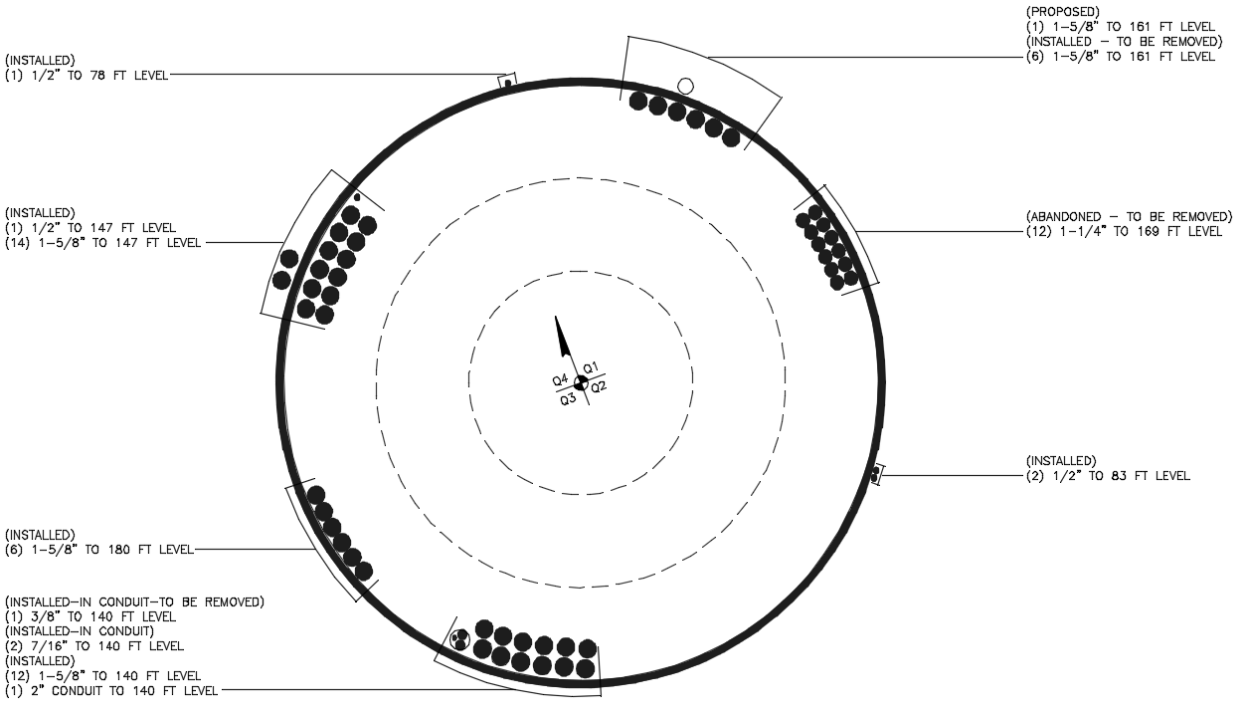
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 131.75 (1)	0.011	0.731	0.000	0.073	0.000	0.744 ✔	1.333	H1-3+VT ✔
L2	131.75 - 86.71 (2)	0.010	1.058	0.000	0.045	0.000	1.068 ✔	1.333	H1-3+VT ✔
L3	86.71 - 43.16 (3)	0.012	1.129	0.000	0.037	0.000	1.141 ✔	1.333	H1-3+VT ✔
L4	43.16 - 0 (4)	0.014	1.093	0.000	0.031	0.000	1.107 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
L1	180 - 131.75	Pole	TP31.39x21x0.25	1	-10.29	1244.60	55.8	Pass
L2	131.75 - 86.71	Pole	TP40.46x29.921x0.375	2	-18.41	2406.90	80.1	Pass
L3	86.71 - 43.16	Pole	TP48.96x38.5229x0.4375	3	-30.00	3400.58	85.6	Pass
L4	43.16 - 0	Pole	TP57.25x46.668x0.5	4	-47.79	4682.07	83.1	Pass
						Summary		
						Pole (L3)	85.6	Pass
						RATING =	**85.6**	**Pass**

APPENDIX B

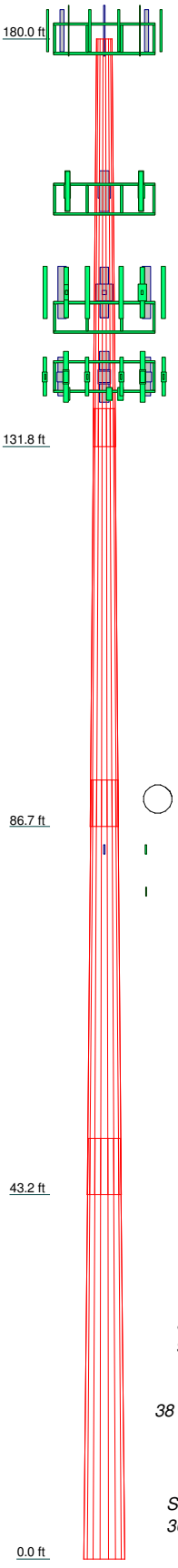
BASE LEVEL DRAWING

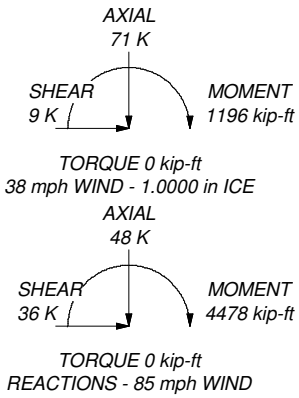

(PROPOSED)
(1) 1-5/8" TO 161 FT LEVEL
(INSTALLED - TO BE REMOVED)
(6) 1-5/8" TO 161 FT LEVEL
(INSTALLED)
(1) 1/2" TO 78 FT LEVEL
(INSTALLED)
(1) 1/2" TO 147 FT LEVEL
(14) 1-5/8" TO 147 FT LEVEL
(ABANDONED - TO BE REMOVED)
(12) 1-1/4" TO 169 FT LEVEL
Q1
Q2
Q3
Q4
(INSTALLED)
(2) 1/2" TO 83 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 180 FT LEVEL
(INSTALLED-IN CONDUIT-TO BE REMOVED)
(1) 3/8" TO 140 FT LEVEL
(INSTALLED-IN CONDUIT)
(2) 7/16" TO 140 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 140 FT LEVEL
(1) 2" CONDUIT TO 140 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	48.2500	18	0.2500	4.5000	21.0000	31.3900	A572-65	3.4
2	49.5400	18	0.3750	5.5800	29.9210	40.4600		7.0
3	49.1300	18	0.4375	6.6700	38.5229	48.9600		10.1
4	49.8300	18	0.5000		46.6680	57.2500		13.8





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) 950F65T2ZE-M w/ Mount Pipe	180	DB-T1-6Z-8AB-0Z	147
(2) DB980H90E-M w/ Mount Pipe	180	FD9R6004/1C-3L	147
(2) DB980H90E-M w/ Mount Pipe	180	FD9R6004/1C-3L	147
Platform Mount [LP 601-1]	180	FD9R6004/1C-3L	147
(2) 6' x 2" Mount Pipe	180	FD9R6004/1C-3L	147
(3) 6' x 2" Mount Pipe	180	FD9R6004/1C-3L	147
(2) 6' x 2" Mount Pipe	180	FD9R6004/1C-3L	147
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	KS24019-L112A	147
		Platform Mount [LP 712-1]	147
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	TME-RRUS 11 BAND 12	141
		(2) TME-RRUS 11 BAND 12	141
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	Pipe Mount [PM 601-3]	141
		(2) 7770.00 w/ Mount Pipe	140
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	161	(2) 7770.00 w/ Mount Pipe	140
		(2) 7770.00 w/ Mount Pipe	140
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	161	(2) LGP 17201	140
		(2) LGP 17201	140
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	161	(2) LGP 17201	140
RRUS 11 B12	161	(2) LGP13519	140
RRUS 11 B12	161	(2) LGP13519	140
RRUS 11 B12	161	(2) LGP13519	140
Platform Mount [LP 305-1]	161	DC6-48-60-18-8F	140
(2) HBXX-6517DS-A2M w/ Mount Pipe	147	HPA-65R-BUU-H6 w/ Mount Pipe	140
(2) HBXX-6517DS-A2M w/ Mount Pipe	147	HPA-65R-BUU-H6 w/ Mount Pipe	140
(2) HBXX-6517DS-A2M w/ Mount Pipe	147	HPA-65R-BUU-H6 w/ Mount Pipe	140
LNX-6514DS-A1M w/ Mount Pipe	147	RRUS 12	140
LNX-6514DS-A1M w/ Mount Pipe	147	RRUS 12	140
LNX-6514DS-A1M w/ Mount Pipe	147	RRUS 12	140
LNX-6514DS-A1M w/ Mount Pipe	147	RRUS A2	140
LNX-6514DS-A1M w/ Mount Pipe	147	RRUS A2	140
LNX-6514DS-A1M w/ Mount Pipe	147	RRUS A2	140
RRH2X60-AWS	147	Platform Mount [LP 303-1]	140
RRH2X60-AWS	147	OG-860/1920/GPS-A	83
RRH2X60-AWS	147	OG-860/1920/GPS-A	83
RRH2X60-PCS	147	Side Arm Mount [SO 701-1]	83
RRH2X60-PCS	147	Side Arm Mount [SO 701-1]	83
RRH2X60-PCS	147	OG-860/1920/GPS-A	78
DB-T1-6Z-8AB-0Z	147	Side Arm Mount [SO 701-1]	78

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 85.6%

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job: 180' Monopole / Columbia/Deojay			
Project: PJF# 37516-0222.002.7805 / BU# 876391			
Client: CCI	Drawn by: Christopher Poelking		App'd:
Code: TIA/EIA-222-F	Date: 04/11/16		Scale: NTS
Path: G:\TOWER\375_Crown_Castle\2016\37516-0222_876391_COLUMBIA - DEOJAY\37516-0222.002.7805_SA_122070437516-0222.002.7805.eri			Dwg No. E-1

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

TIA Rev F

Site Data

BU#:	*876391*
Site Name:	*Columbia / Deojay*
App #:	
Pole Manufacturer:	*Other*

Reactions		
Moment:	4478	ft-kips
Axial:	48	kips
Shear:	36	kips

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	66	in

Plate Data		
Diam:	72	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	9.09	in

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

Pole Data		
Diam:	57.25	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

Maximum Rod Tension:	160.4	Kips	Rigid
Allowable Tension:	195.0	Kips	Service, ASD
Anchor Rod Stress Ratio:	82.3%	**Pass**	Fty*ASIF

Base Plate Results

	Flexural Check		Rigid
Base Plate Stress:	57.4	ksi	Service ASD
Allowable Plate Stress:	60.0	ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	95.7%	**Pass**	Y.L. Length: 32.84

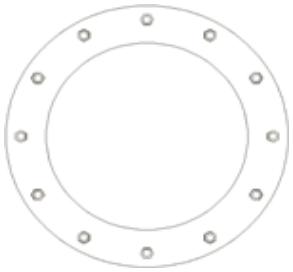
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a



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

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

Foundation Loads:

Pole weight or tower leg compression =	**48**	(kips)
Horizontal load at top of pier =	**36**	(kips)
Overturning moment at top of pier=	**4478**	(ft-kips)

Design criteria:

Safety factor against overturning =	**1.5**	

Soil Properties:

Soil density =	**100**	(pcf)
Allowable soil bearing =	**6**	(ksf)
Depth to water table =	**5**	(ft)

Dimensions:

Pier shape (round or square)	**S**	("R" or "S")
Pier width =	**7**	(ft)
Pier height above grade =	**1**	(ft)
depth to bottom of footing =	**7**	(ft)
Footing thickness =	**3**	(ft)
Footing width =	**26**	(ft)
Footing length =	**26**	(ft)

Concrete:

Concrete strength =	**4**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

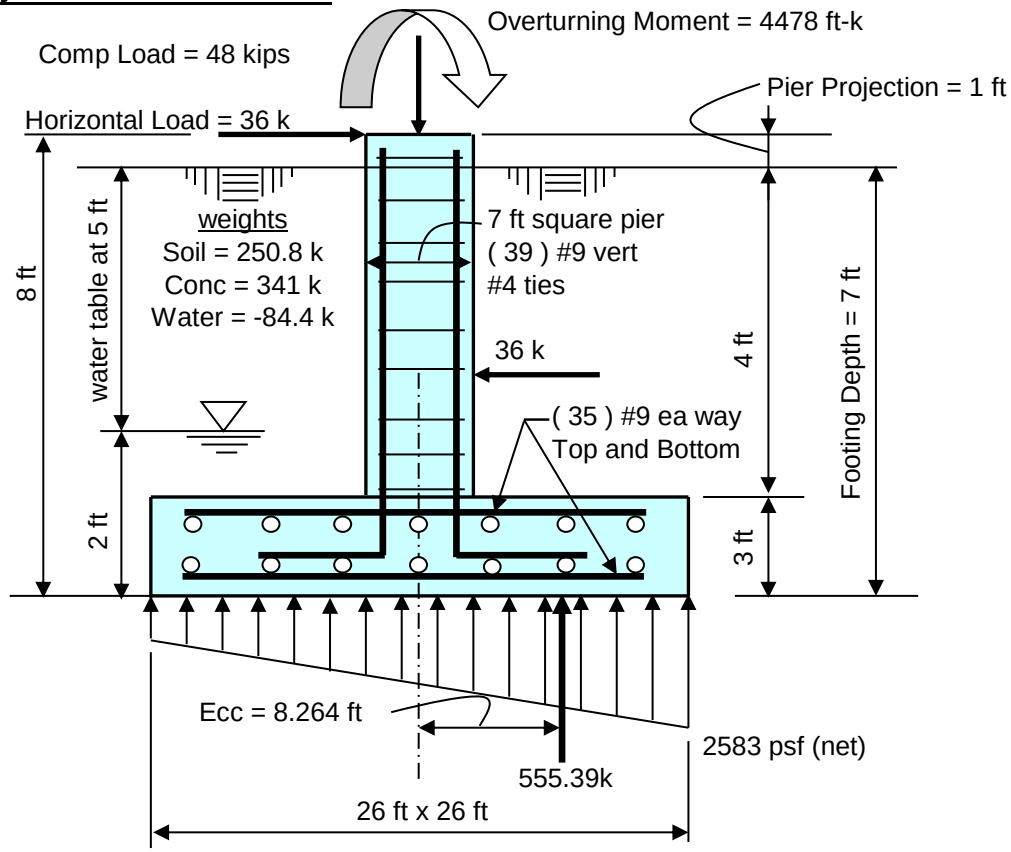
Reinforcing Steel:

	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#9**	bar
quantity of pad rebar =	**35**	(ea direction)

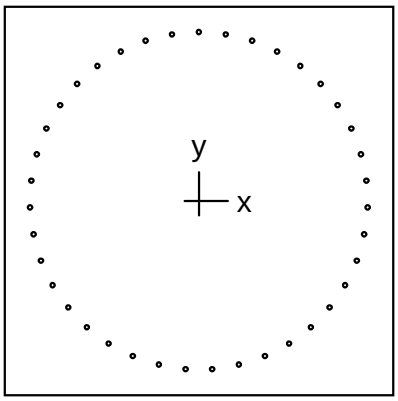
Reinforcing Steel:

	Pier	
size of vert rebar in pier=	**#9**	bar
vertical rebar quantity =	**39**	
size of pier ties =	**#4**	bar
minimum cover over rebar =	**3**	inches

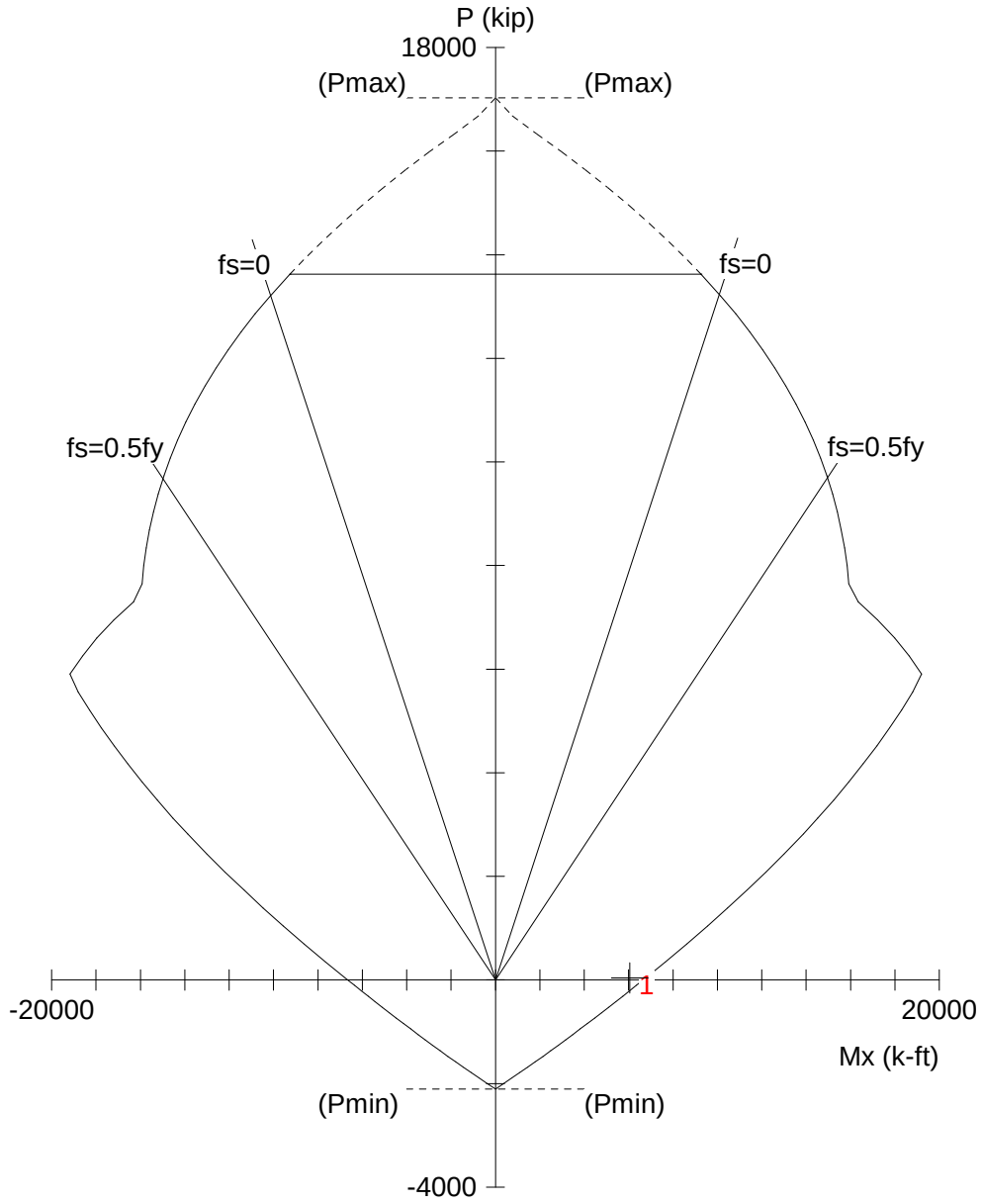
Total volume of concrete = 84.2 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 2.583 ksf Allowable Net Soil Bearing = 6 ksf **Soil Bearing Stress Ratio = 0.43 Okay**	Ult Bending Shear Capacity = 126 psi Ult Bending Shear Stress = 47 psi **Bending Shear Stress Ratio = 0.37 Okay**
Ftg Overturning Resistance = 7220 ft-kips Overturning Moment = 4590 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.573 **Ratio = 0.95 Okay**	Pad Bending Moment Capacity= 4776 ft-k Pad Bending Moment = 2458 ft-k **Bending Moment Stress Ratio = 0.51 OK**



84 x 84 in



Code: ACI 318-02

Units: English

Run axis: About X-axis

Run option: Investigation

Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 04/11/16

Time: 15:31:11

File: G:\TOWER\375_Crown_Castle\2016\37516-0222_876391_COLUMBIA - DEOJAY...\Reinforcement in Foundation.col

Project: 37515-1553

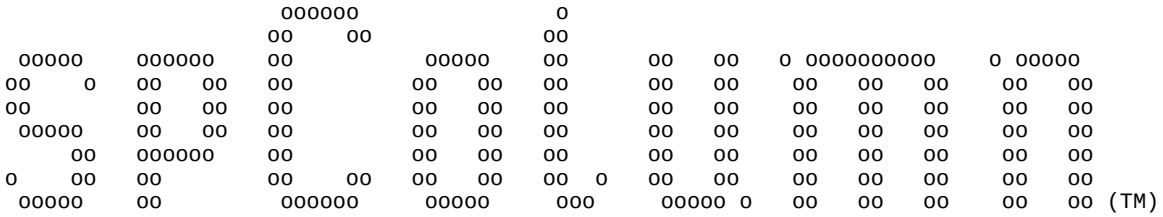
Column:

Engineer: CMM

f'c = 4 ksi	fy = 60 ksi	Ag = 7056 in^2	39 #9 bars
Ec = 3605 ksi	Es = 29000 ksi	As = 39.00 in^2	rho = 0.55%
fc = 3.4 ksi		Xo = 0.00 in	Ix = 4.14893e+006 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 4.14893e+006 in^4
Beta1 = 0.85		Min clear spacing = 4.75 in	Clear cover = 4.94 in

Confinement: Tied

phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65



spColumn v4.80 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

General Information:
==========
File Name: G:\TOWER\375_Crown_Castle\2016\37516-0222_876391_COLUM...\Reinforcement in Foundation.col
Project: 37515-1553
Column: Engineer: CMM
Code: ACI 318-02 Units: English

Run Option: Investigation Slenderness: Not considered
Run Axis: X-axis Column Type: Structural

Material Properties:
==========
f'c = 4 ksi fy = 60 ksi
Ec = 3605 ksi Es = 29000 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.85

Section:
========
Rectangular: Width = 84 in Depth = 84 in

Gross section area, Ag = 7056 in^2
Ix = 4.14893e+006 in^4 Iy = 4.14893e+006 in^4
rx = 24.2487 in ry = 24.2487 in
Xo = 0 in Yo = 0 in

Reinforcement:
==========
Bar Set: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #4 ties with #8 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 39.00 in^2 at rho = 0.55% (Note: rho < 1.0%)
Minimum clear spacing = 4.75 in

39 #9 Cover = 4.436 in

Factored Loads and Moments with Corresponding Capacities:
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No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	43.20	6055.40	6787.33	1.121	7.92	78.38	0.02673	0.900

*** End of output ***

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

T-Mobile Existing Facility

Site ID: CT11503A

SPRINT COLUMBIA Rt 6
14 THOMPSON HILL ROAD
COLUMBIA, CT 06237

April 29, 2016

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general public allowable limit:	**13.37 %**

April 29, 2016

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

Emissions Analysis for Site: **CT11503A – SPRINT COLUMBIA RT 6**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **14 THOMPSON HILL RD, COLUMBIA, 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 both the PCS, 700Mhz 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 **14 THOMPSON HILL RD, COLUMBIA, CT** using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
3) 1 LTE channels (700 Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
4) 1 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.

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] (if required) 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 AIR21 B2A/B4P for 1900 MHz (PCS) and the KRC 118 057/1 for the 700 and 2100 MHz (AWS) channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The AIR21 B2A/B4P has a maximum gain of **15.35 dBd** at its main lobe, and the KRC 118 057/1 has a maximum gain of **15.35 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 160 Feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	1	Antenna #:	1
Make / Model:	AIR21 B2A/B4P	Make / Model:	AIR21 B2A/B4P	Make / Model:	AIR21 B2A/B4P
Gain:	15.35 dBd	Gain:	15.35 dBd	Gain:	15.35 dBd
Height (AGL):	160	Height (AGL):	160	Height (AGL):	160
Frequency Bands	1900 GSM/1900 UMTS	Frequency Bands	1900 GSM/1900 UMTS	Frequency Bands	1900 GSM/1900 UMTS
Channel Count	4	Channel Count	4	# PCS Channels:	4
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	5131.83	ERP (W):	5131.83	ERP (W):	5131.83
Antenna A1 MPE%	1.1	Antenna B1 MPE%	1.1	Antenna C1 MPE%	1.1
Antenna #:	**2**	Antenna #:	2	Antenna #:	2
Make / Model:	KRC 118 057/1	Make / Model:	KRC 118 057/1	Make / Model:	KRC 118 057/1
Gain:	15.35 dBd	Gain:	15.35 dBd	Gain:	15.35 dBd
Height (AGL):	160	Height (AGL):	160	Height (AGL):	160
Frequency Bands	LTE 700 / LTE 2100 (AWS)	Frequency Bands	LTE 700 / LTE 2100 (AWS)	Frequency Bands	LTE 700 / LTE 2100 (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power:	90	Total TX Power:	90	Total TX Power:	90
ERP (W):	2665.22	ERP (W):	2665.22	ERP (W):	2665.22
Antenna A2 MPE%	1.7	Antenna B2 MPE%	1.7	Antenna C2 MPE%	1.7

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**8.4**
Sprint	1.84 %
Other Carrier	2.18 %
Other Carrier	0.95%
Site Total MPE %:	**13.37**

T-Mobile Sector 1 Total:	2.8 %
T-Mobile Sector 2 Total:	2.8%
T-Mobile Sector 3 Total:	2.8 %
Site Total:	8.4

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:	2.8 %
Sector 2:	2.8 %
Sector 3 :	2.8 %
T-Mobile Total:	8.4 %
Site Total:	13.37
Site Compliance Status:	**Compliant**

The anticipated composite MPE value for this site assuming all carriers present is **13.37%** 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.

Brian Frazier
Sr. RF Engineer

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