Crown Castle
3530 Toringdon Way Suite 300
Charlotte NC 28277

Tel (704) 405-6600

April 23, 2015

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

RE: **T-Mobile-Exempt Modification - Crown Site BU: 800515**
T-Mobile Site ID: CT11236A
Located at: 39 Wig Hill Road, Chester, CT 06412

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of T-Mobile. T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement their 700MHz technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Edmund Meehan, First Selectman for the Town of Chester, and the Estate of Bruce Rayner, Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at 39 **Wig Hill Road, Chester, CT 06412**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile's operations at the site (Exhibit-3).

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

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

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

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

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

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

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

Sincerely,

Jerry Feathers
Real Estate Specialist

Enclosure

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

cc: The Honorable Edmund Meehan, Town Selectman
Chester Town Hall
203 Middlesex Avenue
Chester, CT 06412

Estate of Bruce Rayner
1556 Saybrook Road, Apt. 193
Hazel C. Negrelli, Executor
Haddam, CT 06438

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11236A
CROWN CASTLE BU #: 800515
SITE NAME: CT CHESTER CAC
WIG HILL ROAD
CHESTER, CT 06412
MIDDLESEX COUNTY

VICINITY MAP

FROM PARSIPPANY, NJ:

DEPART SYLVAN WAY AND TAKE I-80 E TO I-287 N. TAKE EXIT ONTO I-287 E TOWARD TAPPAN ZEE BRIDGE. FOLLOW SIGNS TO WHITE PLAINS. MERGE ONTO I-95 N. TAKE EXIT 64 FOR CT-145 N. TURN LEFT ONTO CT-145 N. TURN RIGHT ONTO CT-145 N/CT-80 E. TURN LEFT ONTO CT-145 N. TURN RIGHT ONTO CT-148 E/W MAIN ST. TURN LEFT ONTO CT-9 N RAMP TO MIDDLETOWN. TURN RIGHT ONTO WIG 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
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

CONTACT: WARREN KELLEHER
PHONE #: (781) 970-0055

CONSULTANT TEAM

SITE NAME:
CT CHESTER CAC

SITE NUMBER:
CT11236A

TOWER OWNER:
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

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

COORDINATES:
LATITUDE: 41°-24'-13.93" N (NAD83)
LONGITUDE: 72°-28'-20.82" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
704G

PROJECT SUMMARY

SITE ADDRESS:
WIG HILL ROAD
CHESTER, CT 06412
MIDDLESEX COUNTY

PROJECT DIRECTORY

- REMOVE AND REPLACE (6) EXISTING ANTENNAS WITH (6) NEW ANTENNAS.
- INSTALL (6) NEW TMA'S.
- INSTALL (3) NEW BIAS TEES.
- INSTALL (6) NEW LINES OF COAX.
- INSTALL (3) NEW RRU'S ON A UNISTRUT RACK AT GRADE.
- INSTALL (1) NEW BBU CABINET AT GRADE.

SCOPE OF WORK

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

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

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

SHEET INDEX

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

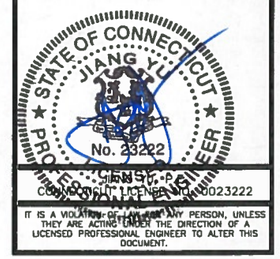
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

CT11236A
CT CHESTER CAC

CONSTRUCTION DRAWINGS

0	04/22/15	ISSUED AS FINAL
A	04/17/15	ISSUED FOR REVIEW

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



DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071475
SITE ADDRESS:	

WIG HILL ROAD
CHESTER, CT 06412
MIDDLESEX 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
T–MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

CT11236A
CT CHESTER CAC

CONSTRUCTION DRAWINGS

0	04/22/15	ISSUED AS FINAL
A	04/17/15	ISSUED FOR REVIEW

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

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 23222
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071475
SITE ADDRESS:	

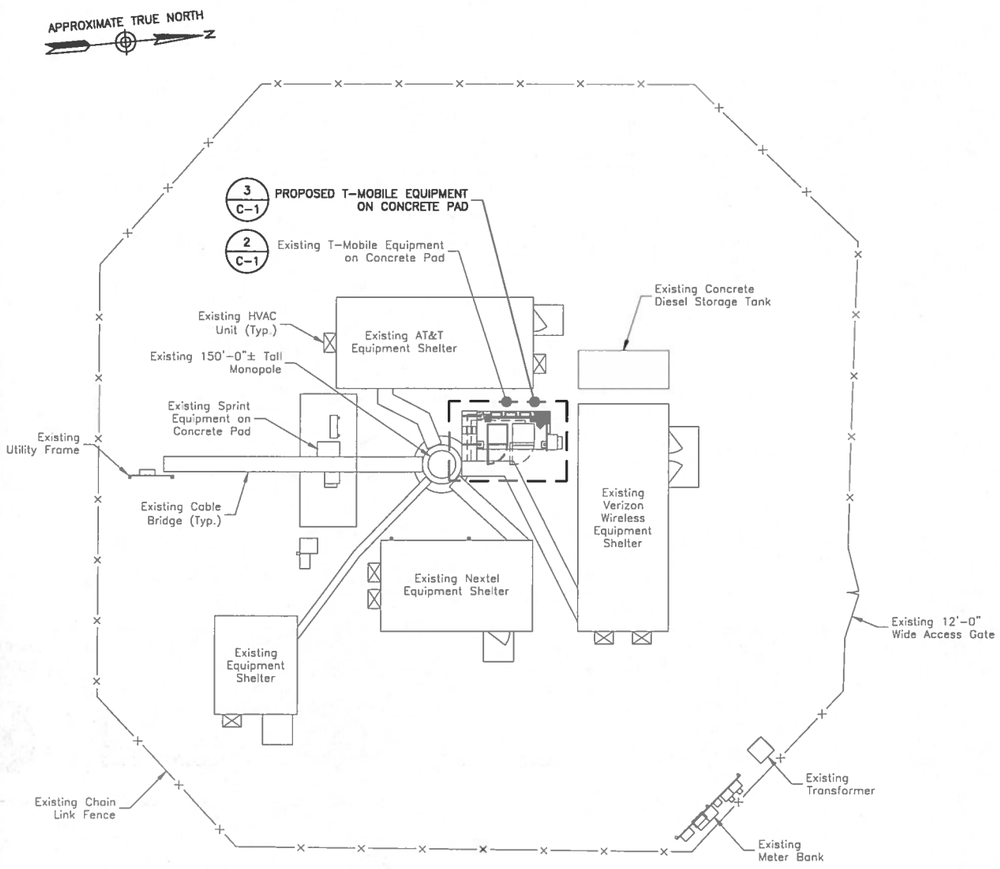
WIG HILL ROAD
CHESTER, CT 06412
MIDDLESEX COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

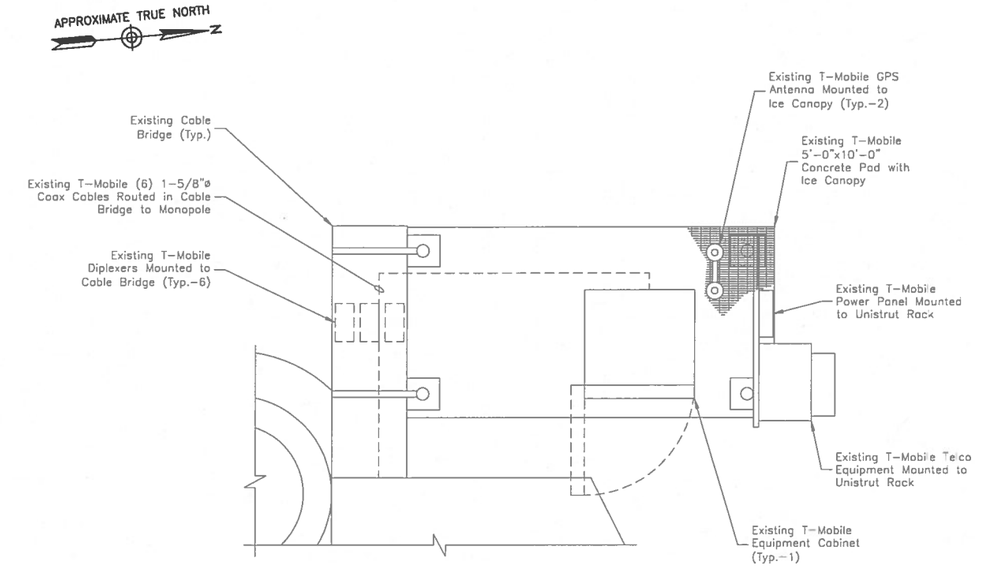
G–1



COMPOUND PLAN 1

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

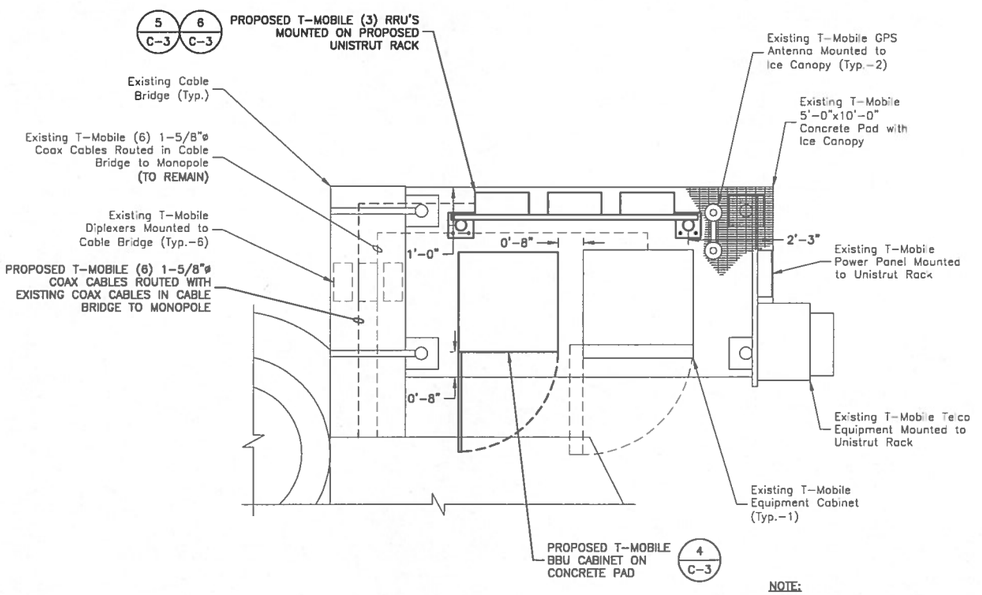
0' 10' 20'



EXISTING EQUIPMENT PLAN 2

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

0' 1' 2' 4'



PROPOSED EQUIPMENT PLAN 3

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

0' 1' 2' 4'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY JACOBS ENGINEERING GROUP, INC. DATED MARCH 27, 2015.

NOTE:

1. EXISTING COAX CABLES TO BE REROUTED AROUND PROPOSED RRU'S, AS REQUIRED.

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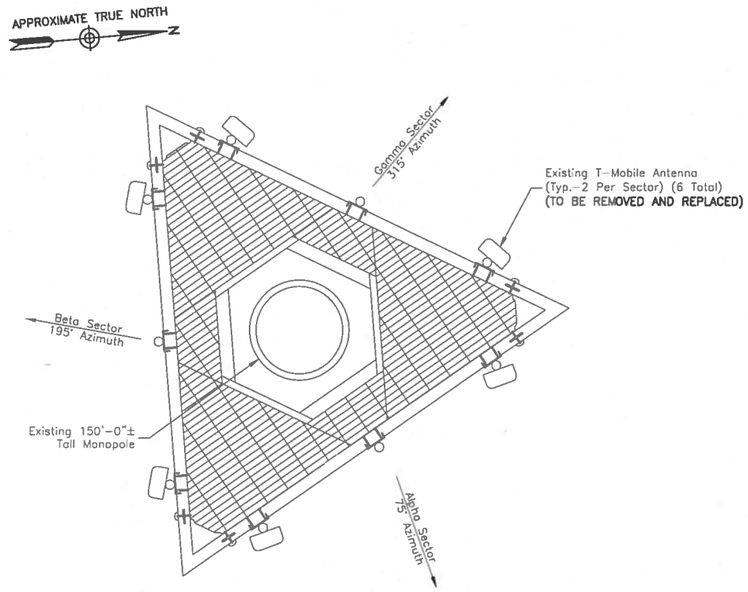
CHESTER, CT 06412
MIDDLESEX COUNTY

SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

SHEET NUMBER

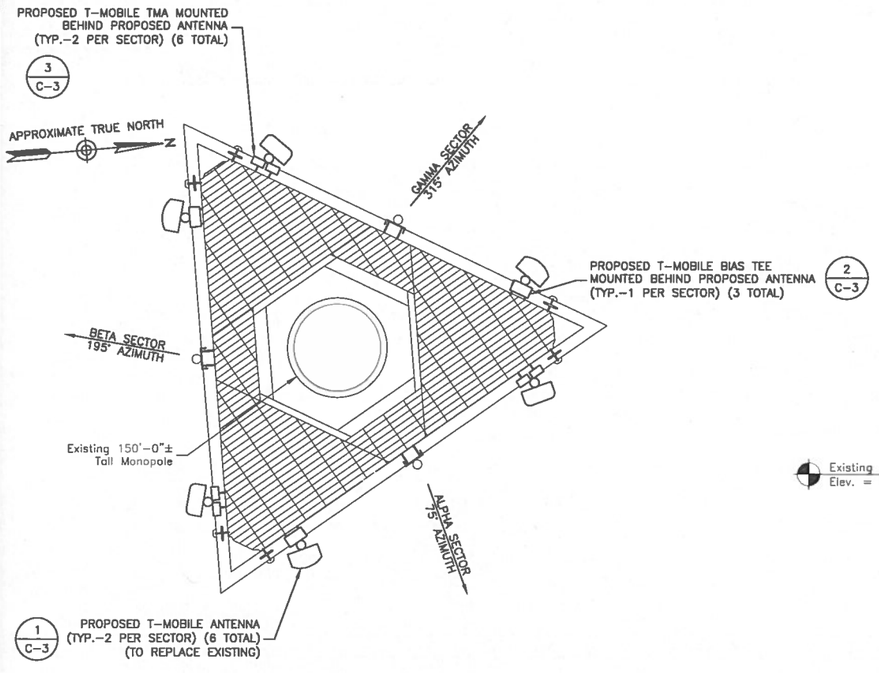
C-1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

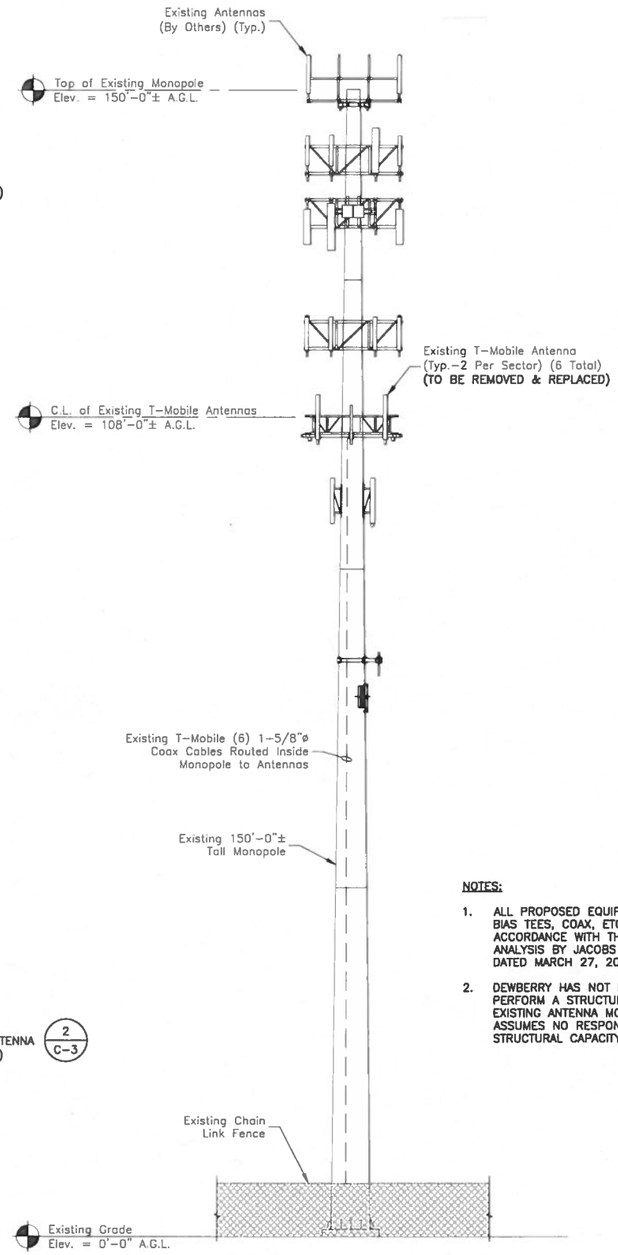
1



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

2

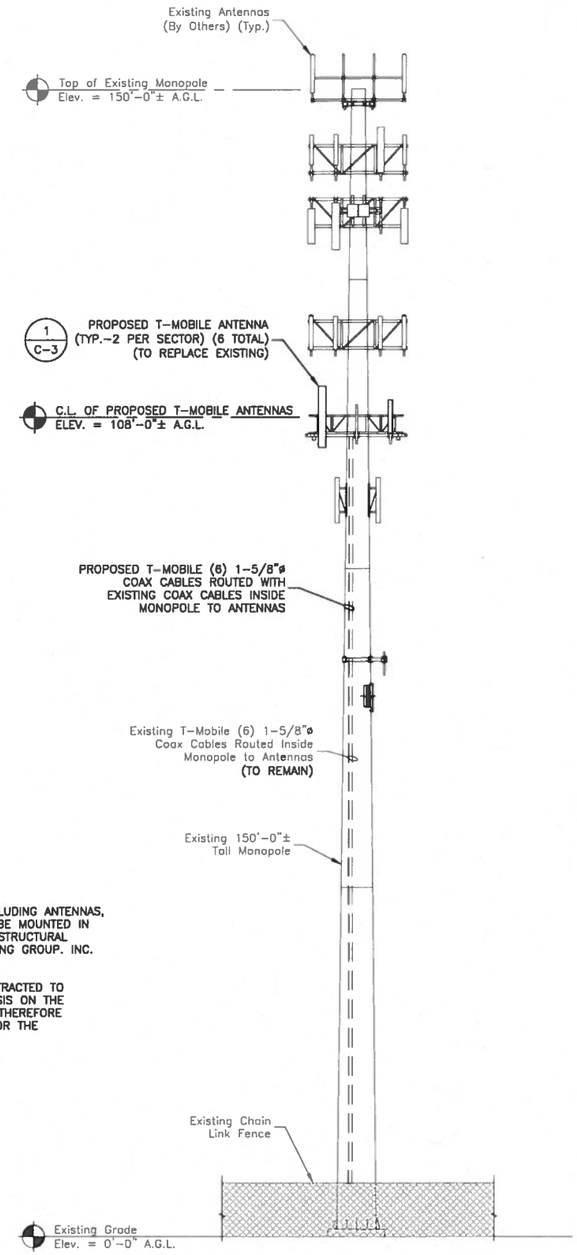


EXISTING ELEVATION

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, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY JACOBS ENGINEERING GROUP. INC. DATED MARCH 27, 2015.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING ANTENNA MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.

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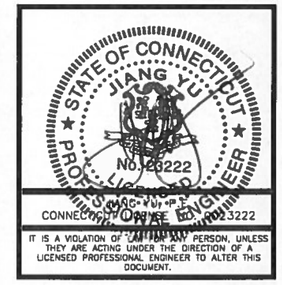

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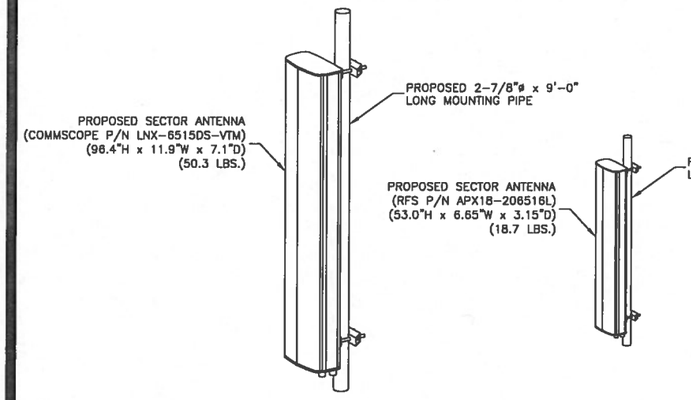
MIDDLESEX COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

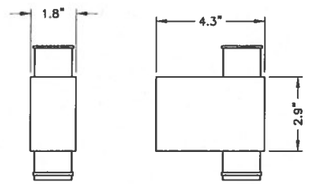
C-2



NOTES:

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

ISOMETRIC ANTENNA DETAILS (1)
SCALE: N.T.S.

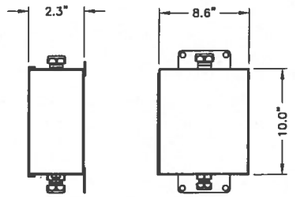


ANDREW ATBT-BOTTOM-24V

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.

BIAS TEE DETAIL (2)
SCALE: N.T.S.

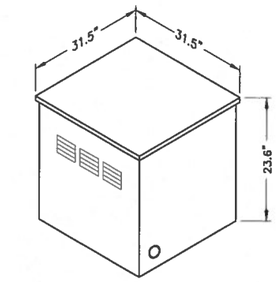


ANDREW ETM19V2S12UB

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.

TMA DETAIL (3)
SCALE: N.T.S.



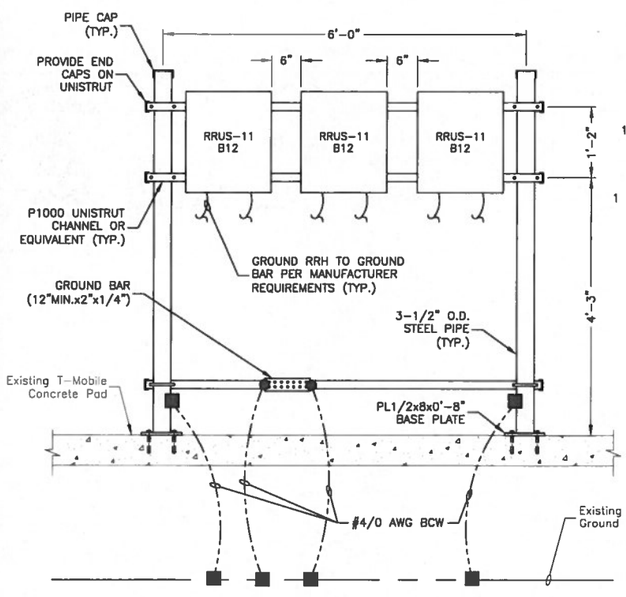
ALCATEL-LUCENT EZBFo BATTERY BACKUP SYSTEM

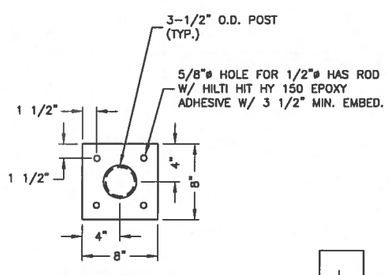
MATERIAL:	ANCHOR:
CONCRETE	3/8"ø HILTI KWIK BOLT 3 W/2-1/2" MIN. EMBED.
STRUCTURAL STEEL	1/2"ø STRUCTURAL BOLTS

NOTE:

1. CONTRACTOR SHALL ANCHOR CABINET IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

BBU CABINET DETAIL (4)
SCALE: N.T.S.



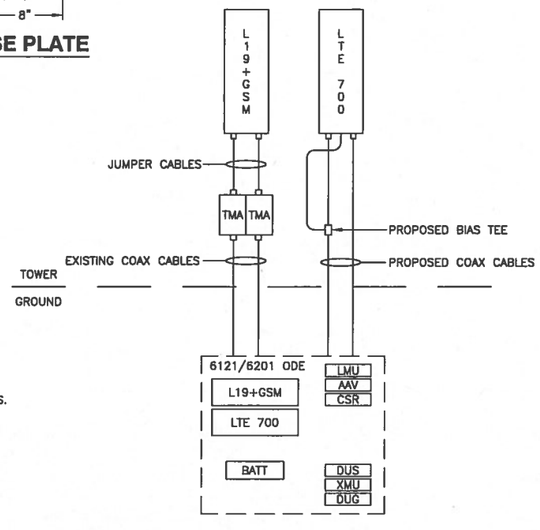


BASE PLATE

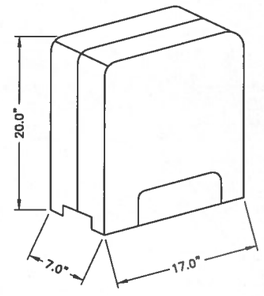
NOTES:

1. CONTRACTOR SHALL SUPPLY AND INSTALL UNISTRUT (OR EQUIVALENT) MOUNTING CHANNELS.
2. CONTRACTOR SHALL SUPPLY (BUT NOT INSTALL) 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER RRU. CONTRACTOR SHALL BAG THE BOLTING HARDWARE AND HANG FROM INSTALLED UNISTRUT FRAME.
3. SPACING MAY VARY BASED ON SELECTED EQUIPMENT. ADJUSTMENTS TO SPACING WILL BE MADE BY RRU INSTALLER.
4. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

RRU RACK DETAIL (6)
SCALE: N.T.S



SITE CONFIGURATION 704G (7)
SCALE: N.T.S.



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

ERICSSON RRUS-11 B12

RRU NOTES:

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

RRUS-11 - REMOTE RADIO UNIT (5)
SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH
	EXISTING	PROPOSED	EXISTING	PROPOSED	
ALPHA	DAPA 59212	RFS APX18-206516L	(2) 1-5/8"ø	(2) 1-5/8"ø	158'-0"
	DAPA 59212	COMMSCOPE LNX-6515DS-VTM			
BETA	DAPA 59212	RFS APX18-206516L	(2) 1-5/8"ø	(2) 1-5/8"ø	158'-0"
	DAPA 59212	COMMSCOPE LNX-6515DS-VTM			
GAMMA	DAPA 59212	RFS APX18-206516L	(2) 1-5/8"ø	(2) 1-5/8"ø	158'-0"
	DAPA 59212	COMMSCOPE LNX-6515DS-VTM			

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CHESTER, CT 06412
MIDDLESEX COUNTY

SHEET TITLE

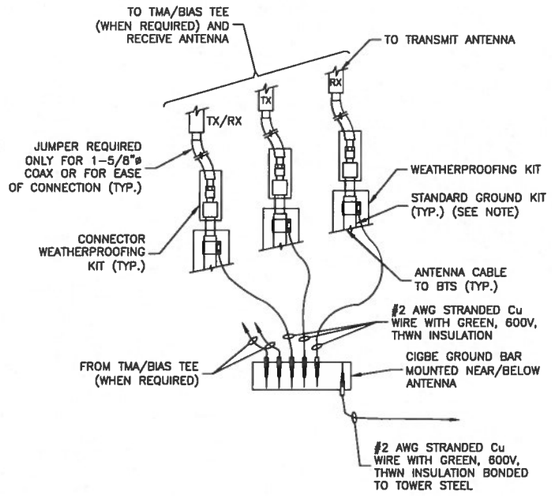
CONSTRUCTION DETAILS

SHEET NUMBER

C-3

GROUNDING NOTES:

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

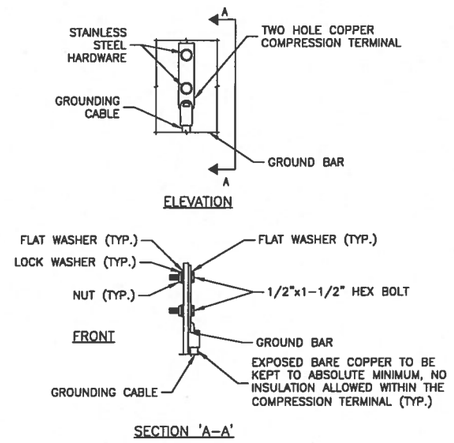


NOTE:

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

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) 1

SCALE: N.T.S.

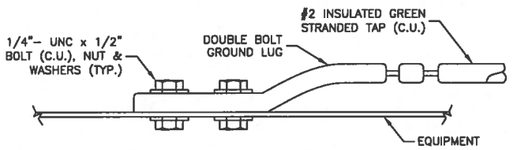


NOTES:

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

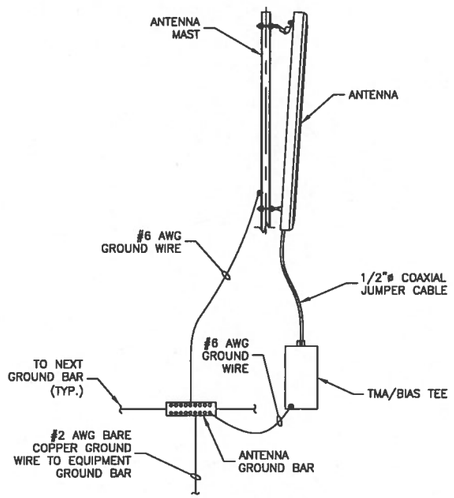
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 2

SCALE: N.T.S.



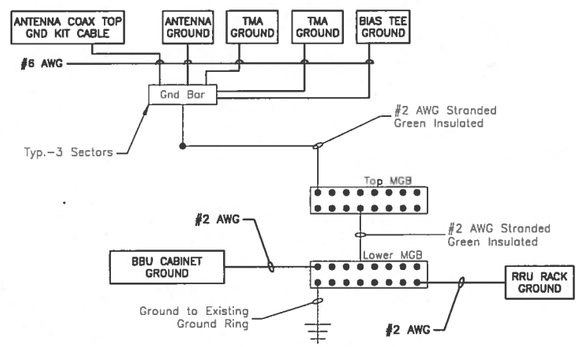
CONNECTION TO EQUIPMENT DETAIL 3

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

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

CROWN CASTLE

CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

CT11236A
CT CHESTER CAC

CONSTRUCTION DRAWINGS		
0	04/22/15	ISSUED AS FINAL
A	04/17/15	ISSUED FOR REVIEW

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

STATE OF CONNECTICUT
JIANG YU
NO. 23222
LICENSED PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071475
SITE ADDRESS:	

WIG HILL ROAD
CHESTER, CT 06412
MIDDLESEX COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

Date: **March 27, 2015**

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

JACOBS
Jacobs Engineering Group. Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
(770) 701-2500

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11236A
	Carrier Site Name:	Chester/Rt9
Crown Castle Designation:	**Crown Castle BU Number:**	800515
	Crown Castle Site Name:	CT CHESTER CAC 800515
	Crown Castle JDE Job Number:	325624
	Crown Castle Work Order Number:	1032989
	Crown Castle Application Number:	282591 Rev. 3
Engineering Firm Designation:	**Jacobs Engineering Group, Inc. Project Number:**	1032989
Site Data:	**Wig Hill Road, Chester, Middlesex County, CT**	
	Latitude *41° 24' 13.93"*, Longitude *-72° 28' 20.82"*	
	150 Foot - Monopole Tower	

Dear Brittany Richardson,

Jacobs Engineering Group, Inc. 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 Brittany Richardson, in accordance with application 282591, revision 3.

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

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

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

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

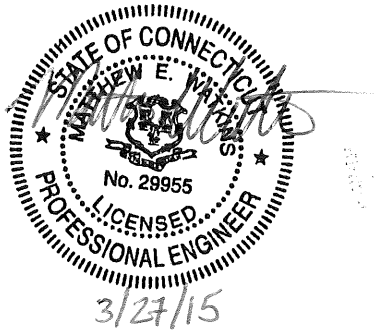
We at *Jacobs Engineering Group, Inc.* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by:

Wensen Jiang
Structural Engineer

Reviewed By:

Matthew Watkins, PE
Engineering Project Manager



3/27/15

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in August of 1998. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 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
106.0	108.0	6	andrew	ETM19V2S12UB	6	1-5/8	-
		3	commscope	ATBT-BOTTOM-24V			
		3	commscope	LNX-6515DS-VTM w/ Mount Pipe			
		3	rfs celwave	APX18-206516L w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	152.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1-5/8	1
	150.0	1	tower mounts	Platform Mount [LP 713-1]			
148.0	163.0	1	rfs celwave	PD1142-1	4	7/8	1
	162.0	1	decibel	DB636-A			
	159.0	1	decibel	DB636-A			
		1	rfs celwave	PD1142-1			
	148.0	1	tower mounts	Side Arm Mount [SO 702-4]			
139.0	142.0	3	alcatel lucent	RRH2X40-AWS	1	1-5/8	2
		3	andrew	HBX-6517DS-VTM w/ Mount Pipe			
		3	andrew	LNX-6514DS-VTM w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	antel	BXA-171085-8BF-EDIN-2 w/ Mount Pipe	3 12	13/64 1-5/8	1
		3	antel	BXA-70063-6CF-2 w/ Mount Pipe			
	139.0	6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 713-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
134.0	134.0	6	ericsson	TME-RRUS-11	-	-	1
		1	tower mounts	Side Arm Mount [SO 102-3]			
132.0	142.0	1	decibel	DB810KE-YP	2 1 1 12	7/16 3/8 7/8 1-1/4	1
	132.0	1	andrew	DBXNH-6565B-R2M w/ Mount Pipe			
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		8	powerwave technologies	LGP21901			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 713-1]			
116.0	120.0	2	gps	GPS_A	2 12	1/2 1-1/4	4
	118.0	12	allgon	7120.16 w/ Mount Pipe			
	116.0	1	tower mounts	Platform Mount [LP 713-1]			
106.0	108.0	6	dapa	59212 w/ Mount Pipe	-	-	3
	106.0	1	tower mounts	Platform Mount [LP 713-1]	6	1-5/8	1
96.0	96.0	3	rfs celwave	APXV18-206517LS w/ Mount Pipe	6	1-1/4	1
		1	tower mounts	Side Arm Mount [SO 104-3]			
75.0	75.0	1	gps	GPS_RESERVED	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 701-1]			
70.0	70.0	1	kathrein	PR-950	1	WEP65	1
		1	tower mounts	T-Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Existing to be removed; Not considered in this analysis
4) Abandoned Equipment; Considered in this analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
152.0	152.0	12	SWEDCOM	ALP 9212	-	-
142.0	142.0	12	SWEDCOM	ALP 9212		
132.0	132.0	12	SWEDCOM	ALP 9212		
118.0	112.0	12	SWEDCOM	ALP 9212		
108.0	102.0	12	SWEDCOM	ALP 9212		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	Engineered Endeavors Incorporated	671925	CCISite
Geotechnical Reports	Dr. Clarence Welti	2301672	CCISite
Foundation Drawings	Tower Engineering Professionals	671930	CCISite
Modification Drawings	GPD Associates	1037702	CCISite
PMI	GPD	1285403	CCISite

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 122.92	Pole	TP28.83x21x0.1875	1	-7.73	848.86	52.7	Pass
L2	122.92 - 84.26	Pole	TP39.51x27.2493x0.375	2	-18.59	2324.15	66.6	Pass
L3	84.26 - 41.55	Pole	TP50.99x37.1855x0.4375	3	-30.65	3506.36	73.1	Pass
L4	41.55 - 0	Pole	TP62x48.1335x0.5	4	-45.30	4815.88	68.5	Pass
							Summary	
						Pole (L3)	73.1	Pass
						Rating =	73.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	61.4	Pass
1	Base Plate	0	82.4	Pass
1	Base Foundation Structure	0	86.9	Pass
1	Base Foundation Soil	0	79.8	Pass

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

Structure Rating (max from all components) =	86.9%

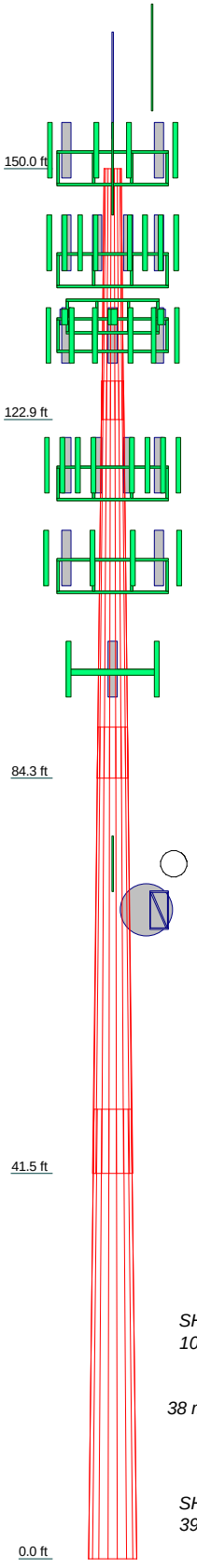
4.1) Recommendations

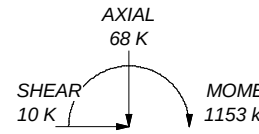
The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

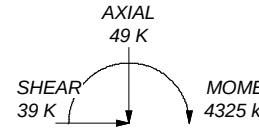
TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	27.08	18	0.1875	4.17	21.0000	28.8300		1.4
2	42.83	18	0.3750	5.50	27.2493	39.5100		5.7
3	48.21	18	0.4375	6.92	37.1855	50.9900		9.9
4	48.47	18	0.5000		48.1335	62.0000		14.3
							A607-65	31.3





TORQUE 2 kip-ft
38 mph WIND - 0.7500 in ICE



TORQUE 6 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 3/8"x6'	150	DBXNH-6565B-R2M w/ Mount Pipe	132
Platform Mount [LP 713-1]	150	(2) 7770.00 w/ Mount Pipe	132
9' Ladder	150	(2) 7770.00 w/ Mount Pipe	132
(2) DB980H90E-M w/ Mount Pipe	150	(2) 7770.00 w/ Mount Pipe	132
(2) DB980H90E-M w/ Mount Pipe	150	(2) LGP21401	132
(2) DB980H90E-M w/ Mount Pipe	150	(2) LGP21401	132
(2) 6' x 2" mount pipe	150	(2) LGP21401	132
(2) 6' x 2" mount pipe	150	(4) LGP21901	132
(2) 6' x 2" mount pipe	150	(2) LGP21901	132
Side Arm Mount [SO 702-4]	148	(2) LGP21901	132
PD1142-1	148	AM-X-CD-16-65-00T-RET w/ Mount Pipe	132
PD1142-1	148	AM-X-CD-16-65-00T-RET w/ Mount Pipe	132
DB636-A	148	DB810KE-YP	132
DB636-A	148	DC6-48-60-18-8F	132
8' x 2.25" Mount Pipe	148	(2) 6' x 2" mount pipe	132
8' x 2.25" Mount Pipe	148	6' x 2" mount pipe	132
8' x 2.25" Mount Pipe	148	6' x 2" mount pipe	132
8' x 2.25" Mount Pipe	148	Platform Mount [LP 713-1]	116
Platform Mount [LP 713-1]	139	9' Ladder	116
9' Ladder	139	(4) 7120.16 w/ Mount Pipe	116
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	139	(4) 7120.16 w/ Mount Pipe	116
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	139	(4) 7120.16 w/ Mount Pipe	116
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	139	(2) GPS_A	116
BXA-70063-6CF-2 w/ Mount Pipe	139	Platform Mount [LP 713-1]	106
BXA-70063-6CF-2 w/ Mount Pipe	139	9' Ladder	106
BXA-70063-6CF-2 w/ Mount Pipe	139	LNX-6515DS-VTM w/ Mount Pipe	106
HBX-6517DS-VTM w/ Mount Pipe	139	LNX-6515DS-VTM w/ Mount Pipe	106
HBX-6517DS-VTM w/ Mount Pipe	139	LNX-6515DS-VTM w/ Mount Pipe	106
HBX-6517DS-VTM w/ Mount Pipe	139	APX18-206516L w/ Mount Pipe	106
LNX-6514DS-VTM w/ Mount Pipe	139	APX18-206516L w/ Mount Pipe	106
LNX-6514DS-VTM w/ Mount Pipe	139	APX18-206516L w/ Mount Pipe	106
LNX-6514DS-VTM w/ Mount Pipe	139	ATBT-BOTTOM-24V	106
(2) FD9R6004/2C-3L	139	ATBT-BOTTOM-24V	106
(2) FD9R6004/2C-3L	139	ATBT-BOTTOM-24V	106
(2) FD9R6004/2C-3L	139	(2) ETM19V2S12UB	106
RRH2X40-AWS	139	(2) ETM19V2S12UB	106
RRH2X40-AWS	139	(2) ETM19V2S12UB	106
RRH2X40-AWS	139	6' x 2" mount pipe	106
DB-T1-6Z-8AB-0Z	139	6' x 2" mount pipe	106
Side Arm Mount [SO 102-3]	134	6' x 2" mount pipe	106
(2) TME-RRUS-11	134	Side Arm Mount [SO 104-3]	96
(2) TME-RRUS-11	134	APXV18-206517LS w/ Mount Pipe	96
(2) TME-RRUS-11	134	APXV18-206517LS w/ Mount Pipe	96
6' x 2" mount pipe	134	APXV18-206517LS w/ Mount Pipe	96
6' x 2" mount pipe	134	GPS_RESERVED	75
6' x 2" mount pipe	134	Side Arm Mount [SO 701-1]	75
Platform Mount [LP 713-1]	132	Side Arm Mount [SO 701-1]	70
9' Ladder	132	PR-950	70

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 73.1%

Jacobs Engineering Group, Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
Phone: (770) 701-2500
FAX: (770) 701-2501

Job: **CT Chester CAC**			
Project: **BU 800515 WO 1032989**			
Client: CCI	Drawn by: Wensen Jiang	App'd:	
Code: TIA/EIA-222-F	Date: 03/27/15	Scale: NTS	
Path: N:\Design\EQ152000 - CrownCastle\Structural\WO\800515 CT Chester CAC\Analysis\20140319_APP219488_800515.eri		Dwg No. E-1	

Tower Input Data

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

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

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-122.92	27.08	4.17	18	21.0000	28.8300	0.1875	0.7500	A607-65 (65 ksi)
L2	122.92-84.26	42.83	5.50	18	27.2493	39.5100	0.3750	1.5000	A607-65 (65 ksi)
L3	84.26-41.55	48.21	6.92	18	37.1855	50.9900	0.4375	1.7500	A607-65 (65 ksi)
L4	41.55-0.00	48.47		18	48.1335	62.0000	0.5000	2.0000	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t

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	12.3860	677.8263	7.3884	10.6680	63.5383	1356.5444	6.1942	3.3660	17.952
	29.2747	17.0459	1766.7635	10.1681	14.6456	120.6341	3535.8517	8.5246	4.7441	25.302
L2	28.8818	31.9871	2918.6754	9.5404	13.8426	210.8469	5841.1912	15.9966	4.1359	11.029
	40.1195	46.5804	9013.0474	13.8929	20.0711	449.0564	18037.9544	23.2946	6.2938	16.783
L3	39.3584	51.0293	8706.1285	13.0456	18.8903	460.8793	17423.7127	25.5195	5.7747	13.199
	51.7766	70.1985	22664.7192	17.9461	25.9029	874.9870	45359.2613	35.1059	8.2042	18.753
L4	50.8863	75.5944	21669.6840	16.9099	24.4518	886.2193	43367.8816	37.8044	7.5915	15.183
	62.9564	97.6005	46637.9792	21.8325	31.4960	1480.7588	93337.3258	48.8095	10.0320	20.064

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150.00-122.92				1	1	1		
L2 122.92-84.26				1	1	1		
L3 84.26-41.55				1	1	1		
L4 41.55-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LCF78-50A(7/8")	A	Surface Ar (CaAa)	132.00 - 8.00	1	1	0.000 0.000	1.0900		0.34

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	150.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
HJ5-50(7/8")	C	No	Inside Pole	148.00 - 8.00	4	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
						1" Ice	0.00	0.54
						2" Ice	0.00	0.54
						4" Ice	0.00	0.54
HJ7-50A(1-5/8")	A	No	Inside Pole	139.00 - 8.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
						2" Ice	0.00	1.04
						4" Ice	0.00	1.04
CATEGORY 5e(13/64")	A	No	Inside Pole	139.00 - 8.00	3	No Ice	0.00	0.02
						1/2" Ice	0.00	0.02
						1" Ice	0.00	0.02
						2" Ice	0.00	0.02
						4" Ice	0.00	0.02
HB158-1-08U8-S8J18(1-5/8)	A	No	Inside Pole	139.00 - 8.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
LCF114-50J(1-1/4")	A	No	Inside Pole	132.00 - 8.00	12	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
						2" Ice	0.00	0.70
						4" Ice	0.00	0.70
FB-L98B-002-75000(3/8")	A	No	Inside Pole	132.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG122ST-BRDA(7/16)	A	No	Inside Pole	132.00 - 8.00	2	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
						2" Ice	0.00	0.14
						4" Ice	0.00	0.14
2" Flex Conduit	A	No	Inside Pole	132.00 - 8.00	1	No Ice	0.00	0.32
						1/2" Ice	0.00	0.32
						1" Ice	0.00	0.32
						2" Ice	0.00	0.32
						4" Ice	0.00	0.32
LDF4-50A(1/2")	B	No	Inside Pole	116.00 - 8.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
CR 1480 PE(1-1/4")	B	No	Inside Pole	116.00 - 8.00	12	No Ice	0.00	0.55
						1/2" Ice	0.00	0.55
						1" Ice	0.00	0.55
						2" Ice	0.00	0.55
						4" Ice	0.00	0.55
LDF7-50A(1-5/8")	B	No	Inside Pole	106.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF6-50A(1-1/4")	B	No	Inside Pole	96.00 - 8.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
FLC 12-50J(1/2")	B	No	CaAa (Out Of Face)	75.00 - 8.00	1	No Ice	0.06	0.17
						1/2" Ice	0.16	0.87
						1" Ice	0.26	2.17
						2" Ice	0.46	6.62
						4" Ice	0.86	22.85
WEP65(ELLIPTICAL)	A	No	CaAa (Out Of Face)	70.00 - 8.00	1	No Ice	0.20	0.53
						1/2" Ice	0.30	2.08
						1" Ice	0.40	4.23
						2" Ice	0.60	10.38
						4" Ice	1.00	30.00
Safety Line 3/8	B	No	CaAa (Out Of Face)	150.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
AVA7-50(1-5/8)	B	No	Inside Pole	106.00 - 0.00	6	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
						2" Ice	0.00	0.70
						4" Ice	0.00	0.70

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-122.92	A	0.000	0.000	0.990	0.000	0.31
		B	0.000	0.000	0.000	1.016	0.01
		C	0.000	0.000	0.000	0.000	0.19
L2	122.92-84.26	A	0.000	0.000	4.214	0.000	0.90
		B	0.000	0.000	0.000	1.450	0.47
		C	0.000	0.000	0.000	0.000	0.27
L3	84.26-41.55	A	0.000	0.000	4.655	5.775	1.01
		B	0.000	0.000	0.000	3.742	0.87
		C	0.000	0.000	0.000	0.000	0.30
L4	41.55-0.00	A	0.000	0.000	3.657	6.811	0.80
		B	0.000	0.000	0.000	3.405	0.72
		C	0.000	0.000	0.000	0.000	0.24

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-122.92	A	0.889	0.000	0.000	2.604	0.000	0.33
		B		0.000	0.000	0.000	5.829	0.03
		C		0.000	0.000	0.000	0.000	0.19
L2	122.92-84.26	A	0.860	0.000	0.000	11.086	0.000	0.98
		B		0.000	0.000	0.000	8.321	0.51
		C		0.000	0.000	0.000	0.000	0.27
L3	84.26-41.55	A	0.810	0.000	0.000	11.998	10.666	1.18
		B		0.000	0.000	0.000	16.835	0.96
		C		0.000	0.000	0.000	0.000	0.30
L4	41.55-0.00	A	0.750	0.000	0.000	9.090	12.243	0.96
		B		0.000	0.000	0.000	14.271	0.80
		C		0.000	0.000	0.000	0.000	0.24

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-122.92	-0.0056	-0.0032	0.1115	0.0644
L2	122.92-84.26	-0.0926	-0.0535	-0.0853	-0.0492
L3	84.26-41.55	-0.0269	-0.2103	0.1131	-0.2394
L4	41.55-0.00	-0.0093	-0.2301	0.1263	-0.2842

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
Lightning Rod 3/8"x6'	C	None		0.0000	150.00	No Ice	0.23	0.23	0.03
						1/2" Ice	0.84	0.84	0.03
						1" Ice	1.46	1.46	0.04
						2" Ice	2.38	2.38	0.06
						4" Ice	3.99	3.99	0.17
150									
Platform Mount [LP 713-1]	C	None		0.0000	150.00	No Ice	31.27	31.27	1.51

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	39.68	39.68	1.93
						1" Ice	48.09	48.09	2.35
						2" Ice	64.91	64.91	3.19
						4" Ice	98.55	98.55	4.86
9' Ladder	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	2.25 2.75 3.25 4.25 6.25	0.08 0.12 0.17 0.26 0.44
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.07 0.11 0.22 0.55
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.07 0.11 0.22 0.55
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.07 0.11 0.22 0.55
(2) 6' x 2" mount pipe	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" mount pipe	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" mount pipe	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
148 Side Arm Mount [SO 702-4]	C	None		0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.86 6.60 8.34 11.82 18.78	4.86 6.60 8.34 11.82 18.78	0.11 0.15 0.20 0.28 0.46
PD1142-1	B	From Leg	4.00 0.00 15.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.32 3.21 5.12 8.99 16.94	1.32 3.21 5.12 8.99 16.94	0.01 0.02 0.05 0.14 0.46
PD1142-1	C	From Leg	4.00 0.00 11.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.32 3.21 5.12 8.99 16.94	1.32 3.21 5.12 8.99 16.94	0.01 0.02 0.05 0.14 0.46

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			
DB636-A	B	From Leg	4.00 0.00 14.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.78 3.96 5.16 7.24 10.16	2.78 3.96 5.16 7.24 10.16	0.03 0.05 0.08 0.16 0.41
DB636-A	A	From Leg	4.00 0.00 11.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.78 3.96 5.16 7.24 10.16	2.78 3.96 5.16 7.24 10.16	0.03 0.05 0.08 0.16 0.41
8' x 2.25" Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.92 4.84 6.18 8.60	3.00 3.92 4.84 6.18 8.60	0.05 0.06 0.09 0.16 0.38
8' x 2.25" Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.92 4.84 6.18 8.60	3.00 3.92 4.84 6.18 8.60	0.05 0.06 0.09 0.16 0.38
8' x 2.25" Mount Pipe	C	From Leg	4.00 0.00 4.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.92 4.84 6.18 8.60	3.00 3.92 4.84 6.18 8.60	0.05 0.06 0.09 0.16 0.38
8' x 2.25" Mount Pipe	A	From Leg	4.00 0.00 4.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.92 4.84 6.18 8.60	3.00 3.92 4.84 6.18 8.60	0.05 0.06 0.09 0.16 0.38
139 Platform Mount [LP 713-1]	C	None		0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	31.27 39.68 48.09 64.91 98.55	31.27 39.68 48.09 64.91 98.55	1.51 1.93 2.35 3.19 4.86
9' Ladder	A	From Leg	4.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	2.25 2.75 3.25 4.25 6.25	0.08 0.12 0.17 0.26 0.44
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0.03 0.06 0.10 0.19 0.49
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0.03 0.06 0.10 0.19 0.49
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice	3.18 3.56 3.96	3.35 3.97 4.60	0.03 0.06 0.10

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	4.85	5.89	0.19
						2" Ice	6.77	8.89	0.49
						4" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
HBX-6517DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.54 6.11 6.65 7.75 10.11	5.02 6.22 7.17 9.01 12.90	0.05 0.09 0.15 0.28 0.69
HBX-6517DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.54 6.11 6.65 7.75 10.11	5.02 6.22 7.17 9.01 12.90	0.05 0.09 0.15 0.28 0.69
HBX-6517DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.54 6.11 6.65 7.75 10.11	5.02 6.22 7.17 9.01 12.90	0.05 0.09 0.15 0.28 0.69
LNX-6514DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.57 9.22 9.84 11.10 13.75	7.00 8.19 9.08 10.90 14.93	0.06 0.13 0.20 0.38 0.89
LNX-6514DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.57 9.22 9.84 11.10 13.75	7.00 8.19 9.08 10.90 14.93	0.06 0.13 0.20 0.38 0.89
LNX-6514DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.57 9.22 9.84 11.10 13.75	7.00 8.19 9.08 10.90 14.93	0.06 0.13 0.20 0.38 0.89
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	B	From Leg	4.00 0.00	0.0000	139.00	No Ice 1/2"	0.37 0.45	0.08 0.14	0.00 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	139.00	No Ice	0.37	0.08	0.00
			0.00			1/2"	0.45	0.14	0.01
			0.00			Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
RRH2X40-AWS	A	From Leg	4.00	0.0000	139.00	No Ice	2.52	1.59	0.04
			0.00			1/2"	2.75	1.80	0.06
			3.00			Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
RRH2X40-AWS	B	From Leg	4.00	0.0000	139.00	No Ice	2.52	1.59	0.04
			0.00			1/2"	2.75	1.80	0.06
			3.00			Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
RRH2X40-AWS	C	From Leg	4.00	0.0000	139.00	No Ice	2.52	1.59	0.04
			0.00			1/2"	2.75	1.80	0.06
			3.00			Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.0000	139.00	No Ice	5.60	2.33	0.04
			0.00			1/2"	5.92	2.56	0.08
			3.00			Ice	6.24	2.79	0.12
						1" Ice	6.91	3.28	0.21
						2" Ice	8.37	4.37	0.45
						4" Ice			
134									
Side Arm Mount [SO 102-3]	C	None		0.0000	134.00	No Ice	3.00	3.00	0.08
						1/2"	3.48	3.48	0.11
						Ice	3.96	3.96	0.14
						1" Ice	4.92	4.92	0.20
						2" Ice	6.84	6.84	0.32
						4" Ice			
(2) TME-RRUS-11	A	From Leg	2.00	0.0000	134.00	No Ice	3.31	1.72	0.05
			0.00			1/2"	3.58	2.03	0.08
			0.00			Ice	3.85	2.37	0.11
						1" Ice	4.45	3.13	0.19
						2" Ice	5.76	4.89	0.40
						4" Ice			
(2) TME-RRUS-11	B	From Leg	2.00	0.0000	134.00	No Ice	3.31	1.72	0.05
			0.00			1/2"	3.58	2.03	0.08
			0.00			Ice	3.85	2.37	0.11
						1" Ice	4.45	3.13	0.19
						2" Ice	5.76	4.89	0.40
						4" Ice			
(2) TME-RRUS-11	C	From Leg	2.00	0.0000	134.00	No Ice	3.31	1.72	0.05
			0.00			1/2"	3.58	2.03	0.08
			0.00			Ice	3.85	2.37	0.11
						1" Ice	4.45	3.13	0.19
						2" Ice	5.76	4.89	0.40
						4" Ice			
6' x 2" mount pipe	A	From Leg	2.00	0.0000	134.00	No Ice	1.44	1.44	0.02
			0.00			1/2"	1.93	1.93	0.03
			0.00			Ice	2.30	2.30	0.05
						1" Ice	3.07	3.07	0.09
						2" Ice	4.71	4.71	0.23
						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
6' x 2'' mount pipe	B	From Leg	2.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
6' x 2'' mount pipe	C	From Leg	2.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
132 Platform Mount [LP 713-1]	C	None		0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	31.27 39.68 48.09 64.91 98.55	31.27 39.68 48.09 64.91 98.55	1.51 1.93 2.35 3.19 4.86
9' Ladder	A	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	2.25 2.75 3.25 4.25 6.25	0.08 0.12 0.17 0.26 0.44
DBXNH-6565B-R2M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.73 9.39 10.02 11.30 13.99	7.16 8.36 9.29 11.14 15.20	0.08 0.15 0.23 0.41 0.92
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice	1.29 1.45 1.61 1.97	0.23 0.31 0.40 0.61	0.01 0.02 0.03 0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.79	1.12	0.14
						4" Ice			
(4) LGP21901	A	From Leg	4.00	0.0000	132.00	No Ice	0.27	0.18	0.01
			0.00			1/2"	0.34	0.25	0.01
			0.00			Ice	0.43	0.32	0.01
						1" Ice	0.62	0.49	0.02
						2" Ice	1.10	0.94	0.07
						4" Ice			
(2) LGP21901	B	From Leg	4.00	0.0000	132.00	No Ice	0.27	0.18	0.01
			0.00			1/2"	0.34	0.25	0.01
			0.00			Ice	0.43	0.32	0.01
						1" Ice	0.62	0.49	0.02
						2" Ice	1.10	0.94	0.07
						4" Ice			
(2) LGP21901	C	From Leg	4.00	0.0000	132.00	No Ice	0.27	0.18	0.01
			0.00			1/2"	0.34	0.25	0.01
			0.00			Ice	0.43	0.32	0.01
						1" Ice	0.62	0.49	0.02
						2" Ice	1.10	0.94	0.07
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	0.0000	132.00	No Ice	8.50	6.30	0.07
			0.00			1/2"	9.15	7.48	0.14
			0.00			Ice	9.77	8.37	0.21
						1" Ice	11.03	10.18	0.38
						2" Ice	13.68	14.02	0.87
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00	0.0000	132.00	No Ice	8.50	6.30	0.07
			0.00			1/2"	9.15	7.48	0.14
			0.00			Ice	9.77	8.37	0.21
						1" Ice	11.03	10.18	0.38
						2" Ice	13.68	14.02	0.87
						4" Ice			
DB810KE-YP	A	From Leg	4.00	0.0000	132.00	No Ice	4.37	4.37	0.04
			0.00			1/2"	5.86	5.86	0.07
			10.00			Ice	7.37	7.37	0.11
						1" Ice	10.43	10.43	0.22
						2" Ice	14.16	14.16	0.56
						4" Ice			
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	132.00	No Ice	1.47	1.47	0.03
			0.00			1/2"	1.67	1.67	0.05
			0.00			Ice	1.88	1.88	0.07
						1" Ice	2.33	2.33	0.12
						2" Ice	3.38	3.38	0.25
						4" Ice			
(2) 6' x 2" mount pipe	A	From Leg	4.00	0.0000	132.00	No Ice	1.44	1.44	0.02
			0.00			1/2"	1.93	1.93	0.03
			0.00			Ice	2.30	2.30	0.05
						1" Ice	3.07	3.07	0.09
						2" Ice	4.71	4.71	0.23
						4" Ice			
6' x 2" mount pipe	B	From Leg	4.00	0.0000	132.00	No Ice	1.44	1.44	0.02
			0.00			1/2"	1.93	1.93	0.03
			0.00			Ice	2.30	2.30	0.05
						1" Ice	3.07	3.07	0.09
						2" Ice	4.71	4.71	0.23
						4" Ice			
6' x 2" mount pipe	C	From Leg	4.00	0.0000	132.00	No Ice	1.44	1.44	0.02
			0.00			1/2"	1.93	1.93	0.03
			0.00			Ice	2.30	2.30	0.05
						1" Ice	3.07	3.07	0.09
						2" Ice	4.71	4.71	0.23
						4" Ice			
116									
Platform Mount [LP 713-1]	C	None		0.0000	116.00	No Ice	31.27	31.27	1.51
						1/2"	39.68	39.68	1.93

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							Ice	48.09	48.09	2.35
							1" Ice	64.91	64.91	3.19
							2" Ice	98.55	98.55	4.86
							4" Ice			
9' Ladder	B	From Leg	4.00	0.00	0.0000	116.00	No Ice	4.50	2.25	0.08
							1/2"	5.50	2.75	0.12
							Ice	6.50	3.25	0.17
							1" Ice	8.50	4.25	0.26
							2" Ice	12.50	6.25	0.44
							4" Ice			
(4) 7120.16 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	116.00	No Ice	3.52	6.22	0.03
							1/2"	3.92	6.99	0.08
							Ice	4.33	7.74	0.13
							1" Ice	5.26	9.28	0.26
							2" Ice	7.26	12.59	0.62
							4" Ice			
(4) 7120.16 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	116.00	No Ice	3.52	6.22	0.03
							1/2"	3.92	6.99	0.08
							Ice	4.33	7.74	0.13
							1" Ice	5.26	9.28	0.26
							2" Ice	7.26	12.59	0.62
							4" Ice			
(4) 7120.16 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	116.00	No Ice	3.52	6.22	0.03
							1/2"	3.92	6.99	0.08
							Ice	4.33	7.74	0.13
							1" Ice	5.26	9.28	0.26
							2" Ice	7.26	12.59	0.62
							4" Ice			
(2) GPS_A	A	From Leg	4.00	0.00	0.0000	116.00	No Ice	0.30	0.30	0.00
							1/2"	0.37	0.37	0.00
							Ice	0.46	0.46	0.01
							1" Ice	0.65	0.65	0.02
							2" Ice	1.15	1.15	0.08
							4" Ice			
106										
Platform Mount [LP 713-1]	C	None			0.0000	106.00	No Ice	31.27	31.27	1.51
							1/2"	39.68	39.68	1.93
							Ice	48.09	48.09	2.35
							1" Ice	64.91	64.91	3.19
							2" Ice	98.55	98.55	4.86
							4" Ice			
9' Ladder	A	From Leg	4.00	0.00	0.0000	106.00	No Ice	4.50	2.25	0.08
							1/2"	5.50	2.75	0.12
							Ice	6.50	3.25	0.17
							1" Ice	8.50	4.25	0.26
							2" Ice	12.50	6.25	0.44
							4" Ice			
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	106.00	No Ice	11.68	9.84	0.08
							1/2"	12.40	11.37	0.17
							Ice	13.14	12.91	0.27
							1" Ice	14.60	15.27	0.51
							2" Ice	17.87	20.14	1.15
							4" Ice			
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	106.00	No Ice	11.68	9.84	0.08
							1/2"	12.40	11.37	0.17
							Ice	13.14	12.91	0.27
							1" Ice	14.60	15.27	0.51
							2" Ice	17.87	20.14	1.15
							4" Ice			
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	106.00	No Ice	11.68	9.84	0.08
							1/2"	12.40	11.37	0.17
							Ice	13.14	12.91	0.27
							1" Ice	14.60	15.27	0.51
							2" Ice	17.87	20.14	1.15
							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
APX18-206516L w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.74 4.16 4.59 5.54 7.57	3.29 4.00 4.66 6.04 9.02	0.04 0.07 0.11 0.21 0.52
APX18-206516L w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.74 4.16 4.59 5.54 7.57	3.29 4.00 4.66 6.04 9.02	0.04 0.07 0.11 0.21 0.52
APX18-206516L w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.74 4.16 4.59 5.54 7.57	3.29 4.00 4.66 6.04 9.02	0.04 0.07 0.11 0.21 0.52
ATBT-BOTTOM-24V	A	From Leg	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.77	0.08 0.12 0.17 0.30 0.67	0.00 0.00 0.01 0.01 0.04
ATBT-BOTTOM-24V	B	From Leg	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.77	0.08 0.12 0.17 0.30 0.67	0.00 0.00 0.01 0.01 0.04
ATBT-BOTTOM-24V	C	From Leg	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.77	0.08 0.12 0.17 0.30 0.67	0.00 0.00 0.01 0.01 0.04
(2) ETM19V2S12UB	A	From Leg	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.84 0.96 1.09 1.39 2.08	0.22 0.31 0.40 0.61 1.14	0.01 0.02 0.02 0.04 0.10
(2) ETM19V2S12UB	B	From Leg	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.84 0.96 1.09 1.39 2.08	0.22 0.31 0.40 0.61 1.14	0.01 0.02 0.02 0.04 0.10
(2) ETM19V2S12UB	C	From Leg	4.00 0.00 2.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.84 0.96 1.09 1.39 2.08	0.22 0.31 0.40 0.61 1.14	0.01 0.02 0.02 0.04 0.10
6' x 2" mount pipe	A	From Leg	4.00 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
6' x 2" mount pipe	B	From Leg	4.00 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	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*
						4" Ice			
6' x 2" mount pipe	C	From Leg	4.00 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.44 1.93 2.30 3.07 4.71	1.44 1.93 2.30 3.07 4.71	0.02 0.03 0.05 0.09 0.23
96									
Side Arm Mount [SO 104-3]	C	None		0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 4.13 4.96 6.62 9.94	3.30 4.13 4.96 6.62 9.94	0.29 0.32 0.46 0.63 0.98
APXV18-206517LS w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.84 6.36 7.42 9.77	4.67 5.82 6.69 8.46 12.21	0.05 0.10 0.15 0.28 0.67
APXV18-206517LS w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.84 6.36 7.42 9.77	4.67 5.82 6.69 8.46 12.21	0.05 0.10 0.15 0.28 0.67
APXV18-206517LS w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.29 5.84 6.36 7.42 9.77	4.67 5.82 6.69 8.46 12.21	0.05 0.10 0.15 0.28 0.67
75									
GPS_RESERVED	C	From Face	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00
Side Arm Mount [SO 701-1]	C	From Face	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
70									
Side Arm Mount [SO 701-1]	B	From Face	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
PR-950	B	Grid	From Face	2.90 -0.78 0.00	-15.0000		70.00	5.67	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	25.22 25.97 26.71 28.21 31.20	0.04 0.17 0.30 0.57 1.10

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 122.92	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.20	-0.98	3.48
			Max. Mx	5	-7.79	-239.91	1.41
			Max. My	2	-7.73	-0.41	247.61
			Max. Vy	5	17.75	-239.91	1.41
			Max. Vx	2	-18.21	-0.41	247.61
			Max. Torque	12			-3.68

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	122.92 - 84.26	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.76	-1.70	4.17
			Max. Mx	5	-18.64	-1152.02	0.62
			Max. My	2	-18.59	0.33	1177.30
			Max. Vy	5	29.90	-1152.02	0.62
			Max. Vx	2	-30.42	0.33	1177.30
			Max. Torque	12			-4.25
L3	84.26 - 41.55	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-46.76	-3.09	4.88
			Max. Mx	5	-30.67	-2480.97	0.35
			Max. My	2	-30.65	0.14	2526.53
			Max. Vy	11	-34.41	2478.69	3.49
			Max. Vx	8	34.91	-3.00	-2523.26
			Max. Torque	6			5.78
L4	41.55 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-67.92	-3.12	5.15
			Max. Mx	5	-49.46	-4255.83	1.75
			Max. My	2	-49.46	-1.21	4325.25
			Max. Vy	11	-38.84	4254.31	2.74
			Max. Vx	8	39.32	-2.21	-4322.66
			Max. Torque	6			5.86

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	67.92	0.01	10.08
	Max. H_x	11	49.48	38.81	-0.02
	Max. H_z	2	49.48	-0.03	39.28
	Max. M_x	2	4325.25	-0.03	39.28
	Max. M_z	5	4255.83	-38.79	0.03
	Max. Torsion	6	5.86	-33.55	-19.56
	Min. Vert	1	49.48	0.00	0.00
	Min. H_x	5	49.48	-38.79	0.03
	Min. H_z	8	49.48	0.02	-39.30
	Min. M_x	8	-4322.66	0.02	-39.30
	Min. M_z	11	-4254.31	38.81	-0.02
	Min. Torsion	12	-5.84	33.49	19.60

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	49.48	0.00	0.00	-1.81	-1.30	-0.00
Dead+Wind 0 deg - No Ice	49.48	0.03	-39.28	-4325.25	-1.21	3.79
Dead+Wind 30 deg - No Ice	49.48	19.44	-34.09	-3750.40	-2129.86	0.97
Dead+Wind 60 deg - No Ice	49.48	33.67	-19.68	-2164.94	-3690.15	-2.58
Dead+Wind 90 deg - No Ice	49.48	38.79	-0.03	-1.75	-4255.83	-5.01
Dead+Wind 120 deg - No Ice	49.48	33.55	19.56	2156.25	-3683.75	-5.86
Dead+Wind 150 deg - No Ice	49.48	19.36	33.91	3736.06	-2127.38	-5.34
Dead+Wind 180 deg - No Ice	49.48	-0.02	39.30	4322.66	-2.21	-3.89
Dead+Wind 210 deg - No Ice	49.48	-19.39	34.07	3745.13	2123.75	-1.05
Dead+Wind 240 deg - No Ice	49.48	-33.65	19.64	2157.76	3685.95	2.70
Dead+Wind 270 deg - No Ice	49.48	-38.81	0.02	-2.74	4254.31	5.10
Dead+Wind 300 deg - No Ice	49.48	-33.49	-19.60	-2162.46	3676.88	5.84
Dead+Wind 330 deg - No Ice	49.48	-19.32	-33.97	-3744.00	2122.25	5.43
Dead+Ice+Temp	67.92	0.00	-0.00	-5.15	-3.12	-0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 0 deg+Ice+Temp	67.92	-0.01	-10.08	-1152.90	-2.09	1.35
Dead+Wind 30 deg+Ice+Temp	67.92	4.99	-8.76	-1001.08	-568.63	0.50
Dead+Wind 60 deg+Ice+Temp	67.92	8.66	-5.05	-579.57	-983.65	-0.67
Dead+Wind 90 deg+Ice+Temp	67.92	9.96	0.01	-4.17	-1133.10	-1.50
Dead+Wind 120 deg+Ice+Temp	67.92	8.63	4.98	564.77	-982.42	-1.67
Dead+Wind 150 deg+Ice+Temp	67.92	4.83	8.83	995.92	-558.15	-1.64
Dead+Wind 180 deg+Ice+Temp	67.92	-0.21	10.18	1149.44	11.06	-0.84
Dead+Wind 210 deg+Ice+Temp	67.92	-5.12	8.81	994.27	571.40	-0.20
Dead+Wind 240 deg+Ice+Temp	67.92	-8.71	5.18	578.19	981.00	0.25
Dead+Wind 270 deg+Ice+Temp	67.92	-10.06	0.21	8.99	1133.79	0.78
Dead+Wind 300 deg+Ice+Temp	67.92	-8.72	-4.89	-569.10	982.64	1.53
Dead+Wind 330 deg+Ice+Temp	67.92	-4.92	-8.74	-999.86	557.98	1.66
Dead+Wind 0 deg - Service	49.48	0.01	-13.59	-1498.93	-1.30	1.32
Dead+Wind 30 deg - Service	49.48	6.73	-11.80	-1299.87	-738.38	0.34
Dead+Wind 60 deg - Service	49.48	11.65	-6.81	-750.87	-1278.64	-0.90
Dead+Wind 90 deg - Service	49.48	13.42	-0.01	-1.84	-1474.50	-1.74
Dead+Wind 120 deg - Service	49.48	11.61	6.77	745.40	-1276.42	-2.04
Dead+Wind 150 deg - Service	49.48	6.70	11.73	1292.44	-737.52	-1.86
Dead+Wind 180 deg - Service	49.48	-0.01	13.60	1495.58	-1.64	-1.35
Dead+Wind 210 deg - Service	49.48	-6.71	11.79	1295.59	734.51	-0.36
Dead+Wind 240 deg - Service	49.48	-11.64	6.79	745.92	1275.43	0.94
Dead+Wind 270 deg - Service	49.48	-13.43	0.01	-2.18	1472.22	1.77
Dead+Wind 300 deg - Service	49.48	-11.59	-6.78	-750.01	1272.29	2.03
Dead+Wind 330 deg - Service	49.48	-6.69	-11.76	-1297.66	733.98	1.89

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	-49.48	0.00	0.00	49.48	0.00	0.000%
2	0.03	-49.48	-39.28	-0.03	49.48	39.28	0.000%
3	19.44	-49.48	-34.09	-19.44	49.48	34.09	0.000%
4	33.67	-49.48	-19.68	-33.67	49.48	19.68	0.000%
5	38.79	-49.48	-0.03	-38.79	49.48	0.03	0.000%
6	33.55	-49.48	19.56	-33.55	49.48	-19.56	0.000%
7	19.36	-49.48	33.91	-19.36	49.48	-33.91	0.000%
8	-0.02	-49.48	39.30	0.02	49.48	-39.30	0.000%
9	-19.39	-49.48	34.07	19.39	49.48	-34.07	0.000%
10	-33.65	-49.48	19.64	33.65	49.48	-19.64	0.000%
11	-38.81	-49.48	0.02	38.81	49.48	-0.02	0.000%
12	-33.49	-49.48	-19.60	33.49	49.48	19.60	0.000%
13	-19.32	-49.48	-33.97	19.32	49.48	33.97	0.000%
14	0.00	-67.92	0.00	-0.00	67.92	0.00	0.000%
15	-0.01	-67.92	-10.08	0.01	67.92	10.08	0.000%
16	4.99	-67.92	-8.76	-4.99	67.92	8.76	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
17	8.66	-67.92	-5.05	-8.66	67.92	5.05	0.000%
18	9.96	-67.92	0.01	-9.96	67.92	-0.01	0.000%
19	8.63	-67.92	4.98	-8.63	67.92	-4.98	0.000%
20	4.83	-67.92	8.83	-4.83	67.92	-8.83	0.000%
21	-0.21	-67.92	10.18	0.21	67.92	-10.18	0.000%
22	-5.12	-67.92	8.81	5.12	67.92	-8.81	0.000%
23	-8.71	-67.92	5.18	8.71	67.92	-5.18	0.000%
24	-10.06	-67.92	0.21	10.06	67.92	-0.21	0.000%
25	-8.72	-67.92	-4.89	8.72	67.92	4.89	0.000%
26	-4.92	-67.92	-8.74	4.92	67.92	8.74	0.000%
27	0.01	-49.48	-13.59	-0.01	49.48	13.59	0.000%
28	6.73	-49.48	-11.80	-6.73	49.48	11.80	0.000%
29	11.65	-49.48	-6.81	-11.65	49.48	6.81	0.000%
30	13.42	-49.48	-0.01	-13.42	49.48	0.01	0.000%
31	11.61	-49.48	6.77	-11.61	49.48	-6.77	0.000%
32	6.70	-49.48	11.73	-6.70	49.48	-11.73	0.000%
33	-0.01	-49.48	13.60	0.01	49.48	-13.60	0.000%
34	-6.71	-49.48	11.79	6.71	49.48	-11.79	0.000%
35	-11.64	-49.48	6.79	11.64	49.48	-6.79	0.000%
36	-13.43	-49.48	0.01	13.43	49.48	-0.01	0.000%
37	-11.59	-49.48	-6.78	11.59	49.48	6.78	0.000%
38	-6.69	-49.48	-11.76	6.69	49.48	11.76	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00001332
3	Yes	6	0.00000001	0.00000363
4	Yes	6	0.00000001	0.00000379
5	Yes	5	0.00000001	0.00002088
6	Yes	6	0.00000001	0.00000327
7	Yes	6	0.00000001	0.00000399
8	Yes	5	0.00000001	0.00001382
9	Yes	6	0.00000001	0.00000356
10	Yes	6	0.00000001	0.00000340
11	Yes	5	0.00000001	0.00002137
12	Yes	6	0.00000001	0.00000402
13	Yes	6	0.00000001	0.00000330
14	Yes	4	0.00000001	0.00001142
15	Yes	5	0.00000001	0.00005613
16	Yes	5	0.00000001	0.00006752
17	Yes	5	0.00000001	0.00006741
18	Yes	5	0.00000001	0.00005516
19	Yes	5	0.00000001	0.00006516
20	Yes	5	0.00000001	0.00006744
21	Yes	5	0.00000001	0.00005511
22	Yes	5	0.00000001	0.00006558
23	Yes	5	0.00000001	0.00006502
24	Yes	5	0.00000001	0.00005456
25	Yes	5	0.00000001	0.00006768
26	Yes	5	0.00000001	0.00006614
27	Yes	4	0.00000001	0.00009153
28	Yes	5	0.00000001	0.00001078
29	Yes	5	0.00000001	0.00001179
30	Yes	5	0.00000001	0.00000419
31	Yes	5	0.00000001	0.00000921
32	Yes	5	0.00000001	0.00001307
33	Yes	4	0.00000001	0.00009275
34	Yes	5	0.00000001	0.00001025
35	Yes	5	0.00000001	0.00000944
36	Yes	5	0.00000001	0.00000423
37	Yes	5	0.00000001	0.00001333
38	Yes	5	0.00000001	0.00000924

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 122.92 (1)	TP28.83x21x0.1875	27.08	0.00	0.0	39.000	16.3283	-7.73	636.80	0.012
L2	122.92 - 84.26 (2)	TP39.51x27.2493x0.375	42.83	0.00	0.0	39.000	44.7064	-18.59	1743.55	0.011
L3	84.26 - 41.55 (3)	TP50.99x37.1855x0.4375	48.21	0.00	0.0	39.000	67.4469	-30.65	2630.43	0.012
L4	41.55 - 0 (4)	TP62x48.1335x0.5	48.47	0.00	0.0	39.000	92.6362	-45.30	3612.81	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 122.92 (1)	TP28.83x21x0.1875	247.60	26.850	39.000	0.688	0.00	0.000	39.000	0.000
L2	122.92 - 84.26 (2)	TP39.51x27.2493x0.375	1177.30	34.167	39.000	0.876	0.00	0.000	39.000	0.000
L3	84.26 - 41.55 (3)	TP50.99x37.1855x0.4375	2526.53	37.548	39.000	0.963	0.00	0.000	39.000	0.000
L4	41.55 - 0 (4)	TP62x48.1335x0.5	3901.29	35.110	39.000	0.900	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 122.92 (1)	TP28.83x21x0.1875	18.21	1.116	26.000	0.086	1.49	0.079	26.000	0.003
L2	122.92 - 84.26 (2)	TP39.51x27.2493x0.375	30.42	0.680	26.000	0.053	1.92	0.027	26.000	0.001
L3	84.26 - 41.55 (3)	TP50.99x37.1855x0.4375	34.89	0.517	26.000	0.040	3.80	0.028	26.000	0.001
L4	41.55 - 0 (4)	TP62x48.1335x0.5	38.49	0.416	26.000	0.032	3.79	0.017	26.000	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 122.92 (1)	0.012	0.688	0.000	0.086	0.003	0.703 ✔	1.333	H1-3+VT ✔
L2	122.92 - 84.26 (2)	0.011	0.876	0.000	0.053	0.001	0.887	1.333	H1-3+VT ✔

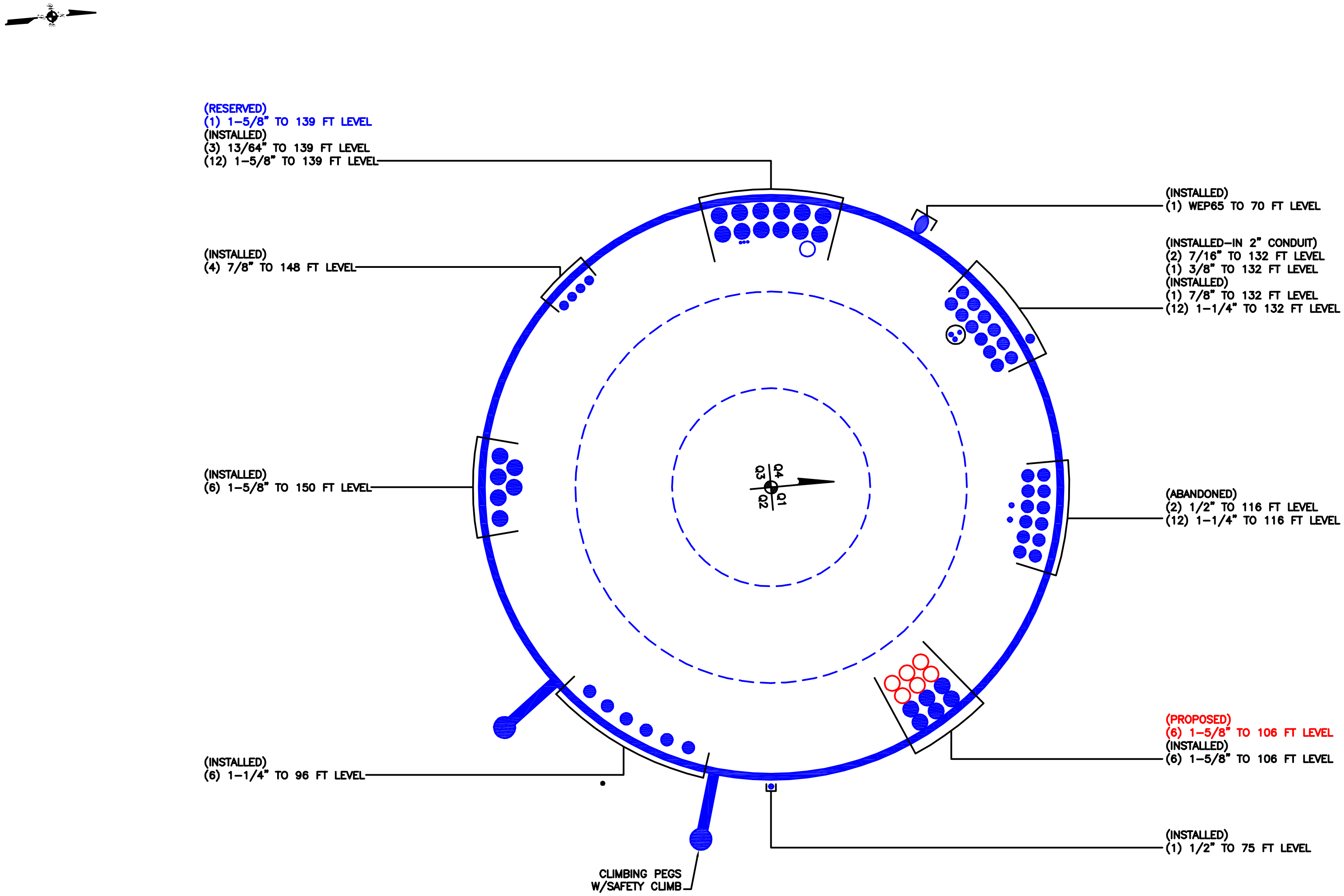
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L3	84.26 - 41.55 (3)	0.012	0.963	0.000	0.040	0.001	0.975 ✔	1.333	H1-3+VT ✔
L4	41.55 - 0 (4)	0.013	0.900	0.000	0.032	0.001	0.913 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
L1	150 - 122.92	Pole	TP28.83x21x0.1875	1	-7.73	848.86	52.7	Pass
L2	122.92 - 84.26	Pole	TP39.51x27.2493x0.375	2	-18.59	2324.15	66.6	Pass
L3	84.26 - 41.55	Pole	TP50.99x37.1855x0.4375	3	-30.65	3506.36	73.1	Pass
L4	41.55 - 0	Pole	TP62x48.1335x0.5	4	-45.30	4815.88	68.5	Pass
							Summary	
						Pole (L3)	73.1	Pass
						RATING =	**73.1**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 800515 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

18/01/12	AS-BUILT INFORMATION ADDED PER WORK ORDER # 456027	MDB
09/03/12	APPLICATION ADDED PER WORK ORDER # 476835	VP
31/05/12	AS-BUILT INFORMATION ADDED PER WORK ORDER # 497933	KAH
21/08/12	APPLICATION ADDED PER WORK ORDER # 520284	AK
13/07/13	UPDATED PER WORK ORDER # 627421	MAJ
12/03/14	AS-BUILT INFORMATION ADDED PER WORK ORDER # 726094	MAG
18/03/14	UPDATED PER WORK ORDER # 730302	JF
7/1/2015	UPDATED PER WORK ORDER 987740	LRW
25/3/2015	UPDATED PER WORK ORDER 1032979	CRM

DRAWN BY: JPD
CHECKED BY:
DRAWING DATE: 31/05/03

SITE NUMBER:
SITE NAME:

SITE NAME

CHESTER

BUSINESS UNIT NUMBER

800515

SITE ADDRESS

WIG HILL ROAD
CHESTER, CT 06412
MIDDLESEX COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING | 1

PLOT DATE: 3/25/2015 FILE NAME:

Xref R:\Standards - JRE\CAD Standards V8.0\Templates\Typical Blocks For Templates\TITLE BLOCK STD-VER 8.1.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *800515*
Site Name: *CT Chester CAC*
App #: *282591*

Pole Manufacturer:	*Other*

Reactions		
Moment:	4325	ft-kips
Axial:	49	kips
Shear:	39	kips

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

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	71	in

Anchor Rod Results

Maximum Rod Tension:	119.8 Kips	
Allowable Tension:	195.0 Kips	
Anchor Rod Stress Ratio:	61.4% **Pass**	

Rigid
Service, ASD
Fty*ASIF

Plate Data		
Diam:	77	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.20	in

Base Plate Results Flexural Check

Base Plate Stress:	49.4 ksi	
Allowable Plate Stress:	60.0 ksi	
Base Plate Stress Ratio:	82.4% **Pass**	

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length: 34.60

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

n/a

Stiffener Results

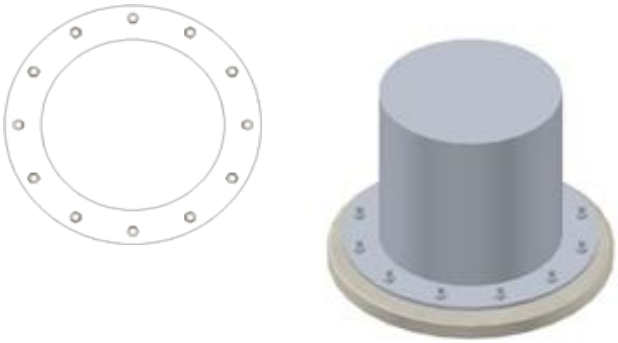
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	62	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	



* 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

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

Site Data

BU#: *800515*
Site Name: *CT Chester CAC*
App #: *282591*

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

Pad & Pier Data		
Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	5.17	ft
Pad Thickness, T:	3	ft
Pad Width=Length, L:	28	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	7.5	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	44.18	ft^2
Pier Height:	2.67	ft
Soil (above pad) Height:	2.17	ft

Soil Parameters		
Unit Weight, γ:	110.0	pcf
Ultimate Bearing Capacity, qn:	40.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	30.00	ksf
Passive Pres. Coeff., Kp	3.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	52.7	kips
Pad Force Location Above D:	1.30	ft
ϕ(Passive Pressure Moment):	68.22	ft-kips
Factored O.T. M(WL), "1.6W":	6137.3	ft-kips
Factored OT (MW-Msoil), M1	6069.06	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	1.25	ft
Sum of Soil Wedges Wt:	10.99	kips
Soil Wedges ecc, K1:	7.63	ft
Ftg+Soil above Pad wt:	547.1	kips
Unfactored (Total ftg-soil Wt):	558.08	kips
1.2D. **No Soil Wedges**.	715.31	kips
0.9D. **With Soil Wedges**	546.37	kips

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

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	49	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	39	kips
Unfactored WL Moment, M:	4325	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	58.8	kips
0.90	0.9D+1.6W, Pu:	44.1	kips
1.35	Vu:	52.65	kips
	Mu:	5838.75	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	715.31	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	6069.06	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	8.48	ft
Orthogonal qu=	2.32	ksf
qu/ϕ*qn Ratio=	**7.72%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	6.00	ft
Diagonal qu=	2.79	ksf
qu/ϕ*qn Ratio=	**9.31%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	546.37	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	5993.54	ft-kips

Orthogonal ecc3 = M2/P2 =	10.97	ft
Ortho Non Bearing Length,NBL=	21.94	ft
Orthogonal qu=	3.22	ksf
Diagonal qu=	3.50	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	4325.00		
M Orthogonal:	5422.74	**79.76%**	**Pass**
M Diagonal:	5422.74	**79.76%**	**Pass**

Project Name:	CT Chester CAC	JACOBS® Jacobs Engineering Group, Inc.	Created On: 6/3/2014
Project Number:	800515		Checked By: DW
Job Number:	1032989		Revised On: 3/4/2015
Date:	3/27/2015		Revision No.: 1.6

Monopole Pad & Pier Foundation

Foundation Parameters

Load		
Code	F	
Axial	49	kips
Shear	39	kips
Moment	4325	k-ft
Soil Unit Weight	110	pcf
Friction Angle	30	
Cohesion	0	psf

Material		
Concrete Strength (F'c)	3000	psi
Concrete Density	150	pcf
Rebar Tensile (Fy)	60	ksi
Clear Cover	3	in

Pad		
Thickness	3	ft
Bearing Depth	5.167	ft
Width	28	ft
Rebar Size	8	
Rebar Quantity	49	

Pier		
Pier type	Circle	
Diameter	7.5	ft
Height above Grade	0.5	ft
Rebar Size	8	
Rebar Quantity	51	
Tie Size	4	
Tie C/C Spacing	12	in

Structural Checks

Pad Beam Shear Capacity	869.6	kips
Pad Beam Shear	344.3	kips
Pad Beam Shear Check	39.6%	Pass

Pad Bending Moment Capacity	5251.0	k-ft
Pad Bending Moment	2633.8	k-ft
Pad Bending Moment Check	50.2%	Pass

Punching Shear Capacity	1975.7	kips
Punching Shear	451.7	kips
Punching Shear Check	22.9%	Pass

Pad-Pier Bearing Capacity	21089.1	kips
Pad-Pier Bearing	715.0	kips
Pad-Pier Bearing Check	3.4%	Pass

Pier Beam Shear Capacity	519.9	kips
Pier Beam Shear	52.7	kips
Pier Beam Shear Check	10.1%	Pass

Pier Bending Moment Capacity	6873.8	k-ft
Pier Bending Moment	5971.1	k-ft
Pier Bending Moment Check	86.9%	Pass

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11236A

Chester/Rt 9
39 Wig Hill Road
Chester, CT 06412

April 15, 2015

EBI Project Number: 6215002587

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	83.29 %

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April 15, 2015

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

Emissions Analysis for Site: **CT11236A – Chester/Rt 9**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **39 Wig Hill Road, Chester, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is 467 $\mu W/cm^2$, and the general population exposure limit for the PCS band 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 **39 Wig Hill Road, Chester, 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) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

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

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

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

7) The antennas used in this modeling are the **RFS APXV18-206516S-C-A20** for 1900 MHz (PCS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APXV18-206516S-C-A20** has a maximum gain of **16.3 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **108 feet** above ground level (AGL).

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

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

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	108	Height (AGL):	108	Height (AGL):	108
Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)
Channel Count	6	Channel Count	6	# PCS Channels:	6
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	10,237.91	ERP (W):	10,237.91	ERP (W):	10,237.91
Antenna A1 MPE%	3.54	Antenna B1 MPE%	3.54	Antenna C1 MPE%	3.54
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	108	Height (AGL):	108	Height (AGL):	108
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A2 MPE%	0.64	Antenna B2 MPE%	0.64	Antenna C2 MPE%	0.64

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**12.53**
AT&T	18.45 %
MetroPCS	14.77 %
Verizon Wireless	21.23 %
Sprint / Nextel	12.52 %
VSECI	3.79 %
Site Total MPE %:	**83.29 %**

T-Mobile Sector 1 Total:	4.18 %
T-Mobile Sector 2 Total:	4.18 %
T-Mobile Sector 3 Total:	4.18 %
Site Total:	83.29 %

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Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	4.18 %
Sector 2:	4.18 %
Sector 3 :	4.18 %
T-Mobile Total:	12.53 %
Site Total:	83.29 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **83.29%** 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.

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RF Engineering Director

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