COHEN and WOLF P.C.
ATTORNEYS AT LAW

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport
WRITER'S DIRECT DIAL: (203) 337-4157
E-Mail Address: jkohler@cohenandwolf.com

May 11, 2015

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Notice of Exempt Modification
Greenwich Hospital/T-Mobile equipment upgrade
T-Mobile Site ID CTFF001A
5 Perryridge Road, Greenwich CT
Revised Exempt Modification Filing

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf. T-Mobile files this revised submission and notes the changes in bold font.

In this case, Greenwich Hospital owns the existing telecommunications tower and related facility at 5 Perryridge Road, Greenwich Connecticut (latitude 41.033934, longitude -73.630829). T-Mobile intends to replace three (3) antennas and add related equipment at this existing facility in Greenwich ("Greenwich Hospital Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the First Selectman, Peter Tesei. Greenwich Hospital is also the property owner.

The existing Greenwich Hospital Facility consists of a 164 foot tower.[1] T-Mobile plans to replace three (3) antennas mounted on the tower at a centerline of 144 feet. **It will add three (3) TMAs (tower mounted amplifiers) and three (3) smart bias Ts at the same centerline.** T-Mobile will also add three (3) RRUs (remote radio units) to an ice bridge post near T-Mobile's existing equipment and add coax cables outside the monopole and inside an existing

[1] While the online docket for the Connecticut Siting Council does not provide a docket or petition number for the approval of this structure, it does reference this structure in connection with notices of intent captioned EM-VER-057-150108, EM-SPRINT-057-140829, EM-VER-057-140127 and EM-T-MOBILE-057-120622.

underground conduit. (See the plans **revised to May 11, 2015** attached hereto as Exhibit A). The existing tower is structurally capable of supporting T-Mobile's proposed use, as indicated in the structural analysis dated **May 4, 2015** and attached hereto as Exhibit B.

The planned modifications to the Greenwich Hospital Facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modification will not increase the height of the tower. T-Mobile's replacement antennas will be installed at the 144 foot level. The enclosed tower drawing (Sheet A-2) confirms that the proposed modification will not increase the height of the tower.

2. The installation of the T-Mobile's equipment in the existing compound, as reflected on the attached site plan, will not require an extension of the site boundaries. (See Sheet A-1). T-Mobile's proposed equipment will be located entirely within the existing site boundaries.

3. The proposed modification to the Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the replacement antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a RF Exposure Analysis prepared by EBI dated March 18, 2015 T-Mobile's operations would add 6.85% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 97.62% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and additional equipment at the Greenwich Hospital Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence construction approximately sixty days from the date of the Council's notice of acknowledgement.

Sincerely,

Julie D. Kohler, Esq.

cc: First Selectman Peter Tesei, Town of Greenwich
Nancy Fritz, Greenwich Hospital
Sheldon Freincle, NSS

EXHIBIT A

T-MOBILE NORTHEAST LLC

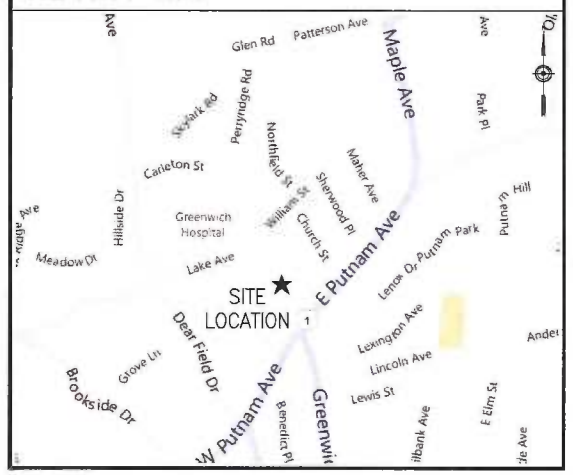
SITE #: CTFF001A

SITE NAME: GREENWICH HOSPITAL

SITE ADDRESS:
5 PERRYRIDGE ROAD
GREENWICH ,CT 06830

WIRELESS BROADBAND FACILITY
CONSTRUCTION DRAWINGS
(704BU CONFIGURATION)

VICINITY MAP



DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL BEFORE YOU DIG:

WWW.CBYD.COM

CALL 800 922 4455, OR 811

CALL THREE WORKING DAYS PRIOR TO DIGGING

SAFETY PRECAUTIONS SHALL BE IMPLEMENTED BY CONTRACTOR(S) AT ALL TRENCHING IN ACCORDANCE WITH CURRENT OSHA STANDARDS.

COLOR CODE FOR UTILITY LOCATIONS

ELECTRIC	– RED	SEWER	– GREEN
GAS/OIL	– YELLOW	SURVEY	– PINK
TEL/CATV	– ORANGE	PROPOSED EXCAVATION	– WHITE
WATER	– BLUE	RECLAIMED WATER	– PURPLE

GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONSTRUCT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE T–MOBILE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF THE CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES, THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXPENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING OF ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUM OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. 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 CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND INSPECTIONS WHICH ARE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY, OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC., DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS, AS WELL AS THE LATEST EDITIONS OF ANY PERTINENT STATE SAFETY REGULATIONS.
14. THE CONTRACTOR SHALL NOTIFY THE T–MOBILE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE T–MOBILE REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC., ON THE JOB.
16. THE CONTRACTOR SHALL RETURN ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITION AT THE COMPLETION OF WORK.
17. ATLANTIS GROUP, INC. HAS NOT CONDUCTED A STRUCTURAL ANALYSIS FOR THIS PROJECT AND DOES NOT ASSUME ANY LIABILITY FOR THE ADEQUACY OF THE STRUCTURE AND COMPONENTS.
18. REFER TO STRUCTURAL ANALYSIS DOCUMENT ENTITLED, "DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 164' MONOPOLE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT" PREPARED BY AECOM, "T–MOBILE SITE ID CTFF001A", DATED MARCH 12, 2015

SITE INFORMATION

SITE NUMBER:	CTFF001A
SITE NAME:	GREENWICH HOSPITAL
SITE ADDRESS:	5 PERRYRIDGE ROAD GREENWICH ,CT 06830
LAT./LONG.:	N 41.033934 / W –73.630829
JURISDICTION:	FAIRFIELD COUNTY
PROPERTY OWNER:	NANCYE FRITZ MANAGER, REAL ESTATE & HOUSING GREENWICH HOSPITAL 5 PERRYRIDGE RD. GREENWICH, CT 06870 PHONE:203–863–2977

CODE COMPLIANCE

CONNECTICUT STATE BUILDING CODE

2005 CONNECTICUT BUILDING CODE WITH 2013 AMENDMENT
2011 NATIONAL ELECTRICAL CODE

CONSTRUCTION TYPE: 2B USE GROUP: N/A

PROJECT SUB–CONTRACTORS

APPLICANT:	T–MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 (860) 692–7100
PROJECT MANAGER	LISA LIN ALLEN NORTHEAST SITE SOLUTIONS 54 MAIN STREET STURBRIDGE, MA 01566 (508) 434–5237
ARCHITECT/ENGINEER:	ATLANTIS GROUP INC. 1340 CENTRE STREET SUITE 212 NEWTON CENTER, MA 02459 (617) 965–0789

SHEET INDEX

SHEET	DESCRIPTION
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N–1	GENERAL AND ELECTRICAL NOTES
A–1	SITE AND EQUIPMENT DETAIL
A–2	ELEVATION, ANTENNA PLAN AND DETAILS
E–1	GROUNDING DIAGRAM
E–2	GROUNDING DETAILS

T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX:(860) 692-7159

ATLANTIS GROUP
1340 Centre Street, Suite 212
Newton Center, MA 02459
Office: 617–965–0789
Fax: 617–213–5056

SUBMITTALS

DATE	DESCRIPTION	REVISION
02/27/15	ISSUED FOR REVIEW	A
03/20/15	REVISION	0
05/07/15	REVISION	1
05/11/15	REVISION	2

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	CTFF001A
DRAWN BY:	EB
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NUMBER
CTFF001A
SITE NAME
GREENWICH HOSPITAL
SITE ADDRESS
5 PERRYRIDGE ROAD
GREENWICH ,CT 06830

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

ELECTRICAL NOTES:

WORK INCLUDED

1. INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, PLANT SERVICES AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE THE ELECTRICAL WORK SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   - A. PREPARE AND SUBMIT SHOP DRAWINGS, DIAGRAMS AND ILLUSTRATIONS.
   - B. PROCURE ALL NECESSARY PERMITS AND APPROVALS AND PAY ALL REQUIRED FEES AND CHARGES IN CONNECTION WITH THE WORK OF THIS CONTRACT.
   - C. SUBMIT AS-BUILT DRAWINGS, OPERATING AND MAINTENANCE INSTRUCTIONS AND MANUALS.
   - D. EXECUTE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING OF EXISTING OR NEWLY INSTALLED CONSTRUCTION REQUIRED FOR THE WORK OF THIS CONTRACT. FOR SLAB PENETRATIONS THROUGH POST TENSION SLABS, X-RAY EXACT AREA OF PENETRATION PRIOR TO PERFORMING WORK. COORDINATE ALL X-RAY WORK WITH BUILDING ENGINEER.
   - E. PROVIDE HANGERS, SUPPORTS, FOUNDATIONS, STRUCTURAL FRAMING SUPPORTS, AND BASES FOR CONDUIT AND EQUIPMENT PROVIDED OR INSTALLED UNDER THE WORK OF HIS CONTRACT. PROVIDE COUNTER FLASHING, SLEEVES AND SEALS FOR FLOOR AND WALL PENETRATIONS.
   - F. MAINTAIN ALL EXISTING ELECTRICAL SERVICES IN THE BUILDING AREAS NOT AFFECTED BY THE ALTERATION DURING THE PROGRESS OF THE WORK INCLUDING PROVIDING ALL TEMPORARY JUMPERS, CONDUITS, CAPS, PROTECTIVE DEVICES, CONNECTIONS AND EQUIPMENT REQUIRED. PROVIDE TEMPORARY LIGHT AND POWER FOR CONSTRUCTION PURPOSES.
2. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO CALL FOR AN INSTALLATION THAT IS COMPLETE IN EVERY RESPECT. IT IS NOT THE INTENT TO GIVE EVERY DETAIL ON THE DRAWINGS AND IN THE SPECIFICATIONS. IF AN ITEM OF WORK IS INDICATED IN THE DRAWINGS, IT IS CONSIDERED SUFFICIENT FOR INCLUSION IN THE CONTRACT. FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT USUALLY FURNISHED OR NEEDED TO MAKE A COMPLETE INSTALLATION WHETHER OR NOT SPECIFICALLY MENTIONED IN THE CONTRACT DOCUMENTS.

GENERAL REQUIREMENTS

1. PROVIDE ALL WORK IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND LOCAL AND STATE ELECTRICAL CODES.
2. THE ELECTRICAL PLANS ARE DIAGRAMMATIC ONLY. REFER TO THE ARCHITECTURAL PLANS FOR THE EXACT DIMENSIONS OF THE BUILDING.
3. LOAD CALCULATIONS ARE BASED ON EXISTING BUILDING INFORMATION/DRAWINGS PROVIDED TO ENGINEERING. CONTRACTOR IS TO VERIFY ALL EXISTING RATINGS AND LOADS PRIOR TO PURCHASING OF SPECIFIED EQUIPMENT FOR COMPLIANCE TO NEC. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES AND REQUEST FURTHER DIRECTION BY ENGINEER.
4. EXISTING BUILDING EQUIPMENT IS NOTED ON THE DRAWINGS. NEW OR RELOCATED EQUIPMENT IS SHOWN WITH SOLID LINES. FUTURE EQUIPMENT (NOT IN THIS CONTRACT) IS DEPICTED WITH SHADED LINES. REQUEST CLARIFICATION OF DRAWINGS OR OF SPECIFICATIONS PRIOR TO PRICING OR INSTALLATION.
5. GENERAL
   - A. AFTER CAREFULLY STUDYING THE DRAWINGS AND SPECIFICATIONS, AND BEFORE SUBMITTING THE PROPOSAL, MAKE A MANDATORY SITE VISIT TO ASCERTAIN CONDITIONS OF THE SITE, AND THE NATURE AND EXACT QUANTITY OF WORK TO BE PERFORMED. NO EXTRA COMPENSATION WILL BE ALLOWED FOR FAILURE TO NOTIFY THE OWNER, IN WRITING, OF ANY DISCREPANCIES THAT MAY HAVE BEEN NOTED BETWEEN THE EXISTING CONDITIONS AND THE DRAWINGS AND SPECIFICATIONS.
   - B. VERIFY ALL MEASUREMENTS AT THE SITE AND BE RESPONSIBLE FOR CORRECTNESS OF SAME.
6. QUALITY, WORKMANSHIP, MATERIALS AND SAFETY
   - A. PROVIDE NEW MATERIALS AND EQUIPMENT OF A DOMESTIC MANUFACTURER BY THOSE REGULARLY ENGAGED IN THE PRODUCTION AND MANUFACTURE OF SPECIFIED MATERIALS AND EQUIPMENT. WHERE UL, OR OTHER AGENCY, HAS ESTABLISHED STANDARDS FOR MATERIALS, PROVIDE MATERIALS WHICH ARE LISTED AND LABELED ACCORDINGLY. THE COMMERCIALLY STANDARD ITEMS OF EQUIPMENT AND THE SPECIFIC NAMES MENTIONED HEREIN ARE INTENDED FOR THE PROPER FUNCTIONING OF THE WORK.
   - B. WORK SHALL BE PERFORMED BY WORKMEN SKILLED IN THE TRADE REQUIRED FOR THE WORK. INSTALL MATERIALS AND EQUIPMENT TO PRESENT A NEAT APPEARANCE WHEN COMPLETED AND IN ACCORDANCE WITH THE APPROVED RECOMMENDATIONS OF THE MANUFACTURER AND IN ACCORDANCE WITH CONTRACT DOCUMENTS.
   - C. PROVIDE LABOR, MATERIALS, APPARATUS AND APPLIANCES ESSENTIAL TO THE FUNCTIONING OF THE SYSTEMS DESCRIBED OR INDICATED HEREIN, OR WHICH MAY BE REASONABLY IMPLIED AS ESSENTIAL WHENEVER MENTIONED IN THE CONTRACT DOCUMENT OR NOT.
   - D. MAKE WRITTEN REQUESTS FOR SUPPLEMENTARY INSTRUCTIONS TO ARCHITECT/ENGINEER IN CASE OF DOUBT AS TO WORK INTENDED OR IN EVENT OF NEED FOR EXPLANATION THEREOF.
   - E. PERFORMANCE AND MATERIAL REQUIREMENTS SCHEDULED OR SPECIFIED ARE MINIMUM STANDARD ACCEPTABLE. THE RIGHT TO JUDGE THE QUALITY OF EQUIPMENT THAT DEVIATES FROM THE CONTRACT DOCUMENT REMAINS SOLELY WITH ARCHITECT/ENGINEER. CONTRACT DOCUMENT OR NOT.

GUARANTEE

1. GUARANTEE MATERIALS, PARTS AND LABOR FOR WORK FOR ONE YEAR FROM THE DATE OF ISSUANCE OF OCCUPANCY PERMIT. DURING THAT PERIOD, MAKE GOOD FAULTS OR IMPERFECTIONS THAT MAY ARISE DUE TO DEFECTS OR OMISSIONS IN MATERIALS OR WORKMANSHIP WITH NO ADDITIONAL COMPENSATION AND AS DIRECTED BY ARCHITECT.

CLEANING

1. REMOVE ALL CONSTRUCTION DEBRIS RESULTING FROM THE WORK.
2. CLEAN EQUIPMENT AND SYSTEMS FOLLOWING THE COMPLETION OF THE PROJECT TO THE SATISFACTION OF THE ENGINEER.

COORDINATION AND SUPERVISION

1. CAREFULLY LAY OUT ALL WORK IN ADVANCE TO AVOID UNNECESSARY CUTTING, CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER SURFACES. WHERE SUCH WORK IS NECESSARY, HOWEVER, PATCH AND REPAIR THE WORK IN AN APPROVED MANNER BY SKILLED MECHANICS AT NO ADDITIONAL COST TO THE OWNER. RENDER FULL COOPERATION TO OTHER TRADES WHERE WORK WILL BE INSTALLED IN CLOSE PROXIMITY TO WORK OF OTHER TRADES. ASSIST IN WORKING OUT SPACE CONDITIONS. IF WORK IS INSTALLED BEFORE COORDINATION WITH OTHER TRADES, OR CAUSES INTERFERENCE, MAKE CHANGES NECESSARY TO CORRECT CONDITIONS WITHOUT EXTRA CHARGE.

SUBMITTALS

1. AS-BUILT DRAWINGS:
   - A. UPON COMPLETION OF THE WORK, FURNISH TO THE OWNER "AS-BUILT" DRAWINGS.
2. SERVICE MANUALS:
   - A. UPON COMPLETION OF THE WORK, FULLY INSTRUCT T-MOBILE AS TO THE OPERATION AND MAINTENANCE OF ALL MATERIAL, EQUIPMENT AND SYSTEMS.
   - B. PROVIDE 3 COMPLETE BOUND SETS OF INSTRUCTIONS FOR OPERATING AND MAINTAINING ALL SYSTEMS AND EQUIPMENT.

CUTTING AND PATCHING

1. PROVIDE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING REQUIRED TO COMPLETE THE WORK.
2. OBTAIN OWNER APPROVAL PRIOR TO CUTTING THROUGH FLOORS OR WALLS FOR PIPING OR CONDUIT.

TESTS, INSPECTION AND APPROVAL

1. BEFORE ENERGIZING ANY ELECTRICAL INSTALLATION, INSPECT EACH UNIT IN DETAIL. TIGHTEN ALL BOLTS AND CONNECTIONS (TORQUE-TIGHTEN WHERE REQUIRED) AND DETERMINE THAT ALL COMPONENTS ARE ALIGNED, AND THE EQUIPMENT IS IN SAFE, OPERATIONAL CONDITION.
2. PROVIDE THE COMPLETE ELECTRICAL SYSTEM FREE OF GROUND FAULTS AND SHORT CIRCUITS SUCH THAT THE SYSTEM WILL OPERATE SATISFACTORILY UNDER FULL LOAD CONDITIONS, WITHOUT EXCESSIVE HEATING AT ANY POINT IN THE SYSTEM.

SPECIAL REQUIREMENTS

1. DO NOT LEAVE ANY WORK INCOMPLETE NOR ANY HAZARDOUS SITUATIONS CREATED WHICH WILL AFFECT THE LIFE OR SAFETY OF THE PUBLIC AND/OR BUILDING OCCUPANTS. DO NOT INTERFERE WITH OR CUTOFF ANY OF THE EXISTING SERVICES WITHOUT THE OWNER'S WRITTEN PERMISSION.
2. WHEN NECESSARY TO TEMPORARILY DISCONNECT ANY EXISTING BUILDING UTILITIES AND SERVICE SYSTEMS, INCLUDING FEEDER OR BRANCH CIRCUITING SUPPLYING EXISTING FACILITIES, CONFER WITH THE OWNER AND ARRANGE THE PERIOD OF INTERRUPTION FOR A TIME MUTUALLY AGREED UPON. SHUTDOWN NOTE: SCHEDULE AND NOTIFY OWNER 48 HOURS PRIOR TO SHUTDOWN. ALL SHUTDOWN WORK TO BE SCHEDULED AT A TIME CONVENIENT TO OWNER.

GROUNDING

1. ROUTE ALL GROUNDING CONDUCTORS AS SHOWN ON CONDUIT/GROUNDING RISER.
2. ROUTE 500 KCMIL CU. THHN CONDUCTOR FROM THE MGB LOCATION TO BUILDING STEEL. VERIFY BUILDING STEEL IS EFFECTIVELY GROUNDED PER NEC TO THE MAIN SERVICE GROUNDING ELECTRODE CONDUCTOR (GEC).
3. MAKE ALL GROUND CONNECTIONS FROM MGB TO ELECTRICAL EQUIPMENT WITH 2 HOLE, CRIMP TYPE, BURNDY COMPRESSION TERMINATIONS, SIZED AS REQUIRED.
4. USE 1 HOLE, CRIMP TYPE, BURNDY COMPRESSIONS TERMINATIONS, SIZED AS REQUIRED, AT EQUIPMENT GROUND CONNECTIONS.
5. HIRE AN INDEPENDENT LAB TO PERFORM THE SPECIFIED OHMS TESTING. PROVIDE 4 SETS OF THE CERTIFIED DOCUMENTS TO THE OWNER FOR VERIFICATION PRIOR TO THE PROJECT COMPLETION.

RACEWAYS

1. ALL WIRING TO BE INSTALLED IN CONDUIT SYSTEMS IN ACCORDANCE WITH THE FOLLOWING:
   - A. EXTERIOR FEEDERS AND CONTROL, WHERE UNDERGROUND, TO BE IN SCH 40 PVC.
   - B. EXTERIOR, ABOVE GROUND POWER CONDUITS TO BE GALVANIZED RIGID STEEL (RGS).
   - C. ALL TELECOMMUNICATION CONDUITS, INTERIOR/EXTERIOR, TO BE EMT.
   - D. INSTALL PULL ROPES IN ALL NEW EMPTY CONDUITS INSTALLED ON THIS PROJECT.
   - E. ALL TELECOM CONDUITS AND PULL BOXES INSTALLED ON THIS PROJECT TO BE LABELED "T-MOBILE". OWNER WILL PROVIDE LABELS FOR CONTRACTOR TO INSTALL.
   - F. INTERIOR FEEDERS TO BE INSTALLED IN E.M.T. WITH STEEL COMPRESSION FITTINGS.
   - G. MINIMUM SIZE CONDUIT TO BE ¾" TRADE SIZE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
   - H. FINAL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT TO BE INSTALLED IN LIQUID-TIGHT FLEXIBLE METAL CONDUIT.
   - I. CONDUIT TO BE RUN CONCEALED IN CEILINGS, FINISHED AREAS OR DRYWALL PARTITIONS, UNLESS OTHERWISE NOTED.
   - J. THE ROUTING OF CONDUITS INDICATED ON THE DRAWINGS IS DIAGRAMMATIC. BEFORE INSTALLING ANY WORK, EXAMINE THE WORKING LAYOUTS AND SHOP DRAWINGS OF THE OTHER TRADES TO DETERMINE THE EXACT LOCATIONS AND CLEARANCES.
   - K. ALL EXTERIOR MOUNTING HARDWARE TO BE GALVANIZED STEEL. COORDINATE WITH BUILDING ENGINEER PRIOR TO ATTACHING TO BUILDING STRUCTURE.

RACEWAYS CONT'D

- L. PENETRATIONS OF WALLS, FLOORS AND ROOFS, FOR THE PASSAGE OF ELECTRICAL RACEWAYS, TO BE PROPERLY SEALED AFTER INSTALLATION OF RACEWAYS SO AS TO MAINTAIN THE STRUCTURAL OR WATERPROOF INTEGRITY OF THE WALL, FLOOR OR ROOF SYSTEM TO BE PENETRATED. SEAL ALL CONDUIT PENETRATIONS THROUGH FIRE OR SMOKE RATED WALLS, CEILINGS OR SMOKE TIGHT CORRIDOR PARTITIONS TO MAINTAIN PROPER RATING OF WALL OR CEILING.
- M. PROVIDE ALL CONDUIT ENDS WITH INSULATED METALLIC GROUNDING BUSHINGS.
- N. CONDUIT TO BE SUPPORTED AT MAXIMUM DISTANCE OF 8'-0", OR AS REQUIRED BY NEC, IN HORIZONTAL AND VERTICAL DIRECTIONS.
- O. PROVIDE STAINLESS STEEL BLANK COVER PLATES FOR ALL JUNCTION BOXES AND/OR OUTLET BOXES NOT USED IN EXPOSED AREAS. PROVIDE ALL OTHER UNUSED BOXES WITH STANDARD STEEL COVER PLATES.
- P. WHERE APPLICABLE, PROVIDE ROOFTOP CONDUIT SUPPORT SYSTEM, CONFORMING TO ROOFTOP WARRANTY REQUIREMENTS, PER BUILDING.

WIRES AND CABLES

1. CONTRACTOR TO COORDINATE WITH EQUIPMENT SUPPLIER AND VENDOR FOR EXACT EQUIPMENT OVER-CURRENT PROTECTION VOLTAGE, WIRE SIZE AND PLUG CONFIGURATION, IF APPLICABLE, PRIOR TO BID.
2. ALL EQUIPMENT/DEVICES TO BE PROVIDED WITH INSULATED GROUND CONDUCTOR.
3. ALL WIRE AND CABLE TO BE 600VOLT, COPPER, WITH THWN/THHN INSULATION, EXCEPT AS NOTED.
4. WIRE FOR POWER AND LIGHTING WILL NOT BE LESS THAN NO. 12AWG. ALL WIRE NO. 8 AND LARGER TO BE STRANDED.
5. CONTROL WIRING IS NOT TO BE LESS THAN NO. 14AWG, FLEXIBLE IN SINGLE CONDUCTORS OR MULTI-CONDUCTOR CABLES. CONTROL WIRING WILL CONSIST OF MULTI-CONDUCTOR CABLES WHEREVER POSSIBLE. CABLES TO BE PROVIDED WITH AN OVERALL FLAME-RETARDANT, EXTRUDED JACKET AND RATED FOR PLENUM USE. ALL CONTROL WIRE TO BE 600VOLT RATED.
6. WIRE PREVIOUSLY PULLED INTO CONDUIT IS CONSIDERED USED AND IS NOT TO BE RE-PULLED.
7. HOME RUNS AND BRANCH CIRCUIT WIRING FOR 20A, 120V CIRCUITS:

LENGTH (FT.)	HOME RUN WIRE SIZE
0 TO 50	NO. 12
51 TO 100	NO. 10
101 TO 150	NO. 8

8. VOLTAGE DROP IS NOT TO EXCEED 3%.
9. MAKE ALL CONNECTIONS WITH UL APPROVED, SOLDERLESS, PRESSURE TYPE INSULATED CONNECTORS: SCOTCHLOK OR AND APPROVED EQUAL.

WIRING DEVICES

1. ALL RECEPTACLES INSTALLED IN THIS PROJECT TO BE GROUNDING TYPE, WITH GROUNDING PIN SLOT CONNECTED TO DEVICE GROUND SCREW FOR GROUND WIRE CONNECTION.

DISCONNECT SWITCHES AND FUSES

1. DISCONNECT SWITCHES TO BE VOLTAGE-RATED TO SUIT THE CHARACTERISTICS OF THE SYSTEM FROM WHICH THEY ARE SUPPLIED.
2. PROVIDE HEAVY-DUTY, METAL-ENCLOSED, EXTERNALLY-OPERATED DISCONNECT SWITCHES, FUSED OR UNFUSED, OF SUCH TYPE AND SIZE AS REQUIRED TO PROPERLY PROTECT OR DISCONNECT THE LOAD FOR WHICH THEY ARE INTENDED.
3. PROVIDE NEMA 1 DISCONNECT SWITCHES FOR INTERIOR INSTALLATION, NEMA 3R FOR EXTERIOR INSTALLATION.
4. DISCONNECT SWITCHES TO BE MANUFACTURED BY:
   - A. GENERAL ELECTRIC COMPANY
   - B. SQUARE-D
5. PROVIDE RK-1 TYPE FUSES, UNLESS NOTED OTHERWISE.

INSTALLATION

1. INSTALL DISCONNECT SWITCHES WHERE INDICATED ON DRAWINGS.
2. INSTALL FUSES IN FUSIBLE DISCONNECT SWITCHES. FUSES MUST MATCH IN TYPE AND RATING.
3. FUSES TO BE MOUNTED SO THAT THE LABELS SHOWING THEIR RATINGS CAN BE READ WITHOUT REQUIRING FUSE REMOVAL.
4. FURNISH AND DEPOSIT SPARE FUSES AT THE JOB SITE AS FOLLOWS:
   - A. THREE SPARES FOR EACH TYPE AND SIZE, IN EXCESS OF 60A, USED FOR INITIAL FUSING.
   - B. TEN PERCENT SPARES FOR EACH TYPE AND SIZE, UP TO AND INCLUDING 60A, USED FOR INITIAL FUSING. IN NO CASE WILL LESS THAN THREE FUSES OF ONE PARTICULAR TYPE AND SIZE BE FURNISHED.

GENERAL NOTES:

INTENT

1. THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION.
2. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED, OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH
3. THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.
4. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.
5. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY THE OWNER WITHOUT ISSUING A CHANGE ORDER.

CONFLICTS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATIONS OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.
2. THE BIDDER, IF AWARDED THE CONTRACT, WILL NOT BE ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY MATTER OR THING CONCERNING SUCH BIDDER MIGHT HAVE FULLY INFORMED THEMSELVES PRIOR TO THE BIDDING.
3. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED IN THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS GOVERNING THE WORK.

CONTRACTS AND WARRANTIES

1. CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS.
2. SEE MASTER CONTRACTION SERVICES AGREEMENT FOR ADDITIONAL DETAILS.

STORAGE

1. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

CLEANUP

1. THE CONTRACTORS SHALL, AT ALL TIMES, KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK. THEY SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS AND SHALL LEAVE THEIR WORK CLEAN AND READY TO USE.
2. EXTERIOR
   - A. VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.
   - B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
   - C. IF NECESSARY, TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.
3. INTERIOR
   - A. VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER FROM WALLS, FLOOR, AND CEILING.
   - B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
   - C. REMOVE PAINT DROPPINGS, SPOTS, STAINS, AND DIRT FROM FINISHED SURFACES.

CHANGE ORDER PROCEDURE:

1. REFER TO SECTION 17 OF SIGNED MCSA: SEE PROFESSIONAL SERVICE AGREEMENT FOR MCSA.

RELATED DOCUMENTS AND COORDINATION

1. GENERAL CARPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. IN PERFORMANCE OF THE WORK, THE CONTRACTOR MUST REFER TO ALL DRAWINGS. ALL COORDINATION TO BE THE RESPONSIBILITY OF THE CONTRACTOR.

SHOP DRAWINGS

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.
2. ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

PRODUCTS AND SUBSTITUTIONS

1. SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST, IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION. INCLUDE RELATED SPECIFICATION SECTION AND DRAWING NUMBERS AND COMPLETE DOCUMENTATION SHOWING COMPLIANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS.
2. SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS, PRODUCTS AND MATERIALS BEING INSTALLED. THE CONTRACTOR SHALL, IF DEEMED NECESSARY BY THE OWNER, SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT SHEETS.

QUALITY ASSURANCE

1. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE, BUT NOT BE LIMITED TO THE APPLICABLE CODES SET FORTH BY THE LOCAL GOVERNING BODY. SEE "CODE COMPLIANCE" T-1.

ADMINISTRATION

1. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.
2. SUBMIT A BAR TYPE PROGRESS CHART, NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE, INDICATING A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT THE SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK AND SHOWING COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.
3. PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON-SITE MEETING WITH ALL MAJOR PARTIES. THIS WOULD INCLUDE, BUT NOT LIMITED TO, THE OWNER, PROJECT MANAGER, CONTRACTOR, LAND OWNER REPRESENTATIVE, LOCAL TELEPHONE COMPANY, TOWER ERECTION FOREMAN (IF SUBCONTRACTED).
4. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY THE OWNER, NOR WILL WIRELESS SERVICE BE ARRANGED.
5. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES. CONTRACTOR WILL COMPLY WITH ALL WPCS SAFETY REQUIREMENTS IN THEIR AGREEMENT.
6. PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE OWNER.
7. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.
8. NOTIFY THE OWNER/PROJECT MANAGER IN WRITING NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CABINET PLACEMENTS.

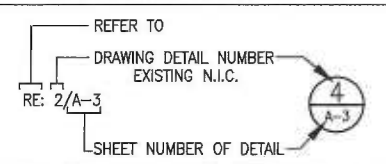
INSURANCE AND BONDS

1. CONTRACTOR, AT THEIR OWN EXPENSE, SHALL CARRY AND MAINTAIN, FOR THE DURATION OF THE PROJECT, ALL INSURANCE, AS REQUIRED AND LISTED, AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGES TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR REQUIRED INSURANCE LIMITS.
2. THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.
3. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

ARCHITECTURAL SYMBOLS

STORAGE
38
3

DETAIL REFERENCE KEY



ABBREVIATIONS

ADJ	ADJUSTABLE
AGL	ABOVE GROUND LINE
&	AND
APPROX	APPROXIMATE
@	AT
BTS	BASE TRANSMISSION STATION
CAB	CABINET
CLG	CEILING
CONC	CONCRETE
CONT	CONTINUOUS
DIA OR ø	DIAMETER
DWG	DRAWING
EA	EACH
ELEC	ELECTRICAL
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EGB	EQUIPMENT GROUND BAR
(E)	EXISTING
EXT	EXTERIOR
FF	FINISHED FLOOR
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GRND	GROUND
LG	LONG
MAX	MAXIMUM
MECH	MECHANICAL
MW	MICROWAVE DISH
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTL	METAL
(N)	NEW
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OPP	OPPOSITE
(P)	PROPOSED
PCS	PERSONAL COMMUNICATION SYSTEM
PPC	POWER PROTECTION CABINET
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SS	STAINLESS STEEL
STL	STEEL
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TYP	TYPICAL
VIF	VERIFY IN FIELD
UON	UNLESS OTHERWISE NOTED
WWF	WELDED WIRE FABRIC
W/	WITH

T-Mobile

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SUBMITTALS

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03/20/15	REVISION	0
05/07/15	REVISION	1
05/11/15	REVISION	2

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RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

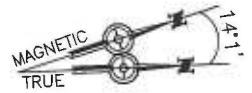
PROJECT NO:	CTFF001A
DRAWN BY:	EB
CHECKED BY:	SM

PROFESSIONAL SEAL

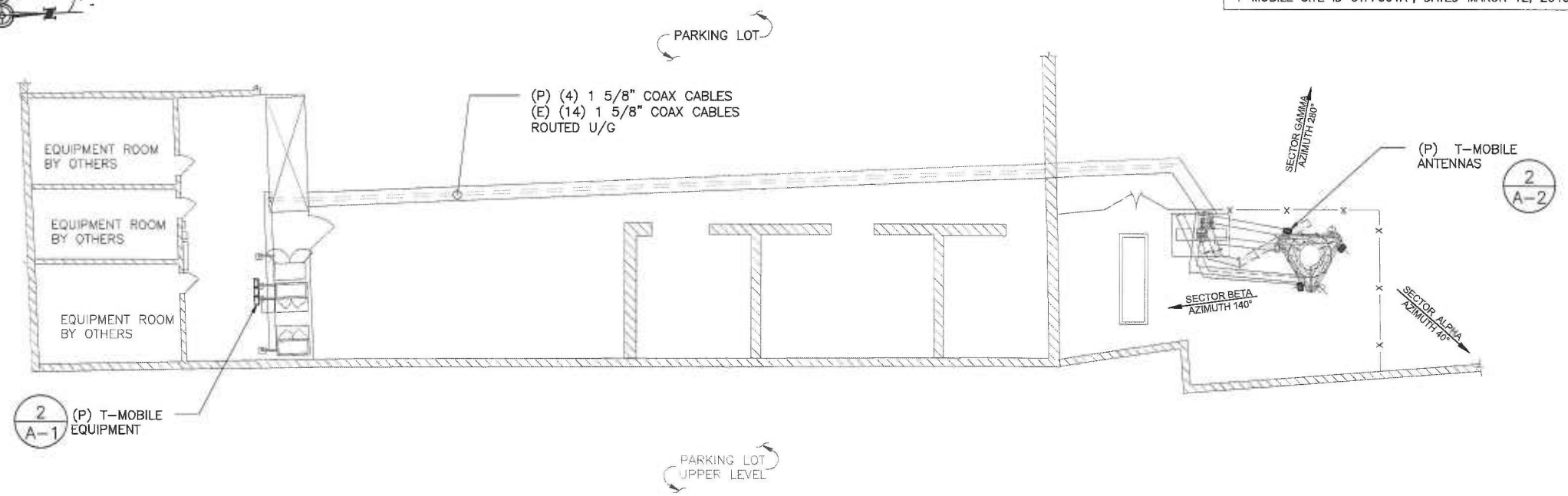
SITE NUMBER
CTFF001A
SITE NAME
GREENWICH HOSPITAL
SITE ADDRESS
5 PERRYRIDGE ROAD
GREENWICH ,CT 06830

SHEET TITLE
GENERAL AND ELECTRICAL NOTES

SHEET NUMBER
N-1



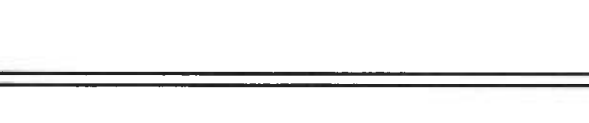
REFER TO STRUCTURAL ANALYSIS DOCUMENT ENTITLED, "DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 164' MONOPOLE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT" PREPARED BY AECOM, "T-MOBILE SITE ID CTFF001A", DATED MARCH 12, 2015

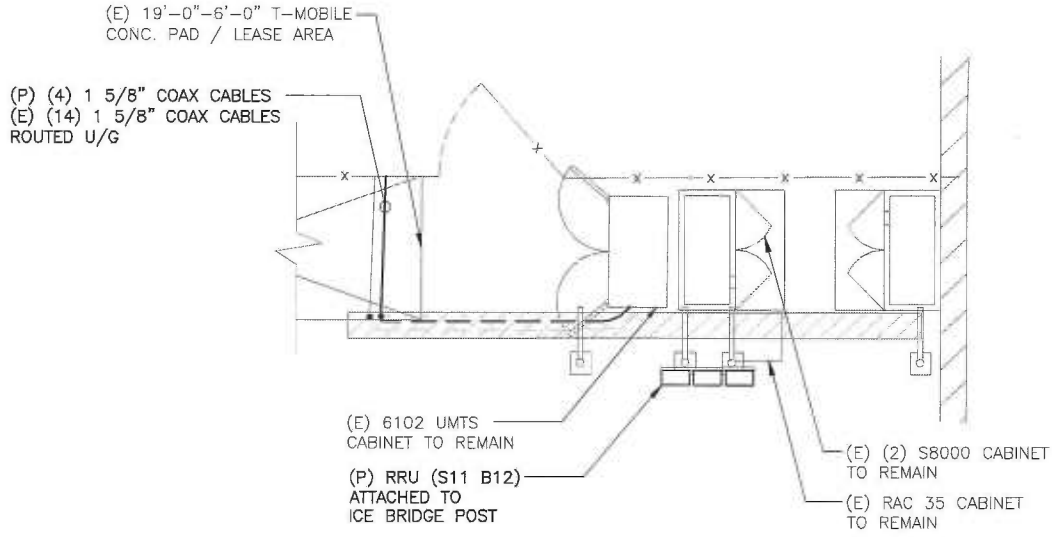


SITE PLAN

1 / A-1

SCALE: 1" = 20'-0" (11x17)
1" = 10'-0" (24x36)

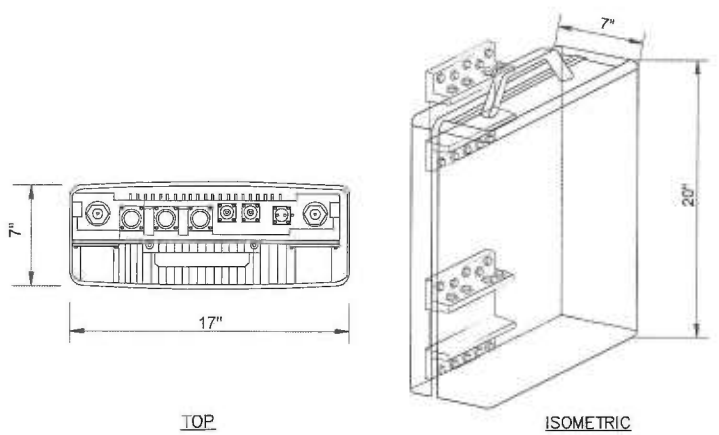




EQUIPMENT PLAN

2 / A-1

SCALE: N.T.S



RRUS 11 B12 DETAILS

3 / A-1

SCALE: N.T.S

GENERAL SITE NOTES

1. SITE INFORMATION WAS OBTAINED FROM A FIELD INVESTIGATION PERFORMED BY ATLANTIS GROUP, INC. CONTRACTOR TO FIELD VERIFY DIMENSIONS AS NECESSARY BEFORE CONSTRUCTION.

2. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE SIGNS OF ADVERTISING.

3. THE PROPOSED DEVELOPMENT IS UNMANNED AND THEREFORE DOES NOT REQUIRE A MEANS OF WATER SUPPLY OR SEWAGE DISPOSAL.

4. NO LANDSCAPING WORK IS PROPOSED IN CONJUNCTION WITH THIS DEVELOPMENT OTHER THAN THAT WHICH IS SHOWN.

5. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES.

6. UTILITIES SHOWN ON PLAN ARE TAKEN FROM OWNERS RECORDS AND FIELD LOCATION OF VISIBLE SURFACE FEATURES. THE EXISTENCE, EXTENT AND EXACT HORIZONTAL AND VERTICAL LOCATIONS OF UTILITIES HAS NOT BEEN VERIFIED. ANY CONTRACTOR PERFORMING WORK ON THIS SITE MUST CONTACT CALL BEFORE YOU DIG THREE WORKING DAYS PRIOR TO COMMENCING WORK.

7. ALL OBSOLETE OR UNUSED FACILITIES SHALL BE REMOVED WITHIN 12 MONTHS OF CESSATION OF OPERATIONS.

SITE LEGEND

- SITE PROPERTY LINE
- STREET OR ROAD
- CHAIN LINK FENCE
- OPAQUE WOODEN FENCE
- BOARD ON BOARD FENCE
- DECIDUOUS TREES/SHRUBS
- EVERGREEN TREES/SHRUBS
- TREE LINE
- UTILITY POLE
- (E) EXISTING
- (N) NEW
- (P) PROPOSED
- (F) FUTURE
- PROP. LTE ANTENNA
- PROP. UMTS/GSM ANTENNA
- EX. GSM ANTENNA
- EX. UMTS ANTENNA

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SITE
AND
EQUIPMENT PLAN

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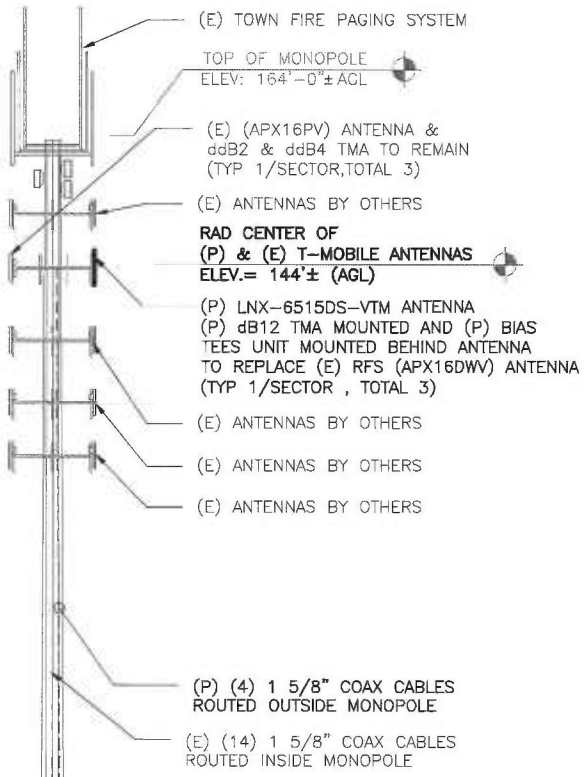
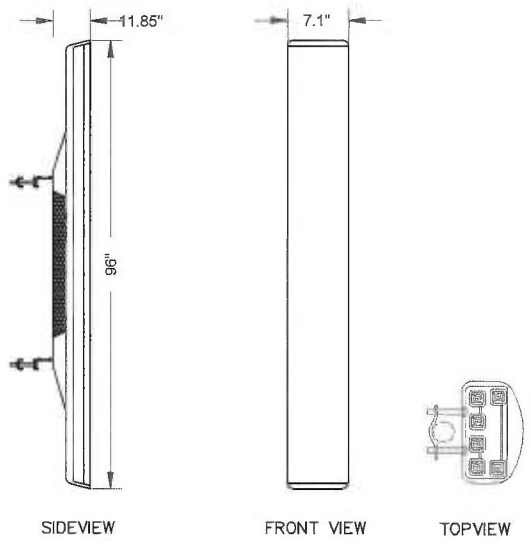
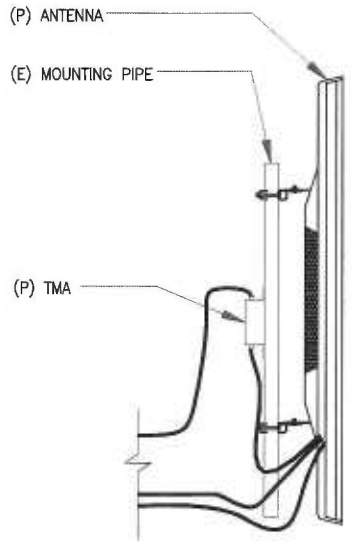


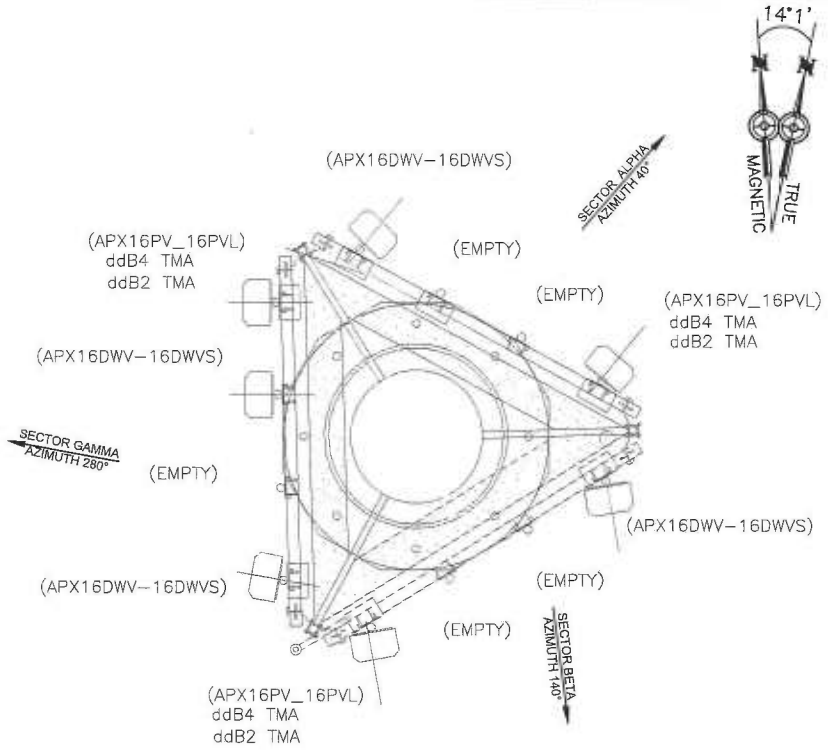


MANUFACTURER: COMMSCOPE
MODEL NO.: LNX-6515DS-VTM
DIMENSIONS - HxWxD, (IN) 96x11.85x7.1

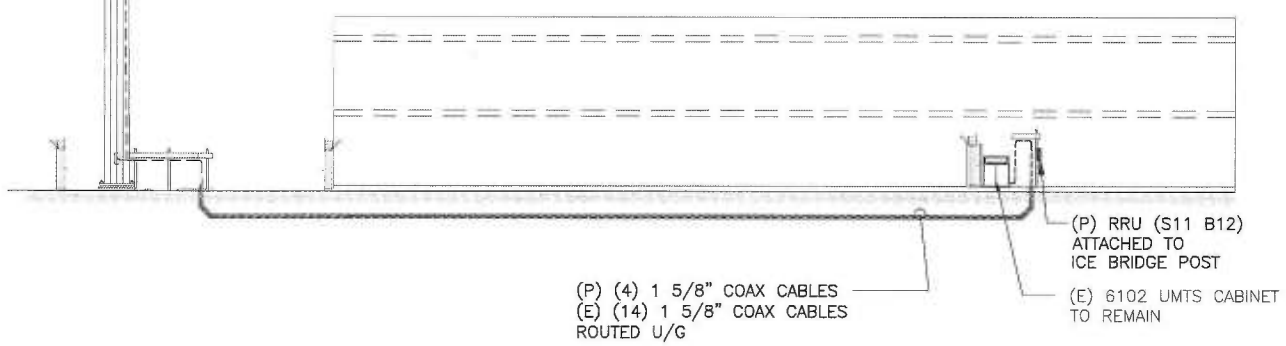
COMMSCOPE ANTENNA DETAIL 3/A-2
SCALE: N.T.S



ANTENNA MOUNT DETAIL 4/A-2
SCALE: N.T.S



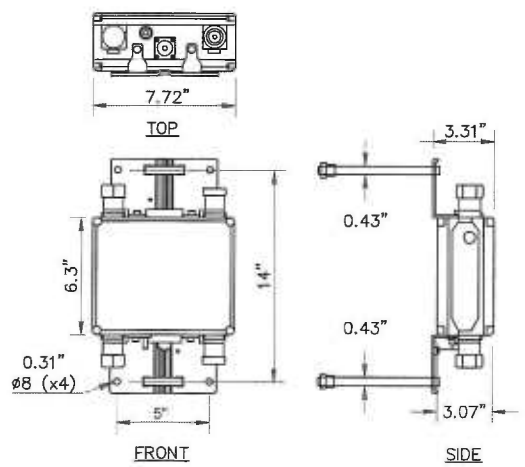
EXISTING



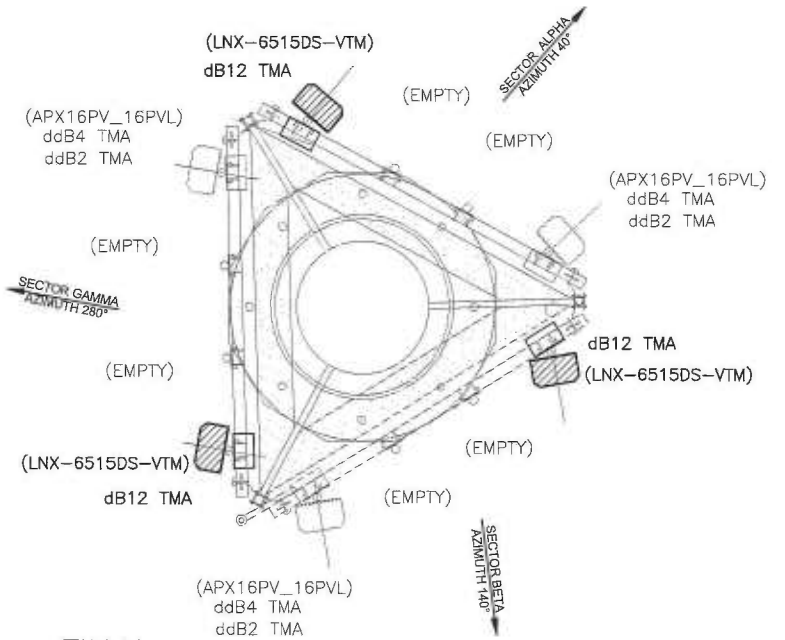
ELEVATION 1/A-2
SCALE: 1" = 30'-0" (11x17)
1" = 15'-0" (24x36)

0 30 60 90

SCALE 1"=30' (11x17)
1"=15' (24x36)



TMA DETAIL 5/A-2
SCALE: N.T.S



FINAL

ANTENNA PLAN 2/A-2
SCALE: N.T.S

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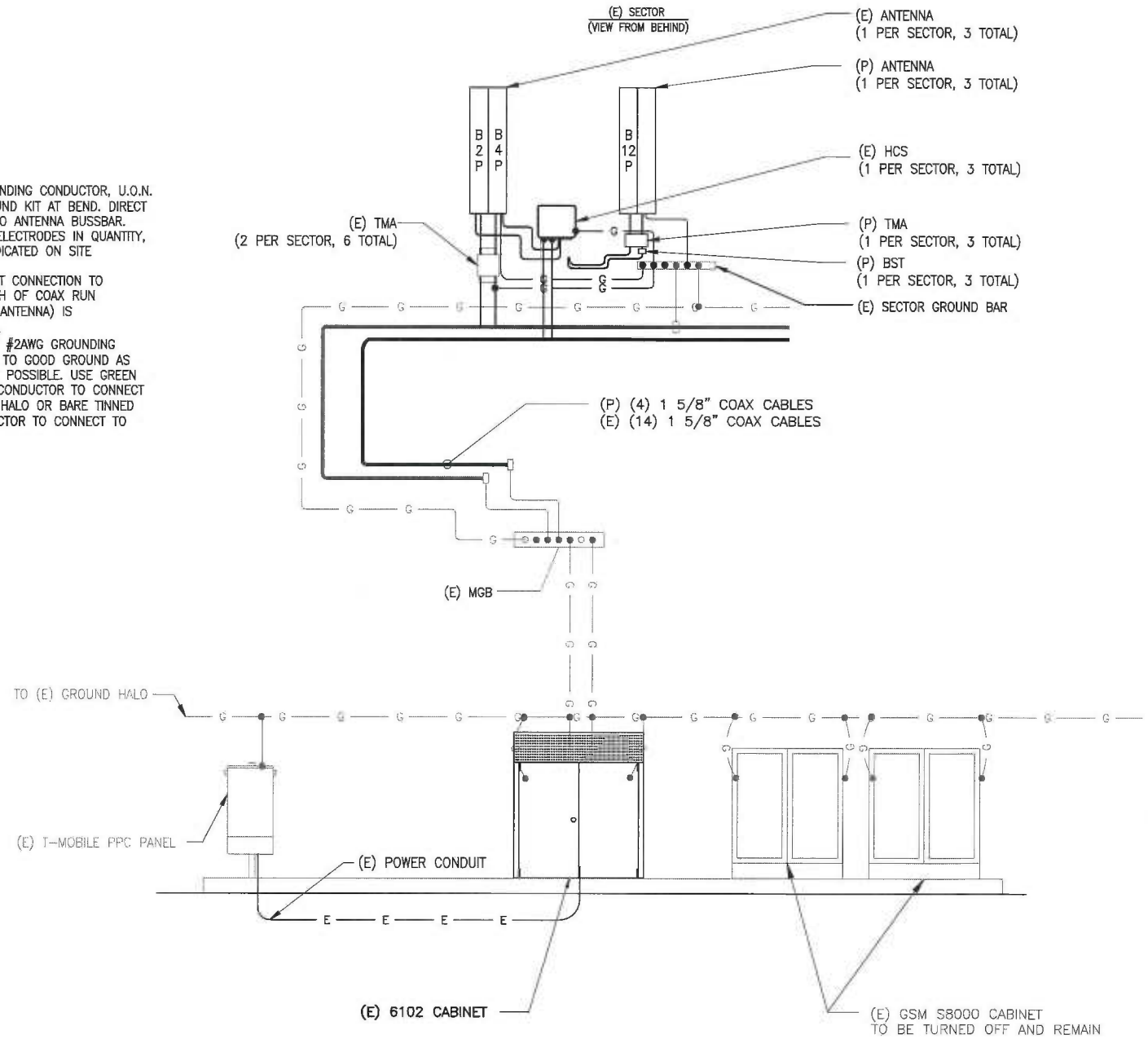
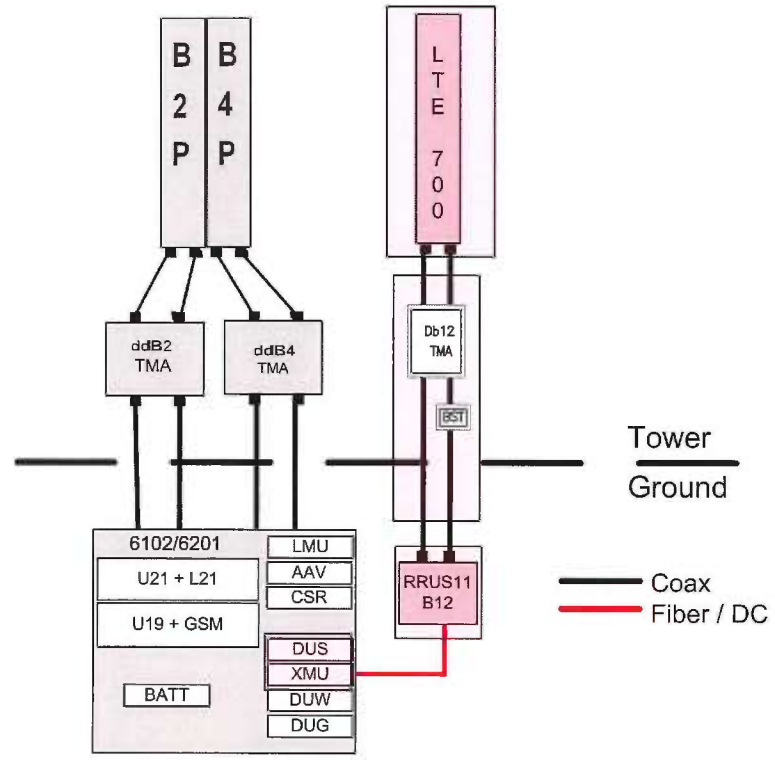
GREENWICH ,CT 06830

SHEET TITLE
ELEVATION AND ANTENNA PLAN

SHEET NUMBER
A-2

NOTES:
A. PROVIDE #2AWG GROUNDING CONDUCTOR, U.O.N.
B. DO NOT INSTALL GROUND KIT AT BEND. DIRECT GROUND WIRE DOWN TO ANTENNA BUSSBAR.
C. PROVIDE GROUNDING ELECTRODES IN QUANTITY, TYPE AND SIZE AS INDICATED ON SITE GROUNDING PLAN.
D. ADD COAX GROUND KIT CONNECTION TO BUSSBAR WHEN LENGTH OF COAX RUN (FROM EQUIPMENT TO ANTENNA) IS GREATER THAN 20'-0".
E. GROUND HCS BOX W/ #2AWG GROUNDING CONDUCTOR ATTACHED TO GOOD GROUND AS DIRECT AND SHORT AS POSSIBLE. USE GREEN STRANDED INSULATED CONDUCTOR TO CONNECT TO BUSSBAR/GROUND HALO OR BARE TINNED SOLID COPPER CONDUCTOR TO CONNECT TO GROUND RING.





TRUNK FIBER NOTES:
1. IN GENERAL THIS CABLE WILL HANDLE SIMILARLY TO ⅞" COAXIAL CABLE, AND SIMILAR INSTALLATION TECHNIQUES APPLY. ALL CABLES ARE INDIVIDUALLY SERIALIZED, BE SURE TO WRITE DOWN THE CABLE SERIAL NUMBER FOR FUTURE REFERENCE.
2. THE TERMINATED FIBER ENDS (THE BROKEN OUT FIBERS PLUS CONNECTORS) HOWEVER ARE FRAGILE, AND THESE MUST BE PROTECTED DURING THE INSTALLATION PROCESS.
3. LEAVE THE PROTECTIVE TUBE AND SOCK AROUND THE FIBER TAILS AND CONNECTORS IN PLACE DURING HOISTING AND SECURING THE CABLE. REMOVE THIS ONLY JUST PRIOR TO MAKING THE FINAL CONNECTIONS TO THE OVP BOX.
4. DO NOT BEND THE FIBER ENDS (IN THE ORANGE FURCATION TUBES) TIGHTER THAN ¾" (19MM) BEND RADIUS, ELSE THERE IS A RISK OF BREAKING THE GLASS FIBERS.
5. BE SURE THAT THE LACE UP ENDS AND FIBER CONNECTORS ARE NOT DAMAGED BY ATTACHMENT OF A HOISTING GRIP OR DURING THE HOISTING PROCESS. ATTACH A HOISTING GRIP ON THE JACKETED CABLE NO LESS THAN 6 INCHES BELOW THE FIBER BREAKOUT POINT. IF A HOISTING GRIP IS NOT EASILY ATTACHED, USE A SIMPLE LINE ATTACHED BELOW THE FIBER BREAK-OUT POINT (I.E. AT THE CABLE OUTER JACKET). PREVENT THE FIBER TAILS (IN PROTECTIVE TUBE) AT THE CABLE END FROM UNDUE MOVEMENT DURING HOISTING BY SECURING THE PROTECTIVE TUBE (WITH OUTER SOCK) TO THE HOISTING LINE.
6. DURING HOISTING ENSURE THAT THERE IS A FREE PATH AND THAT THE CABLE, AND ESPECIALLY THE FIBER ENDS, WILL NOT BE SNAGGED ON TOWER MEMBERS OR OTHER OBSTACLES.
7. INSTALLATION TEMPERATURE RANGE IS -22F TO 158F (-30C TO +70C).
8. MINIMUM CABLE BEND RADII ARE 22.2" (565MM) LOADED (WITH TENSION ON THE CABLE) AND 11.1" (280MM) UNLOADED.
9. MAXIMUM CABLE TENSILE LOAD IS 3560 N (800 LB) SHORT TERM (DURING INSTALLATION) AND 1070 N (240 LB) LONG TERM.
10. COMMSCOPE NON LACE UP GRIP RECOMMENDED FOR MONOPOLE INSTALLATIONS.
11. MAXIMUM HANGER SPACING 3FT (0.9 M).

HYBRID FIBER/POWER JUMPER NOTES:
1. IN GENERAL THIS CABLE WILL HANDLE SIMILARLY TO A ⅜" COAXIAL CABLE.
2. THE TERMINATED FIBER ENDS HOWEVER ARE FRAGILE AND MUST BE PROTECTED DURING INSTALLATION. LEAVE THE PACKAGING AROUND THE FIBER ENDS IN PLACE UNTIL READY TO CONNECT THE JUMPER BETWEEN OVP AND RRU OR BBU.
3. DO NOT BEND THE FIBER BREAKOUT CABLE (BETWEEN THE MAIN CABLE AND THE FIBER CONNECTOR) TIGHTER THAN ¾" (19MM) RADIUS, ELSE THERE IS A RISK OF BREAKING THE GLASS.
4. ATTACH THE MAIN CABLE SECURELY TO THE STRUCTURE OR EQUIPMENT USING HANGERS AND/OR CABLE TIES TO PREVENT STRAIN ON CONNECTIONS FROM MOVEMENT IN WIND OR SNOW/ICE CONDITIONS.
5. ENSURE THE LC FIBER CONNECTORS ARE SEATED FIRMLY IN PANEL IN OVP OR IN EQUIPMENT.
6. INSTALLATION TEMPERATURE RANGE IS -22F TO 158F (-30C TO 70C).
7. MINIMUM CABLE BEND RADII ARE 10.3 INCH (265MM) LOADED (WITH TENSION ON THE CABLE) AND 5.2 INCH (130MM) UNLOADED.
8. MAXIMUM CABLE TENSILE LOAD IS 350 LB (1560N) SHORT TERM (DURING INSTALLATION) AND 105 LB (470N) LONG TERM.
9. STANDARD LENGTHS AVAILABLE ARE 6 FEET, 15 FEET AND 20 FEET

704BU CONFIGURATION
COAX/FIBER PLUMBING DIAGRAM

2
E-1

SCALE: N.T.S

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Fax: 617-213-5056

SUBMITTALS

DATE	DESCRIPTION	REVISION
02/27/15	ISSUED FOR REVIEW	A
03/20/15	REVISION	0
05/07/15	REVISION	1
05/11/15	REVISION	2

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

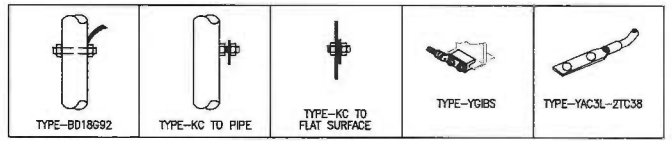
PROJECT NO:	CTFF001A
DRAWN BY:	EB
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NUMBER
CTFF001A
SITE NAME
GREENWICH HOSPITAL
SITE ADDRESS
5 PERRYRIDGE ROAD
GREENWICH ,CT 06830

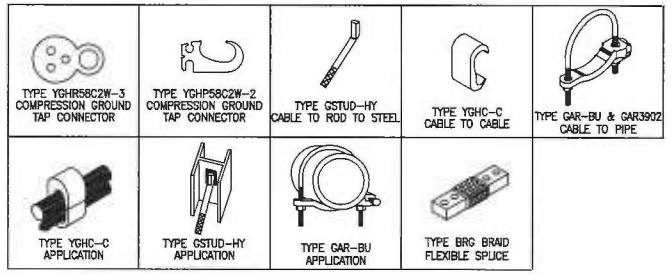
SHEET TITLE
GROUNDING DIAGRAM AND POWER ONE LINE DIAGRAM

SHEET NUMBER
E-1



BURNDY GROUNDING DETAILS (1 / E-2)

SCALE: N.T.S



BURNDY GROUNDING PRODUCTS (2 / E-2)

SCALE: N.T.S

CADWELD GROUNDING CONNECTION PRODUCTS (3 / E-2)

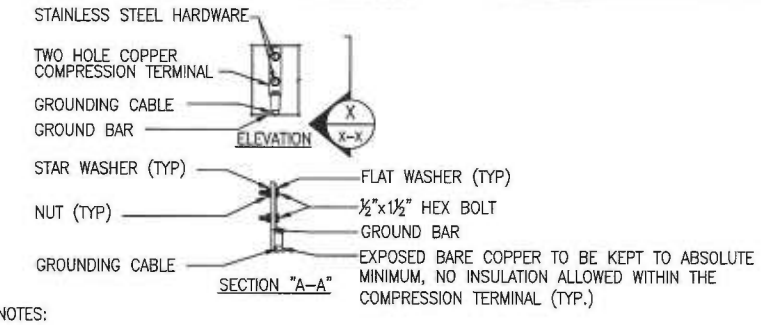
SCALE: N.T.S

TERMINATION TYPES:
A. MECHANICAL COMPRESSION LUG
B. DOUBLE BARRELL COMPRESSION CONNECTOR
C. EXOTHERMIC TERMINATION
D. BEAM CLAMP

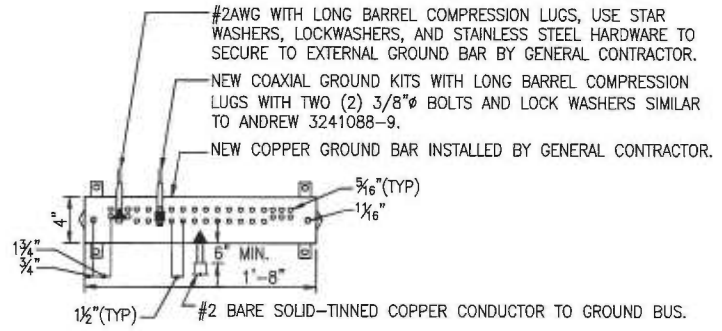
	SOLID #2 TINNED COPPER	#6 GROUND LEAD	#2/0 STRANDED MAIN DOWN CONDUCTOR	MASTER GRND BAR	STRUCTURAL OR TOWER STEEL	BLDG SERVICE ENTR OR GRND RING	GROUND ROD
SOLID #2 TINNED COPPER	B OR C	B OR C		C	A, C, OR D		C
#6 GROUND LEAD	B OR C			A	A, C, OR D		
#2/0 STRANDED GRNDG ELECTRODE CONDUCTOR				A	A, C, OR D	A	
MASTER GROUND BAR	C	A	A				
STRUCTURAL OR TOWER STEEL	A, C, OR D	A, C, OR D	A, C, OR D				
GROUND RING	C		C				C

GROUNDING TERMINATION MATRIX (7 / E-2)

SCALE: N.T.S



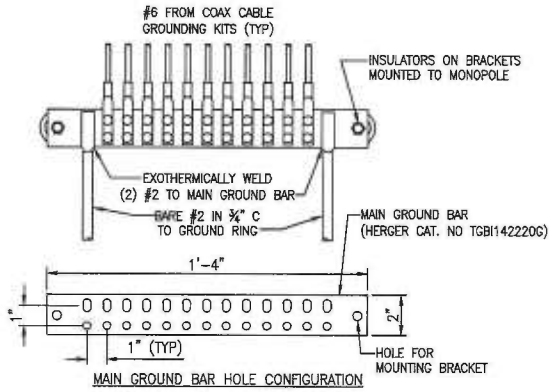
NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.



NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

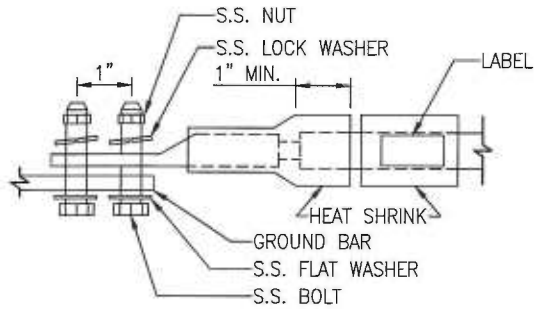
TYPICAL GROUND BAR CONNECTIONS DETAIL (4 / E-2)

SCALE: N.T.S



GROUND BAR DETAIL (5 / E-2)

SCALE: N.T.S



LUG NOTES:
1. ALL HARDWARE IS 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS.
2. ALL HARDWARE SHALL BE S.S. ⅜"ø OR LARGER.
3. FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN LUG AND STEEL. COAT ALL SURFACES WITH ANTI-OXIDIZATION COMPOUND PRIOR TO MATING.

GROUND BAR DETAIL (6 / E-2)

SCALE: N.T.S

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DEPT.	DATE	APP'D	REVISIONS
RFE			
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ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	CTFF001A
DRAWN BY:	EB
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NUMBER
CTFF001A
SITE NAME
GREENWICH HOSPITAL
SITE ADDRESS
5 PERRYRIDGE ROAD
GREENWICH ,CT 06830

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
E-2

EXHIBIT B

AECOM

Submitted to
Northeast Site Solutions
199 Brickyard Road
Farmington, CT 06032

Submitted by
AECOM
500 Enterprise Drive,
Suite 3B
Rocky Hill, CT 06067
May 4, 2015

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 164' MONOPOLE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

T-Mobile

Site ID : CTFF001A
Site Name: FF001/Greenwich Hospital
Site Address: 5 Perryridge Road
Greenwich, Connecticut

02162500.00000
NSS-027

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 164' steel tapered monopole structure, located at 5 Perryridge Road in Greenwich, Connecticut. The analysis was conducted in accordance with the 2005 Connecticut State Building Code which requires a three second gust wind speed of 100 mph which converts to an 80 mph fastest mile per 2003 IBC (Table 1609.3.1) and the TIA/EIA-222-F standard for a wind velocity of 85 mph (fastest mile). The wind speed from the TIA/EIA-222-F standard governs the design at 85 mph (fastest mile) and 74 mph (fastest mile) concurrent with ½" ice.

The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction Section of this report.

The proposed T-Mobile installation is as follows:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
Remove: **(4) RFS APX16DVW-16DWS Panel Antennas**	**T-Mobile (Existing)**	**@ 144'**
Install: **(3) Commscope LNX-6515DS-VTM Panel Antennas** **(3) TMA Units** **(3) Bias Tee Units** **(6) 1-5/8" Coaxial Cables**	**T-Mobile (Proposed)**	**@ 144'**

The results of the analysis indicate that the tower structure, anchor bolts, connecting base plate and caisson foundation have the capacity to support the proposed loading conditions. **The tower, base plate, anchor bolts, and its foundation are considered structurally adequate with the wind load classification specified above and the proposed antenna loading.**

The tower rotation (tilt) is 1.4564 with a wind velocity of 85 mph. The tower rotation (tilt) is within the allowable rotation as indicated from the original manufacturer design documentation. **The tower rotation (tilt) is within the parameters as indicated by the original manufacturer's design documentation.**

1. EXECUTIVE SUMMARY (Continued):

This analysis is based on:

1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Previous structural analysis performed by CHA on behalf of Clearwire, project number 20621-1037, signed and sealed December 29, 2009.
3) Previous structural analysis performed by Centek Engineering on behalf of AT&T, project number 11009.CO12, signed and sealed April 14, 2011.
4) Previous structural analysis performed by Tectonic on behalf of T-Mobile, project number 6203.CTFF001, signed and sealed June, 22, 2012.
5) Previous structural analysis performed by Infinigy on behalf of Sprint, project number 333-000, signed and sealed June 12, 2014.
6) Previous structural analysis performed by Centek Engineering on behalf of Verizon Wireless, project number 14067.063, signed and sealed December 15, 2014.
7) Proposed antenna inventory via T-Mobile Radio Frequency Data Sheet (RFDS), obtained via e-mail, dated February 23, 2015.
8) Previous structural analysis performed by AECOM on behalf of T-Mobile, project number 36931429.00002 / NSS-023, signed and sealed February 12, 2015.
9) Antenna and mount configuration as specified within Section 2 and 6 of this report.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration as well as the physical condition of the tower. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

AECOM, legacy URS Corporation AES,

Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/mcd

2. INTRODUCTION

The subject tower is located at 5 Perryridge Road in Greenwich, Connecticut. The structure is an existing 164' steel tapered monopole structure, designed by Engineered Endeavors Incorporated (EEI) project number 11030, dated August 21, 2002.

The inventory is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(1) 12-ft Omni Antenna (2) 10-ft Omni Antennas (1) 2' Square panel (1) Camera	Town (existing)	Low Profile Platform	164'	(6) 1/2" (inside) (1) 5/8" (inside) (3) 7/8" (inside) (2) 1-1/4" (inside)
(2) 4-ft Dishes w/ Shroud (1) 2-ft Dish w/ Shroud	Town (existing)	(3) 4'x4" Pipes mounted to Pole	160'	(3) 1-1/4" (inside)
(3) LLPX310R Panel Antennas (3) FDD-R6-RRH Units (2) Dragonwave Horizon ODU's (2) Dragonwave A-ANT-23-G-2-C Dishes w/ Shroud	Clearwire (existing)	Low Profile Platform (shared with Sprint)	154'	(2) 2" Rigid Conduits (inside) (2) 5/8" (inside)
(2) RFS APXVSPP18-C-A20 Panel Antennas (1) P40-16-XLPP-RR-A Panel Antennas (3) RFS APXVTM14 Panel Antennas (1) GPS Unit (3) 1900 MHz RRH Units (3) 800 MHz RRH Units (3) TD-RRH-8x20 RRH Units	Sprint (existing)	13' Low Profile Platform	154'	(6) 1-5/8" Hybriflex (inside) (1) ½" (inside)
(3) TMA Units **(3) LNX-6515DS-VTM Panel Antennas** **(3) Bias Tee Units**	**T-Mobile (Proposed)**	*See Below Mount*	**144'**	**(6) 1-5/8" (Outside)**
(3) APX16PV-16PVL-C Panel Antennas (6) TMA Units	T-Mobile (existing)	13' Low Profile Platform	144'	(12) 1-5/8" (inside)
(6) Ericsson RRUS-11 Units (1) DC6-48-60-18-8F Surge Suppressor	AT&T (existing)	Ring Mount on Pole	138'	(1) Fiber Cable (inside) (2) DC Cables (inside)
(6) Powerwave 7770 Panel Antennas (3) Powerwave P65-16-XLH-RR Panel Antennas (6) LGP21401 TMA Units (6) LGP21901 Diplexer Units	AT&T (existing)	13' Low Profile Platform	134'	(12) 1-5/8" (inside)

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(6) DB844H65E-XY Panel Antennas (3) Rymsa MG D3-800T0 Panel Antennas (3) AWS RRH Units (3) RRH2x40-07-U RRH Units (1) RC2DC-3315-PF-48 Distribution Box (6) FD9R6004/2C-3L Diplexer Units	Verizon (Existing)	13' Low Profile Platform	124'	(6) 1-5/8" (inside) (1) 1-5/8" Hybrid (inside)
(2) DB586-Y (1 inverted) (1) Telewae ANT150F2 (1) Comprod 731-50HD Whip	Eversource (existing)	13' Low Profile Platform	114'	(2) 1-5/8" (inside) (2) 7/8" (inside)
(3) GPS units	Unknown (existing)	(3) Stand-off Frames on Pole	50'	(3) 7/8" (Outside)

This structural analysis of the communications tower was performed by AECOM for T-Mobile. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing and proposed antenna loads. This analysis was conducted to evaluate stress on the tower and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was conducted in accordance with the 2005 Connecticut State Building Code, TIA/EIA-222-F - Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction - Allowable Stress Design (ASD).

The analysis was conducted using TNX Tower 6.1.3.1. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 85 mph (fastest mile) Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 74 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

Please note that wind pressure is a function of velocity squared. Under Load Condition 2, a 25 percent reduction in wind pressure is allowed by code to account for the unlikelihood of the full wind pressure and ice load occurring at the same time. The same results may be achieved by utilizing a lower wind pressure without taking the 25 percent reduction, as shown above.

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For the purposes of this analysis, in computing the load capacity the allowable stresses of the tower members were increased by one-third.

4. FINDINGS AND EVALUATION

Combined axial and bending stresses on the monopole structure were evaluated to compare with allowable stresses in accordance with AISC. The calculated stresses under the proposed loading were below the allowable stresses (see table below). Detailed analysis and calculations for the proposed load condition are provided in section 6 of this report. Additionally, the anchor bolts, base plate and foundation were found to be within the allowable limits.

Tower Component Stress vs. Capacity Summary

Component (Section No.)	Controlling Component / Elevation	Stress Ratio (% capacity)	Pass/Fail	Notes:
Pole Shaft (L1)	TP53.42x47x0.3125 / 164' – 131.5'	14.2 %	Pass	
Pole Shaft (L2)	TP56.15x53.42x0.375 / 131.5' – 117.83'	15.3 %	Pass	
Pole Shaft (L3)	TP62.97x54.2018x0.4375 / 117.83' – 77.33'	32.4 %	Pass	
Pole Shaft (L4)	TP69.66x60.5073x0.5625 / 77.33' – 38.42'	37.3 %	Pass	
Pole Shaft (L5)	TP76x66.7462x0.5625 / 38.2' – 0'	49.0 %	Pass	
Anchor Bolts	Compression	50 %	Pass	
Base Plate	Bending (92" dia x 3" thick – A572 Gr- 60)	39 %	Pass	

Foundation Summary

Foundation	Component	Stress (% capacity / FOS)	Pass/Fail	Comments:
Drilled Concrete Caisson	Uplift/Overturn	89 % / 2.24	Pass	Min. F.O.S of 2.0 req'd per IBC 2003 Section 3108.4.2

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicate that the tower structure, anchor bolts, connecting base plate and caisson foundation have the capacity to support the proposed loading conditions. **The tower, base plate, anchor bolts, and its foundation are considered structurally adequate with the wind load classification specified above and the proposed antenna loading.**

The tower rotation (twist) is 1.4564 with a wind velocity of 85 mph. The tower rotation (twist) is within the allowable rotation as indicated from the original manufacturer design documentation. **The tower rotation (twist) is within the parameters as indicated by the original manufacturer's design documentation.**

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations are in good condition without defect and were properly constructed to support original design loads as specified in the original design documents.
10. All coaxial cable is installed within the monopole unless specified otherwise.

AECOM is not responsible for any modifications completed prior to or hereafter in which AECOM is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

AECOM hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact AECOM. AECOM disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

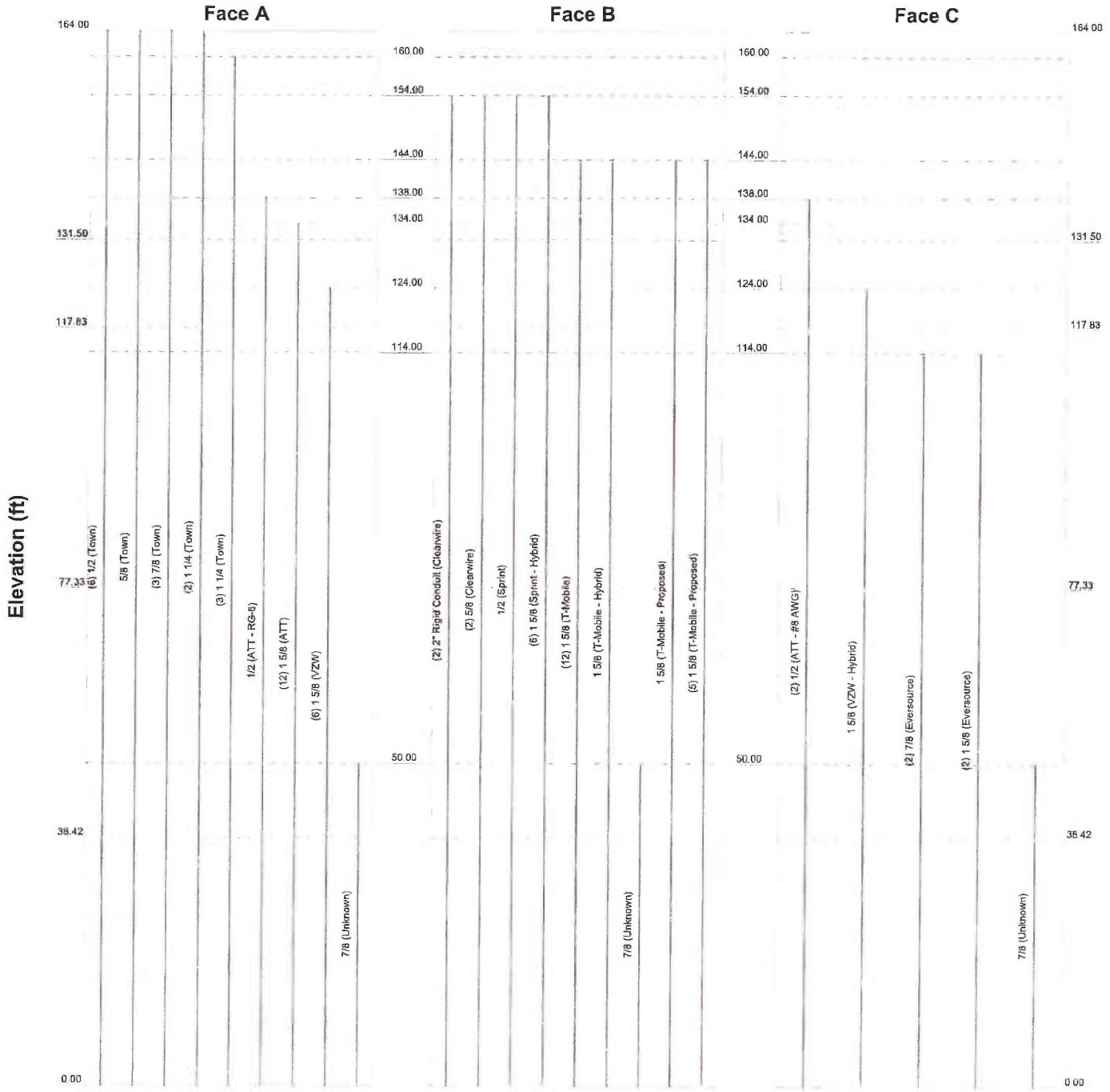
6. DRAWINGS AND DATA

TNX TOWER INPUT/OUTPUT SUMMARY

TNX TOWER FEEDLINE DISTRIBUTION CHART

Feed Line Distribution Chart
0' - 164'

Round Flat App In Face App Out Face Truss Leg



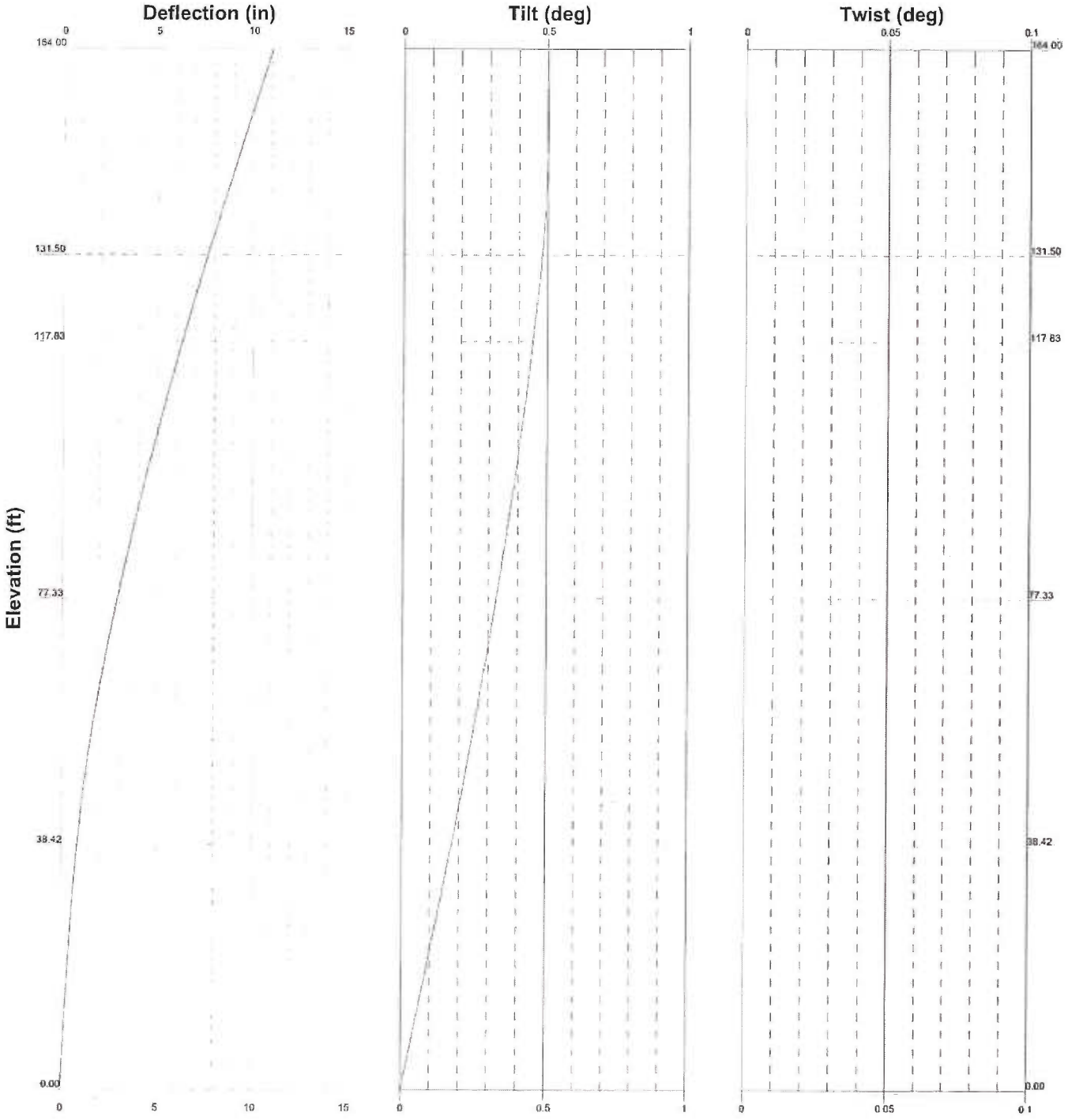
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	***Greenwich Hospital / 164' Monopole***
Project:	***Greenwich, CT***
Client:	Northeast Site Solutions / NSS-027
Drawn by:	MCD
App'd:	
Code:	TIA/EIA-222-F
Date:	05/04/15
Scale:	NTS
Path:	
Dwg No.	E-7

TNX TOWER TOWER DEFLECTION, TILT, AND TWIST

TIA/EIA-222-F - Service - 50 mph

Maximum Values



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Drawn by:	MCD
App'd:	
Code:	TIA/EIA-222-F
Date:	05/04/15
Scale:	NTS
Path:	
Dwg No	E-5

TNX TOWER DETAILED OUTPUT

Tower Input Data

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

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	164.00-131.50	32.50	0.00	18	47.0000	53.4200	0.3125	1.2500	A572-65 (65 ksi)
L2	131.50-117.83	13.67	6.00	18	53.4200	56.1500	0.3750	1.5000	A572-65 (65 ksi)
L3	117.83-77.33	46.50	8.42	18	54.2018	62.9700	0.4375	1.7500	A572-65 (65 ksi)
L4	77.33-38.42	47.33	9.25	18	60.5073	69.6600	0.5625	2.2500	A572-65 (65 ksi)
L5	38.42-0.00	47.67		18	66.7462	76.0000	0.5625	2.2500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	47.7251	46.3082	12752.5270	16.5741	23.8760	534.1149	25521.8341	23.1585	7.7220	24.71
	54.2441	52.6760	18769.9004	18.8532	27.1374	691.6627	37564.4987	26.3430	8.8519	28.326
L2	54.2441	63.1368	22444.4518	18.8310	27.1374	827.0684	44918.4365	31.5744	8.7419	23.312
	57.0162	66.3862	26091.2194	19.8001	28.5242	914.7047	52216.7704	33.1994	9.2224	24.593
L3	56.1867	74.6584	27264.8650	19.0863	27.5345	990.2077	54565.6057	37.3363	8.7695	20.045
	63.9414	86.8342	42898.2727	22.1990	31.9888	1341.0421	85852.9920	43.4253	10.3127	23.572
L4	63.0941	107.0239	48587.1232	21.2804	30.7377	1580.7012	97238.1785	53.5221	9.6593	17.172
	70.7346	123.3649	74413.8720	24.5296	35.3873	2102.8424	148925.6597	61.6942	11.2702	20.036
L5	69.5992	118.1628	65391.3915	23.4952	33.9071	1928.5466	130868.8266	59.0926	10.7573	19.124
	77.1724	134.6842	96834.1984	26.7803	38.6080	2508.1382	193795.8137	67.3549	12.3860	22.02

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 164.00-131.50				1	1	1		
L2 131.50-117.83				1	1	1		
L3 117.83-77.33				1	1	1		
L4 77.33-38.42				1	1	1		
L5 38.42-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1/2 (Town)	A	No	Inside Pole	0.00 - 164.00	6	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
5/8 (Town)	A	No	Inside Pole	0.00 - 164.00	1	No Ice	0.00	0.40
						1/2" Ice	0.00	0.40
7/8 (Town)	A	No	Inside Pole	0.00 - 164.00	3	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
1 1/4 (Town)	A	No	Inside Pole	0.00 - 164.00	2	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
1 1/4 (Town)	A	No	Inside Pole	0.00 - 160.00	3	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
2" Rigid Conduit (Clearwire)	B	No	Inside Pole	0.00 - 154.00	2	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
5/8 (Clearwire)	B	No	Inside Pole	0.00 - 154.00	2	No Ice	0.00	0.40
						1/2" Ice	0.00	0.40
1/2 (Sprint)	B	No	Inside Pole	0.00 - 154.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
1 5/8	B	No	Inside Pole	0.00 - 154.00	6	No Ice	0.00	1.04

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
(Sprint - Hybrid)						1/2" Ice	0.00	1.04
1 5/8	B	No	Inside Pole	0.00 - 144.00	12	No Ice	0.00	1.04
(T-Mobile)						1/2" Ice	0.00	1.04
1 5/8	B	No	Inside Pole	0.00 - 144.00	1	No Ice	0.00	1.04
(T-Mobile - Hybrid)						1/2" Ice	0.00	1.04
1/2	A	No	Inside Pole	0.00 - 138.00	1	No Ice	0.00	0.25
(ATT - RG-6)						1/2" Ice	0.00	0.25
1/2	C	No	Inside Pole	0.00 - 138.00	2	No Ice	0.00	0.25
(ATT - #8 AWG)						1/2" Ice	0.00	0.25
1 5/8	A	No	Inside Pole	0.00 - 134.00	12	No Ice	0.00	1.04
(ATT)						1/2" Ice	0.00	1.04
1 5/8	A	No	Inside Pole	0.00 - 124.00	6	No Ice	0.00	1.04
(VZW)						1/2" Ice	0.00	1.04
1 5/8	C	No	Inside Pole	0.00 - 124.00	1	No Ice	0.00	1.04
(VZW - Hybrid)						1/2" Ice	0.00	1.04
7/8	C	No	Inside Pole	0.00 - 114.00	2	No Ice	0.00	0.54
(Eversource)						1/2" Ice	0.00	0.54
1 5/8	C	No	Inside Pole	0.00 - 114.00	2	No Ice	0.00	1.04
(Eversource)						1/2" Ice	0.00	1.04
7/8	A	No	CaAa (Out Of Face)	0.00 - 50.00	1	No Ice	0.11	0.54
(Unknown)						1/2" Ice	0.21	1.52
7/8	B	No	CaAa (Out Of Face)	0.00 - 50.00	1	No Ice	0.11	0.54
(Unknown)						1/2" Ice	0.21	1.52
7/8	C	No	CaAa (Out Of Face)	0.00 - 50.00	1	No Ice	0.11	0.54
(Unknown)						1/2" Ice	0.21	1.52
1 5/8	B	No	CaAa (Out Of Face)	0.00 - 144.00	1	No Ice	0.20	1.04
(T-Mobile - Proposed)						1/2" Ice	0.30	2.55
1 5/8	B	No	CaAa (Out Of Face)	0.00 - 144.00	5	No Ice	0.00	1.04
(T-Mobile - Proposed)						1/2" Ice	0.00	2.55

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 lb
L1	164.00-131.50	A	0.000	0.000	0.000	0.000	246.555
		B	0.000	0.000	0.000	2.475	537.025
		C	0.000	0.000	0.000	0.000	3.250
L2	131.50-117.83	A	0.000	0.000	0.000	0.000	305.749
		B	0.000	0.000	0.000	2.707	446.325
		C	0.000	0.000	0.000	0.000	13.252
L3	117.83-77.33	A	0.000	0.000	0.000	0.000	1044.495
		B	0.000	0.000	0.000	8.019	1322.325
		C	0.000	0.000	0.000	0.000	178.247
L4	77.33-38.42	A	0.000	0.000	0.000	1.285	1009.742
		B	0.000	0.000	0.000	8.990	1276.665
		C	0.000	0.000	0.000	1.285	189.130
L5	38.42-0.00	A	0.000	0.000	0.000	4.265	1011.599
		B	0.000	0.000	0.000	11.872	1275.160
		C	0.000	0.000	0.000	4.265	201.321

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 lb
L1	164.00-131.50	A	0.500	0.000	0.000	0.000	0.000	246.555
		B		0.000	0.000	0.000	3.725	650.275
		C		0.000	0.000	0.000	0.000	3.250
L2	131.50-117.83	A	0.500	0.000	0.000	0.000	0.000	305.749
		B		0.000	0.000	0.000	4.074	570.176
		C		0.000	0.000	0.000	0.000	13.252
L3	117.83-77.33	A	0.500	0.000	0.000	0.000	0.000	1044.495
		B		0.000	0.000	0.000	12.069	1689.255
		C		0.000	0.000	0.000	0.000	178.247
L4	77.33-38.42	A	0.500	0.000	0.000	0.000	2.443	1021.091
		B		0.000	0.000	0.000	14.038	1640.538
		C		0.000	0.000	0.000	2.443	200.479
L5	38.42-0.00	A	0.500	0.000	0.000	0.000	8.106	1049.250
		B		0.000	0.000	0.000	19.555	1660.897
		C		0.000	0.000	0.000	8.106	238.972

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	164.00-131.50	0.1010	0.0583	0.1478	0.0853
L2	131.50-117.83	0.2465	0.1423	0.3573	0.2063
L3	117.83-77.33	0.2473	0.1428	0.3593	0.2074
L4	77.33-38.42	0.2440	0.1409	0.3507	0.2025
L5	38.42-0.00	0.2364	0.1365	0.3313	0.1913

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
4'x4" Pipe Mount (Town)	A	From Face	0.50 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	1.32 1.58	1.32 1.58	40.000 60.000
4'x4" Pipe Mount (Town)	B	From Face	0.50 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	1.32 1.58	1.32 1.58	40.000 60.000
4'x4" Pipe Mount (Town)	C	From Face	0.50 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	1.32 1.58	1.32 1.58	40.000 60.000
12' Omni (Town)	A	From Face	4.00 -4.00 0.00	0.0000	164.00	No Ice 1/2" Ice	3.39 4.66	3.39 4.66	35.000 59.843
2" Dia 8' Omni (Town)	A	From Face	4.00 4.00 0.00	0.0000	164.00	No Ice 1/2" Ice	2.00 3.03	2.00 3.03	5.000 18.000
2'x2' Flat Panel	B	From Face	4.00	0.0000	164.00	No Ice	5.60	0.72	20.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Town)			4.00 0.00			1/2" Ice	5.92	0.88	50.000
2" Dia 10' Omni	B	From Face	4.00	0.0000	164.00	No Ice	2.00	2.00	10.000
(Town)			-4.00 0.00			1/2" Ice	3.03	3.03	25.000
2" Dia 10' Omni	A	From Face	4.00	0.0000	164.00	No Ice	2.00	2.00	10.000
(Town)			0.00 0.00			1/2" Ice	3.03	3.03	25.000
2" Dia 8' Omni	A	From Face	4.00	0.0000	164.00	No Ice	2.00	2.00	5.000
(Town)			-4.00 0.00			1/2" Ice	3.03	3.03	18.000
Camera	C	From Face	4.00	0.0000	164.00	No Ice	3.00	3.00	100.000
(Town)			0.00 0.00			1/2" Ice	4.00	4.00	150.000
PiROD 13' Low Profile Platform	C	None		0.0000	164.00	No Ice	15.70	15.70	1300.000
(Town)						1/2" Ice	20.10	20.10	1765.000
FD R6-RRH Unit	A	From Face	3.00	0.0000	154.00	No Ice	1.80	0.78	30.000
(Clearwire)			0.00 0.00			1/2" Ice	1.99	0.92	50.000
FD R6-RRH Unit	B	From Face	3.00	0.0000	154.00	No Ice	1.80	0.78	30.000
(Clearwire)			0.00 0.00			1/2" Ice	1.99	0.92	50.000
FD R6-RRH Unit	C	From Face	3.00	0.0000	154.00	No Ice	1.80	0.78	30.000
(Clearwire)			0.00 0.00			1/2" Ice	1.99	0.92	50.000
Horizon ODU Unit	A	None		0.0000	154.00	No Ice	0.79	0.17	10.000
(Clearwire)						1/2" Ice	0.91	0.25	20.000
Horizon ODU Unit	C	None		0.0000	154.00	No Ice	0.79	0.17	10.000
(Clearwire)						1/2" Ice	0.91	0.25	20.000
APXVSPP18-C-A20	A	From Face	4.00	0.0000	154.00	No Ice	8.26	5.28	60.000
(Sprint)			0.00 0.00			1/2" Ice	8.81	5.74	109.519
P40-16-XLPP-RR-A	B	From Face	4.00	0.0000	154.00	No Ice	10.50	3.52	50.000
(Sprint)			0.00 0.00			1/2" Ice	10.98	3.87	110.000
APXVSPP18-C-A20	C	From Face	4.00	0.0000	154.00	No Ice	8.26	5.28	60.000
(Sprint)			0.00 0.00			1/2" Ice	8.81	5.74	109.519
FD-RRH 4x45 1900 MHz	A	From Face	4.00	0.0000	154.00	No Ice	2.71	2.78	60.000
(Sprint)			0.00 0.00			1/2" Ice	2.94	3.02	110.000
FD-RRH 4x45 1900 MHz	B	From Face	4.00	0.0000	154.00	No Ice	2.71	2.78	60.000
(Sprint)			0.00 0.00			1/2" Ice	2.94	3.02	110.000
FD-RRH 4x45 1900 MHz	C	From Face	4.00	0.0000	154.00	No Ice	2.71	2.78	60.000
(Sprint)			0.00 0.00			1/2" Ice	2.94	3.02	110.000
FD-RRH 4x50 800 MHz	A	From Face	4.00	0.0000	154.00	No Ice	2.40	2.25	60.000
(Sprint)			0.00 0.00			1/2" Ice	2.61	2.46	90.000
FD-RRH 4x50 800 MHz	B	From Face	4.00	0.0000	154.00	No Ice	2.40	2.25	60.000
(Sprint)			0.00 0.00			1/2" Ice	2.61	2.46	90.000
FD-RRH 4x50 800 MHz	C	From Face	4.00	0.0000	154.00	No Ice	2.40	2.25	60.000
(Sprint)			0.00 0.00			1/2" Ice	2.61	2.46	90.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
PiROD 13' Low Profile Platform (Sprint/Clearwire)	C	None		0.0000	154.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1300.000 1765.000
LLPX310R (Clearwire)	A	From Face	3.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	4.97 5.35	2.83 3.34	44.600 81.328
LLPX310R (Clearwire)	B	From Face	3.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	4.97 5.35	2.83 3.34	44.600 81.328
LLPX310R (Clearwire)	C	From Face	3.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	4.97 5.35	2.83 3.34	44.600 81.328
GPS Unit (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.000 15.000
GPS Mount (Sprint)	C	None		0.0000	154.00	No Ice 1/2" Ice	1.75 1.94	1.75 1.94	290.000 310.000
APXVTM14 (Sprint)	A	From Face	4.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	6.90 7.35	3.61 3.97	60.000 100.000
APXVTM14 (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	6.90 7.35	3.61 3.97	60.000 100.000
APXVTM14 (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	6.90 7.35	3.61 3.97	60.000 100.000
TD-RRH8x20-25 (Sprint)	A	From Face	4.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	4.72 5.01	1.70 1.92	70.000 100.000
TD-RRH8x20-25 (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	4.72 5.01	1.70 1.92	70.000 100.000
TD-RRH8x20-25 (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	4.72 5.01	1.70 1.92	70.000 100.000
(2) RRUS-11 (ATT)	A	From Face	0.50 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	50.000 69.573
(2) RRUS-11 (ATT)	B	From Face	0.50 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	50.000 69.573
(2) RRUS-11 (ATT)	C	From Face	0.50 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	50.000 69.573
DC6-48-60-18-8F Surge Suppressor (ATT)	C	From Face	0.50 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice	0.00 0.00	0.00 0.00	0.000 0.000
Valmont Light Duty Tri-Bracket (1) (ATT)	C	None		0.0000	138.00	No Ice 1/2" Ice	1.76 2.08	1.76 2.08	54.000 70.000
7770.00 (ATT)	A	From Face	3.00 3.00 0.00	0.0000	134.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	35.000 67.634
7770.00 (ATT)	A	From Face	3.00 -3.00 0.00	0.0000	134.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	35.000 67.634
7770.00	B	From Face	3.00	0.0000	134.00	No Ice	5.88	2.93	35.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(ATT)			3.00 0.00			1/2" Ice	6.31	3.27	67.634
7770.00	B	From Face	3.00	0.0000	134.00	No Ice	5.88	2.93	35.000
(ATT)			-3.00 0.00			1/2" Ice	6.31	3.27	67.634
7770.00	C	From Face	3.00	0.0000	134.00	No Ice	5.88	2.93	35.000
(ATT)			3.00 0.00			1/2" Ice	6.31	3.27	67.634
7770.00	C	From Face	3.00	0.0000	134.00	No Ice	5.88	2.93	35.000
(ATT)			-3.00 0.00			1/2" Ice	6.31	3.27	67.634
P65-16-XLH-RR	A	From Face	3.00	0.0000	134.00	No Ice	8.40	6.13	71.900
(ATT)			0.00 0.00			1/2" Ice	8.95	7.07	135.069
P65-16-XLH-RR	B	From Face	3.00	0.0000	134.00	No Ice	8.40	6.13	71.900
(ATT)			0.00 0.00			1/2" Ice	8.95	7.07	135.069
P65-16-XLH-RR	C	From Face	3.00	0.0000	134.00	No Ice	8.40	6.13	71.900
(ATT)			0.00 0.00			1/2" Ice	8.95	7.07	135.069
(2) LGP214## TMA	A	From Face	3.00	0.0000	134.00	No Ice	1.29	0.23	14.100
(ATT)			0.00 0.00			1/2" Ice	1.45	0.31	21.263
(2) LGP214## TMA	B	From Face	3.00	0.0000	134.00	No Ice	1.29	0.23	14.100
(ATT)			0.00 0.00			1/2" Ice	1.45	0.31	21.263
(2) LGP214## TMA	C	From Face	3.00	0.0000	134.00	No Ice	1.29	0.23	14.100
(ATT)			0.00 0.00			1/2" Ice	1.45	0.31	21.263
(2) LGP219## Diplexer	A	From Face	3.00	0.0000	134.00	No Ice	0.23	0.12	5.500
(ATT)			0.00 0.00			1/2" Ice	0.30	0.17	7.704
(2) LGP219## Diplexer	B	From Face	3.00	0.0000	134.00	No Ice	0.23	0.12	5.500
(ATT)			0.00 0.00			1/2" Ice	0.30	0.17	7.704
(2) LGP219## Diplexer	C	From Face	3.00	0.0000	134.00	No Ice	0.23	0.12	5.500
(ATT)			0.00 0.00			1/2" Ice	0.30	0.17	7.704
PiROD 13' Low Profile Platform	C	None		0.0000	134.00	No Ice	15.70	15.70	1300.000
(ATT)						1/2" Ice	20.10	20.10	1765.000
DB844H65E-XY w/Mount Pipe	A	From Face	4.00	0.0000	124.00	No Ice	3.58	5.86	35.550
(Verizon)			6.00 0.00			1/2" Ice	4.20	6.96	81.200
HBXX-6517DS-VTM	A	From Face	4.00	0.0000	124.00	No Ice	8.74	5.24	43.000
(Verizon)			2.00 0.00			1/2" Ice	9.31	5.71	93.492
LNX-6514DS-VTM	A	From Face	4.00	0.0000	124.00	No Ice	8.41	5.41	31.300
(Verizon)			0.00 0.00			1/2" Ice	8.96	5.86	81.807
MGD3-800TX	A	From Face	4.00	0.0000	124.00	No Ice	3.37	3.56	38.250
(Verizon)			-2.00 0.00			1/2" Ice	3.74	4.19	71.559
DB844H65E-XY w/Mount Pipe	A	From Face	4.00	0.0000	124.00	No Ice	3.58	5.86	35.550
(Verizon)			-6.00 0.00			1/2" Ice	4.20	6.96	81.200
DB844H65E-XY w/Mount	B	From Face	4.00	0.0000	124.00	No Ice	3.58	5.86	35.550

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Pipe			6.00			1/2" Ice	4.20	6.96	81.200
(Verizon)			0.00						
HBXX-6517DS-VTM	B	From Face	4.00	0.0000	124.00	No Ice	8.74	5.24	43.000
(Verizon)			2.00			1/2" Ice	9.31	5.71	93.492
			0.00						
LNX-6514DS-VTM	B	From Face	4.00	0.0000	124.00	No Ice	8.41	5.41	31.300
(Verizon)			0.00			1/2" Ice	8.96	5.86	81.807
			0.00						
MGD3-800TX	B	From Face	4.00	0.0000	124.00	No Ice	3.37	3.56	38.250
(Verizon)			-2.00			1/2" Ice	3.74	4.19	71.559
			0.00						
DB844H65E-XY w/Mount	B	From Face	4.00	0.0000	124.00	No Ice	3.58	5.86	35.550
Pipe			-6.00			1/2" Ice	4.20	6.96	81.200
(Verizon)			0.00						
DB844H65E-XY w/Mount	C	From Face	4.00	0.0000	124.00	No Ice	3.58	5.86	35.550
Pipe			6.00			1/2" Ice	4.20	6.96	81.200
(Verizon)			0.00						
HBXX-6517DS-VTM	C	From Face	4.00	0.0000	124.00	No Ice	8.74	5.24	43.000
(Verizon)			2.00			1/2" Ice	9.31	5.71	93.492
			0.00						
LNX-6514DS-VTM	C	From Face	4.00	0.0000	124.00	No Ice	8.41	5.41	31.300
(Verizon)			0.00			1/2" Ice	8.96	5.86	81.807
			0.00						
MGD3-800TX	C	From Face	4.00	0.0000	124.00	No Ice	3.37	3.56	38.250
(Verizon)			-2.00			1/2" Ice	3.74	4.19	71.559
			0.00						
DB844H65E-XY w/Mount	C	From Face	4.00	0.0000	124.00	No Ice	3.58	5.86	35.550
Pipe			-6.00			1/2" Ice	4.20	6.96	81.200
(Verizon)			0.00						
(2) FD9R6004/2C-3L	A	From Face	4.00	0.0000	124.00	No Ice	0.37	0.08	5.000
Diplexer			0.00			1/2" Ice	0.45	0.14	7.299
(Verizon)			0.00						
(2) FD9R6004/2C-3L	B	From Face	4.00	0.0000	124.00	No Ice	0.37	0.08	5.000
Diplexer			0.00			1/2" Ice	0.45	0.14	7.299
(Verizon)			0.00						
(2) FD9R6004/2C-3L	C	From Face	4.00	0.0000	124.00	No Ice	0.37	0.08	5.000
Diplexer			0.00			1/2" Ice	0.45	0.14	7.299
(Verizon)			0.00						
RRH_2x40-AWS	A	From Face	4.00	0.0000	124.00	No Ice	2.52	1.59	45.000
(Verizon)			0.00			1/2" Ice	2.75	1.80	62.396
			0.00						
RRH_2x40-AWS	B	From Face	4.00	0.0000	124.00	No Ice	2.52	1.59	45.000
(Verizon)			0.00			1/2" Ice	2.75	1.80	62.396
			0.00						
RRH_2x40-AWS	C	From Face	4.00	0.0000	124.00	No Ice	2.52	1.59	45.000
(Verizon)			0.00			1/2" Ice	2.75	1.80	62.396
			0.00						
RRH2x40-07-U	A	From Face	4.00	0.0000	124.00	No Ice	2.25	1.23	50.000
(Verizon)			0.00			1/2" Ice	2.45	1.39	66.848
			0.00						
RRH2x40-07-U	B	From Face	4.00	0.0000	124.00	No Ice	2.25	1.23	50.000
(Verizon)			0.00			1/2" Ice	2.45	1.39	66.848
			0.00						
RRH2x40-07-U	C	From Face	4.00	0.0000	124.00	No Ice	2.25	1.23	50.000
(Verizon)			0.00			1/2" Ice	2.45	1.39	66.848
			0.00						
RC2DC-3315-PF-48	C	From Face	4.00	0.0000	124.00	No Ice	2.90	1.58	26.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Distribution Box (Verizon)			0.00 0.00			1/2" Ice	3.16	1.75	57.468
PiROD 13' Low Profile Platform (Verizon)	C	None		0.0000	124.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1300.000 1765.000
3" Dia 20' Omni (Eversource)	B	From Face	3.00 0.00 0.00	0.0000	114.00	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	55.000 100.000
DB586-Y (Eversource)	B	From Face	3.00 0.00 2.00	0.0000	114.00	No Ice 1/2" Ice	1.01 1.28	1.01 1.28	8.250 16.589
DB586-Y (Eversource)	B	From Face	3.00 0.00 -2.00	0.0000	114.00	No Ice 1/2" Ice	1.01 1.28	1.01 1.28	8.250 16.589
ANT150F6 (Eversource)	B	From Face	3.00 0.00 0.00	0.0000	114.00	No Ice 1/2" Ice	4.80 6.83	4.80 6.83	30.000 65.724
PiROD 13' Low Profile Platform (Eversource)	C	None		0.0000	114.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1300.000 1765.000
GPS Unit	A	From Face	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.000 15.000
GPS Unit	B	From Face	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.000 15.000
GPS Unit	C	From Face	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.000 15.000
PiROD 13' Low Profile Platform (T-Mobile)	C	None		0.0000	144.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1300.000 1765.000
APX16PV-16PVL (T-Mobile)	A	From Face	3.00 6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	6.79 7.25	3.17 3.80	58.250 102.577
LNX-6515DS-VTM (T-Mobile)	A	From Leg	3.00 -6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	11.39 12.01	9.96 11.38	90.020 180.497
APX16PV-16PVL (T-Mobile)	B	From Face	3.00 6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	6.79 7.25	3.17 3.80	58.250 102.577
LNX-6515DS-VTM (T-Mobile)	B	From Leg	3.00 -6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	11.39 12.01	9.96 11.38	90.020 180.497
APX16PV-16PVL (T-Mobile)	C	From Face	3.00 6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	6.79 7.25	3.17 3.80	58.250 102.577
LNX-6515DS-VTM (T-Mobile)	C	From Leg	3.00 -6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	11.39 12.01	9.96 11.38	90.020 180.497
Ericsson TMA Unit (T-Mobile)	A	From Face	3.00 6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.69 0.81	0.66 0.86	19.473 28.287
Ericsson TMA Unit (T-Mobile)	A	From Face	3.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.69 0.81	0.66 0.86	19.473 28.287
Ericsson TMA Unit	A	From Face	3.00	0.0000	144.00	No Ice	0.69	0.66	19.473

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(T-Mobile)			-6.00 0.00			1/2" Ice	0.81	0.86	28.287
Ericsson TMA Unit (T-Mobile)	B	From Face	3.00 6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.69 0.81	0.66 0.86	19.473 28.287
Ericsson TMA Unit (T-Mobile)	B	From Face	3.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.69 0.81	0.66 0.86	19.473 28.287
Ericsson TMA Unit (T-Mobile)	B	From Face	3.00 -6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.69 0.81	0.66 0.86	19.473 28.287
Ericsson TMA Unit (T-Mobile)	C	From Face	3.00 6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.69 0.81	0.66 0.86	19.473 28.287
Ericsson TMA Unit (T-Mobile)	C	From Face	3.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.69 0.81	0.66 0.86	19.473 28.287
Ericsson TMA Unit (T-Mobile)	C	From Face	3.00 -6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.69 0.81	0.66 0.86	19.473 28.287
Bias-T Unit (T-Mobile)	A	From Face	3.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.08 0.12	0.07 0.11	1.500 2.481
Bias-T Unit (T-Mobile)	B	From Face	3.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.08 0.12	0.07 0.11	1.500 2.481
Bias-T Unit (T-Mobile)	C	From Face	3.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.08 0.12	0.07 0.11	1.500 2.481

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
Andrew 4' w/ Shroud	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		160.00	4.00	No Ice 1/2" Ice	12.57 13.10	140.000 282.000
Andrew 4' w/ Shroud	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		160.00	4.00	No Ice 1/2" Ice	12.57 13.10	140.000 282.000
Andrew 2' w/ Shroud	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		160.00	2.00	No Ice 1/2" Ice	3.14 3.41	70.000 282.000
A-Ant-23G-2-C /w Radome (Celwave)	A	Paraboloid w/Radome	From Leg	3.10 0.00 0.00	Worst		154.00	2.17	No Ice 1/2" Ice	3.70 3.99	30.000 50.482
A-Ant-23G-2-C /w Radome	C	Paraboloid w/Radome	From Leg	3.80 0.00	Worst		154.00	2.17	No Ice 1/2" Ice	3.70 3.99	30.000 50.482

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 ft²	Weight lb
(Celwave)				0.00						

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg % %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	147.53	1.534	28	135.985	A	0.000	135.985	135.985	100.00	0.000	0.000
164.00-131.50					B	0.000	135.985		100.00	0.000	2.475
					C	0.000	135.985		100.00	0.000	0.000
L2	124.61	1.462	27	62.409	A	0.000	62.409	62.409	100.00	0.000	0.000
131.50-117.83					B	0.000	62.409		100.00	0.000	2.707
					C	0.000	62.409		100.00	0.000	0.000
L3	97.45	1.363	25	199.637	A	0.000	199.637	199.637	100.00	0.000	0.000
117.83-77.33					B	0.000	199.637		100.00	0.000	8.019
					C	0.000	199.637		100.00	0.000	0.000
L4 77.33-38.42	57.98	1.175	22	213.674	A	0.000	213.674	213.674	100.00	0.000	1.285
					B	0.000	213.674		100.00	0.000	8.990
					C	0.000	213.674		100.00	0.000	1.285
L5 38.42-0.00	18.88	1	18	231.387	A	0.000	231.387	231.387	100.00	0.000	4.265
					B	0.000	231.387		100.00	0.000	11.872
					C	0.000	231.387		100.00	0.000	4.265

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg % %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	147.53	1.534	21	0.5000	138.694	A	0.000	138.694	138.694	100.00	0.000	0.000
164.00-131.50						B	0.000	138.694		100.00	0.000	3.725
						C	0.000	138.694		100.00	0.000	0.000
L2	124.61	1.462	20	0.5000	63.548	A	0.000	63.548	63.548	100.00	0.000	0.000
131.50-117.83						B	0.000	63.548		100.00	0.000	4.074
						C	0.000	63.548		100.00	0.000	0.000
L3 117.83-77.33	97.45	1.363	19	0.5000	203.012	A	0.000	203.012	203.012	100.00	0.000	0.000
						B	0.000	203.012		100.00	0.000	12.069
						C	0.000	203.012		100.00	0.000	0.000
L4 77.33-38.42	57.98	1.175	16	0.5000	216.916	A	0.000	216.916	216.916	100.00	0.000	2.443
						B	0.000	216.916		100.00	0.000	14.038
						C	0.000	216.916		100.00	0.000	2.443
L5 38.42-0.00	18.88	1	14	0.5000	234.589	A	0.000	234.589	234.589	100.00	0.000	8.106
						B	0.000	234.589		100.00	0.000	19.555
						C	0.000	234.589		100.00	0.000	8.106

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	147.53	1.534	10	135.985	A	0.000	135.985	135.985	100.00	0.000	0.000
164.00-131.50					B	0.000	135.985		100.00	0.000	2.475
					C	0.000	135.985		100.00	0.000	0.000
L2	124.61	1.462	9	62.409	A	0.000	62.409	62.409	100.00	0.000	0.000
131.50-117.83					B	0.000	62.409		100.00	0.000	2.707
					C	0.000	62.409		100.00	0.000	0.000
L3	97.45	1.363	9	199.637	A	0.000	199.637	199.637	100.00	0.000	0.000
117.83-77.33					B	0.000	199.637		100.00	0.000	8.019
					C	0.000	199.637		100.00	0.000	0.000
L4 77.33-38.42	57.98	1.175	7	213.674	A	0.000	213.674	213.674	100.00	0.000	1.285
					B	0.000	213.674		100.00	0.000	8.990
					C	0.000	213.674		100.00	0.000	1.285
L5 38.42-0.00	18.88	1	6	231.387	A	0.000	231.387	231.387	100.00	0.000	4.265
					B	0.000	231.387		100.00	0.000	11.872
					C	0.000	231.387		100.00	0.000	4.265

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl Face
L1	786.830	5473.366	A	1	0.65	1	1	1	135.985	4354.537	133.99	C
164.00-131.50			B	1	0.65	1	1	1	135.985			
			C	1	0.65	1	1	1	135.985			
L2	765.327	3012.457	A	1	0.65	1	1	1	62.409	1977.173	144.64	C
131.50-117.83			B	1	0.65	1	1	1	62.409			
			C	1	0.65	1	1	1	62.409			
L3	2545.067	12776.472	A	1	0.65	1	1	1	199.637	5856.670	144.61	C
117.83-77.33			B	1	0.65	1	1	1	199.637			
			C	1	0.65	1	1	1	199.637			
L4	2475.537	18552.542	A	1	0.65	1	1	1	213.674	5495.248	141.23	C
77.33-38.42			B	1	0.65	1	1	1	213.674			
			C	1	0.65	1	1	1	213.674			
L5 38.42-0.00	2488.079	20507.294	A	1	0.65	1	1	1	231.387	5338.996	138.96	C
			B	1	0.65	1	1	1	231.387			
			C	1	0.65	1	1	1	231.387			
Sum Weight:	9060.840	60322.130						OTM	22546851.16 lb-in	23022.625		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	786.830	5473.366	A	1	0.65	1	1	1	135.985	4354.537	133.99	C
164.00-131.50			B	1	0.65	1	1	1	135.985			
			C	1	0.65	1	1	1	135.985			
L2	765.327	3012.457	A	1	0.65	1	1	1	62.409	1977.173	144.64	C
131.50-117.83			B	1	0.65	1	1	1	62.409			
			C	1	0.65	1	1	1	62.409			
L3	2545.067	12776.472	A	1	0.65	1	1	1	199.637	5856.670	144.61	C
117.83-77.33			B	1	0.65	1	1	1	199.637			
			C	1	0.65	1	1	1	199.637			
L4	2475.537	18552.542	A	1	0.65	1	1	1	213.674	5495.248	141.23	C
77.33-38.42			B	1	0.65	1	1	1	213.674			
			C	1	0.65	1	1	1	213.674			
L5 38.42-0.00	2488.079	20507.294	A	1	0.65	1	1	1	231.387	5338.996	138.96	C
			B	1	0.65	1	1	1	231.387			
			C	1	0.65	1	1	1	231.387			
Sum Weight:	9060.840	60322.130						OTM	22546851.16 lb-in	23022.625		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	786.830	5473.366	A	1	0.65	1	1	1	135.985	4354.537	133.99	C
164.00-131.50			B	1	0.65	1	1	1	135.985			
			C	1	0.65	1	1	1	135.985			
L2	765.327	3012.457	A	1	0.65	1	1	1	62.409	1977.173	144.64	C
131.50-117.83			B	1	0.65	1	1	1	62.409			
			C	1	0.65	1	1	1	62.409			
L3	2545.067	12776.472	A	1	0.65	1	1	1	199.637	5856.670	144.61	C
117.83-77.33			B	1	0.65	1	1	1	199.637			
			C	1	0.65	1	1	1	199.637			
L4	2475.537	18552.542	A	1	0.65	1	1	1	213.674	5495.248	141.23	C
77.33-38.42			B	1	0.65	1	1	1	213.674			
			C	1	0.65	1	1	1	213.674			
L5 38.42-0.00	2488.079	20507.294	A	1	0.65	1	1	1	231.387	5338.996	138.96	C
			B	1	0.65	1	1	1	231.387			
			C	1	0.65	1	1	1	231.387			
Sum Weight:	9060.840	60322.130						OTM	22546851.16 lb-in	23022.625		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl Face
L1	786.830	5473.366	A	1	0.65	1	1	1	135.985	4354.537	133.99	C
164.00-131.50			B	1	0.65	1	1	1	135.985			
			C	1	0.65	1	1	1	135.985			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl Face
L2	765.327	3012.457	A	1	0.65	1	1	1	62.409	1977.173	144.64	C
131.50-117.83			B	1	0.65	1	1	1	62.409			
			C	1	0.65	1	1	1	62.409			
L3	2545.067	12776.472	A	1	0.65	1	1	1	199.637	5856.670	144.61	C
117.83-77.33			B	1	0.65	1	1	1	199.637			
			C	1	0.65	1	1	1	199.637			
L4	2475.537	18552.542	A	1	0.65	1	1	1	213.674	5495.248	141.23	C
77.33-38.42			B	1	0.65	1	1	1	213.674			
			C	1	0.65	1	1	1	213.674			
L5 38.42-0.00	2488.079	20507.294	A	1	0.65	1	1	1	231.387	5338.996	138.96	C
			B	1	0.65	1	1	1	231.387			
			C	1	0.65	1	1	1	231.387			
Sum Weight:	9060.840	60322.130						OTM	22546851. 16 lb-in	23022.625		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	900.080	6490.503	A	1	0.65	1	1	1	138.694	3374.106	103.82	C
164.00-131.50			B	1	0.65	1	1	1	138.694			
			C	1	0.65	1	1	1	138.694			
L2	889.177	3478.878	A	1	0.65	1	1	1	63.548	1555.099	113.76	C
131.50-117.83			B	1	0.65	1	1	1	63.548			
			C	1	0.65	1	1	1	63.548			
L3	2911.997	14267.478	A	1	0.65	1	1	1	203.012	4591.552	113.37	C
117.83-77.33			B	1	0.65	1	1	1	203.012			
			C	1	0.65	1	1	1	203.012			
L4	2862.107	20147.015	A	1	0.65	1	1	1	216.916	4380.930	112.59	C
77.33-38.42			B	1	0.65	1	1	1	216.916			
			C	1	0.65	1	1	1	216.916			
L5 38.42-0.00	2949.119	22232.805	A	1	0.65	1	1	1	234.589	4413.308	114.87	C
			B	1	0.65	1	1	1	234.589			
			C	1	0.65	1	1	1	234.589			
Sum Weight:	10512.480	66616.679						OTM	17715655. 48 lb-in	18314.995		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl Face
L1	900.080	6490.503	A	1	0.65	1	1	1	138.694	3374.106	103.82	C
164.00-131.50			B	1	0.65	1	1	1	138.694			
			C	1	0.65	1	1	1	138.694			
L2	889.177	3478.878	A	1	0.65	1	1	1	63.548	1555.099	113.76	C
131.50-117.83			B	1	0.65	1	1	1	63.548			
			C	1	0.65	1	1	1	63.548			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L3	2911.997	14267.478	A	1	0.65	1	1	1	203.012	4591.552	113.37	C
117.83-77.33			B	1	0.65	1	1	1	203.012			
			C	1	0.65	1	1	1	203.012			
L4	2862.107	20147.015	A	1	0.65	1	1	1	216.916	4380.930	112.59	C
77.33-38.42			B	1	0.65	1	1	1	216.916			
			C	1	0.65	1	1	1	216.916			
L5 38.42-0.00	2949.119	22232.805	A	1	0.65	1	1	1	234.589	4413.308	114.87	C
			B	1	0.65	1	1	1	234.589			
			C	1	0.65	1	1	1	234.589			
Sum Weight:	10512.480	66616.679						OTM	17715655. 48 lb-in	18314.995		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	900.080	6490.503	A	1	0.65	1	1	1	138.694	3374.106	103.82	C
164.00-131.50			B	1	0.65	1	1	1	138.694			
			C	1	0.65	1	1	1	138.694			
L2	889.177	3478.878	A	1	0.65	1	1	1	63.548	1555.099	113.76	C
131.50-117.83			B	1	0.65	1	1	1	63.548			
			C	1	0.65	1	1	1	63.548			
L3	2911.997	14267.478	A	1	0.65	1	1	1	203.012	4591.552	113.37	C
117.83-77.33			B	1	0.65	1	1	1	203.012			
			C	1	0.65	1	1	1	203.012			
L4	2862.107	20147.015	A	1	0.65	1	1	1	216.916	4380.930	112.59	C
77.33-38.42			B	1	0.65	1	1	1	216.916			
			C	1	0.65	1	1	1	216.916			
L5 38.42-0.00	2949.119	22232.805	A	1	0.65	1	1	1	234.589	4413.308	114.87	C
			B	1	0.65	1	1	1	234.589			
			C	1	0.65	1	1	1	234.589			
Sum Weight:	10512.480	66616.679						OTM	17715655. 48 lb-in	18314.995		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl Face
L1	900.080	6490.503	A	1	0.65	1	1	1	138.694	3374.106	103.82	C
164.00-131.50			B	1	0.65	1	1	1	138.694			
			C	1	0.65	1	1	1	138.694			
L2	889.177	3478.878	A	1	0.65	1	1	1	63.548	1555.099	113.76	C
131.50-117.83			B	1	0.65	1	1	1	63.548			
			C	1	0.65	1	1	1	63.548			
L3	2911.997	14267.478	A	1	0.65	1	1	1	203.012	4591.552	113.37	C
117.83-77.33			B	1	0.65	1	1	1	203.012			
			C	1	0.65	1	1	1	203.012			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L4	2862.107	20147.015	A	1	0.65	1	1	1	216.916	4380.930	112.59	C
77.33-38.42			B	1	0.65	1	1	1	216.916			
			C	1	0.65	1	1	1	216.916			
L5 38.42-0.00	2949.119	22232.805	A	1	0.65	1	1	1	234.589	4413.308	114.87	C
			B	1	0.65	1	1	1	234.589			
			C	1	0.65	1	1	1	234.589			
Sum Weight:	10512.480	66616.679						OTM	17715655.48 lb-in	18314.995		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	786.830	5473.366	A	1	0.65	1	1	1	135.985	1506.760	46.36	C
164.00-131.50			B	1	0.65	1	1	1	135.985			
			C	1	0.65	1	1	1	135.985			
L2	765.327	3012.457	A	1	0.65	1	1	1	62.409	684.143	50.05	C
131.50-117.83			B	1	0.65	1	1	1	62.409			
			C	1	0.65	1	1	1	62.409			
L3	2545.067	12776.472	A	1	0.65	1	1	1	199.637	2026.529	50.04	C
117.83-77.33			B	1	0.65	1	1	1	199.637			
			C	1	0.65	1	1	1	199.637			
L4	2475.537	18552.542	A	1	0.65	1	1	1	213.674	1901.470	48.87	C
77.33-38.42			B	1	0.65	1	1	1	213.674			
			C	1	0.65	1	1	1	213.674			
L5 38.42-0.00	2488.079	20507.294	A	1	0.65	1	1	1	231.387	1847.404	48.08	C
			B	1	0.65	1	1	1	231.387			
			C	1	0.65	1	1	1	231.387			
Sum Weight:	9060.840	60322.130						OTM	7801678.60 lb-in	7966.306		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	786.830	5473.366	A	1	0.65	1	1	1	135.985	1506.760	46.36	C
164.00-131.50			B	1	0.65	1	1	1	135.985			
			C	1	0.65	1	1	1	135.985			
L2	765.327	3012.457	A	1	0.65	1	1	1	62.409	684.143	50.05	C
131.50-117.83			B	1	0.65	1	1	1	62.409			
			C	1	0.65	1	1	1	62.409			
L3	2545.067	12776.472	A	1	0.65	1	1	1	199.637	2026.529	50.04	C
117.83-77.33			B	1	0.65	1	1	1	199.637			
			C	1	0.65	1	1	1	199.637			
L4	2475.537	18552.542	A	1	0.65	1	1	1	213.674	1901.470	48.87	C
77.33-38.42			B	1	0.65	1	1	1	213.674			
			C	1	0.65	1	1	1	213.674			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L5 38.42-0.00	2488.079	20507.294	A	1	0.65	1	1	1	231.387	1847.404	48.08	C
			B	1	0.65	1	1	1	231.387			
			C	1	0.65	1	1	1	231.387			
Sum Weight:	9060.840	60322.130						OTM	7801678.6 0 lb-in	7966.306		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	786.830	5473.366	A	1	0.65	1	1	1	135.985	1506.760	46.36	C
164.00-131.50			B	1	0.65	1	1	1	135.985			
			C	1	0.65	1	1	1	135.985			
L2	765.327	3012.457	A	1	0.65	1	1	1	62.409	684.143	50.05	C
131.50-117.83			B	1	0.65	1	1	1	62.409			
			C	1	0.65	1	1	1	62.409			
L3	2545.067	12776.472	A	1	0.65	1	1	1	199.637	2026.529	50.04	C
117.83-77.33			B	1	0.65	1	1	1	199.637			
			C	1	0.65	1	1	1	199.637			
L4	2475.537	18552.542	A	1	0.65	1	1	1	213.674	1901.470	48.87	C
77.33-38.42			B	1	0.65	1	1	1	213.674			
			C	1	0.65	1	1	1	213.674			
L5 38.42-0.00	2488.079	20507.294	A	1	0.65	1	1	1	231.387	1847.404	48.08	C
			B	1	0.65	1	1	1	231.387			
			C	1	0.65	1	1	1	231.387			
Sum Weight:	9060.840	60322.130						OTM	7801678.6 0 lb-in	7966.306		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	786.830	5473.366	A	1	0.65	1	1	1	135.985	1506.760	46.36	C
164.00-131.50			B	1	0.65	1	1	1	135.985			
			C	1	0.65	1	1	1	135.985			
L2	765.327	3012.457	A	1	0.65	1	1	1	62.409	684.143	50.05	C
131.50-117.83			B	1	0.65	1	1	1	62.409			
			C	1	0.65	1	1	1	62.409			
L3	2545.067	12776.472	A	1	0.65	1	1	1	199.637	2026.529	50.04	C
117.83-77.33			B	1	0.65	1	1	1	199.637			
			C	1	0.65	1	1	1	199.637			
L4	2475.537	18552.542	A	1	0.65	1	1	1	213.674	1901.470	48.87	C
77.33-38.42			B	1	0.65	1	1	1	213.674			
			C	1	0.65	1	1	1	213.674			
L5 38.42-0.00	2488.079	20507.294	A	1	0.65	1	1	1	231.387	1847.404	48.08	C
			B	1	0.65	1	1	1	231.387			
			C	1	0.65	1	1	1	231.387			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
Sum Weight:	9060.840	60322.130						OTM	7801678.60 lb-in	7966.306		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-in	Sum of Overturning Moments, M_z lb-in	Sum of Torques lb-in
Leg Weight	60322.130					
Bracing Weight	0.000					
Total Member Self-Weight	60322.130			17980.72	-27897.23	
Total Weight	81907.087			17980.72	-27897.23	
Wind 0 deg - No Ice		188.578	-45100.596	-59821700.70	-388921.88	14921.28
Wind 30 deg - No Ice		22792.332	-39152.551	-51985215.87	-30423960.35	7138.01
Wind 45 deg - No Ice		32135.609	-32024.282	-42550346.78	-42827541.83	2370.85
Wind 60 deg - No Ice		39288.898	-22713.612	-30214516.51	-52314398.25	-2557.88
Wind 90 deg - No Ice		45258.036	-188.578	-343043.94	-60194710.43	-11568.38
Wind 120 deg - No Ice		39100.320	22386.984	29625164.90	-51953373.60	-17479.15
Wind 135 deg - No Ice		31868.919	31757.592	42075742.25	-42316975.86	-18731.02
Wind 150 deg - No Ice		22465.704	38963.973	51660152.65	-29798647.30	-18706.40
Wind 180 deg - No Ice		-188.578	45100.596	59857662.14	333127.43	-14921.28
Wind 210 deg - No Ice		-22792.332	39152.551	52021177.31	30368165.90	-7138.01
Wind 225 deg - No Ice		-32135.609	32024.282	42586308.21	42771747.37	-2370.85
Wind 240 deg - No Ice		-39288.898	22713.612	30250477.95	52258603.80	2557.88
Wind 270 deg - No Ice		-45258.036	188.578	379005.37	60138915.97	11568.38
Wind 300 deg - No Ice		-39100.320	-22386.984	-29589203.47	51897579.14	17479.15
Wind 315 deg - No Ice		-31868.919	-31757.592	-42039780.81	42261181.41	18731.02
Wind 330 deg - No Ice		-22465.704	-38963.973	-51624191.22	29742852.85	18706.40
Member Ice	6294.548					
Total Weight Ice	96024.163			39895.52	-64857.64	
Wind 0 deg - Ice		144.556	-37496.532	-50017266.85	-341704.43	12180.17
Wind 30 deg - Ice		18932.834	-32545.227	-43449302.13	-25457200.62	3138.39
Wind 45 deg - Ice		26700.243	-26616.269	-35551623.68	-35831747.01	-1866.57
Wind 60 deg - Ice		32648.074	-18873.455	-25228442.02	-43768839.01	-6744.32
Wind 90 deg - Ice		37615.289	-144.556	-236951.27	-50370030.88	-14819.90
Wind 120 deg - Ice		32503.518	18623.077	24828720.35	-43491992.21	-18924.49
Wind 135 deg - Ice		26495.810	26411.835	35239894.23	-35440226.52	-19091.93
Wind 150 deg - Ice		18682.455	32400.671	43252246.38	-24977687.90	-17958.29
Wind 180 deg - Ice		-144.556	37496.532	50097057.89	211989.16	-12180.17
Wind 210 deg - Ice		-18932.834	32545.227	43529093.17	25327485.34	-3138.39
Wind 225 deg - Ice		-26700.243	26616.269	35631414.73	35702031.74	1866.57
Wind 240 deg - Ice		-32648.074	18873.455	25308233.07	43639123.73	6744.32
Wind 270 deg - Ice		-37615.289	144.556	316742.32	50240315.60	14819.90
Wind 300 deg - Ice		-32503.518	-18623.077	-24748929.30	43362276.93	18924.49
Wind 315 deg - Ice		-26495.810	-26411.835	-35160103.19	35310511.24	19091.93
Wind 330 deg - Ice		-18682.455	-32400.671	-43172455.33	24847972.62	17958.29
Total Weight	81907.087			17980.72	-27897.23	
Wind 0 deg - Service		65.252	-15605.743	-20702046.05	-128129.47	5163.07
Wind 30 deg - Service		7886.620	-13547.596	-17990459.61	-10520876.34	2469.90
Wind 45 deg - Service		11119.588	-11081.067	-14725799.02	-14812773.05	820.36
Wind 60 deg - Service		13594.774	-7859.381	-10457345.64	-18095422.33	-885.08
Wind 90 deg - Service		15660.220	-65.252	-121195.96	-20822173.95	-4002.90
Wind 120 deg - Service		13529.522	7746.361	10248426.47	-17970500.30	-6048.15
Wind 135 deg - Service		11027.308	10988.786	14556584.73	-14636106.62	-6481.32
Wind 150 deg - Service		7773.600	13482.344	17872989.71	-10304505.05	-6472.80

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-in	Sum of Overturning Moments, M_z lb-in	Sum of Torques lb-in
Wind 180 deg - Service		-65.252	15605.743	20709498.18	121714.58	-5163.07
Wind 210 deg - Service		-7886.620	13547.596	17997911.74	10514461.46	-2469.90
Wind 225 deg - Service		-11119.588	11081.067	14733251.15	14806358.16	-820.36
Wind 240 deg - Service		-13594.774	7859.381	10464797.77	18089007.44	885.08
Wind 270 deg - Service		-15660.220	65.252	128648.09	20815759.06	4002.90
Wind 300 deg - Service		-13529.522	-7746.361	-10240974.35	17964085.42	6048.15
Wind 315 deg - Service		-11027.308	-10988.786	-14549132.60	14629691.74	6481.32
Wind 330 deg - Service		-7773.600	-13482.344	-17865537.58	10298090.16	6472.80

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 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service

Comb. No.	Description
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-in	Minor Axis Moment lb-in
L1	164 - 131.5	Pole	Max Tension	1	0.000	0.00	0.00
			Max. Compression	18	-20794.912	2387.16	-9470.42
			Max. Mx	14	-14666.884	4250474.13	-70153.86
			Max. My	10	-14675.419	64240.72	-4182098.93
			Max. Vy	6	20625.753	-4249228.29	57935.55
			Max. Vx	10	20405.350	64240.72	-4182098.93
			Max. Torque	27			-24194.74
L2	131.5 - 117.83	Pole	Max Tension	1	0.000	0.00	0.00
			Max. Compression	18	-26706.077	-396.71	-15414.19
			Max. Mx	6	-18829.161	-6211103.15	73082.73
			Max. My	10	-18837.512	80695.12	-6125284.08
			Max. Vy	6	26849.026	-6211103.15	73082.73
			Max. Vx	10	26688.348	80695.12	-6125284.08
			Max. Torque	27			-21621.62
L3	117.83 - 77.33	Pole	Max Tension	1	0.000	0.00	0.00
			Max. Compression	18	-44400.663	-26175.12	-17562.16
			Max. Mx	6	-34270.754	-20204273.94	160614.93
			Max. My	10	-34277.522	157466.51	-20033290.14
			Max. Vy	6	33699.891	-20204273.94	160614.93
			Max. Vx	10	33538.442	157466.51	-20033290.14
			Max. Torque	19			21066.55
L4	77.33 - 38.42	Pole	Max Tension	1	0.000	0.00	0.00
			Max. Compression	18	-65933.659	-42423.72	-26943.29
			Max. Mx	6	-54063.847	-36882402.19	244913.89
			Max. My	10	-54068.168	238790.56	-36634810.40
			Max. Vy	6	39223.180	-36882402.19	244913.89
			Max. Vx	10	39062.159	238790.56	-36634810.40
			Max. Torque	32			-18776.98
L5	38.42 - 0	Pole	Max Tension	1	0.000	0.00	0.00
			Max. Compression	18	-96024.163	-64857.64	-39895.52
			Max. Mx	6	-81895.118	-61087354.	348840.52

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-in	Minor Axis Moment lb-in
			Max. My	10	-81895.227	338810.27	-60744526.70
			Max. Vy	6	45279.692	-61087354.04	348840.52
			Max. Vx	10	45122.130	338810.27	-60744526.70
			Max. Torque	33			-18955.40

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	23	96024.163	-37615.290	144.556
	Max. H_x	14	81907.088	45258.037	-188.578
	Max. H_z	2	81907.088	-188.578	45100.597
	Max. M_x	2	60707937.28	-188.578	45100.597
	Max. M_z	6	61087354.70	-45258.037	188.578
	Max. Torsion	25	18952.93	-26495.810	-26411.836
	Min. Vert	38	81907.087	-13594.775	7859.381
	Min. H_x	6	81907.088	-45258.037	188.578
	Min. H_z	10	81907.088	188.578	-45100.597
	Min. M_x	10	-60744526.03	188.578	-45100.597
	Min. M_z	14	-61030677.37	45258.037	-188.578
	Min. Torsion	33	-18955.34	26495.810	26411.836

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-in	Overturning Moment, M_z lb-in	Torque lb-in
Dead Only	81907.087	0.000	0.000	17980.72	-27897.23	0.00
Dead+Wind 0 deg - No Ice	81907.088	188.578	-45100.597	-60707937.28	-395487.74	14850.80
Dead+Wind 30 deg - No Ice	81907.088	22792.332	-39152.552	-52755635.56	-30875804.73	7160.80
Dead+Wind 45 deg - No Ice	81907.088	32135.610	-32024.283	-43181132.38	-43463163.97	2440.05
Dead+Wind 60 deg - No Ice	81907.088	39288.899	-22713.612	-30662687.50	-53090520.52	-2446.68
Dead+Wind 90 deg - No Ice	81907.088	45258.037	-188.578	-348839.60	-61087354.70	-11397.85
Dead+Wind 120 deg - No Ice	81907.088	39100.321	22386.985	30063468.59	-52723517.62	-17295.60
Dead+Wind 135 deg - No Ice	81907.088	31868.920	31757.593	42698656.90	-42944071.70	-18560.19
Dead+Wind 150 deg - No Ice	81907.088	22465.705	38963.974	52425239.64	-30239962.40	-18560.18
Dead+Wind 180 deg - No Ice	81907.088	-188.578	45100.597	60744526.03	338811.44	-14851.94
Dead+Wind 210 deg - No Ice	81907.088	-22792.332	39152.552	52792231.11	30819115.68	-7163.69
Dead+Wind 225 deg - No Ice	81907.088	-32135.610	32024.283	43217735.24	43406472.74	-2442.72
Dead+Wind 240 deg - No Ice	81907.088	-39288.899	22713.612	30699297.84	53033830.96	2445.00
Dead+Wind 270 deg - No Ice	81907.088	-45258.037	188.578	385457.93	61030677.37	11399.45
Dead+Wind 300 deg - No Ice	81907.088	-39100.321	-22386.985	-30026857.06	52666853.03	17299.12
Dead+Wind 315 deg - No Ice	81907.088	-31868.920	-31757.593	-42662052.67	42887409.29	18563.34
Dead+Wind 330 deg - No Ice	81907.088	-22465.705	-38963.974	-52388642.90	30183298.32	18562.16
Dead+Ice+Temp	96024.163	0.000	0.000	39895.52	-64857.64	0.00
Dead+Wind 0 deg+Ice+Temp	96024.163	144.556	-37496.533	-50962549.86	-348998.93	12136.29
Dead+Wind 30 deg+Ice+Temp	96024.163	18932.834	-32545.228	-44270766.09	-25939529.74	3175.40
Dead+Wind 45 deg+Ice+Temp	96024.163	26700.243	-26616.269	-36223962.14	-36510202.51	-1791.15

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-in	lb-in	lb-in
Dead+Wind 60 deg+Ice+Temp	96024.163	32648.075	-18873.456	-25705793.87	-44597276.61	-6635.43
Dead+Wind 90 deg+Ice+Temp	96024.163	37615.290	-144.556	-242084.41	-51322987.87	-14667.87
Dead+Wind 120 deg+Ice+Temp	96024.163	32503.519	18623.077	25297453.95	-44314495.21	-18770.39
Dead+Wind 135 deg+Ice+Temp	96024.163	26495.810	26411.836	35905543.66	-36110252.54	-18952.93
Dead+Wind 150 deg+Ice+Temp	96024.163	18682.456	32400.672	44069502.46	-25449649.89	-17844.00
Dead+Wind 180 deg+Ice+Temp	96024.163	-144.556	37496.533	51044039.65	216703.19	-12136.63
Dead+Wind 210 deg+Ice+Temp	96024.163	-18932.834	32545.228	44352271.75	25807219.00	-3176.98
Dead+Wind 225 deg+Ice+Temp	96024.163	-26700.243	26616.269	36305479.27	36377892.09	1789.72
Dead+Wind 240 deg+Ice+Temp	96024.163	-32648.075	18873.456	25787320.85	44464972.12	6634.67
Dead+Wind 270 deg+Ice+Temp	96024.163	-37615.290	144.556	323616.85	51190704.62	14669.19
Dead+Wind 300 deg+Ice+Temp	96024.163	-32503.519	-18623.077	-25215937.39	44182226.96	18772.96
Dead+Wind 315 deg+Ice+Temp	96024.163	-26495.810	-26411.836	-35824038.56	35977983.97	18955.34
Dead+Wind 330 deg+Ice+Temp	96024.163	-18682.456	-32400.672	-43988007.22	25317375.39	17845.74
Dead+Wind 0 deg - Service	81907.087	65.252	-15605.743	-20996250.02	-155406.55	5141.21
Dead+Wind 30 deg - Service	81907.087	7886.620	-13547.596	-18244358.29	-10703257.91	2478.75
Dead+Wind 45 deg - Service	81907.087	11119.588	-11081.067	-14931068.54	-15059178.82	844.29
Dead+Wind 60 deg - Service	81907.087	13594.775	-7859.381	-10599005.15	-18390773.78	-847.66
Dead+Wind 90 deg - Service	81907.087	15660.221	-65.252	-108755.52	-21158096.04	-3946.83
Dead+Wind 120 deg - Service	81907.087	13529.523	7746.362	10415541.89	-18263721.45	-5988.54
Dead+Wind 135 deg - Service	81907.087	11027.308	10988.787	14787990.35	-14879496.97	-6426.12
Dead+Wind 150 deg - Service	81907.087	7773.600	13482.344	18153908.47	-10483190.30	-6425.80
Dead+Wind 180 deg - Service	81907.087	-65.252	15605.743	21032850.22	98708.31	-5141.30
Dead+Wind 210 deg - Service	81907.087	-7886.620	13547.596	18280959.30	10646558.16	-2479.06
Dead+Wind 225 deg - Service	81907.087	-11119.588	11081.067	14967670.43	15002478.80	-844.49
Dead+Wind 240 deg - Service	81907.087	-13594.775	7859.381	10635607.93	18334073.96	847.68
Dead+Wind 270 deg - Service	81907.087	-15660.221	65.252	145359.26	21101397.69	3947.39
Dead+Wind 300 deg - Service	81907.087	-13529.523	-7746.362	-10378938.96	18207024.62	5989.32
Dead+Wind 315 deg - Service	81907.087	-11027.308	-10988.787	-14751388.30	14822800.40	6426.79
Dead+Wind 330 deg - Service	81907.087	-7773.600	-13482.344	-18117307.32	10426493.54	6426.24

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.000	-81907.087	0.000	0.000	81907.087	0.000	0.000%
2	188.578	-81907.087	-45100.596	-188.578	81907.088	45100.597	0.000%
3	22792.332	-81907.087	-39152.551	-22792.332	81907.088	39152.552	0.000%
4	32135.609	-81907.087	-32024.282	-32135.610	81907.088	32024.283	0.000%
5	39288.898	-81907.087	-22713.612	-39288.899	81907.088	22713.612	0.000%
6	45258.036	-81907.087	-188.578	-45258.037	81907.088	188.578	0.000%
7	39100.320	-81907.087	22386.984	-39100.321	81907.088	-22386.985	0.000%
8	31868.919	-81907.087	31757.592	-31868.920	81907.088	-31757.593	0.000%
9	22465.704	-81907.087	38963.973	-22465.705	81907.088	-38963.974	0.000%
10	-188.578	-81907.087	45100.596	188.578	81907.088	-45100.597	0.000%
11	-22792.332	-81907.087	39152.551	22792.332	81907.088	-39152.552	0.000%
12	-32135.609	-81907.087	32024.282	32135.610	81907.088	-32024.283	0.000%
13	-39288.898	-81907.087	22713.612	39288.899	81907.088	-22713.612	0.000%
14	-45258.036	-81907.087	188.578	45258.037	81907.088	-188.578	0.000%
15	-39100.320	-81907.087	-22386.984	39100.321	81907.088	22386.985	0.000%
16	-31868.919	-81907.087	-31757.592	31868.920	81907.088	31757.593	0.000%
17	-22465.704	-81907.087	-38963.973	22465.705	81907.088	38963.974	0.000%
18	0.000	-96024.163	0.000	0.000	96024.163	0.000	0.000%
19	144.556	-96024.163	-37496.532	-144.556	96024.163	37496.533	0.000%
20	18932.834	-96024.163	-32545.227	-18932.834	96024.163	32545.228	0.000%
21	26700.243	-96024.163	-26616.269	-26700.243	96024.163	26616.269	0.000%
22	32648.074	-96024.163	-18873.455	-32648.075	96024.163	18873.456	0.000%
23	37615.289	-96024.163	-144.556	-37615.290	96024.163	144.556	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
24	32503.518	-96024.163	18623.077	-32503.519	96024.163	-18623.077	0.000%
25	26495.810	-96024.163	26411.835	-26495.810	96024.163	-26411.836	0.000%
26	18682.455	-96024.163	32400.671	-18682.456	96024.163	-32400.672	0.000%
27	-144.556	-96024.163	37496.532	144.556	96024.163	-37496.533	0.000%
28	-18932.834	-96024.163	32545.227	18932.834	96024.163	-32545.228	0.000%
29	-26700.243	-96024.163	26616.269	26700.243	96024.163	-26616.269	0.000%
30	-32648.074	-96024.163	18873.455	32648.075	96024.163	-18873.456	0.000%
31	-37615.289	-96024.163	144.556	37615.290	96024.163	-144.556	0.000%
32	-32503.518	-96024.163	-18623.077	32503.519	96024.163	18623.077	0.000%
33	-26495.810	-96024.163	-26411.835	26495.810	96024.163	26411.836	0.000%
34	-18682.455	-96024.163	-32400.671	18682.456	96024.163	32400.672	0.000%
35	65.252	-81907.087	-15605.743	-65.252	81907.087	15605.743	0.000%
36	7886.620	-81907.087	-13547.596	-7886.620	81907.087	13547.596	0.000%
37	11119.588	-81907.087	-11081.067	-11119.588	81907.087	11081.067	0.000%
38	13594.774	-81907.087	-7859.381	-13594.775	81907.087	7859.381	0.000%
39	15660.220	-81907.087	-65.252	-15660.221	81907.087	65.252	0.000%
40	13529.522	-81907.087	7746.361	-13529.523	81907.087	-7746.362	0.000%
41	11027.308	-81907.087	10988.786	-11027.308	81907.087	-10988.787	0.000%
42	7773.600	-81907.087	13482.344	-7773.600	81907.087	-13482.344	0.000%
43	-65.252	-81907.087	15605.743	65.252	81907.087	-15605.743	0.000%
44	-7886.620	-81907.087	13547.596	7886.620	81907.087	-13547.596	0.000%
45	-11119.588	-81907.087	11081.067	11119.588	81907.087	-11081.067	0.000%
46	-13594.774	-81907.087	7859.381	13594.775	81907.087	-7859.381	0.000%
47	-15660.220	-81907.087	65.252	15660.221	81907.087	-65.252	0.000%
48	-13529.522	-81907.087	-7746.361	13529.523	81907.087	7746.362	0.000%
49	-11027.308	-81907.087	-10988.786	11027.308	81907.087	10988.787	0.000%
50	-7773.600	-81907.087	-13482.344	7773.600	81907.087	13482.344	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00004717
3	Yes	4	0.00000001	0.00060176
4	Yes	4	0.00000001	0.00069035
5	Yes	4	0.00000001	0.00061080
6	Yes	4	0.00000001	0.00005298
7	Yes	4	0.00000001	0.00056091
8	Yes	4	0.00000001	0.00066625
9	Yes	4	0.00000001	0.00059515
10	Yes	4	0.00000001	0.00003795
11	Yes	4	0.00000001	0.00059884
12	Yes	4	0.00000001	0.00068994
13	Yes	4	0.00000001	0.00059392
14	Yes	4	0.00000001	0.00004063
15	Yes	4	0.00000001	0.00059719
16	Yes	4	0.00000001	0.00066435
17	Yes	4	0.00000001	0.00055903
18	Yes	4	0.00000001	0.00000001
19	Yes	5	0.00000001	0.00002803
20	Yes	5	0.00000001	0.00003746
21	Yes	5	0.00000001	0.00004010
22	Yes	5	0.00000001	0.00003768
23	Yes	5	0.00000001	0.00002825
24	Yes	5	0.00000001	0.00003680

25	Yes	5	0.00000001	0.00003946
26	Yes	5	0.00000001	0.00003702
27	Yes	5	0.00000001	0.00002808
28	Yes	5	0.00000001	0.00003750
29	Yes	5	0.00000001	0.00004006
30	Yes	5	0.00000001	0.00003741
31	Yes	5	0.00000001	0.00002817
32	Yes	5	0.00000001	0.00003695
33	Yes	5	0.00000001	0.00003926
34	Yes	5	0.00000001	0.00003660
35	Yes	4	0.00000001	0.00001476
36	Yes	4	0.00000001	0.00004073
37	Yes	4	0.00000001	0.00004611
38	Yes	4	0.00000001	0.00004164
39	Yes	4	0.00000001	0.00001520
40	Yes	4	0.00000001	0.00003762
41	Yes	4	0.00000001	0.00004498
42	Yes	4	0.00000001	0.00004137
43	Yes	4	0.00000001	0.00001459
44	Yes	4	0.00000001	0.00004037
45	Yes	4	0.00000001	0.00004605
46	Yes	4	0.00000001	0.00003979
47	Yes	4	0.00000001	0.00001487
48	Yes	4	0.00000001	0.00004140
49	Yes	4	0.00000001	0.00004464
50	Yes	4	0.00000001	0.00003736

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	164 - 131.5	11.005	38	0.5041	0.0004
L2	131.5 - 117.83	7.618	38	0.4804	0.0003
L3	123.83 - 77.33	6.857	38	0.4664	0.0003
L4	85.75 - 38.42	3.512	38	0.3527	0.0002
L5	47.67 - 0	1.183	38	0.2146	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
164.00	12' Omni	38	11.005	0.5041	0.0004	233674
160.00	Andrew 4' w/ Shroud	38	10.581	0.5028	0.0004	233674
154.00	A-Ant-23G-2-C /w Radome	38	9.946	0.5006	0.0003	116837
144.00	PiROD 13' Low Profile Platform	38	8.898	0.4947	0.0003	58418
138.00	(2) RRUS-11	38	8.278	0.4890	0.0003	44937
134.00	7770.00	38	7.870	0.4841	0.0003	38890
124.00	DB844H65E-XY w/Mount Pipe	38	6.873	0.4667	0.0003	27532
114.00	3" Dia 20' Omni	38	5.919	0.4426	0.0003	24007
50.00	GPS Unit	38	1.286	0.2239	0.0001	10988

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	164 - 131.5	31.781	5	1.4564	0.0018
L2	131.5 - 117.83	21.999	5	1.3876	0.0010
L3	123.83 - 77.33	19.802	5	1.3469	0.0011
L4	85.75 - 38.42	10.143	5	1.0185	0.0006
L5	47.67 - 0	3.417	5	0.6198	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
164.00	12' Omni	5	31.781	1.4564	0.0018	81235
160.00	Andrew 4' w/ Shroud	5	30.556	1.4526	0.0016	81235
154.00	A-Ant-23G-2-C /w Radome	5	28.724	1.4460	0.0014	40617
144.00	PiROD 13' Low Profile Platform	5	25.697	1.4288	0.0012	20308
138.00	(2) RRUS-11	5	23.907	1.4124	0.0011	15621
134.00	7770.00	5	22.728	1.3981	0.0011	13518
124.00	DB844H65E-XY w/Mount Pipe	5	19.849	1.3479	0.0011	9544
114.00	3" Dia 20' Omni	5	17.094	1.2782	0.0010	8319
50.00	GPS Unit	5	3.713	0.6466	0.0003	3805

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	164 - 131.5 (1)	TP53.42x47x0.3125	32.50	164.00	104.4	13.705	52.6760	-14661.700	721909.000	0.020
L2	131.5 - 117.83 (2)	TP56.15x53.42x0.375	13.67	164.00	101.6	14.474	64.9600	-18823.801	940197.000	0.020
L3	117.83 - 77.33 (3)	TP62.97x54.2018x0.4375	46.50	164.00	91.0	17.985	84.6295	-34266.102	1522090.000	0.023
L4	77.33 - 38.42 (4)	TP69.66x60.5073x0.5625	47.33	164.00	82.4	20.911	120.1710	-54060.801	2512890.000	0.022
L5	38.42 - 0 (5)	TP76x66.7462x0.5625	47.67	164.00	73.5	23.718	134.6840	-81895.000	3194420.000	0.026

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-in	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-in	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	164 - 131.5 (1)	TP53.42x47x0.3125	4290420.00	6.203	36.775	0.169	0.00	0.000	36.775	0.000
L2	131.5 - 117.83 (2)	TP56.15x53.42x0.375	6261670.00	7.151	39.000	0.183	0.00	0.000	39.000	0.000
L3	117.83 - 77.33 (3)	TP62.97x54.2018x0.4375	20303100.00	15.942	39.000	0.409	0.00	0.000	39.000	0.000
L4	77.33 - 38.42 (4)	TP69.66x60.5073x0.5625	37036300.00	18.565	39.000	0.476	0.00	0.000	39.000	0.000
L5	38.42 - 0 (5)	TP76x66.7462x0.5625	61309100.00	24.444	39.000	0.627	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-in	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	164 - 131.5 (1)	TP53.42x47x0.3125	20736.500	0.394	26.000	0.030	11712.60	0.008	26.000	0.000
L2	131.5 - 117.83 (2)	TP56.15x53.42x0.375	26975.900	0.415	26.000	0.032	11458.30	0.006	26.000	0.000
L3	117.83 - 77.33 (3)	TP62.97x54.2018x0.4375	33826.699	0.400	26.000	0.031	5420.80	0.002	26.000	0.000
L4	77.33 - 38.42 (4)	TP69.66x60.5073x0.5625	39349.602	0.327	26.000	0.025	4080.35	0.001	26.000	0.000
L5	38.42 - 0 (5)	TP76x66.7462x0.5625	45403.699	0.337	26.000	0.026	2516.35	0.000	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	164 - 131.5 (1)	0.020	0.169	0.000	0.030	0.000	0.189 ✔	1.333	H1-3+VT ✔
L2	131.5 - 117.83 (2)	0.020	0.183	0.000	0.032	0.000	0.204 ✔	1.333	H1-3+VT ✔
L3	117.83 - 77.33 (3)	0.023	0.409	0.000	0.031	0.000	0.432 ✔	1.333	H1-3+VT ✔
L4	77.33 - 38.42 (4)	0.022	0.476	0.000	0.025	0.000	0.498 ✔	1.333	H1-3+VT ✔
L5	38.42 - 0 (5)	0.026	0.627	0.000	0.026	0.000	0.653 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
L1	164 - 131.5	Pole	TP53.42x47x0.3125	1	-14661.700	962304.657	14.2	Pass
L2	131.5 - 117.83	Pole	TP56.15x53.42x0.375	2	-18823.801	1253282.549	15.3	Pass
L3	117.83 - 77.33	Pole	TP62.97x54.2018x0.4375	3	-34266.102	2028945.886	32.4	Pass
L4	77.33 - 38.42	Pole	TP69.66x60.5073x0.5625	4	-54060.801	3349682.231	37.3	Pass
L5	38.42 - 0	Pole	TP76x66.7462x0.5625	5	-81895.000	4258161.683	49.0	Pass
							Summary	
						Pole (L5)	49.0	Pass
						RATING =	**49.0**	**Pass**

ANCHOR BOLT AND
BASE PLATE ANALYSIS

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ANCHOR BOLT AND BASE PLATE ANALYSIS

Input Data

Tower Reactions:

Overturning Moment:	$OM := 5109\,ft \cdot kips$	*user input*
Shear Force:	$Shear := 45.382\,kips$	*user input*
Axial Force:	$Axial := 81.907\,kips$	*user input*

Anchor Bolt Data:

Use ASTM A615 Grade 75		*user input*
Number of Anchor Bolts = N	$N := 30$	*user input*
Diameter of Bolt Circle:	$D_{bc} := 86.0\,in$	*user input*
Bolt "Column" Distance:	$l := 3.0\,in$	*user input*
Bolt Ultimate Strength:	$F_u := 100\,ksi$	*user input*
Bolt Yield Strength:	$Fy := 75 \cdot ksi$	*user input*
Bolt Modulus:	$E := 29000\,ksi$	*user input*
Anchor Bolt Diameter	$D := 2.25\,in$	*user input*
Threads per Inch:	$n := 4.5$	*user input*

Base Plate Data:

Use ASTM A572 Grade 60		*user input*
Plate Yield Strength:	$Fy_{bp} := 60 \cdot ksi$	*user input*
Base Plate Thickness:	$PlateThickness := 3 \cdot in$	*user input*
Base Plate Diameter:	$D_{bp} := 92.0 \cdot in$	*user input*
Outer Pole Diameter:	$D_{pole} := 76.0\,in$	*user input*

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Geometric Layout Data:

Distance from the center of gravity of the group to bolt in question = d(i)

Radius of Bolt Circle: $R_{bc} := \frac{D_{bc}}{2}$

Distance to Bolts: $i := 1 .. N$

$$d_i := \left| \begin{array}{l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array} \right.$$

$d_1 = 8.94 \cdot in$ $d_7 = 42.76 \cdot in$

$d_2 = 17.49 \cdot in$ $d_8 = 42.76 \cdot in$

$d_3 = 25.27 \cdot in$ $d_9 = 40.90 \cdot in$

$d_4 = 31.96 \cdot in$ $d_{10} = 37.24 \cdot in$

$d_5 = 37.24 \cdot in$ $d_{11} = 31.96 \cdot in$

$d_6 = 40.90 \cdot in$ etc.

Critical Distances For Bending in Plate:

Outer Pole Radius: $R_{pole} := \frac{D_{pole}}{2}$ $R_{pole} = 38.00 \cdot in$

Moment Arms of Bolts about Neutral Axis: $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$ $MA_7 = 4.76 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = 4.76 \cdot in$

$MA_3 = 0.00 \cdot in$ $MA_9 = 2.90 \cdot in$

$MA_4 = 0.00 \cdot in$ $MA_{10} = 0.00 \cdot in$

$MA_5 = 0.00 \cdot in$ $MA_{11} = 0.00 \cdot in$

$MA_6 = 2.90 \cdot in$ etc.

Effective Width of Baseplate for Bending: $EffectiveWidth := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2}$ $EffectiveWidth = 41.48 \cdot in$

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Anchor Bolt Analysis:

Polar Moment of Inertia I_p:

$$I_p := \sum_i \left(d_i\right)^2 \qquad I_p = 2.773 \times 10^4 \cdot in^2$$

Gross Area of Bolt:

$$A_g := \frac{\pi}{4} \cdot D^2 \qquad A_g = 3.976 \cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 \qquad A_n = 3.248 \cdot in^2$$

Net Diameter:

$$D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} \qquad D_n = 2.03 \cdot in$$

Radius of Gyration of Bolt:

$$r := \frac{D_n}{4} \qquad r = 0.51 \cdot in$$

Section Modulus of Bolt:

$$S_x := \frac{\pi \cdot D_n^{\,3}}{32} \qquad S_x = 0.826 \cdot in^3$$

Anchor Bolt Bending Stress:

Maximum Applied Bending:

$$M_x := \left(\frac{Shear}{N}\right) \cdot 1 \qquad M_x = 0.378 \cdot ft \cdot kips$$

$$f_{bx} := \frac{M_x}{S_x} \qquad f_{bx} = 5.5 \cdot ksi$$

Allowable Bending

$$F_{bx} := 1.333 \cdot 0.60 \cdot Fy \qquad F_{bx} = 60.0 \cdot ksi$$

Note: 1.333 increase allowed per TIA/EIA

Check Tensile Forces:

Maximum Tensile Force (Gross Area):

$AllowableTension := 1.333 \cdot (0.33 \cdot A_g \cdot F_u)$ $AllowableTension = 174.9 \cdot kips$

Note: 1.333 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$F_{net.area} := 1.333 \cdot (0.60 \cdot A_n \cdot Fy)$ $F_{net.area} = 194.8 \cdot kips$

Note: 1.333 increase allowed per TIA/EIA

Applied Tension:

$MaxTension := \frac{OM \cdot R_{bc}}{I_p} - \frac{Axial}{N}$ $MaxTension = 92.3 \cdot kips$

Check Stresses:

Note: Bolts supplied are "upset bolts." Use net area for checking per AISC.

$\frac{MaxTension}{F_{net.area}} = 0.47$

$Condition := if\left(\frac{MaxTension}{F_{net.area}} \le 1.00, "OK", "Overstressed"\right)$

$Condition = "OK"$

Check Compression & Combined Stresses (if required):

Check to see if a complete combined stress analysis is required:

Per ASCE Manual 72: "If the clearance between the base plate and concrete does not exceed two times the bolt diameter a bending stress analysis of the bolts is NOT normally required."

Set the clear space between the plate and bolt to zero and remove bending stresses if a combined stress analysis is not required:

$$l := \begin{cases} l & \text{if } l > 2 \cdot D_n \\ 0.00\,in & \text{otherwise} \end{cases} \qquad l = 0.00 \cdot in$$

$$f_{bx} := \begin{cases} f_{bx} & \text{if } l > 2 \cdot D_n \\ 0.0\,ksi & \text{otherwise} \end{cases} \qquad f_{bx} = 0.0 \cdot ksi$$

Allowable Compressive Force:

$$K := 0.65$$

$$C_c := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{Fy}} \qquad C_c = 87.36$$

$$F_a := \begin{cases} \dfrac{\left[1 - \dfrac{\left(\frac{K \cdot l}{r}\right)^2}{2 \cdot C_c^2}\right] \cdot Fy}{\dfrac{5}{3} + \dfrac{3 \cdot \left(\frac{K \cdot l}{r}\right)}{8 \cdot C_c} - \dfrac{\left(\frac{K \cdot l}{r}\right)^3}{8 \cdot C_c^3}} & \text{if } \dfrac{K \cdot l}{r} \le C_c \\ \dfrac{12 \cdot \pi^2 \cdot E}{23 \cdot \left(\frac{K \cdot l}{r}\right)^2} & \text{if } \dfrac{K \cdot l}{r} > C_c \end{cases} \qquad F_a = 45.0 \cdot ksi$$

$$F_a := 1.333 \cdot F_a \quad \text{Note: 1.333 increase allowed per TIA/EIA} \qquad F_a = 60.0 \cdot ksi$$

Applied Compressive Force:

$$MaxCompression := \frac{OM \cdot R_{bc}}{I_p} + \frac{Axial}{N} \qquad MaxCompression = 97.8 \cdot kips$$

$$f_a := \frac{MaxCompression}{A_n} \qquad f_a = 30.1 \cdot ksi$$

Check Combined Stresses:

$$\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} = 0.50$$

$$Condition := if\left(\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right) \qquad \boxed{Condition = \text{"OK"}}$$

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Base Plate Analysis:

Force from Bolt(s):

$$C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$$

$C_1 = 22.5 \cdot kips$ $C_7 = 97.3 \cdot kips$

$C_2 = 41.4 \cdot kips$ $C_8 = 97.3 \cdot kips$

$C_3 = 58.6 \cdot kips$ $C_9 = 93.1 \cdot kips$

$C_4 = 73.4 \cdot kips$ $C_{10} = 85.0 \cdot kips$

$C_5 = 85.0 \cdot kips$ $C_{11} = 73.4 \cdot kips$

$C_6 = 93.1 \cdot kips$ etc.

Bending Stress in Plate:

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{EffectiveWidth \cdot PlateThickness^2} \qquad f_{bp} = 23.6 \cdot ksi$$

Check Stresses:

$$\frac{f_{bp}}{1.333 \cdot 0.75 Fy_{bp}} = 0.39$$

$$Condition := if\left(\frac{f_{bp}}{1.333 \cdot 0.75 Fy_{bp}} < 1.00, "OK", "Overstressed"\right)$$

Condition = "OK"

FOUNDATION ANALYSIS

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Check Foundation Depth TIA/EIA-222-F 7.2.5

Shear Force:	$S := 45.382k$		*USER INPUT*
Overturning Moment:	$M := 61309084in \cdot lb$		*USER INPUT*
Foundation Diameter:	$d := 9ft$		*USER INPUT*
Overall Length of Caisson:	$L_c := 28ft$		*USER INPUT*
Depth From Top of Caisson to Grade:	$L_{pag} := 1ft$		*USER INPUT*
Depth of Caisson Below Ground Level:	$LD := L_c - L_{pag}$	$LD = 27.0ft$	*USER INPUT*

Depth Required:

$$LD1 := 2.0ft + \left(\frac{S \cdot ft^2}{3k \cdot d}\right) + 2ft \cdot .5\left(\frac{M \cdot ft}{3 \cdot k\, d} + \frac{S \cdot ft}{2k} + \frac{S^2 ft^3}{18k^2 d^2}\right)^{.5} \quad LD1 = 32.9ft$$

$DepthCheck := if(LD1 \le LD, "OK", "NO GOOD")$ $DepthCheck = "NO GOOD"$

Note: Result not applicable. Actual soil is better than normal soil as defined in TIA/EIA 222 F. Refer to L-Pile analysis.

Moment Capacity:

Bending Moment:	$Mu := 64571816in \cdot lb$		*USER INPUT--FROM LPILE*
Moment Capacity:	$Mn := 145553.559in \cdot kip$		*USER INPUT--FROM LPILE*
Factor of Safety:	$FS := \frac{Mn}{Mu}$	$FS = 2.25$	
Factor of Safety Required	$FS_{reqd} := 2.0$	$FOSCheck := if(FS \ge FS_{reqd}, "OK", "NO GOOD")$	$FOSCheck = "OK"$
Factor of Safety Ratio:	$FS_{ratio} := \left(\frac{FS_{reqd}}{FS}\right) = 0.89$		

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Axial Capacity:

Applied Axial Load: $A1 := 81.907k$ *USER INPUT*

Concrete Weight: $A2 := .150\frac{k}{ft^3} \cdot LD \cdot \pi \frac{d^2}{4}$ $A2 = 257.6 \cdot k$

Total Axial Load: $AT := A1 + A2$ $AT = 339.6 \cdot k$

Number of Rebar: $n := 33$ *USER INPUT*

Area of Rebar: $Ar := 1.560in^2$ *USER INPUT* #11

Rebar Yield Strength: $fy := 60ksi$ *USER INPUT*

Area of Concrete: $Ag := \pi \cdot \frac{d^2}{4}$ $Ag = 63.6\,ft^{2.0}$

Concrete Comp Strength: $f'c := 3ksi$ *USER INPUT*

Axial Capacity: $Po := n \cdot Ar \cdot fy + (Ag - n \cdot Ar) \cdot 0.85 \cdot f'c$ $Po = 26317.8 \cdot k$

$AxialCheck := if(AT \le Po, "OK", "NO GOOD")$ $AxialCheck = "OK"$

LPile Plus for Windows, Version 2013-07.005

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

This copy of LPile is used by:

MCD
URS/AECOM

Serial Number of Security Device: 138585063
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is forbidden by the software license agreement.

Files Used for Analysis

Path to file locations:
W:\Structurals_By_Location\Connecticut\Greenwich_Monopole\2_02162500_NSS-027\Mathcad\LPile\
Name of input data file: Greenwich_SA.lp7d
Name of output report file: Greenwich_SA.lp7o
Name of plot output file: Greenwich_SA.lp7p
Name of runtime messeage file: Greenwich_SA.lp7r

Date and Time of Analysis

Date: May 4, 2015 Time: 10:26:06

Problem Title

Project Name: Greenwich SA

Job Number: NSS-023/36931429

Client: NorthEast Site Solution

Engineer: MCD

Description:

Program Options and Settings

Engineering Units of Input Data and Computations:
- Engineering units are US Customary Units (pounds, feet, inches)

Analysis Control Options:
- Maximum number of iterations allowed = 500
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 100.0000 in
- Number of pile increments = 100

Loading Type and Number of Cycles of Loading:
- Static loading specified

Computational Options:
- Use unfactored loads in computations (conventional analysis)
- Compute pile response under loading and nonlinear bending properties of pile (only if nonlinear pile properties are input)
- Use of p-y modification factors for p-y curves not selected
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:
- No p-y curves to be computed and reported for user-specified depths
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 1

Pile Structural Properties and Geometry

Total number of pile sections = 1

Total length of pile = 28.00 ft

Depth of ground surface below top of pile = 1.00 ft

Pile diameter values used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile.

Point	Depth X	Pile Diameter

	ft	in
1	0.00000	108.0000000
2	28.000000	108.0000000

Input Structural Properties:

Pile Section No. 1:

Section Type = Drilled Shaft (Bored Pile)
Section Length = 28.00000 ft
Section Diameter = 108.00000 in

Ground Slope and Pile Batter Angles

Ground Slope Angle = 0.000 degrees
= 0.000 radians

Pile Batter Angle = 0.000 degrees
= 0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 1.00000 ft
Distance from top of pile to bottom of layer = 4.00000 ft
Effective unit weight at top of layer = 100.22000 pcf
Effective unit weight at bottom of layer = 100.22000 pcf
Friction angle at top of layer = 20.00000 deg.
Friction angle at bottom of layer = 20.00000 deg.
Subgrade k at top of layer = 0.0000 pci
Subgrade k at bottom of layer = 0.0000 pci

NOTE: Internal default values for subgrade k will be computed for this soil layer.

Layer 2 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 4.00000 ft
Distance from top of pile to bottom of layer = 6.00000 ft
Effective unit weight at top of layer = 119.23000 pcf
Effective unit weight at bottom of layer = 119.23000 pcf
Friction angle at top of layer = 30.00000 deg.
Friction angle at bottom of layer = 30.00000 deg.
Subgrade k at top of layer = 0.0000 pci

Subgrade k at bottom of layer = 0.0000 pci

NOTE: Internal default values for subgrade k will be computed for this soil layer.

Layer 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 6.00000 ft
Distance from top of pile to bottom of layer = 11.00000 ft
Effective unit weight at top of layer = 119.23000 pcf
Effective unit weight at bottom of layer = 119.23000 pcf
Friction angle at top of layer = 35.00000 deg.
Friction angle at bottom of layer = 35.00000 deg.
Subgrade k at top of layer = 0.0000 pci
Subgrade k at bottom of layer = 0.0000 pci

NOTE: Internal default values for subgrade k will be computed for this soil layer.

Layer 4 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 11.00000 ft
Distance from top of pile to bottom of layer = 30.00000 ft
Effective unit weight at top of layer = 129.60000 pcf
Effective unit weight at bottom of layer = 129.60000 pcf
Friction angle at top of layer = 42.00000 deg.
Friction angle at bottom of layer = 42.00000 deg.
Subgrade k at top of layer = 0.0000 pci
Subgrade k at bottom of layer = 0.0000 pci

NOTE: Internal default values for subgrade k will be computed for this soil layer.

(Depth of lowest soil layer extends 2.00 ft below pile tip)

Summary of Soil Properties

Layer Num.	Layer Soil Type (p-y Curve Criteria)	Layer Depth ft	Effective Unit Wt. pcf	Angle of Friction deg.	kpy pci
1	Sand (Reese, et al.)	1.000	100.220	20.000	default
		4.000	100.220	20.000	default
2	Sand (Reese, et al.)	4.000	119.230	30.000	default
		6.000	119.230	30.000	default
3	Sand (Reese, et al.)	6.000	119.230	35.000	default
		11.000	119.230	35.000	default
4	Sand (Reese, et al.)	11.000	129.600	42.000	default
		30.000	129.600	42.000	default

Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 37711. lbs	M = 51475285. in-lbs	96024.	No
2	1	V = 45382. lbs	M = 61309084. in-lbs	81907.	No

V = perpendicular shear force applied to pile head
M = bending moment applied to pile head
y = lateral deflection relative to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applie to pile head
Axial thrust is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section = 28.00000 ft
Shaft Diameter = 108.00000 in
Concrete Cover Thickness = 3.00000 in
Number of Reinforcing Bars = 33 bars
Yield Stress of Reinforcing Bars = 60000. psi
Modulus of Elasticity of Reinforcing Bars = 29000000. psi
Gross Area of Shaft = 9160.88418 sq. in.
Total Area of Reinforcing Steel = 51.48000 sq. in.
Area Ratio of Steel Reinforcement = 0.56 percent
Edge-to-Edge Bar Spacing = 8.15169 in
Maximum Concrete Aggregate Size = 0.75000 in
Ratio of Bar Spacing to Aggregate Size = 10.87
Offset of Center of Rebar Cage from Center of Pile = 0.0000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = 0.85 Fc Ac + Fy As = 26317.781 kips
Tensile Load for Cracking of Concrete = -3470.922 kips
Nominal Axial Tensile Capacity = -3088.800 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.41000	1.56000	50.29500	0.00000
2	1.41000	1.56000	49.38610	9.51839
3	1.41000	1.56000	46.69227	18.69276
4	1.41000	1.56000	42.31085	27.19153
5	1.41000	1.56000	36.40020	34.70752
6	1.41000	1.56000	29.17396	40.96910
7	1.41000	1.56000	20.89330	45.74994
8	1.41000	1.56000	11.85750	48.87726
9	1.41000	1.56000	2.39313	50.23803
10	1.41000	1.56000	-7.15772	49.78307
11	1.41000	1.56000	-16.44988	47.52882
12	1.41000	1.56000	-25.14750	43.55675
13	1.41000	1.56000	-32.93622	38.01042
14	1.41000	1.56000	-39.53454	31.09031
15	1.41000	1.56000	-44.70398	23.04650
16	1.41000	1.56000	-48.25770	14.16974
17	1.41000	1.56000	-50.06726	4.78084
18	1.41000	1.56000	-50.06726	-4.78084
19	1.41000	1.56000	-48.25770	-14.16974
20	1.41000	1.56000	-44.70398	-23.04650
21	1.41000	1.56000	-39.53454	-31.09031
22	1.41000	1.56000	-32.93622	-38.01042
23	1.41000	1.56000	-25.14750	-43.55675
24	1.41000	1.56000	-16.44988	-47.52882
25	1.41000	1.56000	-7.15772	-49.78307
26	1.41000	1.56000	2.39313	-50.23803
27	1.41000	1.56000	11.85750	-48.87726
28	1.41000	1.56000	20.89330	-45.74994
29	1.41000	1.56000	29.17396	-40.96910
30	1.41000	1.56000	36.40020	-34.70752
31	1.41000	1.56000	42.31085	-27.19153
32	1.41000	1.56000	46.69227	-18.69276
33	1.41000	1.56000	49.38610	-9.51839

NOTE: The positions of the above rebars were computed by LPile

Minimum spacing between any two bars not equal to zero = 8.15169 inches between Bars 1 and 33

Spacing to aggregate size ratio = 10.86892

Concrete Properties:

Compressive Strength of Concrete = 3000.00000 psi
Modulus of Elasticity of Concrete = 3122019. psi
Modulus of Rupture of Concrete = -410.79191 psi
Compression Strain at Peak Stress = 0.00163
Tensile Strain at Fracture of Concrete = -0.0001160
Maximum Coarse Aggregate Size = 0.75000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 2

Number	Axial Thrust Force kips
1	81.907
2	96.024

Definitions of Run Messages and Notes:

C = concrete in section has cracked in tension.
Y = stress in reinforcing steel has reached yield stress.
T = ACI 318-08 criteria for tension-controlled section met, tensile strain in reinforcement exceeds 0.005 while simultaneously compressive strain in concrete more than than 0.003. See ACI 318-08, Section 10.3.4.
Z = depth of tensile zone in concrete section is less than 10 percent of section depth.

Bending Stiffness (EI) = Computed Bending Moment / Curvature.
Position of neutral axis is measured from edge of compression side of pile.
Compressive stresses and strains are positive in sign.
Tensile stresses and strains are negative in sign.

Axial Thrust Force = 81.907 kips

Bending Curvature rad/in.	Bending Moment in-kip	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Max Concrete Stress ksi	Max Steel Stress ksi	Run Msg
0.000000250	6526.8827327	26107530931.	63.4057891	0.0000159	-0.0000111	0.0574482	0.4557770	
0.000000500	13021.	26042006109.	58.7186314	0.0000294	-0.0000246	0.1058927	0.8435902	
0.000000750	19481.	25974798248.	57.1563695	0.0000429	-0.0000381	0.1539353	1.2314060	
0.000001000	25907.	25907164620.	56.3753029	0.0000564	-0.0000516	0.2015761	1.6192238	
0.000001250	32299.	25839360139.	55.9067096	0.0000699	-0.0000651	0.2488150	2.0070432	
0.000001500	38657.	25771470175.	55.5943526	0.0000834	-0.0000786	0.2956520	2.3948643	
0.000001750	44981.	25703531319.	55.3712731	0.0000969	-0.0000921	0.3420871	2.7826871	
0.000002000	51271.	25635561877.	55.2039918	0.0001104	-0.0001056	0.3881203	3.1705115	
0.000002250	51271.	22787166113.	27.6941869	0.0000623	-0.0001807	0.2202102	-5.2047194	C
0.000002500	51271.	20508449502.	27.2522326	0.0000681	-0.0002019	0.2402690	-5.8150631	C
0.000002750	51271.	18644045002.	26.8858864	0.0000739	-0.0002231	0.2602093	-6.4257855	C
0.000003000	51271.	17090374585.	26.5816847	0.0000797	-0.0002443	0.2800887	-7.0364134	C
0.000003250	51271.	15775730386.	26.3187479	0.0000855	-0.0002655	0.2998331	-7.6475630	C
0.000003500	51271.	14648892501.	26.0892700	0.0000913	-0.0002867	0.3194556	-8.2591291	C

0.000003750	51271.	13672299668.	25.8912828	0.0000971	-0.0003079	0.3390182	-8.8705980 C
0.000004000	51271.	12817780939.	25.7188843	0.0001029	-0.0003291	0.3585208	-9.4819694 C
0.000004250	51271.	12063793825.	25.5675613	0.0001087	-0.0003503	0.3779631	-10.0932431 C
0.000004500	51271.	11393583057.	25.4338033	0.0001145	-0.0003715	0.3973453	-10.7044187 C
0.000004750	51271.	10793920790.	25.3115062	0.0001202	-0.0003928	0.4166131	-11.3159550 C
0.000005000	51271.	10254224751.	25.1996665	0.0001260	-0.0004140	0.4357793	-11.9277483 C
0.000005250	51271.	9765928334.	25.0991482	0.0001318	-0.0004352	0.4548859	-12.5394397 C
0.000005500	51271.	9322022501.	25.0084096	0.0001375	-0.0004565	0.4739331	-13.1510287 C
0.000005750	51271.	8916717175.	24.9261768	0.0001433	-0.0004777	0.4929206	-13.7625150 C
0.000006000	51271.	8545187292.	24.8513887	0.0001491	-0.0004989	0.5118483	-14.3738984 C
0.000006250	51271.	8203379801.	24.7831535	0.0001549	-0.0005201	0.5307162	-14.9851784 C
0.000006500	51271.	7887865193.	24.7207170	0.0001607	-0.0005413	0.5495241	-15.5963548 C
0.000006750	51271.	7595722038.	24.6634365	0.0001665	-0.0005625	0.5682720	-16.2074273 C
0.000007000	51271.	7324446251.	24.6107612	0.0001723	-0.0005837	0.5869597	-16.8183955 C
0.000007250	51271.	7071879139.	24.5622164	0.0001781	-0.0006049	0.6055872	-17.4292590 C
0.000007500	51271.	6836149834.	24.5173905	0.0001839	-0.0006261	0.6241543	-18.0400175 C
0.000007750	51271.	6615628872.	24.4759251	0.0001897	-0.0006473	0.6426610	-18.6506708 C
0.000008000	51271.	6408890469.	24.4375067	0.0001955	-0.0006685	0.6611072	-19.2612184 C
0.000008250	51271.	6214681667.	24.4018597	0.0002013	-0.0006897	0.6794927	-19.8716600 C
0.000008500	51271.	6031896912.	24.3687409	0.0002071	-0.0007109	0.6978174	-20.4819953 C
0.000008750	51271.	5859557001.	24.3379351	0.0002130	-0.0007320	0.7160813	-21.0922239 C
0.000009000	51271.	5696791528.	24.3092508	0.0002188	-0.0007532	0.7342843	-21.7023455 C
0.000009250	51271.	5542824190.	24.2815709	0.0002246	-0.0007744	0.7523983	-22.3126136 C
0.000009500	51271.	5396960395.	24.2552829	0.0002304	-0.0007956	0.7704377	-22.9228995 C
0.000009750	51271.	5258576795.	24.2307427	0.0002362	-0.0008168	0.7884167	-23.5330725 C
0.0000102	51271.	5002060854.	24.1863995	0.0002479	-0.0008591	0.8241931	-24.7530777 C
0.0000107	51271.	4769406861.	24.1476465	0.0002596	-0.0009014	0.8597267	-25.9726262 C
0.0000112	51271.	4557433223.	24.1137483	0.0002713	-0.0009437	0.8950165	-27.1917146 C
0.0000117	51271.	4363499894.	24.0840948	0.0002830	-0.0009860	0.9300617	-28.4103397 C
0.0000122	51271.	4185397858.	24.0581755	0.0002947	-0.0010283	0.9648613	-29.6284981 C
0.0000127	52576.	4123613630.	24.0355602	0.0003065	-0.0010705	0.9994146	-30.8461866 C
0.0000133	54516.	4114433823.	24.0158836	0.0003182	-0.0011128	1.0337206	-32.0634017 C
0.0000138	56455.	4105799178.	23.9988338	0.0003300	-0.0011550	1.0677783	-33.2801400 C
0.0000143	58392.	4097651411.	23.9841428	0.0003418	-0.0011972	1.1015869	-34.4963983 C
0.0000148	60327.	4089940617.	23.9715789	0.0003536	-0.0012394	1.1351454	-35.7121723 C
0.0000153	62260.	4082622920.	23.9609410	0.0003654	-0.0012816	1.1684529	-36.9274590 C
0.0000157	64192.	4075660187.	23.9520537	0.0003772	-0.0013238	1.2015084	-38.1422546 C
0.0000162	66122.	4069018969.	23.9447631	0.0003891	-0.0013659	1.2343110	-39.3565554 C
0.0000167	68050.	4062669799.	23.9389340	0.0004010	-0.0014080	1.2668597	-40.5703578 C
0.0000172	69976.	4056586623.	23.9344467	0.0004129	-0.0014501	1.2991534	-41.7836580 C
0.0000177	71901.	4050746313.	23.9311955	0.0004248	-0.0014922	1.3311913	-42.9964521 C
0.0000182	73824.	4045128265.	23.9290859	0.0004367	-0.0015343	1.3629723	-44.2087362 C
0.0000187	75745.	4039714067.	23.9280340	0.0004487	-0.0015763	1.3944953	-45.4205064 C
0.0000192	77664.	4034487212.	23.9279645	0.0004606	-0.0016184	1.4257594	-46.6317588 C
0.0000197	79581.	4029432856.	23.9288098	0.0004726	-0.0016604	1.4567635	-47.8424891 C
0.0000202	81497.	4024537613.	23.9305092	0.0004846	-0.0017024	1.4875066	-49.0526934 C
0.0000207	83411.	4019789380.	23.9330078	0.0004966	-0.0017444	1.5179875	-50.2623675 C
0.0000212	85323.	4015177185.	23.9362561	0.0005086	-0.0017864	1.5482053	-51.4715071 C
0.0000217	87233.	4010691058.	23.9402093	0.0005207	-0.0018283	1.5781588	-52.6801080 C
0.0000222	89141.	4006321914.	23.9448264	0.0005328	-0.0018702	1.6078469	-53.8881658 C
0.0000227	91047.	4002061464.	23.9500705	0.0005449	-0.0019121	1.6372686	-55.0956760 C
0.0000232	92951.	3997902121.	23.9559077	0.0005570	-0.0019540	1.6664226	-56.3026343 C
0.0000237	94854.	3993836930.	23.9623072	0.0005691	-0.0019959	1.6953079	-57.5090360 C
0.0000242	96754.	3989859502.	23.9692407	0.0005813	-0.0020377	1.7239233	-58.7148766 C
0.0000247	98653.	3985963956.	23.9766825	0.0005934	-0.0020796	1.7522675	-59.9201514 C

0.0000252	100549.	3982144870.	23.9846087	0.0006056	-0.0021214	1.7803396	-60.0000000	CY
0.0000257	102437.	3978130918.	23.9924556	0.0006178	-0.0021632	1.8081058	-60.0000000	CY
0.0000262	104083.	3965072941.	23.9818482	0.0006295	-0.0022055	1.8344615	-60.0000000	CY
0.0000267	105520.	3944674563.	23.9559163	0.0006408	-0.0022482	1.8595705	-60.0000000	CY
0.0000272	106844.	3920872897.	23.9226810	0.0006519	-0.0022911	1.8839021	-60.0000000	CY
0.0000277	108035.	3893140138.	23.8807399	0.0006627	-0.0023343	1.9073623	-60.0000000	CY
0.0000282	109156.	3863913533.	23.8352584	0.0006733	-0.0023777	1.9302619	-60.0000000	CY
0.0000287	110204.	3833181613.	23.7861443	0.0006839	-0.0024211	1.9525937	-60.0000000	CY
0.0000292	111194.	3801509939.	23.7345582	0.0006942	-0.0024648	1.9744292	-60.0000000	CY
0.0000297	112108.	3768343937.	23.6790954	0.0007045	-0.0025085	1.9956800	-60.0000000	CY
0.0000317	115377.	3633919144.	23.4486363	0.0007445	-0.0026845	2.0767721	-60.0000000	CY
0.0000337	118076.	3498552066.	23.2067843	0.0007832	-0.0028618	2.1519019	-60.0000000	CY
0.0000357	120348.	3366378295.	22.9490195	0.0008204	-0.0030406	2.2209709	-60.0000000	CY
0.0000377	122316.	3240148457.	22.6977652	0.0008568	-0.0032202	2.2857000	-60.0000000	CY
0.0000397	123996.	3119402742.	22.4515205	0.0008924	-0.0034006	2.3462410	-60.0000000	CY
0.0000417	125527.	3006644710.	22.2198533	0.0009277	-0.0035813	2.4034853	-60.0000000	CY
0.0000437	126859.	2899631196.	21.9858823	0.0009619	-0.0037631	2.4565022	-60.0000000	CY
0.0000457	128052.	2798956936.	21.7575959	0.0009954	-0.0039456	2.5060454	-60.0000000	CY
0.0000477	129127.	2704233441.	21.5405865	0.0010286	-0.0041284	2.5526902	-60.0000000	CY
0.0000497	130132.	2615728398.	21.3372721	0.0010615	-0.0043115	2.5967706	-60.0000000	CY
0.0000517	130996.	2531320945.	21.1390135	0.0010939	-0.0044951	2.6378614	-60.0000000	CY
0.0000537	131843.	2452897846.	20.9487498	0.0011260	-0.0046790	2.6763064	-60.0000000	CY
0.0000557	132584.	2378181864.	20.7578306	0.0011572	-0.0048638	2.7116871	-60.0000000	CY
0.0000577	133250.	2307352792.	20.5748029	0.0011882	-0.0050488	2.7446908	-60.0000000	CY
0.0000597	133910.	2241179222.	20.4057826	0.0012192	-0.0052338	2.7757943	-60.0000000	CY
0.0000617	134524.	2178530597.	20.2448800	0.0012501	-0.0054189	2.8047144	-60.0000000	CY
0.0000637	135058.	2118552180.	20.0875999	0.0012806	-0.0056044	2.8312791	-60.0000000	CY
0.0000657	135567.	2061861558.	19.9360382	0.0013108	-0.0057902	2.8556986	-60.0000000	CY
0.0000677	136062.	2008294511.	19.7852808	0.0013405	-0.0059765	2.8778016	-60.0000000	CY
0.0000697	136541.	1957582623.	19.6433122	0.0013701	-0.0061629	2.8980750	-60.0000000	CY
0.0000717	136939.	1908564174.	19.5013510	0.0013992	-0.0063498	2.9161628	-60.0000000	CY
0.0000737	137317.	1861927857.	19.3664583	0.0014283	-0.0065367	2.9324595	-60.0000000	CY
0.0000757	137691.	1817704111.	19.2399913	0.0014574	-0.0067236	2.9470448	-60.0000000	CY
0.0000777	138062.	1775715764.	19.1214054	0.0014867	-0.0069103	2.9599036	-60.0000000	CY
0.0000797	138430.	1735793920.	19.0101267	0.0015161	-0.0070969	2.9710160	-60.0000000	CY
0.0000817	138748.	1697220967.	18.8998386	0.0015451	-0.0072839	2.9802206	-60.0000000	CY
0.0000837	139030.	1660062577.	18.7818821	0.0015730	-0.0074720	2.9874157	-60.0000000	CY
0.0000857	139294.	1624414944.	18.6683780	0.0016008	-0.0076602	2.9929748	-60.0000000	CY
0.0000877	139554.	1590363487.	18.5612335	0.0016287	-0.0078483	2.9969372	-60.0000000	CY
0.0000897	139813.	1557800976.	18.4600406	0.0016568	-0.0080362	2.9992841	-60.0000000	CY
0.0000917	140068.	1526628649.	18.3644501	0.0016849	-0.0082241	2.9996189	-60.0000000	CY
0.0000937	140313.	1496676135.	18.2733780	0.0017131	-0.0084119	2.9941227	-60.0000000	CY
0.0000957	140539.	1467768733.	18.1846799	0.0017412	-0.0085998	2.9974645	-60.0000000	CY
0.0000977	140751.	1439911360.	18.0990676	0.0017692	-0.0087878	2.9994192	-60.0000000	CY
0.0000997	140936.	1412892831.	18.0142631	0.0017969	-0.0089761	2.9996325	-60.0000000	CY
0.0001017	141117.	1386901731.	17.9341777	0.0018248	-0.0091642	2.9945145	-60.0000000	CY
0.0001037	141297.	1361896022.	17.8580185	0.0018528	-0.0093522	2.9958285	-60.0000000	CY
0.0001057	141469.	1337772493.	17.7809172	0.0018803	-0.0095407	2.9983118	-60.0000000	CY
0.0001077	141635.	1314480406.	17.7025620	0.0019075	-0.0097295	2.9996739	-60.0000000	CY
0.0001097	141799.	1292019706.	17.6279945	0.0019347	-0.0099183	2.9990053	-60.0000000	CY
0.0001217	142616.	1171386460.	17.2257672	0.0020972	-0.0110518	2.9992806	-60.0000000	CY
0.0001337	143267.	1071158754.	16.8974258	0.0022600	-0.0121850	2.9993764	60.0000000	CY
0.0001457	143847.	986944010.	16.6177582	0.0024220	-0.0133190	2.9932867	60.0000000	CY
0.0001577	144238.	914343378.	16.3414888	0.0025779	-0.0144591	2.9984886	60.0000000	CY
0.0001697	144591.	851789849.	16.1208820	0.0027365	-0.0155965	2.9911582	60.0000000	CY

0.0001817	144871.	797086911.	15.9545388	0.0028997	-0.0167293	2.9998941	60.0000000	CY
0.0001937	145082.	748808404.	15.8218362	0.0030655	-0.0178595	2.9850867	60.0000000	CYT
0.0002057	145204.	705730303.	15.7055314	0.0032314	-0.0189896	2.9946909	60.0000000	CYT
0.0002177	145300.	667278326.	15.5971442	0.0033963	-0.0201207	2.9999987	60.0000000	CYT
0.0002297	145364.	632706485.	15.5056705	0.0035624	-0.0212506	2.9858974	60.0000000	CYT
0.0002417	145425.	601551312.	15.4272066	0.0037295	-0.0223795	2.9829096	60.0000000	CYT
0.0002537	145474.	573297451.	15.3644311	0.0038987	-0.0235063	2.9953578	60.0000000	CYT

Axial Thrust Force = 96.024 kips

Bending Curvature rad/in.	Bending Moment in-kip	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Max Concrete Stress ksi	Max Steel Stress ksi	Run Msg
0.000000250	6526.4067314	26105626926.	65.0271275	0.0000163	-0.0000107	0.0589225	0.4675317	
0.000000500	13021.	26041034649.	59.5319620	0.0000298	-0.0000242	0.1073596	0.8553835	
0.000000750	19481.	25974144607.	57.7004088	0.0000433	-0.0000377	0.1553949	1.2432389	
0.000001000	25907.	25906670598.	56.7847115	0.0000568	-0.0000512	0.2030283	1.6310966	
0.000001250	32299.	25838962099.	56.2353499	0.0000703	-0.0000647	0.2502598	2.0189564	
0.000001500	38657.	25771136104.	55.8691537	0.0000838	-0.0000782	0.2970893	2.4068182	
0.000001750	44981.	25703242962.	55.6076240	0.0000973	-0.0000917	0.3435169	2.7946819	
0.000002000	51271.	25635307819.	55.4115105	0.0001108	-0.0001052	0.3895424	3.1825476	
0.000002250	51271.	22786940284.	28.4526313	0.0000640	-0.0001790	0.2262404	-5.1552308	C
0.000002500	51271.	20508246255.	27.9483600	0.0000699	-0.0002001	0.2463964	-5.7645939	C
0.000002750	51271.	18643860232.	27.5368035	0.0000757	-0.0002213	0.2664888	-6.3738749	C
0.000003000	51271.	17090205213.	27.1789083	0.0000815	-0.0002425	0.2863511	-6.9844550	C
0.000003250	51271.	15775574043.	26.8770816	0.0000874	-0.0002636	0.3061524	-7.5949400	C
0.000003500	51271.	14648747325.	26.6193113	0.0000932	-0.0002848	0.3258926	-8.2053299	C
0.000003750	51271.	13672164170.	26.3937106	0.0000990	-0.0003060	0.3455317	-8.8159590	C
0.000004000	51271.	12817653910.	26.1903724	0.0001048	-0.0003272	0.3650167	-9.4272768	C
0.000004250	51271.	12063674268.	26.0117511	0.0001105	-0.0003485	0.3844415	-10.0384967	C
0.000004500	51271.	11393470142.	25.8537296	0.0001163	-0.0003697	0.4038060	-10.6496183	C
0.000004750	51271.	10793813819.	25.7130573	0.0001221	-0.0003909	0.4231101	-11.2606413	C
0.000005000	51271.	10254123128.	25.5871338	0.0001279	-0.0004121	0.4423537	-11.8715656	C
0.000005250	51271.	9765831550.	25.4738542	0.0001337	-0.0004333	0.4615368	-12.4823907	C
0.000005500	51271.	9321930116.	25.3710593	0.0001395	-0.0004545	0.4806511	-13.0931860	C
0.000005750	51271.	8916628807.	25.2734249	0.0001453	-0.0004757	0.4996203	-13.7046114	C
0.000006000	51271.	8545102606.	25.1845198	0.0001511	-0.0004969	0.5185297	-14.3159335	C
0.000006250	51271.	8203298502.	25.1032983	0.0001569	-0.0005181	0.5373792	-14.9271522	C
0.000006500	51271.	7887787021.	25.0288757	0.0001627	-0.0005393	0.5561688	-15.5382669	C
0.000006750	51271.	7595646761.	24.9604982	0.0001685	-0.0005605	0.5748982	-16.1492775	C
0.000007000	51271.	7324373663.	24.8975197	0.0001743	-0.0005817	0.5935675	-16.7601835	C
0.000007250	51271.	7071809054.	24.8393834	0.0001801	-0.0006029	0.6121764	-17.3709846	C
0.000007500	51271.	6836082085.	24.7856065	0.0001859	-0.0006241	0.6307250	-17.9816806	C
0.000007750	51271.	6615563308.	24.7357687	0.0001917	-0.0006453	0.6492131	-18.5922710	C
0.000008000	51271.	6408826955.	24.6895023	0.0001975	-0.0006665	0.6676406	-19.2027555	C
0.000008250	51271.	6214620077.	24.6464838	0.0002033	-0.0006877	0.6860074	-19.8131337	C
0.000008500	51271.	6031837134.	24.6064283	0.0002092	-0.0007088	0.7043134	-20.4234054	C
0.000008750	51271.	5859498930.	24.5690830	0.0002150	-0.0007300	0.7225585	-21.0335702	C
0.000009000	51271.	5696735071.	24.5342235	0.0002208	-0.0007512	0.7407426	-21.6436276	C
0.000009250	51271.	5542769258.	24.5016495	0.0002266	-0.0007724	0.7588656	-22.2535775	C
0.000009500	51271.	5396906909.	24.4711819	0.0002325	-0.0007935	0.7769274	-22.8634194	C
0.000009750	51271.	5258524681.	24.4426599	0.0002383	-0.0008147	0.7949279	-23.4731529	C
0.0000102	51271.	5002011282.	24.3908881	0.0002500	-0.0008570	0.8307445	-24.6922935	C

0.0000107	51271.	4769359594.	24.3453364	0.0002617	-0.0008993	0.8663146	-25.9109963	C
0.0000112	51271.	4557388057.	24.3051843	0.0002734	-0.0009416	0.9016373	-27.1292586	C
0.0000117	51271.	4363456650.	24.2680928	0.0002852	-0.0009838	0.9366525	-28.3476424	C
0.0000122	51271.	4185356379.	24.2350857	0.0002969	-0.0010261	0.9714121	-29.5656508	C
0.0000127	53007.	4157380383.	24.2059418	0.0003086	-0.0010684	1.0059251	-30.7831880	C
0.0000133	54946.	4146891403.	24.1802327	0.0003204	-0.0011106	1.0401906	-32.0002506	C
0.0000138	56884.	4137042552.	24.1575923	0.0003322	-0.0011528	1.0742076	-33.2168350	C
0.0000143	58821.	4127765702.	24.1377062	0.0003440	-0.0011950	1.1079753	-34.4329379	C
0.0000148	60755.	4119001954.	24.1203024	0.0003558	-0.0012372	1.1414926	-35.6485556	C
0.0000153	62688.	4110699947.	24.1051450	0.0003676	-0.0012794	1.1747587	-36.8636850	C
0.0000157	64619.	4102815384.	24.0920281	0.0003794	-0.0013216	1.2077725	-38.0783214	C
0.0000162	66549.	4095308838.	24.0807711	0.0003913	-0.0013637	1.2405333	-39.2924618	C
0.0000167	68476.	4088145783.	24.0712152	0.0004032	-0.0014058	1.2730398	-40.5061023	C
0.0000172	70402.	4081295688.	24.0632201	0.0004151	-0.0014479	1.3052912	-41.7192392	C
0.0000177	72326.	4074731451.	24.0566613	0.0004270	-0.0014900	1.3372865	-42.9318686	C
0.0000182	74249.	4068428934.	24.0514282	0.0004389	-0.0015321	1.3690246	-44.1439866	C
0.0000187	76169.	4062366566.	24.0474220	0.0004509	-0.0015741	1.4005045	-45.3555893	C
0.0000192	78088.	4056525007.	24.0445544	0.0004629	-0.0016161	1.4317252	-46.5666725	C
0.0000197	80005.	4050886869.	24.0427458	0.0004748	-0.0016582	1.4626857	-47.7772323	C
0.0000202	81920.	4045436473.	24.0419250	0.0004868	-0.0017002	1.4933849	-48.9872645	C
0.0000207	83833.	4040159643.	24.0420275	0.0004989	-0.0017421	1.5238217	-50.1967649	C
0.0000212	85745.	4035043531.	24.0429950	0.0005109	-0.0017841	1.5539950	-51.4057293	C
0.0000217	87654.	4030076460.	24.0447747	0.0005230	-0.0018260	1.5839038	-52.6141533	C
0.0000222	89562.	4025247797.	24.0473186	0.0005351	-0.0018679	1.6135469	-53.8220326	C
0.0000227	91467.	4020547835.	24.0505830	0.0005472	-0.0019098	1.6429233	-55.0293628	C
0.0000232	93371.	4015967694.	24.0545282	0.0005593	-0.0019517	1.6720318	-56.2361393	C
0.0000237	95273.	4011499234.	24.0591178	0.0005714	-0.0019936	1.7008712	-57.4423576	C
0.0000242	97173.	4007134979.	24.0643186	0.0005836	-0.0020354	1.7294404	-58.6480130	C
0.0000247	99071.	4002868050.	24.0701000	0.0005957	-0.0020773	1.7577383	-59.8531009	C
0.0000252	100967.	3998692104.	24.0764340	0.0006079	-0.0021191	1.7857635	-60.0000000	CY
0.0000257	102855.	3994360084.	24.0828034	0.0006201	-0.0021609	1.8134858	-60.0000000	CY
0.0000262	104523.	3981840526.	24.0725121	0.0006319	-0.0022031	1.8399038	-60.0000000	CY
0.0000267	105966.	3961357495.	24.0456229	0.0006432	-0.0022458	1.8649983	-60.0000000	CY
0.0000272	107298.	3937541786.	24.0116152	0.0006543	-0.0022887	1.8893248	-60.0000000	CY
0.0000277	108493.	3909652776.	23.9686102	0.0006651	-0.0023319	1.9127607	-60.0000000	CY
0.0000282	109620.	3880362803.	23.9223042	0.0006758	-0.0023752	1.9356485	-60.0000000	CY
0.0000287	110670.	3849388751.	23.8719788	0.0006863	-0.0024187	1.9579425	-60.0000000	CY
0.0000292	111665.	3817612163.	23.8195248	0.0006967	-0.0024623	1.9797594	-60.0000000	CY
0.0000297	112582.	3784263709.	23.7630275	0.0007070	-0.0025060	2.0009794	-60.0000000	CY
0.0000317	115862.	3649212365.	23.5288916	0.0007470	-0.0026820	2.0819567	-60.0000000	CY
0.0000337	118572.	3513239065.	23.2844768	0.0007859	-0.0028591	2.1570149	-60.0000000	CY
0.0000357	120851.	3380459772.	23.0274845	0.0008232	-0.0030378	2.2262124	-60.0000000	CY
0.0000377	122821.	3253525875.	22.7727366	0.0008597	-0.0032173	2.2907634	-60.0000000	CY
0.0000397	124508.	3132273917.	22.5237683	0.0008953	-0.0033977	2.3511559	-60.0000000	CY
0.0000417	126045.	3019036108.	22.2896007	0.0009306	-0.0035784	2.4082450	-60.0000000	CY
0.0000437	127381.	2911566594.	22.0579713	0.0009650	-0.0037600	2.4614216	-60.0000000	CY
0.0000457	128581.	2810512825.	21.8275999	0.0009986	-0.0039424	2.5108072	-60.0000000	CY
0.0000477	129655.	2715287238.	21.6079920	0.0010318	-0.0041252	2.5572434	-60.0000000	CY
0.0000497	130666.	2626459667.	21.4029648	0.0010648	-0.0043082	2.6011595	-60.0000000	CY
0.0000517	131529.	2541621433.	21.2024563	0.0010972	-0.0044918	2.6420390	-60.0000000	CY
0.0000537	132381.	2462910863.	21.0154215	0.0011296	-0.0046754	2.6806155	-60.0000000	CY
0.0000557	133127.	2387930023.	20.8230624	0.0011609	-0.0048601	2.7158131	-60.0000000	CY
0.0000577	133793.	2316763750.	20.6381507	0.0011919	-0.0050451	2.7485957	-60.0000000	CY
0.0000597	134453.	2250261872.	20.4672972	0.0012229	-0.0052301	2.7794697	-60.0000000	CY
0.0000617	135069.	2187359106.	20.3050315	0.0012538	-0.0054152	2.8081797	-60.0000000	CY

0.0000637	135605.	2127142145.	20.1464699	0.0012843	-0.0056007	2.8345322	-60.0000000	CY
0.0000657	136119.	2070247112.	19.9972463	0.0013148	-0.0057862	2.8589223	-60.0000000	CY
0.0000677	136614.	2016449846.	19.8465980	0.0013446	-0.0059724	2.8808617	-60.0000000	CY
0.0000697	137094.	1965504145.	19.7032523	0.0013743	-0.0061587	2.9008858	-60.0000000	CY
0.0000717	137497.	1916333188.	19.5605657	0.0014035	-0.0063455	2.9187512	-60.0000000	CY
0.0000737	137874.	1869478325.	19.4243457	0.0014325	-0.0065325	2.9347918	-60.0000000	CY
0.0000757	138247.	1825045310.	19.2966087	0.0014617	-0.0067193	2.9491170	-60.0000000	CY
0.0000777	138617.	1782858326.	19.1768250	0.0014910	-0.0069060	2.9617124	-60.0000000	CY
0.0000797	138984.	1742747671.	19.0644155	0.0015204	-0.0070926	2.9725580	-60.0000000	CY
0.0000817	139306.	1704045033.	18.9535651	0.0015495	-0.0072795	2.9815089	-60.0000000	CY
0.0000837	139596.	1666822640.	18.8407259	0.0015779	-0.0074671	2.9885607	-60.0000000	CY
0.0000857	139859.	1631008810.	18.7261270	0.0016058	-0.0076552	2.9938274	-60.0000000	CY
0.0000877	140119.	1596798610.	18.6179449	0.0016337	-0.0078433	2.9974934	-60.0000000	CY
0.0000897	140377.	1564084305.	18.5157681	0.0016618	-0.0080312	2.9995398	-60.0000000	CY
0.0000917	140631.	1532764391.	18.4193045	0.0016900	-0.0082190	2.9985735	-60.0000000	CY
0.0000937	140878.	1502698164.	18.3276625	0.0017182	-0.0084068	2.9949209	-60.0000000	CY
0.0000957	141103.	1473657598.	18.2380873	0.0017463	-0.0085947	2.9979811	-60.0000000	CY
0.0000977	141318.	1445709961.	18.1521746	0.0017744	-0.0087826	2.9996542	-60.0000000	CY
0.0000997	141502.	1418564568.	18.0666564	0.0018021	-0.0089709	2.9985470	-60.0000000	CY
0.0001017	141682.	1392455967.	17.9857585	0.0018301	-0.0091589	2.9934243	-60.0000000	CY
0.0001037	141861.	1367337213.	17.9088235	0.0018580	-0.0093470	2.9965192	-60.0000000	CY
0.0001057	142038.	1343151848.	17.8356375	0.0018861	-0.0095349	2.9987783	-60.0000000	CY
0.0001077	142206.	1319774954.	17.7586203	0.0019135	-0.0097235	2.9998642	-60.0000000	CY
0.0001097	142369.	1297207909.	17.6834700	0.0019408	-0.0099122	2.9977406	-60.0000000	CY
0.0001217	143188.	1176084401.	17.2782776	0.0021036	-0.0110454	2.9979526	-60.0000000	CY
0.0001337	143837.	1075416288.	16.9462651	0.0022666	-0.0121784	2.9996743	60.0000000	CY
0.0001457	144422.	990889120.	16.6717377	0.0024299	-0.0133111	2.9945841	60.0000000	CY
0.0001577	144815.	918004149.	16.3937684	0.0025861	-0.0144509	2.9967756	60.0000000	CY
0.0001697	145162.	855151553.	16.1722592	0.0027452	-0.0155878	2.9928117	60.0000000	CY
0.0001817	145441.	800227404.	16.0039948	0.0029087	-0.0167203	2.9999994	60.0000000	CY
0.0001937	145646.	751720389.	15.8711706	0.0030750	-0.0178500	2.9831013	60.0000000	CYT
0.0002057	145771.	708483696.	15.7538575	0.0032414	-0.0189796	2.9961161	60.0000000	CYT
0.0002177	145867.	669883546.	15.6590020	0.0034097	-0.0201073	2.9974214	60.0000000	CYT
0.0002297	145930.	635170596.	15.5655873	0.0035762	-0.0212368	2.9830381	60.0000000	CYT
0.0002417	145990.	603888336.	15.4854271	0.0037436	-0.0223654	2.9865888	60.0000000	CYT
0.0002537	146036.	575509778.	15.4226293	0.0039135	-0.0234915	2.9972463	60.0000000	CYT

Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1

Moment values interpolated at maximum compressive strain = 0.003
or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	81.907	144998.235	0.00300000
2	96.024	145553.559	0.00300000

Note note that the values of moment capacity in the table above are not factored by a strength reduction factor (phi-factor).

In ACI 318-08, the value of the strength reduction factor depends on whether

the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318-08, Section 9.3.2.2 or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding bending stiffnesses computed for common resistance factor values used for reinforced concrete sections.

Axial Load No.	Resistance Factor for Moment	Nominal Moment Capacity in-kip	Ultimate (Factored) Axial Thrust kips	Ultimate (Factored) Moment Capacity in-kip	Bending Stiffness at Ult. Mom. Cap. kip-in^2
1	0.65	144998.235	53.240	94248.850	3995129262.268
2	0.65	145553.559	62.416	94609.810	4013057665.669
1	0.70	144998.235	57.335	101498.763	3980125670.731
2	0.70	145553.559	67.217	101887.489	3996579755.326
1	0.75	144998.235	61.430	108748.677	3874522460.707
2	0.75	145553.559	72.018	109165.169	3892185992.027

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 1

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 37711.0 lbs
Applied moment at pile head = 51475285.0 in-lbs
Axial thrust load on pile head = 96024.0 lbs

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil Res. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.4348	51475285.	37711.	-0.003037	0.000	1.287E+13	0.000	0.000	0.000
0.280	0.4246	51602972.	37711.	-0.003024	0.000	1.287E+13	0.000	0.000	0.000
0.560	0.4145	51730654.	37711.	-0.003001	0.000	5.471E+12	0.000	0.000	0.000
0.840	0.4045	51858326.	37711.	-0.002965	0.000	4.176E+12	0.000	0.000	0.000
1.120	0.3946	51985985.	37704.	-0.002923	0.000	4.174E+12	-4.1958	35.7311	0.000
1.400	0.3848	52113583.	37674.	-0.002881	0.000	4.171E+12	-13.6405	119.1037	0.000
1.680	0.3752	52241013.	37613.	-0.002839	0.000	4.169E+12	-22.6099	202.4764	0.000
1.960	0.3657	52368175.	37523.	-0.002797	0.000	4.167E+12	-31.1143	285.8490	0.000
2.240	0.3564	52494971.	37405.	-0.002754	0.000	4.165E+12	-39.1645	369.2216	0.000
2.520	0.3472	52621312.	37260.	-0.002712	0.000	4.163E+12	-46.7711	452.5942	0.000
2.800	0.3382	52747111.	37091.	-0.002669	0.000	4.161E+12	-53.9446	535.9668	0.000
3.080	0.3293	52872288.	36899.	-0.002627	0.000	4.159E+12	-60.6959	619.3394	0.000
3.360	0.3205	52996765.	36684.	-0.002584	0.000	4.158E+12	-67.0356	702.7121	0.000
3.640	0.3119	53120471.	36449.	-0.002541	0.000	4.157E+12	-72.9745	786.0847	0.000

3.920	0.3035	53243340.	36194.	-0.002498	0.000	4.156E+12	-78.5234	869.4573	0.000
4.200	0.2951	53365309.	35370.	-0.002455	0.000	4.155E+12	-412.3754	4694.8087	0.000
4.480	0.2870	53482608.	33926.	-0.002412	0.000	4.155E+12	-446.9354	5233.2550	0.000
4.760	0.2789	53594847.	32370.	-0.002369	0.000	4.154E+12	-479.1244	5771.7012	0.000
5.040	0.2710	53701664.	30710.	-0.002325	0.000	4.154E+12	-509.0129	6310.1474	0.000
5.320	0.2633	53802720.	28953.	-0.002282	0.000	4.153E+12	-536.6715	6848.5937	0.000
5.600	0.2557	53897702.	27107.	-0.002238	0.000	4.152E+12	-562.1710	7387.0399	0.000
5.880	0.2483	53986325.	25179.	-0.002194	0.000	4.152E+12	-585.5825	7925.4861	0.000
6.160	0.2410	54068322.	21672.	-0.002151	0.000	4.152E+12	-1502.0530	20945.	0.000
6.440	0.2338	54133347.	16470.	-0.002107	0.000	4.151E+12	-1594.4721	22914.	0.000
6.720	0.2268	54180357.	11010.	-0.002063	0.000	4.151E+12	-1655.3059	24523.	0.000
7.000	0.2199	54208666.	5355.3358	-0.002019	0.000	4.151E+12	-1710.5756	26132.	0.000
7.280	0.2132	54217648.	-476.0609	-0.001975	0.000	4.151E+12	-1760.4938	27741.	0.000
7.560	0.2067	54206741.	-6466.5482	-0.001932	0.000	4.151E+12	-1805.2724	29350.	0.000
7.840	0.2002	54175439.	-12599.	-0.001888	0.000	4.151E+12	-1845.1231	30960.	0.000
8.120	0.1940	54123292.	-18858.	-0.001844	0.000	4.151E+12	-1880.2567	32569.	0.000
8.400	0.1879	54049904.	-25227.	-0.001800	0.000	4.152E+12	-1910.8834	34178.	0.000
8.680	0.1819	53954929.	-31692.	-0.001756	0.000	4.152E+12	-1937.2124	35787.	0.000
8.960	0.1761	53838069.	-38238.	-0.001713	0.000	4.153E+12	-1959.4518	37396.	0.000
9.240	0.1704	53699073.	-44853.	-0.001669	0.000	4.154E+12	-1977.8083	39005.	0.000
9.520	0.1648	53537735.	-51523.	-0.001626	0.000	4.154E+12	-1992.4875	40614.	0.000
9.800	0.1594	53353889.	-58236.	-0.001583	0.000	4.155E+12	-2003.6930	42223.	0.000
10.080	0.1542	53147408.	-64982.	-0.001540	0.000	4.157E+12	-2011.6269	43832.	0.000
10.360	0.1491	52918202.	-71749.	-0.001497	0.000	4.159E+12	-2016.4893	45441.	0.000
10.640	0.1441	52666218.	-78528.	-0.001454	0.000	4.163E+12	-2018.4779	47050.	0.000
10.920	0.1393	52391431.	-85309.	-0.001412	0.000	4.167E+12	-2017.7871	48659.	0.000
11.200	0.1347	52093851.	-94629.	-0.001370	0.000	4.172E+12	-3529.6658	88072.	0.000
11.480	0.1301	51756410.	-106517.	-0.001328	0.000	4.177E+12	-3546.5629	91575.	0.000
11.760	0.1257	51378915.	-118452.	-0.001301	0.000	1.437E+13	-3557.9689	95078.	0.000
12.040	0.1214	50961248.	-130413.	-0.001292	0.000	2.564E+13	-3561.4019	98582.	0.000
12.320	0.1171	50503373.	-142371.	-0.001285	0.000	2.564E+13	-3556.4435	102085.	0.000
12.600	0.1127	50005344.	-154298.	-0.001278	0.000	2.565E+13	-3543.1574	105588.	0.000
12.880	0.1085	49467313.	-166167.	-0.001272	0.000	2.565E+13	-3521.6058	109091.	0.000
13.160	0.1042	48889522.	-177950.	-0.001265	0.000	2.566E+13	-3491.8496	112595.	0.000
13.440	0.1000	48272307.	-189619.	-0.001259	0.000	2.567E+13	-3453.9479	116098.	0.000
13.720	0.0957	47616097.	-201147.	-0.001253	0.000	2.567E+13	-3407.9581	119601.	0.000
14.000	0.0915	46921410.	-212507.	-0.001247	0.000	2.568E+13	-3353.9359	123104.	0.000
14.280	0.0874	46188857.	-223672.	-0.001241	0.000	2.569E+13	-3291.9349	126607.	0.000
14.560	0.0832	45419137.	-234615.	-0.001235	0.000	2.570E+13	-3222.0070	130111.	0.000
14.840	0.0791	44613039.	-245310.	-0.001229	0.000	2.571E+13	-3144.2019	133614.	0.000
15.120	0.0749	43771444.	-255731.	-0.001223	0.000	2.571E+13	-3058.5673	137117.	0.000
15.400	0.0708	42895316.	-265851.	-0.001217	0.000	2.572E+13	-2965.1489	140620.	0.000
15.680	0.0668	41985711.	-275644.	-0.001212	0.000	2.573E+13	-2863.9898	144123.	0.000
15.960	0.0627	41043771.	-285084.	-0.001206	0.000	2.574E+13	-2755.1313	147627.	0.000
16.240	0.0587	40070725.	-294145.	-0.001201	0.000	2.575E+13	-2638.6119	151130.	0.000
16.520	0.0546	39067889.	-302803.	-0.001196	0.000	2.577E+13	-2514.4680	154633.	0.000
16.800	0.0506	38036663.	-311030.	-0.001191	0.000	2.578E+13	-2382.7334	158136.	0.000
17.080	0.0466	36978536.	-318802.	-0.001186	0.000	2.579E+13	-2243.4397	161640.	0.000
17.360	0.0427	35895080.	-326093.	-0.001181	0.000	2.580E+13	-2096.6159	165143.	0.000
17.640	0.0387	34787952.	-332879.	-0.001177	0.000	2.581E+13	-1942.2885	168646.	0.000
17.920	0.0348	33658895.	-339133.	-0.001172	0.000	2.582E+13	-1780.4813	172149.	0.000
18.200	0.0308	32509736.	-344831.	-0.001168	0.000	2.584E+13	-1611.2159	175652.	0.000
18.480	0.0269	31342386.	-349948.	-0.001164	0.000	2.585E+13	-1434.5110	179156.	0.000
18.760	0.0230	30158839.	-354458.	-0.001160	0.000	2.586E+13	-1250.3830	182659.	0.000
19.040	0.0191	28961174.	-358338.	-0.001156	0.000	2.587E+13	-1058.8459	186162.	0.000

19.320	0.0152	27751555.	-361561.	-0.001152	0.000	2.588E+13	-859.9108	189665.	0.000
19.600	0.0114	26532226.	-364104.	-0.001149	0.000	2.590E+13	-653.5867	193168.	0.000
19.880	0.007515	25305517.	-365941.	-0.001145	0.000	2.591E+13	-439.8799	196672.	0.000
20.160	0.003673	24073841.	-367048.	-0.001142	0.000	2.592E+13	-218.7944	200175.	0.000
20.440	-0.000159	22839694.	-367399.	-0.001139	0.000	2.593E+13	9.6681	203678.	0.000
20.720	-0.003982	21605656.	-366970.	-0.001136	0.000	2.595E+13	245.5083	207181.	0.000
21.000	-0.007794	20374388.	-365737.	-0.001133	0.000	2.596E+13	488.7290	210685.	0.000
21.280	-0.0116	19148636.	-363674.	-0.001131	0.000	2.598E+13	739.3353	214188.	0.000
21.560	-0.0154	17931231.	-360756.	-0.001128	0.000	2.599E+13	997.3343	217691.	0.000
21.840	-0.0192	16725085.	-356959.	-0.001126	0.000	2.600E+13	1262.7351	221194.	0.000
22.120	-0.0230	15533193.	-352258.	-0.001124	0.000	2.601E+13	1535.5484	224697.	0.000
22.400	-0.0267	14358637.	-346628.	-0.001122	0.000	2.602E+13	1815.7869	228201.	0.000
22.680	-0.0305	13204580.	-340043.	-0.001120	0.000	2.604E+13	2103.4650	231704.	0.000
22.960	-0.0343	12074269.	-332480.	-0.001119	0.000	2.605E+13	2398.5984	235207.	0.000
23.240	-0.0380	10971037.	-323912.	-0.001117	0.000	2.605E+13	2701.2042	238710.	0.000
23.520	-0.0418	9898300.	-314315.	-0.001116	0.000	2.606E+13	3011.3005	242213.	0.000
23.800	-0.0455	8859559.	-303664.	-0.001115	0.000	2.607E+13	3328.9066	245717.	0.000
24.080	-0.0493	7858400.	-291932.	-0.001114	0.000	2.608E+13	3654.0425	249220.	0.000
24.360	-0.0530	6898493.	-279096.	-0.001113	0.000	2.610E+13	3986.7290	252723.	0.000
24.640	-0.0567	5983594.	-265129.	-0.001112	0.000	2.611E+13	4326.9873	256226.	0.000
24.920	-0.0605	5117545.	-250006.	-0.001111	0.000	2.611E+13	4674.8386	259729.	0.000
25.200	-0.0642	4304273.	-233701.	-0.001111	0.000	2.611E+13	5030.3043	263233.	0.000
25.480	-0.0679	3547791.	-216189.	-0.001110	0.000	2.611E+13	5393.4052	266736.	0.000
25.760	-0.0717	2852198.	-197444.	-0.001110	0.000	2.611E+13	5764.1620	270239.	0.000
26.040	-0.0754	2221680.	-177441.	-0.001109	0.000	2.611E+13	6142.5942	273742.	0.000
26.320	-0.0791	1660509.	-156153.	-0.001109	0.000	2.611E+13	6528.7206	277246.	0.000
26.600	-0.0828	1173045.	-133555.	-0.001109	0.000	2.611E+13	6922.5585	280749.	0.000
26.880	-0.0866	763734.	-109621.	-0.001109	0.000	2.611E+13	7324.1233	284252.	0.000
27.160	-0.0903	437109.	-84324.	-0.001109	0.000	2.611E+13	7733.4287	287755.	0.000
27.440	-0.0940	197792.	-57639.	-0.001109	0.000	2.611E+13	8150.4860	291258.	0.000
27.720	-0.0978	50490.	-29540.	-0.001109	0.000	2.611E+13	8575.3035	294762.	0.000
28.000	-0.1015	0.000	0.000	-0.001109	0.000	2.611E+13	9007.8866	149132.	0.000

* This analysis computed pile response using nonlinear moment-curvature relationships.
Values of total stress due to combined axial and bending stresses are computed only
for elastic sections only and do not equal the actual stresses in concrete and steel.
Stresses in concrete and steel may be interpolated from the output for nonlinear
bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 1:

Pile-head deflection = 0.4348029 inches
Computed slope at pile head = -0.0030374 radians
Maximum bending moment = 54217648. inch-lbs
Maximum shear force = -367399. lbs
Depth of maximum bending moment = 7.2800000 feet below pile head
Depth of maximum shear force = 20.4400000 feet below pile head
Number of iterations = 175
Number of zero deflection points = 1

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for Lateral Loading for Load Case Number 2

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 45382.0 lbs
Applied moment at pile head = 61309084.0 in-lbs
Axial thrust load on pile head = 81907.0 lbs

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil Res. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.5869	61309084.	45382.	-0.004168	0.000	4.086E+12	0.000	0.000	0.000
0.280	0.5729	61462708.	45382.	-0.004118	0.000	4.086E+12	0.000	0.000	0.000
0.560	0.5592	61616318.	45382.	-0.004067	0.000	4.085E+12	0.000	0.000	0.000
0.840	0.5456	61769914.	45382.	-0.004017	0.000	4.084E+12	0.000	0.000	0.000
1.120	0.5322	61923495.	45372.	-0.003966	0.000	4.084E+12	-5.6595	35.7311	0.000
1.400	0.5190	62076999.	45332.	-0.003915	0.000	4.083E+12	-18.3957	119.1037	0.000
1.680	0.5059	62230282.	45250.	-0.003864	0.000	4.083E+12	-30.4853	202.4764	0.000
1.960	0.4930	62383206.	45128.	-0.003812	0.000	4.082E+12	-41.9410	285.8490	0.000
2.240	0.4803	62535642.	44969.	-0.003761	0.000	4.082E+12	-52.7757	369.2216	0.000
2.520	0.4677	62687468.	44775.	-0.003709	0.000	4.081E+12	-63.0023	452.5942	0.000
2.800	0.4553	62838569.	44547.	-0.003658	0.000	4.080E+12	-72.6338	535.9668	0.000
3.080	0.4431	62988836.	44288.	-0.003606	0.000	4.080E+12	-81.6831	619.3394	0.000
3.360	0.4311	63138166.	43999.	-0.003554	0.000	4.079E+12	-90.1633	702.7121	0.000
3.640	0.4193	63286464.	43683.	-0.003502	0.000	4.079E+12	-98.0874	786.0847	0.000
3.920	0.4076	63433641.	43341.	-0.003450	0.000	4.078E+12	-105.4687	869.4573	0.000
4.200	0.3961	63579612.	42234.	-0.003397	0.000	4.078E+12	-553.4267	4694.8087	0.000
4.480	0.3848	63719321.	40297.	-0.003345	0.000	4.077E+12	-599.2574	5233.2550	0.000
4.760	0.3736	63852250.	38212.	-0.003292	0.000	4.077E+12	-641.7608	5771.7012	0.000
5.040	0.3626	63977919.	35990.	-0.003240	0.000	4.076E+12	-681.0226	6310.1474	0.000
5.320	0.3518	64095885.	33641.	-0.003187	0.000	4.076E+12	-717.1284	6848.5937	0.000
5.600	0.3412	64205741.	31176.	-0.003134	0.000	4.076E+12	-750.1643	7387.0399	0.000
5.880	0.3308	64307113.	28605.	-0.003081	0.000	4.075E+12	-780.2164	7925.4861	0.000
6.160	0.3205	64399662.	24562.	-0.003028	0.000	4.075E+12	-1626.4593	17051.	0.000
6.440	0.3104	64473834.	18883.	-0.002975	0.000	4.075E+12	-1753.7760	18983.	0.000
6.720	0.3005	64528193.	12780.	-0.002922	0.000	4.074E+12	-1879.2153	21011.	0.000
7.000	0.2908	64561321.	6256.6436	-0.002868	0.000	4.074E+12	-2003.4565	23149.	0.000
7.280	0.2812	64571816.	-688.9056	-0.002815	0.000	4.074E+12	-2130.7990	25457.	0.000
7.560	0.2719	64558241.	-8059.3628	-0.002762	0.000	4.074E+12	-2256.3779	27886.	0.000
7.840	0.2627	64519177.	-15848.	-0.002709	0.000	4.075E+12	-2379.9334	30442.	0.000
8.120	0.2537	64453231.	-23978.	-0.002655	0.000	4.075E+12	-2458.8607	32569.	0.000
8.400	0.2448	64359510.	-32292.	-0.002602	0.000	4.075E+12	-2490.4941	34178.	0.000
8.680	0.2362	64237658.	-40703.	-0.002549	0.000	4.075E+12	-2515.5666	35787.	0.000
8.960	0.2277	64087391.	-49186.	-0.002496	0.000	4.076E+12	-2534.3303	37396.	0.000
9.240	0.2194	63908499.	-57723.	-0.002444	0.000	4.077E+12	-2547.0358	39005.	0.000
9.520	0.2113	63700837.	-66293.	-0.002391	0.000	4.077E+12	-2553.9317	40614.	0.000
9.800	0.2033	63464327.	-74876.	-0.002339	0.000	4.078E+12	-2555.2648	42223.	0.000
10.080	0.1956	63198956.	-83455.	-0.002287	0.000	4.079E+12	-2551.2794	43832.	0.000
10.360	0.1880	62904767.	-92012.	-0.002235	0.000	4.080E+12	-2542.2174	45441.	0.000
10.640	0.1806	62581863.	-100531.	-0.002183	0.000	4.081E+12	-2528.3181	47050.	0.000
10.920	0.1733	62230401.	-108995.	-0.002132	0.000	4.083E+12	-2509.8179	48659.	0.000
11.200	0.1662	61850591.	-120532.	-0.002081	0.000	4.084E+12	-4357.2242	88072.	0.000
11.480	0.1593	61421575.	-135147.	-0.002030	0.000	4.086E+12	-4342.3469	91575.	0.000

11.760	0.1526	60943522.	-149696.	-0.001980	0.000	4.088E+12	-4317.8734	95078.	0.000
12.040	0.1460	60416708.	-164148.	-0.001930	0.000	4.090E+12	-4284.2938	98582.	0.000
12.320	0.1396	59841512.	-178472.	-0.001880	0.000	4.092E+12	-4242.0877	102085.	0.000
12.600	0.1334	59218411.	-192641.	-0.001831	0.000	4.094E+12	-4191.7241	105588.	0.000
12.880	0.1273	58547974.	-206627.	-0.001783	0.000	4.097E+12	-4133.6604	109091.	0.000
13.160	0.1214	57830857.	-220407.	-0.001735	0.000	4.100E+12	-4068.3418	112595.	0.000
13.440	0.1157	57067796.	-233955.	-0.001688	0.000	4.103E+12	-3996.2008	116098.	0.000
13.720	0.1101	56259607.	-247250.	-0.001642	0.000	4.107E+12	-3917.6563	119601.	0.000
14.000	0.1046	55407177.	-260272.	-0.001596	0.000	4.110E+12	-3833.1130	123104.	0.000
14.280	0.0993	54511460.	-273000.	-0.001551	0.000	4.114E+12	-3742.9613	126607.	0.000
14.560	0.0942	53573474.	-285416.	-0.001507	0.000	4.119E+12	-3647.5761	130111.	0.000
14.840	0.0892	52594296.	-297503.	-0.001464	0.000	4.124E+12	-3547.3168	133614.	0.000
15.120	0.0844	51575059.	-309246.	-0.001422	0.000	4.173E+12	-3442.5265	137117.	0.000
15.400	0.0797	50516946.	-320630.	-0.001398	0.000	2.564E+13	-3333.4685	140620.	0.000
15.680	0.0750	49421197.	-331632.	-0.001391	0.000	2.565E+13	-3215.5485	144123.	0.000
15.960	0.0703	48289144.	-342223.	-0.001385	0.000	2.567E+13	-3088.8142	147627.	0.000
16.240	0.0657	47122218.	-352374.	-0.001379	0.000	2.568E+13	-2953.3110	151130.	0.000
16.520	0.0610	45921949.	-362055.	-0.001372	0.000	2.569E+13	-2809.0812	154633.	0.000
16.800	0.0564	44689965.	-371237.	-0.001367	0.000	2.571E+13	-2656.1642	158136.	0.000
17.080	0.0519	43427992.	-379890.	-0.001361	0.000	2.572E+13	-2494.5965	161640.	0.000
17.360	0.0473	42137854.	-387986.	-0.001355	0.000	2.573E+13	-2324.4120	165143.	0.000
17.640	0.0427	40821473.	-395495.	-0.001350	0.000	2.575E+13	-2145.6412	168646.	0.000
17.920	0.0382	39480868.	-402390.	-0.001345	0.000	2.576E+13	-1958.3120	172149.	0.000
18.200	0.0337	38118152.	-408641.	-0.001339	0.000	2.578E+13	-1762.4490	175652.	0.000
18.480	0.0292	36735537.	-414219.	-0.001335	0.000	2.579E+13	-1558.0741	179156.	0.000
18.760	0.0247	35335332.	-419097.	-0.001330	0.000	2.580E+13	-1345.2060	182659.	0.000
19.040	0.0203	33919938.	-423245.	-0.001325	0.000	2.582E+13	-1123.8606	186162.	0.000
19.320	0.0158	32491855.	-426635.	-0.001321	0.000	2.584E+13	-894.0508	189665.	0.000
19.600	0.0114	31053677.	-429239.	-0.001317	0.000	2.585E+13	-655.7866	193168.	0.000
19.880	0.006989	29608095.	-431028.	-0.001313	0.000	2.586E+13	-409.0752	196672.	0.000
20.160	0.002584	28157893.	-431974.	-0.001309	0.000	2.588E+13	-153.9209	200175.	0.000
20.440	-0.001809	26705953.	-432048.	-0.001306	0.000	2.590E+13	109.6746	203678.	0.000
20.720	-0.006190	25255250.	-431222.	-0.001302	0.000	2.591E+13	381.7125	207181.	0.000
21.000	-0.0106	23808855.	-429469.	-0.001299	0.000	2.593E+13	662.1963	210685.	0.000
21.280	-0.0149	22369936.	-426758.	-0.001296	0.000	2.594E+13	951.1322	214188.	0.000
21.560	-0.0193	20941753.	-423063.	-0.001293	0.000	2.596E+13	1248.5288	217691.	0.000
21.840	-0.0236	19527665.	-418354.	-0.001291	0.000	2.597E+13	1554.3967	221194.	0.000
22.120	-0.0279	18131125.	-412603.	-0.001288	0.000	2.598E+13	1868.7491	224697.	0.000
22.400	-0.0323	16755682.	-405782.	-0.001286	0.000	2.600E+13	2191.6009	228201.	0.000
22.680	-0.0366	15404980.	-397861.	-0.001284	0.000	2.601E+13	2522.9689	231704.	0.000
22.960	-0.0409	14082762.	-388813.	-0.001282	0.000	2.603E+13	2862.8716	235207.	0.000
23.240	-0.0452	12792863.	-378608.	-0.001280	0.000	2.604E+13	3211.3291	238710.	0.000
23.520	-0.0495	11539219.	-367218.	-0.001279	0.000	2.605E+13	3568.3630	242213.	0.000
23.800	-0.0538	10325859.	-354614.	-0.001277	0.000	2.606E+13	3933.9957	245717.	0.000
24.080	-0.0581	9156913.	-340767.	-0.001276	0.000	2.607E+13	4308.2507	249220.	0.000
24.360	-0.0624	8036604.	-325648.	-0.001275	0.000	2.608E+13	4691.1522	252723.	0.000
24.640	-0.0667	6969257.	-309228.	-0.001274	0.000	2.610E+13	5082.7250	256226.	0.000
24.920	-0.0709	5959291.	-291478.	-0.001273	0.000	2.611E+13	5482.9940	259729.	0.000
25.200	-0.0752	5011226.	-272368.	-0.001272	0.000	2.611E+13	5891.9840	263233.	0.000
25.480	-0.0795	4129678.	-251869.	-0.001272	0.000	2.611E+13	6309.7197	266736.	0.000
25.760	-0.0838	3319365.	-229952.	-0.001271	0.000	2.611E+13	6736.2248	270239.	0.000
26.040	-0.0880	2585101.	-206587.	-0.001271	0.000	2.611E+13	7171.5223	273742.	0.000
26.320	-0.0923	1931801.	-181745.	-0.001271	0.000	2.611E+13	7615.6340	277246.	0.000
26.600	-0.0966	1364477.	-155395.	-0.001271	0.000	2.611E+13	8068.5798	280749.	0.000
26.880	-0.1008	888245.	-127509.	-0.001270	0.000	2.611E+13	8530.3781	284252.	0.000

27.160	-0.1051	508318.	-98056.	-0.001270	0.000	2.611E+13	9001.0445	287755.	0.000
27.440	-0.1094	230008.	-67007.	-0.001270	0.000	2.611E+13	9480.5921	291258.	0.000
27.720	-0.1136	58731.	-34331.	-0.001270	0.000	2.611E+13	9969.0308	294762.	0.000
28.000	-0.1179	0.000	0.000	-0.001270	0.000	2.611E+13	10466.	149132.	0.000

* This analysis computed pile response using nonlinear moment-curvature relationships.
Values of total stress due to combined axial and bending stresses are computed only
for elastic sections only and do not equal the actual stresses in concrete and steel.
Stresses in concrete and steel may be interpolated from the output for nonlinear
bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 2:

Pile-head deflection = 0.5868594 inches
Computed slope at pile head = -0.0041684 radians
Maximum bending moment = 64571816. inch-lbs
Maximum shear force = -432048. lbs
Depth of maximum bending moment = 7.2800000 feet below pile head
Depth of maximum shear force = 20.4400000 feet below pile head
Number of iterations = 243
Number of zero deflection points = 1

Summary of Pile Response(s)

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, lbs, and Load 2 = Moment, in-lbs
Load Type 2: Load 1 = Shear, lbs, and Load 2 = Slope, radians
Load Type 3: Load 1 = Shear, lbs, and Load 2 = Rotational Stiffness, in-lbs/radian
Load Type 4: Load 1 = Top Deflection, inches, and Load 2 = Moment, in-lbs
Load Type 5: Load 1 = Top Deflection, inches, and Load 2 = Slope, radians

Load Case No.	Load Type No.	Pile-head Condition 1 V(lbs) or y(inches)	Pile-head Condition 2 in-lb, rad., or in-lb/rad.	Axial Loading lbs	Maximum Pile-head Deflection inches	Maximum Moment in Pile in-lbs	Shear in Pile lbs	Pile-head Rotation radians
1	1	V = 37711.	M = 51475285.	96024.	0.43480286	54217648.	-367399.	-0.00303743
2	1	V = 45382.	M = 61309084.	81907.	0.58685940	64571816.	-432048.	-0.00416840

The analysis ended normally.

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of $6 billion.

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EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CTFF001

Greenwich Hospital
5 Perryridge Road
Greenwich, CT 06830

March 18, 2015

EBI Project Number: 6215001498

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	97.62 %

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

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March 18, 2015

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

Emissions Analysis for Site: **CTFF001 – Greenwich Hospital**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **5 Perryridge Road, Greenwich, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **5 Perryridge Road, Greenwich, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

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

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

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

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

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

7) The antennas used in this modeling are the **RFS APX16PV_16PVL** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16PV_16PVL** 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 **144 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 APX16PV_16PVL	Make / Model:	RFS APX16PV_16PVL	Make / Model:	RFS APX16PV_16PVL
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	144	Height (AGL):	144	Height (AGL):	144
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	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%	1.93	Antenna B1 MPE%	1.93	Antenna C1 MPE%	1.93
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):	144	Height (AGL):	144	Height (AGL):	144
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%	0.35	Antenna B2 MPE%	0.35	Antenna C2 MPE%	0.35

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**6.85**
Verizon Wireless	34.38 %
AT&T	26.02 %
MW to Bruce	6.85 %
MW to PD	0.17 %
MW to Putnam	6.85 %
Trunked System	2.04 %
Mutual Aid	1.13 %
CMED	0.77 %
Fire Paging	1.15 %
SP Hotline	1.49 %
Sprint	0.62 %
Clearwire	0.78 %
Nextel	5.96 %
Sprint/Nextel WiMAX	2.56 %
Site Total MPE %:	**97.62 %**

T-Mobile Sector 1 Total:	2.28 %
T-Mobile Sector 2 Total:	2.28 %
T-Mobile Sector 3 Total:	2.28 %
Site Total:	97.62 %

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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:	2.28 %
Sector 2:	2.28 %
Sector 3 :	2.28 %
T-Mobile Total:	6.85 %
Site Total:	97.62 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **97.62%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

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