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

April 8, 2015

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

Re: Notice of Exempt Modification
UCONN/T-Mobile equipment upgrade
Site ID CT11303B
82 North Eagleville Road, Mansfield (Storrs) CT

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.

In this case, UCONN owns the existing telecommunications tower and related facility at 82 North Eagleville Road, Mansfield (Storrs) Connecticut (latitude 41.814537, longitude -72.259742). T-Mobile intends to add three (3) antennas and related equipment at this existing facility at UCONN ("UCONN 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 Mayor of Mansfield, Elizabeth C. Paterson and the property owner, the University of Connecticut.

The existing UCONN Facility consists of a 245 foot lattice tower.[1] T-Mobile plans to add three (3) antennas and three (3) RRU (remote radio units) mounted on the tower at a centerline of 235 feet. (See the plans dated February 18, 2015 attached hereto as Exhibit A). The existing tower is structurally capable of supporting T-Mobile's proposed use assuming the modifications detailed in the structural analysis and modification report are implemented. See the structural analysis and modification report dated April 1, 2015 and attached hereto as Exhibit B.[2]

[1] The Connecticut Siting Council database does not contain any Dockets or Petitions relative to this Facility however there is are notices of intent captioned EM-SPRINT-078-150213, EM-T-MOBILE-078-120614 and EM-VER-078-100114.

[2] T-Mobile will implement the modifications shown on SK-1 through SK-3 of the report prior to installation of the proposed equipment.

The planned modifications to the UCONN 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 additional antennas and equipment will be installed at the 235 foot level. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. T-Mobile does not propose any changes to the existing compound area, so no extension of the site boundaries is required.

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 additional 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 25, 2105 T-Mobile' operations would add 2.30% 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 10.19% 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 additional antennas and equipment at the UCONN 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: Mayor Elizabeth C. Paterson, Town of Mansfield
University of Connecticut
Mark Richard, T-Mobile
Sheldon Freincle, NSS

T-MOBILE USA, INC.
12920 SE 38TH STREET
BELLEVUE, WA 98006
(425) 378-4000

3050106
2/23/2015
2000011160

Invoice Number	Inv. Date	Description	Deductions	Voucher	Amount Paid
CT11303B-1	2/19/2015	Exempt Mod Filing Fees	0.00	1100314072	625.00

DO NOT ACCEPT THIS CHECK UNLESS THE FACE FADES FROM BLACK TO RED WITH LOGO IN BACKGROUND. THE BACK OF THIS DOCUMENT HAS HEAT-SENSITIVE INK THAT CHANGES FROM ORANGE TO YELLOW.
COPYBAN CAPTURE - ANTI-FRAUD PROTECTION

T-MOBILE USA, INC.
12920 SE 38th Street
Bellevue, WA 98006
(425) 378-4000

The Bank of New York Mellon
Pittsburgh, PA
60-160/433

3050106
2/23/2015
VID 2000011160

PAY $625 00
SIX TWO FIVE CTS CTS

*$625.00

Six Hundred Twenty Five Dollars Only*******

To The Order Of
CONNECTICUT SITING COUNCIL
10 FRANKLIN SQ
NEW BRITAIN, CT 06051

VOID AFTER 180 DAYS
THIS CHECK CLEARS THROUGH POSITIVE PAY

⑈000030501 06⑈ ⑆043301601⑆ 013⑈8430⑈

EXHIBIT A

T-MOBILE NORTHEAST LLC

SITE #: CT11303B

SITE NAME: UCONN

SITE ADDRESS:
82 NORTH EAGLEVILLE ROAD
STORRS, CT 06268

WIRELESS BROADBAND FACILITY
CONSTRUCTION DRAWINGS
(702Cu 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.

SITE INFORMATION

SITE NUMBER:	CT11303B
SITE NAME:	UCONN
SITE ADDRESS:	82 NORTH EAGLEVILLE ROAD STORRS, CT 06268
LAT./LONG.:	N 41.814537 / W –72.259742
JURISDICTION:	TOWN OF STORRS , CT
PROPERTY OWNER:	UNIVERSITY OF CONNECTICUT OFFICE OF UNIVERSITY PLANNING REAL ESTATE & RISK MANAGEMENT 31 LEDOYT ROAD, UNIT 3094 STORRS, CONNECTICUT 06269–3094 ATTN: ROBERT J. SITKOWSKI, REAL ESTATE OFFICER ROBERT.SITKOWSKI@UCONN.EDU DESK: 860–486–3396 CELL: 860–803–7913

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

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A–2	ANTENNA PLAN AND DETAILS
E–1	GROUNDING AND POWER ONE LINE DIAGRAM
E–2	GROUNDING DETAILS

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

NORTHEAST SITE SOLUTIONS
54 MAIN STREET, UNIT 3
STURBRIDGE, MA 01566
(508) 434-5237

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

SUBMITTALS

DATE	DESCRIPTION	REVISION
02/18/15	ISSUED FOR REVIEW	A

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

DRAWN BY: FG
CHECKED BY: SM

PROFESSIONAL SEAL

SITE NAME
CT11303B
SITE NAME
UCONN
SITE ADDRESS
82 NORTH EAGLEVILLE ROAD
STORRS, CT 06268

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.

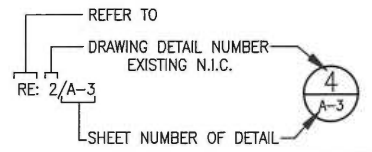
INSURANCE AND BONDS

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

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SUBMITTALS

DATE	DESCRIPTION	REVISION
02/18/15	ISSUED FOR REVIEW	A

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

DRAWN BY: FG
CHECKED BY: SM

PROFESSIONAL SEAL

SITE NAME
CT11303B
SITE NAME
UCONN
SITE ADDRESS
82 NORTH EAGLEVILLE ROAD
STORRS, CT 06268

SHEET TITLE
GENERAL AND ELECTRICAL NOTES

SHEET NUMBER
N-1

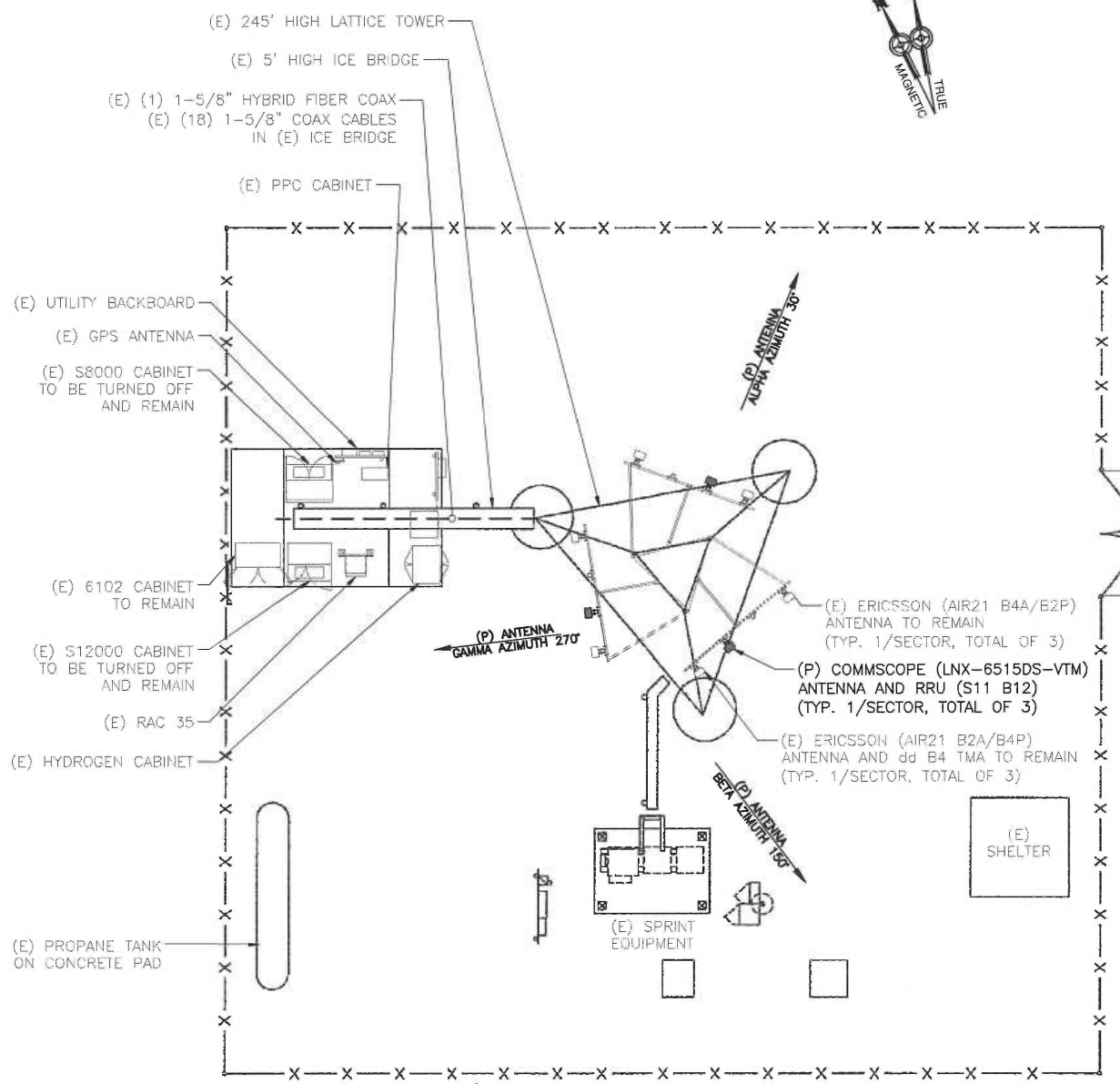
(E) SITE LOCATION

(E) DRIVEWAY

KEY PLAN

SCALE: N.T.S.

1 / A-1



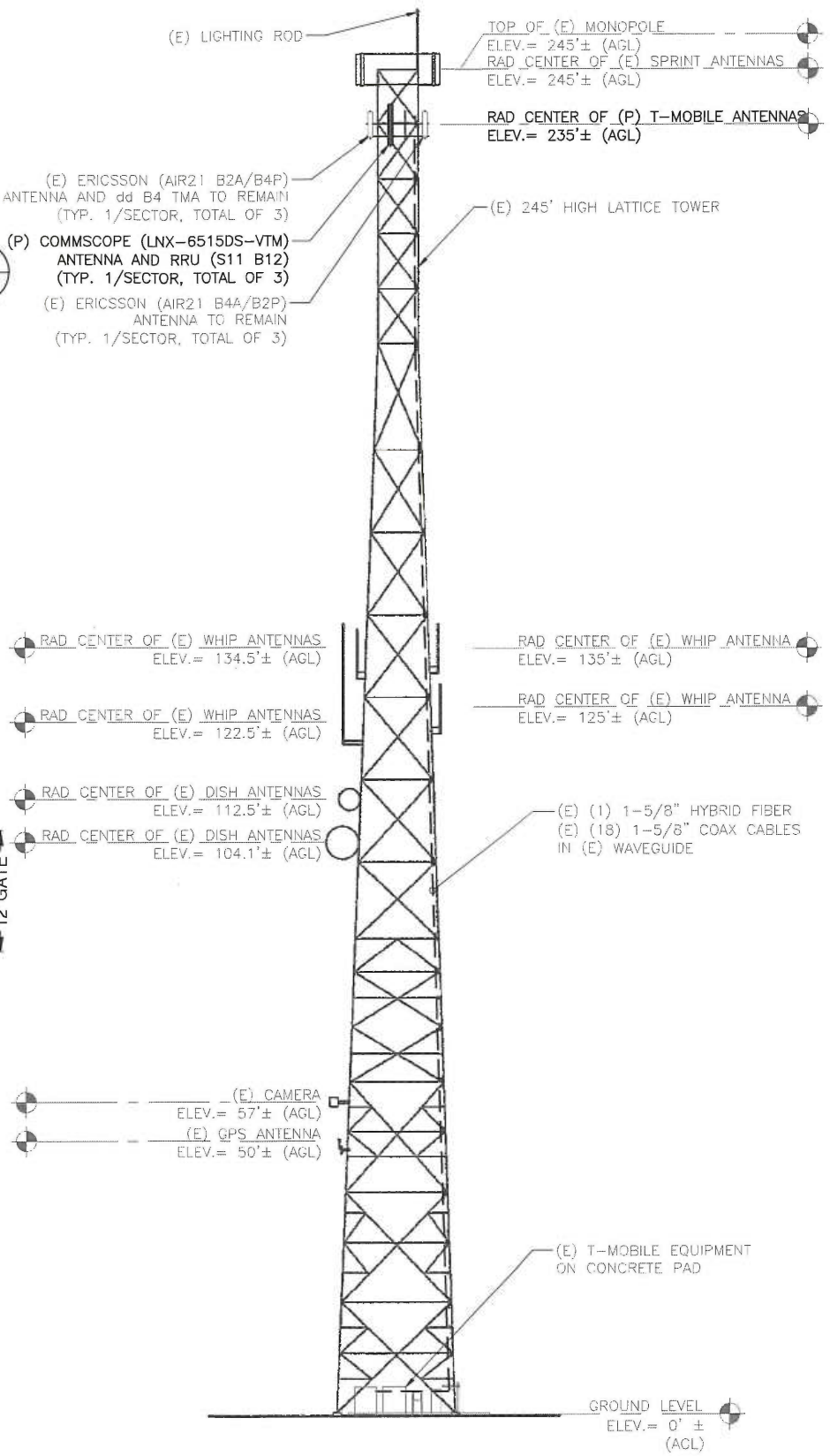
COMPOUND PLAN

SCALE: 1/6" = 1'-0" (11x17)
1/8" = 1'-0" (24x36)

2 / A-1

0 16 32 48

SCALE 1/16"=1' (11x17)
SCALE 1/8"=1' (24x36)



ELEVATION VIEW

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

3 / A-1

0 30 60 90

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

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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RF MAN.			
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OPS			
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SITE AC.			

DRAWN BY:	FG
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NAME
CT11303B
SITE NAME
UCONN
SITE ADDRESS
82 NORTH EAGLEVILLE ROAD
STORRS, CT 06268

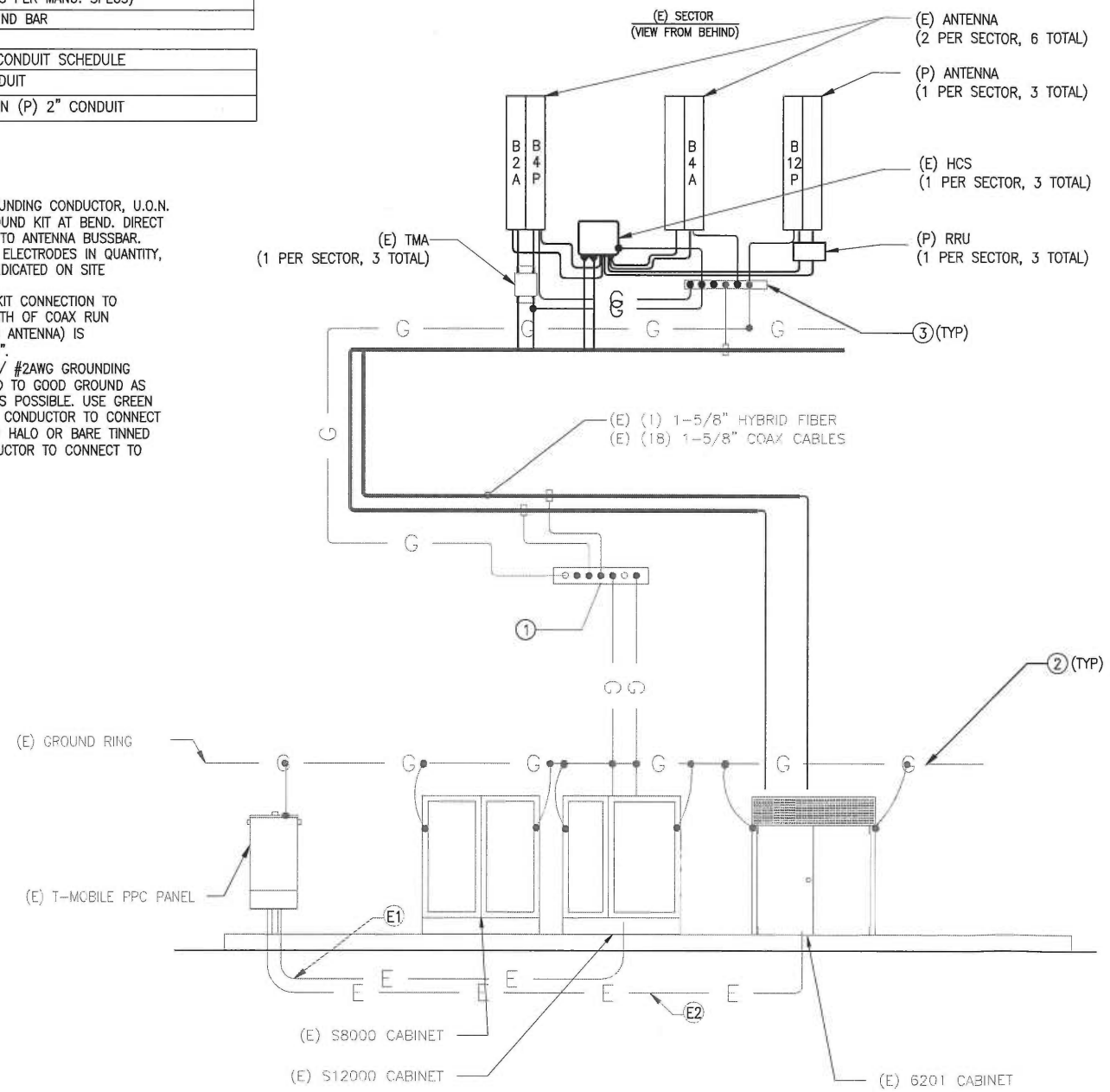
SHEET TITLE
COMPOUND PLAN AND ELEVATION

SHEET NUMBER
A-1

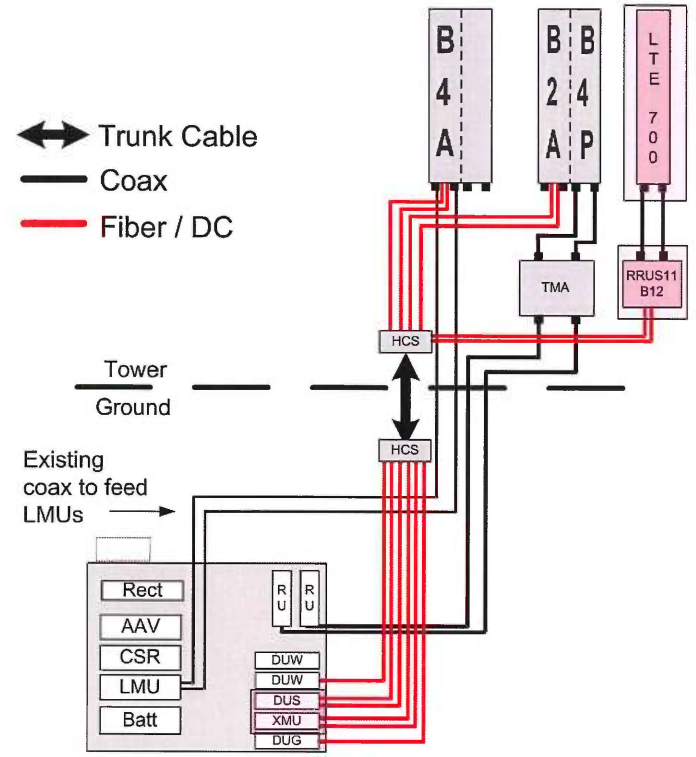
GROUNDING SCHEDULE	
①	(E) MGB (BUSSBAR #1)
②	(E) #2AWG BARE TINNED SOLID COPPER CONDUCTOR BONDED TO GROUND RING (GROUND CABINETS PER MANU. SPECS)
③	(E) SECTOR GROUND BAR

CONDUIT SCHEDULE	
E1	(E) POWER CONDUIT
E2	(E) 3#6+1#8G IN (P) 2" CONDUIT

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.



GROUNDING DIAGRAM
SCALE: N.T.S
1 E-1



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

702Cu CONFIGURATION
COAX/FIBER PLUMBING DIAGRAM
SCALE: N.T.S
2 E-1

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RF MAN.			
ZONING			
OPS			
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SITE AC.			

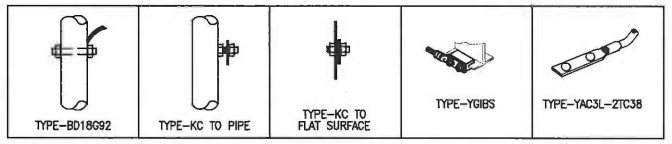
DRAWN BY:	FG
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NAME
CT11303B
SITE NAME
UCONN
SITE ADDRESS
82 NORTH EAGLEVILLE ROAD
STORRS, CT 06268

SHEET TITLE
GROUNDING AND POWER ONE LINE DIAGRAM

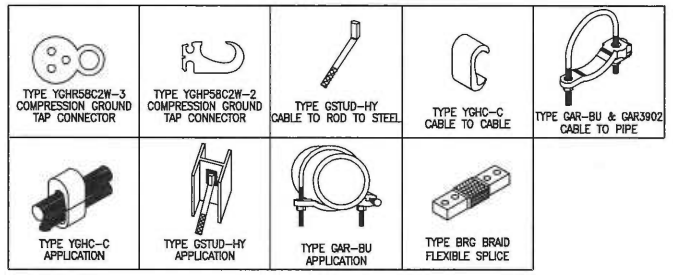
SHEET NUMBER
E-1



BURNDY GROUNDING DETAILS

1 E-2

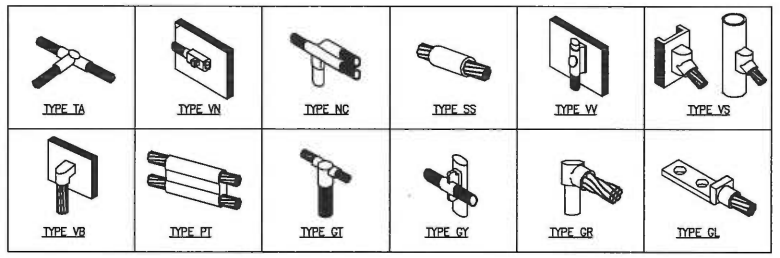
SCALE: N.T.S.



BURNDY GROUNDING PRODUCTS

2 E-2

SCALE: N.T.S.



CADWELD GROUNDING CONNECTION PRODUCTS

3 E-2

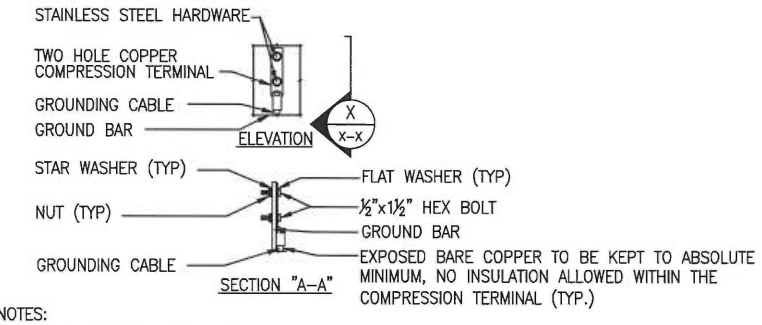
SCALE: N.T.S.

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

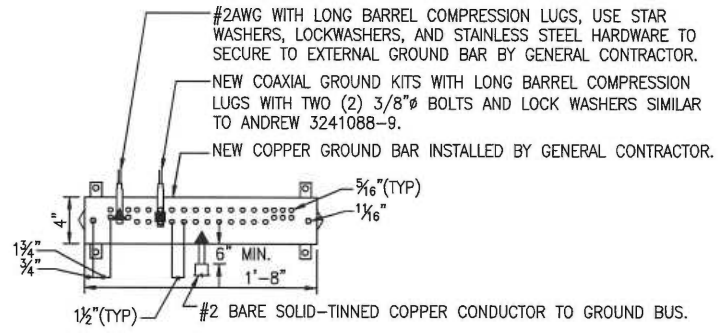
	SOLID #2 TINNED COPPER	#6 GROUND LEAD	#2/0 STRANDED MAIN DOWN CONDUCTOR	MASTER GRND BAR	STRUCTURAL OR TOWER STEEL	BLDG SERVICE ENTR OR GRND RING	GROUND ROD
SOLID #2 TINNED COPPER	B OR C	B OR C		C	A, C, OR D		C
#6 GROUND LEAD	B OR C			A	A, C, OR D		
#2/0 STRANDED GRNDG ELECTRODE CONDUCTOR				A	A, C, OR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

7 E-2



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

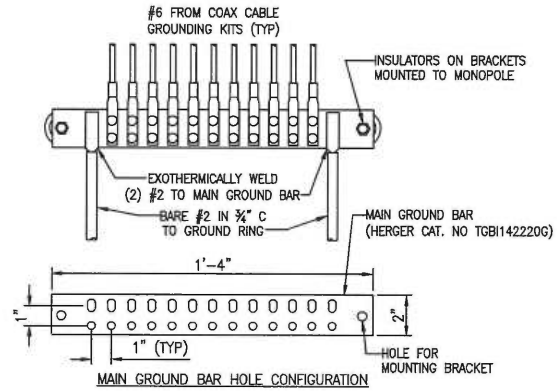


NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

TYPICAL GROUND BAR CONNECTIONS DETAIL

4 E-2

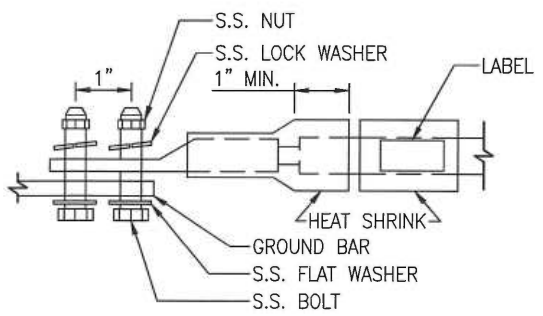
SCALE: N.T.S.



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.

T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
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NORTHEAST SITE SOLUTIONS
54 MAIN STREET, UNIT 3
STURBRIDGE, MA 01566
(508) 434-5237

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

SUBMITTALS

DATE	DESCRIPTION	REVISION
02/18/15	ISSUED FOR REVIEW	A

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

DRAWN BY:	FG
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NAME
CT11303B
SITE NAME
UCONN
SITE ADDRESS
82 NORTH EAGLEVILLE ROAD
STORRS, CT 06268

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
April 1, 2015

DETAILED STRUCTURAL ANALYSIS AND MODIFICATION OF AN EXISTING 245' SELF SUPPORTING LATTICE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

T-Mobile

Site ID : CT11303B
Site Name: UCONN
Site Address: 82 North Eagleville Road
Storrs, Connecticut

36931420
NSS-021 Rev. 1

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the reinforced 245' self-supporting tower located at the campus of the University of Connecticut, on North Eagleville Road in Storrs, 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) concurrence 1/2" 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 modification is as follows:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
Remove: **(1) ADFD 1820-80B-R2DM Panel Antenna (Beta Sector)**	**T-Mobile (Proposed)**	**@ 235'**
Install: **(3) Commscope LNX-6515DS-VTM Panel Antennas** **(3) Ericsson RRUS-11 RRH Units**	**T-Mobile (Proposed)**	**@ 235'**

The results of an initial analysis indicated that the existing tower structure did not have enough capacity for the proposed loading conditions stated above. The tower structure requires modifications shown on SK-1 through SK-3. **Once the modifications indicated on SK-1 through SK-3 are performed, the modified structure is considered to be structurally adequate with the wind load classification specified above with the existing and propose antenna loading.**

The results of an initial analysis indicated that the existing tower anchor bolts and the foundation have the capacity for the proposed loading conditions stated above. **The tower anchor bolts and foundation are considered structurally adequate with the wind load classification specified above for the existing and proposed loading and do NOT require modification.**

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) Tower foundation, geometry and structural member sizes taken from the manufacturers original design documents prepared by Pirod Inc., drawing number 202932-B, dated September 23, 1997.
3) Structural analysis performed by URS Corporation, on behalf of Sprint, project TWS-019 / 36932110, signed and sealed December 30, 2014.
4) Proposed antennas via T-Mobile RFDS form, dated February 5, 2015.
5) Previous structural analysis performed by URS Corporation, on behalf of T-Mobile, project number 36931419 / NSS-021, signed and sealed February 24, 2015.
6) Antenna and mount configuration as specified on the following page 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 and connections. 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,

URS Corporation AES,
a subsidiary of AECOM

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

RAS/mcd

cc: IA, CF/Book – URS

2. INTRODUCTION

The subject tower is located at 82 North Eagleville Road in Storrs, Connecticut. The structure is a 245' self-supporting tower designed and manufactured by Pirod, Inc.

The tower geometry and structural member sizes taken from original construction drawings (Pirod Drawing #: 202932-B) prepared by Pirod, dated September 23, 1997.

The inventory is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
Lightning Rod	Tower (existing)	15' Rotatable Platform	247'	---
Flash Beacon	Tower (existing)	*See Above Mount*	247'	(1) 1/2" DC cable
(3) APXV9TM14-ALU-I20 Panel Antennas (3) Alcatel-Lucent TD-RRH 8x20 RRH Units (2) Sector Jumper Cables (27) RRH Jumper Cables (2) APXVSPP18-C-A20 (Alpha & Gamma) (1) RFS APX9ERR18-C-A20 (Beta) (6) 1900 MHz RRH Units (3) 800 MHz RRH Units (3) IBC1900BB-1 (3) IBC1900HG-2A	Sprint (existing)	*See Above Mount*	247'	(1) Alcatel-Lucent ALU Hybrid Cable (3) 1-1/4" Hybrid Cables
(3) LNX-6515DS-VTM (3) RRUS-11 RRH Units	**T-Mobile (Proposed)**	*See Below Mount*	**232'**	*See Below Cables*
(3) AIR21 B2A/B4P (3) AIR21 B4A/B2P (3) TMA Units	T-Mobile (existing)	(3) Sector Mounts	232'	(1) Fiber Optic Cable (12) 1-5/8" coax cables
(2) 10' Omni Antennas	Unknown (existing)	(2) 4' Standoff	135'	(2) 7/8" coax cables
(1) 20' Omni Antenna	Unknown (existing)	6' Standoff	125'	(1) 7/8" coax cable
(3) L-810 Obstruction Lights	Tower (existing)	Leg mounted	125'	(1) 1/2" DC cable
(1) 10' Omni Antenna	Unknown (existing)	4' Standoff	110'	(1) 7/8" coax cable
4' Grid Dish	Unknown (existing)	Leg mounted	110'	(1) 7/8" coax cable
(1) 6' Dish w/ Radome	Unknown (existing)	Leg mounted	105'	(1) EW63 cable
(1) Camera	Unknown (existing)	Leg mounted	60'	(1) 7/8" coax cable
(1) 4' Omni	Unknown (existing)	4' Standoff	50'	(1) 7/8" coax cable

This structural analysis of the communications tower was performed by URS Corporation AES, a subsidiary of AECOM, for T-Mobile. The purpose of this analysis was to investigate the structural integrity of the modified 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 done 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.

The Connecticut State Building Code required a three second wind speed of 100 mph which converts to a 80 mph fastest mile per IBC (Table 1609.3.1). The TIA/EIA-222-F requires a basic wind speed of 85 mph (fastest mile). In this case the wind speed from the TIA/EIA-222-F governs the design.

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% 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

Stresses on the tower structure were evaluated to compare with allowable stresses in accordance with AISC. The results of an initial analysis indicated that the existing tower structure did not have enough capacity to support the proposed loading conditions. The tower structure requires modifications shown on SK-1 through SK-3. **Once the modifications indicated on SK-1 through SK-3 are performed, the modified structure is considered structurally adequate with the wind load classification specified with the existing and proposed antenna loading noted herein.** See below for tower and foundation capacity summary.

Tower Reactions

Component	Value (kips)
Base Shear	51
Base Compression	345
Anchor Uplift	296
Anchor Shear	33

Tower Component Stress vs. Capacity Summary:

Component/ (Section No.)	Existing Component Size	Controlling Component/Elevation	Stress (% capacity)	Pass/Fail
Tower Leg (T2)	2" SR	Compression / 230' – 210'	83.6 %	**Pass**
Diagonal (T1)	3/4" SR	Compression / 245' – 230'	98.3 %	**Pass**
Secondary Horizontal (T9)	L3x3x5/16	Compression / 110' – 100'	67.3 %	**Pass**
Top Grit (T2)	1" SR	Compression / 230' - 210'	47.9 %	**Pass**
Bottom Girt (T1)	7/8" SR	Compression / 245' – 230'	64.4 %	**Pass**
Bolt Checks				
Anchor Bolts	(6) 2" Dia. Bolts	Tension	64 %	**Pass**

Foundation Summary:

Foundation	Component	Stress (% capacity/Factor of Safety)	Pass/Fail	Comments:
Drilled Concrete Caisson	Uplift	93.5 % / 2.14	**Pass**	Min. FOS of 2.0 req'd per IBC 2003 Section 3108.4.2

5. CONCLUSIONS

The results of an initial analysis indicated that the existing tower structure did not have enough capacity for the proposed loading conditions stated above. The tower structure requires modifications shown on SK-1 through SK-3. **Once the modifications indicated on SK-1 through SK-3 are performed, the modified structure is considered to be structurally adequate with the wind load classification specified above with the existing and propose antenna loading.**

The results of an initial analysis indicated that the existing tower anchor bolts and the foundation have the capacity for the proposed loading conditions stated above. **The tower anchor bolts and foundation are considered structurally adequate with the wind load classification specified above for the existing and proposed loading and do NOT require modification.**

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 were properly constructed to support original design loads as specified in the original design documents.
10. All coaxial cable is installed as specified in Section 6 of this report.

URS is not responsible for any modifications completed prior to or hereafter in which URS 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

URS 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 URS. URS 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

REINFORCEMENT DRAWINGS SK-1 THROUGH SK-3

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL COMPLY WITH THE CONNECTICUT STATE BUILDING, SUPPLEMENTS AND AMENDMENTS AND LIFE SAFETY CODES.
2. CONTRACTOR IS TO REVIEW ALL DRAWINGS AND NOTES IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUB-CONTRACTORS AND ALL RELATED PARTIES. THE SUB-CONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND NOTES FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON DRAWINGS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION AND ELECTRICAL SUB-CONTRACTORS SHALL PAY FOR THEIR PERMITS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS ON SITE AT ALL TIMES AND ENSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUB-CONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. CONTRACTOR SHALL FURNISH 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. INSTALLATION OF THIS WIRELESS COMMUNICATIONS EQUIPMENT SITE REQUIRES WORK IN THE IMMEDIATE VICINITY OF EXISTING OPERATING TELECOMMUNICATION SYSTEMS. THE CONTRACTOR SHALL PROVIDE AND COORDINATE THE METHODS OF PROTECTION WITH THE VARIOUS TELECOMMUNICATION CARRIERS AND THE TOWER OWNER. THERE SHALL BE NO INTERRUPTION OF OPERATION WITHOUT TIMELY COORDINATION WITH AND APPROVAL BY THE VARIOUS COMMUNICATIONS OPERATORS.
8. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER MFR'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR ARCHITECT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
10. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ARCHITECT FOR REVIEW. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTAL TO THE ARCHITECT FOR REVIEW.
11. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA. SUBMIT ANY DISCREPANCIES FROM THE DRAWINGS TO THE ARCHITECT.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURE AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. CONTRACTOR TO CONTACT "CALL BEFORE YOU DIG" AT 1-800-922-4455 TO VERIFY AND IDENTIFY THE EXACT LOCATIONS OF ALL UNDERGROUND UTILITIES AND OBSTRUCTIONS IDENTIFIED PRIOR TO COMMENCING WORK IN THE CONTRACT AREA.
14. EXISTING DIMENSIONS OF STRUCTURE SHOWN ON THESE DOCUMENTS ARE BASED ON ORIGINAL TOWER CONSTRUCTION DRAWINGS PERFORMED BY PIROD, DATED SEPTEMBER 1997, ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD DIMENSIONS AS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENT ARE SUBMITTED FOR REVIEW, DIMENSIONS ARE PROVIDED FOR THE ENGINEER'S REFERENCE ONLY.
15. TOWER INVENTORY IS BASED ON INFORMATION OBTAINED FROM T-MOBILE DATED FEBRUARY 2015.

STRUCTURAL NOTES

STRUCTURAL STEEL MATERIAL:

STRUCTURAL STEEL BEAMS, CHANNELS, PLATES	A36
STRUCTURAL ANGLES	A36
EXISTING TOWER LEG	A 572-Gr. 50
EXISTING TOWER LEG PIROD TRUSS	A 572-Gr. 50

STRUCTURAL STEEL SHALL CONFORM TO ALL THE REQUIREMENTS OF THE ASTM SPECIFICATION, AS REFERENCED IN THE CODE.

UNLESS OTHERWISE NOTED, ALL STEEL WILL BE GALVANIZED IN ACCORDANCE WITH ASTM 123 AFTER FABRICATION. TOUCH UP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC-IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCH-UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.

SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL STEEL WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. SUBMIT 2 SETS OF PRINTS FOR THE ENGINEER REVIEW.

MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

THE OMISSION OF ANY MATERIAL THAT WAS SHOWN ON THE CONTRACT DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF PROVIDING THE SAME.

CONNECTIONS / FIELD ASSEMBLY:

BOLTED CONNECTIONS: UNLESS OTHERWISE NOTED, ALL JOINTS ARE SLIP CRITICAL TYPE, REQUIRING 3/4" DIA. A325-N BOLTS, A563 NUTS AND F436 WASHERS, ALL GALVANIZED. BEVELED WASHERS SHALL BE USED ON BEAM FLANGES HAVING A SLOPE GREATER THAN 1:20.

STRUCTURE IS DESIGNED TO BE LEVEL AND PLUMB, SELF-SUPPORTING AND STABLE AFTER WORK IS COMPLETED.

COMMENCEMENT OF WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION. NO MEMBER OF THE TOWER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY. THE CONTRACTOR SHALL BE AWARE OF WEATHER AND WIND CONDITIONS AND NOT PERFORM MEMBER REPLACEMENT IN A WIND.

INSPECTIONS:

SPECIAL INSPECTIONS ARE REQUIRED PER THE CODE FOR STRUCTURAL STEEL WORK.

OWNER WILL SUPPLY THE SERVICES OF A SPECIAL INSPECTOR AND TESTING AGENTS AS REQUIRED. CONTRACTOR SHALL COORDINATE INSPECTIONS OF FABRICATOR'S AND ERECTOR'S WORK AND MATERIALS TO MEET THE REQUIREMENTS OF THE STATEMENT OF SPECIAL INSPECTIONS FOR THIS PROJECT.

COPIES OF TESTING AND INSPECTION REPORTS WILL BE PROVIDED TO THE OWNER, BUILDING OFFICIAL, ENGINEER OF RECORD AND CONTRACTOR.

PROJECT NO. 36931420
Designed by: MCD
Drawn by: KAP
Checked by: KAB
Approved by: RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

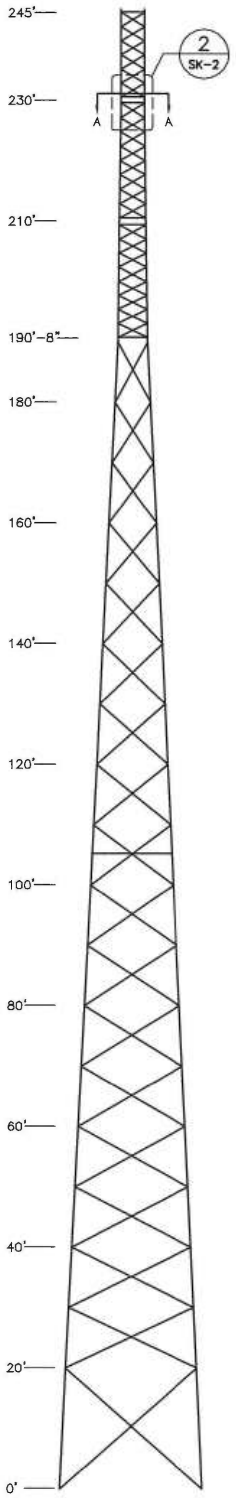
T-Mobile

SITE ADDRESS: 82 NORTH EAGLEVILLE ROAD
STORRS, CONNECTICUT 06268

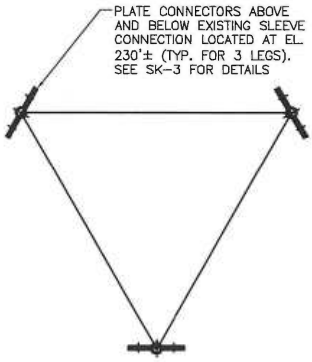
REV.	DATE:	DESCRIPTION

Scale: AS NOTED | Date: 04/01/15
Job No. NSS-022 | File No.

Dwg. No. SK-1
Dwg. 1 of 3

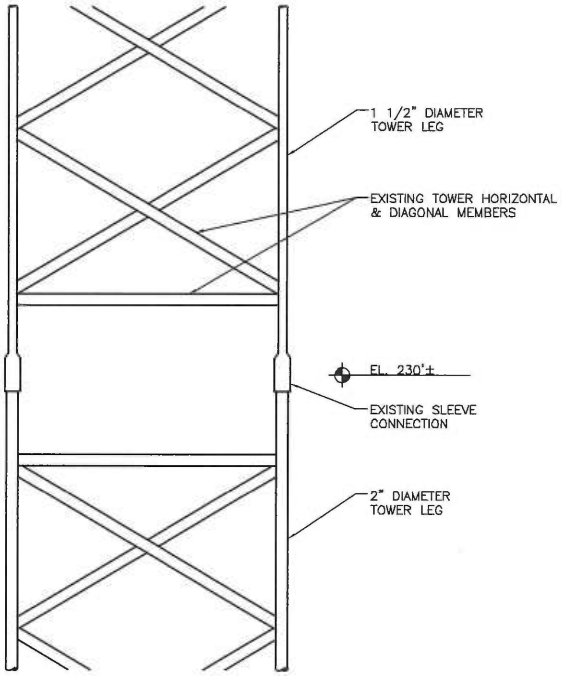


1 SK-2 TOWER ELEVATION
SCALE: 1" = 30'-0"



PLAN SECTION A-A

NOTE:
CONTRACTOR SHALL INSTALL CONNECTOR PLATES AS CLOSE TO EXISTING SLEEVE CONNECTION AS POSSIBLE WITHOUT CONFLICTING WITH EXISTING TOWER HORIZONTAL & DIAGONAL MEMBERS.



2 SK-2 EXISTING TOWER ELEVATION DETAIL
SCALE: 1" = 30'-0"

PROJECT NO.	36931420
Designed by:	MCD
Drawn by:	KAP
Checked by:	KAB
Approved by:	RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

T-Mobile

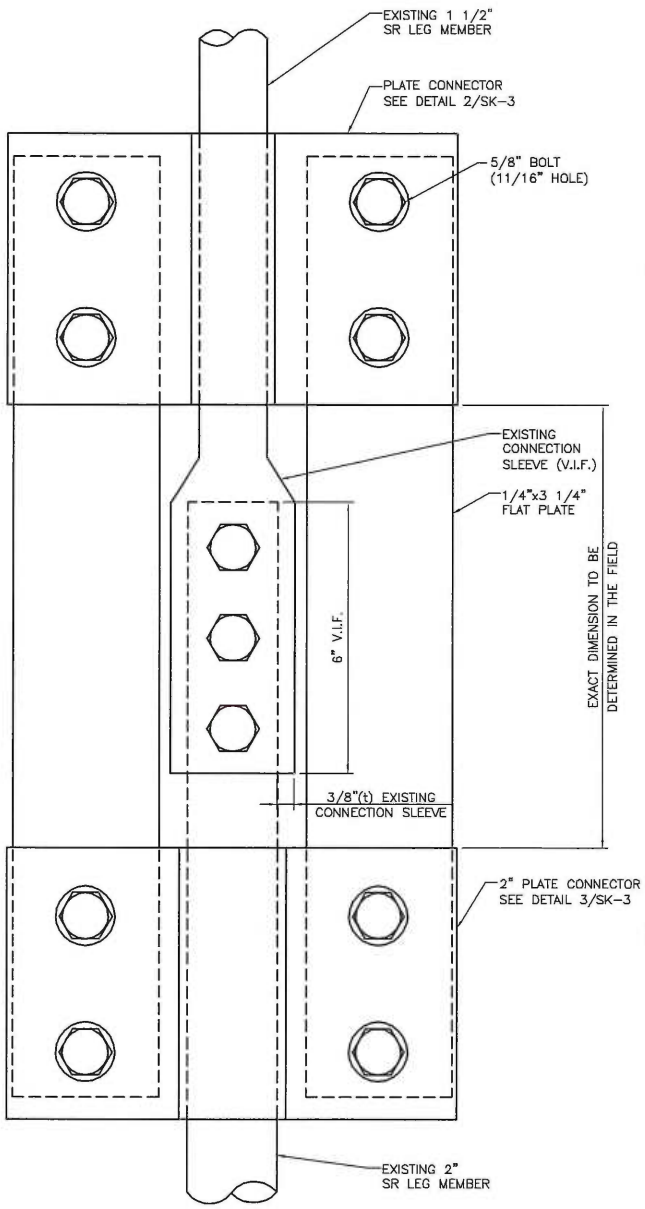
SITE ADDRESS: 82 NORTH EAGLEVILLE ROAD
STORRS, CONNECTICUT 06268

REV.	DATE:	DESCRIPTION

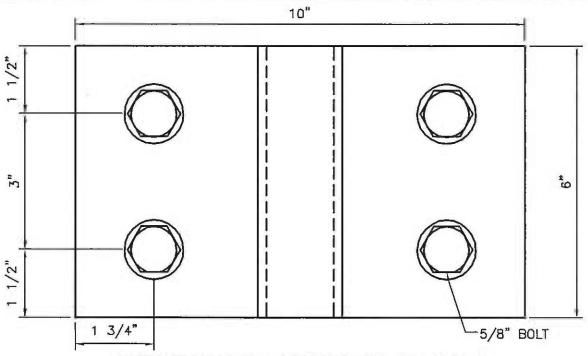
Scale: AS NOTED | Date: 04/01/15
Job No. NSS-022 | File No.

Dwg. No. SK-2

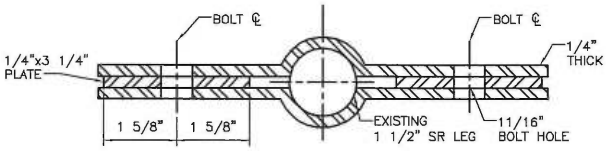
Dwg. 2 of 3



1 SK-3 PLATE CONNECTORS
SCALE: 3"=1'-0"

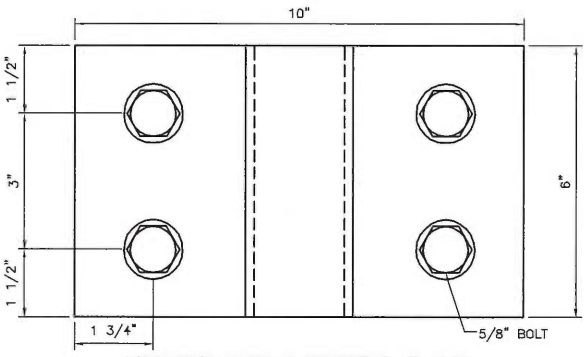


ELEVATION PLATE CONNECTOR AT 1 1/2" LEG

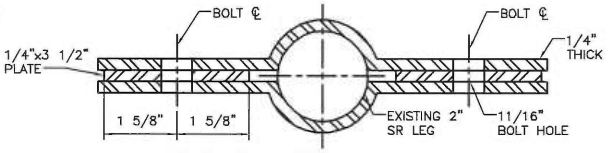


PLAN - PLATE CONNECTOR AT 1 1/2" LEG

2 SK-3 PLATE CONNECTOR AT 1 1/2" LEG
SCALE: 3"=1'-0"

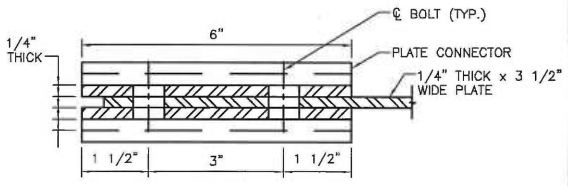


ELEVATION PLATE CONNECTOR AT 2" LEG



PLAN - PLATE CONNECTOR AT 2" LEG

3 SK-3 PLATE CONNECTOR AT 2" LEG
SCALE: 3"=1'-0"



SECTION - PLATE CONNECTOR

4 SK-3 TYPICAL SECTION
SCALE: 3"=1'-0"

SR = SOLID ROD

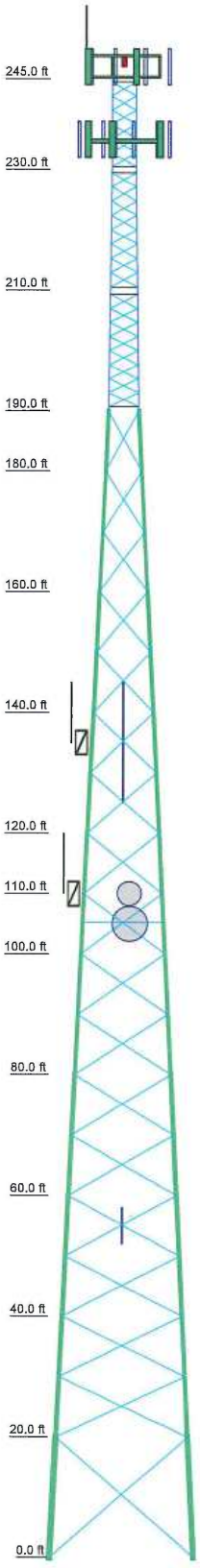
PROJECT NO. 36931420	AECOM 500 ENTERPRISE DRIVE ROCKY HILL, CONNECTICUT (860)-529-8882	T-Mobile
Designed by: MCD		
Drawn by: KAP		
Checked by: KAB		
Approved by: RAS		SITE ADDRESS: 82 NORTH EAGLEVILLE ROAD STORRS, CONNECTICUT 06268

REV.	DATE:	DESCRIPTION

Scale: AS NOTED | Date: 04/01/15
Job No. NSS-022 | File No.
Dwg. No. SK-3
Dwg. 3 of 3

TNX TOWER INPUT/OUTPUT SUMMARY

Section	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	Pirod 112738		Pirod 105220		Pirod 105219			Pirod 105218		Pirod 105217	A	SR 2 1/2	SR 2	SR 1 1/2
Leg Grade								A572-50						
Diagonals	B	L44x4x1/4	L3 1/2x3 1/2x5/16		L3x3x5/16			L3x3x3/16		L2 1/2x2 1/2x3/16		SR 1	SR 7/8	SR 3/4
Diagonal Grade								A36					A572-50	
Top Girts								N.A.				SR 1		SR 7/8
Bottom Girts								N.A.				SR 1		SR 7/8
Sec. Horizontals			N.A.			C				N.A.		4.5		4
Face Width (ft)	24	22	20	18	16	14	13	12	10	8	6	5		
# Panels @ (ft)		1 @ 20				17 @ 10						9 @ 2.333	8 @ 2.375	6 @ 2.33333
Weight (K)	44.4	7.8	5.3	5.3	4.9	4.2	2.1	3.0	2.8	2.3	1.2	1.8	1.3	0.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2"x10' (Tower)	247	AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	235
Flash Beacon Lighting (Tower)	247	AIR B4A/B2P w/ 6' Sch 40 Pipe Mount (T-Mobile)	235
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	247	AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	235
APXV9ERR18-C-A20 w/ 6' Mount Pipe (Sprint)	247	AIR B4A/B2P w/ 6' Sch 40 Pipe Mount (T-Mobile)	235
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	247	AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	235
(2) Panasonic RRH 1900MHZ (Sprint)	247	AIR B4A/B2P w/ 6' Sch 40 Pipe Mount (T-Mobile)	235
(2) Panasonic RRH 1900MHZ (Sprint)	247	LNX-6515DS-VTM (T-Mobile)	235
(2) Panasonic RRH 1900MHZ (Sprint)	247	LNX-6515DS-VTM (T-Mobile)	235
Andrew 800MHz RRH (Sprint)	247	LNX-6515DS-VTM (T-Mobile)	235
Andrew 800MHz RRH (Sprint)	247	RRUS-11 (T-Mobile)	235
Andrew 800MHz RRH (Sprint)	247	RRUS-11 (T-Mobile)	235
IBC1900BB-1 Combiner (Sprint)	247	RRUS-11 (T-Mobile)	235
IBC1900BB-1 Combiner (Sprint)	247	2.5" Dia. 12' OMNI	135
IBC1900BB-1 Combiner (Sprint)	247	4' Standoff Mount	135
IBC1900HG-2A Combiner (Sprint)	247	2.5" Dia. 12' OMNI	135
IBC1900HG-2A Combiner (Sprint)	247	4' Standoff Mount	135
IBC1900HG-2A Combiner (Sprint)	247	(3) L-810 Obstruction Lights w/ Mount Kit (Tower)	125
PiROD Rotatable Platform #122379 (Sprint)	247	20' Omni	125
APXV9TM14-120 (Sprint)	247	6' Standoff Mount	125
APXV9TM14-120 (Sprint)	247	2.5" Dia. 12' OMNI	110
APXV9TM14-120 (Sprint)	247	4' Standoff Mount	110
TD-RRH 8x20 (Sprint)	247	KP4F-23	110
TD-RRH 8x20 (Sprint)	247	Andrew 6' w/Radome	105
TD-RRH 8x20 (Sprint)	247	Camera with Mount	60
TMA (T-Mobile)	235	4' Standoff Mount	50
TMA (T-Mobile)	235	1.5" Dia 4' Omni w/Pipe Mount	50
TMA (T-Mobile)	235		
PiROD 12' Universal T-Frame (3) (T-Mobile)	235		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105245	C	L3x3x5/16
B	2L3 1/2x3 1/2x5/16x3/4		

MATERIAL STRENGTH

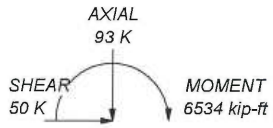
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

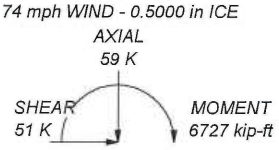
1. Tower is located in Tolland County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.3%

MAX. CORNER REACTIONS AT BASE:
DOWN: 345 K
SHEAR: 33 K

UPLIFT: -296 K
SHEAR: 32 K



TORQUE 41 kip-ft
74 mph WIND - 0.5000 in ICE



TORQUE 40 kip-ft
REACTIONS - 85 mph WIND

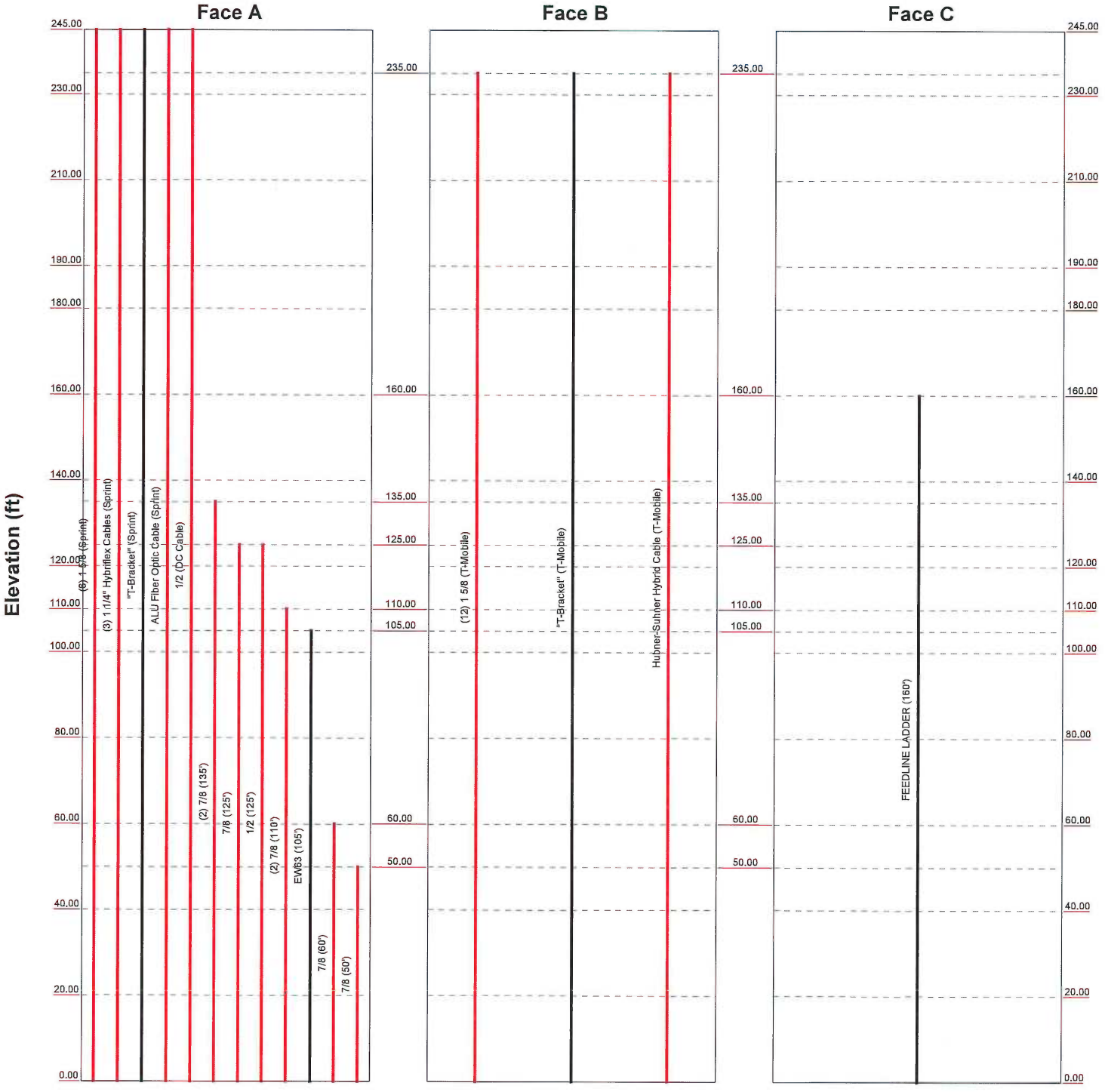
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	***MODification Structural Analysis - Tower***		
Project:	***Storrs (UCONN), CT (Site: CT11303B) / NSS-022***		
Client: Northeast Site Solutions / T-Mobile		Drawn by: MCD	App'd:
Code: TIA/EIA-222-F		Date: 04/01/15	Scale: NTS
Path: W:\Structurals_By_Location\Connecticut\Mansfield-EST_UCONN\02\MOD_35931420-NSS-022\ERI\Mansfield.eri			Dwg No. E-1

TNX TOWER FEEDLINE DISTRIBUTION

Feed Line Distribution Chart
0' - 245'

Round | Flat | App In Face | App Out Face | Truss Leg



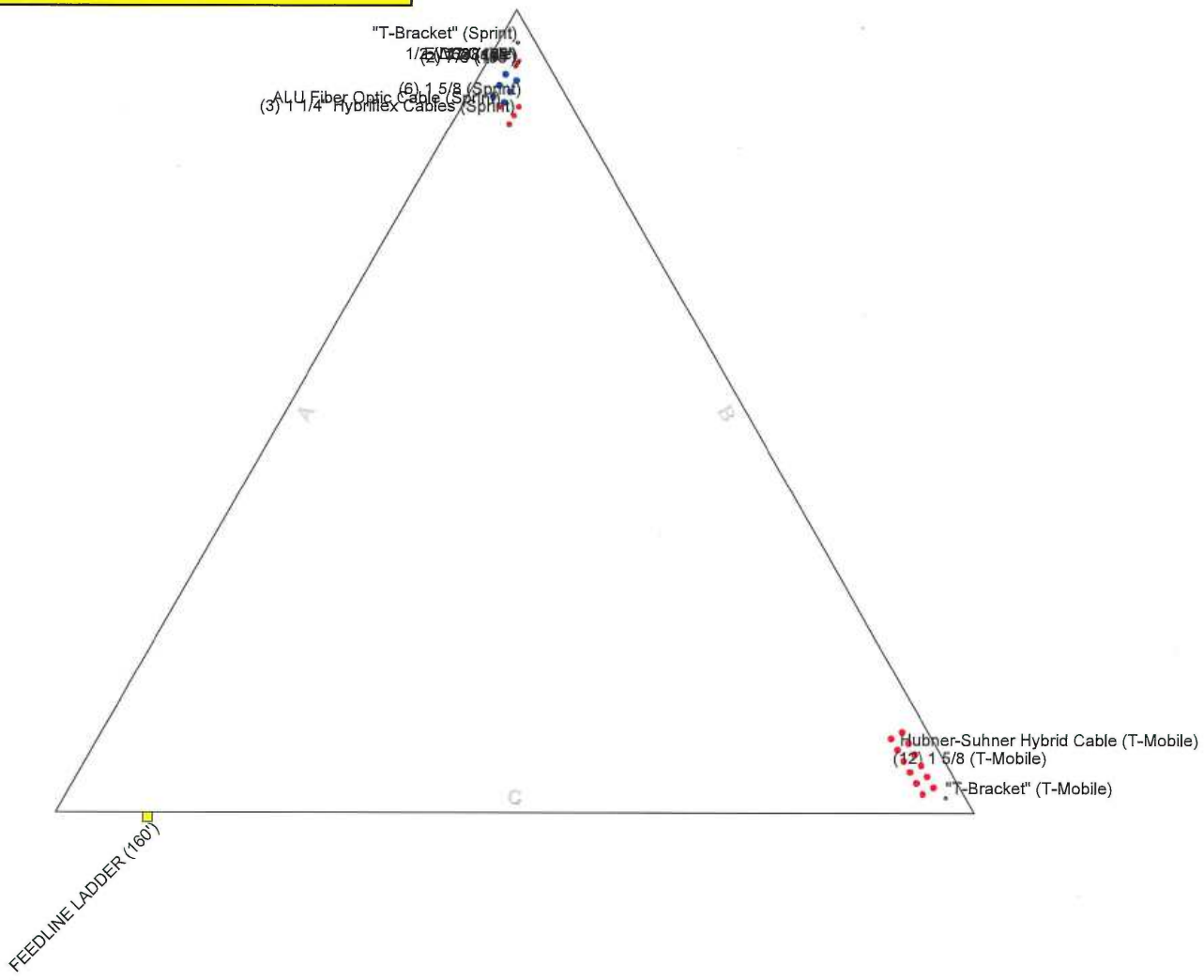
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job: *MODification Structural Analysis - Tower*		
	Project: *Storrs (UCONN), CT (Site: CT11303B) / NSS-022*		
	Client: Northeast Site Solutions / T-Mobile	Drawn by: MCD	App'd:
	Code: TIA/EIA-222-F	Date: 04/01/15	Scale: NTS
	Path: W:\Structurals_By_Location\Connecticut\Mansfield SST_UCONN\2MOD_36931429-NSS-022\ER\Mansfield.ert		Dwg No. E-7

TNX TOWER FEEDLINE PLAN

Feed Line Plan

Round Flat App In Face App Out Face Truss-Leg

(6) 1-5/8" coax cables - Sprint
(3) 1-1/4" Hybrid cables - Sprint
(1) "T-Bracket"
(2) 1/2" DC cables
(7) 7/8" coax cables
(1) EW63 Elliptical cable
(1) Fiber Optic Cable - Sprint



AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job: ***MODification Structural Analysis - Tower***		
	Project: ***Storrs (UCONN), CT (Site: CT11303B) / NSS-022***		
	Client: Northeast Site Solutions / T-Mobile	Drawn by: MCD	App'd:
	Code: TIA/EIA-222-F	Date: 04/01/15	Scale: NTS
	Path: W:\Structurals_By_Location\Connecticut\Mansfield SST_UCONN\02\MOD_36931420-NSS-022\ER\Mansfield.ed		Dwg No. E-7

TNX TOWER DETAILED OUTPUT

tnxTower	Job	Page
	MODification Structural Analysis - Tower	1 of 46
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Project Storrs (UCONN), CT (Site: CT11303B) / NSS-022	Date 15:37:53 04/01/15
	Client Northeast Site Solutions / T-Mobile	Designed by MCD

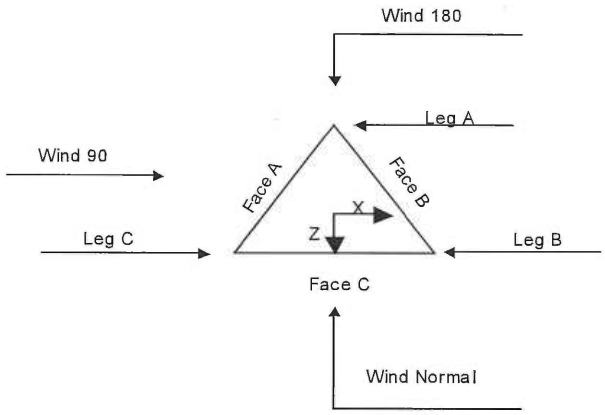
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 245.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 24.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Tolland 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 tower member 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	



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	245.00-230.00			4.00	1	15.00
T2	230.00-210.00			4.00	1	20.00
T3	210.00-190.00			4.50	1	20.00
T4	190.00-180.00		U6.0 105245	5.00	1	10.00
T5	180.00-160.00		U8.0 105217	6.00	1	20.00
T6	160.00-140.00		U10.0 105216	8.00	1	20.00
T7	140.00-120.00		U12.0 105218	10.00	1	20.00
T8	120.00-110.00		U14.0 105218	12.00	1	10.00
T9	110.00-100.00		U14.0 105218	13.00	1	10.00
T10	100.00-80.00		U16.0 105219	14.00	1	20.00
T11	80.00-60.00		U18.0 105219	16.00	1	20.00
T12	60.00-40.00		U20.0 105219 L3.5x5/16	18.00	1	20.00
T13	40.00-20.00		U22.0 105220 L4x1/4	20.00	1	20.00
T14	20.00-0.00		U24.0 105220	22.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	245.00-230.00	2.33	X Brace	No	Steps	6.0000	6.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T2	230.00-210.00	2.38	X Brace	No	Steps	6.0000	6.0000
T3	210.00-190.00	2.33	X Brace	No	No	8.0160	8.0160
T4	190.00-180.00	10.00	X Brace	No	No	0.0000	0.0000
T5	180.00-160.00	10.00	X Brace	No	No	0.0000	0.0000
T6	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T7	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T8	120.00-110.00	10.00	X Brace	No	No	0.0000	0.0000
T9	110.00-100.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T11	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T12	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T13	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T14	20.00-0.00	20.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 245.00-230.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 230.00-210.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 210.00-190.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 190.00-180.00	Truss Leg	Pirod 105245	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 180.00-160.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 160.00-140.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 140.00-120.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 120.00-110.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T9 110.00-100.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T10 100.00-80.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T11 80.00-60.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T12 60.00-40.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T13 40.00-20.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T14 20.00-0.00	Truss Leg	Pirod 112738	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16x3/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 245.00-230.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 230.00-210.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 210.00-190.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 110.00-100.00	Equal Angle	L3x3x5/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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
T1 245.00-230.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T2 230.00-210.00	0.00	0.0000	A36 (36 ksi)	1	1	1.1	36.0000	36.0000
T3 210.00-190.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T4 190.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T5 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T6 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T7 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T8 120.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T9 110.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T10 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T11 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T12 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T13 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T14 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	No	1	1	1	1	1	1	1	1
245.00-230.00				1	1	1	1	1	1	1
T2	No	No	1	1	1	1	1	1	1	1
230.00-210.00				1	1	1	1	1	1	1
T3	No	No	1	1	1	1	1	1	1	1
210.00-190.00				1	1	1	1	1	1	1
T4	No	No	1	1	1	1	1	1	1	1
190.00-180.00				1	1	1	1	1	1	1
T5	No	No	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T6	No	No	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T7	No	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T8	No	No	1	1	1	1	1	1	1	1
120.00-110.00				1	1	1	1	1	1	1
T9	No	No	1	1	1	1	1	1	1	1
110.00-100.00				1	1	1	1	1	1	1
T10	No	No	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T11	No	No	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T12	No	No	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T13	No	No	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T14	No	No	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4	1	0.5	0.85	1	0.5	0.85
190.00-180.00						
T5	1	0.5	0.85	1	0.5	0.85
180.00-160.00						
T6	1	0.5	0.85	1	0.5	0.85
160.00-140.00						
T7	1	0.5	0.85	1	0.5	0.85
140.00-120.00						
T8	1	0.5	0.85	1	0.5	0.85
120.00-110.00						

T9 110.00-100.00	1	0.5	0.85	1	0.5	0.85
T10 100.00-80.00	1	0.5	0.85	1	0.5	0.85
T11 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T12 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T13 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T14 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg*		*Diagonal*		*Top Girt*		*Bottom Girt*		*Mid Girt*		*Long Horizontal*		*Short Horizontal*	
	Net Width Deduct in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*
T1 245.00-230.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 230.00-210.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 210.00-190.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 190.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 120.00-110.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 110.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T11 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T12 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T13 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T14 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1	Sleeve DS	0.6250	5	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
245.00-230.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2	Flange	0.7500	5	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
230.00-210.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3	Flange	1.0000	6	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
210.00-190.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4	Flange	1.0000	6	1.0000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
190.00-180.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5	Flange	1.0000	6	1.0000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
180.00-160.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6	Flange	1.0000	6	1.0000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
160.00-140.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T7	Flange	1.0000	6	1.0000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
140.00-120.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T8	Flange	1.0000	0	1.2500	1	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
120.00-110.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T9	Flange	1.2500	6	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
110.00-100.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T10	Flange	1.2500	6	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
100.00-80.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T11	Flange	1.2500	6	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
80.00-60.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T12	Flange	1.2500	6	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
60.00-40.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T13	Flange	1.2500	6	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
40.00-20.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T14 20.00-0.00	Flange	1.2500	6	1.0000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Sprint)	A	Yes	Ar (CaAa)	245.00 - 0.00	-10.0000	0.42	6	3	1.9800	1.9800		1.04
1 1/4" Hybriflex Cables (Sprint)	A	Yes	Ar (CfAe)	245.00 - 0.00	-15.0000	0.4	3	3	1.5400	1.5400		1.08
"T-Bracket" (Sprint)	A	Yes	Af (CfAe)	245.00 - 0.00	-5.0000	0.47	1	1	0.7500	0.7500	3.0000	1.50
ALU Fiber Optic Cable (Sprint)	A	Yes	Ar (CfAe)	245.00 - 0.00	-10.0000	0.4	1	1	1.2500	1.2500		0.99
FEEDLINE LADDER (160')	C	Yes	Af (CfAe)	160.00 - 0.00	0.0000	0.4	1	1	3.0000	3.0000	12.0000	8.40
1/2 (DC Cable)	A	Yes	Ar (CfAe)	245.00 - 0.00	-8.0000	0.45	1	1	0.5800	0.5800		0.25
7/8 (135')	A	Yes	Ar (CfAe)	135.00 - 0.00	-8.0000	0.45	2	2	1.1100	1.1100		0.54
7/8 (125')	A	Yes	Ar (CfAe)	125.00 - 0.00	-8.0000	0.45	1	1	1.1100	1.1100		0.54

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/2 (125')	A	Yes	Ar (CfAe)	125.00 - 0.00	-8.0000	0.45	1	1	0.5800	0.5800		0.25
7/8 (110')	A	Yes	Ar (CfAe)	110.00 - 0.00	-8.0000	0.45	2	2	1.1100	1.1100		0.54
EW63 (105')	A	Yes	Af (CfAe)	105.00 - 0.00	-8.0000	0.45	1	1	1.5742	1.5742	5.0668	0.51
7/8 (60')	A	Yes	Ar (CfAe)	60.00 - 0.00	-8.0000	0.45	1	1	1.1100	1.1100		0.54
7/8 (50')	A	Yes	Ar (CfAe)	50.00 - 0.00	-8.0000	0.45	1	1	1.1100	1.1100		0.54
1 5/8 (T-Mobile)	B	Yes	Ar (CfAe)	235.00 - 0.00	-10.0000	0.42	12	6	1.9800	1.9800		1.04
"T-Bracket" (T-Mobile)	B	Yes	Af (CfAe)	235.00 - 0.00	-5.0000	0.47	1	1	0.7500	0.7500	3.0000	1.50
Hubner-Suhner Hybrid Cable (T-Mobile)	B	Yes	Ar (CfAe)	235.00 - 0.00	-10.0000	0.4	1	1	0.7087	0.7087		0.48

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	245.00-230.00	A	8.063	0.938	16.252	0.000	0.18
		B	5.245	0.313	0.000	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.00
T2	230.00-210.00	A	10.750	1.250	21.670	0.000	0.24
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	0.000	0.000	0.000	0.00
T3	210.00-190.00	A	10.750	1.250	21.670	0.000	0.24
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	0.000	0.000	0.000	0.00
T4	190.00-180.00	A	5.375	0.625	10.835	0.000	0.12
		B	10.491	0.625	0.000	0.000	0.14
		C	0.000	0.000	0.000	0.000	0.00
T5	180.00-160.00	A	10.750	1.250	21.670	0.000	0.24
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	0.000	0.000	0.000	0.00
T6	160.00-140.00	A	10.750	1.250	21.670	0.000	0.24
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	5.000	0.000	0.000	0.17
T7	140.00-120.00	A	14.229	1.250	21.670	0.000	0.26
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	5.000	0.000	0.000	0.17
T8	120.00-110.00	A	8.633	0.625	10.835	0.000	0.14
		B	10.491	0.625	0.000	0.000	0.14
		C	0.000	2.500	0.000	0.000	0.08
T9	110.00-100.00	A	10.483	1.281	10.835	0.000	0.15
		B	10.491	0.625	0.000	0.000	0.14
		C	0.000	2.500	0.000	0.000	0.08
T10	100.00-80.00	A	20.967	3.874	21.670	0.000	0.31
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	5.000	0.000	0.000	0.17
T11	80.00-60.00	A	20.967	3.874	21.670	0.000	0.31
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	5.000	0.000	0.000	0.17
T12	60.00-40.00	A	23.742	3.874	21.670	0.000	0.33

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	5.000	0.000	0.000	0.17
T13	40.00-20.00	A	24.667	3.874	21.670	0.000	0.34
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	5.000	0.000	0.000	0.17
T14	20.00-0.00	A	24.667	3.874	21.670	0.000	0.34
		B	20.981	1.250	0.000	0.000	0.29
		C	0.000	5.000	0.000	0.000	0.17

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	245.00-230.00	A	0.500	14.313	1.771	17.752	0.000	0.42
		B		8.162	0.590	0.000	0.000	0.17
		C		0.000	0.000	0.000	0.000	0.00
T2	230.00-210.00	A	0.500	19.083	2.361	23.670	0.000	0.55
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	0.000	0.000	0.000	0.00
T3	210.00-190.00	A	0.500	19.083	2.361	23.670	0.000	0.55
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	0.000	0.000	0.000	0.00
T4	190.00-180.00	A	0.500	9.542	1.181	11.835	0.000	0.28
		B		16.324	1.181	0.000	0.000	0.34
		C		0.000	0.000	0.000	0.000	0.00
T5	180.00-160.00	A	0.500	19.083	2.361	23.670	0.000	0.55
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	0.000	0.000	0.000	0.00
T6	160.00-140.00	A	0.500	19.083	2.361	23.670	0.000	0.55
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	6.111	0.000	0.000	0.22
T7	140.00-120.00	A	0.500	25.896	2.361	23.670	0.000	0.61
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	6.111	0.000	0.000	0.22
T8	120.00-110.00	A	0.500	16.133	1.181	11.835	0.000	0.33
		B		16.324	1.181	0.000	0.000	0.34
		C		0.000	3.056	0.000	0.000	0.11
T9	110.00-100.00	A	0.500	19.650	2.114	11.835	0.000	0.37
		B		16.324	1.181	0.000	0.000	0.34
		C		0.000	3.056	0.000	0.000	0.11
T10	100.00-80.00	A	0.500	39.300	6.096	23.670	0.000	0.76
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	6.111	0.000	0.000	0.22
T11	80.00-60.00	A	0.500	39.300	6.096	23.670	0.000	0.76
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	6.111	0.000	0.000	0.22
T12	60.00-40.00	A	0.500	44.575	6.096	23.670	0.000	0.81
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	6.111	0.000	0.000	0.22
T13	40.00-20.00	A	0.500	46.333	6.096	23.670	0.000	0.82
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	6.111	0.000	0.000	0.22
T14	20.00-0.00	A	0.500	46.333	6.096	23.670	0.000	0.82
		B		32.648	2.361	0.000	0.000	0.69
		C		0.000	6.111	0.000	0.000	0.22

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	245.00-230.00	A	1.110	4.314	0.000	0.000
		B	0.376	1.386	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	230.00-210.00	A	1.646	5.901	0.000	0.000
		B	1.671	5.687	0.000	0.000
		C	0.000	0.000	0.000	0.000
T3	210.00-190.00	A	1.809	6.098	0.000	0.000
		B	1.837	5.877	0.000	0.000
		C	0.000	0.000	0.000	0.000
T4	190.00-180.00	A	0.000	0.637	0.946	1.594
		B	0.000	0.614	0.960	1.536
		C	0.000	0.000	0.000	0.000
T5	180.00-160.00	A	0.000	1.076	1.597	2.690
		B	0.000	1.037	1.621	2.593
		C	0.000	0.000	0.000	0.000
T6	160.00-140.00	A	0.000	0.921	1.367	2.302
		B	0.000	0.888	1.387	2.219
		C	0.000	0.166	0.312	0.416
T7	140.00-120.00	A	0.000	0.986	1.717	2.957
		B	0.000	0.802	1.504	2.406
		C	0.000	0.150	0.338	0.451
T8	120.00-110.00	A	0.000	0.534	0.910	1.603
		B	0.000	0.380	0.712	1.139
		C	0.000	0.071	0.160	0.213
T9	110.00-100.00	A	0.000	0.861	1.458	2.584
		B	0.000	0.517	0.969	1.551
		C	0.000	0.097	0.218	0.291
T10	100.00-80.00	A	0.000	1.231	2.088	3.692
		B	0.000	0.713	1.336	2.138
		C	0.000	0.134	0.301	0.401
T11	80.00-60.00	A	0.000	1.188	2.016	3.563
		B	0.000	0.688	1.290	2.064
		C	0.000	0.129	0.290	0.387
T12	60.00-40.00	A	0.000	1.256	2.473	4.396
		B	0.000	0.670	1.466	2.345
		C	0.000	0.126	0.330	0.440
T13	40.00-20.00	A	0.000	1.264	2.839	5.054
		B	0.000	0.657	1.642	2.626
		C	0.000	0.123	0.369	0.492
T14	20.00-0.00	A	0.000	0.756	1.486	2.645
		B	0.000	0.393	0.859	1.374
		C	0.000	0.074	0.193	0.258

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	245.00-230.00	2.4274	-3.7725	2.3713	-3.2824
T2	230.00-210.00	3.5092	-2.1483	3.5744	-1.6269
T3	210.00-190.00	3.5931	-2.4523	3.7063	-1.9085

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T4	190.00-180.00	3.0332	-2.3256	3.1758	-1.8195
T5	180.00-160.00	3.7537	-3.3037	4.0139	-2.6798
T6	160.00-140.00	3.5542	-3.6778	4.0783	-3.0506
T7	140.00-120.00	4.0133	-5.3865	4.6799	-5.0227
T8	120.00-110.00	4.3079	-6.7785	5.0377	-6.7517
T9	110.00-100.00	4.1500	-8.0208	4.8313	-8.2418
T10	100.00-80.00	4.8833	-10.0135	5.7279	-10.3607
T11	80.00-60.00	5.2414	-11.1077	6.1752	-11.5158
T12	60.00-40.00	5.3930	-12.7766	6.4235	-13.6460
T13	40.00-20.00	5.5013	-13.7065	6.6369	-14.8720
T14	20.00-0.00	6.2812	-15.7421	7.6827	-17.3842

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 2"x10'	C	From Leg	5.00	0.0000	247.00	No Ice	2.00	2.00	0.04
(Tower)			0.00			1/2" Ice	3.02	3.02	0.06
			5.00						
Flash Beacon Lighting	A	From Leg	0.00	0.0000	247.00	No Ice	2.50	2.50	0.03
(Tower)			0.00			1/2" Ice	2.76	2.76	0.06
			0.00						
2.5" Dia. 12' OMNI	A	From Leg	4.00	0.0000	135.00	No Ice	2.50	2.50	0.03
			0.00			1/2" Ice	3.53	3.53	0.05
			5.00						
4' Standoff Mount	A	From Leg	2.00	0.0000	135.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
2.5" Dia. 12' OMNI	C	From Leg	4.00	0.0000	135.00	No Ice	2.50	2.50	0.03
			0.00			1/2" Ice	3.53	3.53	0.05
			5.00						
4' Standoff Mount	C	From Leg	2.00	0.0000	135.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
20' Omni	A	From Leg	6.00	0.0000	125.00	No Ice	6.00	6.00	0.06
			0.00			1/2" Ice	8.03	8.03	0.10
			10.00						
6' Standoff Mount	A	From Leg	3.00	0.0000	125.00	No Ice	4.97	6.12	0.07
			0.00			1/2" Ice	6.12	7.27	0.13
			0.00						
(3) L-810 Obstruction Lights	C	None		0.0000	125.00	No Ice	0.85	0.43	0.05
w/ Mount Kit						1/2" Ice	0.97	0.53	0.05
(Tower)									
2.5" Dia. 12' OMNI	C	From Leg	4.00	0.0000	110.00	No Ice	2.50	2.50	0.03
			0.00			1/2" Ice	3.53	3.53	0.05
			5.00						
4' Standoff Mount	C	From Leg	2.00	0.0000	110.00	No Ice	2.72	2.72	0.05
			0.00			1/2" Ice	4.91	4.91	0.09
			0.00						
Camera with Mount	A	From Leg	0.00	0.0000	60.00	No Ice	5.60	5.60	0.15
			0.00			1/2" Ice	5.92	5.92	0.21

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 K
			0.00						
1.5" Dia 4' Omni w/Pipe Mount	A	From Leg	4.00 0.00 5.00	0.0000	50.00	No Ice 1/2" Ice	0.94 1.39	0.94 1.39	0.02 0.03
4' Standoff Mount	A	From Leg	2.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	A	From Face	4.00 -2.00 0.00	0.0000	247.00	No Ice 1/2" Ice	8.56 9.21	6.95 8.13	0.08 0.15
APXV9ERR18-C-A20 w/ 6' Mount Pipe (Sprint)	B	From Face	4.00 -2.00 0.00	0.0000	247.00	No Ice 1/2" Ice	10.35 10.97	6.37 7.37	0.06 0.13
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	C	From Face	4.00 -2.00 0.00	0.0000	247.00	No Ice 1/2" Ice	8.56 9.21	6.95 8.13	0.08 0.15
(2) Panasonic RRH 1900MHZ (Sprint)	A	From Face	4.00 2.00 0.00	0.0000	247.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.84	0.06 0.08
(2) Panasonic RRH 1900MHZ (Sprint)	B	From Face	4.00 2.00 0.00	0.0000	247.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.84	0.06 0.08
(2) Panasonic RRH 1900MHZ (Sprint)	C	From Face	4.00 2.00 0.00	0.0000	247.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.84	0.06 0.08
Andrew 800MHz RRH (Sprint)	A	From Face	4.00 2.00 0.00	0.0000	247.00	No Ice 1/2" Ice	2.49 2.57	1.97 2.17	0.06 0.08
Andrew 800MHz RRH (Sprint)	B	From Face	4.00 2.00 0.00	0.0000	247.00	No Ice 1/2" Ice	2.49 2.57	1.97 2.17	0.06 0.08
Andrew 800MHz RRH (Sprint)	C	From Face	4.00 2.00 0.00	0.0000	247.00	No Ice 1/2" Ice	2.49 2.57	1.97 2.17	0.06 0.08
IBC1900BB-1 Combiner (Sprint)	A	From Face	4.00 0.00 0.00	0.0000	247.00	No Ice 1/2" Ice	1.13 1.27	0.54 0.65	0.02 0.03
IBC1900BB-1 Combiner (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	247.00	No Ice 1/2" Ice	1.13 1.27	0.54 0.65	0.02 0.03
IBC1900BB-1 Combiner (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	247.00	No Ice 1/2" Ice	1.13 1.27	0.54 0.65	0.02 0.03
IBC1900HG-2A Combiner (Sprint)	A	From Face	4.00 0.00 0.00	0.0000	247.00	No Ice 1/2" Ice	1.13 1.27	0.54 0.65	0.02 0.03
IBC1900HG-2A Combiner (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	247.00	No Ice 1/2" Ice	1.13 1.27	0.54 0.65	0.02 0.03
IBC1900HG-2A Combiner (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	247.00	No Ice 1/2" Ice	1.13 1.27	0.54 0.65	0.02 0.03
PiROD Rotatable Platform #122379 (Sprint)	C	None		0.0000	247.00	No Ice 1/2" Ice	24.90 30.70	24.90 30.70	1.81 2.44
APXV9TM14-120 (Sprint)	A	From Face	4.00 6.00	0.0000	247.00	No Ice 1/2" Ice	7.27 7.80	5.33 6.05	0.10 0.16

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 K
			0.00						
APXV9TM14-120	B	From Face	4.00	0.0000	247.00	No Ice	7.27	5.33	0.10
(Sprint)			6.00			1/2" Ice	7.80	6.05	0.16
			0.00						
APXV9TM14-120	C	From Face	4.00	0.0000	247.00	No Ice	7.27	5.33	0.10
(Sprint)			6.00			1/2" Ice	7.80	6.05	0.16
			0.00						
TD-RRH 8x20	A	From Face	4.00	0.0000	247.00	No Ice	4.72	1.70	0.07
(Sprint)			6.00			1/2" Ice	5.01	1.92	0.10
			0.00						
TD-RRH 8x20	B	From Face	4.00	0.0000	247.00	No Ice	4.72	1.70	0.07
(Sprint)			6.00			1/2" Ice	5.01	1.92	0.10
			0.00						
TD-RRH 8x20	C	From Face	4.00	0.0000	247.00	No Ice	4.72	1.70	0.07
(Sprint)			6.00			1/2" Ice	5.01	1.92	0.10
			0.00						
TMA	A	From Face	4.00	0.0000	235.00	No Ice	1.40	0.70	0.01
(T-Mobile)			0.00			1/2" Ice	1.56	0.82	0.02
			0.00						
TMA	B	From Face	4.00	0.0000	235.00	No Ice	1.40	0.70	0.01
(T-Mobile)			0.00			1/2" Ice	1.56	0.82	0.02
			0.00						
TMA	C	From Face	4.00	0.0000	235.00	No Ice	1.40	0.70	0.01
(T-Mobile)			0.00			1/2" Ice	1.56	0.82	0.02
			0.00						
PiROD 12' Universal	C	None		0.0000	235.00	No Ice	21.88	21.88	1.07
T-Frame (3)						1/2" Ice	30.68	30.68	1.49
(T-Mobile)									
AIR B2A/B4P w/ 6' Sch 40	A	From Face	4.00	0.0000	235.00	No Ice	6.75	5.65	0.10
Pipe Mount			-6.00			1/2" Ice	7.31	6.56	0.16
(T-Mobile)			0.00						
AIR B4A/B2P w/ 6' Sch 40	A	From Face	4.00	0.0000	235.00	No Ice	6.75	5.65	0.10
Pipe Mount			6.00			1/2" Ice	7.31	6.56	0.16
(T-Mobile)			0.00						
AIR B2A/B4P w/ 6' Sch 40	B	From Face	4.00	0.0000	235.00	No Ice	6.75	5.65	0.10
Pipe Mount			-6.00			1/2" Ice	7.31	6.56	0.16
(T-Mobile)			0.00						
AIR B4A/B2P w/ 6' Sch 40	B	From Face	4.00	0.0000	235.00	No Ice	6.75	5.65	0.10
Pipe Mount			6.00			1/2" Ice	7.31	6.56	0.16
(T-Mobile)			0.00						
AIR B2A/B4P w/ 6' Sch 40	C	From Face	4.00	0.0000	235.00	No Ice	6.75	5.65	0.10
Pipe Mount			-6.00			1/2" Ice	7.31	6.56	0.16
(T-Mobile)			0.00						
AIR B4A/B2P w/ 6' Sch 40	C	From Face	4.00	0.0000	235.00	No Ice	6.75	5.65	0.10
Pipe Mount			6.00			1/2" Ice	7.31	6.56	0.16
(T-Mobile)			0.00						
LNX-6515DS-VTM	A	From Face	4.00	0.0000	235.00	No Ice	11.39	9.96	0.09
(T-Mobile)			2.00			1/2" Ice	12.01	11.38	0.18
			0.00						
LNX-6515DS-VTM	B	From Face	4.00	0.0000	235.00	No Ice	11.39	9.96	0.09
(T-Mobile)			2.00			1/2" Ice	12.01	11.38	0.18
			0.00						
LNX-6515DS-VTM	C	From Face	4.00	0.0000	235.00	No Ice	11.39	9.96	0.09
(T-Mobile)			2.00			1/2" Ice	12.01	11.38	0.18
			0.00						
RRUS-11	A	From Face	4.00	0.0000	235.00	No Ice	3.00	1.53	0.06
(T-Mobile)			2.00			1/2" Ice	3.23	1.82	0.08

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 K
RRUS-11 (T-Mobile)	B	From Face	0.00 4.00 2.00	0.0000	235.00	No Ice 1/2" Ice	3.00 3.23	1.53 1.82	0.06 0.08
RRUS-11 (T-Mobile)	C	From Face	0.00 4.00 2.00 0.00	0.0000	235.00	No Ice 1/2" Ice	3.00 3.23	1.53 1.82	0.06 0.08

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 K
KP4F-23	B	Grid	From Face	1.00 -6.00 0.00	0.0000		110.00	4.00	No Ice 1/2" Ice	10.05 13.09	0.05 0.12
Andrew 6' w/Radome	B	Paraboloid w/Radome	From Face	1.00 -6.00 0.00	0.0000		105.00	6.00	No Ice 1/2" Ice	28.27 29.07	0.38 0.45

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105245	1090.3344	1814.3549	0.68	0.22	7.5718	12.5997	5.3014
Pirod 105217	2130.7479	3520.4599	0.62	0.44	7.3984	12.2238	5.3014
Pirod 105218	2263.4687	3690.8612	0.75	0.46	7.8593	12.8155	7.2158
Pirod 105218	2263.4687	3690.8612	0.75	0.46	7.8593	12.8155	7.2158
Pirod 105219	2441.8688	3942.2854	0.94	0.49	8.4787	13.6885	9.4248
Pirod 105219	2441.8688	3942.2854	0.94	0.49	8.4787	13.6885	9.4248
Pirod 105219	2441.8688	3942.2854	0.94	0.49	8.4787	13.6885	9.4248
Pirod 105220	2578.8005	4132.5504	1.12	0.50	8.9542	14.3491	11.9282
Pirod 105220	2578.8005	4132.5504	1.12	0.50	8.9542	14.3491	11.9282
Pirod 105220	2578.8005	4132.5504	1.12	0.50	8.9542	14.3491	11.9282
Pirod 112738	3466.5160	5074.9521	1.69	0.68	12.0365	17.6214	14.7262

Tower Pressures - No Ice

$G_H = 1.101$

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
T1	237.50	1.758	33	61.875	A	0.938	14.632	3.750	24.09	16.252	0.000
245.00-230.00					B	0.313	12.549		29.16	0.000	0.000
					C	0.000	7.680		48.83	0.000	0.000
T2	220.00	1.72	32	88.334	A	1.250	21.909	6.667	28.79	21.670	0.000
230.00-210.00					B	1.250	32.116		19.98	0.000	0.000
					C	0.000	12.806		52.07	0.000	0.000
T3	200.00	1.673	31	99.167	A	1.250	24.779	8.334	32.02	21.670	0.000
210.00-190.00					B	1.250	34.982		23.00	0.000	0.000
					C	0.000	15.838		52.62	0.000	0.000
T4	185.00	1.636	30	66.264	A	3.914	18.016	12.641	57.64	10.835	0.000
190.00-180.00					B	3.900	23.131		46.76	0.000	0.000
					C	4.235	12.641		74.90	0.000	0.000
T5	170.00	1.597	30	162.528	A	8.376	35.453	24.703	56.36	21.670	0.000
180.00-160.00					B	8.352	45.684		45.72	0.000	0.000
					C	8.723	24.703		73.90	0.000	0.000
T6	150.00	1.541	29	202.945	A	9.854	36.991	26.241	56.02	21.670	0.000
160.00-140.00					B	9.833	47.222		45.99	0.000	0.000
					C	14.658	26.241		64.16	0.000	0.000
T7	130.00	1.48	27	242.945	A	13.053	40.470	26.241	49.03	21.670	0.000
140.00-120.00					B	13.266	47.222		43.38	0.000	0.000
					C	18.182	26.241		59.07	0.000	0.000
T8	115.00	1.429	26	136.681	A	7.080	22.788	14.155	47.39	10.835	0.000
120.00-110.00					B	7.278	24.645		44.34	0.000	0.000
					C	9.705	14.155		59.32	0.000	0.000
T9	105.00	1.392	26	146.681	A	10.723	24.638	14.155	40.03	10.835	0.000
110.00-100.00					B	10.555	24.645		40.21	0.000	0.000
					C	13.182	14.155		51.78	0.000	0.000
T10	90.00	1.332	25	323.362	A	18.615	49.276	28.309	41.70	21.670	0.000
100.00-80.00					B	16.743	49.291		42.87	0.000	0.000
					C	21.529	28.309		56.80	0.000	0.000
T11	70.00	1.24	23	363.780	A	20.424	50.864	29.897	41.94	21.670	0.000
80.00-60.00					B	18.526	50.878		43.08	0.000	0.000
					C	23.276	29.897		56.23	0.000	0.000
T12	50.00	1.126	21	403.780	A	25.135	53.639	29.897	37.95	21.670	0.000
60.00-40.00					B	23.519	50.878		40.19	0.000	0.000
					C	28.405	29.897		51.28	0.000	0.000
T13	30.00	1	18	443.780	A	30.574	54.564	29.897	35.12	21.670	0.000
40.00-20.00					B	29.148	50.878		37.36	0.000	0.000
					C	34.170	29.897		46.67	0.000	0.000
T14 20.00-0.00	10.00	1	18	494.209	A	19.205	64.855	40.189	47.81	21.670	0.000
					B	17.208	61.170		51.28	0.000	0.000
					C	21.624	40.189		65.02	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.101$

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
T1	237.50	1.758	24	0.5000	63.125	A	1.771	25.310	6.250	23.08	17.752	0.000
245.00-230.00						B	0.590	22.087		27.56	0.000	0.000
						C	0.000	15.312		40.82	0.000	0.000
T2	220.00	1.72	24	0.5000	90.000	A	2.361	36.240	10.001	25.91	23.670	0.000
230.00-210.00						B	2.361	50.018		19.09	0.000	0.000

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
						C	0.000	23.057		43.37	0.000	0.000
T3	200.00	1.673	23	0.5000	100.834	A	2.361	39.661	11.668	27.77	23.670	0.000
210.00-190.00						B	2.361	53.447		20.91	0.000	0.000
						C	0.000	26.676		43.74	0.000	0.000
T4	185.00	1.636	23	0.5000	67.098	A	3.822	31.633	21.034	59.33	11.835	0.000
190.00-180.00						B	3.880	38.438		49.71	0.000	0.000
						C	4.235	22.728		78.01	0.000	0.000
T5	170.00	1.597	22	0.5000	164.197	A	8.393	62.310	40.814	57.73	23.670	0.000
180.00-160.00						B	8.491	75.914		48.36	0.000	0.000
						C	8.723	44.303		76.97	0.000	0.000
T6	150.00	1.541	21	0.5000	204.614	A	10.029	64.940	42.789	57.08	23.670	0.000
160.00-140.00						B	10.112	78.538		48.27	0.000	0.000
						C	15.665	46.611		68.71	0.000	0.000
T7	130.00	1.48	21	0.5000	244.614	A	12.924	72.206	42.789	50.26	23.670	0.000
140.00-120.00						B	13.475	79.142		46.20	0.000	0.000
						C	19.180	47.146		64.51	0.000	0.000
T8	115.00	1.429	20	0.5000	137.516	A	6.942	40.906	22.852	47.76	11.835	0.000
120.00-110.00						B	7.407	41.252		46.96	0.000	0.000
						C	10.207	25.236		64.48	0.000	0.000
T9	105.00	1.392	19	0.5000	147.516	A	10.429	45.274	22.852	41.02	11.835	0.000
110.00-100.00						B	10.529	42.292		43.26	0.000	0.000
						C	13.664	26.388		57.06	0.000	0.000
T10	90.00	1.332	18	0.5000	325.031	A	19.234	89.384	45.704	42.08	23.670	0.000
100.00-80.00						B	17.053	83.249		45.57	0.000	0.000
						C	22.540	51.181		62.00	0.000	0.000
T11 80.00-60.00	70.00	1.24	17	0.5000	365.448	A	21.099	92.211	47.910	42.28	23.670	0.000
						B	18.864	86.059		45.66	0.000	0.000
						C	24.291	53.970		61.22	0.000	0.000
T12 60.00-40.00	50.00	1.126	16	0.5000	405.448	A	25.434	98.010	47.910	38.81	23.670	0.000
						B	23.751	86.669		43.39	0.000	0.000
						C	29.406	54.566		57.05	0.000	0.000
T13 40.00-20.00	30.00	1	14	0.5000	445.448	A	30.581	100.365	47.910	36.59	23.670	0.000
						B	29.274	87.286		41.10	0.000	0.000
						C	35.158	55.172		53.04	0.000	0.000
T14 20.00-0.00	10.00	1	14	0.5000	495.878	A	20.268	109.218	58.836	45.44	23.670	0.000
						B	17.803	95.896		51.75	0.000	0.000
						C	22.670	63.567		68.23	0.000	0.000

Tower Pressure - Service

$G_H = 1.101$

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
T1	237.50	1.758	11	61.875	A	0.938	14.632	3.750	24.09	16.252	0.000
245.00-230.00					B	0.313	12.549		29.16	0.000	0.000
					C	0.000	7.680		48.83	0.000	0.000
T2	220.00	1.72	11	88.334	A	1.250	21.909	6.667	28.79	21.670	0.000
230.00-210.00					B	1.250	32.116		19.98	0.000	0.000
					C	0.000	12.806		52.07	0.000	0.000
T3	200.00	1.673	11	99.167	A	1.250	24.779	8.334	32.02	21.670	0.000
210.00-190.00					B	1.250	34.982		23.00	0.000	0.000
					C	0.000	15.838		52.62	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T4	185.00	1.636	10	66.264	A	3.914	18.016	12.641	57.64	10.835	0.000
190.00-180.00					B	3.900	23.131		46.76	0.000	0.000
					C	4.235	12.641		74.90	0.000	0.000
T5	170.00	1.597	10	162.528	A	8.376	35.453	24.703	56.36	21.670	0.000
180.00-160.00					B	8.352	45.684		45.72	0.000	0.000
					C	8.723	24.703		73.90	0.000	0.000
T6	150.00	1.541	10	202.945	A	9.854	36.991	26.241	56.02	21.670	0.000
160.00-140.00					B	9.833	47.222		45.99	0.000	0.000
					C	14.658	26.241		64.16	0.000	0.000
T7	130.00	1.48	9	242.945	A	13.053	40.470	26.241	49.03	21.670	0.000
140.00-120.00					B	13.266	47.222		43.38	0.000	0.000
					C	18.182	26.241		59.07	0.000	0.000
T8	115.00	1.429	9	136.681	A	7.080	22.788	14.155	47.39	10.835	0.000
120.00-110.00					B	7.278	24.645		44.34	0.000	0.000
					C	9.705	14.155		59.32	0.000	0.000
T9	105.00	1.392	9	146.681	A	10.723	24.638	14.155	40.03	10.835	0.000
110.00-100.00					B	10.555	24.645		40.21	0.000	0.000
					C	13.182	14.155		51.78	0.000	0.000
T10	90.00	1.332	9	323.362	A	18.615	49.276	28.309	41.70	21.670	0.000
100.00-80.00					B	16.743	49.291		42.87	0.000	0.000
					C	21.529	28.309		56.80	0.000	0.000
T11	70.00	1.24	8	363.780	A	20.424	50.864	29.897	41.94	21.670	0.000
80.00-60.00					B	18.526	50.878		43.08	0.000	0.000
					C	23.276	29.897		56.23	0.000	0.000
T12	50.00	1.126	7	403.780	A	25.135	53.639	29.897	37.95	21.670	0.000
60.00-40.00					B	23.519	50.878		40.19	0.000	0.000
					C	28.405	29.897		51.28	0.000	0.000
T13	30.00	1	6	443.780	A	30.574	54.564	29.897	35.12	21.670	0.000
40.00-20.00					B	29.148	50.878		37.36	0.000	0.000
					C	34.170	29.897		46.67	0.000	0.000
T14 20.00-0.00	10.00	1	6	494.209	A	19.205	64.855	40.189	47.81	21.670	0.000
					B	17.208	61.170		51.28	0.000	0.000
					C	21.624	40.189		65.02	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.60	A	0.252	2.433	0.602	1	1	9.750	1.43	95.33	A
245.00-230.00			B	0.208	2.57	0.592	1	1	7.742			
			C	0.124	2.869	0.578	1	1	4.438			
T2	0.53	1.31	A	0.262	2.401	0.605	1	1	14.506	2.38	118.76	B
230.00-210.00			B	0.378	2.11	0.643	1	1	21.893			
			C	0.145	2.79	0.581	1	1	7.436			
T3	0.53	1.85	A	0.262	2.401	0.605	1	1	16.244	2.45	122.68	B
210.00-190.00			B	0.365	2.137	0.638	1	1	23.572			
			C	0.16	2.736	0.583	1	1	9.234			
T4	0.27	1.24	A	0.331	2.217	0.626	1	1	15.189	1.66	166.08	B
190.00-180.00			B	0.408	2.049	0.655	1	1	19.048			
			C	0.255	2.424	0.603	1	1	11.858			
T5	0.53	2.33	A	0.27	2.38	0.607	1	1	29.899	3.37	168.25	B
180.00-160.00			B	0.332	2.213	0.626	1	1	36.967			
			C	0.206	2.577	0.592	1	1	23.336			
T6	0.70	2.79	A	0.231	2.496	0.597	1	1	31.944	3.53	176.33	B
160.00-140.00			B	0.281	2.347	0.61	1	1	38.653			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.202	2.591	0.591	1	1	30.159			
T7	0.72	2.96	A	0.22	2.53	0.595	1	1	37.123	3.72	185.80	B
140.00-120.00			B	0.249	2.441	0.602	1	1	41.676			
			C	0.183	2.654	0.587	1	1	33.587			
T8	0.37	1.79	A	0.219	2.535	0.594	1	1	20.624	1.91	190.75	B
120.00-110.00			B	0.234	2.488	0.598	1	1	22.012			
			C	0.175	2.683	0.586	1	1	17.993			
T9	0.38	2.07	A	0.241	2.465	0.6	1	1	25.497	2.09	208.75	A
110.00-100.00			B	0.24	2.468	0.599	1	1	25.327			
			C	0.186	2.642	0.588	1	1	21.500			
T10	0.77	4.21	A	0.21	2.563	0.592	1	1	47.810	3.91	195.51	A
100.00-80.00			B	0.204	2.582	0.591	1	1	45.887			
			C	0.154	2.756	0.582	1	1	38.009			
T11	0.77	4.87	A	0.196	2.61	0.59	1	1	50.413	3.87	193.33	A
80.00-60.00			B	0.191	2.627	0.589	1	1	48.471			
			C	0.146	2.786	0.581	1	1	40.643			
T12	0.79	5.29	A	0.195	2.612	0.589	1	1	56.750	3.90	194.76	A
60.00-40.00			B	0.184	2.649	0.587	1	1	53.400			
			C	0.144	2.792	0.581	1	1	45.764			
T13	0.79	5.30	A	0.192	2.623	0.589	1	1	62.700	3.79	189.48	A
40.00-20.00			B	0.18	2.663	0.587	1	1	58.992			
			C	0.144	2.792	0.581	1	1	51.529			
T14	0.79	7.81	A	0.17	2.699	0.585	1	1	57.129	3.58	178.99	A
20.00-0.00			B	0.159	2.74	0.583	1	1	52.859			
			C	0.125	2.865	0.578	1	1	44.852			
Sum Weight:	8.21	44.43						OTM	4649.66 kip-ft	41.56		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.60	A	0.252	2.433	0.602	0.825	1	9.586	1.42	94.38	A
245.00-230.00			B	0.208	2.57	0.592	0.825	1	7.687			
			C	0.124	2.869	0.578	0.825	1	4.438			
T2	0.53	1.31	A	0.262	2.401	0.605	0.825	1	14.288	2.36	117.95	B
230.00-210.00			B	0.378	2.11	0.643	0.825	1	21.674			
			C	0.145	2.79	0.581	0.825	1	7.436			
T3	0.53	1.85	A	0.262	2.401	0.605	0.825	1	16.026	2.44	121.89	B
210.00-190.00			B	0.365	2.137	0.638	0.825	1	23.353			
			C	0.16	2.736	0.583	0.825	1	9.234			
T4	0.27	1.24	A	0.331	2.217	0.626	0.825	1	14.505	1.61	161.42	B
190.00-180.00			B	0.408	2.049	0.655	0.825	1	18.365			
			C	0.255	2.424	0.603	0.825	1	11.117			
T5	0.53	2.33	A	0.27	2.38	0.607	0.825	1	28.433	3.26	162.99	B
180.00-160.00			B	0.332	2.213	0.626	0.825	1	35.505			
			C	0.206	2.577	0.592	0.825	1	21.809			
T6	0.70	2.79	A	0.231	2.496	0.597	0.825	1	30.219	3.40	169.99	B
160.00-140.00			B	0.281	2.347	0.61	0.825	1	36.933			
			C	0.202	2.591	0.591	0.825	1	27.594			
T7	0.72	2.96	A	0.22	2.53	0.595	0.825	1	34.839	3.55	177.27	B
140.00-120.00			B	0.249	2.441	0.602	0.825	1	39.354			
			C	0.183	2.654	0.587	0.825	1	30.405			
T8	0.37	1.79	A	0.219	2.535	0.594	0.825	1	19.385	1.82	181.54	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
120.00-110.00			B	0.234	2.488	0.598	0.825	1	20.738			
			C	0.175	2.683	0.586	0.825	1	16.295			
T9	0.38	2.07	A	0.241	2.465	0.6	0.825	1	23.620	1.96	195.65	A
110.00-100.00			B	0.24	2.468	0.599	0.825	1	23.480			
			C	0.186	2.642	0.588	0.825	1	19.194			
T10	0.77	4.21	A	0.21	2.563	0.592	0.825	1	44.553	3.68	184.19	A
100.00-80.00			B	0.204	2.582	0.591	0.825	1	42.957			
			C	0.154	2.756	0.582	0.825	1	34.241			
T11	0.77	4.87	A	0.196	2.61	0.59	0.825	1	46.838	3.63	181.56	A
80.00-60.00			B	0.191	2.627	0.589	0.825	1	45.229			
			C	0.146	2.786	0.581	0.825	1	36.570			
T12	0.79	5.29	A	0.195	2.612	0.589	0.825	1	52.351	3.63	181.59	A
60.00-40.00			B	0.184	2.649	0.587	0.825	1	49.284			
			C	0.144	2.792	0.581	0.825	1	40.793			
T13	0.79	5.30	A	0.192	2.623	0.589	0.825	1	57.349	3.50	175.19	A
40.00-20.00			B	0.18	2.663	0.587	0.825	1	53.891			
			C	0.144	2.792	0.581	0.825	1	45.549			
T14	0.79	7.81	A	0.17	2.699	0.585	0.825	1	53.768	3.40	169.76	A
20.00-0.00			B	0.159	2.74	0.583	0.825	1	49.848			
			C	0.125	2.865	0.578	0.825	1	41.067			
Sum Weight:	8.21	44.43						OTM	4487.04 kip-ft	39.65		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.60	A	0.252	2.433	0.602	0.8	1	9.563	1.41	94.25	A
245.00-230.00			B	0.208	2.57	0.592	0.8	1	7.680			
			C	0.124	2.869	0.578	0.8	1	4.438			
T2	0.53	1.31	A	0.262	2.401	0.605	0.8	1	14.256	2.36	117.84	B
230.00-210.00			B	0.378	2.11	0.643	0.8	1	21.643			
			C	0.145	2.79	0.581	0.8	1	7.436			
T3	0.53	1.85	A	0.262	2.401	0.605	0.8	1	15.994	2.44	121.77	B
210.00-190.00			B	0.365	2.137	0.638	0.8	1	23.322			
			C	0.16	2.736	0.583	0.8	1	9.234			
T4	0.27	1.24	A	0.331	2.217	0.626	0.8	1	14.407	1.61	160.75	B
190.00-180.00			B	0.408	2.049	0.655	0.8	1	18.268			
			C	0.255	2.424	0.603	0.8	1	11.011			
T5	0.53	2.33	A	0.27	2.38	0.607	0.8	1	28.224	3.24	162.24	B
180.00-160.00			B	0.332	2.213	0.626	0.8	1	35.296			
			C	0.206	2.577	0.592	0.8	1	21.591			
T6	0.70	2.79	A	0.231	2.496	0.597	0.8	1	29.973	3.38	169.09	B
160.00-140.00			B	0.281	2.347	0.61	0.8	1	36.687			
			C	0.202	2.591	0.591	0.8	1	27.228			
T7	0.72	2.96	A	0.22	2.53	0.595	0.8	1	34.512	3.52	176.05	B
140.00-120.00			B	0.249	2.441	0.602	0.8	1	39.023			
			C	0.183	2.654	0.587	0.8	1	29.950			
T8	0.37	1.79	A	0.219	2.535	0.594	0.8	1	19.208	1.80	180.22	B
120.00-110.00			B	0.234	2.488	0.598	0.8	1	20.556			
			C	0.175	2.683	0.586	0.8	1	16.052			
T9	0.38	2.07	A	0.241	2.465	0.6	0.8	1	23.352	1.94	193.77	A
110.00-100.00			B	0.24	2.468	0.599	0.8	1	23.216			
			C	0.186	2.642	0.588	0.8	1	18.864			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T10	0.77	4.21	A	0.21	2.563	0.592	0.8	1	44.087	3.65	182.57	A
100.00-80.00			B	0.204	2.582	0.591	0.8	1	42.539			
			C	0.154	2.756	0.582	0.8	1	33.703			
T11	0.77	4.87	A	0.196	2.61	0.59	0.8	1	46.328	3.60	179.88	A
80.00-60.00			B	0.191	2.627	0.589	0.8	1	44.766			
			C	0.146	2.786	0.581	0.8	1	35.988			
T12	0.79	5.29	A	0.195	2.612	0.589	0.8	1	51.723	3.59	179.71	A
60.00-40.00			B	0.184	2.649	0.587	0.8	1	48.696			
			C	0.144	2.792	0.581	0.8	1	40.083			
T13	0.79	5.30	A	0.192	2.623	0.589	0.8	1	56.585	3.46	173.15	A
40.00-20.00			B	0.18	2.663	0.587	0.8	1	53.162			
			C	0.144	2.792	0.581	0.8	1	44.695			
T14	0.79	7.81	A	0.17	2.699	0.585	0.8	1	53.288	3.37	168.44	A
20.00-0.00			B	0.159	2.74	0.583	0.8	1	49.417			
			C	0.125	2.865	0.578	0.8	1	40.527			
Sum Weight:	8.21	44.43						OTM	4463.81 kip-ft	39.38		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.60	A	0.252	2.433	0.602	0.85	1	9.609	1.42	94.52	A
245.00-230.00			B	0.208	2.57	0.592	0.85	1	7.695			
			C	0.124	2.869	0.578	0.85	1	4.438			
T2	0.53	1.31	A	0.262	2.401	0.605	0.85	1	14.319	2.36	118.07	B
230.00-210.00			B	0.378	2.11	0.643	0.85	1	21.705			
			C	0.145	2.79	0.581	0.85	1	7.436			
T3	0.53	1.85	A	0.262	2.401	0.605	0.85	1	16.057	2.44	122.00	B
210.00-190.00			B	0.365	2.137	0.638	0.85	1	23.384			
			C	0.16	2.736	0.583	0.85	1	9.234			
T4	0.27	1.24	A	0.331	2.217	0.626	0.85	1	14.602	1.62	162.08	B
190.00-180.00			B	0.408	2.049	0.655	0.85	1	18.463			
			C	0.255	2.424	0.603	0.85	1	11.223			
T5	0.53	2.33	A	0.27	2.38	0.607	0.85	1	28.642	3.27	163.74	B
180.00-160.00			B	0.332	2.213	0.626	0.85	1	35.714			
			C	0.206	2.577	0.592	0.85	1	22.027			
T6	0.70	2.79	A	0.231	2.496	0.597	0.85	1	30.466	3.42	170.90	B
160.00-140.00			B	0.281	2.347	0.61	0.85	1	37.178			
			C	0.202	2.591	0.591	0.85	1	27.961			
T7	0.72	2.96	A	0.22	2.53	0.595	0.85	1	35.165	3.57	178.49	B
140.00-120.00			B	0.249	2.441	0.602	0.85	1	39.686			
			C	0.183	2.654	0.587	0.85	1	30.859			
T8	0.37	1.79	A	0.219	2.535	0.594	0.85	1	19.562	1.83	182.86	B
120.00-110.00			B	0.234	2.488	0.598	0.85	1	20.920			
			C	0.175	2.683	0.586	0.85	1	16.537			
T9	0.38	2.07	A	0.241	2.465	0.6	0.85	1	23.888	1.98	197.52	A
110.00-100.00			B	0.24	2.468	0.599	0.85	1	23.744			
			C	0.186	2.642	0.588	0.85	1	19.523			
T10	0.77	4.21	A	0.21	2.563	0.592	0.85	1	45.018	3.72	185.81	A
100.00-80.00			B	0.204	2.582	0.591	0.85	1	43.376			
			C	0.154	2.756	0.582	0.85	1	34.779			
T11	0.77	4.87	A	0.196	2.61	0.59	0.85	1	47.349	3.66	183.24	A
80.00-60.00			B	0.191	2.627	0.589	0.85	1	45.692			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.146	2.786	0.581	0.85	1	37.152			
T12	0.79	5.29	A	0.195	2.612	0.589	0.85	1	52.980	3.67	183.47	A
60.00-40.00			B	0.184	2.649	0.587	0.85	1	49.872			
			C	0.144	2.792	0.581	0.85	1	41.503			
T13	0.79	5.30	A	0.192	2.623	0.589	0.85	1	58.114	3.54	177.23	A
40.00-20.00			B	0.18	2.663	0.587	0.85	1	54.620			
			C	0.144	2.792	0.581	0.85	1	46.404			
T14	0.79	7.81	A	0.17	2.699	0.585	0.85	1	54.248	3.42	171.08	A
20.00-0.00			B	0.159	2.74	0.583	0.85	1	50.278			
			C	0.125	2.865	0.578	0.85	1	41.608			
Sum Weight:	8.21	44.43						OTM	4510.27 kip-ft	39.92		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.59	0.80	A	0.429	2.009	0.664	1	1	18.573	1.48	98.52	A
245.00-230.00			B	0.359	2.15	0.636	1	1	14.634			
			C	0.243	2.46	0.6	1	1	9.187			
T2	1.24	1.62	A	0.429	2.01	0.664	1	1	26.418	2.51	125.27	B
230.00-210.00			B	0.582	1.816	0.743	1	1	39.512			
			C	0.256	2.419	0.603	1	1	13.914			
T3	1.24	2.21	A	0.417	2.032	0.659	1	1	28.481	2.54	127.02	B
210.00-190.00			B	0.553	1.84	0.726	1	1	41.175			
			C	0.265	2.395	0.606	1	1	16.157			
T4	0.62	1.73	A	0.528	1.866	0.712	1	1	26.357	1.80	179.62	B
190.00-180.00			B	0.631	1.788	0.773	1	1	33.587			
			C	0.402	2.06	0.652	1	1	19.062			
T5	1.24	4.01	A	0.431	2.007	0.665	1	1	49.803	3.42	171.16	B
180.00-160.00			B	0.514	1.882	0.705	1	1	61.992			
			C	0.323	2.237	0.623	1	1	36.332			
T6	1.46	4.54	A	0.366	2.134	0.638	1	1	51.491	3.50	174.82	B
160.00-140.00			B	0.433	2.002	0.666	1	1	62.397			
			C	0.304	2.284	0.617	1	1	44.436			
T7	1.52	4.82	A	0.348	2.176	0.632	1	1	58.542	3.60	179.98	B
140.00-120.00			B	0.379	2.108	0.643	1	1	64.372			
			C	0.271	2.376	0.607	1	1	47.821			
T8	0.79	2.78	A	0.348	2.176	0.632	1	1	32.784	1.84	184.09	B
120.00-110.00			B	0.354	2.163	0.634	1	1	33.554			
			C	0.258	2.414	0.604	1	1	25.447			
T9	0.83	3.18	A	0.378	2.11	0.643	1	1	39.528	2.02	202.40	A
110.00-100.00			B	0.358	2.153	0.635	1	1	37.401			
			C	0.272	2.375	0.608	1	1	29.698			
T10	1.67	6.26	A	0.334	2.209	0.627	1	1	75.274	3.86	193.14	A
100.00-80.00			B	0.309	2.273	0.619	1	1	68.548			
			C	0.227	2.509	0.596	1	1	53.056			
T11	1.67	7.02	A	0.31	2.27	0.619	1	1	78.181	3.81	190.31	A
80.00-60.00			B	0.287	2.331	0.612	1	1	71.535			
			C	0.214	2.549	0.593	1	1	56.316			
T12	1.72	7.60	A	0.304	2.284	0.617	1	1	85.933	3.78	189.07	A
60.00-40.00			B	0.272	2.372	0.608	1	1	76.431			
			C	0.207	2.572	0.592	1	1	61.702			
T13	1.73	7.78	A	0.294	2.312	0.614	1	1	92.212	3.62	180.83	A

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
40.00-20.00			B	0.262	2.403	0.605	1	1	82.075			
			C	0.203	2.587	0.591	1	1	67.763			
T14	1.73	10.87	A	0.261	2.405	0.605	1	1	86.320	3.53	176.51	A
20.00-0.00			B	0.229	2.501	0.597	1	1	75.035			
			C	0.174	2.685	0.585	1	1	59.884			
Sum Weight:	18.05	65.24						OTM	4688.04 kip-ft	41.30		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.59	0.80	A	0.429	2.009	0.664	0.825	1	18.263	1.46	97.40	A
245.00-230.00			B	0.359	2.15	0.636	0.825	1	14.531			
			C	0.243	2.46	0.6	0.825	1	9.187			
T2	1.24	1.62	A	0.429	2.01	0.664	0.825	1	26.005	2.49	124.28	B
230.00-210.00			B	0.582	1.816	0.743	0.825	1	39.099			
			C	0.256	2.419	0.603	0.825	1	13.914			
T3	1.24	2.21	A	0.417	2.032	0.659	0.825	1	28.068	2.52	126.05	B
210.00-190.00			B	0.553	1.84	0.726	0.825	1	40.762			
			C	0.265	2.395	0.606	0.825	1	16.157			
T4	0.62	1.73	A	0.528	1.866	0.712	0.825	1	25.688	1.77	176.59	B
190.00-180.00			B	0.631	1.788	0.773	0.825	1	32.908			
			C	0.402	2.06	0.652	0.825	1	18.321			
T5	1.24	4.01	A	0.431	2.007	0.665	0.825	1	48.334	3.35	167.75	B
180.00-160.00			B	0.514	1.882	0.705	0.825	1	60.506			
			C	0.323	2.237	0.623	0.825	1	34.805			
T6	1.46	4.54	A	0.366	2.134	0.638	0.825	1	49.736	3.41	170.65	B
160.00-140.00			B	0.433	2.002	0.666	0.825	1	60.628			
			C	0.304	2.284	0.617	0.825	1	41.694			
T7	1.52	4.82	A	0.348	2.176	0.632	0.825	1	56.280	3.49	174.37	B
140.00-120.00			B	0.379	2.108	0.643	0.825	1	62.014			
			C	0.271	2.376	0.607	0.825	1	44.464			
T8	0.79	2.78	A	0.348	2.176	0.632	0.825	1	31.570	1.78	177.97	B
120.00-110.00			B	0.354	2.163	0.634	0.825	1	32.258			
			C	0.258	2.414	0.604	0.825	1	23.660			
T9	0.83	3.18	A	0.378	2.11	0.643	0.825	1	37.703	1.94	194.21	A
110.00-100.00			B	0.358	2.153	0.635	0.825	1	35.559			
			C	0.272	2.375	0.608	0.825	1	27.307			
T10	1.67	6.26	A	0.334	2.209	0.627	0.825	1	71.908	3.71	185.58	A
100.00-80.00			B	0.309	2.273	0.619	0.825	1	65.564			
			C	0.227	2.509	0.596	0.825	1	49.111			
T11	1.67	7.02	A	0.31	2.27	0.619	0.825	1	74.488	3.65	182.38	A
80.00-60.00			B	0.287	2.331	0.612	0.825	1	68.234			
			C	0.214	2.549	0.593	0.825	1	52.065			
T12	1.72	7.60	A	0.304	2.284	0.617	0.825	1	81.482	3.61	180.33	A
60.00-40.00			B	0.272	2.372	0.608	0.825	1	72.274			
			C	0.207	2.572	0.592	0.825	1	56.556			
T13	1.73	7.78	A	0.294	2.312	0.614	0.825	1	86.860	3.43	171.38	A
40.00-20.00			B	0.262	2.403	0.605	0.825	1	76.952			
			C	0.203	2.587	0.591	0.825	1	61.610			
T14	1.73	10.87	A	0.261	2.405	0.605	0.825	1	82.773	3.40	170.00	A
20.00-0.00			B	0.229	2.501	0.597	0.825	1	71.919			
			C	0.174	2.685	0.585	0.825	1	55.917			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	18.05	65.24						OTM	4575.50 kip-ft	40.00		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.59	0.80	A	0.429	2.009	0.664	0.8	1	18.219	1.46	97.24	A
245.00-230.00			B	0.359	2.15	0.636	0.8	1	14.516			
			C	0.243	2.46	0.6	0.8	1	9.187			
T2	1.24	1.62	A	0.429	2.01	0.664	0.8	1	25.946	2.48	124.14	B
230.00-210.00			B	0.582	1.816	0.743	0.8	1	39.039			
			C	0.256	2.419	0.603	0.8	1	13.914			
T3	1.24	2.21	A	0.417	2.032	0.659	0.8	1	28.009	2.52	125.91	B
210.00-190.00			B	0.553	1.84	0.726	0.8	1	40.703			
			C	0.265	2.395	0.606	0.8	1	16.157			
T4	0.62	1.73	A	0.528	1.866	0.712	0.8	1	25.593	1.76	176.15	B
190.00-180.00			B	0.631	1.788	0.773	0.8	1	32.811			
			C	0.402	2.06	0.652	0.8	1	18.215			
T5	1.24	4.01	A	0.431	2.007	0.665	0.8	1	48.124	3.35	167.26	B
180.00-160.00			B	0.514	1.882	0.705	0.8	1	60.294			
			C	0.323	2.237	0.623	0.8	1	34.587			
T6	1.46	4.54	A	0.366	2.134	0.638	0.8	1	49.485	3.40	170.05	B
160.00-140.00			B	0.433	2.002	0.666	0.8	1	60.375			
			C	0.304	2.284	0.617	0.8	1	41.303			
T7	1.52	4.82	A	0.348	2.176	0.632	0.8	1	55.957	3.47	173.57	B
140.00-120.00			B	0.379	2.108	0.643	0.8	1	61.677			
			C	0.271	2.376	0.607	0.8	1	43.985			
T8	0.79	2.78	A	0.348	2.176	0.632	0.8	1	31.396	1.77	177.10	B
120.00-110.00			B	0.354	2.163	0.634	0.8	1	32.073			
			C	0.258	2.414	0.604	0.8	1	23.405			
T9	0.83	3.18	A	0.378	2.11	0.643	0.8	1	37.442	1.93	193.04	A
110.00-100.00			B	0.358	2.153	0.635	0.8	1	35.295			
			C	0.272	2.375	0.608	0.8	1	26.965			
T10	1.67	6.26	A	0.334	2.209	0.627	0.8	1	71.427	3.69	184.50	A
100.00-80.00			B	0.309	2.273	0.619	0.8	1	65.138			
			C	0.227	2.509	0.596	0.8	1	48.548			
T11	1.67	7.02	A	0.31	2.27	0.619	0.8	1	73.961	3.63	181.25	A
80.00-60.00			B	0.287	2.331	0.612	0.8	1	67.762			
			C	0.214	2.549	0.593	0.8	1	51.458			
T12	1.72	7.60	A	0.304	2.284	0.617	0.8	1	80.847	3.58	179.09	A
60.00-40.00			B	0.272	2.372	0.608	0.8	1	71.680			
			C	0.207	2.572	0.592	0.8	1	55.821			
T13	1.73	7.78	A	0.294	2.312	0.614	0.8	1	86.096	3.40	170.03	A
40.00-20.00			B	0.262	2.403	0.605	0.8	1	76.220			
			C	0.203	2.587	0.591	0.8	1	60.731			
T14	1.73	10.87	A	0.261	2.405	0.605	0.8	1	82.266	3.38	169.07	A
20.00-0.00			B	0.229	2.501	0.597	0.8	1	71.474			
			C	0.174	2.685	0.585	0.8	1	55.350			
Sum Weight:	18.05	65.24						OTM	4559.42 kip-ft	39.82		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.59	0.80	A	0.429	2.009	0.664	0.85	1	18.307	1.46	97.56	A
245.00-230.00			B	0.359	2.15	0.636	0.85	1	14.545			
			C	0.243	2.46	0.6	0.85	1	9.187			
T2	1.24	1.62	A	0.429	2.01	0.664	0.85	1	26.064	2.49	124.42	B
230.00-210.00			B	0.582	1.816	0.743	0.85	1	39.158			
			C	0.256	2.419	0.603	0.85	1	13.914			
T3	1.24	2.21	A	0.417	2.032	0.659	0.85	1	28.127	2.52	126.19	B
210.00-190.00			B	0.553	1.84	0.726	0.85	1	40.821			
			C	0.265	2.395	0.606	0.85	1	16.157			
T4	0.62	1.73	A	0.528	1.866	0.712	0.85	1	25.784	1.77	177.02	B
190.00-180.00			B	0.631	1.788	0.773	0.85	1	33.005			
			C	0.402	2.06	0.652	0.85	1	18.427			
T5	1.24	4.01	A	0.431	2.007	0.665	0.85	1	48.543	3.36	168.23	B
180.00-160.00			B	0.514	1.882	0.705	0.85	1	60.718			
			C	0.323	2.237	0.623	0.85	1	35.023			
T6	1.46	4.54	A	0.366	2.134	0.638	0.85	1	49.986	3.42	171.24	B
160.00-140.00			B	0.433	2.002	0.666	0.85	1	60.880			
			C	0.304	2.284	0.617	0.85	1	42.086			
T7	1.52	4.82	A	0.348	2.176	0.632	0.85	1	56.603	3.50	175.17	B
140.00-120.00			B	0.379	2.108	0.643	0.85	1	62.351			
			C	0.271	2.376	0.607	0.85	1	44.944			
T8	0.79	2.78	A	0.348	2.176	0.632	0.85	1	31.743	1.79	178.84	B
120.00-110.00			B	0.354	2.163	0.634	0.85	1	32.443			
			C	0.258	2.414	0.604	0.85	1	23.916			
T9	0.83	3.18	A	0.378	2.11	0.643	0.85	1	37.964	1.95	195.38	A
110.00-100.00			B	0.358	2.153	0.635	0.85	1	35.822			
			C	0.272	2.375	0.608	0.85	1	27.648			
T10	1.67	6.26	A	0.334	2.209	0.627	0.85	1	72.389	3.73	186.66	A
100.00-80.00			B	0.309	2.273	0.619	0.85	1	65.990			
			C	0.227	2.509	0.596	0.85	1	49.675			
T11	1.67	7.02	A	0.31	2.27	0.619	0.85	1	75.016	3.67	183.52	A
80.00-60.00			B	0.287	2.331	0.612	0.85	1	68.706			
			C	0.214	2.549	0.593	0.85	1	52.672			
T12	1.72	7.60	A	0.304	2.284	0.617	0.85	1	82.118	3.63	181.58	A
60.00-40.00			B	0.272	2.372	0.608	0.85	1	72.868			
			C	0.207	2.572	0.592	0.85	1	57.291			
T13	1.73	7.78	A	0.294	2.312	0.614	0.85	1	87.625	3.45	172.73	A
40.00-20.00			B	0.262	2.403	0.605	0.85	1	77.684			
			C	0.203	2.587	0.591	0.85	1	62.489			
T14	1.73	10.87	A	0.261	2.405	0.605	0.85	1	83.280	3.42	170.93	A
20.00-0.00			B	0.229	2.501	0.597	0.85	1	72.365			
			C	0.174	2.685	0.585	0.85	1	56.483			
Sum Weight:	18.05	65.24						OTM	4591.57 kip-ft	40.19		

Tower Forces - Service - Wind Normal To Face

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

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.60	A	0.252	2.433	0.602	1	1	9.750	0.49	32.99	A
245.00-230.00			B	0.208	2.57	0.592	1	1	7.742			
			C	0.124	2.869	0.578	1	1	4.438			
T2	0.53	1.31	A	0.262	2.401	0.605	1	1	14.506	0.82	41.09	B
230.00-210.00			B	0.378	2.11	0.643	1	1	21.893			
			C	0.145	2.79	0.581	1	1	7.436			
T3	0.53	1.85	A	0.262	2.401	0.605	1	1	16.244	0.85	42.45	B
210.00-190.00			B	0.365	2.137	0.638	1	1	23.572			
			C	0.16	2.736	0.583	1	1	9.234			
T4	0.27	1.24	A	0.331	2.217	0.626	1	1	15.189	0.57	57.47	B
190.00-180.00			B	0.408	2.049	0.655	1	1	19.048			
			C	0.255	2.424	0.603	1	1	11.858			
T5	0.53	2.33	A	0.27	2.38	0.607	1	1	29.899	1.16	58.22	B
180.00-160.00			B	0.332	2.213	0.626	1	1	36.967			
			C	0.206	2.577	0.592	1	1	23.336			
T6	0.70	2.79	A	0.231	2.496	0.597	1	1	31.944	1.22	61.01	B
160.00-140.00			B	0.281	2.347	0.61	1	1	38.653			
			C	0.202	2.591	0.591	1	1	30.159			
T7	0.72	2.96	A	0.22	2.53	0.595	1	1	37.123	1.29	64.29	B
140.00-120.00			B	0.249	2.441	0.602	1	1	41.676			
			C	0.183	2.654	0.587	1	1	33.587			
T8	0.37	1.79	A	0.219	2.535	0.594	1	1	20.624	0.66	66.01	B
120.00-110.00			B	0.234	2.488	0.598	1	1	22.012			
			C	0.175	2.683	0.586	1	1	17.993			
T9	0.38	2.07	A	0.241	2.465	0.6	1	1	25.497	0.72	72.23	A
110.00-100.00			B	0.24	2.468	0.599	1	1	25.327			
			C	0.186	2.642	0.588	1	1	21.500			
T10	0.77	4.21	A	0.21	2.563	0.592	1	1	47.810	1.35	67.65	A
100.00-80.00			B	0.204	2.582	0.591	1	1	45.887			
			C	0.154	2.756	0.582	1	1	38.009			
T11	0.77	4.87	A	0.196	2.61	0.59	1	1	50.413	1.34	66.90	A
80.00-60.00			B	0.191	2.627	0.589	1	1	48.471			
			C	0.146	2.786	0.581	1	1	40.643			
T12	0.79	5.29	A	0.195	2.612	0.589	1	1	56.750	1.35	67.39	A
60.00-40.00			B	0.184	2.649	0.587	1	1	53.400			
			C	0.144	2.792	0.581	1	1	45.764			
T13	0.79	5.30	A	0.192	2.623	0.589	1	1	62.700	1.31	65.56	A
40.00-20.00			B	0.18	2.663	0.587	1	1	58.992			
			C	0.144	2.792	0.581	1	1	51.529			
T14	0.79	7.81	A	0.17	2.699	0.585	1	1	57.129	1.24	61.93	A
20.00-0.00			B	0.159	2.74	0.583	1	1	52.859			
			C	0.125	2.865	0.578	1	1	44.852			
Sum Weight:	8.21	44.43						OTM	1608.88 kip-ft	14.38		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.60	A	0.252	2.433	0.602	0.825	1	9.586	0.49	32.66	A
245.00-230.00			B	0.208	2.57	0.592	0.825	1	7.687			
			C	0.124	2.869	0.578	0.825	1	4.438			
T2	0.53	1.31	A	0.262	2.401	0.605	0.825	1	14.288	0.82	40.81	B
230.00-210.00			B	0.378	2.11	0.643	0.825	1	21.674			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.145	2.79	0.581	0.825	1	7.436			
T3	0.53	1.85	A	0.262	2.401	0.605	0.825	1	16.026	0.84	42.18	B
210.00-190.00			B	0.365	2.137	0.638	0.825	1	23.353			
			C	0.16	2.736	0.583	0.825	1	9.234			
T4	0.27	1.24	A	0.331	2.217	0.626	0.825	1	14.505	0.56	55.85	B
190.00-180.00			B	0.408	2.049	0.655	0.825	1	18.365			
			C	0.255	2.424	0.603	0.825	1	11.117			
T5	0.53	2.33	A	0.27	2.38	0.607	0.825	1	28.433	1.13	56.40	B
180.00-160.00			B	0.332	2.213	0.626	0.825	1	35.505			
			C	0.206	2.577	0.592	0.825	1	21.809			
T6	0.70	2.79	A	0.231	2.496	0.597	0.825	1	30.219	1.18	58.82	B
160.00-140.00			B	0.281	2.347	0.61	0.825	1	36.933			
			C	0.202	2.591	0.591	0.825	1	27.594			
T7	0.72	2.96	A	0.22	2.53	0.595	0.825	1	34.839	1.23	61.34	B
140.00-120.00			B	0.249	2.441	0.602	0.825	1	39.354			
			C	0.183	2.654	0.587	0.825	1	30.405			
T8	0.37	1.79	A	0.219	2.535	0.594	0.825	1	19.385	0.63	62.82	B
120.00-110.00			B	0.234	2.488	0.598	0.825	1	20.738			
			C	0.175	2.683	0.586	0.825	1	16.295			
T9	0.38	2.07	A	0.241	2.465	0.6	0.825	1	23.620	0.68	67.70	A
110.00-100.00			B	0.24	2.468	0.599	0.825	1	23.480			
			C	0.186	2.642	0.588	0.825	1	19.194			
T10	0.77	4.21	A	0.21	2.563	0.592	0.825	1	44.553	1.27	63.73	A
100.00-80.00			B	0.204	2.582	0.591	0.825	1	42.957			
			C	0.154	2.756	0.582	0.825	1	34.241			
T11	0.77	4.87	A	0.196	2.61	0.59	0.825	1	46.838	1.26	62.82	A
80.00-60.00			B	0.191	2.627	0.589	0.825	1	45.229			
			C	0.146	2.786	0.581	0.825	1	36.570			
T12	0.79	5.29	A	0.195	2.612	0.589	0.825	1	52.351	1.26	62.83	A
60.00-40.00			B	0.184	2.649	0.587	0.825	1	49.284			
			C	0.144	2.792	0.581	0.825	1	40.793			
T13	0.79	5.30	A	0.192	2.623	0.589	0.825	1	57.349	1.21	60.62	A
40.00-20.00			B	0.18	2.663	0.587	0.825	1	53.891			
			C	0.144	2.792	0.581	0.825	1	45.549			
T14	0.79	7.81	A	0.17	2.699	0.585	0.825	1	53.768	1.17	58.74	A
20.00-0.00			B	0.159	2.74	0.583	0.825	1	49.848			
			C	0.125	2.865	0.578	0.825	1	41.067			
Sum Weight:	8.21	44.43						OTM	1552.61 kip-ft	13.72		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.60	A	0.252	2.433	0.602	0.8	1	9.563	0.49	32.61	A
245.00-230.00			B	0.208	2.57	0.592	0.8	1	7.680			
			C	0.124	2.869	0.578	0.8	1	4.438			
T2	0.53	1.31	A	0.262	2.401	0.605	0.8	1	14.256	0.82	40.77	B
230.00-210.00			B	0.378	2.11	0.643	0.8	1	21.643			
			C	0.145	2.79	0.581	0.8	1	7.436			
T3	0.53	1.85	A	0.262	2.401	0.605	0.8	1	15.994	0.84	42.14	B
210.00-190.00			B	0.365	2.137	0.638	0.8	1	23.322			
			C	0.16	2.736	0.583	0.8	1	9.234			
T4	0.27	1.24	A	0.331	2.217	0.626	0.8	1	14.407	0.56	55.62	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
190.00-180.00			B	0.408	2.049	0.655	0.8	1	18.268			
			C	0.255	2.424	0.603	0.8	1	11.011			
T5	0.53	2.33	A	0.27	2.38	0.607	0.8	1	28.224	1.12	56.14	B
180.00-160.00			B	0.332	2.213	0.626	0.8	1	35.296			
			C	0.206	2.577	0.592	0.8	1	21.591			
T6	0.70	2.79	A	0.231	2.496	0.597	0.8	1	29.973	1.17	58.51	B
160.00-140.00			B	0.281	2.347	0.61	0.8	1	36.687			
			C	0.202	2.591	0.591	0.8	1	27.228			
T7	0.72	2.96	A	0.22	2.53	0.595	0.8	1	34.512	1.22	60.92	B
140.00-120.00			B	0.249	2.441	0.602	0.8	1	39.023			
			C	0.183	2.654	0.587	0.8	1	29.950			
T8	0.37	1.79	A	0.219	2.535	0.594	0.8	1	19.208	0.62	62.36	B
120.00-110.00			B	0.234	2.488	0.598	0.8	1	20.556			
			C	0.175	2.683	0.586	0.8	1	16.052			
T9	0.38	2.07	A	0.241	2.465	0.6	0.8	1	23.352	0.67	67.05	A
110.00-100.00			B	0.24	2.468	0.599	0.8	1	23.216			
			C	0.186	2.642	0.588	0.8	1	18.864			
T10	0.77	4.21	A	0.21	2.563	0.592	0.8	1	44.087	1.26	63.17	A
100.00-80.00			B	0.204	2.582	0.591	0.8	1	42.539			
			C	0.154	2.756	0.582	0.8	1	33.703			
T11	0.77	4.87	A	0.196	2.61	0.59	0.8	1	46.328	1.24	62.24	A
80.00-60.00			B	0.191	2.627	0.589	0.8	1	44.766			
			C	0.146	2.786	0.581	0.8	1	35.988			
T12	0.79	5.29	A	0.195	2.612	0.589	0.8	1	51.723	1.24	62.18	A
60.00-40.00			B	0.184	2.649	0.587	0.8	1	48.696			
			C	0.144	2.792	0.581	0.8	1	40.083			
T13	0.79	5.30	A	0.192	2.623	0.589	0.8	1	56.585	1.20	59.91	A
40.00-20.00			B	0.18	2.663	0.587	0.8	1	53.162			
			C	0.144	2.792	0.581	0.8	1	44.695			
T14	0.79	7.81	A	0.17	2.699	0.585	0.8	1	53.288	1.17	58.28	A
20.00-0.00			B	0.159	2.74	0.583	0.8	1	49.417			
			C	0.125	2.865	0.578	0.8	1	40.527			
Sum Weight:	8.21	44.43						OTM	1544.57 kip-ft	13.62		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.60	A	0.252	2.433	0.602	0.85	1	9.609	0.49	32.71	A
245.00-230.00			B	0.208	2.57	0.592	0.85	1	7.695			
			C	0.124	2.869	0.578	0.85	1	4.438			
T2	0.53	1.31	A	0.262	2.401	0.605	0.85	1	14.319	0.82	40.85	B
230.00-210.00			B	0.378	2.11	0.643	0.85	1	21.705			
			C	0.145	2.79	0.581	0.85	1	7.436			
T3	0.53	1.85	A	0.262	2.401	0.605	0.85	1	16.057	0.84	42.21	B
210.00-190.00			B	0.365	2.137	0.638	0.85	1	23.384			
			C	0.16	2.736	0.583	0.85	1	9.234			
T4	0.27	1.24	A	0.331	2.217	0.626	0.85	1	14.602	0.56	56.08	B
190.00-180.00			B	0.408	2.049	0.655	0.85	1	18.463			
			C	0.255	2.424	0.603	0.85	1	11.223			
T5	0.53	2.33	A	0.27	2.38	0.607	0.85	1	28.642	1.13	56.66	B
180.00-160.00			B	0.332	2.213	0.626	0.85	1	35.714			
			C	0.206	2.577	0.592	0.85	1	22.027			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T6	0.70	2.79	A	0.231	2.496	0.597	0.85	1	30.466	1.18	59.14	B
160.00-140.00			B	0.281	2.347	0.61	0.85	1	37.178			
			C	0.202	2.591	0.591	0.85	1	27.961			
T7	0.72	2.96	A	0.22	2.53	0.595	0.85	1	35.165	1.24	61.76	B
140.00-120.00			B	0.249	2.441	0.602	0.85	1	39.686			
			C	0.183	2.654	0.587	0.85	1	30.859			
T8	0.37	1.79	A	0.219	2.535	0.594	0.85	1	19.562	0.63	63.27	B
120.00-110.00			B	0.234	2.488	0.598	0.85	1	20.920			
			C	0.175	2.683	0.586	0.85	1	16.537			
T9	0.38	2.07	A	0.241	2.465	0.6	0.85	1	23.888	0.68	68.35	A
110.00-100.00			B	0.24	2.468	0.599	0.85	1	23.744			
			C	0.186	2.642	0.588	0.85	1	19.523			
T10	0.77	4.21	A	0.21	2.563	0.592	0.85	1	45.018	1.29	64.29	A
100.00-80.00			B	0.204	2.582	0.591	0.85	1	43.376			
			C	0.154	2.756	0.582	0.85	1	34.779			
T11	0.77	4.87	A	0.196	2.61	0.59	0.85	1	47.349	1.27	63.41	A
80.00-60.00			B	0.191	2.627	0.589	0.85	1	45.692			
			C	0.146	2.786	0.581	0.85	1	37.152			
T12	0.79	5.29	A	0.195	2.612	0.589	0.85	1	52.980	1.27	63.48	A
60.00-40.00			B	0.184	2.649	0.587	0.85	1	49.872			
			C	0.144	2.792	0.581	0.85	1	41.503			
T13	0.79	5.30	A	0.192	2.623	0.589	0.85	1	58.114	1.23	61.33	A
40.00-20.00			B	0.18	2.663	0.587	0.85	1	54.620			
			C	0.144	2.792	0.581	0.85	1	46.404			
T14	0.79	7.81	A	0.17	2.699	0.585	0.85	1	54.248	1.18	59.20	A
20.00-0.00			B	0.159	2.74	0.583	0.85	1	50.278			
			C	0.125	2.865	0.578	0.85	1	41.608			
Sum Weight:	8.21	44.43						OTM	1560.65 kip-ft	13.81		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	30.31					
Bracing Weight	14.11					
Total Member Self-Weight	44.43			-11.56	-8.77	
Total Weight	59.10			-11.56	-8.77	
Wind 0 deg - No Ice		0.04	-50.57	-6645.30	-18.15	13.61
Wind 30 deg - No Ice		24.67	-42.55	-5657.16	-3285.49	-8.14
Wind 45 deg - No Ice		34.68	-34.63	-4615.07	-4621.94	-18.08
Wind 60 deg - No Ice		42.25	-24.38	-3259.90	-5638.77	-26.90
Wind 90 deg - No Ice		49.21	-0.07	-24.62	-6539.58	-38.03
Wind 120 deg - No Ice		43.84	25.25	3297.19	-5762.16	-39.75
Wind 135 deg - No Ice		34.38	34.39	4558.85	-4583.34	-34.46
Wind 150 deg - No Ice		24.38	42.38	5611.01	-3246.06	-28.77
Wind 180 deg - No Ice		-0.14	48.58	6457.72	11.78	-11.40
Wind 210 deg - No Ice		-24.77	42.75	5654.70	3278.98	9.47
Wind 225 deg - No Ice		-34.79	34.74	4603.12	4616.58	19.37
Wind 240 deg - No Ice		-44.25	25.53	3336.01	5793.09	28.73
Wind 270 deg - No Ice		-49.43	0.07	0.74	6545.44	38.98
Wind 300 deg - No Ice		-42.18	-24.17	-3228.40	5607.78	38.78
Wind 315 deg - No Ice		-34.56	-34.34	-4576.95	4584.87	35.37
Wind 330 deg - No Ice		-24.54	-42.29	-5624.57	3245.08	29.87

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Member Ice	20.81					
Total Weight Ice	92.83			-29.01	-30.34	
Wind 0 deg - Ice		0.06	-49.37	-6466.75	-40.77	14.95
Wind 30 deg - Ice		24.31	-41.96	-5540.78	-3226.05	-6.59
Wind 45 deg - Ice		34.23	-34.20	-4526.36	-4535.26	-16.84
Wind 60 deg - Ice		41.81	-24.13	-3206.57	-5536.81	-26.25
Wind 90 deg - Ice		48.51	-0.06	-39.30	-6403.93	-38.13
Wind 120 deg - Ice		42.81	24.64	3180.83	-5613.58	-40.34
Wind 135 deg - Ice		34.01	33.92	4431.99	-4505.84	-36.05
Wind 150 deg - Ice		24.03	41.76	5456.94	-3189.73	-30.14
Wind 180 deg - Ice		-0.47	48.17	6309.61	24.74	-10.62
Wind 210 deg - Ice		-24.64	42.12	5499.07	3202.07	9.72
Wind 225 deg - Ice		-34.53	34.31	4479.84	4506.54	19.48
Wind 240 deg - Ice		-43.31	24.99	3226.12	5610.50	28.45
Wind 270 deg - Ice		-48.82	0.27	4.90	6375.73	39.43
Wind 300 deg - Ice		-41.97	-23.68	-3150.62	5489.39	41.19
Wind 315 deg - Ice		-34.33	-33.79	-4476.39	4478.84	37.85
Wind 330 deg - Ice		-24.17	-41.68	-5506.71	3143.35	31.09
Total Weight	59.10			-11.56	-8.77	
Wind 0 deg - Service		0.01	-17.50	-2302.34	-2.12	4.71
Wind 30 deg - Service		8.54	-14.72	-1960.42	-1132.69	-2.82
Wind 45 deg - Service		12.00	-11.98	-1599.84	-1595.13	-6.25
Wind 60 deg - Service		14.62	-8.44	-1130.92	-1946.97	-9.31
Wind 90 deg - Service		17.03	-0.03	-11.44	-2258.67	-13.16
Wind 120 deg - Service		15.17	8.74	1137.97	-1989.67	-13.76
Wind 135 deg - Service		11.90	11.90	1574.53	-1581.77	-11.92
Wind 150 deg - Service		8.44	14.67	1938.60	-1119.05	-9.95
Wind 180 deg - Service		-0.05	16.81	2231.58	8.24	-3.94
Wind 210 deg - Service		-8.57	14.79	1953.72	1138.75	3.28
Wind 225 deg - Service		-12.04	12.02	1589.85	1601.59	6.70
Wind 240 deg - Service		-15.31	8.83	1151.40	2008.69	9.94
Wind 270 deg - Service		-17.10	0.02	-2.67	2269.02	13.49
Wind 300 deg - Service		-14.59	-8.36	-1120.02	1944.57	13.42
Wind 315 deg - Service		-11.96	-11.88	-1586.65	1590.62	12.24
Wind 330 deg - Service		-8.49	-14.63	-1949.14	1127.03	10.33

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

Comb. No.	Description
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
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 K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	245 - 230	Leg	Max Tension	5	26.12	0.80	-0.48
			Max. Compression	13	-30.08	0.66	-0.40
			Max. Mx	14	-26.27	-0.92	0.06
			Max. My	2	-29.74	0.02	-0.95
			Max. Vy	14	-3.27	0.71	-0.11
			Max. Vx	2	-3.44	-0.01	0.77
		Diagonal	Max Tension	3	4.20	0.00	0.00
			Max. Compression	11	-4.20	0.00	0.00
			Max. Mx	30	0.08	-0.00	-0.00
			Max. My	4	-1.85	-0.00	-0.00
			Max. Vy	29	-0.00	-0.00	0.00
			Max. Vx	4	-0.00	0.00	0.00
		Top Girt	Max Tension	13	1.18	0.00	0.00
			Max. Compression	5	-1.27	0.00	0.00
			Max. Mx	18	-0.00	0.01	0.00
			Max. My	24	-0.47	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Bottom Girt	Max Tension	5	1.53	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	13	-1.71	0.00	0.00
			Max. Mx	18	0.00	0.01	0.00
			Max. My	32	-0.57	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	32	0.00	0.00	0.00
T2	230 - 210	Leg	Max Tension	5	76.18	1.33	-0.03
			Max. Compression	13	-81.26	0.52	-0.01
			Max. Mx	13	-30.14	2.25	-0.06
			Max. My	6	-2.30	0.00	2.00
			Max. Vy	13	-3.82	0.52	-0.01
			Max. Vx	6	-3.05	0.00	0.34
		Diagonal	Max Tension	11	4.65	0.00	0.00
			Max. Compression	3	-4.78	0.00	0.00
			Max. Mx	12	0.89	-0.01	0.00
			Max. My	11	-4.77	0.00	0.00
			Max. Vy	29	-0.01	-0.01	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Top Girt	Max Tension	13	2.31	0.00	0.00
			Max. Compression	5	-2.20	0.00	0.00
			Max. Mx	18	-0.00	0.01	0.00
			Max. My	25	-0.72	0.00	0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	25	-0.00	0.00	0.00
		Bottom Girt	Max Tension	5	2.06	0.00	0.00
			Max. Compression	13	-2.21	0.00	0.00
			Max. Mx	18	0.03	0.01	0.00
			Max. My	32	-0.78	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	32	0.00	0.00	0.00
T3	210 - 190	Leg	Max Tension	5	125.59	0.25	-0.00
			Max. Compression	13	-132.26	2.99	-0.05
			Max. Mx	13	-81.27	3.02	-0.06
			Max. My	6	-3.11	-0.01	2.37
			Max. Vy	13	-4.91	2.99	-0.05
			Max. Vx	6	-3.05	-0.01	2.37
		Diagonal	Max Tension	17	5.24	0.00	0.00
			Max. Compression	17	-5.49	0.00	0.00
			Max. Mx	12	1.47	-0.01	0.00
			Max. My	9	-5.46	0.00	-0.00
			Max. Vy	29	-0.01	-0.01	0.00
			Max. Vx	9	0.00	0.00	-0.00
		Top Girt	Max Tension	13	1.87	0.00	0.00
			Max. Compression	5	-1.73	0.00	0.00
			Max. Mx	18	0.02	0.01	0.00
			Max. My	25	-0.68	0.00	0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	25	-0.00	0.00	0.00
		Bottom Girt	Max Tension	5	1.43	0.00	0.00
			Max. Compression	13	-1.36	0.00	0.00
			Max. Mx	18	0.04	0.01	0.00
			Max. My	32	-0.68	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	32	0.00	0.00	0.00
T4	190 - 180	Leg	Max Tension	5	124.40	-2.81	0.04
			Max. Compression	13	-130.50	5.89	-0.01
			Max. Mx	5	124.15	-6.22	0.01
			Max. My	6	-4.31	-0.14	10.24
			Max. Vy	32	0.49	-5.87	-0.03
			Max. Vx	6	-1.00	-0.14	10.24
		Diagonal	Max Tension	7	4.43	0.00	0.00
			Max. Compression	6	-4.65	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	5	2.70	0.09	-0.01
			Max. My	34	-2.37	-0.06	-0.03
			Max. Vy	22	0.02	0.09	-0.01
			Max. Vx	26	-0.01	0.00	0.00
T5	180 - 160	Leg	Max Tension	5	142.02	-6.06	0.00
			Max. Compression	13	-150.58	5.55	-0.01
			Max. Mx	5	134.45	-6.22	0.01
			Max. My	6	-4.95	-0.14	10.24
			Max. Vy	32	-0.19	-5.65	-0.03
			Max. Vx	6	0.60	-0.14	10.24
		Diagonal	Max Tension	25	3.62	0.00	0.00
			Max. Compression	33	-4.03	0.00	0.00
			Max. Mx	24	2.71	0.09	0.01
			Max. My	33	2.15	0.07	-0.01
			Max. Vy	24	-0.03	0.09	0.01
			Max. Vx	26	-0.00	0.00	0.00
T6	160 - 140	Leg	Max Tension	5	158.34	-5.28	-0.00
			Max. Compression	13	-169.98	5.25	-0.04
			Max. Mx	5	150.44	-5.61	0.00
			Max. My	6	-6.63	-0.01	5.30
			Max. Vy	32	-0.19	-5.30	-0.03
			Max. Vx	31	0.20	-0.04	-5.07
		Diagonal	Max Tension	34	3.92	0.00	0.00
			Max. Compression	34	-4.26	0.00	0.00
			Max. Mx	24	2.51	0.06	0.00
			Max. My	25	0.57	0.05	0.01
			Max. Vy	22	0.02	0.06	0.00
			Max. Vx	25	0.00	0.00	0.00
T7	140 - 120	Leg	Max Tension	5	175.74	-4.88	0.09
			Max. Compression	13	-190.90	4.54	-0.07
			Max. Mx	5	166.88	-5.27	0.03
			Max. My	6	-8.13	-0.03	5.41
			Max. Vy	27	-0.26	-5.09	0.04
			Max. Vx	14	0.36	-0.05	-5.40
		Diagonal	Max Tension	34	4.72	0.00	0.00
			Max. Compression	34	-5.03	0.00	0.00
			Max. Mx	24	3.12	0.09	0.01
			Max. My	24	-0.25	0.06	0.01
			Max. Vy	22	0.03	0.09	0.01
			Max. Vx	24	0.00	0.00	0.00
T8	120 - 110	Leg	Max Tension	5	185.13	-4.56	0.08
			Max. Compression	13	-201.93	3.08	0.02
			Max. Mx	5	185.13	-4.56	0.08
			Max. My	6	-8.33	-0.03	5.41
			Max. Vy	7	0.28	4.55	0.06
			Max. Vx	31	-0.26	-0.08	-5.23
		Diagonal	Max Tension	33	5.30	0.00	0.00
			Max. Compression	26	-5.50	0.00	0.00
			Max. Mx	24	3.37	0.08	0.01
			Max. My	25	0.97	0.06	0.01
			Max. Vy	21	0.03	0.08	-0.01
			Max. Vx	25	-0.00	0.00	0.00
T9	110 - 100	Leg	Max Tension	5	194.05	-3.37	-0.03
			Max. Compression	13	-212.67	4.14	-0.28
			Max. Mx	19	-210.61	8.65	0.08
			Max. My	14	-8.97	-0.14	-6.56
			Max. Vy	19	-1.27	8.65	0.08
			Max. Vx	14	1.52	-0.14	-6.56
		Diagonal	Max Tension	33	5.70	0.00	0.00
			Max. Compression	30	-6.17	0.00	0.00
			Max. Mx	22	4.36	0.08	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	32	-4.52	0.03	-0.01
			Max. Vy	22	0.03	0.08	0.01
			Max. Vx	32	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	13	3.69	0.00	0.00
			Max. Compression	13	-3.69	0.00	0.00
			Max. Mx	30	-1.96	-0.21	0.00
			Max. My	31	3.16	0.00	0.01
			Max. Vy	30	0.06	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T10	100 - 80	Leg	Max Tension	5	214.61	-3.99	-0.02
			Max. Compression	13	-237.95	4.59	-0.01
			Max. Mx	13	-237.95	4.59	-0.01
			Max. My	14	-9.34	-0.14	-6.56
			Max. Vy	13	-0.20	4.59	-0.01
			Max. Vx	6	0.35	-0.08	5.38
		Diagonal	Max Tension	34	6.39	0.00	0.00
			Max. Compression	34	-6.61	0.00	0.00
			Max. Mx	19	4.80	0.13	-0.01
			Max. My	32	-5.59	0.05	-0.02
			Max. Vy	22	0.05	0.13	0.01
			Max. Vx	32	0.00	0.00	0.00
T11	80 - 60	Leg	Max Tension	5	234.10	-4.11	-0.00
			Max. Compression	13	-262.35	4.61	-0.05
			Max. Mx	13	-262.35	4.61	-0.05
			Max. My	14	-12.44	-0.04	-4.27
			Max. Vy	27	0.20	-4.37	0.01
			Max. Vx	31	0.22	-0.03	-3.98
		Diagonal	Max Tension	33	6.88	0.00	0.00
			Max. Compression	34	-7.06	0.00	0.00
			Max. Mx	22	4.81	0.14	0.01
			Max. My	32	-6.20	0.08	-0.02
			Max. Vy	22	0.05	0.14	0.01
			Max. Vx	32	0.00	0.00	0.00
T12	60 - 40	Leg	Max Tension	5	253.52	-3.83	-0.01
			Max. Compression	19	-287.50	5.30	0.05
			Max. Mx	30	-287.29	5.31	0.03
			Max. My	3	-15.30	-0.51	-5.47
			Max. Vy	27	-0.52	-4.48	-0.01
			Max. Vx	6	-0.27	-0.51	5.43
		Diagonal	Max Tension	17	7.56	0.00	0.00
			Max. Compression	34	-8.04	0.00	0.00
			Max. Mx	22	4.86	0.19	0.02
			Max. My	32	-6.75	0.10	-0.03
			Max. Vy	22	0.07	0.19	0.02
			Max. Vx	32	0.00	0.00	0.00
T13	40 - 20	Leg	Max Tension	5	273.96	-4.62	-0.05
			Max. Compression	13	-313.54	5.62	-0.42
			Max. Mx	30	-312.73	13.29	-0.41
			Max. My	14	-16.98	-1.21	-19.78
			Max. Vy	30	-1.36	13.29	-0.41
			Max. Vx	14	2.50	-1.21	-19.78
		Diagonal	Max Tension	33	9.28	0.00	0.00
			Max. Compression	32	-10.27	0.00	0.00
			Max. Mx	20	-2.51	0.29	0.04
			Max. My	32	-10.22	0.19	-0.07
			Max. Vy	20	0.08	0.29	0.04
			Max. Vx	32	0.01	0.00	0.00
T14	20 - 0	Leg	Max Tension	5	282.60	-7.62	0.40
			Max. Compression	19	-331.38	0.00	0.00
			Max. Mx	30	-329.22	13.29	-0.41

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	14	-16.47	-1.21	-19.78
			Max. Vy	30	0.87	13.29	-0.41
			Max. Vx	14	-1.32	-1.21	-19.78
		Diagonal	Max Tension	32	17.32	0.00	0.00
			Max. Compression	7	-15.95	0.00	0.00
			Max. Mx	21	15.07	-0.52	0.09
			Max. My	24	6.35	-0.50	-0.11
			Max. Vy	21	-0.16	-0.52	0.09
			Max. Vx	24	0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	30	345.29	28.15	-17.06
	Max. H_x	13	343.35	32.75	-19.71
	Max. H_z	22	-279.85	-31.16	18.71
	Min. Vert	5	-295.66	-27.56	16.65
	Min. H_x	22	-279.85	-31.16	18.71
	Min. H_z	13	343.35	32.75	-19.71
Leg B	Max. Vert	24	344.33	-27.69	-17.19
	Max. H_x	32	-276.50	30.87	18.92
	Max. H_z	32	-276.50	30.87	18.92
	Min. Vert	15	-293.60	27.28	16.82
	Min. H_x	7	341.12	-32.33	-19.80
	Min. H_z	7	341.12	-32.33	-19.80
Leg A	Max. Vert	19	345.04	0.42	32.59
	Max. H_x	5	177.54	1.06	19.54
	Max. H_z	2	341.43	0.35	37.90
	Min. Vert	10	-292.97	-0.27	-32.01
	Min. H_x	14	19.67	-0.98	2.25
	Min. H_z	27	-275.55	-0.22	-36.15

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	59.10	-0.00	0.00	-11.56	-8.77	-0.00
Dead+Wind 0 deg - No Ice	59.10	0.04	-50.56	-6687.11	-18.34	13.68
Dead+Wind 30 deg - No Ice	59.10	24.67	-42.55	-5693.04	-3306.32	-8.07
Dead+Wind 45 deg - No Ice	59.10	34.67	-34.63	-4644.37	-4651.25	-18.04
Dead+Wind 60 deg - No Ice	59.10	42.25	-24.38	-3280.65	-5674.58	-26.92
Dead+Wind 90 deg - No Ice	59.10	49.20	-0.07	-24.84	-6581.05	-38.13
Dead+Wind 120 deg - No Ice	59.10	43.84	25.25	3317.85	-5798.49	-39.85
Dead+Wind 135 deg - No Ice	59.10	34.38	34.39	4587.75	-4612.58	-34.54
Dead+Wind 150 deg - No Ice	59.10	24.38	42.38	5646.59	-3266.78	-28.82
Dead+Wind 180 deg - No Ice	59.10	-0.14	48.58	6498.78	11.81	-11.47
Dead+Wind 210 deg - No Ice	59.10	-24.77	42.74	5690.50	3299.79	9.40
Dead+Wind 225 deg - No Ice	59.10	-34.79	34.73	4632.27	4645.92	19.36
Dead+Wind 240 deg - No Ice	59.10	-44.25	25.53	3356.91	5829.50	28.74
Dead+Wind 270 deg - No Ice	59.10	-49.43	0.07	0.70	6586.87	39.07

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 300 deg - No Ice	59.10	-42.17	-24.16	-3248.99	5643.35	38.87
Dead+Wind 315 deg - No Ice	59.10	-34.56	-34.34	-4606.10	4613.89	35.44
Dead+Wind 330 deg - No Ice	59.10	-24.54	-42.29	-5660.32	3265.56	29.92
Dead+Ice+Temp	92.83	-0.00	0.00	-28.97	-30.25	0.00
Dead+Wind 0 deg+Ice+Temp	92.83	0.06	-49.37	-6528.45	-41.21	15.16
Dead+Wind 30 deg+Ice+Temp	92.83	24.30	-41.96	-5593.87	-3257.03	-6.43
Dead+Wind 45 deg+Ice+Temp	92.83	34.23	-34.20	-4569.76	-4578.82	-16.76
Dead+Wind 60 deg+Ice+Temp	92.83	41.81	-24.12	-3237.36	-5590.00	-26.25
Dead+Wind 90 deg+Ice+Temp	92.83	48.51	-0.06	-39.71	-6465.40	-38.30
Dead+Wind 120 deg+Ice+Temp	92.83	42.81	24.63	3211.21	-5667.26	-40.57
Dead+Wind 135 deg+Ice+Temp	92.83	34.01	33.91	4474.67	-4549.23	-36.27
Dead+Wind 150 deg+Ice+Temp	92.83	24.03	41.76	5509.45	-3220.47	-30.36
Dead+Wind 180 deg+Ice+Temp	92.83	-0.47	48.16	6370.34	24.77	-10.83
Dead+Wind 210 deg+Ice+Temp	92.83	-24.64	42.12	5551.87	3232.67	9.56
Dead+Wind 225 deg+Ice+Temp	92.83	-34.53	34.31	4522.86	4549.73	19.40
Dead+Wind 240 deg+Ice+Temp	92.83	-43.30	24.99	3256.85	5663.95	28.46
Dead+Wind 270 deg+Ice+Temp	92.83	-48.81	0.27	4.81	6436.81	39.60
Dead+Wind 300 deg+Ice+Temp	92.83	-41.97	-23.68	-3181.09	5542.01	41.41
Dead+Wind 315 deg+Ice+Temp	92.83	-34.32	-33.79	-4519.53	4521.74	38.07
Dead+Wind 330 deg+Ice+Temp	92.83	-24.17	-41.68	-5559.62	3173.49	31.31
Dead+Wind 0 deg - Service	59.10	0.01	-17.50	-2321.60	-12.11	4.73
Dead+Wind 30 deg - Service	59.10	8.53	-14.72	-1977.61	-1149.90	-2.80
Dead+Wind 45 deg - Service	59.10	12.00	-11.98	-1614.73	-1615.30	-6.25
Dead+Wind 60 deg - Service	59.10	14.62	-8.43	-1142.82	-1969.41	-9.31
Dead+Wind 90 deg - Service	59.10	17.03	-0.03	-16.17	-2283.08	-13.19
Dead+Wind 120 deg - Service	59.10	15.17	8.74	1140.54	-2012.27	-13.79
Dead+Wind 135 deg - Service	59.10	11.90	11.90	1579.98	-1601.89	-11.96
Dead+Wind 150 deg - Service	59.10	8.44	14.66	1946.36	-1136.19	-9.98
Dead+Wind 180 deg - Service	59.10	-0.05	16.81	2241.25	-1.68	-3.97
Dead+Wind 210 deg - Service	59.10	-8.57	14.79	1961.55	1136.08	3.26
Dead+Wind 225 deg - Service	59.10	-12.04	12.02	1595.37	1601.89	6.71
Dead+Wind 240 deg - Service	59.10	-15.31	8.83	1154.05	2011.46	9.95
Dead+Wind 270 deg - Service	59.10	-17.10	0.02	-7.33	2273.55	13.51
Dead+Wind 300 deg - Service	59.10	-14.59	-8.36	-1131.86	1947.07	13.45
Dead+Wind 315 deg - Service	59.10	-11.96	-11.88	-1601.47	1590.83	12.27
Dead+Wind 330 deg - Service	59.10	-8.49	-14.63	-1966.28	1124.26	10.36

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-59.10	0.00	0.00	59.10	-0.00	0.000%
2	0.04	-59.10	-50.57	-0.04	59.10	50.56	0.005%
3	24.67	-59.10	-42.55	-24.67	59.10	42.55	0.005%
4	34.68	-59.10	-34.63	-34.67	59.10	34.63	0.005%
5	42.25	-59.10	-24.38	-42.25	59.10	24.38	0.005%
6	49.21	-59.10	-0.07	-49.20	59.10	0.07	0.005%
7	43.84	-59.10	25.25	-43.84	59.10	-25.25	0.005%
8	34.38	-59.10	34.39	-34.38	59.10	-34.39	0.005%
9	24.38	-59.10	42.38	-24.38	59.10	-42.38	0.005%
10	-0.14	-59.10	48.58	0.14	59.10	-48.58	0.005%
11	-24.77	-59.10	42.75	24.77	59.10	-42.74	0.005%
12	-34.79	-59.10	34.74	34.79	59.10	-34.73	0.005%
13	-44.25	-59.10	25.53	44.25	59.10	-25.53	0.005%
14	-49.43	-59.10	0.07	49.43	59.10	-0.07	0.005%
15	-42.18	-59.10	-24.17	42.17	59.10	24.16	0.005%
16	-34.56	-59.10	-34.34	34.56	59.10	34.34	0.005%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
17	-24.54	-59.10	-42.29	24.54	59.10	42.29	0.005%
18	0.00	-92.83	0.00	0.00	92.83	-0.00	0.001%
19	0.06	-92.83	-49.37	-0.06	92.83	49.37	0.003%
20	24.31	-92.83	-41.96	-24.30	92.83	41.96	0.003%
21	34.23	-92.83	-34.20	-34.23	92.83	34.20	0.003%
22	41.81	-92.83	-24.13	-41.81	92.83	24.12	0.003%
23	48.51	-92.83	-0.06	-48.51	92.83	0.06	0.003%
24	42.81	-92.83	24.64	-42.81	92.83	-24.63	0.003%
25	34.01	-92.83	33.92	-34.01	92.83	-33.91	0.003%
26	24.03	-92.83	41.76	-24.03	92.83	-41.76	0.003%
27	-0.47	-92.83	48.17	0.47	92.83	-48.16	0.003%
28	-24.64	-92.83	42.12	24.64	92.83	-42.12	0.003%
29	-34.53	-92.83	34.31	34.53	92.83	-34.31	0.003%
30	-43.31	-92.83	24.99	43.30	92.83	-24.99	0.003%
31	-48.82	-92.83	0.27	48.81	92.83	-0.27	0.003%
32	-41.97	-92.83	-23.68	41.97	92.83	23.68	0.003%
33	-34.33	-92.83	-33.79	34.32	92.83	33.79	0.003%
34	-24.17	-92.83	-41.68	24.17	92.83	41.68	0.003%
35	0.01	-59.10	-17.50	-0.01	59.10	17.50	0.002%
36	8.54	-59.10	-14.72	-8.53	59.10	14.72	0.002%
37	12.00	-59.10	-11.98	-12.00	59.10	11.98	0.002%
38	14.62	-59.10	-8.44	-14.62	59.10	8.43	0.002%
39	17.03	-59.10	-0.03	-17.03	59.10	0.03	0.002%
40	15.17	-59.10	8.74	-15.17	59.10	-8.74	0.002%
41	11.90	-59.10	11.90	-11.90	59.10	-11.90	0.002%
42	8.44	-59.10	14.67	-8.44	59.10	-14.66	0.002%
43	-0.05	-59.10	16.81	0.05	59.10	-16.81	0.002%
44	-8.57	-59.10	14.79	8.57	59.10	-14.79	0.002%
45	-12.04	-59.10	12.02	12.04	59.10	-12.02	0.002%
46	-15.31	-59.10	8.83	15.31	59.10	-8.83	0.002%
47	-17.10	-59.10	0.02	17.10	59.10	-0.02	0.002%
48	-14.59	-59.10	-8.36	14.59	59.10	8.36	0.002%
49	-11.96	-59.10	-11.88	11.96	59.10	11.88	0.002%
50	-8.49	-59.10	-14.63	8.49	59.10	14.63	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00007196	0.00012233
3	Yes	15	0.00007818	0.00013269
4	Yes	15	0.00008215	0.00013928
5	Yes	15	0.00008375	0.00014195
6	Yes	15	0.00007821	0.00013274
7	Yes	15	0.00007197	0.00012237
8	Yes	15	0.00007394	0.00012573
9	Yes	15	0.00007812	0.00013263
10	Yes	15	0.00008373	0.00014195
11	Yes	15	0.00007807	0.00013250
12	Yes	15	0.00007390	0.00012561
13	Yes	15	0.00007191	0.00012220
14	Yes	15	0.00007808	0.00013248
15	Yes	15	0.00008371	0.00014187
16	Yes	15	0.00008210	0.00013921
17	Yes	15	0.00007810	0.00013256

18	Yes	6	0.00000001	0.00007867
19	Yes	16	0.00006509	0.00011179
20	Yes	16	0.00006870	0.00011779
21	Yes	16	0.00007104	0.00012168
22	Yes	16	0.00007199	0.00012327
23	Yes	16	0.00006872	0.00011786
24	Yes	16	0.00006512	0.00011188
25	Yes	16	0.00006623	0.00011379
26	Yes	16	0.00006866	0.00011780
27	Yes	16	0.00007199	0.00012330
28	Yes	16	0.00006863	0.00011768
29	Yes	16	0.00006619	0.00011366
30	Yes	16	0.00006504	0.00011169
31	Yes	16	0.00006862	0.00011764
32	Yes	16	0.00007196	0.00012319
33	Yes	16	0.00007100	0.00012160
34	Yes	16	0.00006910	0.00011770
35	Yes	15	0.00000001	0.00012739
36	Yes	15	0.00000001	0.00013104
37	Yes	15	0.00000001	0.00013336
38	Yes	15	0.00000001	0.00013434
39	Yes	15	0.00000001	0.00013113
40	Yes	15	0.00000001	0.00012753
41	Yes	15	0.00000001	0.00012882
42	Yes	15	0.00000001	0.00013108
43	Yes	15	0.00000001	0.00013436
44	Yes	15	0.00000001	0.00013099
45	Yes	15	0.00000001	0.00012870
46	Yes	15	0.00000001	0.00012736
47	Yes	15	0.00000001	0.00013089
48	Yes	15	0.00000001	0.00013418
49	Yes	15	0.00000001	0.00013321
50	Yes	15	0.00000001	0.00013090

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	245 - 230	13.089	35	0.6586	0.0498
T2	230 - 210	10.978	35	0.6259	0.0515
T3	210 - 190	8.443	35	0.5339	0.0458
T4	190 - 180	6.354	35	0.4297	0.0384
T5	180 - 160	5.500	35	0.3772	0.0333
T6	160 - 140	4.098	35	0.2877	0.0266
T7	140 - 120	2.995	35	0.2303	0.0217
T8	120 - 110	2.121	35	0.1778	0.0183
T9	110 - 100	1.759	35	0.1587	0.0160
T10	100 - 80	1.432	35	0.1401	0.0136
T11	80 - 60	0.903	46	0.1034	0.0101
T12	60 - 40	0.507	46	0.0754	0.0069
T13	40 - 20	0.227	46	0.0480	0.0041
T14	20 - 0	0.050	46	0.0210	0.0013

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
247.00	Lightning Rod 2"x10'	35	13.089	0.6586	0.0498	39977
235.00	TMA	35	11.669	0.6398	0.0514	19988
135.00	2.5" Dia. 12' OMNI	35	2.757	0.2166	0.0208	22236
125.00	20' Omni	35	2.320	0.1895	0.0192	23100
110.00	KP4F-23	35	1.759	0.1587	0.0160	36173
105.00	Andrew 6' w/Radome	35	1.591	0.1496	0.0147	31286
60.00	Camera with Mount	46	0.507	0.0754	0.0069	39657
50.00	1.5" Dia 4' Omni w/Pipe Mount	46	0.354	0.0620	0.0055	46758

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	245 - 230	37.872	13	1.9054	0.1442
T2	230 - 210	31.754	13	1.8088	0.1489
T3	210 - 190	24.416	13	1.5429	0.1325
T4	190 - 180	18.375	13	1.2419	0.1111
T5	180 - 160	15.906	13	1.0903	0.0962
T6	160 - 140	11.853	13	0.8313	0.0768
T7	140 - 120	8.668	13	0.6655	0.0640
T8	120 - 110	6.143	13	0.5134	0.0538
T9	110 - 100	5.095	13	0.4585	0.0472
T10	100 - 80	4.150	13	0.4049	0.0400
T11	80 - 60	2.618	13	0.2991	0.0300
T12	60 - 40	1.469	13	0.2182	0.0208
T13	40 - 20	0.656	13	0.1390	0.0125
T14	20 - 0	0.144	13	0.0608	0.0038

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
247.00	Lightning Rod 2"x10'	13	37.872	1.9054	0.1442	13909
235.00	TMA	13	33.757	1.8493	0.1487	6954
135.00	2.5" Dia. 12' OMNI	13	7.979	0.6257	0.0614	7708
125.00	20' Omni	13	6.717	0.5475	0.0566	8005
110.00	KP4F-23	13	5.095	0.4585	0.0472	12536
105.00	Andrew 6' w/Radome	13	4.609	0.4321	0.0435	10855
60.00	Camera with Mount	13	1.469	0.2182	0.0208	13704
50.00	1.5" Dia 4' Omni w/Pipe Mount	13	1.026	0.1793	0.0166	16163

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	245	Leg	A325N	0.6250	5	0.28	12.89	0.022 ✔	1.333	Bolt DS
T2	230	Leg	A325N	0.7500	5	5.23	19.40	0.270 ✔	1.333	Bolt Tension
T3	210	Leg	A325N	1.0000	6	12.70	34.53	0.368 ✔	1.333	Bolt Tension
T4	190	Leg	A325N	1.0000	6	20.73	34.56	0.600 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	4.43	8.16	0.543 ✔	1.333	Member Bearing
T5	180	Leg	A325N	1.0000	6	22.41	34.56	0.648 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	3.62	8.16	0.444 ✔	1.333	Member Bearing
T6	160	Leg	A325N	1.0000	6	25.07	34.56	0.726 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	3.92	8.16	0.481 ✔	1.333	Member Bearing
T7	140	Leg	A325N	1.0000	6	27.81	34.56	0.805 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	4.72	8.16	0.579 ✔	1.333	Member Bearing
T8	120	Diagonal	A325N	1.2500	1	5.30	10.20	0.520 ✔	1.333	Member Bearing
T9	110	Leg	A325N	1.2500	6	32.34	54.00	0.599 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	5.70	10.20	0.559 ✔	1.333	Member Bearing
T10	100	Leg	A325N	1.2500	6	34.04	54.00	0.630 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	6.39	16.99	0.376 ✔	1.333	Member Bearing
T11	80	Leg	A325N	1.2500	6	37.42	54.00	0.693 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	6.88	16.99	0.405 ✔	1.333	Member Bearing
T12	60	Leg	A325N	1.2500	6	40.66	54.00	0.753 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	7.56	16.99	0.445 ✔	1.333	Member Bearing
T13	40	Leg	A325N	1.2500	6	43.88	54.00	0.813 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	9.28	13.59	0.683 ✔	1.333	Member Bearing
T14	20	Leg	A325N	1.2500	6	47.10	54.00	0.872 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	17.32	27.19	0.637 ✔	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	245 - 230	1 1/2	15.00	2.33	74.7 K=1.00	20.058	1.7672	-30.08	35.44	0.849 ✔
T2	230 - 210	2	20.00	2.38	57.0 K=1.00	23.222	3.1416	-81.26	72.95	1.114 ✔
T3	210 - 190	2 1/2	20.00	2.33	44.8 K=1.00	25.141	4.9087	-128.75	123.41	1.043 ✔
T4	190 - 180	Pirod 105245	10.02	10.02	37.8	26.132	5.3014	-130.50	138.54	0.942

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
					K=1.00					✔
T5	180 - 160	Pirod 105217	20.03	10.02	37.8	26.132	5.3014	-150.58	138.54	1.087
					K=1.00					✔
T6	160 - 140	Pirod 105218	20.03	10.02	32.4	26.848	7.2158	-169.98	193.73	0.877
					K=1.00					✔
T7	140 - 120	Pirod 105218	20.03	10.02	32.4	26.848	7.2158	-190.90	193.73	0.985
					K=1.00					✔
T8	120 - 110	Pirod 105219	10.02	10.02	28.4	27.351	9.4248	-201.93	257.78	0.783
					K=1.00					✔
T9	110 - 100	Pirod 105219	10.02	5.19	28.4	27.351	9.4248	-212.67	257.78	0.825
					K=1.00					✔
T10	100 - 80	Pirod 105219	20.03	10.02	28.4	27.351	9.4248	-237.95	257.78	0.923
					K=1.00					✔
T11	80 - 60	Pirod 105220	20.03	10.02	25.2	27.723	11.9282	-262.35	330.69	0.793
					K=1.00					✔
T12	60 - 40	Pirod 105220	20.03	10.02	25.2	27.723	11.9282	-287.50	330.69	0.869
					K=1.00					✔
T13	40 - 20	Pirod 105220	20.03	10.02	25.2	27.723	11.9282	-313.54	330.69	0.948
					K=1.00					✔
T14	20 - 0	Pirod 112738	20.03	20.03	32.6	26.826	14.7262	-331.38	395.05	0.839
					K=1.00					✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T4	190 - 180	0.5	1.47	120.0	10.366	0.1963	1.00	2.28	0.440
									✔
T5	180 - 160	0.5	1.47	120.0	10.279	0.1963	0.60	2.26	0.265
									✔
T6	160 - 140	0.5	1.46	119.0	10.423	0.1963	0.21	2.29	0.091
									✔
T7	140 - 120	0.5	1.46	119.0	10.423	0.1963	0.36	2.29	0.159
									✔
T8	120 - 110	0.625	1.45	94.4	13.671	0.3068	0.29	4.69	0.061
									✔
T9	110 - 100	0.625	1.45	94.4	13.671	0.3068	1.52	4.69	0.324
									✔
T10	100 - 80	0.625	1.45	94.4	13.671	0.3068	0.35	4.69	0.074
									✔
T11	80 - 60	0.625	1.43	93.6	13.766	0.3068	0.23	4.73	0.048
									✔
T12	60 - 40	0.625	1.43	93.6	13.766	0.3068	0.48	4.73	0.101
									✔
T13	40 - 20	0.625	1.43	93.6	13.766	0.3068	2.71	4.73	0.573
									✔
T14	20 - 0	0.75	1.73	93.9	16.080	0.4418	1.35	9.78	0.138
									✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	245 - 230	3/4	4.63	2.24	143.6 K=1.00	7.246	0.4418	-4.20	3.20	1.311 ✔
T2	230 - 210	7/8	5.05	2.45	134.3 K=1.00	8.281	0.6013	-4.57	4.98	0.917 ✔
T3	210 - 190	1	5.11	2.46	117.9 K=1.00	10.745	0.7854	-5.49	8.44	0.650 ✔
T4	190 - 180	L2 1/2x2 1/2x3/16	11.42	5.19	125.8 K=1.00	9.431	0.9020	-4.65	8.51	0.547 ✔
T5	180 - 160	L2 1/2x2 1/2x3/16	12.50	5.84	141.5 K=1.00	7.462	0.9020	-4.00	6.73	0.594 ✔
T6	160 - 140	L2 1/2x2 1/2x3/16	13.80	6.54	158.4 K=1.00	5.949	0.9020	-4.26	5.37	0.795 ✔
T7	140 - 120	L3x3x3/16	15.24	7.29	146.8 K=1.00	6.931	1.0900	-5.03	7.56	0.665 ✔
T8	120 - 110	L3x3x3/16	16.01	7.69	154.7 K=1.00	6.237	1.0900	-5.50	6.80	0.810 ✔
T9	110 - 100	L3x3x3/16	16.80	8.09	162.9 K=1.00	5.628	1.0900	-6.17	6.13	1.006 ✔
T10	100 - 80	L3x3x5/16	18.45	8.93	181.9 K=1.00	4.515	1.7800	-6.61	8.04	0.823 ✔
T11	80 - 60	L3x3x5/16	20.16	9.79	199.5 K=1.00	3.753	1.7800	-7.06	6.68	1.057 ✔
T12	60 - 40	L3 1/2x3 1/2x5/16	21.92	10.68	185.7 K=1.00	4.331	2.0900	-8.04	9.05	0.888 ✔
T13	40 - 20	L4x4x1/4	23.71	11.58	174.8 K=1.00	4.887	1.9400	-10.27	9.48	1.084 ✔
T14	20 - 0	2L3 1/2x3 1/2x5/16x3/4	30.49	14.91	165.7 K=1.00	5.440	4.1800	-15.95	22.74	0.702 ✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	110 - 100	L3x3x5/16	13.48	12.48	254.3 K=1.00	2.309	1.7800	-3.69	4.11	0.897 ✔
		KL/R > 250 (C) - 232								

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	245 - 230	7/8	4.00	3.88	212.6 K=1.00	3.305	0.6013	-1.27	1.99	0.638 ✔
		KL/R > 200 (C) - 5								
T2	230 - 210	1	4.01	3.85	184.6 K=1.00	4.382	0.7854	-2.20	3.44	0.639 ✔
T3	210 - 190	1	4.52	4.31	206.8 K=1.00	3.492	0.7854	-1.73	2.74	0.632 ✔
		KL/R > 200 (C) - 107								

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	245 - 230	7/8	4.00	3.88	212.6 K=1.00	3.305	0.6013	-1.71	1.99	0.859 ✔
		KL/R > 200 (C) - 8								
T2	230 - 210	1	4.49	4.32	207.4 K=1.00	3.472	0.7854	-2.21	2.73	0.810 ✔
		KL/R > 200 (C) - 53								
T3	210 - 190	1	4.98	4.77	229.2 K=1.00	2.843	0.7854	-1.36	2.23	0.609 ✔
		KL/R > 200 (C) - 110								

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	245 - 230	1 1/2	15.00	0.50	16.0	32.500	0.7732	26.12	25.13	1.039 ✔
T2	230 - 210	2	20.00	0.50	12.0	30.000	3.1416	76.18	94.25	0.808 ✔
T3	210 - 190	2 1/2	20.00	0.67	12.8	30.000	4.9087	125.59	147.26	0.853 ✔
T4	190 - 180	Pirod 105245	10.02	10.02	37.8	30.000	5.3014	124.40	159.04	0.782 ✔
T5	180 - 160	Pirod 105217	20.03	10.02	37.8	30.000	5.3014	142.02	159.04	0.893 ✔
T6	160 - 140	Pirod 105218	20.03	10.02	32.4	30.000	7.2158	158.34	216.47	0.731 ✔
T7	140 - 120	Pirod 105218	20.03	10.02	32.4	30.000	7.2158	175.74	216.47	0.812 ✔
T8	120 - 110	Pirod 105219	10.02	10.02	28.4	30.000	9.4248	185.13	282.74	0.655

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	110 - 100	Pirod 105219	10.02	4.82	28.4	30.000	9.4248	194.05	282.74	0.686 ✔
T10	100 - 80	Pirod 105219	20.03	10.02	28.4	30.000	9.4248	214.61	282.74	0.759 ✔
T11	80 - 60	Pirod 105220	20.03	10.02	25.2	30.000	11.9282	234.10	357.85	0.654 ✔
T12	60 - 40	Pirod 105220	20.03	10.02	25.2	30.000	11.9282	253.54	357.85	0.709 ✔
T13	40 - 20	Pirod 105220	20.03	10.02	25.2	30.000	11.9282	273.96	357.85	0.766 ✔
T14	20 - 0	Pirod 112738	20.03	20.03	32.6	30.000	14.7262	282.60	441.79	0.640 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T4	190 - 180	0.5	1.47	120.0	10.366	0.1963	1.00	2.28	0.440 ✔
T5	180 - 160	0.5	1.47	120.0	10.279	0.1963	0.60	2.26	0.265 ✔
T6	160 - 140	0.5	1.46	119.0	10.423	0.1963	0.21	2.29	0.091 ✔
T7	140 - 120	0.5	1.46	119.0	10.423	0.1963	0.36	2.29	0.159 ✔
T8	120 - 110	0.625	1.45	94.4	13.671	0.3068	0.29	4.69	0.061 ✔
T9	110 - 100	0.625	1.45	94.4	13.671	0.3068	1.52	4.69	0.324 ✔
T10	100 - 80	0.625	1.45	94.4	13.671	0.3068	0.35	4.69	0.074 ✔
T11	80 - 60	0.625	1.43	93.6	13.766	0.3068	0.23	4.73	0.048 ✔
T12	60 - 40	0.625	1.43	93.6	13.766	0.3068	0.48	4.73	0.101 ✔
T13	40 - 20	0.625	1.43	93.6	13.766	0.3068	2.71	4.73	0.573 ✔
T14	20 - 0	0.75	1.73	93.9	16.080	0.4418	1.35	9.78	0.138 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	245 - 230	3/4	4.63	2.24	143.6	30.000	0.4418	4.20	13.25	0.317 ✔
T2	230 - 210	7/8	4.69	2.27	124.4	30.000	0.6013	4.65	18.04	0.258 ✔
T3	210 - 190	1	5.11	2.46	117.9	30.000	0.7854	5.24	23.56	0.222 ✔
T4	190 - 180	L2 1/2x2 1/2x3/16	11.42	5.19	80.1	21.600	0.9020	4.43	19.48	0.227 ✔
T5	180 - 160	L2 1/2x2 1/2x3/16	11.93	5.59	86.2	21.600	0.9020	3.62	19.48	0.186 ✔
T6	160 - 140	L2 1/2x2 1/2x3/16	13.80	6.54	100.8	21.600	0.9020	3.92	19.48	0.201 ✔
T7	140 - 120	L3x3x3/16	15.24	7.29	93.2	21.600	1.0900	4.72	23.54	0.201 ✔
T8	120 - 110	L3x3x3/16	16.01	7.69	98.2	21.600	1.0900	5.30	23.54	0.225 ✔
T9	110 - 100	L3x3x3/16	16.80	8.09	103.4	21.600	1.0900	5.70	23.54	0.242 ✔
T10	100 - 80	L3x3x5/16	18.45	8.93	116.2	21.600	1.7800	6.39	38.45	0.166 ✔
T11	80 - 60	L3x3x5/16	20.16	9.79	127.4	21.600	1.7800	6.88	38.45	0.179 ✔
T12	60 - 40	L3 1/2x3 1/2x5/16	21.92	10.68	118.6	21.600	2.0900	7.56	45.14	0.168 ✔
T13	40 - 20	L4x4x1/4	22.81	11.13	106.9	21.600	1.9400	9.28	41.90	0.221 ✔
T14	20 - 0	2L3 1/2x3 1/2x5/16x3/4	30.49	14.91	165.7	21.600	4.1800	17.32	90.29	0.192 ✔

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	110 - 100	L3x3x5/16	13.48	12.48	162.4	21.600	1.7800	3.69	38.45	0.096 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	245 - 230	7/8	4.00	3.88	212.6	30.000	0.6013	1.18	18.04	0.065 ✔
T2	230 - 210	1	4.01	3.85	184.6	30.000	0.7854	2.31	23.56	0.098 ✔
T3	210 - 190	1	4.52	4.31	206.8	30.000	0.7854	1.87	23.56	0.079

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
										✔

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	245 - 230	7/8	4.00	3.88	212.6	30.000	0.6013	1.53	18.04	0.085 ✔
T2	230 - 210	1	4.49	4.32	207.4	30.000	0.7854	2.06	23.56	0.087 ✔
T3	210 - 190	1	4.98	4.77	229.2	30.000	0.7854	1.43	23.56	0.060 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	245 - 230	Leg	1 1/2	1	26.12	33.50	78.0	Pass
T2	230 - 210	Leg	2	46	-81.26	97.25	83.6	Pass
T3	210 - 190	Leg	2 1/2	103	-128.75	164.50	78.3	Pass
T4	190 - 180	Leg	Pirod 105245	160	-130.50	184.67	70.7	Pass
T5	180 - 160	Leg	Pirod 105217	169	-150.58	184.67	81.5	Pass
T6	160 - 140	Leg	Pirod 105218	184	-169.98	258.24	65.8	Pass
T7	140 - 120	Leg	Pirod 105218	199	-190.90	258.24	73.9	Pass
T8	120 - 110	Leg	Pirod 105219	214	-201.93	343.62	58.8	Pass
T9	110 - 100	Leg	Pirod 105219	223	-212.67	343.62	61.9	Pass
T10	100 - 80	Leg	Pirod 105219	235	-237.95	343.62	69.2	Pass
T11	80 - 60	Leg	Pirod 105220	250	-262.35	440.81	59.5	Pass
T12	60 - 40	Leg	Pirod 105220	267	-287.50	440.81	65.2	Pass
T13	40 - 20	Leg	Pirod 105220	280	-313.54	440.81	71.1	Pass
T14	20 - 0	Leg	Pirod 112738	297	-331.38	526.59	62.9 65.4 (b)	Pass
T1	245 - 230	Diagonal	3/4	15	-4.20	4.27	98.3	Pass
T2	230 - 210	Diagonal	7/8	58	-4.57	6.64	68.8	Pass
T3	210 - 190	Diagonal	1	157	-5.49	11.25	48.8	Pass
T4	190 - 180	Diagonal	L2 1/2x2 1/2x3/16	165	-4.65	11.34	41.0	Pass
T5	180 - 160	Diagonal	L2 1/2x2 1/2x3/16	175	-4.00	8.97	44.6	Pass
T6	160 - 140	Diagonal	L2 1/2x2 1/2x3/16	190	-4.26	7.15	59.6	Pass
T7	140 - 120	Diagonal	L3x3x3/16	205	-5.03	10.07	49.9	Pass
T8	120 - 110	Diagonal	L3x3x3/16	219	-5.50	9.06	60.7	Pass
T9	110 - 100	Diagonal	L3x3x3/16	231	-6.17	8.18	75.4	Pass
T10	100 - 80	Diagonal	L3x3x5/16	241	-6.61	10.71	61.7	Pass
T11	80 - 60	Diagonal	L3x3x5/16	256	-7.06	8.90	79.3	Pass
T12	60 - 40	Diagonal	L3 1/2x3 1/2x5/16	271	-8.04	12.07	66.6	Pass
T13	40 - 20	Diagonal	L4x4x1/4	286	-10.27	12.64	81.3	Pass
T14	20 - 0	Diagonal	2L3 1/2x3 1/2x5/16x3/4	300	-15.95	30.31	52.6	Pass
T9	110 - 100	Secondary Horizontal	L3x3x5/16	232	-3.69	5.48	67.3	Pass
T1	245 - 230	Top Girt	7/8	5	-1.27	2.65	47.9	Pass
T2	230 - 210	Top Girt	1	50	-2.20	4.59	47.9	Pass
T3	210 - 190	Top Girt	1	107	-1.73	3.66	47.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	245 - 230	Bottom Girt	7/8	8	-1.71	2.65	64.4	Pass
T2	230 - 210	Bottom Girt	1	53	-2.21	3.63	60.8	Pass
T3	210 - 190	Bottom Girt	1	110	-1.36	2.98	45.7	Pass
							Summary	
						Leg (T2)	83.6	Pass
						Diagonal (T1)	98.3	Pass
						Secondary Horizontal (T9)	67.3	Pass
						Top Girt (T2)	47.9	Pass
						Bottom Girt (T1)	64.4	Pass
						Bolt Checks	65.4	Pass
						RATING =	**98.3**	**Pass**

ANCHOR BOLT ANALYSIS

AECOM

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Job	245' SST Self-Supporting Tower, Mansfield, CT	Project No.	NSS-021 Rev. 1	Sheet 1	of 3
Description	Anchor Bolt Analysis	Computed by	MCD	Date	04/01/15
		Checked by		Date	

ANCHOR BOLT ANALYSIS

Input Data

Max Pier Reactions:

Uplift:	Uplift := 296·kips	*user input*	
Shear:	Shear := 51·kips	*user input*	
Compression:	Compression := 345·kips	*user input*	

Anchor Bolt Data:

Bolt Material --> A572 - Gr. 42 (for bolts up to 6" Dia.)

Number of Anchor Bolts = N	$N := 6$	*user input*	
Bolt Ultimate Strength:	$F_u := 60 \cdot ksi$	*user input*	
Bolt Yield Strength:	$Fy := 42 \cdot ksi$	*user input*	
Bolt Modulus:	$E := 29000\,ksi$	*user input*	
Thickness of Anchor Bolts	$D := 2.0in$	*user input*	From PiROD DWG No. 202932-B
Threads per Inch:	$n := 4.5$	*user input*	
Coefficient of Friction:	$\mu := 0.55$	*user input*	(for baseplate with grout ASCE 10-97)

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Job	245' SST Self-Supporting Tower, Mansfield, CT	Project No.	NSS-021 Rev. 1	Sheet 2	of 3
Description	Anchor Bolt Analysis	Computed by	MCD	Date	04/01/15
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Anchor Bolt Area:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4}\cdot D^2 \qquad A_g = 3.142\cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4}\cdot\left(D - \frac{0.9743\cdot in}{n}\right)^2 \qquad A_n = 2.498\cdot in^2$$

Check Tensile Forces:

Maximum Tensile Force (Gross Area):

$$AllowableTension := 1.333\cdot\left(0.33\cdot A_g\cdot F_u\right) \qquad AllowableTension = 82.9\cdot kips$$

Note: 1.333 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$$F_{net.area} := 1.333\cdot\left(0.60\cdot A_n\cdot Fy\right) \qquad F_{net.area} = 83.9\cdot kips$$

Note: 1.333 increase allowed per TIA/EIA

Applied Tension:

$$MaxTension := \frac{Uplift}{N} \qquad MaxTension = 49.3\cdot kips$$

Check Stresses:

$$\frac{MaxTension}{F_{net.area}} = 0.59$$

$$Condition1 := if\left(\frac{MaxTension}{F_{net.area}} \le 1.00, "OK", "Overstressed"\right)$$

Condition1 = "OK"

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Job	245' SST Self-Supporting Tower, Mansfield, CT	Project No.	NSS-021 Rev. 1	Sheet 3	of 3
Description	Anchor Bolt Analysis	Computed by	MCD	Date	04/01/15
		Checked by		Date	

Check Anchor Bolt Area:

Based on the ASCE 10-97 Design of Latticed Steel Transmission Structures

Required Area:

$$A_{s1} := \frac{Uplift}{Fy} + \frac{Shear}{\mu \cdot 0.85 \cdot Fy} \qquad A_{s1} = 9.6 \cdot in^2$$

$$A_{s2} := \left| \frac{Shear - (0.3 \cdot Compression)}{\mu \cdot 0.85 \cdot Fy} \right| \qquad A_{s2} = 2.7 \cdot in^2$$

Provided Area:

$$A_{sprovided} := A_n \cdot N \qquad A_{sprovided} = 15.0 \cdot in^2$$

$$Condition2 := if\left(\frac{A_{s1}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s1}}{A_{sprovided}} = 0.64$$

Condition2 = "OK"

$$Condition3 := if\left(\frac{A_{s2}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s2}}{A_{sprovided}} = 0.18$$

Condition3 = "OK"

FOUNDATION ANALYSIS

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Job	245' SST Self-Supporting Tower, Mansfield, CT	Project No.	NSS-021 Rev. 1	Page / Sheet	of / 1 of 2
Description	Drilled Pier Cassion Evaluation	Computed by	MCD	Date	04/01/15
		Checked by		Date	

FOUNDATION ANALYSIS

Input Data

Maximum Pier Reactions:

Compression: $C_t := 345 \cdot kips$ *user input*

Uplift: $U_t := 296 \cdot kips$ *user input*

Foundation Dimensions:

Drilled Caisson Length: $C_{Length} := 31 \cdot ft$ *user input*

Diameter of Pier: $d_p := 5.5ft$ *user input*

Extension of Pier Above Grade: $L_{pag} := 0.5ft$ *user input*

Material Properties:

Unit Weight of Concrete: $\gamma c := 150pcf$ *user input*

Unit Weight of Water: $\gamma w := 62.4pcf$ *user input*

Unit Weight of Soil: $\gamma s := 125pcf$ *user input*

Allowable Soil Bearing Capacity: $q_s := 5000psf$ *user input*

Water Table Below Grade: $Wd := 32 \cdot ft$ *user input*

Average Allowable Shear: $fl := 1020 \cdot psf$ *user input*

Depth Neglected for Skin Friction at Top: $Depthunbond := 1.0 \cdot ft$ *user input*

Loading:

$$TotalDownLoad := C_t + \pi \cdot \frac{d_p^{\,2}}{4} \cdot \left[L_{pag} \cdot \gamma c + \left[\gamma c \cdot \left(C_{Length} - L_{pag} \right) \right] \right]$$

$$TotalDownLoad = 455.5\,kips$$

$$PierWeight := \pi \cdot \frac{d_p^{\,2}}{4} \cdot \left[\left(Wd + L_{pag} \right) \cdot \gamma c + \left(C_{Length} - Wd - L_{pag} \right) \cdot \left(\gamma c - \gamma w \right) \right]$$

$$PierWeight = 112.7 \cdot kips$$

$$SoilShear := \pi \, d_p \cdot \left[fl \cdot (Wd - Depthunbond) + fl \cdot \left(C_{Length} - Wd - L_{pag} \right) \right]$$

$$SoilShear = 519.9 \cdot kips$$

AECOM

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Job	245' SST Self-Supporting Tower, Mansfield, CT	Project No.	NSS-021 Rev. 1	Sheet 2	of 2
Description	Drilled Pier Cassion Evaluation	Computed by	MCD	Date	04/01/15
		Checked by		Date	

Compression Capacity:

$$\text{TotalDownLoadCapacity} := \text{SoilShear} + q_s \cdot \left(\pi \cdot \frac{d_p^{\,2}}{4} \right)$$

$\text{TotalDownLoadCapacity} = 638.7 \cdot \text{kips}$

$\text{CheckDownLoadCapacity} := \text{if}(\text{TotalDownLoad} < \text{TotalDownLoadCapacity}, \text{"Okay"}, \text{"No Good"})$

$\text{CheckDownLoadCapacity} = \text{"Okay"}$

Tension Capacity:

$\text{TotalUpLiftCapacity} := \text{SoilShear} + \text{PierWeight}$

$\text{TotalUpLiftCapacity} = 632.6 \cdot \text{kips}$

$\text{CheckUpLiftCapacity} := \text{if}\left(U_t < \text{TotalUpLiftCapacity}, \text{"Okay"}, \text{"No Good"}\right)$

$\text{CheckUpLiftCapacity} = \text{"Okay"}$

$$\text{SafetyFactor}_{provided} := \frac{\text{TotalUpLiftCapacity}}{U_t}$$

$\text{SafetyFactor}_{provided} = 2.14$

Check Cone Failure:

$$\text{ConeFailureCapacity} := \frac{\left[\left(C_{Length} - L_{pag}\right) \cdot \tan(30\text{deg}) \cdot 2 + d_p\right]^2 \cdot \pi}{4} \cdot \frac{C_{Length} - L_{pag}}{3} \cdot \gamma s$$

$\text{ConeFailureCapacity} = 1654.85 \cdot \text{kips}$

$\text{CheckConeFailureCapacity} := \text{if}\left(U_t < \text{ConeFailureCapacity}, \text{"Okay"}, \text{"No Good"}\right)$

$\text{CheckConeFailureCapacity} = \text{"Okay"}$

$$\text{ConeSafetyFactor}_{provided} := \frac{\text{ConeFailureCapacity}}{U_t}$$

$\text{ConeSafetyFactor}_{provided} = 5.59$

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.

More information on AECOM and its services can be found at www.aecom.com.

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EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CT11303B

UCONN
82 North Eagleville Road
Storrs, CT 06268

March 25, 2015

EBI Project Number: 6215001747

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	10.19 %

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

EBI Consulting
environmental | engineering | due diligence

March 25, 2015

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

Emissions Analysis for Site: **CT11303B – UCONN**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **82 North Eagleville Road, Storrs, 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 **82 North Eagleville Road, Storrs, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

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

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

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

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

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

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

8) The antenna mounting height centerline of the proposed antennas is **235 feet** above ground level (AGL).

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

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

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	235	Height (AGL):	235	Height (AGL):	235
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	0.32	Antenna B1 MPE%	0.32	Antenna C1 MPE%	0.32
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	235	Height (AGL):	235	Height (AGL):	235
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	0.32	Antenna B2 MPE%	0.32	Antenna C2 MPE%	0.32
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	235	Height (AGL):	235	Height (AGL):	235
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 A3 MPE%	0.13	Antenna B3 MPE%	0.13	Antenna C3 MPE%	0.13

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**2.30**
CT Public Broadcasting	1.66 %
UCONN	2.14 %
UCONN Fire	0.83 %
Sprint	3.26 %
Site Total MPE %:	**10.19 %**

T-Mobile Sector 1 Total:	0.77 %
T-Mobile Sector 2 Total:	0.77 %
T-Mobile Sector 3 Total:	0.77 %
Site Total:	10.19 %

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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:	0.77 %
Sector 2:	0.77 %
Sector 3 :	0.77 %
T-Mobile Total:	2.30 %
Site Total:	10.19 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.19%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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