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

March 24, 2015

Via Overnight Mail and Electronic Mail

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

Re: Notice of Exempt Modification
Connecticut State Police/T-Mobile Equipment Upgrade
Site ID CT11612B
880 Post Road East, Westport, 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, the Connecticut State Police owns the existing self-supporting lattice telecommunications tower and related facility at 880 Post Road East, Westport, CT (41.137562/-73.334318). T-Mobile intends to add three (3) antennas and related equipment at this existing telecommunications facility in Westport ("Westport Facility"). Please accept this letter as notification, pursuant to R.C.S.A. §16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the First Selectman, Jim Marpe, and the property owner, Westport Drug Association LLC.

The existing Westport Facility consists of a 180-foot self-supporting lattice tower.[1] T-Mobile plans to add three (3) antennas on proposed T-arm mounts at a centerline of 125 feet, as well as remove three (3) existing antenna mounts at the 125-foot centerline. T-Mobile will also add three (3) remote radio units at the 125-foot centerline, replace three (3) existing dual standoff arms at the 125-foot centerline, reuse existing coax cable, and reuse fiber optic cable. (See the plans dated February 25, 2015 attached hereto as **Exhibit A**). The existing Westport

[1] This Facility was approved in Docket No. 123. The Docket No. 123 Decision and Order contains no limitations or restrictions relevant to T-Mobile's proposed modifications.

Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated February 23, 2015, and attached hereto as **Exhibit B**.

The planned modifications to the Westport 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 existing antennas are at a centerline of 125 feet; the additional antennas and equipment will be installed at the same 125-foot level. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension on the site boundaries or lease area as T-Mobile does not propose to make any changes to the compound area.

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 and equipment 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 Radio Frequency Emissions Analysis Report prepared by EBI dated March 6, 2015, T-Mobile's operations would add 8.52% 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 41.06% 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 Westport Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement of this exempt modification, T-Mobile shall commence construction approximately sixty days from the receipt of the Council's decision.

Sincerely,

Julie D. Kohler, Esq.

cc: Town of Westport, First Selectman Jim Marpe
Public Safety Director of Telecommunications, Department of Emergency Services and Public Protection, Division of State Police
Westport Drug Association, LLC
Sheldon Freincle, Northeast Site Solutions

EXHIBIT A

T-Mobile

T-MOBILE NORTHEAST LLC

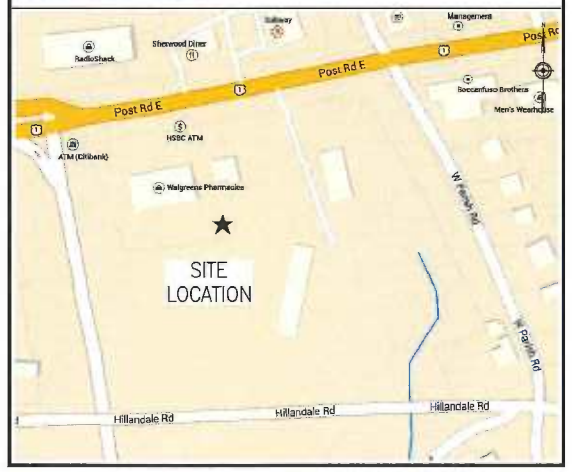
SITE #: CT11612B

SITE NAME: CT STATE POLICE TOWER

SITE ADDRESS:
880 POST ROAD EAST
WESTPORT, CT, 06880

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. FINAL DESIGN PENDING STRUCTURAL EVALUATION.

SITE INFORMATION

SITE NUMBER:	CT11612B
SITE NAME:	CT STATE POLICE TOWER
SITE ADDRESS:	880 POST ROAD EAST WESTPORT, CT, 06880
LAT./LONG.:	N 41.137562 / W –73.334318
JURISDICTION:	FAIRFIELD COUNTY
PROPERTY OWNER:	PAUL ZITO PUBLIC SAFETY DIRECTOR OF TELECOMMUNICATIONS CT DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION DIVISION OF STATE POLICE 1111 COUNTRY CLUB ROAD MIDDLETOWN, CT 06457 860–685–8280 – OFFICE 860–685–8345 – FAX 860–305–5275 – CELL

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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N–1	GENERAL AND ELECTRICAL NOTES
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A–2	ANTENNA PLAN AND DETAILS
E–1	GROUNDING DIAGRAM
E–2	GROUNDING DETAILS

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

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

SUBMITTALS

DATE	DESCRIPTION	REVISION
02/25/15	ISSUED FOR REVIEW	A

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

PROJECT NO:	CT11612B
DRAWN BY:	MB
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NAME
CT11612B
SITE NAME
CT STATE POLICE TOWER
SITE ADDRESS
880 POST ROAD EAST
WESTPORT, CT, 06880

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

ELECTRICAL NOTES:

WORK INCLUDED

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

GENERAL REQUIREMENTS

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

GUARANTEE

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

CLEANING

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

COORDINATION AND SUPERVISION

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

SUBMITTALS

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

CUTTING AND PATCHING

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

TESTS, INSPECTION AND APPROVAL

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

SPECIAL REQUIREMENTS

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

GROUNDING

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

RACEWAYS

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

RACEWAYS CONT'D

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

WIRES AND CABLES

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

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

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

WIRING DEVICES

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

DISCONNECT SWITCHES AND FUSES

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

INSTALLATION

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

GENERAL NOTES:

INTENT

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

CONFLICTS

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

CONTRACTS AND WARRANTIES

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

STORAGE

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

CLEANUP

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

CHANGE ORDER PROCEDURE:

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

RELATED DOCUMENTS AND COORDINATION

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

SHOP DRAWINGS

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

PRODUCTS AND SUBSTITUTIONS

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

QUALITY ASSURANCE

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

ADMINISTRATION

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

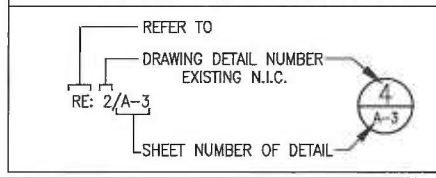
INSURANCE AND BONDS

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

ARCHITECTURAL SYMBOLS

STORAGE
38
3

DETAIL REFERENCE KEY



ABBREVIATIONS

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

T-Mobile

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SUBMITTALS

DATE	DESCRIPTION	REVISION
02/25/15	ISSUED FOR REVIEW	A

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

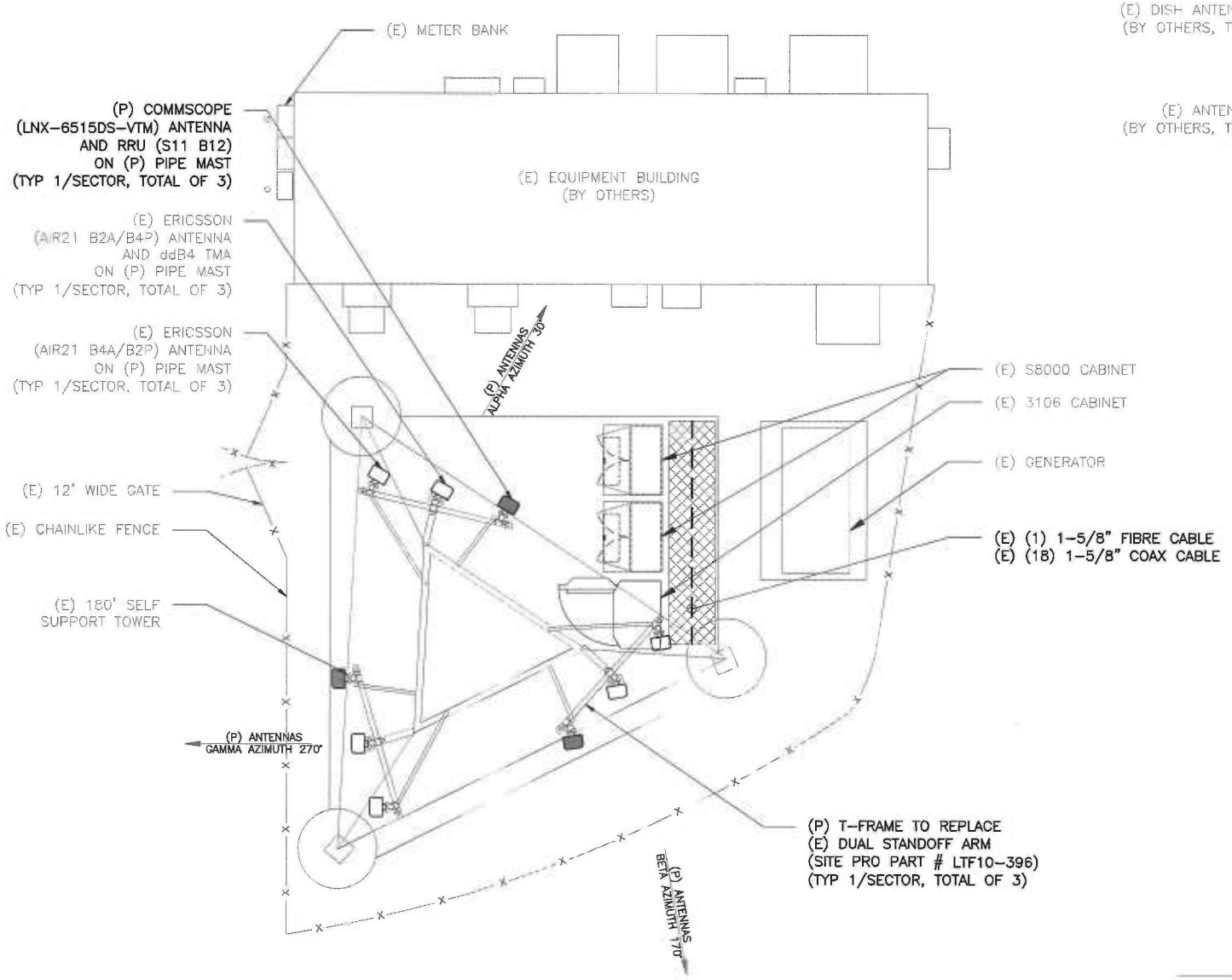
PROJECT NO:	CT11612B
DRAWN BY:	MB
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NAME
CT11612B
SITE NAME
CT STATE POLICE TOWER
SITE ADDRESS
880 POST ROAD EAST
WESTPORT, CT, 06880

SHEET TITLE
GENERAL AND ELECTRICAL NOTES

SHEET NUMBER
N-1



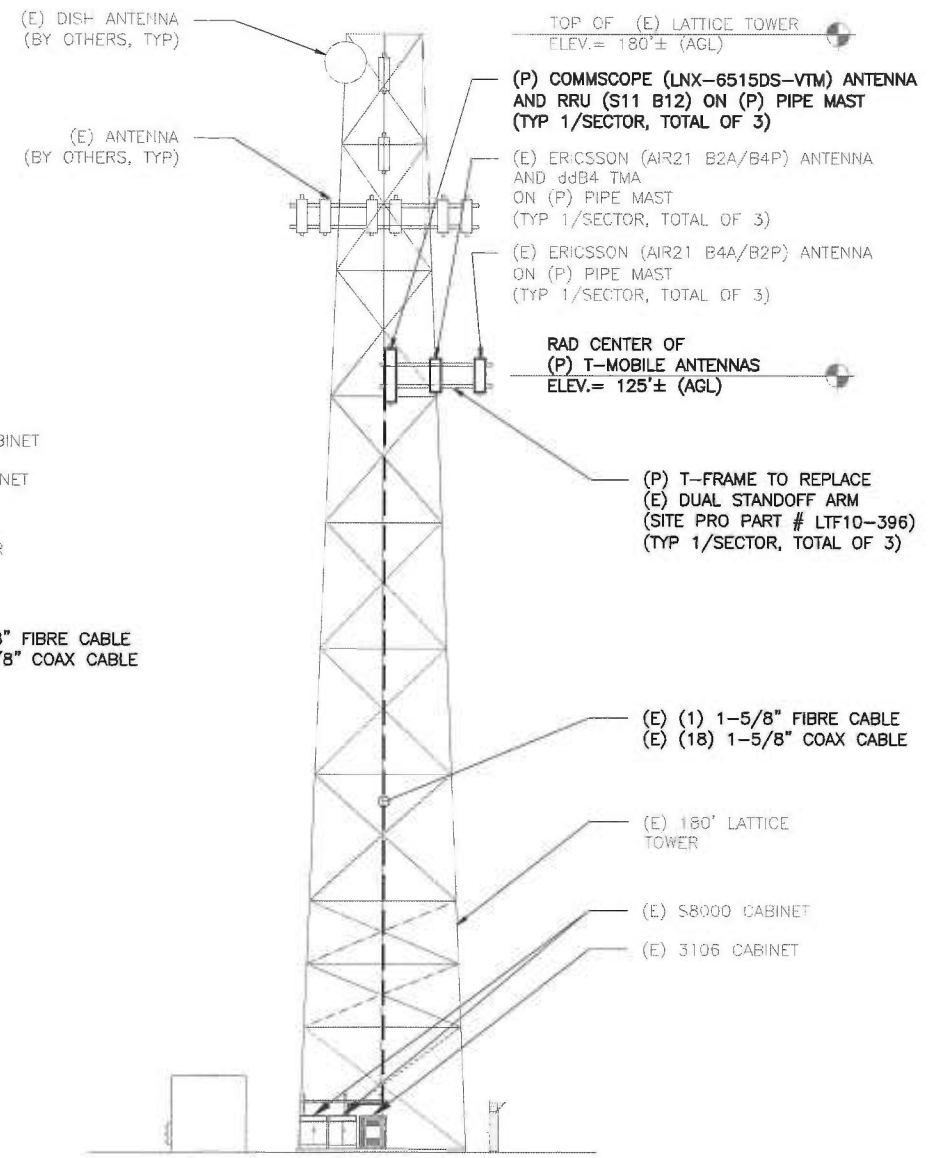
SITE PLAN

1 / A-1

SCALE: 1" = 10'-0" (11x17)
1" = 5'-0" (24x36)

0 10 20 30

SCALE 1"=10' (11x17)
1"=5' (24x36)



ELEVATION VIEW

2 / A-1

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

0 30 60 90

SCALE 1"=30' (11x17)
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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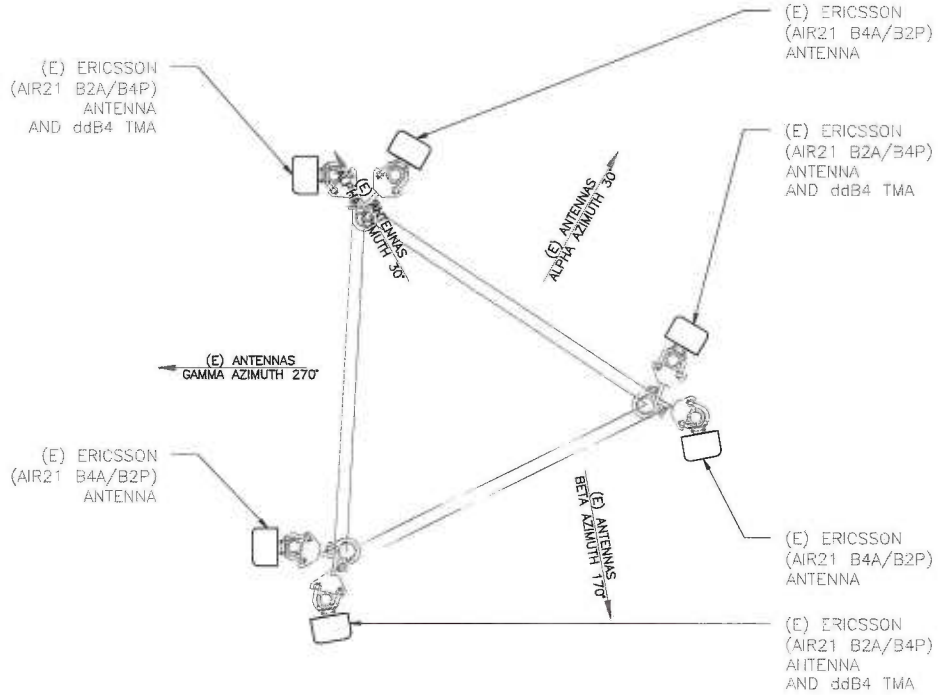
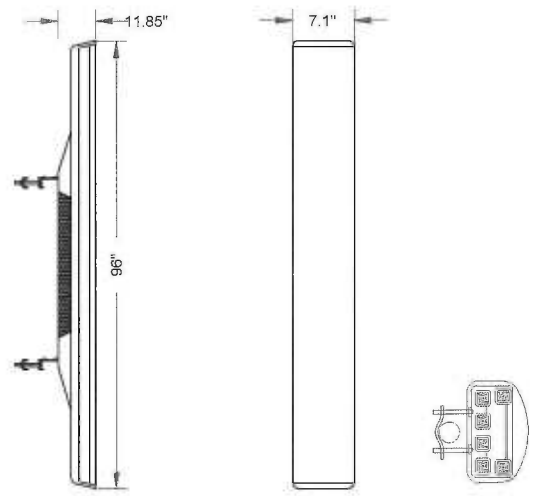
SHEET TITLE
SITE PLAN AND EQUIPMENT PLAN

SHEET NUMBER
A-1

FINAL DESIGN PENDING
STRUCTURAL EVALUATION

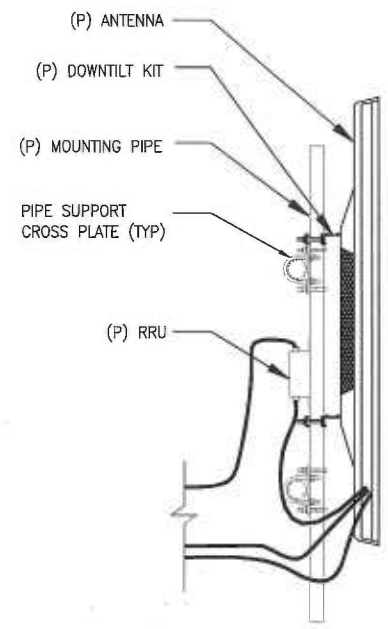




MANUFACTURER: COMMSCOPE
MODEL NO.: LNX-6515DS-VTM
DIMENSIONS – HxWxD, (IN) 96x11.85x7.1

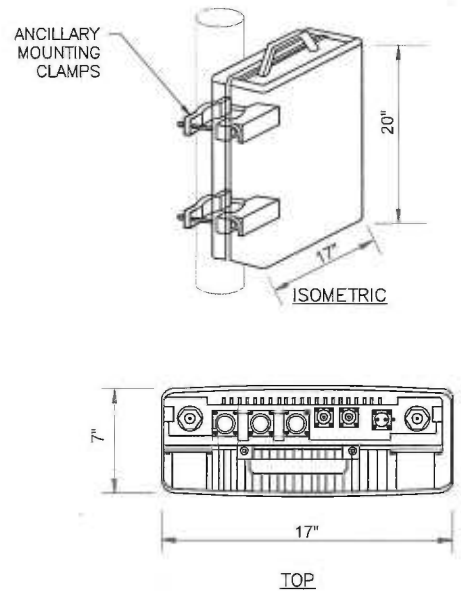
COMMSCOPE ANTENNA DETAIL 2/A-2

SCALE: N.T.S



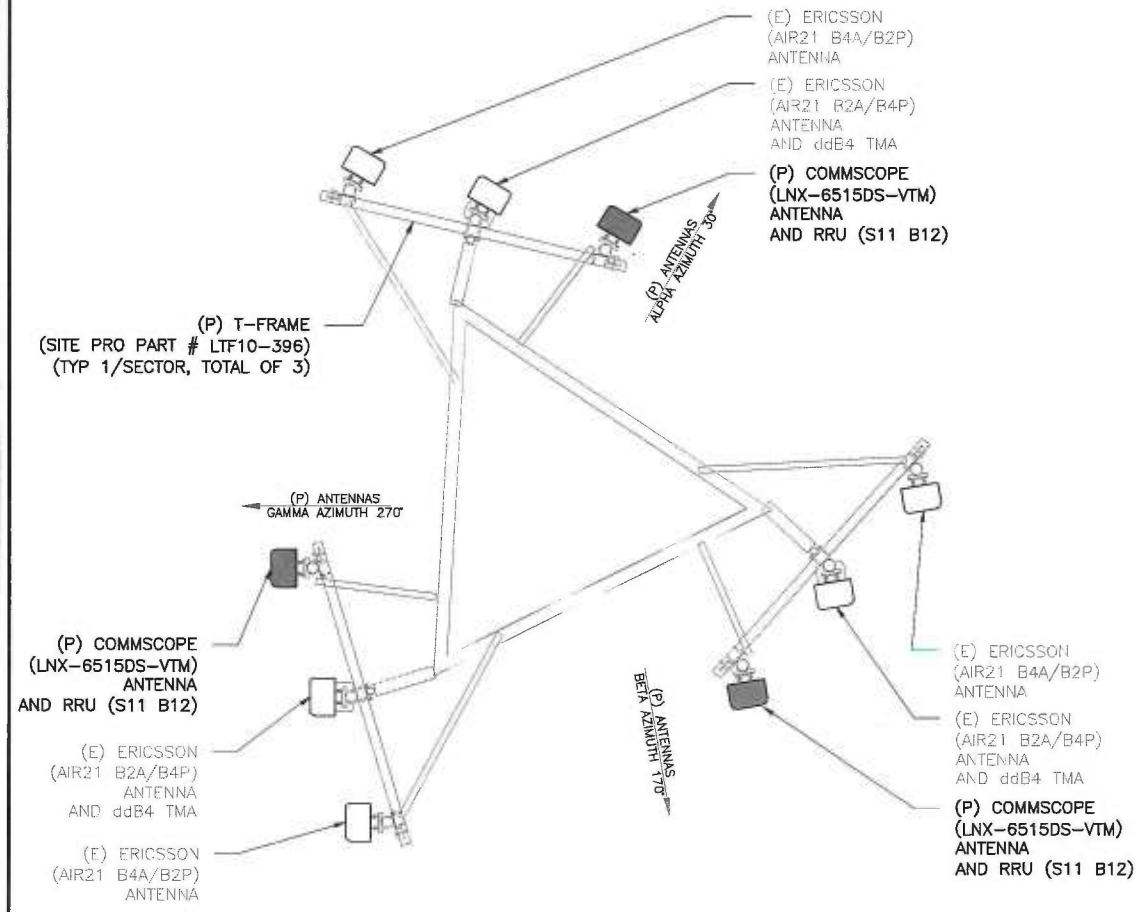
ANTENNA MOUNT DETAIL 3/A-2

SCALE: N.T.S



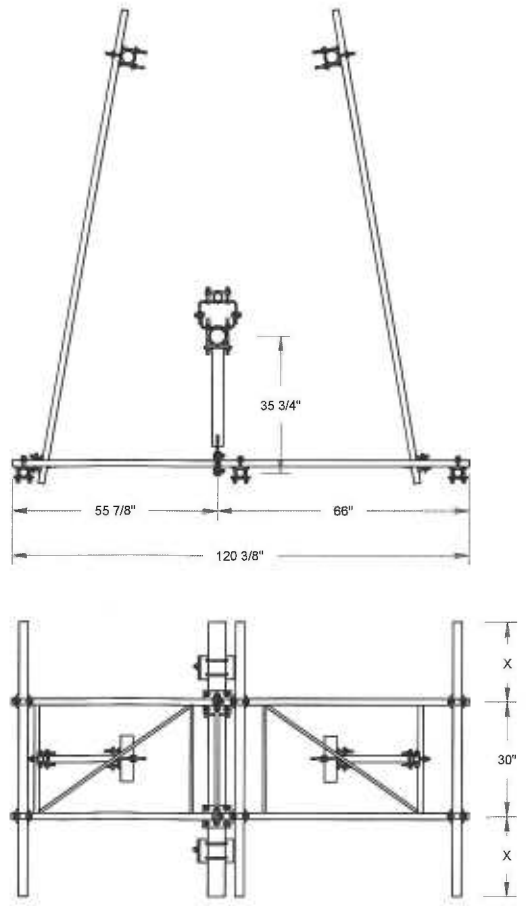
RRUS 11 B12 DETAILS 4/A-2

SCALE: N.T.S

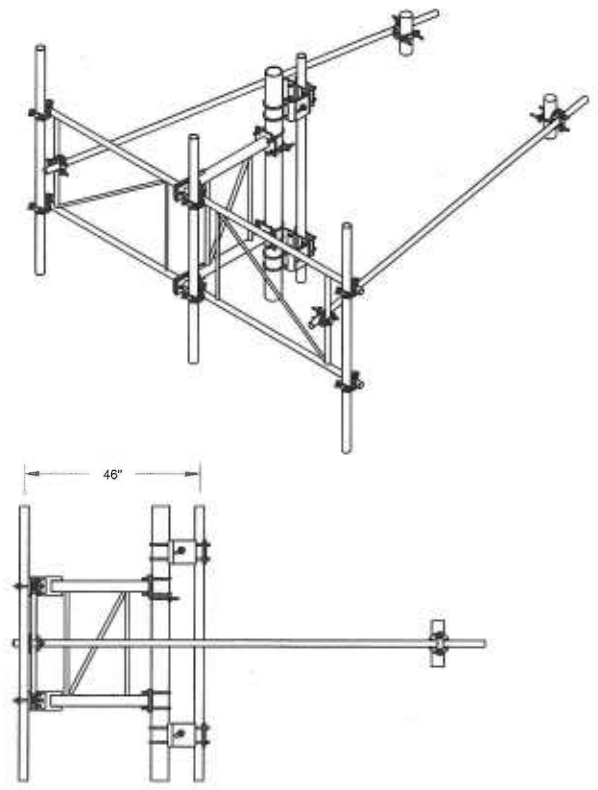


ANTENNA PLAN 1/A-2

SCALE: N.T.S



T-FRAME
(SITE PRO PART # LTF10-396)



T-FRAME MOUNT DETAIL 5/A-2

SCALE: N.T.S

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RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	CT11612B
DRAWN BY:	MB
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NAME
CT11612B
SITE NAME
CT STATE POLICE TOWER
SITE ADDRESS
880 POST ROAD EAST
WESTPORT, CT, 06880

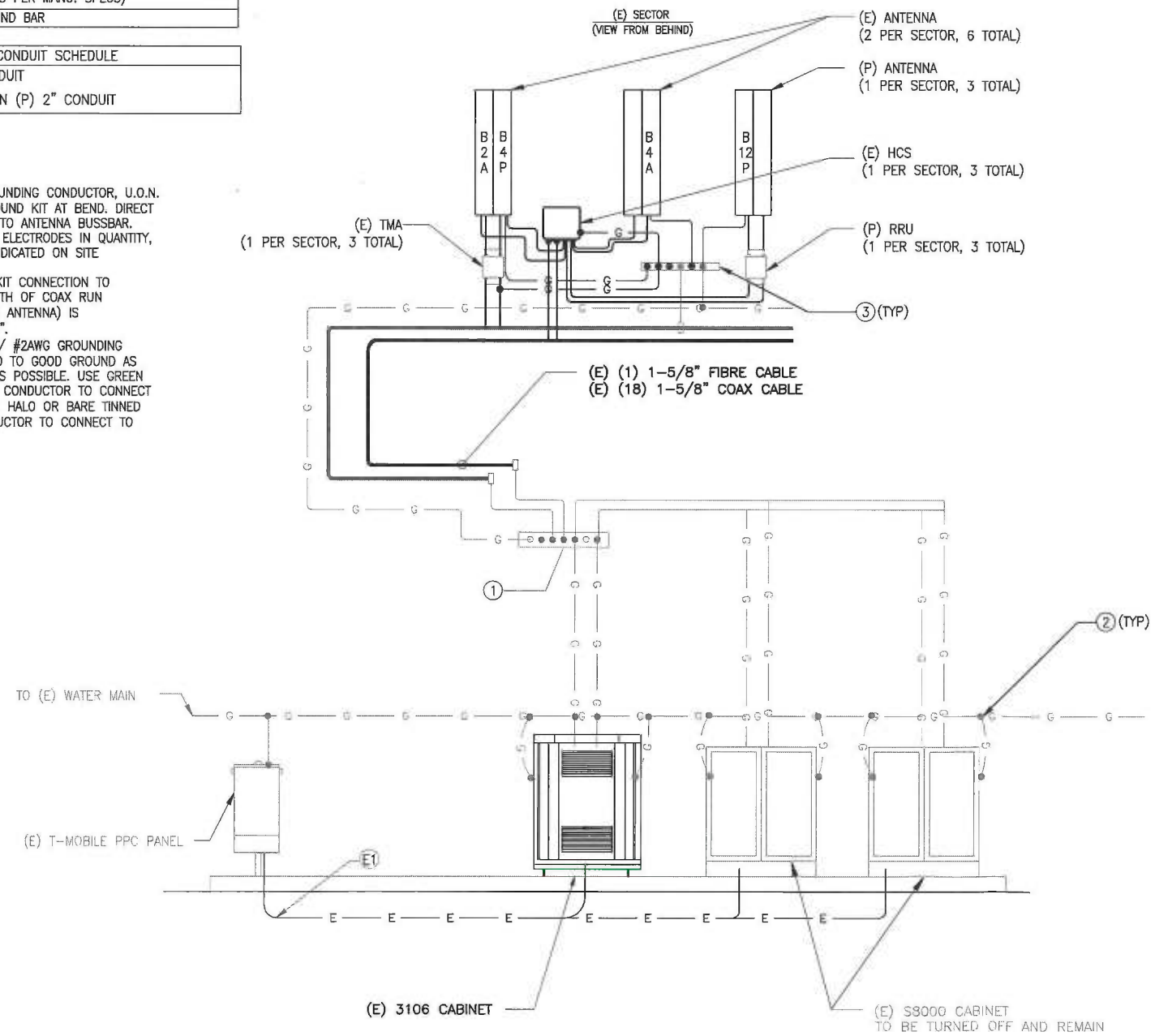
SHEET TITLE
ANTENNA PLAN AND DETAILS

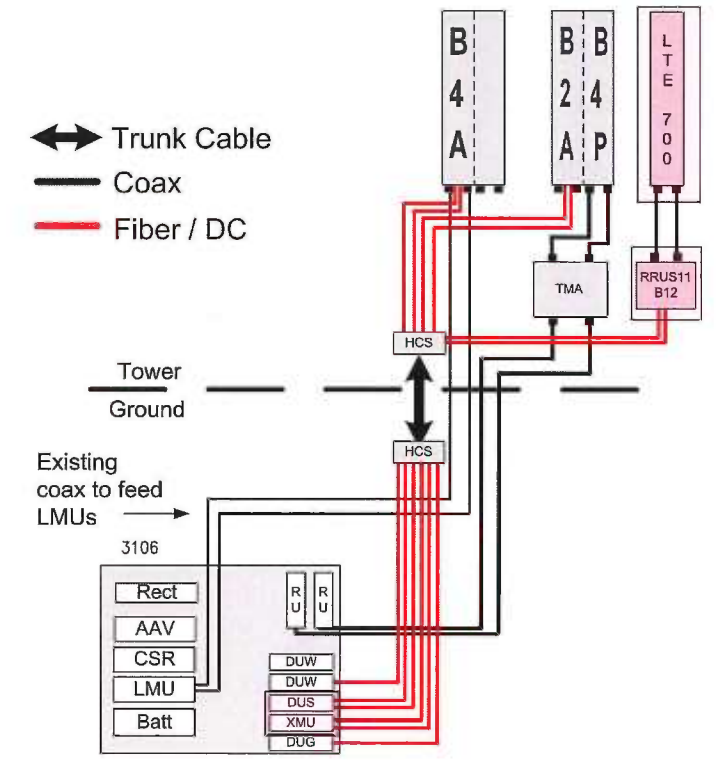
SHEET NUMBER
A-2

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
	(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.





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

2
E-1

SCALE: N.T.S

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PROFESSIONAL SEAL

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SITE ADDRESS
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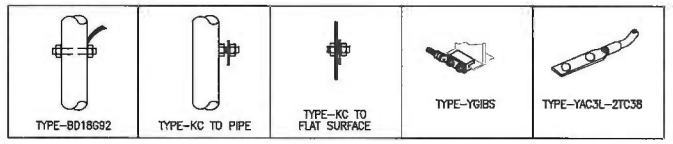
WESTPORT, CT, 06880

SHEET TITLE
GROUNDING DIAGRAM AND POWER ONE LINE DIAGRAM

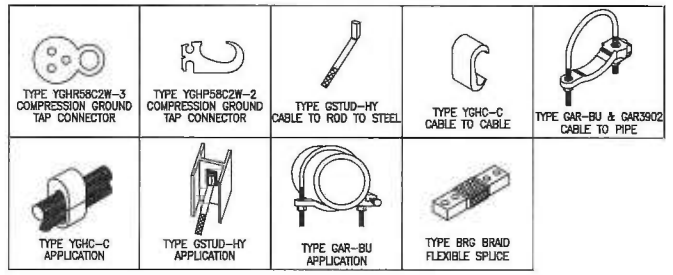
SHEET NUMBER
E-1



BURNDY GROUNDING DETAILS

1 E-2

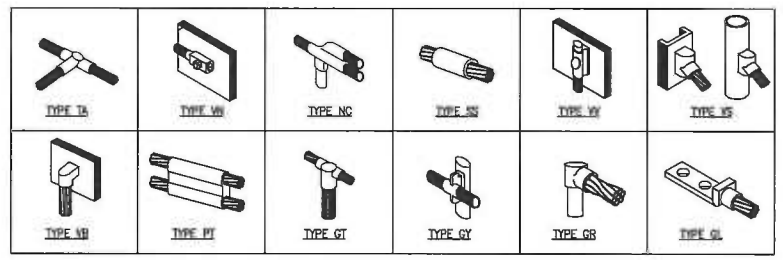
SCALE: N.T.S



BURNDY GROUNDING PRODUCTS

2 E-2

SCALE: N.T.S



CADWELD GROUNDING CONNECTION PRODUCTS

3 E-2

SCALE: N.T.S

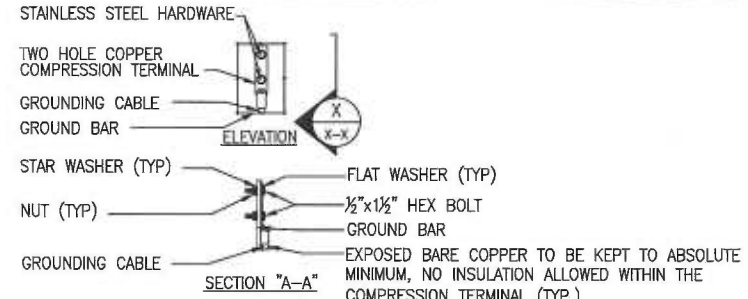
TERMINATION TYPES:
A. MECHANICAL COMPRESSION LUG
B. DOUBLE BARRELL COMPRESSION CONNECTOR
C. EXOTHERMIC TERMINATION
D. BEAM CLAMP

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

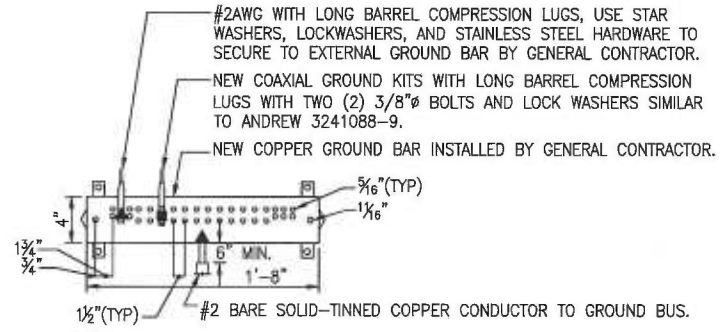
GROUNDING TERMINATION MATRIX

7 E-2

SCALE: N.T.S



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

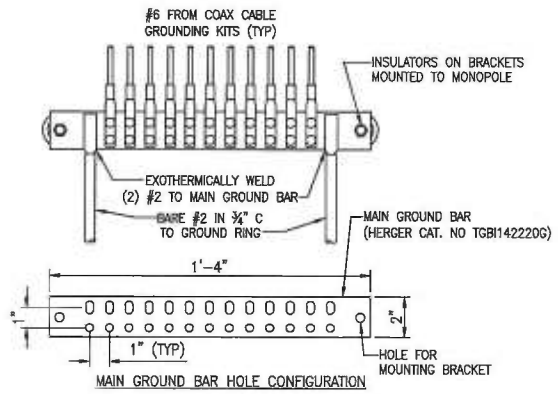


NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

TYPICAL GROUND BAR CONNECTIONS DETAIL

4 E-2

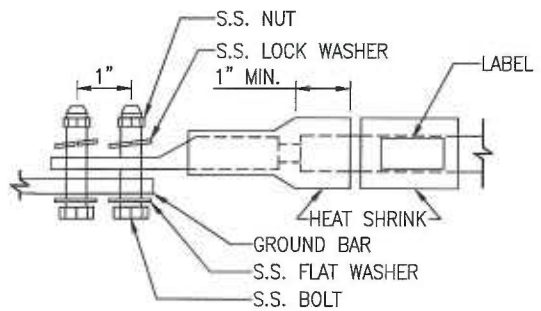
SCALE: N.T.S



GROUND BAR DETAIL

5 E-2

SCALE: N.T.S



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

GROUND BAR DETAIL

6 E-2

SCALE: N.T.S

T-Mobile

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

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

SUBMITTALS

DATE	DESCRIPTION	REVISION
02/25/15	ISSUED FOR REVIEW	A

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

PROJECT NO:	CT11612B
DRAWN BY:	MB
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NAME
CT11612B
SITE NAME
CT STATE POLICE TOWER
SITE ADDRESS
880 POST ROAD EAST
WESTPORT, CT, 06880

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
February 23, 2015

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 180' SELF SUPPORTING LATTICE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

T-Mobile

Site ID : CT11612B
Site Name: CT State Police Tower
Site Address: 880 Post Road East
Westport, Connecticut
CSP Tower # 32

36931409
NSS-020

TABLE OF CONTENTS

2. INTRODUCTION

The subject tower is located at 880 Post Road East in Westport, Connecticut. The structure is a 180' self-supporting lattice tower manufactured by Rohn Industries Incorporated. The inventory is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(1) Yagi Antenna	CSP-1 (existing)	Standoff	@ 180'	(1) LDF5-50A
(1) Celwave PA6-65 dish	CSP-42 (existing)	Dish Standoff	@ 177'	(1) EW-63
(2) Scala AP11-850 antenna	CSP-46,47 (existing)	Leg Mount	@ 175'	(2) LDF7-50A
(1) Sinclair SC479-HF1LDF whip antenna	CSP-56 (existing)	Standoff	@ 170'	(1) LDF7-50A
(3) Sinclair SC479-HF1LDF whip antenna (inverted) (1) TX/RX TTA	CSP-57-60 (existing)	Standoff	@ 170'	(3) LDF7-50A (1) LDF4-50A
(1) Andrew HP6-65H dish	Verizon (existing)	Dish Standoff	@ 170'	(1) EW-65
(1) VHF150 Dipole Antenna	CSP-22 (existing)	Leg Mount	@ 167'	(1) LDF5-50A
(1) 8' Panel	Unknown (existing)	Mounted to Tower Face	@ 167'	(2) LDF7-50A
(2) Scala OGT9-806 inverted whips	CSP-48,49 (existing)	Standoff	@ 160'	(2) LDF7-50A
(1) Decibel DB536 whip	CSP-45 (future)	Standoff	@ 160'	(1) LDF5-50A
(1) Amphenol BXA 70080-4CF Panel Antennas (Alpha Sector) (2) Amphenol 70063-4CF Panel Antennas (Beta and Gamma Sectors) (3) Amphenol BXA171063-12CF Panel Antennas (3) AWS RRH Units (1) Raycap DB-T1-6Z-8AB-0Z Distribution Box (3) P65-15-XL-2 (3) MG D3-800T0 (6) Diplexers	Verizon (existing)	(3) 15' T-Frames	@ 160'	(12) LDF7-50A (1) 1 5/8" Fiber
(9) P65-16-XLH-H-RR Panel Antennas (6) RRUS-11 Units (1) DC6-48-60-18-8F Distribution Box (3) TT19-08BP111-001 Twin TMA's (3) RRUS-11 RRH Units (1) DC6-48-60-18-8F Distribution Box	AT&T (existing)	(3) Existing Antenna Mount Frames	@ 133'	(12) LDF6-50A (2) Fiber Optic Cable (4) DC Cables
(3) Commscope LNX-6515DS-VTM Panel Antennas (3) Ericsson RRUS-11 Remote Radio Units	**T-Mobile (Proposed)**	**(3) Antenna Frame Mounts (Valmont Site Pro 1 part # LTF12-372)**	**@ 125'**	*See Below Cables*

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(9) TMAs (1) GPS (6) Ericsson Air 21 antennas	T-Mobile (existing)	*Existing Mount Replaced w/ Above Mount*	@ 125'	(18) LDF7-50A (1) LDF4-50A (1) Huber Suhner Hybrid cable
(1) Telewave VHF150 Dipole Antenna	CSP-44 (existing)	Leg Mount	@ 111'	(1) LDF4-50A
(1) GPS Antenna	CSP-43 (existing)	Leg Mount	@ 61'	(1) LDF4-50A

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 analyze the existing tower for its existing and proposed antenna loads. This analysis was conducted to evaluate twist (rotation), sway (deflection) and 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.

Load Condition 1 = 90 mph (fastest mile) Wind Load + Tower Dead Load
Load Condition 2 = 90 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

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

The combined axial and bending stresses on the tower structure were evaluated to compare with the allowable stress in accordance with AISC. The results of the analysis indicate that the calculated stresses under the proposed loading, are below the allowable stresses for the tower structure. The foundation reactions were below the allowable values in the foundation capacity report. The anchor bolts under the proposed loading were found to be within the allowable limits. The tower deflection does not exceed the Connecticut State Police specification of 0.75 degrees for deflection (sway) and rotation (twist).

Tower Base Reactions:

Description	Original	Revised Reactions (Geotech 10/10/2002)	Current	Stress (% capacity)	Pass/ Fail
Pier Compression (kips)	319.9	374	331	88.5	Pass
Pier Uplift (kips)	276.7	324	284	87.7	Pass
Overall Overturning (kip-ft)	7010.3	---	7382	---	---
Overall Shear (kips)	61.5	---	69	---	---
Shear per Leg (kips)	41.0	48	42	87.5	Pass

Tower Component Stress vs. Capacity Summary:

Component / (Section No.)	Controlling Component/ Elevation	Stress (% capacity)	Pass/ Fail	Comments:
Tower Leg (T12)	ROHN 8 EHS / 20'-30'	84.2	Pass	
Diagonal (T6)	ROHN 2.5 EH / 100' – 120'	97.2	Pass	
Horizontal (T11)	ROHN 2.5 STD / 30'-40'	72.2	Pass	
Top Girt (T12)	ROHN 2.5 STD / 20'-30'	79.9	Pass	
Redund Horz 1 Bracing (T13)	ROHN 1.5 STD / 0'-20'	29.1	Pass	
Redund Diag 1 Bracing (T13)	ROHN 1.5 STD / 0'-20'	81.7	Pass	
Redund Hip 1 Bracing (T13)	ROHN 2.5 STD / 0'-20'	0.1	Pass	
Inner Bracing (T5)	L2x2x1/8 / 120'-126.667'	5.8	Pass	
Tower Bolt	(3) A325N Bolts / Diagonal / 20'	98.1	Pass	
Anchor Bolts	1" Dia. / Tension	57.0	Pass	Min area per ASCE @ 50%

Tower Twist & Sway at Top:

Description	Current	Total Allowable
Tower Twist (degrees)	0.1975	
Tower Sway (degrees)	0.5029	
Total Deflection (degrees)	0.7004	0.75

5. CONCLUSIONS

The results of the analysis indicate that the tower superstructure steel stresses are within the allowable limits. Also, the loading to the tower foundation is less than the design reactions utilized in the *Evaluation of Existing Foundation for Increased Design Loads*, prepared by Dr. Clarence Welti, P.E., P.C, signed and sealed October 10, 2002. **Therefore, the overall tower structure and its foundation and anchor bolts are deemed structurally adequate for the proposed antenna loading for the wind load classification specified above.**

The tower deflection (sway) is 0.5029 degrees, and the tower rotation (twist) is 0.1975 degrees with a wind velocity of 90 mph concurrent with 0.5" ice. **The tower deflection and rotation are within the Connecticut State Police specification of 0.75 degrees for combined deflection (sway) and rotation (twist).**

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.

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.

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 condition.

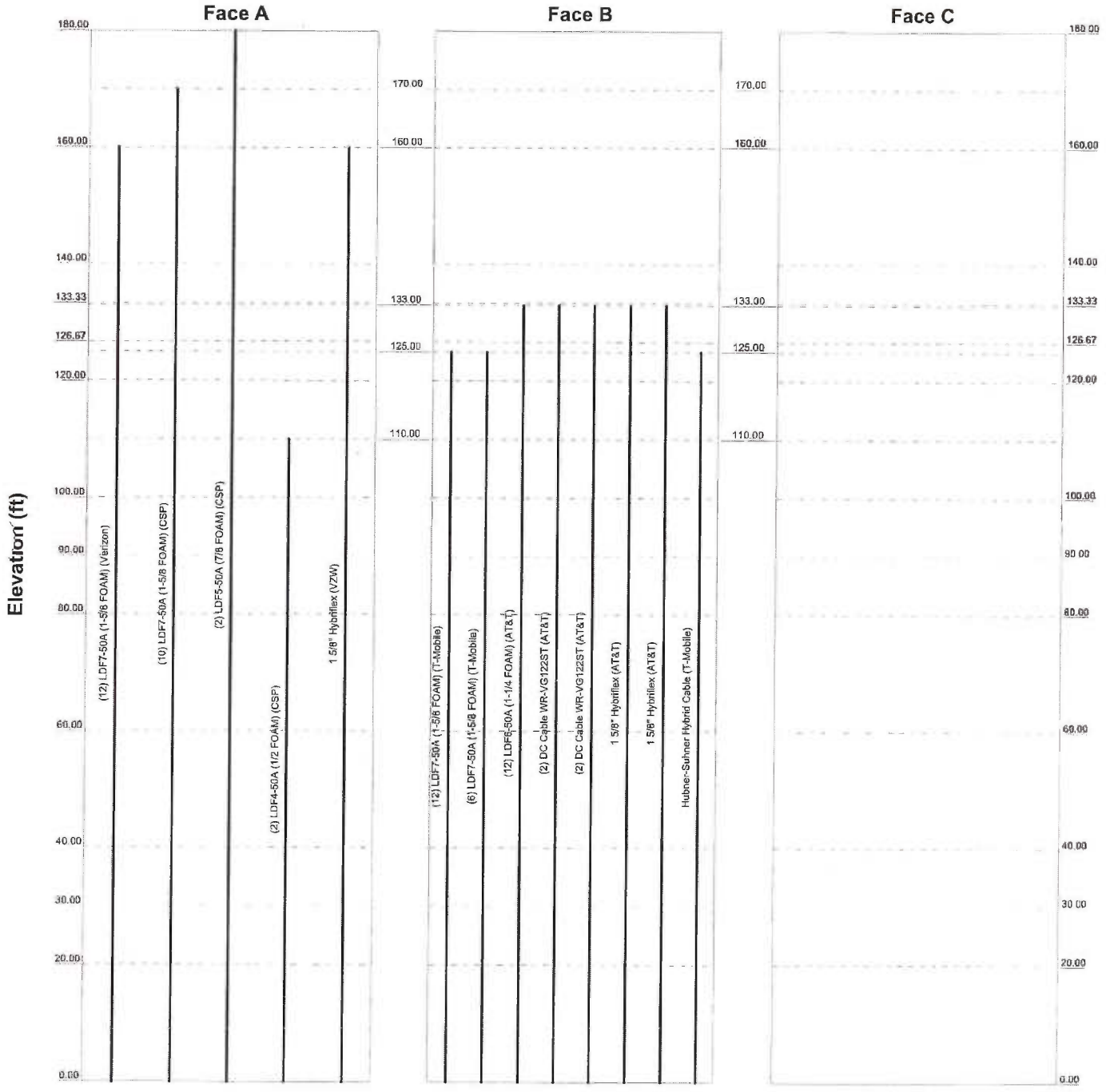
6. DRAWINGS AND DATA

TNX TOWER INPUT / OUPUT SUMMARY

TNX TOWER FEEDLINE DISTRIBUTION

Feed Line Distribution Chart
0' - 180'

Round Flat App In Face App Out Face Truss Leg



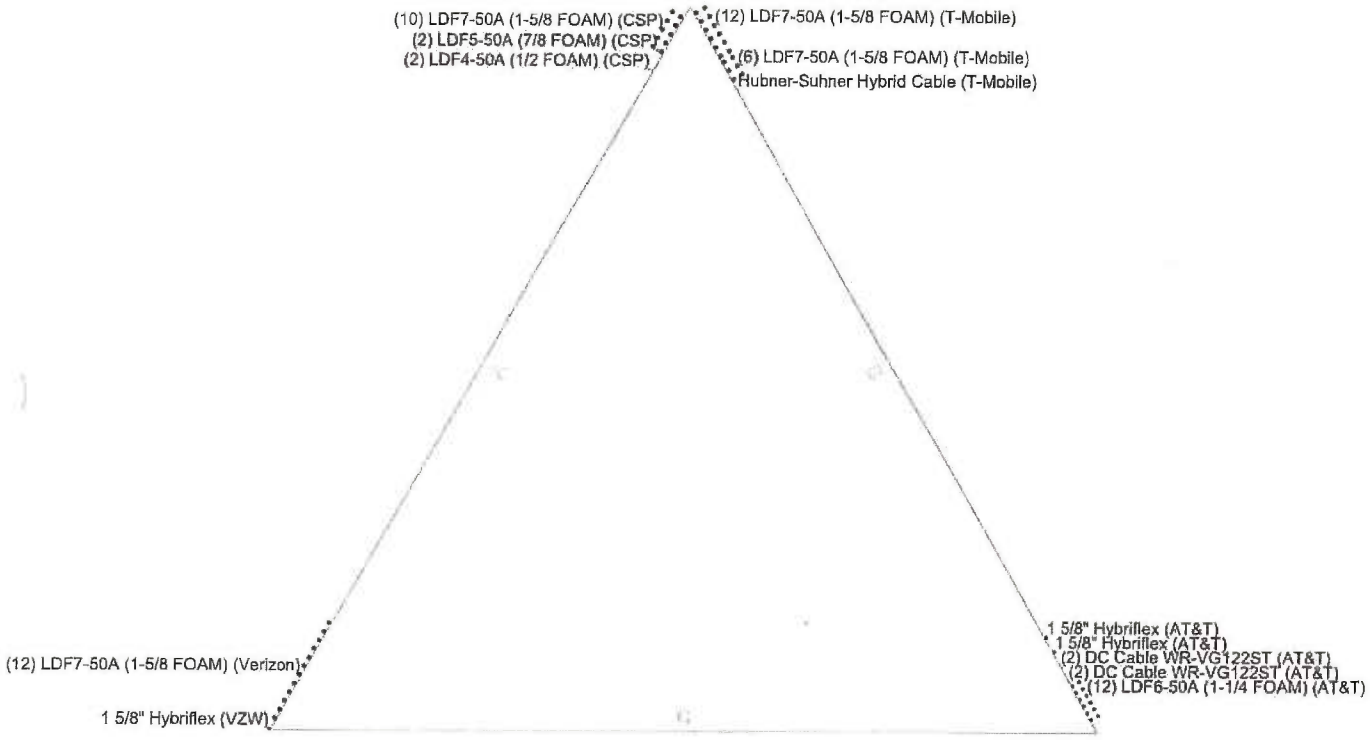
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	***180' CSP Lattice Tower***
Project:	***Westport, Connecticut / NSS-020***
Client: Northeast Site Solutions / T-Mobile	Drawn by: MCD App'd:
Code: TIA/EIA-222-F	Date: 02/23/15 Scale: NTS
Path:	Dwg No. E-7

TNX TOWER FEEDLINE PLAN

Feed Line Plan

Round Flat App In Face App Out Face



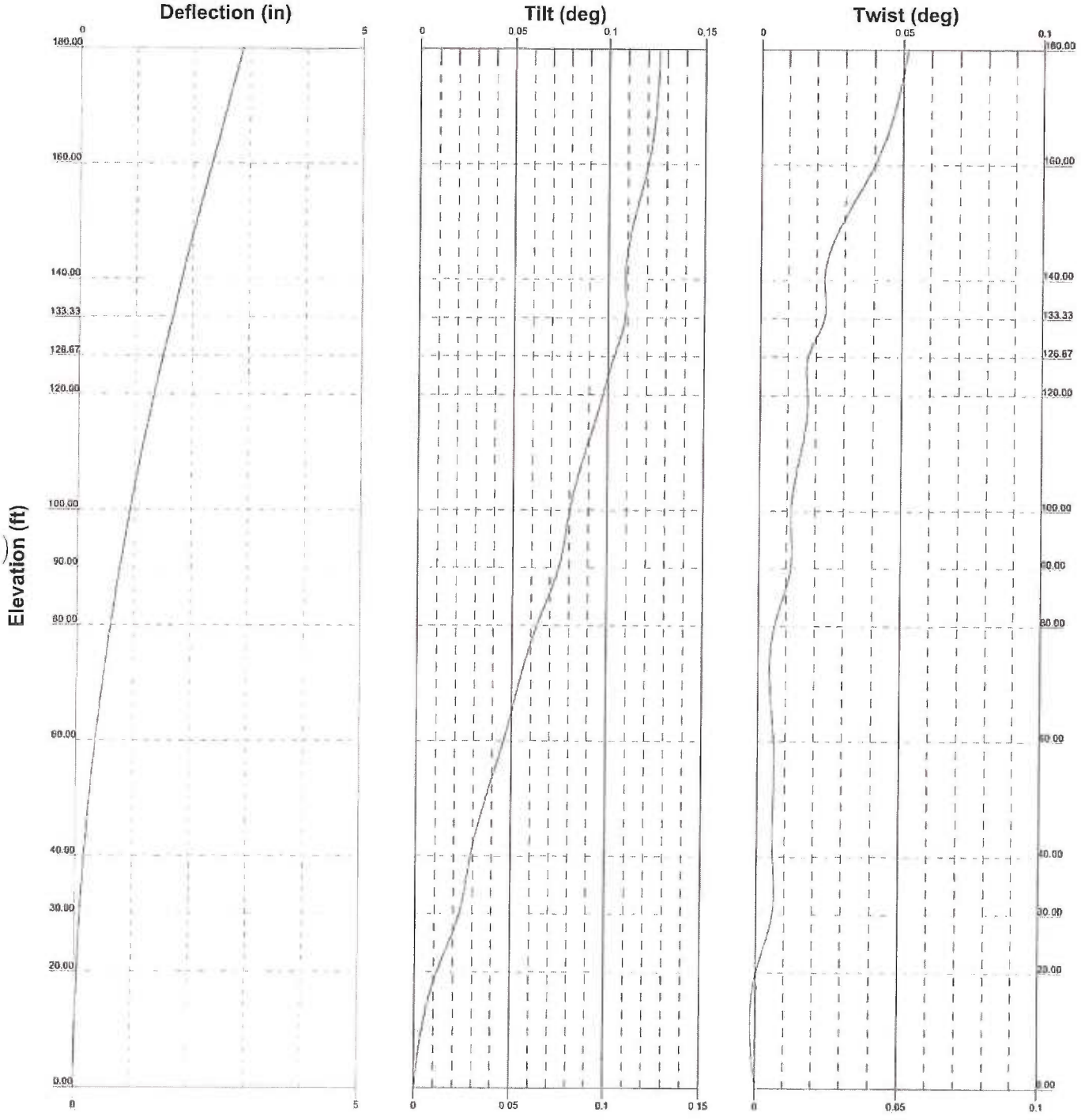
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	***180' CSP Lattice Tower***
Project:	***Westport, Connecticut / NSS-020***
Client:	Northeast Site Solutions / T-Mobile
Drawn by:	MCD
App'd:	
Code:	TIA/EIA-222-F
Date:	02/23/15
Scale:	NTS
Path:	
Dwg No.	E-7

TNX TOWER DEFLECTION, TILT, AND TWIST

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

Maximum Values



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

Job:	*180' CSP Lattice Tower*
Project:	*Westport, Connecticut / NSS-020*
Client:	Northeast Site Solutions / T-Mobile
Drawn by:	MCD
App'd:	
Code:	TIA/EIA-222-F
Date:	02/23/15
Scale:	NTS
Path:	
Dwg No.	E-5

DETAILED OUTPUT

tnxTower	Job	Page
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	180' CSP Lattice Tower	1 of 52
	Project Westport, Connecticut / NSS-020	Date 09:51:57 02/23/15
	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 180.00 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 8.54 ft at the top and 27.68 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

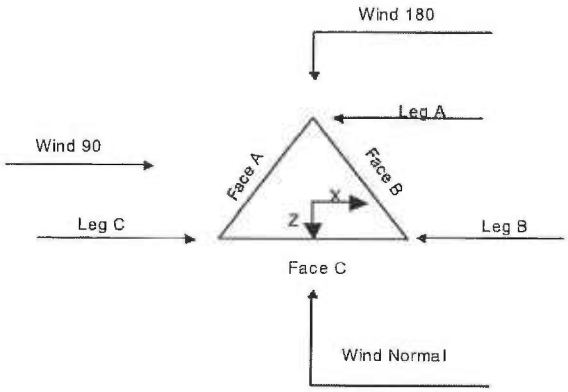
Basic wind speed of 90 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 90 mph is used in combination with ice.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in 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
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
√ Include Bolts In Member Capacity
√ Leg Bolts Are At Top Of Section
√ Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
Add IBC .6D+W Combination

√ Distribute Leg Loads As Uniform
Assume Legs Pinned
Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
√ Retension Guys To Initial Tension
Bypass Mast Stability Checks
Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
√ SR Members Have Cut Ends
Sort Capacity Reports By Component
√ Triangulate Diamond Inner Bracing
Use TIA-222-G Tension Splice Capacity Exemption

Treat Feedline Bundles As Cylinder
Use ASCE 10 X-Brace Ly Rules
√ Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
√ SR Leg Bolts Resist Compression
√ All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feedline Torque
Include Angle Block Shear Check
Poles
√ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.00-160.00			8.54	1	20.00
T2	160.00-140.00			8.63	1	20.00
T3	140.00-133.33			10.71	1	6.67
T4	133.33-126.67			11.40	1	6.67
T5	126.67-120.00			12.10	1	6.67
T6	120.00-100.00			12.79	1	20.00
T7	100.00-90.00			15.04	1	10.00
T8	90.00-80.00			16.36	1	10.00
T9	80.00-60.00			17.68	1	20.00
T10	60.00-40.00			20.18	1	20.00
T11	40.00-30.00			22.68	1	10.00
T12	30.00-20.00			23.93	1	10.00
T13	20.00-0.00			25.18	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	180.00-160.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T2	160.00-140.00	6.67	K Brace Down	No	Yes	0.0000	0.0000

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
T3	140.00-133.33	6.67	K Brace Down	No	Yes	0.0000	0.0000
T4	133.33-126.67	6.67	K Brace Down	No	Yes	0.0000	0.0000
T5	126.67-120.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T6	120.00-100.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T7	100.00-90.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T8	90.00-80.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T9	80.00-60.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T10	60.00-40.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T11	40.00-30.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T12	30.00-20.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T13	20.00-0.00	20.00	K1 Down	No	Yes	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 180.00-160.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T2 160.00-140.00	Pipe	ROHN 4 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T3 140.00-133.33	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	ROHN 2 EH	A572-50 (50 ksi)
T4 133.33-126.67	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	ROHN 2 EH	A572-50 (50 ksi)
T5 126.67-120.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	ROHN 2 EH	A572-50 (50 ksi)
T6 120.00-100.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)
T7 100.00-90.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T8 90.00-80.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T9 80.00-60.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T10 60.00-40.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	P3.5x.226	A572-50 (50 ksi)
T11 40.00-30.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	P3.5x.226	A572-50 (50 ksi)
T12 30.00-20.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	P3.5x.226	A572-50 (50 ksi)
T13 20.00-0.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	P3.5x.226	A572-50 (50 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
T4 133.33-126.67	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)
T5 126.67-120.00	Pipe	ROHN 2 STD	A572-50	Solid Round		A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T8 90.00-80.00	Pipe	ROHN 2 STD	(50 ksi) A572-50 (50 ksi)	Single Angle		(36 ksi) A36 (36 ksi)
T12 30.00-20.00	Pipe	ROHN 2.5 STD	(50 ksi) A572-50 (50 ksi)	Single Angle		(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T2 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T3 140.00-133.33	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 133.33-126.67	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 126.67-120.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T6 120.00-100.00	None	Single Angle		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T7 100.00-90.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T8 90.00-80.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T9 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T10 60.00-40.00	None	Single Angle		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T11 40.00-30.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T12 30.00-20.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T13 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Pipe	P3.5x.226	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
T1 180.00-160.00	Solid Round		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T2 160.00-140.00	Solid Round		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T3 140.00-133.33	Solid Round		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T4 133.33-126.67	Solid Round		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 126.67-120.00	Solid Round		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 120.00-100.00	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 100.00-90.00	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 90.00-80.00	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 80.00-60.00	Solid Round		A36 (36 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T10 60.00-40.00	Single Angle		A36 (36 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T11 40.00-30.00	Single Angle		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T12 30.00-20.00	Single Angle		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T13 20.00-0.00	Solid Round		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T13 20.00-0.00	A572-50 (50 ksi)	Horizontal (1)	Pipe	ROHN 1.5 STD	0.8
		Diagonal (1)	Pipe	ROHN 1.5 STD	0.8
		Hip (1)	Pipe	ROHN 2.5 STD	0.8

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	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 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 140.00-133.33	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 133.33-126.67	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 126.67-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 100.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
T8 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T11 40.00-30.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T12 30.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T13 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
ft															
T1 180.00-160.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 160.00-140.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 140.00-133.33	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 133.33-126.67	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 126.67-120.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 100.00-90.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 90.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T11 40.00-30.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T12 30.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T13 20.00-0.00	Yes	Yes	1	1	1	1	1	1	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	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 180.00-160.00	0.0000	0.75	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 160.00-140.00	0.0000	0.75	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 140.00-133.33	0.0000	0.75	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 133.33-126.67	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 126.67-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 120.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.00-90.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 90.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 60.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 40.00-30.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 30.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 20.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 180.00-160.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T2 160.00-140.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T3 140.00-133.33	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T4 133.33-126.67	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T5 126.67-120.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T6 120.00-100.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T7 100.00-90.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T8 90.00-80.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T9 80.00-60.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T10 60.00-40.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T11 40.00-30.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T12 30.00-20.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T13 20.00-0.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

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 180.00-160.00	Flange	0.8750 A325N	4	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T2 160.00-140.00	Flange	0.8750 A325N	4	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T3 140.00-133.33	Flange	0.7500 A325N	6	0.6250 A325N	3	0.6250 A325N	2	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T4 133.33-126.67	Flange	0.7500 A325N	6	0.6250 A325N	3	0.6250 A325N	2	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T5 126.67-120.00	Flange	0.7500 A325N	6	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T6 120.00-100.00	Flange	0.7500 A325N	6	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T7 100.00-90.00	Flange	0.7500 A325N	6	0.6250 A325N	3	0.6250 A325N	2	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T8 90.00-80.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T9 80.00-60.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T10 60.00-40.00	Flange	1.0000 A325N	8	0.6250 A325N	3	0 6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T11 40.00-30.00	Flange	1.0000 A325N	8	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T12 30.00-20.00	Flange	1.0000 A325N	8	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T13 20.00-0 00	Flange	1.0000 A325N	8	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	2	0.6250 A325N	0

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
LDF7-50A (1-5/8 FOAM) (Verizon)	A	Yes	Ar (CfAe)	160.00 - 0.00	0.0000	-0.42	12	12	1.9800	1.9800		0.82

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
LDF7-50A (1-5/8 FOAM) (T-Mobile)	B	Yes	Ar (CfAe)	125.00 - 0.00	0.0000	-0.46	12	6	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (T-Mobile)	B	Yes	Ar (CfAe)	125.00 - 0.00	0.0000	-0.41	6	3	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (CSP)	A	Yes	Ar (CfAe)	170.00 - 0.00	0.0000	0.46	10	5	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM) (CSP)	A	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.435	2	1	1.0900	1.0900		0.33
LDF4-50A (1/2 FOAM) (CSP)	A	Yes	Ar (CfAe)	110.00 - 0.00	0.0000	0.41	2	1	0.6300	0.6300		0.15
1 5/8" Hybriflex (VZW)	A	Yes	Ar (CfAe)	160.00 - 0.00	0.0000	-0.5	1	1	1.6250	1.6250		0.21
LDF6-50A (1-1/4 FOAM) (AT&T)	B	Yes	Ar (CfAe)	133.00 - 0.00	0.0000	0.46	12	6	1.5500	1.5500		0.66
DC Cable WR-VG122ST (AT&T)	B	Yes	Ar (CfAe)	133.00 - 0.00	0.0000	0.43	2	2	0.4000	0.4000		0.25
DC Cable WR-VG122ST (AT&T)	B	Yes	Ar (CfAe)	133.00 - 0.00	0.0000	0.41	2	2	0.4000	0.4000		0.25
1 5/8" Hybriflex (AT&T)	B	Yes	Ar (CfAe)	133.00 - 0.00	0.0000	0.39	1	1	1.6250	1.6250		0.21
1 5/8" Hybriflex (AT&T)	B	Yes	Ar (CfAe)	133.00 - 0.00	0.0000	0.37	1	1	1.6250	1.6250		0.21
Hubner-Suhner Hybrid Cable (T-Mobile)	B	Yes	Ar (CfAe)	125.00 - 0.00	0.0000	-0.385	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	180.00-160.00	A	10.067	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	60.625	0.000	0.000	0.000	0.38
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	140.00-133.33	A	20.208	0.000	0.000	0.000	0.13
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T4	133.33-126.67	A	20.208	0.000	0.000	0.000	0.13
		B	7.468	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
T5	126.67-120.00	A	20.208	0.000	0.000	0.000	0.13

tnxTower	Job	Page
	180' CSP Lattice Tower	10 of 52
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Project Westport, Connecticut / NSS-020	Date 09:51:57 02/23/15
	Client Northeast Site Solutions / T-Mobile	Designed by MCD

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	15.581	0.000	0.000	0.000	0.14
		C	0.000	0.000	0.000	0.000	0.00
T6	120.00-100.00	A	61.150	0.000	0.000	0.000	0.38
		B	54.465	0.000	0.000	0.000	0.49
		C	0.000	0.000	0.000	0.000	0.00
T7	100.00-90.00	A	30.838	0.000	0.000	0.000	0.19
		B	27.232	0.000	0.000	0.000	0.25
		C	0.000	0.000	0.000	0.000	0.00
T8	90.00-80.00	A	30.838	0.000	0.000	0.000	0.19
		B	27.232	0.000	0.000	0.000	0.25
		C	0.000	0.000	0.000	0.000	0.00
T9	80.00-60.00	A	61.675	0.000	0.000	0.000	0.38
		B	54.465	0.000	0.000	0.000	0.49
		C	0.000	0.000	0.000	0.000	0.00
T10	60.00-40.00	A	61.675	0.000	0.000	0.000	0.38
		B	54.465	0.000	0.000	0.000	0.49
		C	0.000	0.000	0.000	0.000	0.00
T11	40.00-30.00	A	30.838	0.000	0.000	0.000	0.19
		B	27.232	0.000	0.000	0.000	0.25
		C	0.000	0.000	0.000	0.000	0.00
T12	30.00-20.00	A	30.838	0.000	0.000	0.000	0.19
		B	27.232	0.000	0.000	0.000	0.25
		C	0.000	0.000	0.000	0.000	0.00
T13	20.00-0.00	A	61.675	0.000	0.000	0.000	0.38
		B	54.464	0.000	0.000	0.000	0.49
		C	0.000	0.000	0.000	0.000	0.00

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	180.00-160.00	A	0.500	15.900	0.000	0.000	0.000	0.29
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	0.500	92.292	0.000	0.000	0.000	1.11
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T3	140.00-133.33	A	0.500	30.764	0.000	0.000	0.000	0.37
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T4	133.33-126.67	A	0.500	30.764	0.000	0.000	0.000	0.37
		B		12.324	0.844	0.000	0.000	0.18
		C		0.000	0.000	0.000	0.000	0.00
T5	126.67-120.00	A	0.500	30.764	0.000	0.000	0.000	0.37
		B		24.859	0.889	0.000	0.000	0.41
		C		0.000	0.000	0.000	0.000	0.00
T6	120.00-100.00	A	0.500	93.650	0.000	0.000	0.000	1.13
		B		86.465	2.667	0.000	0.000	1.44
		C		0.000	0.000	0.000	0.000	0.00
T7	100.00-90.00	A	0.500	47.504	0.000	0.000	0.000	0.57
		B		43.232	1.333	0.000	0.000	0.72
		C		0.000	0.000	0.000	0.000	0.00
T8	90.00-80.00	A	0.500	47.504	0.000	0.000	0.000	0.57
		B		43.232	1.333	0.000	0.000	0.72
		C		0.000	0.000	0.000	0.000	0.00
T9	80.00-60.00	A	0.500	95.008	0.000	0.000	0.000	1.14
		B		86.465	2.667	0.000	0.000	1.44

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
		C		0.000	0.000	0.000	0.000	0.00
T10	60.00-40.00	A	0.500	95.008	0.000	0.000	0.000	1.14
		B		86.465	2.667	0.000	0.000	1.44
		C		0.000	0.000	0.000	0.000	0.00
T11	40.00-30.00	A	0.500	47.504	0.000	0.000	0.000	0.57
		B		43.232	1.333	0.000	0.000	0.72
		C		0.000	0.000	0.000	0.000	0.00
T12	30.00-20.00	A	0.500	47.504	0.000	0.000	0.000	0.57
		B		43.232	1.333	0.000	0.000	0.72
		C		0.000	0.000	0.000	0.000	0.00
T13	20.00-0.00	A	0.500	95.008	0.000	0.000	0.000	1.14
		B		86.464	2.667	0.000	0.000	1.44
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	180.00-160.00	A	0.791	1.814	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	160.00-140.00	A	4.442	9.841	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T3	140.00-133.33	A	1.525	3.297	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T4	133.33-126.67	A	1.494	3.232	0.000	0.000
		B	0.552	1.383	0.000	0.000
		C	0.000	0.000	0.000	0.000
T5	126.67-120.00	A	1.468	3.175	0.000	0.000
		B	1.132	2.657	0.000	0.000
		C	0.000	0.000	0.000	0.000
T6	120.00-100.00	A	3.710	7.793	0.000	0.000
		B	3.304	7.417	0.000	0.000
		C	0.000	0.000	0.000	0.000
T7	100.00-90.00	A	2.030	4.148	0.000	0.000
		B	1.793	3.891	0.000	0.000
		C	0.000	0.000	0.000	0.000
T8	90.00-80.00	A	1.968	4.025	0.000	0.000
		B	1.738	3.776	0.000	0.000
		C	0.000	0.000	0.000	0.000
T9	80.00-60.00	A	4.052	8.166	0.000	0.000
		B	3.578	7.661	0.000	0.000
		C	0.000	0.000	0.000	0.000
T10	60.00-40.00	A	4.254	8.413	0.000	0.000
		B	3.756	7.893	0.000	0.000
		C	0.000	0.000	0.000	0.000
T11	40.00-30.00	A	2.078	4.113	0.000	0.000
		B	1.835	3.859	0.000	0.000
		C	0.000	0.000	0.000	0.000
T12	30.00-20.00	A	2.051	4.061	0.000	0.000
		B	1.812	3.810	0.000	0.000
		C	0.000	0.000	0.000	0.000
T13	20.00-0.00	A	4.310	8.927	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		B	3.806	8.375	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.00-160.00	-0.5185	-6.3388	-0.5670	-6.9108
T2	160.00-140.00	-15.5661	-0.6285	-16.3920	-0.8206
T3	140.00-133.33	-15.7453	-0.5997	-16.9998	-0.8127
T4	133.33-126.67	-6.9782	3.1066	-7.1479	3.1938
T5	126.67-120.00	-5.4250	-5.2353	-5.4588	-5.6286
T6	120.00-100.00	-5.4800	-8.4616	-5.6133	-9.3705
T7	100.00-90.00	-5.8843	-9.1647	-6.1005	-10.3747
T8	90.00-80.00	-6.3121	-9.7786	-6.5441	-11.0743
T9	80.00-60.00	-6.2759	-9.6602	-6.6819	-11.2326
T10	60.00-40.00	-6.7520	-10.3236	-7.2494	-12.1001
T11	40.00-30.00	-7.2161	-10.9880	-7.7506	-12.8876
T12	30.00-20.00	-7.5142	-11.4146	-8.0730	-13.3940
T13	20.00-0.00	-8.1785	-12.3845	-8.7350	-14.4273

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
3' Yagi	A	From Leg	1.50	0.0000	180.00	No Ice	2.08	2.08	0.03
(CSP-1)			0.00 0.00			1/2" Ice	3.79	3.79	0.05
Standoff	A	None		0.0000	180.00	No Ice	0.52	0.52	0.02
(CSP)						1/2" Ice	0.79	0.79	0.02
Valmont Single Dish Standoff	C	None		0.0000	177.00	No Ice	2.64	2.64	0.04
(1)						1/2" Ice	3.69	3.69	0.05
(CSP)									
AP11-850	B	From Face	1.00	0.0000	175.00	No Ice	4.96	2.25	0.01
(CSP-46)			3.00 0.00			1/2" Ice	5.36	2.57	0.04
AP11-850	B	From Face	1.00	0.0000	175.00	No Ice	4.96	2.25	0.01
(CSP-47)			-3.00 0.00			1/2" Ice	5.36	2.57	0.04
Valmont Single Dish Standoff	B	None		0.0000	170.00	No Ice	2.64	2.64	0.04
(1)						1/2" Ice	3.69	3.69	0.05
(Verizon)									
SC479-HF1LDF	C	From Leg	3.00	0.0000	170.00	No Ice	5.06	5.06	0.03
(CSP-59)			0.00 -11.00			1/2" Ice	6.54	6.54	0.07
SC479-HF1LDF	C	From Leg	1.00	0.0000	170.00	No Ice	5.06	5.06	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(CSP-56)			0.00 0.00			1/2" Ice	6.54	6.54	0.07
SC479-HF1LDF	C	From Leg	1.00	0.0000	170.00	No Ice	5.06	5.06	0.03
(CSP-57)			0.00 0.00			1/2" Ice	6.54	6.54	0.07
SC479-HF1LDF	C	From Leg	1.00	0.0000	170.00	No Ice	5.06	5.06	0.03
(CSP-58)			0.00 0.00			1/2" Ice	6.54	6.54	0.07
TMA	C	From Leg	1.00	0.0000	170.00	No Ice	1.06	0.45	0.02
(CSP-60)			0.00 0.00			1/2" Ice	1.21	0.57	0.03
Standoff	B	None		0.0000	170.00	No Ice	0.52	0.52	0.02
(CSP)						1/2" Ice	0.79	0.79	0.02
Standoff	C	None		0.0000	170.00	No Ice	0.52	0.52	0.02
(CSP)						1/2" Ice	0.79	0.79	0.02
VHF-150 2' Dipole	C	From Leg	1.50	0.0000	167.00	No Ice	5.28	2.73	0.06
(CSP-22)			0.00 0.00			1/2" Ice	5.74	3.77	0.10
Standoff	A	None		0.0000	160.00	No Ice	0.52	0.52	0.02
(CSP)						1/2" Ice	0.79	0.79	0.02
Standoff	A	None		0.0000	160.00	No Ice	0.52	0.52	0.02
(CSP)						1/2" Ice	0.79	0.79	0.02
Standoff	C	None		0.0000	160.00	No Ice	0.52	0.52	0.02
(CSP)						1/2" Ice	0.79	0.79	0.02
OGT9-806	A	From Leg	3.00	0.0000	160.00	No Ice	2.15	2.15	0.02
(CSP-48)			3.00 -11.00			1/2" Ice	3.25	3.25	0.03
OGT9-806	A	From Leg	3.00	0.0000	160.00	No Ice	2.15	2.15	0.02
(CSP-49)			-3.00 -11.00			1/2" Ice	3.25	3.25	0.03
DB536	C	From Leg	3.00	0.0000	160.00	No Ice	2.83	2.83	0.02
(CSP-45)			0.00 0.00			1/2" Ice	3.99	3.99	0.04
Pirod 15' T-Frame Sector Mount (1)	A	None		0.0000	160.00	No Ice	15.00	15.00	0.50
(Verizon)						1/2" Ice	20.60	20.60	0.65
Pirod 15' T-Frame Sector Mount (1)	B	None		0.0000	160.00	No Ice	15.00	15.00	0.50
(Verizon)						1/2" Ice	20.60	20.60	0.65
Pirod 15' T-Frame Sector Mount (1)	C	None		0.0000	160.00	No Ice	15.00	15.00	0.50
(Verizon)						1/2" Ice	20.60	20.60	0.65
P65-15-XL-2	A	From Face	3.00	0.0000	160.00	No Ice	8.54	5.99	0.07
(Verizon)			2.00 0.00			1/2" Ice	9.13	6.89	0.13
P65-15-XL-2	B	From Face	3.00	0.0000	160.00	No Ice	8.54	5.99	0.07
(Verizon)			2.00 0.00			1/2" Ice	9.13	6.89	0.13
P65-15-XL-2	C	From Face	3.00	0.0000	160.00	No Ice	8.54	5.99	0.07
(Verizon)			2.00 0.00			1/2" Ice	9.13	6.89	0.13
Rymsa MG D3-800Tx	A	From Face	3.00	0.0000	160.00	No Ice	3.57	3.43	0.03
(Verizon)			4.00 0.00			1/2" Ice	3.94	4.07	0.06
Rymsa MG D3-800Tx	B	From Face	3.00	0.0000	160.00	No Ice	3.57	3.43	0.03
(Verizon)			4.00 0.00			1/2" Ice	3.94	4.07	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Rymsa MG D3-800Tx	C	From Face	3.00	0.0000	160.00	No Ice	3.57	3.43	0.03
(Verizon)			4.00			1/2" Ice	3.94	4.07	0.06
			0.00						
(2) Diplexer	A	From Leg	3.00	0.0000	160.00	No Ice	0.47	0.12	0.01
(Verizon)			0.00			1/2" Ice	0.56	0.17	0.01
			0.00						
(2) Diplexer	B	From Leg	3.00	0.0000	160.00	No Ice	0.47	0.12	0.01
(Verizon)			0.00			1/2" Ice	0.56	0.17	0.01
			0.00						
(2) Diplexer	C	From Leg	3.00	0.0000	160.00	No Ice	0.47	0.12	0.01
(Verizon)			0.00			1/2" Ice	0.56	0.17	0.01
			0.00						
GPS	C	From Face	1.00	0.0000	125.00	No Ice	0.00	0.00	0.00
(GPS)			0.00			1/2" Ice	0.00	0.00	0.00
			0.00						
VHF-150 2' Dipole	A	From Leg	1.50	0.0000	110.00	No Ice	5.28	2.73	0.06
(CSP-44)			0.00			1/2" Ice	5.74	3.77	0.10
			0.00						
BXA-171063-12CF-EDIN-X	A	From Face	3.00	0.0000	160.00	No Ice	4.80	3.63	0.01
(Verizon)			0.00			1/2" Ice	5.25	4.06	0.04
			0.00						
BXA-171063-12CF-EDIN-X	B	From Face	3.00	0.0000	160.00	No Ice	4.80	3.63	0.01
(Verizon)			0.00			1/2" Ice	5.25	4.06	0.04
			0.00						
BXA-171063-12CF-EDIN-X	C	From Face	3.00	0.0000	160.00	No Ice	4.80	3.63	0.01
(Verizon)			0.00			1/2" Ice	5.25	4.06	0.04
			0.00						
BXA-70080-4CF	A	From Face	3.00	0.0000	160.00	No Ice	3.69	2.79	0.02
(Verizon)			-2.00			1/2" Ice	4.06	3.10	0.05
			0.00						
BXA-70063-4CF-EDIN-X	B	From Face	3.00	0.0000	160.00	No Ice	5.16	2.52	0.01
(Verizon)			-2.00			1/2" Ice	5.55	2.82	0.04
			0.00						
BXA-70063-4CF-EDIN-X	C	From Face	3.00	0.0000	160.00	No Ice	5.16	2.52	0.01
(Verizon)			-2.00			1/2" Ice	5.55	2.82	0.04
			0.00						
RH_2X40-AWS	A	From Leg	3.00	0.0000	160.00	No Ice	2.52	1.59	0.04
(Verizon)			0.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RH_2X40-AWS	B	From Leg	3.00	0.0000	160.00	No Ice	2.52	1.59	0.04
(Verizon)			0.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RH_2X40-AWS	C	From Leg	3.00	0.0000	160.00	No Ice	2.52	1.59	0.04
(Verizon)			0.00			1/2" Ice	2.75	1.80	0.06
			0.00						
Raycap DC6-48-60-18-8F	C	From Face	3.00	0.0000	160.00	No Ice	1.27	1.27	0.05
DC Power Surge Protection			0.00			1/2" Ice	1.46	1.46	0.07
(Verizon)			0.00						
4' Standoff	C	None		0.0000	60.00	No Ice	3.42	3.42	0.11
(GPS)						1/2" Ice	3.67	3.67	0.15
Pirod 15' T-Frame Sector	A	None		0.0000	133.00	No Ice	15.00	15.00	0.50
Mount (1)						1/2" Ice	20.60	20.60	0.65
(AT&T)									
Pirod 15' T-Frame Sector	B	None		0.0000	133.00	No Ice	15.00	15.00	0.50
Mount (1)						1/2" Ice	20.60	20.60	0.65
(AT&T)									
Pirod 15' T-Frame Sector	C	None		0.0000	133.00	No Ice	15.00	15.00	0.50

tnxTower	Job: 180' CSP Lattice Tower	Page: 15 of 52
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Project: Westport, Connecticut / NSS-020	Date: 09:51:57 02/23/15
	Client: Northeast Site Solutions / T-Mobile	Designed by: MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount (1)						1/2" Ice	20.60	20.60	0.65
(AT&T)									
(3) P65-16-XLH-RR	A	From Face	3.00	0.0000	133.00	No Ice	8.40	4.70	0.06
(AT&T)			0.00			1/2" Ice	8.95	5.15	0.11
			0.00						
(3) P65-16-XLH-RR	B	From Face	3.00	0.0000	133.00	No Ice	8.40	4.70	0.06
(AT&T)			0.00			1/2" Ice	8.95	5.15	0.11
			0.00						
(3) P65-16-XLH-RR	C	From Face	3.00	0.0000	133.00	No Ice	8.40	4.70	0.06
(AT&T)			0.00			1/2" Ice	8.95	5.15	0.11
			0.00						
(2) RRUS-11	A	From Leg	3.00	0.0000	133.00	No Ice	3.00	1.53	0.06
(AT&T - LTE)			0.00			1/2" Ice	3.23	1.82	0.08
			0.00						
(2) RRUS-11	B	From Leg	3.00	0.0000	133.00	No Ice	3.00	1.53	0.06
(AT&T - LTE)			0.00			1/2" Ice	3.23	1.82	0.08
			0.00						
(2) RRUS-11	C	From Leg	3.00	0.0000	133.00	No Ice	3.00	1.53	0.06
(AT&T - LTE)			0.00			1/2" Ice	3.23	1.82	0.08
			0.00						
RRUS-11	A	From Leg	3.00	0.0000	133.00	No Ice	3.00	1.53	0.06
(AT&T - UMTS)			0.00			1/2" Ice	3.23	1.82	0.08
			0.00						
RRUS-11	B	From Leg	3.00	0.0000	133.00	No Ice	3.00	1.53	0.06
(AT&T - UMTS)			0.00			1/2" Ice	3.23	1.82	0.08
			0.00						
RRUS-11	C	From Leg	3.00	0.0000	133.00	No Ice	3.00	1.53	0.06
(AT&T - UMTS)			0.00			1/2" Ice	3.23	1.82	0.08
			0.00						
DC6-48-60-18-8F	C	None		0.0000	133.00	No Ice	1.27	1.27	0.02
(AT&T - LTE)						1/2" Ice	1.46	1.46	0.04
DC6-48-60-18-8F	C	None		0.0000	133.00	No Ice	1.27	1.27	0.02
(AT&T - UMTS)						1/2" Ice	1.46	1.46	0.04
Twin TMAs	A	From Leg	3.00	0.0000	133.00	No Ice	0.68	0.45	0.01
(AT&T)			0.00			1/2" Ice	0.80	0.56	0.02
			0.00						
Twin TMAs	B	From Leg	3.00	0.0000	133.00	No Ice	0.68	0.45	0.01
(AT&T)			0.00			1/2" Ice	0.80	0.56	0.02
			0.00						
Twin TMAs	C	From Leg	3.00	0.0000	133.00	No Ice	0.68	0.45	0.01
(AT&T)			0.00			1/2" Ice	0.80	0.56	0.02
			0.00						
AIR21 B2A/B4P	A	From Face	3.00	0.0000	125.00	No Ice	6.53	5.56	0.11
(T-Mobile)			-4.00			1/2" Ice	6.98	6.26	0.17
			0.00						
AIR21 B2A/B4P	B	From Face	3.00	0.0000	125.00	No Ice	6.53	5.56	0.11
(T-Mobile)			-4.00			1/2" Ice	6.98	6.26	0.17
			0.00						
AIR21 B2A/B4P	C	From Face	3.00	0.0000	125.00	No Ice	6.53	5.56	0.11
(T-Mobile)			-4.00			1/2" Ice	6.98	6.26	0.17
			0.00						
TMA	A	From Face	3.00	0.0000	125.00	No Ice	1.06	0.45	0.02
(T-Mobile)			0.00			1/2" Ice	1.21	0.57	0.03
			0.00						
TMA	B	From Face	3.00	0.0000	125.00	No Ice	1.06	0.45	0.02
(T-Mobile)			0.00			1/2" Ice	1.21	0.57	0.03
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
TMA	C	From Face	3.00	0.0000	125.00	No Ice	1.06	0.45	0.02
(T-Mobile)			0.00			1/2" Ice	1.21	0.57	0.03
			0.00						
LNX-6515DS-VTM	A	From Face	3.00	0.0000	125.00	No Ice	11.39	9.96	0.09
(T-Mobile)			0.00			1/2" Ice	12.01	11.38	0.18
			0.00						
LNX-6515DS-VTM	B	From Face	3.00	0.0000	125.00	No Ice	11.39	9.96	0.09
(T-Mobile)			0.00			1/2" Ice	12.01	11.38	0.18
			0.00						
LNX-6515DS-VTM	C	From Face	3.00	0.0000	125.00	No Ice	11.39	9.96	0.09
(T-Mobile)			0.00			1/2" Ice	12.01	11.38	0.18
			0.00						
AIR21 B2A/B4P	A	From Face	3.00	0.0000	125.00	No Ice	6.53	5.56	0.11
(T-Mobile)			4.00			1/2" Ice	6.98	6.26	0.17
			0.00						
AIR21 B2A/B4P	B	From Face	3.00	0.0000	125.00	No Ice	6.53	5.56	0.11
(T-Mobile)			4.00			1/2" Ice	6.98	6.26	0.17
			0.00						
AIR21 B2A/B4P	C	From Face	3.00	0.0000	125.00	No Ice	6.53	5.56	0.11
(T-Mobile)			4.00			1/2" Ice	6.98	6.26	0.17
			0.00						
LTF12=372 Sector Mount (1)	A	None		0.0000	125.00	No Ice	13.60	13.60	0.47
(T-Mobile)						1/2" Ice	18.40	18.40	0.60
LTF12=372 Sector Mount (1)	B	None		0.0000	125.00	No Ice	13.60	13.60	0.47
(T-Mobile)						1/2" Ice	18.40	18.40	0.60
LTF12=372 Sector Mount (1)	C	None		0.0000	125.00	No Ice	13.60	13.60	0.47
(T-Mobile)						1/2" Ice	18.40	18.40	0.60
RRUS-11	A	From Face	3.00	0.0000	125.00	No Ice	3.00	1.53	0.06
(T-Mobile)			0.00			1/2" Ice	3.23	1.82	0.08
			0.00						
RRUS-11	B	From Face	3.00	0.0000	125.00	No Ice	3.00	1.53	0.06
(T-Mobile)			0.00			1/2" Ice	3.23	1.82	0.08
			0.00						
RRUS-11	C	From Face	3.00	0.0000	125.00	No Ice	3.00	1.53	0.06
(T-Mobile)			0.00			1/2" Ice	3.23	1.82	0.08
			0.00						
8' Panel Antenna	B	From Face	0.00	0.0000	167.00	No Ice	11.39	9.96	0.09
(Unknown)			0.00			1/2" Ice	12.01	11.38	0.18
			0.00						

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
PA6-65AC	C	Paraboloid w/o	From	1.00	Worst		177.00	6.00	No Ice	28.27	0.09
(CSP-42)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00							
HP6-65	B	Paraboloid	From	1.00	Worst		170.00	6.00	No Ice	28.27	0.14

tnxTower	Job: 180' CSP Lattice Tower	Page: 17 of 52
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Project: Westport, Connecticut / NSS-020	Date: 09:51:57 02/23/15
	Client: Northeast Site Solutions / T-Mobile	Designed by: MCD

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
(Verizon)		w/Shroud (HP)	Leg	0.00 0.00					1/2" Ice	29.05	0.29

Tower Pressures - No Ice

$G_H = 1.121$

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	170.00	1.597	33	177.503	A	0.000	33.975	11.667	34.34	0.000	0.000
180.00-160.00					B	0.000	24.699		47.24	0.000	0.000
					C	0.000	24.699		47.24	0.000	0.000
T2	150.00	1.541	32	200.850	A	0.000	85.008	15.027	17.68	0.000	0.000
160.00-140.00					B	0.000	28.825		52.13	0.000	0.000
					C	0.000	28.825		52.13	0.000	0.000
T3	136.67	1.501	31	76.803	A	0.000	30.260	6.192	20.46	0.000	0.000
140.00-133.33					B	0.000	11.577		53.49	0.000	0.000
					C	0.000	11.577		53.49	0.000	0.000
T4	130.00	1.48	31	81.431	A	0.000	30.506	6.192	20.30	0.000	0.000
133.33-126.67					B	0.000	18.708		33.10	0.000	0.000
					C	0.000	11.792		52.51	0.000	0.000
T5	123.33	1.457	30	86.060	A	0.000	30.768	6.192	20.13	0.000	0.000
126.67-120.00					B	0.000	26.477		23.39	0.000	0.000
					C	0.000	12.028		51.48	0.000	0.000
T6	110.00	1.411	29	289.399	A	0.000	96.041	22.130	23.04	0.000	0.000
120.00-100.00					B	0.000	89.761		24.65	0.000	0.000
					C	0.000	38.601		57.33	0.000	0.000
T7	95.00	1.353	28	162.540	A	0.000	50.034	11.074	22.13	0.000	0.000
100.00-90.00					B	0.000	46.666		23.73	0.000	0.000
					C	0.000	21.227		52.17	0.000	0.000
T8 90.00-80.00	85.00	1.31	27	175.715	A	0.000	50.617	11.074	21.88	0.000	0.000
					B	0.000	47.242		23.44	0.000	0.000
					C	0.000	21.747		50.92	0.000	0.000
T9 80.00-60.00	70.00	1.24	26	392.943	A	0.000	110.636	28.825	26.05	0.000	0.000
					B	0.000	103.899		27.74	0.000	0.000
					C	0.000	53.013		54.37	0.000	0.000
T10	50.00	1.126	23	442.943	A	0.000	115.077	28.825	25.05	0.000	0.000
60.00-40.00					B	0.000	108.364		26.60	0.000	0.000
					C	0.000	57.656		49.99	0.000	0.000
T11	35.00	1.017	21	240.222	A	0.000	58.518	14.412	24.63	0.000	0.000
40.00-30.00					B	0.000	55.156		26.13	0.000	0.000
					C	0.000	29.759		48.43	0.000	0.000
T12	25.00	1	21	252.722	A	0.000	59.174	14.412	24.36	0.000	0.000
30.00-20.00					B	0.000	55.808		25.82	0.000	0.000
					C	0.000	30.387		47.43	0.000	0.000
T13 20.00-0.00	10.00	1	21	542.943	A	0.000	116.942	28.825	24.65	0.000	0.000
					B	0.000	110.236		26.15	0.000	0.000
					C	0.000	59.577		48.38	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.121$

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2	e	ft^2	ft^2	ft^2		ft^2	ft^2
T1	170.00	1.597	33	0.5000	179.170	A	0.000	48.019	15.000	31.24	0.000	0.000
180.00-160.00						B	0.000	33.933		44.20	0.000	0.000
						C	0.000	33.933		44.20	0.000	0.000
T2	150.00	1.541	32	0.5000	202.519	A	0.000	120.873	18.366	15.19	0.000	0.000
160.00-140.00						B	0.000	38.423		47.80	0.000	0.000
						C	0.000	38.423		47.80	0.000	0.000
T3	136.67	1.501	31	0.5000	77.359	A	0.000	42.421	7.305	17.22	0.000	0.000
140.00-133.33						B	0.000	14.954		48.85	0.000	0.000
						C	0.000	14.954		48.85	0.000	0.000
T4	130.00	1.48	31	0.5000	81.988	A	0.000	42.793	7.305	17.07	0.000	0.000
133.33-126.67						B	0.844	26.201		27.01	0.000	0.000
						C	0.000	15.260		47.87	0.000	0.000
T5	123.33	1.457	30	0.5000	86.617	A	0.000	43.184	7.305	16.92	0.000	0.000
126.67-120.00						B	0.889	37.797		18.88	0.000	0.000
						C	0.000	15.595		46.85	0.000	0.000
T6	110.00	1.411	29	0.5000	291.068	A	0.000	133.899	25.470	19.02	0.000	0.000
120.00-100.00						B	2.667	127.090		19.63	0.000	0.000
						C	0.000	48.043		53.02	0.000	0.000
T7 100.00-90.00	95.00	1.353	28	0.5000	163.375	A	0.000	69.544	12.745	18.33	0.000	0.000
						B	1.333	65.528		19.06	0.000	0.000
						C	0.000	26.187		48.67	0.000	0.000
T8 90.00-80.00	85.00	1.31	27	0.5000	176.550	A	0.000	70.372	12.745	18.11	0.000	0.000
						B	1.333	66.349		18.83	0.000	0.000
						C	0.000	26.892		47.39	0.000	0.000
T9 80.00-60.00	70.00	1.24	26	0.5000	394.613	A	0.000	150.634	32.167	21.35	0.000	0.000
						B	2.667	142.595		22.14	0.000	0.000
						C	0.000	63.792		50.42	0.000	0.000
T10 60.00-40.00	50.00	1.126	23	0.5000	444.613	A	0.000	155.742	32.167	20.65	0.000	0.000
						B	2.667	147.719		21.39	0.000	0.000
						C	0.000	69.147		46.52	0.000	0.000
T11 40.00-30.00	35.00	1.017	21	0.5000	241.056	A	0.000	79.172	16.083	20.31	0.000	0.000
						B	1.333	75.154		21.03	0.000	0.000
						C	0.000	35.781		44.95	0.000	0.000
T12 30.00-20.00	25.00	1	21	0.5000	253.556	A	0.000	80.039	16.083	20.09	0.000	0.000
						B	1.333	76.018		20.79	0.000	0.000
						C	0.000	36.596		43.95	0.000	0.000
T13 20.00-0.00	10.00	1	21	0.5000	544.613	A	0.000	158.298	32.167	20.32	0.000	0.000
						B	2.667	150.306		21.03	0.000	0.000
						C	0.000	72.216		44.54	0.000	0.000

Tower Pressure - Service

$G_H = 1.121$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2	e	ft^2	ft^2	ft^2		ft^2	ft^2
T1	170.00	1.597	10	177.503	A	0.000	33.975	11.667	34.34	0.000	0.000
180.00-160.00					B	0.000	24.699		47.24	0.000	0.000
					C	0.000	24.699		47.24	0.000	0.000
T2	150.00	1.541	10	200.850	A	0.000	85.008	15.027	17.68	0.000	0.000

tnxTower	Job: 180' CSP Lattice Tower	Page: 19 of 52
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Project: Westport, Connecticut / NSS-020	Date: 09:51:57 02/23/15
	Client: Northeast Site Solutions / T-Mobile	Designed by: MCD

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
160.00-140.00					B	0.000	28.825		52.13	0.000	0.000
					C	0.000	28.825		52.13	0.000	0.000
T3	136.67	1.501	10	76.803	A	0.000	30.260	6.192	20.46	0.000	0.000
140.00-133.33					B	0.000	11.577		53.49	0.000	0.000
					C	0.000	11.577		53.49	0.000	0.000
T4	130.00	1.48	9	81.431	A	0.000	30.506	6.192	20.30	0.000	0.000
133.33-126.67					B	0.000	18.708		33.10	0.000	0.000
					C	0.000	11.792		52.51	0.000	0.000
T5	123.33	1.457	9	86.060	A	0.000	30.768	6.192	20.13	0.000	0.000
126.67-120.00					B	0.000	26.477		23.39	0.000	0.000
					C	0.000	12.028		51.48	0.000	0.000
T6	110.00	1.411	9	289.399	A	0.000	96.041	22.130	23.04	0.000	0.000
120.00-100.00					B	0.000	89.761		24.65	0.000	0.000
					C	0.000	38.601		57.33	0.000	0.000
T7	95.00	1.353	9	162.540	A	0.000	50.034	11.074	22.13	0.000	0.000
100.00-90.00					B	0.000	46.666		23.73	0.000	0.000
					C	0.000	21.227		52.17	0.000	0.000
T8 90.00-80.00	85.00	1.31	8	175.715	A	0.000	50.617	11.074	21.88	0.000	0.000
					B	0.000	47.242		23.44	0.000	0.000
					C	0.000	21.747		50.92	0.000	0.000
T9 80.00-60.00	70.00	1.24	8	392.943	A	0.000	110.636	28.825	26.05	0.000	0.000
					B	0.000	103.899		27.74	0.000	0.000
					C	0.000	53.013		54.37	0.000	0.000
T10	50.00	1.126	7	442.943	A	0.000	115.077	28.825	25.05	0.000	0.000
60.00-40.00					B	0.000	108.364		26.60	0.000	0.000
					C	0.000	57.656		49.99	0.000	0.000
T11	35.00	1.017	7	240.222	A	0.000	58.518	14.412	24.63	0.000	0.000
40.00-30.00					B	0.000	55.156		26.13	0.000	0.000
					C	0.000	29.759		48.43	0.000	0.000
T12	25.00	1	6	252.722	A	0.000	59.174	14.412	24.36	0.000	0.000
30.00-20.00					B	0.000	55.808		25.82	0.000	0.000
					C	0.000	30.387		47.43	0.000	0.000
T13 20.00-0.00	10.00	1	6	542.943	A	0.000	116.942	28.825	24.65	0.000	0.000
					B	0.000	110.236		26.15	0.000	0.000
					C	0.000	59.577		48.38	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	0.10	1.25	A	0.191	2.625	0.589	1	1	20.001	1.95	97.46	A
180.00-160.00			B	0.139	2.812	0.58	1	1	14.322			
			C	0.139	2.812	0.58	1	1	14.322			
T2	0.38	1.50	A	0.423	2.02	0.661	1	1	56.220	4.07	203.39	A
160.00-140.00			B	0.144	2.796	0.581	1	1	16.733			
			C	0.144	2.796	0.581	1	1	16.733			
T3	0.13	0.83	A	0.394	2.076	0.649	1	1	19.644	1.42	213.38	A
140.00-133.33			B	0.151	2.769	0.582	1	1	6.733			
			C	0.151	2.769	0.582	1	1	6.733			
T4	0.19	0.84	A	0.375	2.116	0.642	1	1	19.572	1.42	213.67	A
133.33-126.67			B	0.23	2.5	0.597	1	1	11.167			
			C	0.145	2.791	0.581	1	1	6.848			
T5	0.26	0.86	A	0.358	2.154	0.635	1	1	19.543	1.43	213.92	A
126.67-120.00			B	0.308	2.276	0.618	1	1	16.370			
			C	0.14	2.81	0.58	1	1	6.976			

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
T6	0.87	2.93	A	0.332	2.215	0.626	1	1	60.138	4.37	218.33	A
120.00-100.00			B	0.31	2.269	0.619	1	1	55.568			
			C	0.133	2.834	0.579	1	1	22.353			
T7	0.44	1.68	A	0.308	2.275	0.618	1	1	30.937	2.21	221.32	A
100.00-90.00			B	0.287	2.331	0.612	1	1	28.562			
			C	0.131	2.844	0.579	1	1	12.284			
T8	0.44	1.72	A	0.288	2.328	0.612	1	1	30.994	2.20	219.78	A
90.00-80.00			B	0.269	2.382	0.607	1	1	28.670			
			C	0.124	2.87	0.578	1	1	12.566			
T9	0.88	4.10	A	0.282	2.346	0.61	1	1	67.536	4.57	228.28	A
80.00-60.00			B	0.264	2.395	0.606	1	1	62.927			
			C	0.135	2.828	0.579	1	1	30.710			
T10	0.88	4.70	A	0.26	2.408	0.604	1	1	69.555	4.38	219.22	A
60.00-40.00			B	0.245	2.454	0.601	1	1	65.075			
			C	0.13	2.846	0.579	1	1	33.362			
T11	0.44	2.44	A	0.244	2.457	0.6	1	1	35.126	2.04	203.98	A
40.00-30.00			B	0.23	2.5	0.597	1	1	32.922			
			C	0.124	2.87	0.578	1	1	17.195			
T12	0.44	2.50	A	0.234	2.486	0.598	1	1	35.383	2.04	204.44	A
30.00-20.00			B	0.221	2.528	0.595	1	1	33.199			
			C	0.12	2.884	0.577	1	1	17.545			
T13	0.88	5.17	A	0.215	2.545	0.594	1	1	69.424	4.11	205.36	A
20.00-0.00			B	0.203	2.586	0.591	1	1	65.152			
			C	0.11	2.925	0.576	1	1	34.325			
Sum Weight:	6.30	30.51						OTM	3076.79 kip-ft	36.21		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
T1	0.10	1.25	A	0.191	2.625	0.589	0.825	1	20.001	1.95	97.46	A
180.00-160.00			B	0.139	2.812	0.58	0.825	1	14.322			
			C	0.139	2.812	0.58	0.825	1	14.322			
T2	0.38	1.50	A	0.423	2.02	0.661	0.825	1	56.220	4.07	203.39	A
160.00-140.00			B	0.144	2.796	0.581	0.825	1	16.733			
			C	0.144	2.796	0.581	0.825	1	16.733			
T3	0.13	0.83	A	0.394	2.076	0.649	0.825	1	19.644	1.42	213.38	A
140.00-133.33			B	0.151	2.769	0.582	0.825	1	6.733			
			C	0.151	2.769	0.582	0.825	1	6.733			
T4	0.19	0.84	A	0.375	2.116	0.642	0.825	1	19.572	1.42	213.67	A
133.33-126.67			B	0.23	2.5	0.597	0.825	1	11.167			
			C	0.145	2.791	0.581	0.825	1	6.848			
T5	0.26	0.86	A	0.358	2.154	0.635	0.825	1	19.543	1.43	213.92	A
126.67-120.00			B	0.308	2.276	0.618	0.825	1	16.370			
			C	0.14	2.81	0.58	0.825	1	6.976			
T6	0.87	2.93	A	0.332	2.215	0.626	0.825	1	60.138	4.37	218.33	A
120.00-100.00			B	0.31	2.269	0.619	0.825	1	55.568			
			C	0.133	2.834	0.579	0.825	1	22.353			
T7	0.44	1.68	A	0.308	2.275	0.618	0.825	1	30.937	2.21	221.32	A
100.00-90.00			B	0.287	2.331	0.612	0.825	1	28.562			
			C	0.131	2.844	0.579	0.825	1	12.284			
T8	0.44	1.72	A	0.288	2.328	0.612	0.825	1	30.994	2.20	219.78	A
90.00-80.00			B	0.269	2.382	0.607	0.825	1	28.670			

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	0.124	2.87	0.578	0.825	1	12.566			
T9	0.88	4.10	A	0.282	2.346	0.61	0.825	1	67.536	4.57	228.28	A
80.00-60.00			B	0.264	2.395	0.606	0.825	1	62.927			
			C	0.135	2.828	0.579	0.825	1	30.710			
T10	0.88	4.70	A	0.26	2.408	0.604	0.825	1	69.555	4.38	219.22	A
60.00-40.00			B	0.245	2.454	0.601	0.825	1	65.075			
			C	0.13	2.846	0.579	0.825	1	33.362			
T11	0.44	2.44	A	0.244	2.457	0.6	0.825	1	35.126	2.04	203.98	A
40.00-30.00			B	0.23	2.5	0.597	0.825	1	32.922			
			C	0.124	2.87	0.578	0.825	1	17.195			
T12	0.44	2.50	A	0.234	2.486	0.598	0.825	1	35.383	2.04	204.44	A
30.00-20.00			B	0.221	2.528	0.595	0.825	1	33.199			
			C	0.12	2.884	0.577	0.825	1	17.545			
T13	0.88	5.17	A	0.215	2.545	0.594	0.825	1	69.424	4.11	205.36	A
20.00-0.00			B	0.203	2.586	0.591	0.825	1	65.152			
			C	0.11	2.925	0.576	0.825	1	34.325			
Sum Weight:	6.30	30.51						OTM	3076.79 kip-ft	36.21		

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	0.10	1.25	A	0.191	2.625	0.589	0.8	1	20.001	1.95	97.46	A
180.00-160.00			B	0.139	2.812	0.58	0.8	1	14.322			
			C	0.139	2.812	0.58	0.8	1	14.322			
T2	0.38	1.50	A	0.423	2.02	0.661	0.8	1	56.220	4.07	203.39	A
160.00-140.00			B	0.144	2.796	0.581	0.8	1	16.733			
			C	0.144	2.796	0.581	0.8	1	16.733			
T3	0.13	0.83	A	0.394	2.076	0.649	0.8	1	19.644	1.42	213.38	A
140.00-133.33			B	0.151	2.769	0.582	0.8	1	6.733			
			C	0.151	2.769	0.582	0.8	1	6.733			
T4	0.19	0.84	A	0.375	2.116	0.642	0.8	1	19.572	1.42	213.67	A
133.33-126.67			B	0.23	2.5	0.597	0.8	1	11.167			
			C	0.145	2.791	0.581	0.8	1	6.848			
T5	0.26	0.86	A	0.358	2.154	0.635	0.8	1	19.543	1.43	213.92	A
126.67-120.00			B	0.308	2.276	0.618	0.8	1	16.370			
			C	0.14	2.81	0.58	0.8	1	6.976			
T6	0.87	2.93	A	0.332	2.215	0.626	0.8	1	60.138	4.37	218.33	A
120.00-100.00			B	0.31	2.269	0.619	0.8	1	55.568			
			C	0.133	2.834	0.579	0.8	1	22.353			
T7	0.44	1.68	A	0.308	2.275	0.618	0.8	1	30.937	2.21	221.32	A
100.00-90.00			B	0.287	2.331	0.612	0.8	1	28.562			
			C	0.131	2.844	0.579	0.8	1	12.284			
T8	0.44	1.72	A	0.288	2.328	0.612	0.8	1	30.994	2.20	219.78	A
90.00-80.00			B	0.269	2.382	0.607	0.8	1	28.670			
			C	0.124	2.87	0.578	0.8	1	12.566			
T9	0.88	4.10	A	0.282	2.346	0.61	0.8	1	67.536	4.57	228.28	A
80.00-60.00			B	0.264	2.395	0.606	0.8	1	62.927			
			C	0.135	2.828	0.579	0.8	1	30.710			
T10	0.88	4.70	A	0.26	2.408	0.604	0.8	1	69.555	4.38	219.22	A
60.00-40.00			B	0.245	2.454	0.601	0.8	1	65.075			
			C	0.13	2.846	0.579	0.8	1	33.362			
T11	0.44	2.44	A	0.244	2.457	0.6	0.8	1	35.126	2.04	203.98	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
40.00-30.00			B	0.23	2.5	0.597	0.8	1	32.922			
			C	0.124	2.87	0.578	0.8	1	17.195			
T12	0.44	2.50	A	0.234	2.486	0.598	0.8	1	35.383	2.04	204.44	A
30.00-20.00			B	0.221	2.528	0.595	0.8	1	33.199			
			C	0.12	2.884	0.577	0.8	1	17.545			
T13	0.88	5.17	A	0.215	2.545	0.594	0.8	1	69.424	4.11	205.36	A
20.00-0.00			B	0.203	2.586	0.591	0.8	1	65.152			
			C	0.11	2.925	0.576	0.8	1	34.325			
Sum Weight:	6.30	30.51						OTM	3076.79 kip-ft	36.21		

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	0.10	1.25	A	0.191	2.625	0.589	0.85	1	20.001	1.95	97.46	A
180.00-160.00			B	0.139	2.812	0.58	0.85	1	14.322			
			C	0.139	2.812	0.58	0.85	1	14.322			
T2	0.38	1.50	A	0.423	2.02	0.661	0.85	1	56.220	4.07	203.39	A
160.00-140.00			B	0.144	2.796	0.581	0.85	1	16.733			
			C	0.144	2.796	0.581	0.85	1	16.733			
T3	0.13	0.83	A	0.394	2.076	0.649	0.85	1	19.644	1.42	213.38	A
140.00-133.33			B	0.151	2.769	0.582	0.85	1	6.733			
			C	0.151	2.769	0.582	0.85	1	6.733			
T4	0.19	0.84	A	0.375	2.116	0.642	0.85	1	19.572	1.42	213.67	A
133.33-126.67			B	0.23	2.5	0.597	0.85	1	11.167			
			C	0.145	2.791	0.581	0.85	1	6.848			
T5	0.26	0.86	A	0.358	2.154	0.635	0.85	1	19.543	1.43	213.92	A
126.67-120.00			B	0.308	2.276	0.618	0.85	1	16.370			
			C	0.14	2.81	0.58	0.85	1	6.976			
T6	0.87	2.93	A	0.332	2.215	0.626	0.85	1	60.138	4.37	218.33	A
120.00-100.00			B	0.31	2.269	0.619	0.85	1	55.568			
			C	0.133	2.834	0.579	0.85	1	22.353			
T7	0.44	1.68	A	0.308	2.275	0.618	0.85	1	30.937	2.21	221.32	A
100.00-90.00			B	0.287	2.331	0.612	0.85	1	28.562			
			C	0.131	2.844	0.579	0.85	1	12.284			
T8	0.44	1.72	A	0.288	2.328	0.612	0.85	1	30.994	2.20	219.78	A
90.00-80.00			B	0.269	2.382	0.607	0.85	1	28.670			
			C	0.124	2.87	0.578	0.85	1	12.566			
T9	0.88	4.10	A	0.282	2.346	0.61	0.85	1	67.536	4.57	228.28	A
80.00-60.00			B	0.264	2.395	0.606	0.85	1	62.927			
			C	0.135	2.828	0.579	0.85	1	30.710			
T10	0.88	4.70	A	0.26	2.408	0.604	0.85	1	69.555	4.38	219.22	A
60.00-40.00			B	0.245	2.454	0.601	0.85	1	65.075			
			C	0.13	2.846	0.579	0.85	1	33.362			
T11	0.44	2.44	A	0.244	2.457	0.6	0.85	1	35.126	2.04	203.98	A
40.00-30.00			B	0.23	2.5	0.597	0.85	1	32.922			
			C	0.124	2.87	0.578	0.85	1	17.195			
T12	0.44	2.50	A	0.234	2.486	0.598	0.85	1	35.383	2.04	204.44	A
30.00-20.00			B	0.221	2.528	0.595	0.85	1	33.199			
			C	0.12	2.884	0.577	0.85	1	17.545			
T13	0.88	5.17	A	0.215	2.545	0.594	0.85	1	69.424	4.11	205.36	A
20.00-0.00			B	0.203	2.586	0.591	0.85	1	65.152			
			C	0.11	2.925	0.576	0.85	1	34.325			

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:	6.30	30.51						OTM	3076.79 kip-ft	36.21		

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	0.29	1.84	A	0.268	2.385	0.607	1	1	29.130	2.58	128.95	A
180.00-160.00			B	0.189	2.632	0.588	1	1	19.963			
			C	0.189	2.632	0.588	1	1	19.963			
T2	1.11	2.15	A	0.597	1.806	0.752	1	1	90.857	5.88	293.90	A
160.00-140.00			B	0.19	2.631	0.588	1	1	22.606			
			C	0.19	2.631	0.588	1	1	22.606			
T3	0.37	1.08	A	0.548	1.845	0.723	1	1	30.686	1.97	296.24	A
140.00-133.33			B	0.193	2.619	0.589	1	1	8.809			
			C	0.193	2.619	0.589	1	1	8.809			
T4	0.55	1.10	A	0.522	1.873	0.709	1	1	30.337	1.95	293.11	A
133.33-126.67			B	0.33	2.22	0.625	1	1	17.233			
			C	0.186	2.643	0.588	1	1	8.968			
T5	0.78	1.13	A	0.499	1.902	0.697	1	1	30.089	1.94	290.77	A
126.67-120.00			B	0.447	1.979	0.672	1	1	26.278			
			C	0.18	2.664	0.587	1	1	9.147			
T6	2.57	3.73	A	0.46	1.957	0.678	1	1	90.774	5.83	291.26	A
120.00-100.00			B	0.446	1.98	0.671	1	1	87.989			
			C	0.165	2.717	0.584	1	1	28.052			
T7	1.29	2.13	A	0.426	2.015	0.662	1	1	46.066	2.92	291.90	A
100.00-90.00			B	0.409	2.046	0.655	1	1	44.282			
			C	0.16	2.734	0.583	1	1	15.270			
T8	1.29	2.19	A	0.399	2.067	0.651	1	1	45.814	2.88	288.39	A
90.00-80.00			B	0.383	2.098	0.645	1	1	44.125			
			C	0.152	2.763	0.582	1	1	15.647			
T9	2.59	5.22	A	0.382	2.101	0.644	1	1	97.056	5.88	293.81	A
80.00-60.00			B	0.368	2.131	0.639	1	1	93.800			
			C	0.162	2.729	0.583	1	1	37.211			
T10	2.59	5.98	A	0.35	2.171	0.633	1	1	98.519	5.60	279.87	A
60.00-40.00			B	0.338	2.199	0.628	1	1	95.485			
			C	0.156	2.751	0.582	1	1	40.267			
T11	1.29	3.11	A	0.328	2.223	0.625	1	1	49.484	2.60	260.02	A
40.00-30.00			B	0.317	2.251	0.621	1	1	48.030			
			C	0.148	2.777	0.581	1	1	20.797			
T12	1.29	3.19	A	0.316	2.255	0.621	1	1	49.690	2.60	260.45	A
30.00-20.00			B	0.305	2.283	0.617	1	1	48.272			
			C	0.144	2.792	0.581	1	1	21.249			
T13	2.59	6.38	A	0.291	2.321	0.613	1	1	97.050	5.24	261.79	A
20.00-0.00			B	0.281	2.348	0.61	1	1	94.389			
			C	0.133	2.837	0.579	1	1	41.811			
Sum Weight:	18.59	39.23						OTM	4146.04 kip-ft	47.87		

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	0.29	1.84	A	0.268	2.385	0.607	0.825	1	29.130	2.58	128.95	A
180.00-160.00			B	0.189	2.632	0.588	0.825	1	19.963			
			C	0.189	2.632	0.588	0.825	1	19.963			
T2	1.11	2.15	A	0.597	1.806	0.752	0.825	1	90.857	5.88	293.90	A
160.00-140.00			B	0.19	2.631	0.588	0.825	1	22.606			
			C	0.19	2.631	0.588	0.825	1	22.606			
T3	0.37	1.08	A	0.548	1.845	0.723	0.825	1	30.686	1.97	296.24	A
140.00-133.33			B	0.193	2.619	0.589	0.825	1	8.809			
			C	0.193	2.619	0.589	0.825	1	8.809			
T4	0.55	1.10	A	0.522	1.873	0.709	0.825	1	30.337	1.95	293.11	A
133.33-126.67			B	0.33	2.22	0.625	0.825	1	17.085			
			C	0.186	2.643	0.588	0.825	1	8.968			
T5	0.78	1.13	A	0.499	1.902	0.697	0.825	1	30.089	1.94	290.77	A
126.67-120.00			B	0.447	1.979	0.672	0.825	1	26.123			
			C	0.18	2.664	0.587	0.825	1	9.147			
T6	2.57	3.73	A	0.46	1.957	0.678	0.825	1	90.774	5.83	291.26	A
120.00-100.00			B	0.446	1.98	0.671	0.825	1	87.522			
			C	0.165	2.717	0.584	0.825	1	28.052			
T7	1.29	2.13	A	0.426	2.015	0.662	0.825	1	46.066	2.92	291.90	A
100.00-90.00			B	0.409	2.046	0.655	0.825	1	44.048			
			C	0.16	2.734	0.583	0.825	1	15.270			
T8	1.29	2.19	A	0.399	2.067	0.651	0.825	1	45.814	2.88	288.39	A
90.00-80.00			B	0.383	2.098	0.645	0.825	1	43.892			
			C	0.152	2.763	0.582	0.825	1	15.647			
T9	2.59	5.22	A	0.382	2.101	0.644	0.825	1	97.056	5.88	293.81	A
80.00-60.00			B	0.368	2.131	0.639	0.825	1	93.334			
			C	0.162	2.729	0.583	0.825	1	37.211			
T10	2.59	5.98	A	0.35	2.171	0.633	0.825	1	98.519	5.60	279.87	A
60.00-40.00			B	0.338	2.199	0.628	0.825	1	95.018			
			C	0.156	2.751	0.582	0.825	1	40.267			
T11	1.29	3.11	A	0.328	2.223	0.625	0.825	1	49.484	2.60	260.02	A
40.00-30.00			B	0.317	2.251	0.621	0.825	1	47.797			
			C	0.148	2.777	0.581	0.825	1	20.797			
T12	1.29	3.19	A	0.316	2.255	0.621	0.825	1	49.690	2.60	260.45	A
30.00-20.00			B	0.305	2.283	0.617	0.825	1	48.038			
			C	0.144	2.792	0.581	0.825	1	21.249			
T13	2.59	6.38	A	0.291	2.321	0.613	0.825	1	97.050	5.24	261.79	A
20.00-0.00			B	0.281	2.348	0.61	0.825	1	93.922			
			C	0.133	2.837	0.579	0.825	1	41.811			
Sum Weight:	18.59	39.23						OTM	4146.04 kip-ft	47.87		

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	0.29	1.84	A	0.268	2.385	0.607	0.8	1	29.130	2.58	128.95	A
180.00-160.00			B	0.189	2.632	0.588	0.8	1	19.963			
			C	0.189	2.632	0.588	0.8	1	19.963			
T2	1.11	2.15	A	0.597	1.806	0.752	0.8	1	90.857	5.88	293.90	A
160.00-140.00			B	0.19	2.631	0.588	0.8	1	22.606			
			C	0.19	2.631	0.588	0.8	1	22.606			
T3	0.37	1.08	A	0.548	1.845	0.723	0.8	1	30.686	1.97	296.24	A

tnxTower	Job: 180' CSP Lattice Tower	Page: 25 of 52
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Project: Westport, Connecticut / NSS-020	Date: 09:51:57 02/23/15
	Client: Northeast Site Solutions / T-Mobile	Designed by: MCD

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
140.00-133.33			B	0.193	2.619	0.589	0.8	1	8.809			
			C	0.193	2.619	0.589	0.8	1	8.809			
T4	0.55	1.10	A	0.522	1.873	0.709	0.8	1	30.337	1.95	293.11	A
133.33-126.67			B	0.33	2.22	0.625	0.8	1	17.064			
			C	0.186	2.643	0.588	0.8	1	8.968			
T5	0.78	1.13	A	0.499	1.902	0.697	0.8	1	30.089	1.94	290.77	A
126.67-120.00			B	0.447	1.979	0.672	0.8	1	26.100			
			C	0.18	2.664	0.587	0.8	1	9.147			
T6	2.57	3.73	A	0.46	1.957	0.678	0.8	1	90.774	5.83	291.26	A
120.00-100.00			B	0.446	1.98	0.671	0.8	1	87.456			
			C	0.165	2.717	0.584	0.8	1	28.052			
T7	1.29	2.13	A	0.426	2.015	0.662	0.8	1	46.066	2.92	291.90	A
100.00-90.00			B	0.409	2.046	0.655	0.8	1	44.015			
			C	0.16	2.734	0.583	0.8	1	15.270			
T8	1.29	2.19	A	0.399	2.067	0.651	0.8	1	45.814	2.88	288.39	A
90.00-80.00			B	0.383	2.098	0.645	0.8	1	43.858			
			C	0.152	2.763	0.582	0.8	1	15.647			
T9	2.59	5.22	A	0.382	2.101	0.644	0.8	1	97.056	5.88	293.81	A
80.00-60.00			B	0.368	2.131	0.639	0.8	1	93.267			
			C	0.162	2.729	0.583	0.8	1	37.211			
T10	2.59	5.98	A	0.35	2.171	0.633	0.8	1	98.519	5.60	279.87	A
60.00-40.00			B	0.338	2.199	0.628	0.8	1	94.952			
			C	0.156	2.751	0.582	0.8	1	40.267			
T11	1.29	3.11	A	0.328	2.223	0.625	0.8	1	49.484	2.60	260.02	A
40.00-30.00			B	0.317	2.251	0.621	0.8	1	47.764			
			C	0.148	2.777	0.581	0.8	1	20.797			
T12	1.29	3.19	A	0.316	2.255	0.621	0.8	1	49.690	2.60	260.45	A
30.00-20.00			B	0.305	2.283	0.617	0.8	1	48.005			
			C	0.144	2.792	0.581	0.8	1	21.249			
T13	2.59	6.38	A	0.291	2.321	0.613	0.8	1	97.050	5.24	261.79	A
20.00-0.00			B	0.281	2.348	0.61	0.8	1	93.856			
			C	0.133	2.837	0.579	0.8	1	41.811			
Sum Weight:	18.59	39.23						OTM	4146.04 kip-ft	47.87		

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	0.29	1.84	A	0.268	2.385	0.607	0.85	1	29.130	2.58	128.95	A
180.00-160.00			B	0.189	2.632	0.588	0.85	1	19.963			
			C	0.189	2.632	0.588	0.85	1	19.963			
T2	1.11	2.15	A	0.597	1.806	0.752	0.85	1	90.857	5.88	293.90	A
160.00-140.00			B	0.19	2.631	0.588	0.85	1	22.606			
			C	0.19	2.631	0.588	0.85	1	22.606			
T3	0.37	1.08	A	0.548	1.845	0.723	0.85	1	30.686	1.97	296.24	A
140.00-133.33			B	0.193	2.619	0.589	0.85	1	8.809			
			C	0.193	2.619	0.589	0.85	1	8.809			
T4	0.55	1.10	A	0.522	1.873	0.709	0.85	1	30.337	1.95	293.11	A
133.33-126.67			B	0.33	2.22	0.625	0.85	1	17.106			
			C	0.186	2.643	0.588	0.85	1	8.968			
T5	0.78	1.13	A	0.499	1.902	0.697	0.85	1	30.089	1.94	290.77	A
126.67-120.00			B	0.447	1.979	0.672	0.85	1	26.145			
			C	0.18	2.664	0.587	0.85	1	9.147			

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	2.57	3.73	A	0.46	1.957	0.678	0.85	1	90.774	5.83	291.26	A
120.00-100.00			B	0.446	1.98	0.671	0.85	1	87.589			
			C	0.165	2.717	0.584	0.85	1	28.052			
T7	1.29	2.13	A	0.426	2.015	0.662	0.85	1	46.066	2.92	291.90	A
100.00-90.00			B	0.409	2.046	0.655	0.85	1	44.082			
			C	0.16	2.734	0.583	0.85	1	15.270			
T8	1.29	2.19	A	0.399	2.067	0.651	0.85	1	45.814	2.88	288.39	A
90.00-80.00			B	0.383	2.098	0.645	0.85	1	43.925			
			C	0.152	2.763	0.582	0.85	1	15.647			
T9	2.59	5.22	A	0.382	2.101	0.644	0.85	1	97.056	5.88	293.81	A
80.00-60.00			B	0.368	2.131	0.639	0.85	1	93.400			
			C	0.162	2.729	0.583	0.85	1	37.211			
T10	2.59	5.98	A	0.35	2.171	0.633	0.85	1	98.519	5.60	279.87	A
60.00-40.00			B	0.338	2.199	0.628	0.85	1	95.085			
			C	0.156	2.751	0.582	0.85	1	40.267			
T11	1.29	3.11	A	0.328	2.223	0.625	0.85	1	49.484	2.60	260.02	A
40.00-30.00			B	0.317	2.251	0.621	0.85	1	47.830			
			C	0.148	2.777	0.581	0.85	1	20.797			
T12	1.29	3.19	A	0.316	2.255	0.621	0.85	1	49.690	2.60	260.45	A
30.00-20.00			B	0.305	2.283	0.617	0.85	1	48.072			
			C	0.144	2.792	0.581	0.85	1	21.249			
T13	2.59	6.38	A	0.291	2.321	0.613	0.85	1	97.050	5.24	261.79	A
20.00-0.00			B	0.281	2.348	0.61	0.85	1	93.989			
			C	0.133	2.837	0.579	0.85	1	41.811			
Sum Weight:	18.59	39.23						OTM	4146.04 kip-ft	47.87		

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
T1	0.10	1.25	A	0.191	2.625	0.589	1	1	20.001	0.60	30.08	A
180.00-160.00			B	0.139	2.812	0.58	1	1	14.322			
			C	0.139	2.812	0.58	1	1	14.322			
T2	0.38	1.50	A	0.423	2.02	0.661	1	1	56.220	1.26	62.78	A
160.00-140.00			B	0.144	2.796	0.581	1	1	16.733			
			C	0.144	2.796	0.581	1	1	16.733			
T3	0.13	0.83	A	0.394	2.076	0.649	1	1	19.644	0.44	65.86	A
140.00-133.33			B	0.151	2.769	0.582	1	1	6.733			
			C	0.151	2.769	0.582	1	1	6.733			
T4	0.19	0.84	A	0.375	2.116	0.642	1	1	19.572	0.44	65.95	A
133.33-126.67			B	0.23	2.5	0.597	1	1	11.167			
			C	0.145	2.791	0.581	1	1	6.848			
T5	0.26	0.86	A	0.358	2.154	0.635	1	1	19.543	0.44	66.03	A
126.67-120.00			B	0.308	2.276	0.618	1	1	16.370			
			C	0.14	2.81	0.58	1	1	6.976			
T6	0.87	2.93	A	0.332	2.215	0.626	1	1	60.138	1.35	67.38	A
120.00-100.00			B	0.31	2.269	0.619	1	1	55.568			
			C	0.133	2.834	0.579	1	1	22.353			
T7	0.44	1.68	A	0.308	2.275	0.618	1	1	30.937	0.68	68.31	A
100.00-90.00			B	0.287	2.331	0.612	1	1	28.562			
			C	0.131	2.844	0.579	1	1	12.284			
T8	0.44	1.72	A	0.288	2.328	0.612	1	1	30.994	0.68	67.83	A
90.00-80.00			B	0.269	2.382	0.607	1	1	28.670			

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	0.124	2.87	0.578	1	1	12.566			
T9	0.88	4.10	A	0.282	2.346	0.61	1	1	67.536	1.41	70.46	A
80.00-60.00			B	0.264	2.395	0.606	1	1	62.927			
			C	0.135	2.828	0.579	1	1	30.710			
T10	0.88	4.70	A	0.26	2.408	0.604	1	1	69.555	1.35	67.66	A
60.00-40.00			B	0.245	2.454	0.601	1	1	65.075			
			C	0.13	2.846	0.579	1	1	33.362			
T11	0.44	2.44	A	0.244	2.457	0.6	1	1	35.126	0.63	62.96	A
40.00-30.00			B	0.23	2.5	0.597	1	1	32.922			
			C	0.124	2.87	0.578	1	1	17.195			
T12	0.44	2.50	A	0.234	2.486	0.598	1	1	35.383	0.63	63.10	A
30.00-20.00			B	0.221	2.528	0.595	1	1	33.199			
			C	0.12	2.884	0.577	1	1	17.545			
T13	0.88	5.17	A	0.215	2.545	0.594	1	1	69.424	1.27	63.38	A
20.00-0.00			B	0.203	2.586	0.591	1	1	65.152			
			C	0.11	2.925	0.576	1	1	34.325			
Sum Weight:	6.30	30.51						OTM	949.63 kip-ft	11.18		

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	0.10	1.25	A	0.191	2.625	0.589	0.825	1	20.001	0.60	30.08	A
180.00-160.00			B	0.139	2.812	0.58	0.825	1	14.322			
			C	0.139	2.812	0.58	0.825	1	14.322			
T2	0.38	1.50	A	0.423	2.02	0.661	0.825	1	56.220	1.26	62.78	A
160.00-140.00			B	0.144	2.796	0.581	0.825	1	16.733			
			C	0.144	2.796	0.581	0.825	1	16.733			
T3	0.13	0.83	A	0.394	2.076	0.649	0.825	1	19.644	0.44	65.86	A
140.00-133.33			B	0.151	2.769	0.582	0.825	1	6.733			
			C	0.151	2.769	0.582	0.825	1	6.733			
T4	0.19	0.84	A	0.375	2.116	0.642	0.825	1	19.572	0.44	65.95	A
133.33-126.67			B	0.23	2.5	0.597	0.825	1	11.167			
			C	0.145	2.791	0.581	0.825	1	6.848			
T5	0.26	0.86	A	0.358	2.154	0.635	0.825	1	19.543	0.44	66.03	A
126.67-120.00			B	0.308	2.276	0.618	0.825	1	16.370			
			C	0.14	2.81	0.58	0.825	1	6.976			
T6	0.87	2.93	A	0.332	2.215	0.626	0.825	1	60.138	1.35	67.38	A
120.00-100.00			B	0.31	2.269	0.619	0.825	1	55.568			
			C	0.133	2.834	0.579	0.825	1	22.353			
T7	0.44	1.68	A	0.308	2.275	0.618	0.825	1	30.937	0.68	68.31	A
100.00-90.00			B	0.287	2.331	0.612	0.825	1	28.562			
			C	0.131	2.844	0.579	0.825	1	12.284			
T8	0.44	1.72	A	0.288	2.328	0.612	0.825	1	30.994	0.68	67.83	A
90.00-80.00			B	0.269	2.382	0.607	0.825	1	28.670			
			C	0.124	2.87	0.578	0.825	1	12.566			
T9	0.88	4.10	A	0.282	2.346	0.61	0.825	1	67.536	1.41	70.46	A
80.00-60.00			B	0.264	2.395	0.606	0.825	1	62.927			
			C	0.135	2.828	0.579	0.825	1	30.710			
T10	0.88	4.70	A	0.26	2.408	0.604	0.825	1	69.555	1.35	67.66	A
60.00-40.00			B	0.245	2.454	0.601	0.825	1	65.075			
			C	0.13	2.846	0.579	0.825	1	33.362			
T11	0.44	2.44	A	0.244	2.457	0.6	0.825	1	35.126	0.63	62.96	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
40.00-30.00			B	0.23	2.5	0.597	0.825	1	32.922			
			C	0.124	2.87	0.578	0.825	1	17.195			
T12	0.44	2.50	A	0.234	2.486	0.598	0.825	1	35.383	0.63	63.10	A
30.00-20.00			B	0.221	2.528	0.595	0.825	1	33.199			
			C	0.12	2.884	0.577	0.825	1	17.545			
T13	0.88	5.17	A	0.215	2.545	0.594	0.825	1	69.424	1.27	63.38	A
20.00-0.00			B	0.203	2.586	0.591	0.825	1	65.152			
			C	0.11	2.925	0.576	0.825	1	34.325			
Sum Weight:	6.30	30.51						OTM	949.63 kip-ft	11.18		

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	0.10	1.25	A	0.191	2.625	0.589	0.8	1	20.001	0.60	30.08	A
180.00-160.00			B	0.139	2.812	0.58	0.8	1	14.322			
			C	0.139	2.812	0.58	0.8	1	14.322			
T2	0.38	1.50	A	0.423	2.02	0.661	0.8	1	56.220	1.26	62.78	A
160.00-140.00			B	0.144	2.796	0.581	0.8	1	16.733			
			C	0.144	2.796	0.581	0.8	1	16.733			
T3	0.13	0.83	A	0.394	2.076	0.649	0.8	1	19.644	0.44	65.86	A
140.00-133.33			B	0.151	2.769	0.582	0.8	1	6.733			
			C	0.151	2.769	0.582	0.8	1	6.733			
T4	0.19	0.84	A	0.375	2.116	0.642	0.8	1	19.572	0.44	65.95	A
133.33-126.67			B	0.23	2.5	0.597	0.8	1	11.167			
			C	0.145	2.791	0.581	0.8	1	6.848			
T5	0.26	0.86	A	0.358	2.154	0.635	0.8	1	19.543	0.44	66.03	A
126.67-120.00			B	0.308	2.276	0.618	0.8	1	16.370			
			C	0.14	2.81	0.58	0.8	1	6.976			
T6	0.87	2.93	A	0.332	2.215	0.626	0.8	1	60.138	1.35	67.38	A
120.00-100.00			B	0.31	2.269	0.619	0.8	1	55.568			
			C	0.133	2.834	0.579	0.8	1	22.353			
T7	0.44	1.68	A	0.308	2.275	0.618	0.8	1	30.937	0.68	68.31	A
100.00-90.00			B	0.287	2.331	0.612	0.8	1	28.562			
			C	0.131	2.844	0.579	0.8	1	12.284			
T8	0.44	1.72	A	0.288	2.328	0.612	0.8	1	30.994	0.68	67.83	A
90.00-80.00			B	0.269	2.382	0.607	0.8	1	28.670			
			C	0.124	2.87	0.578	0.8	1	12.566			
T9	0.88	4.10	A	0.282	2.346	0.61	0.8	1	67.536	1.41	70.46	A
80.00-60.00			B	0.264	2.395	0.606	0.8	1	62.927			
			C	0.135	2.828	0.579	0.8	1	30.710			
T10	0.88	4.70	A	0.26	2.408	0.604	0.8	1	69.555	1.35	67.66	A
60.00-40.00			B	0.245	2.454	0.601	0.8	1	65.075			
			C	0.13	2.846	0.579	0.8	1	33.362			
T11	0.44	2.44	A	0.244	2.457	0.6	0.8	1	35.126	0.63	62.96	A
40.00-30.00			B	0.23	2.5	0.597	0.8	1	32.922			
			C	0.124	2.87	0.578	0.8	1	17.195			
T12	0.44	2.50	A	0.234	2.486	0.598	0.8	1	35.383	0.63	63.10	A
30.00-20.00			B	0.221	2.528	0.595	0.8	1	33.199			
			C	0.12	2.884	0.577	0.8	1	17.545			
T13	0.88	5.17	A	0.215	2.545	0.594	0.8	1	69.424	1.27	63.38	A
20.00-0.00			B	0.203	2.586	0.591	0.8	1	65.152			
			C	0.11	2.925	0.576	0.8	1	34.325			

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:	6.30	30.51						OTM	949.63 kip-ft	11.18		

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	0.10	1.25	A	0.191	2.625	0.589	0.85	1	20.001	0.60	30.08	A
180.00-160.00			B	0.139	2.812	0.58	0.85	1	14.322			
			C	0.139	2.812	0.58	0.85	1	14.322			
T2	0.38	1.50	A	0.423	2.02	0.661	0.85	1	56.220	1.26	62.78	A
160.00-140.00			B	0.144	2.796	0.581	0.85	1	16.733			
			C	0.144	2.796	0.581	0.85	1	16.733			
T3	0.13	0.83	A	0.394	2.076	0.649	0.85	1	19.644	0.44	65.86	A
140.00-133.33			B	0.151	2.769	0.582	0.85	1	6.733			
			C	0.151	2.769	0.582	0.85	1	6.733			
T4	0.19	0.84	A	0.375	2.116	0.642	0.85	1	19.572	0.44	65.95	A
133.33-126.67			B	0.23	2.5	0.597	0.85	1	11.167			
			C	0.145	2.791	0.581	0.85	1	6.848			
T5	0.26	0.86	A	0.358	2.154	0.635	0.85	1	19.543	0.44	66.03	A
126.67-120.00			B	0.308	2.276	0.618	0.85	1	16.370			
			C	0.14	2.81	0.58	0.85	1	6.976			
T6	0.87	2.93	A	0.332	2.215	0.626	0.85	1	60.138	1.35	67.38	A
120.00-100.00			B	0.31	2.269	0.619	0.85	1	55.568			
			C	0.133	2.834	0.579	0.85	1	22.353			
T7	0.44	1.68	A	0.308	2.275	0.618	0.85	1	30.937	0.68	68.31	A
100.00-90.00			B	0.287	2.331	0.612	0.85	1	28.562			
			C	0.131	2.844	0.579	0.85	1	12.284			
T8	0.44	1.72	A	0.288	2.328	0.612	0.85	1	30.994	0.68	67.83	A
90.00-80.00			B	0.269	2.382	0.607	0.85	1	28.670			
			C	0.124	2.87	0.578	0.85	1	12.566			
T9	0.88	4.10	A	0.282	2.346	0.61	0.85	1	67.536	1.41	70.46	A
80.00-60.00			B	0.264	2.395	0.606	0.85	1	62.927			
			C	0.135	2.828	0.579	0.85	1	30.710			
T10	0.88	4.70	A	0.26	2.408	0.604	0.85	1	69.555	1.35	67.66	A
60.00-40.00			B	0.245	2.454	0.601	0.85	1	65.075			
			C	0.13	2.846	0.579	0.85	1	33.362			
T11	0.44	2.44	A	0.244	2.457	0.6	0.85	1	35.126	0.63	62.96	A
40.00-30.00			B	0.23	2.5	0.597	0.85	1	32.922			
			C	0.124	2.87	0.578	0.85	1	17.195			
T12	0.44	2.50	A	0.234	2.486	0.598	0.85	1	35.383	0.63	63.10	A
30.00-20.00			B	0.221	2.528	0.595	0.85	1	33.199			
			C	0.12	2.884	0.577	0.85	1	17.545			
T13	0.88	5.17	A	0.215	2.545	0.594	0.85	1	69.424	1.27	63.38	A
20.00-0.00			B	0.203	2.586	0.591	0.85	1	65.152			
			C	0.11	2.925	0.576	0.85	1	34.325			
Sum Weight:	6.30	30.51						OTM	949.63 kip-ft	11.18		

Force Totals

tnxTower	Job: 180' CSP Lattice Tower	Page: 30 of 52
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Project: Westport, Connecticut / NSS-020	Date: 09:51:57 02/23/15
	Client: Northeast Site Solutions / T-Mobile	Designed by: MCD

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	14.03					
Bracing Weight	16.48					
Total Member Self-Weight	30.51			-22.23	1.84	
Total Weight	45.09			-22.23	1.84	
Wind 0 deg - No Ice		0.19	-54.21	-5759.15	-30.24	-29.59
Wind 30 deg - No Ice		27.30	-47.04	-5006.59	-2903.22	-32.84
Wind 45 deg - No Ice		38.51	-38.46	-4101.53	-4089.93	-31.13
Wind 60 deg - No Ice		47.10	-27.27	-2918.48	-4997.80	-27.30
Wind 90 deg - No Ice		54.28	-0.19	-54.32	-5752.72	-14.44
Wind 120 deg - No Ice		46.91	26.94	2818.44	-4965.71	2.29
Wind 135 deg - No Ice		38.25	38.20	4011.69	-4044.56	10.71
Wind 150 deg - No Ice		26.98	46.85	4930.04	-2847.65	18.40
Wind 180 deg - No Ice		-0.19	54.21	5714.68	33.93	29.59
Wind 210 deg - No Ice		-27.30	47.04	4962.12	2906.91	32.84
Wind 225 deg - No Ice		-38.51	38.46	4057.07	4093.62	31.13
Wind 240 deg - No Ice		-47.10	27.27	2874.01	5001.48	27.30
Wind 270 deg - No Ice		-54.28	0.19	9.85	5756.41	14.44
Wind 300 deg - No Ice		-46.91	-26.94	-2862.90	4969.40	-2.29
Wind 315 deg - No Ice		-38.25	-38.20	-4056.16	4048.25	-10.71
Wind 330 deg - No Ice		-26.98	-46.85	-4974.50	2851.34	-18.40
Member Ice	8.72					
Total Weight Ice	70.22			-63.39	3.52	
Wind 0 deg - Ice		0.17	-69.10	-7342.56	-25.43	-40.80
Wind 30 deg - Ice		34.73	-59.93	-6381.82	-3669.15	-48.46
Wind 45 deg - Ice		49.03	-48.98	-5231.02	-5175.44	-47.42
Wind 60 deg - Ice		59.99	-34.70	-3728.05	-6328.78	-43.15
Wind 90 deg - Ice		69.17	-0.17	-92.34	-7291.68	-26.27
Wind 120 deg - Ice		59.82	34.40	3551.13	-6299.83	-2.35
Wind 135 deg - Ice		48.79	48.74	5063.29	-5134.49	10.27
Wind 150 deg - Ice		34.44	59.76	6226.09	-3619.00	22.20
Wind 180 deg - Ice		-0.17	69.10	7215.79	32.48	40.80
Wind 210 deg - Ice		-34.73	59.93	6255.04	3676.20	48.46
Wind 225 deg - Ice		-49.03	48.98	5104.24	5182.48	47.42
Wind 240 deg - Ice		-59.99	34.70	3601.27	6335.83	43.15
Wind 270 deg - Ice		-69.17	0.17	-34.43	7298.73	26.27
Wind 300 deg - Ice		-59.82	-34.40	-3677.90	6306.88	2.35
Wind 315 deg - Ice		-48.79	-48.74	-5190.07	5141.54	-10.27
Wind 330 deg - Ice		-34.44	-59.76	-6352.86	3626.05	-22.20
Total Weight	45.09			-22.23	1.84	
Wind 0 deg - Service		0.06	-16.73	-1770.21	-9.11	-9.13
Wind 30 deg - Service		8.43	-14.52	-1537.94	-895.83	-10.14
Wind 45 deg - Service		11.89	-11.87	-1258.60	-1262.10	-9.61
Wind 60 deg - Service		14.54	-8.42	-893.46	-1542.31	-8.43
Wind 90 deg - Service		16.75	-0.06	-9.46	-1775.31	-4.46
Wind 120 deg - Service		14.48	8.31	877.19	-1532.40	0.71
Wind 135 deg - Service		11.80	11.79	1245.48	-1248.10	3.31
Wind 150 deg - Service		8.33	14.46	1528.92	-878.68	5.68
Wind 180 deg - Service		-0.06	16.73	1771.09	10.70	9.13
Wind 210 deg - Service		-8.43	14.52	1538.82	897.42	10.14
Wind 225 deg - Service		-11.89	11.87	1259.48	1263.69	9.61
Wind 240 deg - Service		-14.54	8.42	894.34	1543.89	8.43
Wind 270 deg - Service		-16.75	0.06	10.34	1776.89	4.46
Wind 300 deg - Service		-14.48	-8.31	-876.31	1533.99	-0.71
Wind 315 deg - Service		-11.80	-11.79	-1244.60	1249.68	-3.31
Wind 330 deg - Service		-8.33	-14.46	-1528.04	880.27	-5.68

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice
19	Dead+Wind 0 deg+Ice
20	Dead+Wind 30 deg+Ice
21	Dead+Wind 45 deg+Ice
22	Dead+Wind 60 deg+Ice
23	Dead+Wind 90 deg+Ice
24	Dead+Wind 120 deg+Ice
25	Dead+Wind 135 deg+Ice
26	Dead+Wind 150 deg+Ice
27	Dead+Wind 180 deg+Ice
28	Dead+Wind 210 deg+Ice
29	Dead+Wind 225 deg+Ice
30	Dead+Wind 240 deg+Ice
31	Dead+Wind 270 deg+Ice
32	Dead+Wind 300 deg+Ice
33	Dead+Wind 315 deg+Ice
34	Dead+Wind 330 deg+Ice
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

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	180 - 160	Leg	Max Tension	27	4.69	-0.51	0.16
			Max. Compression	30	-6.87	0.06	-0.11
			Max. Mx	22	-0.32	-1.10	-0.20
			Max. My	26	-0.32	-0.00	1.83
			Max. Vy	22	0.70	-1.10	-0.20
			Max. Vx	34	-1.00	-0.00	1.53
		Diagonal	Max Tension	23	6.22	0.00	0.00
			Max. Compression	23	-6.32	0.00	0.00
			Max. Mx	31	6.22	0.02	0.00
			Max. My	19	0.50	0.00	0.00
			Max. Vy	31	-0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	23	3.42	0.00	0.00
			Max. Compression	31	-3.37	-0.01	-0.00
			Max. Mx	27	0.07	-0.02	-0.01
			Max. My	22	-0.11	-0.02	-0.01
			Max. Vy	27	-0.01	-0.02	-0.01
			Max. Vx	22	0.00	-0.02	-0.01
		Top Girt	Max Tension	27	0.78	-0.01	0.00
			Max. Compression	19	-0.78	-0.01	-0.00
			Max. Mx	32	-0.06	-0.01	-0.00
			Max. My	22	-0.35	-0.01	-0.00
			Max. Vy	32	-0.01	-0.01	-0.00
			Max. Vx	27	0.00	-0.01	-0.00
		Inner Bracing	Max Tension	19	0.01	0.00	0.00
			Max. Compression	19	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.01	0.00
			Max. My	30	0.00	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
T2	160 - 140	Leg	Max Tension	22	31.63	-0.42	0.05
			Max. Compression	30	-38.42	0.51	-0.04
			Max. Mx	22	31.51	-0.52	0.04
			Max. My	34	-3.48	-0.01	0.67
			Max. Vy	22	0.40	-0.51	0.03
			Max. Vx	34	-0.47	-0.01	0.60
		Diagonal	Max Tension	20	8.98	0.00	0.00
			Max. Compression	20	-9.09	0.00	0.00
			Max. Mx	20	8.98	0.03	0.00
			Max. My	19	1.00	0.00	0.00
			Max. Vy	20	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	20	5.65	-0.01	0.00
			Max. Compression	20	-5.63	-0.01	0.00
			Max. Mx	32	0.49	-0.02	-0.01
			Max. My	30	-0.00	-0.01	0.01
			Max. Vy	32	-0.02	-0.02	-0.01
			Max. Vx	30	-0.00	-0.01	0.01
		Inner Bracing	Max Tension	34	0.01	0.00	0.00
			Max. Compression	23	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.01	0.00
			Max. My	19	0.00	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T3	140 - 133.333	Leg	Max Tension	22	42.35	-0.52	0.04
			Max. Compression	30	-50.05	0.50	-0.02
			Max. Mx	22	42.35	-0.52	0.04
			Max. My	34	-3.73	-0.01	0.67
			Max. Vy	22	-0.34	-0.52	0.04
			Max. Vx	26	-0.42	-0.01	-0.67
		Diagonal	Max Tension	20	9.36	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	20	-9.51	0.00	0.00
			Max. Mx	20	9.36	0.04	0.00
			Max. My	19	1.36	0.00	0.00
			Max. Vy	20	-0.02	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	20	6.12	-0.02	0.00
			Max. Compression	20	-6.11	-0.02	0.00
			Max. Mx	32	0.46	-0.04	-0.01
			Max. My	22	-0.47	-0.04	-0.01
			Max. Vy	32	-0.02	-0.04	-0.01
			Max. Vx	22	0.00	-0.04	-0.01
		Inner Bracing	Max Tension	25	0.01	0.00	0.00
			Max. Compression	27	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.01	0.00
			Max. My	19	0.00	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T4	133.333 - 126.667	Leg	Max Tension	22	52.92	-0.51	0.02
			Max. Compression	30	-62.98	1.18	-0.00
			Max. Mx	22	51.64	-1.27	0.00
			Max. My	34	-5.67	-0.04	1.24
			Max. Vy	22	-1.97	-0.51	0.02
			Max. Vx	34	1.93	-0.01	0.46
		Diagonal	Max Tension	20	11.91	0.00	0.00
			Max. Compression	20	-12.08	0.00	0.00
			Max. Mx	20	11.91	0.05	0.00
			Max. My	19	1.36	0.00	0.00
			Max. Vy	20	-0.02	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	20	8.03	-0.02	0.00
			Max. Compression	20	-8.05	-0.02	0.00
			Max. Mx	22	-1.13	-0.04	-0.02
			Max. My	22	-1.39	-0.04	-0.02
			Max. Vy	22	-0.02	-0.04	-0.02
			Max. Vx	22	0.00	-0.04	-0.02
		Inner Bracing	Max Tension	20	0.14	0.00	0.00
			Max. Compression	20	-0.14	0.00	0.00
			Max. Mx	18	0.00	-0.01	0.00
			Max. My	19	0.14	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T5	126.667 - 120	Leg	Max Tension	22	65.30	-1.27	0.00
			Max. Compression	30	-78.80	1.54	-0.06
			Max. Mx	27	63.12	-1.59	-0.07
			Max. My	31	-6.57	-0.04	-1.59
			Max. Vy	27	-1.54	-1.27	-0.01
			Max. Vx	23	1.49	-0.04	1.22
		Diagonal	Max Tension	20	13.83	0.00	0.00
			Max. Compression	20	-14.01	0.00	0.00
			Max. Mx	20	13.83	0.05	0.00
			Max. My	19	1.29	0.00	0.00
			Max. Vy	20	-0.02	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	20	9.60	-0.03	0.00
			Max. Compression	20	-9.62	-0.03	0.00
			Max. Mx	22	-1.01	-0.04	-0.02
			Max. My	22	-1.30	-0.04	-0.02
			Max. Vy	22	-0.02	-0.04	-0.02
			Max. Vx	22	0.00	-0.04	-0.02
		Inner Bracing	Max Tension	20	0.17	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	20	-0.17	0.00	0.00
			Max. Mx	18	0.00	-0.02	0.00
			Max. My	19	0.16	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T6	120 - 100	Leg	Max Tension	22	102.88	-1.16	0.08
			Max. Compression	30	-120.38	1.32	-0.09
			Max. Mx	27	78.74	-1.59	-0.07
			Max. My	31	-6.99	-0.04	-1.59
			Max. Vy	27	-0.56	-1.18	-0.04
			Max. Vx	31	-0.62	-0.03	-1.27
		Diagonal	Max Tension	28	17.91	0.00	0.00
			Max. Compression	28	-18.16	0.00	0.00
			Max. Mx	20	17.43	0.12	0.00
			Max. My	19	1.58	0.00	0.00
			Max. Vy	20	-0.04	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	28	10.52	0.00	0.00
			Max. Compression	28	-10.57	-0.04	-0.00
			Max. Mx	22	1.10	-0.06	-0.02
			Max. My	22	-1.14	-0.05	-0.02
			Max. Vy	22	-0.03	-0.06	-0.02
			Max. Vx	22	0.00	-0.05	-0.02
		Inner Bracing	Max Tension	26	0.01	0.00	0.00
			Max. Compression	20	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.03	0.00
			Max. My	19	0.00	0.00	-0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T7	100 - 90	Leg	Max Tension	22	124.62	-1.33	0.09
			Max. Compression	30	-144.02	1.24	-0.07
			Max. Mx	27	122.40	-1.34	-0.06
			Max. My	31	-9.57	-0.03	-1.32
			Max. Vy	27	-0.52	-1.34	-0.06
			Max. Vx	31	-0.53	-0.03	-1.32
		Diagonal	Max Tension	28	15.89	0.00	0.00
			Max. Compression	28	-16.18	0.00	0.00
			Max. Mx	20	15.82	0.13	0.00
			Max. My	19	1.35	0.00	0.00
			Max. Vy	20	-0.04	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	28	10.02	0.00	0.00
			Max. Compression	28	-10.21	-0.04	-0.00
			Max. Mx	22	1.32	-0.06	-0.02
			Max. My	22	-1.46	-0.06	-0.02
			Max. Vy	22	-0.03	-0.06	-0.02
			Max. Vx	22	0.00	-0.06	-0.02
		Inner Bracing	Max Tension	26	0.00	0.00	0.00
			Max. Compression	20	-0.01	0.00	0.00
			Max. Mx	18	-0.00	-0.04	0.00
			Max. My	19	0.00	0.00	-0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T8	90 - 80	Leg	Max Tension	22	143.33	-1.27	0.08
			Max. Compression	19	-165.05	1.45	0.07
			Max. Mx	27	140.19	-1.52	-0.07
			Max. My	31	-11.50	-0.04	-1.61
			Max. Vy	27	0.53	-1.52	-0.07
			Max. Vx	23	-0.56	-0.03	1.60
		Diagonal	Max Tension	28	15.51	0.00	0.00
			Max. Compression	28	-15.83	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	20	15.41	0.15	0.00
			Max. My	19	1.23	0.00	0.00
			Max. Vy	20	0.04	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	28	10.30	-0.05	-0.00
			Max. Compression	28	-10.37	-0.05	-0.00
			Max. Mx	22	0.08	-0.07	-0.02
			Max. My	27	0.45	-0.07	-0.02
			Max. Vy	22	-0.03	-0.07	-0.02
			Max. Vx	22	0.00	-0.07	-0.02
		Inner Bracing	Max Tension	28	0.18	0.00	0.00
			Max. Compression	28	-0.18	0.00	0.00
			Max. Mx	18	0.00	-0.05	0.00
			Max. My	19	0.16	0.00	-0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T9	80 - 60	Leg	Max Tension	22	178.16	-1.80	0.06
			Max. Compression	19	-204.98	1.92	0.07
			Max. Mx	27	174.25	-1.98	-0.07
			Max. My	31	-14.36	-0.04	-2.01
			Max. Vy	27	0.54	-1.80	-0.03
			Max. Vx	23	-0.55	-0.02	2.00
		Diagonal	Max Tension	28	15.83	0.00	0.00
			Max. Compression	28	-16.23	0.00	0.00
			Max. Mx	20	15.66	0.18	0.00
			Max. My	19	1.13	0.00	0.00
			Max. Vy	20	-0.05	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	28	11.31	0.00	0.00
			Max. Compression	28	-11.32	-0.09	-0.00
			Max. Mx	22	1.87	-0.13	-0.02
			Max. My	27	-1.85	-0.12	-0.02
			Max. Vy	22	-0.05	-0.13	-0.02
			Max. Vx	27	0.00	-0.12	-0.02
		Inner Bracing	Max Tension	25	0.00	0.00	0.00
			Max. Compression	28	-0.01	0.00	0.00
			Max. Mx	18	-0.01	-0.07	0.00
			Max. My	19	-0.00	0.00	-0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T10	60 - 40	Leg	Max Tension	22	210.94	-1.78	0.06
			Max. Compression	19	-243.46	1.55	0.04
			Max. Mx	27	191.19	-1.98	-0.07
			Max. My	31	-15.18	-0.04	-2.01
			Max. Vy	27	-0.55	-1.98	-0.07
			Max. Vx	23	0.56	-0.02	2.00
		Diagonal	Max Tension	28	15.86	0.00	0.00
			Max. Compression	28	-16.43	0.00	0.00
			Max. Mx	20	15.68	0.26	0.00
			Max. My	19	0.97	0.00	0.00
			Max. Vy	20	-0.07	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	28	12.08	0.00	0.00
			Max. Compression	28	-12.01	-0.12	-0.00
			Max. Mx	22	2.22	-0.15	-0.02
			Max. My	27	-2.20	-0.14	-0.02
			Max. Vy	22	-0.06	-0.15	-0.02
			Max. Vx	27	0.00	-0.14	-0.02
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	28	-0.01	0.00	0.00
			Max. Mx	18	-0.01	-0.13	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. My	19	-0.00	0.00	-0.00
			Max. Vy	18	0.05	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T11	40 - 30	Leg	Max Tension	22	226.53	-1.66	0.07
			Max. Compression	19	-262.01	2.55	-0.02
			Max. Mx	30	-260.30	2.55	0.01
			Max. My	31	-18.41	-0.06	-1.89
			Max. Vy	30	-0.52	2.55	0.01
			Max. Vx	31	-0.54	-0.06	-1.89
		Diagonal	Max Tension	28	15.86	0.00	0.00
			Max. Compression	28	-16.49	0.00	0.00
			Max. Mx	20	15.69	0.28	0.00
			Max. My	22	-1.38	0.00	0.00
			Max. Vy	20	-0.07	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Horizontal	Max Tension	28	12.40	0.00	0.00
			Max. Compression	28	-12.32	-0.13	-0.00
			Max. Mx	22	2.39	-0.16	-0.02
			Max. My	27	-2.37	-0.16	-0.02
			Max. Vy	22	-0.06	-0.16	-0.02
			Max. Vx	27	0.00	-0.16	-0.02
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	28	-0.01	0.00	0.00
			Max. Mx	18	-0.01	-0.14	0.00
			Max. My	19	-0.00	0.00	-0.00
			Max. Vy	18	0.05	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T12	30 - 20	Leg	Max Tension	22	241.58	-2.33	0.02
			Max. Compression	19	-280.05	-1.79	0.23
			Max. Mx	30	-277.78	2.55	0.01
			Max. My	31	-20.71	-0.54	-4.69
			Max. Vy	30	0.85	2.55	0.01
			Max. Vx	23	-0.82	-0.57	4.69
		Diagonal	Max Tension	28	15.86	0.00	0.00
			Max. Compression	28	-16.55	0.00	0.00
			Max. Mx	20	15.69	0.30	0.00
			Max. My	22	-1.40	0.00	0.00
			Max. Vy	20	-0.07	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Top Girt	Max Tension	28	12.73	-0.14	-0.00
			Max. Compression	28	-12.54	-0.14	-0.00
			Max. Mx	22	1.15	-0.18	-0.02
			Max. My	27	1.12	-0.17	-0.02
			Max. Vy	22	-0.06	-0.18	-0.02
			Max. Vx	27	0.00	-0.17	-0.02
		Inner Bracing	Max Tension	28	0.22	0.00	0.00
			Max. Compression	28	-0.22	0.00	0.00
			Max. Mx	18	-0.01	-0.16	0.00
			Max. My	19	0.19	0.00	-0.00
			Max. Vy	18	0.05	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T13	20 - 0	Leg	Max Tension	22	253.38	0.55	0.25
			Max. Compression	19	-297.18	0.00	-0.00
			Max. Mx	19	-296.35	8.10	-0.30
			Max. My	31	-21.91	-0.54	-4.69
			Max. Vy	19	-1.39	8.10	-0.30
			Max. Vx	23	1.17	-0.56	4.69
		Diagonal	Max Tension	28	24.68	-0.22	0.03
			Max. Compression	28	-25.29	0.00	0.00
			Max. Mx	21	14.89	-0.30	0.08
			Max. My	20	-23.82	0.03	-0.17

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	21	0.07	-0.30	0.08
			Max. Vx	20	-0.01	0.00	0.00
		Horizontal	Max Tension	28	13.39	0.00	0.00
			Max. Compression	28	-13.70	-0.26	-0.00
			Max. Mx	22	-2.81	-0.39	-0.04
			Max. My	30	2.25	-0.12	0.04
			Max. Vy	22	0.11	-0.39	-0.04
			Max. Vx	30	-0.00	-0.12	0.04
		Redund Horz 1 Bracing	Max Tension	19	5.16	0.00	0.00
			Max. Compression	19	-5.16	0.00	0.00
			Max. Mx	18	0.43	0.02	0.00
			Max. Vy	18	-0.01	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	19	4.71	0.00	0.00
			Max. Compression	19	-4.71	0.00	0.00
			Max. Mx	29	4.52	0.03	0.00
			Max. My	20	1.46	0.00	0.00
			Max. Vy	29	-0.01	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-0.04	0.00	0.00
			Max. Mx	18	-0.01	0.04	0.00
			Max. Vy	18	-0.02	0.00	0.00
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	30	-0.01	0.00	0.00
			Max. Mx	18	-0.01	0.11	0.00
			Max. My	19	-0.00	0.00	0.00
			Max. Vy	18	-0.03	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	30	328.30	35.60	-21.62
	Max. H_x	30	328.30	35.60	-21.62
	Max. H_z	21	-273.53	-30.61	20.73
	Min. Vert	22	-283.88	-32.66	19.88
	Min. H_x	22	-283.88	-32.66	19.88
	Min. H_z	29	317.95	33.61	-22.38
Leg B	Max. Vert	24	325.94	-35.85	-20.80
	Max. H_x	32	-282.03	32.94	19.04
	Max. H_z	33	-271.45	31.04	19.56
	Min. Vert	32	-282.03	32.94	19.04
	Min. H_x	24	325.94	-35.85	-20.80
	Min. H_z	25	315.35	-34.02	-21.26
Leg A	Max. Vert	19	330.59	-0.84	41.58
	Max. H_x	31	24.85	6.81	1.86
	Max. H_z	19	330.59	-0.84	41.58
	Min. Vert	27	-278.48	0.88	-38.04
	Min. H_x	23	27.27	-6.81	2.07
	Min. H_z	27	-278.48	0.88	-38.04

Tower Mast Reaction Summary

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 Only	45.09	0.00	0.00	-22.23	1.84	0.00
Dead+Wind 0 deg - No Ice	45.09	0.19	-54.21	-5769.32	-30.24	-29.60
Dead+Wind 30 deg - No Ice	45.09	27.30	-47.04	-5015.47	-2908.32	-32.86
Dead+Wind 45 deg - No Ice	45.09	38.51	-38.46	-4108.82	-4097.15	-31.16
Dead+Wind 60 deg - No Ice	45.09	47.10	-27.27	-2923.67	-5006.64	-27.34
Dead+Wind 90 deg - No Ice	45.09	54.28	-0.19	-54.41	-5762.90	-14.51
Dead+Wind 120 deg - No Ice	45.09	46.91	26.94	2823.46	-4974.47	2.24
Dead+Wind 135 deg - No Ice	45.09	38.25	38.20	4018.83	-4051.67	10.69
Dead+Wind 150 deg - No Ice	45.09	26.98	46.85	4938.79	-2852.62	18.40
Dead+Wind 180 deg - No Ice	45.09	-0.19	54.21	5724.80	34.09	29.60
Dead+Wind 210 deg - No Ice	45.09	-27.30	47.04	4970.88	2912.13	32.86
Dead+Wind 225 deg - No Ice	45.09	-38.51	38.46	4064.22	4100.92	31.16
Dead+Wind 240 deg - No Ice	45.09	-47.10	27.27	2879.08	5010.37	27.34
Dead+Wind 270 deg - No Ice	45.09	-54.28	0.19	9.89	5766.60	14.51
Dead+Wind 300 deg - No Ice	45.09	-46.91	-26.94	-2867.91	4978.21	-2.24
Dead+Wind 315 deg - No Ice	45.09	-38.25	-38.20	-4063.27	4055.44	-10.69
Dead+Wind 330 deg - No Ice	45.09	-26.98	-46.85	-4983.25	2856.43	-18.40
Dead+Ice	70.22	0.00	0.00	-63.38	3.52	-0.00
Dead+Wind 0 deg+Ice	70.22	0.17	-69.10	-7362.90	-25.40	-40.83
Dead+Wind 30 deg+Ice	70.22	34.73	-59.93	-6399.55	-3679.27	-48.52
Dead+Wind 45 deg+Ice	70.22	49.03	-48.98	-5245.57	-5189.77	-47.52
Dead+Wind 60 deg+Ice	70.22	59.99	-34.70	-3738.44	-6346.34	-43.31
Dead+Wind 90 deg+Ice	70.22	69.17	-0.17	-92.59	-7311.92	-26.52
Dead+Wind 120 deg+Ice	70.22	59.82	34.40	3561.05	-6317.27	-2.52
Dead+Wind 135 deg+Ice	70.22	48.79	48.74	5077.43	-5148.65	10.19
Dead+Wind 150 deg+Ice	70.22	34.44	59.76	6243.45	-3628.91	22.18
Dead+Wind 180 deg+Ice	70.22	-0.17	69.10	7235.85	32.76	40.83
Dead+Wind 210 deg+Ice	70.22	-34.73	59.93	6272.39	3686.57	48.52
Dead+Wind 225 deg+Ice	70.22	-49.03	48.98	5118.38	5197.00	47.52
Dead+Wind 240 deg+Ice	70.22	-59.99	34.70	3611.25	6353.52	43.31
Dead+Wind 270 deg+Ice	70.22	-69.17	0.17	-34.50	7319.02	26.52
Dead+Wind 300 deg+Ice	70.22	-59.82	-34.40	-3688.01	6324.42	2.52
Dead+Wind 315 deg+Ice	70.22	-48.79	-48.74	-5204.36	5155.86	-10.19
Dead+Wind 330 deg+Ice	70.22	-34.44	-59.76	-6370.39	3636.19	-22.18
Dead+Wind 0 deg - Service	45.09	0.06	-16.73	-1796.06	-8.07	-9.13
Dead+Wind 30 deg - Service	45.09	8.43	-14.52	-1563.38	-896.37	-10.15
Dead+Wind 45 deg - Service	45.09	11.89	-11.87	-1283.59	-1263.26	-9.62
Dead+Wind 60 deg - Service	45.09	14.54	-8.42	-917.77	-1543.98	-8.44
Dead+Wind 90 deg - Service	45.09	16.75	-0.06	-32.19	-1777.41	-4.48
Dead+Wind 120 deg - Service	45.09	14.48	8.31	856.05	-1534.07	0.69
Dead+Wind 135 deg - Service	45.09	11.80	11.79	1224.99	-1249.25	3.29
Dead+Wind 150 deg - Service	45.09	8.33	14.46	1508.93	-879.18	5.68
Dead+Wind 180 deg - Service	45.09	-0.06	16.73	1751.54	11.80	9.13
Dead+Wind 210 deg - Service	45.09	-8.43	14.52	1518.85	900.08	10.15
Dead+Wind 225 deg - Service	45.09	-11.89	11.87	1239.02	1267.00	9.63
Dead+Wind 240 deg - Service	45.09	-14.54	8.42	873.22	1547.70	8.44
Dead+Wind 270 deg - Service	45.09	-16.75	0.06	-12.33	1781.10	4.48
Dead+Wind 300 deg - Service	45.09	-14.48	-8.31	-900.56	1537.77	-0.69
Dead+Wind 315 deg - Service	45.09	-11.80	-11.79	-1269.53	1252.94	-3.30
Dead+Wind 330 deg - Service	45.09	-8.33	-14.46	-1553.45	882.89	-5.68

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-45.09	0.00	0.00	45.09	0.00	0.000%
2	0.19	-45.09	-54.21	-0.19	45.09	54.21	0.000%
3	27.30	-45.09	-47.04	-27.30	45.09	47.04	0.001%
4	38.51	-45.09	-38.46	-38.51	45.09	38.46	0.001%
5	47.10	-45.09	-27.27	-47.10	45.09	27.27	0.000%
6	54.28	-45.09	-0.19	-54.28	45.09	0.19	0.001%
7	46.91	-45.09	26.94	-46.91	45.09	-26.94	0.000%
8	38.25	-45.09	38.20	-38.25	45.09	-38.20	0.000%
9	26.98	-45.09	46.85	-26.98	45.09	-46.85	0.001%
10	-0.19	-45.09	54.21	0.19	45.09	-54.21	0.000%
11	-27.30	-45.09	47.04	27.30	45.09	-47.04	0.001%
12	-38.51	-45.09	38.46	38.51	45.09	-38.46	0.001%
13	-47.10	-45.09	27.27	47.10	45.09	-27.27	0.000%
14	-54.28	-45.09	0.19	54.28	45.09	-0.19	0.001%
15	-46.91	-45.09	-26.94	46.91	45.09	26.94	0.000%
16	-38.25	-45.09	-38.20	38.25	45.09	38.20	0.000%
17	-26.98	-45.09	-46.85	26.98	45.09	46.85	0.001%
18	0.00	-70.22	0.00	0.00	70.22	0.00	0.000%
19	0.17	-70.22	-69.10	-0.17	70.22	69.10	0.001%
20	34.73	-70.22	-59.93	-34.73	70.22	59.93	0.002%
21	49.03	-70.22	-48.98	-49.03	70.22	48.98	0.001%
22	59.99	-70.22	-34.70	-59.99	70.22	34.70	0.001%
23	69.17	-70.22	-0.17	-69.17	70.22	0.17	0.001%
24	59.82	-70.22	34.40	-59.82	70.22	-34.40	0.000%
25	48.79	-70.22	48.74	-48.79	70.22	-48.74	0.001%
26	34.44	-70.22	59.76	-34.44	70.22	-59.76	0.002%
27	-0.17	-70.22	69.10	0.17	70.22	-69.10	0.001%
28	-34.73	-70.22	59.93	34.73	70.22	-59.93	0.002%
29	-49.03	-70.22	48.98	49.03	70.22	-48.98	0.002%
30	-59.99	-70.22	34.70	59.99	70.22	-34.70	0.001%
31	-69.17	-70.22	0.17	69.17	70.22	-0.17	0.002%
32	-59.82	-70.22	-34.40	59.82	70.22	34.40	0.001%
33	-48.79	-70.22	-48.74	48.79	70.22	48.74	0.001%
34	-34.44	-70.22	-59.76	34.44	70.22	59.76	0.002%
35	0.06	-45.09	-16.73	-0.06	45.09	16.73	0.000%
36	8.43	-45.09	-14.52	-8.43	45.09	14.52	0.000%
37	11.89	-45.09	-11.87	-11.89	45.09	11.87	0.000%
38	14.54	-45.09	-8.42	-14.54	45.09	8.42	0.000%
39	16.75	-45.09	-0.06	-16.75	45.09	0.06	0.000%
40	14.48	-45.09	8.31	-14.48	45.09	-8.31	0.000%
41	11.80	-45.09	11.79	-11.80	45.09	-11.79	0.000%
42	8.33	-45.09	14.46	-8.33	45.09	-14.46	0.000%
43	-0.06	-45.09	16.73	0.06	45.09	-16.73	0.000%
44	-8.43	-45.09	14.52	8.43	45.09	-14.52	0.000%
45	-11.89	-45.09	11.87	11.89	45.09	-11.87	0.000%
46	-14.54	-45.09	8.42	14.54	45.09	-8.42	0.000%
47	-16.75	-45.09	0.06	16.75	45.09	-0.06	0.000%
48	-14.48	-45.09	-8.31	14.48	45.09	8.31	0.000%
49	-11.80	-45.09	-11.79	11.80	45.09	11.79	0.000%
50	-8.33	-45.09	-14.46	8.33	45.09	14.46	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001

2	Yes	4	0.00000001	0.00000171
3	Yes	4	0.00000001	0.00000410
4	Yes	4	0.00000001	0.00000359
5	Yes	4	0.00000001	0.00000234
6	Yes	4	0.00000001	0.00000246
7	Yes	4	0.00000001	0.00000141
8	Yes	4	0.00000001	0.00000191
9	Yes	4	0.00000001	0.00000233
10	Yes	4	0.00000001	0.00000239
11	Yes	4	0.00000001	0.00000412
12	Yes	4	0.00000001	0.00000321
13	Yes	4	0.00000001	0.00000167
14	Yes	4	0.00000001	0.00000246
15	Yes	4	0.00000001	0.00000214
16	Yes	4	0.00000001	0.00000232
17	Yes	4	0.00000001	0.00000231
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000360
20	Yes	4	0.00032212	0.00000900
21	Yes	4	0.00024056	0.00000809
22	Yes	4	0.00000001	0.00000529
23	Yes	4	0.00019892	0.00000476
24	Yes	4	0.00000001	0.00000286
25	Yes	4	0.00016061	0.00000413
26	Yes	4	0.00020916	0.00000501
27	Yes	4	0.00000001	0.00000532
28	Yes	4	0.00033189	0.00000909
29	Yes	4	0.00028540	0.00000713
30	Yes	4	0.00000001	0.00000368
31	Yes	4	0.00019842	0.00000476
32	Yes	4	0.00000001	0.00000469
33	Yes	4	0.00015355	0.00000515
34	Yes	4	0.00020081	0.00000493
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	2.867	37	0.1254	0.0511
T2	160 - 140	2.332	37	0.1230	0.0384
T3	140 - 133.333	1.803	36	0.1112	0.0248
T4	133.333 - 126.667	1.643	36	0.1076	0.0221
T5	126.667 - 120	1.484	36	0.1036	0.0196

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	120 - 100	1.329	36	0.0988	0.0174
T7	100 - 90	0.925	36	0.0816	0.0124
T8	90 - 80	0.751	36	0.0734	0.0104
T9	80 - 60	0.596	36	0.0646	0.0085
T10	60 - 40	0.339	37	0.0485	0.0059
T11	40 - 30	0.154	37	0.0313	0.0039
T12	30 - 20	0.089	45	0.0224	0.0029
T13	20 - 0	0.042	43	0.0134	0.0019

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	3' Yagi	37	2.867	0.1254	0.0511	Inf
177.00	PA6-65AC	37	2.787	0.1254	0.0494	Inf
175.00	AP11-850	37	2.734	0.1255	0.0482	Inf
170.00	HP6-65	37	2.601	0.1253	0.0451	528198
167.00	VHF-150 2' Dipole	37	2.520	0.1249	0.0432	406308
160.00	Standoff	37	2.332	0.1230	0.0384	402760
133.00	Pirod 15' T-Frame Sector Mount (1)	36	1.635	0.1075	0.0220	491069
125.00	GPS	36	1.445	0.1024	0.0190	99490
110.00	VHF-150 2' Dipole	36	1.116	0.0904	0.0146	55247
60.00	4' Standoff	37	0.339	0.0485	0.0059	64664

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	11.648	21	0.5029	0.1975
T2	160 - 140	9.496	21	0.4949	0.1563
T3	140 - 133.333	7.361	20	0.4503	0.1114
T4	133.333 - 126.667	6.709	20	0.4364	0.0997
T5	126 667 - 120	6.065	20	0.4202	0.0884
T6	120 - 100	5.436	20	0.4011	0.0780
T7	100 - 90	3.789	20	0.3322	0.0560
T8	90 - 80	3.080	20	0.2990	0.0481
T9	80 - 60	2.444	20	0.2635	0.0407
T10	60 - 40	1.392	21	0.1980	0.0288
T11	40 - 30	0.637	21	0.1277	0.0188
T12	30 - 20	0.367	28	0.0916	0.0140
T13	20 - 0	0.175	27	0.0550	0.0094

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	3' Yagi	21	11.648	0.5029	0.1975	225491
177.00	PA6-65AC	21	11.327	0.5033	0.1916	225491
175.00	AP11-850	21	11.113	0.5034	0.1877	225491
170.00	HP6-65	21	10.577	0.5029	0.1773	112746
167.00	VHF-150 2' Dipole	21	10.254	0.5016	0.1707	86728
160.00	Standoff	21	9.496	0.4949	0.1563	79898
133.00	Pirod 15' T-Frame Sector Mount (1)	20	6.677	0.4357	0.0991	130169
125.00	GPS	20	5.905	0.4157	0.0857	24991
110.00	VHF-150 2' Dipole	20	4.569	0.3673	0.0657	13793
60.00	4' Standoff	21	1.392	0.1980	0.0288	15852

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	180	Leg	A325N	0.8750	4	0.00	26.45	0.000 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	2.11	6.44	0.327 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	1.71	6.44	0.266 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	0.39	6.44	0.060 ✓	1.333	Bolt Shear
T2	160	Leg	A325N	0.8750	4	2.54	26.46	0.096 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.03	6.44	0.471 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	2.83	6.44	0.439 ✓	1.333	Bolt Shear
T3	140	Leg	A325N	0.7500	6	7.06	19.44	0.363 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.17	6.44	0.492 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.06	6.44	0.475 ✓	1.333	Bolt Shear
T4	133.333	Leg	A325N	0.7500	6	8.82	19.43	0.454 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.03	6.44	0.625 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	4.02	6.44	0.625 ✓	1.333	Bolt Shear
T5	126.667	Leg	A325N	0.7500	6	10.88	19.43	0.560 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.67	6.44	0.725 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	4.81	6.44	0.747 ✓	1.333	Bolt Shear
T6	120	Leg	A325N	0.7500	6	13.31	19.44	0.685 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	6.05	6.44	0.939 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	5.29	6.44	0.820 ✓	1.333	Bolt Shear
T7	100	Leg	A325N	0.7500	6	20.77	19.44	1.069 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.39	6.44	0.837 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	5.10	6.44	0.792 ✓	1.333	Bolt Shear
T8	90	Leg	A325N	1.0000	6	23.89	34.56	0.691 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.28	6.44	0.819 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	5.18	6.44	0.805 ✓	1.333	Bolt Shear
T9	80	Leg	A325N	1.0000	6	26.81	34.56	0.776 ✓	1.333	Bolt Tension

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
		Diagonal	A325N	0.6250	3	5.41	6.44	0.840 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	5.66	6.44	0.879 ✓	1.333	Bolt Shear
T10	60	Leg	A325N	1.0000	8	24.36	34.56	0.705 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.48	6.44	0.850 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	6.04	6.44	0.938 ✓	1.333	Bolt Shear
T11	40	Leg	A325N	1.0000	8	28.32	34.56	0.819 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.50	6.44	0.853 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	6.20	6.44	0.962 ✓	1.333	Bolt Shear
T12	30	Leg	A325N	1.0000	8	30.20	34.56	0.874 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	5.52	6.44	0.856 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	6.37	6.44	0.988 ✓	1.333	Bolt Shear
T13	20	Leg	A325N	1.0000	8	31.67	34.56	0.917 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	8.43	6.44	1.308 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.7500	2	6.85	9.28	0.739 ✓	1.333	Bolt Shear

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 P / P_a
T1	180 - 160	ROHN 3 STD	20.00	6.67	68.8 K=1.00	21.168	2.2285	-6.87	47.17	0.146 ✓
T2	160 - 140	ROHN 4 STD	20.04	6.68	53.1 K=1.00	23.861	3.1741	-38.42	75.74	0.507 ✓
T3	140 - 133.333	ROHN 5 EH	6.68	6.68	43.6 K=1.00	25.320	6.1120	-50.05	154.75	0.323 ✓
T4	133.333 - 126.667	ROHN 5 EH	6.68	6.68	43.6 K=1.00	25.320	6.1120	-62.98	154.75	0.407 ✓
T5	126.667 - 120	ROHN 5 EH	6.68	6.68	43.6 K=1.00	25.320	6.1120	-78.80	154.75	0.509 ✓
T6	120 - 100	ROHN 6 EHS	20.04	10.02	54.0 K=1.00	23.709	6.7133	-120.38	159.16	0.756 ✓
T7	100 - 90	ROHN 6 EH	10.03	10.03	54.8 K=1.00	23.580	8.4049	-144.02	198.19	0.727 ✓
T8	90 - 80	ROHN 6 EH	10.03	10.03	54.8 K=1.00	23.580	8.4049	-165.05	198.19	0.833 ✓
T9	80 - 60	ROHN 8 EHS	20.05	10.03	41.2 K=1.00	25.662	9.7193	-204.98	249.41	0.822 ✓
T10	60 - 40	ROHN 8 EHS	20.05	10.03	41.2 K=1.00	25.662	9.7193	-243.46	249.41	0.976 ✓

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 $\frac{P}{P_a}$
T11	40 - 30	ROHN 8 EHS	10.03	10.03	41.2 K=1.00	25.662	9.7193	-262.01	249.41	1.051 ✓
T12	30 - 20	ROHN 8 EHS	10.03	10.03	41.2 K=1.00	25.662	9.7193	-280.05	249.41	1.123 ✓
T13	20 - 0	ROHN 8 EH	20.05	10.03	41.8 K=1.00	25.576	12.7627	-297.18	326.43	0.910 ✓

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	180 - 160	ROHN 2 STD	7.94	7.67	117.0 K=1.00	10.918	1.0745	-6.32	11.73	0.538 ✓
T2	160 - 140	ROHN 2 STD	8.55	8.25	125.8 K=1.00	9.431	1.0745	-9.09	10.13	0.897 ✓
T3	140 - 133.333	ROHN 2 EH	8.77	8.42	131.5 K=1.00	8.637	1.4807	-9.51	12.79	0.744 ✓
T4	133.333 - 126.667	ROHN 2 EH	9.00	8.66	135.3 K=1.00	8.163	1.4807	-12.08	12.09	0.999 ✓
T5	126.667 - 120	ROHN 2 EH	9.24	8.91	139.1 K=1.00	7.717	1.4807	-14.01	11.43	1.226 ✓
T6	120 - 100	ROHN 2.5 EH	12.52	12.06	156.6 K=1.00	6.090	2.2535	-17.74	13.72	1.293 ✓
T7	100 - 90	ROHN 3 STD	12.92	12.49	128.8 K=1.00	9.001	2.2285	-16.18	20.06	0.807 ✓
T8	90 - 80	ROHN 3 STD	13.35	12.93	133.4 K=1.00	8.392	2.2285	-15.83	18.70	0.846 ✓
T9	80 - 60	ROHN 3 STD	14.21	13.70	141.3 K=1.00	7.477	2.2285	-16.21	16.66	0.973 ✓
T10	60 - 40	P3.5x.226	15.12	14.64	131.5 K=1.00	8.641	2.6795	-16.43	23.15	0.709 ✓
T11	40 - 30	P3.5x.226	15.60	15.13	135.8 K=1.00	8.096	2.6795	-16.49	21.69	0.760 ✓
T12	30 - 20	P3.5x.226	16.08	15.62	140.2 K=1.00	7.592	2.6795	-16.55	20.34	0.813 ✓
T13	20 - 0	P3.5x.226	24.33	12.17	109.2 K=1.00	12.519	2.6795	-25.29	33.55	0.754 ✓

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 $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.60	4.15	80.0 K=1.00	19.004	0.7995	-3.37	15.19	0.222 ✓
T2	160 - 140	ROHN 1.5 STD	10.01	4.82	92.9	16.309	0.7995	-5.63	13.04	0.432

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					✓
T3	140 - 133.333	ROHN 2 STD	10.71	5.17	78.8 K=1.00	19.257	1.0745	-6.11	20.69	0.295 ✓
T6	120 - 100	ROHN 2 STD	13.92	6.68	101.9 K=1.00	14.269	1.0745	-10.57	15.33	0.689 ✓
T7	100 - 90	ROHN 2 STD	15.04	7.24	110.5 K=1.00	12.241	1.0745	-10.21	13.15	0.776 ✓
T9	80 - 60	ROHN 2.5 STD	18.93	9.10	115.3 K=1.00	11.230	1.7040	-11.32	19.14	0.592 ✓
T10	60 - 40	ROHN 2.5 STD	21.43	10.35	131.1 K=1.00	8.682	1.7040	-12.01	14.80	0.812 ✓
T11	40 - 30	ROHN 2.5 STD	22.68	10.98	139.1 K=1.00	7.722	1.7040	-12.32	13.16	0.936 ✓
T13	20 - 0	P3.5x.226	25.18	12.23	109.8 K=1.00	12.390	2.6795	-13.70	33.20	0.413 ✓

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	180 - 160	ROHN 1.5 STD	8.54	4.13	79.5 K=1.00	19.110	0.7995	-0.78	15.28	0.051 ✓
T4	133.333 - 126.667	ROHN 2 STD	11.40	5.47	83.4 K=1.00	18.326	1.0745	-8.05	19.69	0.409 ✓
T5	126.667 - 120	ROHN 2 STD	12.10	5.82	88.7 K=1.00	17.220	1.0745	-9.62	18.50	0.520 ✓
T8	90 - 80	ROHN 2 STD	16.36	7.90	120.5 K=1.00	10.285	1.0745	-10.37	11.05	0.938 ✓
T12	30 - 20	ROHN 2.5 STD	23.93	11.60	147.0 K=1.00	6.913	1.7040	-12.54	11.78	1.064 ✓

Redundant Horizontal (1) 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 $\frac{P}{P_a}$
T13	20 - 0	ROHN 1.5 STD	6.29	5.93	91.5 K=0.80	16.611	0.7995	-5.16	13.28	0.388 ✓

Redundant Diagonal (1) 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 $\frac{P}{P_a}$
T13	20 - 0	ROHN 1.5 STD	11.50	10.77	166.1 K=0.80	5.412	0.7995	-4.71	4.33	1.089 ✓

Redundant Hip (1) 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 $\frac{P}{P_a}$
T13	20 - 0	ROHN 2.5 STD	6.29	6.29	63.8 K=0.80	22.062	1.7040	-0.04	37.59	0.001 ✓

Inner Bracing 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	180 - 160	L2x2x1/8	4.27	4.27	128.9 K=1.00	8.985	0.4844	-0.01	4.35	0.003 ✓
T2	160 - 140	L2x2x1/8	5.01	5.01	151.1 K=1.00	6.537	0.4844	-0.01	3.17	0.002 ✓
T3	140 - 133.333	L2x2x1/8	5.35	5.35	161.6 K=1.00	5.716	0.4844	-0.01	2.77	0.003 ✓
T4	133.333 - 126.667	L2x2x1/8	5.70	5.70	172.1 K=1.00	5.041	0.4844	-0.14	2.44	0.057 ✓
T5	126.667 - 120	L2x2x1/8	6.05	6.05	182.6 K=1.00	4.479	0.4844	-0.17	2.17	0.077 ✓
T6	120 - 100	L2 1/2x2 1/2x3/16	6.96	6.96	168.7 K=1.00	5.248	0.9020	-0.01	4.73	0.003 ✓
T7	100 - 90	L2 1/2x2 1/2x3/16	7.52	7.52	182.3 K=1.00	4.492	0.9020	-0.01	4.05	0.003 ✓
T8	90 - 80	L2 1/2x2 1/2x3/16	8.18	8.18	198.3 K=1.00	3.798	0.9020	-0.18	3.43	0.052 ✓
T9	80 - 60	L3x3x3/16	9.46	9.46	190.5 K=1.00	4.113	1.0900	-0.01	4.48	0.003 ✓
T10	60 - 40	L3 1/2x3 1/2x1/4	10.71	10.71	185.2 K=1.00	4.352	1.6900	-0.01	7.35	0.002 ✓
T11	40 - 30	L3 1/2x3 1/2x1/4	11.34	11.34	196.1 K=1.00	3.885	1.6900	-0.01	6.57	0.002 ✓
T12	30 - 20	L3 1/2x3 1/2x1/4	11.96	11.96	206.9 K=1.00	3.490	1.6900	-0.22	5.90	0.037 ✓
T13	20 - 0	ROHN 2 STD	12.59	12.59	191.9 K=1.00	4.054	1.0745	-0.01	4.36	0.002* ✓

* DL controls

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	180 - 160	ROHN 3 STD	20.00	6.67	68.8	30.000	2.2285	4.69	66.85	0.070 ✓
T2	160 - 140	ROHN 4 STD	20.04	6.68	53.1	30.000	3.1741	31.63	95.22	0.332 ✓
T3	140 - 133.333	ROHN 5 EH	6.68	6.68	43.6	30.000	6.1120	42.35	183.36	0.231 ✓
T4	133.333 - 126.667	ROHN 5 EH	6.68	6.68	43.6	30.000	6.1120	52.92	183.36	0.289 ✓
T5	126.667 - 120	ROHN 5 EH	6.68	6.68	43.6	30.000	6.1120	65.30	183.36	0.356 ✓
T6	120 - 100	ROHN 6 EHS	20.04	10.02	54.0	30.000	6.7133	102.89	201.40	0.511 ✓
T7	100 - 90	ROHN 6 EH	10.03	10.03	54.8	30.000	8.4049	124.62	252.15	0.494 ✓
T8	90 - 80	ROHN 6 EH	10.03	10.03	54.8	30.000	8.4049	143.33	252.15	0.568 ✓
T9	80 - 60	ROHN 8 EHS	20.05	10.03	41.2	30.000	9.7193	178.16	291.58	0.611 ✓
T10	60 - 40	ROHN 8 EHS	20.05	10.03	41.2	30.000	9.7193	210.94	291.58	0.723 ✓
T11	40 - 30	ROHN 8 EHS	10.03	10.03	41.2	30.000	9.7193	226.53	291.58	0.777 ✓
T12	30 - 20	ROHN 8 EHS	10.03	10.03	41.2	30.000	9.7193	241.58	291.58	0.829 ✓
T13	20 - 0	ROHN 8 EH	20.05	10.03	41.8	30.000	12.7627	253.38	382.88	0.662 ✓

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 $\frac{P}{P_a}$
T1	180 - 160	ROHN 2 STD	7.94	7.67	117.0	30.000	1.0745	6.22	32.24	0.193 ✓
T2	160 - 140	ROHN 2 STD	8.55	8.25	125.8	30.000	1.0745	8.98	32.24	0.278 ✓
T3	140 - 133.333	ROHN 2 EH	8.77	8.42	131.5	30.000	1.4807	9.36	44.42	0.211 ✓
T4	133.333 - 126.667	ROHN 2 EH	9.00	8.66	135.3	30.000	1.4807	11.91	44.42	0.268 ✓
T5	126.667 - 120	ROHN 2 EH	9.24	8.91	139.1	30.000	1.4807	13.83	44.42	0.311 ✓
T6	120 - 100	ROHN 2.5 EH	12.19	11.73	152.3	30.000	2.2535	17.91	67.61	0.265

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 $\frac{P}{P_a}$
T7	100 - 90	ROHN 3 STD	12.92	12.49	128.8	30.000	2.2285	15.89	66.85	0.238
T8	90 - 80	ROHN 3 STD	13.35	12.93	133.4	30.000	2.2285	15.51	66.85	0.232
T9	80 - 60	ROHN 3 STD	13.77	13.27	136.8	30.000	2.2285	15.83	66.85	0.237
T10	60 - 40	P3.5x.226	14.66	14.18	127.3	30.000	2.6795	15.86	80.39	0.197
T11	40 - 30	P3.5x.226	15.60	15.13	135.8	30.000	2.6795	15.86	80.39	0.197
T12	30 - 20	P3.5x.226	16.08	15.62	140.2	30.000	2.6795	15.86	80.39	0.197
T13	20 - 0	P3.5x.226	24.33	12.17	109.2	30.000	2.6795	24.68	80.39	0.307

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 $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.60	4.15	80.0	30.000	0.7995	3.42	23.98	0.143
T2	160 - 140	ROHN 1.5 STD	10.01	4.82	92.9	30.000	0.7995	5.65	23.98	0.236
T3	140 - 133.333	ROHN 2 STD	10.71	5.17	78.8	30.000	1.0745	6.12	32.24	0.190
T6	120 - 100	ROHN 2 STD	13.92	6.68	101.9	30.000	1.0745	10.52	32.24	0.326
T7	100 - 90	ROHN 2 STD	15.04	7.24	110.5	30.000	1.0745	10.02	32.24	0.311
T9	80 - 60	ROHN 2.5 STD	18.93	9.10	115.3	30.000	1.7040	11.31	51.12	0.221
T10	60 - 40	ROHN 2.5 STD	21.43	10.35	131.1	30.000	1.7040	12.08	51.12	0.236
T11	40 - 30	ROHN 2.5 STD	22.68	10.98	139.1	30.000	1.7040	12.40	51.12	0.242
T13	20 - 0	P3.5x.226	25.18	12.23	109.8	30.000	2.6795	13.39	80.39	0.167

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	180 - 160	ROHN 1.5 STD	8.54	4.13	79.5	30.000	0.7995	0.78	23.98	0.032

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 $\frac{P}{P_a}$
T4	133.333 - 126.667	ROHN 2 STD	11.40	5.47	83.4	30.000	1.0745	8.03	32.24	0.249 ✔
T5	126.667 - 120	ROHN 2 STD	12.10	5.82	88.7	30.000	1.0745	9.60	32.24	0.298 ✔
T8	90 - 80	ROHN 2 STD	16.36	7.90	120.5	30.000	1.0745	10.30	32.24	0.320 ✔
T12	30 - 20	ROHN 2.5 STD	23.93	11.60	147.0	30.000	1.7040	12.73	51.12	0.249 ✔

Redundant Horizontal (1) 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 $\frac{P}{P_a}$
T13	20 - 0	ROHN 1.5 STD	6.29	5.93	114.4	30.000	0.7995	5.16	23.98	0.215 ✔

Redundant Diagonal (1) 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 $\frac{P}{P_a}$
T13	20 - 0	ROHN 1.5 STD	11.50	10.77	207.6	30.000	0.7995	4.71	23.98	0.196 ✔

Inner Bracing 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	180 - 160	L2x2x1/8	4.27	4.27	81.8	21.600	0.4844	0.01	10.46	0.001 ✔
T2	160 - 140	L2x2x1/8	4.31	4.31	82.6	21.600	0.4844	0.01	10.46	0.001 ✔
T3	140 - 133.333	L2x2x1/8	5.35	5.35	102.6	21.600	0.4844	0.01	10.46	0.001 ✔
T4	133.333 - 126.667	L2x2x1/8	5.70	5.70	109.3	21.600	0.4844	0.14	10.46	0.013 ✔
T5	126.667 - 120	L2x2x1/8	6.05	6.05	115.9	21.600	0.4844	0.17	10.46	0.016 ✔
T6	120 - 100	L2 1/2x2 1/2x3/16	6.40	6.40	98.7	21.600	0.9020	0.01	19.48	0.000 ✔
T7	100 - 90	L2 1/2x2 1/2x3/16	7.52	7.52	116.0	21.600	0.9020	0.00	19.48	0.000 ✔

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 $\frac{P}{P_a}$
T8	90 - 80	L2 1/2x2 1/2x3/16	8.18	8.18	126.2	21.600	0.9020	0.18	19.48	0.009 ✔
T9	80 - 60	L3x3x3/16	8.84	8.84	113.0	21.600	1.0900	0.00	23.54	0.000 ✔
T12	30 - 20	L3 1/2x3 1/2x1/4	11.96	11.96	131.7	30.000	1.6900	0.22	50.70	0.004 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 3 STD	1	-6.87	62.88	10.9	Pass
		Diagonal	ROHN 2 STD	9	-6.32	15.64	40.4	Pass
		Horizontal	ROHN 1.5 STD	7	-3.37	20.25	16.7	Pass
							19.9 (b)	
		Top Girt	ROHN 1.5 STD	6	-0.78	20.37	3.8	Pass
							4.5 (b)	
		Inner Bracing	L2x2x1/8	38	-0.01	5.80	0.2	Pass
T2	160 - 140	Leg	ROHN 4 STD	40	-38.42	100.96	38.1	Pass
		Diagonal	ROHN 2 STD	50	-9.09	13.51	67.3	Pass
		Horizontal	ROHN 1.5 STD	49	-5.63	17.38	32.4	Pass
							32.9 (b)	
		Inner Bracing	L2x2x1/8	54	-0.01	4.22	0.2	Pass
T3	140 - 133.333	Leg	ROHN 5 EH	79	-50.05	206.29	24.3	Pass
							27.2 (b)	
		Diagonal	ROHN 2 EH	89	-9.51	17.05	55.8	Pass
		Horizontal	ROHN 2 STD	88	-6.11	27.58	22.1	Pass
							35.6 (b)	
		Inner Bracing	L2x2x1/8	92	-0.01	3.69	0.2	Pass
T4	133.333 - 126.667	Leg	ROHN 5 EH	94	-62.98	206.29	30.5	Pass
							34.1 (b)	
		Diagonal	ROHN 2 EH	104	-12.08	16.11	75.0	Pass
		Top Girt	ROHN 2 STD	99	-8.05	26.25	30.7	Pass
							46.9 (b)	
		Inner Bracing	L2x2x1/8	107	-0.14	3.26	4.3	Pass
T5	126.667 - 120	Leg	ROHN 5 EH	109	-78.80	206.29	38.2	Pass
							42.0 (b)	
		Diagonal	ROHN 2 EH	119	-14.01	15.23	92.0	Pass
		Top Girt	ROHN 2 STD	114	-9.62	24.67	39.0	Pass
							56.0 (b)	
		Inner Bracing	L2x2x1/8	122	-0.17	2.89	5.8	Pass
T6	120 - 100	Leg	ROHN 6 EHS	124	-120.38	212.17	56.7	Pass
		Diagonal	ROHN 2.5 EH	135	-17.74	18.30	97.0	Pass
		Horizontal	ROHN 2 STD	133	-10.57	20.44	51.7	Pass
							61.5 (b)	
		Inner Bracing	L2 1/2x2 1/2x3/16	136	-0.01	6.31	0.2	Pass
T7	100 - 90	Leg	ROHN 6 EH	151	-144.02	264.19	54.5	Pass
							80.2 (b)	
		Diagonal	ROHN 3 STD	162	-16.18	26.74	60.5	Pass
							62.8 (b)	
		Horizontal	ROHN 2 STD	160	-10.21	17.53	58.2	Pass
							59.4 (b)	
		Inner Bracing	L2 1/2x2 1/2x3/16	165	-0.01	5.40	0.2	Pass
T8	90 - 80	Leg	ROHN 6 EH	168	-165.05	264.19	62.5	Pass
		Diagonal	ROHN 3 STD	177	-15.83	24.93	63.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
		Top Girt	ROHN 2 STD	171	-10.37	14.73	70.4	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	179	-0.18	4.57	3.9	Pass
T9	80 - 60	Leg	ROHN 8 EHS	183	-204.98	332.47	61.7	Pass
		Diagonal	ROHN 3 STD	192	-16.21	22.21	73.0	Pass
		Horizontal	ROHN 2.5 STD	190	-11.32	25.51	44.4	Pass
							65.9 (b)	
		Inner Bracing	L3x3x3/16	194	-0.01	5.98	0.3	Pass
T10	60 - 40	Leg	ROHN 8 EHS	210	-243.46	332.47	73.2	Pass
		Diagonal	P3.5x.226	219	-16.43	30.86	53.2	Pass
							63.8 (b)	
		Horizontal	ROHN 2.5 STD	217	-12.01	19.72	60.9	Pass
							70.3 (b)	
		Inner Bracing	L3 1/2x3 1/2x1/4	220	-0.01	9.80	0.2	Pass
T11	40 - 30	Leg	ROHN 8 EHS	237	-262.01	332.47	78.8	Pass
		Diagonal	P3.5x.226	246	-16.49	28.92	57.0	Pass
							64.0 (b)	
		Horizontal	ROHN 2.5 STD	244	-12.32	17.54	70.3	Pass
							72.2 (b)	
		Inner Bracing	L3 1/2x3 1/2x1/4	247	-0.01	8.75	0.2	Pass
T12	30 - 20	Leg	ROHN 8 EHS	252	-280.05	332.47	84.2	Pass
		Diagonal	P3.5x.226	261	-16.55	27.12	61.0	Pass
							64.2 (b)	
		Top Girt	ROHN 2.5 STD	255	-12.54	15.70	79.9	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	263	-0.22	7.86	2.8	Pass
T13	20 - 0	Leg	ROHN 8 EH	267	-297.18	435.13	68.3	Pass
							68.8 (b)	
		Diagonal	P3.5x.226	287	-25.29	44.72	56.5	Pass
							98.1 (b)	
		Horizontal	P3.5x.226	283	-13.70	44.25	31.0	Pass
							55.4 (b)	
		Redund Horz 1 Bracing	ROHN 1.5 STD	285	-5.16	17.70	29.1	Pass
		Redund Diag 1 Bracing	ROHN 1.5 STD	286	-4.71	5.77	81.7	Pass
		Redund Hip 1 Bracing	ROHN 2.5 STD	282	-0.04	50.11	0.1	Pass
		Inner Bracing	ROHN 2 STD	294	-0.01	4.36	0.5	Pass
							Summary	
						Leg (T12)	84.2	Pass
						Diagonal (T13)	98.1	Pass
						Horizontal (T11)	72.2	Pass
						Top Girt (T12)	79.9	Pass
						Redund Horz 1 Bracing (T13)	29.1	Pass
						Redund Diag 1 Bracing (T13)	81.7	Pass
						Redund Hip 1 Bracing (T13)	0.1	Pass
						Inner Bracing (T5)	5.8	Pass
						Bolt Checks	98.1	Pass
						RATING =	**98.1**	**Pass**

Program Version 6.1.3.1 - 3/21/2014 File:W:/Structurals_By_Location/Connecticut/WestportCSP#32/##-36931409-NSS-020/ERI/180' Self-Supported Lattice Tower.eri

ANCHOR BOLT EVALUATION

AECOM

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Job	180' Rohn SSMW Tower - Westport, CT	Project No.	NSS-020	Sheet 1	of 3
Description	Anchor Bolt Analysis	Computed by	MCD	Date	02/23/15
		Checked by		Date	

ANCHOR BOLT ANALYSIS

Input Data

Max Pier Reactions:

Uplift:	$Uplift := 284 \cdot kips$	*user input*
Shear:	$Shear := 42 \cdot kips$	*user input*
Compression:	$Compression := 331 \cdot kips$	*user input*

Anchor Bolt Data:

Use ASTM A354 Gr. BC

Number of Anchor Bolts = N	$N := 10$	*user input*	
Bolt Ultimate Strength:	$F_u := 125 \cdot ksi$	*user input*	
Bolt Yield Strength:	$Fy := 109 \cdot ksi$	*user input*	
Bolt Modulus:	$E := 29000 \cdot ksi$	*user input*	
Thickness of Anchor Bolts	$D := 1.0in$	*user input*	
Threads per Inch:	$n := 8$	*user input*	
Coefficient of Friction:	$\mu := 0.55$	*user input*	(for baseplate with grout ASCE 10-97)

AECOM

				Page	of
Job	180' Rohn SSMW Tower - Westport, CT	Project No.	NSS-020	Sheet 2	of 3
Description	Anchor Bolt Analysis	Computed by	MCD	Date	02/23/15
		Checked by		Date	

Anchor Bolt Area:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4} \cdot D^2 \qquad A_g = 0.785 \cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 \qquad A_n = 0.606 \cdot in^2$$

Check Tensile Forces:

Maximum Tensile Force (Gross Area):

$$AllowableTension := 1.333 \cdot (0.33 \cdot A_g \cdot F_u) \qquad AllowableTension = 43.2 \cdot kips$$

Note: 1.333 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$$F_{net.area} := 1.333 \cdot (0.60 \cdot A_n \cdot Fy) \qquad F_{net.area} = 52.8 \cdot kips$$

Note: 1.333 increase allowed per TIA/EIA

Applied Tension:

$$MaxTension := \frac{Uplift}{N} \qquad MaxTension = 28.4 \cdot kips$$

Check Stresses:

$$\frac{MaxTension}{F_{net.area}} = 0.54$$

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

Condition1 = "OK"

AECOM

				Page	of
Job	180' Rohn SSMW Tower - Westport, CT	Project No.	NSS-020	Sheet 3	of 3
Description	Anchor Bolt Analysis	Computed by	MCD	Date	02/23/15
		Checked by		Date	

Check Anchor Bolt Area:

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

Required Area:

$$A_{s1} := \frac{Uplift}{Fy} + \frac{Shear}{\mu \cdot 0.85 \cdot Fy} \qquad A_{s1} = 3.4 \cdot in^2$$

$$A_{s2} := \left| \frac{Shear - (0.3 \cdot Compression)}{\mu \cdot 0.85 \cdot Fy} \right| \qquad A_{s2} = 1.1 \cdot in^2$$

Provided Area:

$$A_{sprovided} := A_n \cdot N \qquad A_{sprovided} = 6.1 \cdot in^2$$

$$Condition2 := if\left(\frac{A_{s1}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s1}}{A_{sprovided}} = 0.57$$

Condition2 = "OK"

$$Condition3 := if\left(\frac{A_{s2}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s2}}{A_{sprovided}} = 0.19$$

Condition3 = "OK"

FOUNDATION ANALYSIS
(PERFORMED BY DR. CLARENCE WELTI, P.E., P.C.)

DR. CLARENCE WELTI, P.E., P.C.

GEOTECHNICAL ENGINEERING

227 Williams Street • P.O. Box 397
Glastonbury, CT 06033

(860) 633-4623 / FAX (860) 657-2514

October 10, 2002

Mr. Mohsen Sahirad
URS Corporation
500 Enterprise Drive; Suite 3B
Rocky Hill, CT 06067

Re: Telecommunications Tower; 880 Post Road; Westport, CT ; Evaluation of Existing Foundation for Increased Design Loads

Dear Mohsen:

1.0 Herewith are boring data pertaining to the above. Two borings were drilled to a maximum depth of 12 feet. One boring was drilled 10 feet into bedrock and the second boring was drilled to the top of bedrock. The two borings are shown on the attached photo. Boring B-1 was about 11 feet from the tower leg and boring B-2 was about 15 feet from the tower leg. Considering that the rock outcrops at the third leg, the two borings define rock sufficiently to permit a reasonable interpolation of rock at the actual leg foundations. The former police station site is undergoing environmental remediation. *The borings were drilled by Clarence Welti Associates, Inc. and sampling was conducted by this firm solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.*

2.0 The purpose of this study is to assess the capability of tower legs to receive the proposed revised loadings. The load summary, including initial and revised design loadings is as follows:

Loading Type	Original Reaction	Revised Reactions
Uplift	276.7 kips	324 kips
Download	319.9 kips	374 kips
Shear	41.0 kips	48 kips

3.0 The initial boring data (1990 data from Test Craig Laboratories) indicated bedrock over the entire site. It is understood that there is information indicating that two of the legs were placed in earth instead of rock. The recent boring tends to belie this. The analyses for uplift (which is the only critical item on the above reaction schedule) have been done for both earth and rock. The reference for both analyses is FHWA-1F-025 Publication "Drilled Shafts: Construction Procedures and Design Methods".

3.0.1 The tower legs were each placed on 4.5 feet diameter shafts installed 27 feet deep into either earth or rock. The design uplift was and is based on an effective length of 21 feet.

3.1 Regarding the shaft in earth analysis there were no deep blow counts in the borings, since rock was encountered within 2 feet of grade. It is however reasonable to assume the N value (blows per 12" on split spoon) will be about 60 in the till overlying rock. Using the procedure indicated on the attached calculations the ultimate uplift capacity would be 831 kips. Design capacity would be ½ of this value or 415 kips. In reviewing the reference you cited (Foundation Engineering by Das, 4th edition) a similar ultimate load capacity can also be found if one assumes an angle of internal friction of about 40° (which would be typical for N = 60) and a δ/ϕ ratio of 1.0 (relative density of soil ≥ 85+%).

3.2 Regarding the shaft in rock the friction is defined in the attached calculations. The ultimate uplift of the shaft placed the Straits Schist rock formation would be about 10 kips/sf. With a factor of safety of 3 (using 3 kips/sf) the allowable loading would be 888 kips.

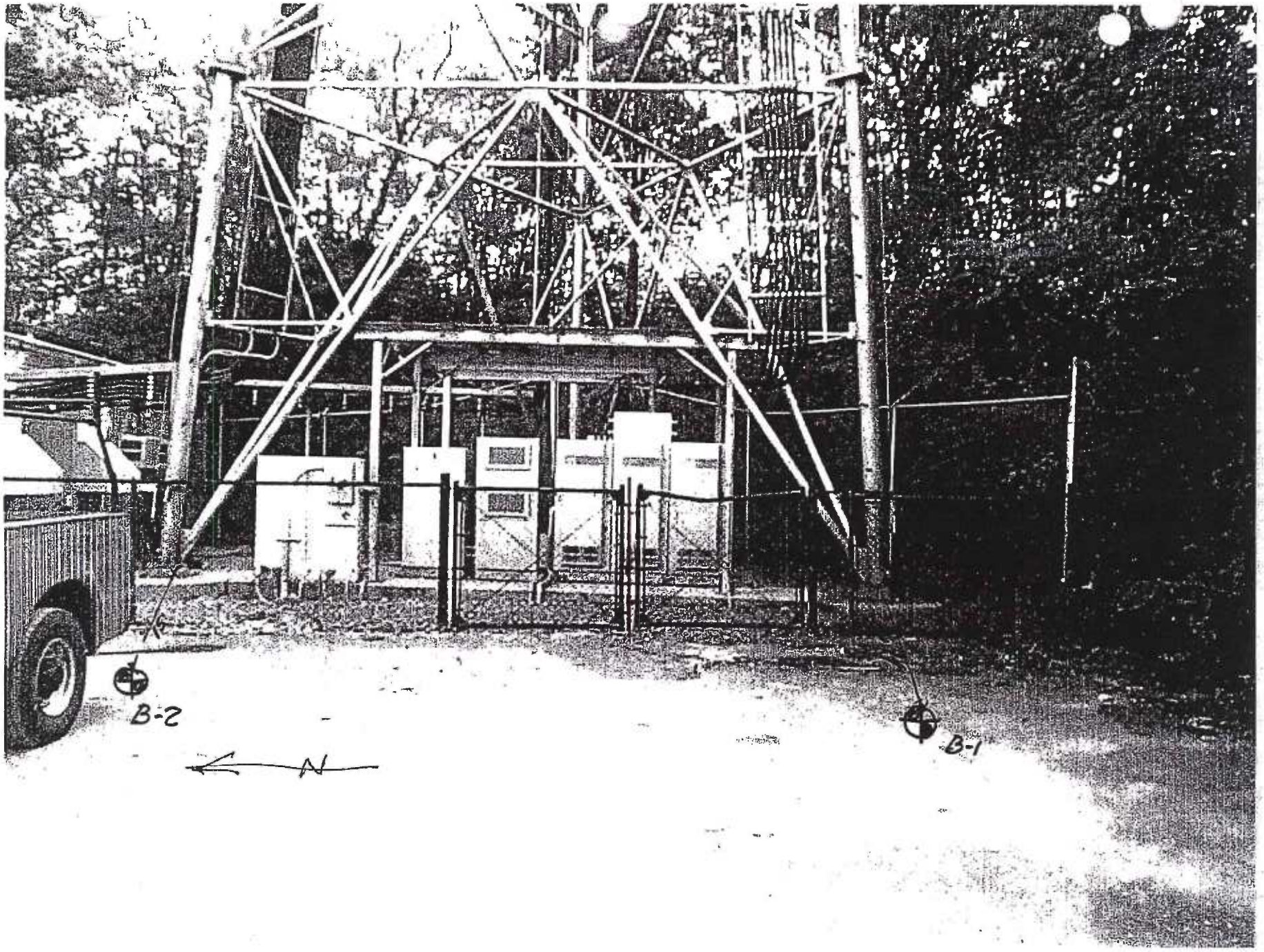
4.0 In summary it is believed that the shafts are in rock. The rock is a Schist with steep foliation and may have been drilled with only moderate effort. If the actual shaft are in earth there would have to have been a deep depression between the rock outcrop (which was cut down about 5 feet at the east leg) and the boring locations west of the two west legs, which indicated rock at 2 feet below grade similar to the original borings on the site. If there was a depression in the rock, the soil would be glacial till similar to what is being excavated to the northwest of the site at the old State Police Station. The analyses included herewith indicate that with either rock or till overburden the shafts have adequate capacity for the revised loading.

If you have any questions, please call me.

Very truly yours.

Clarence Welti, PhD, P. E.
Pres. Dr. Clarence Welti, P. E., P.C.

A:\urstoweranalysis9/04/02


B-2
B-1
N

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
URS CORPORATION

PROJECT NAME
CELL TOWER SITE

LOCATION
880 POST ROAD
WESTPORT, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	NX
SIZE I.D.	3.75"		1.5"	2.0"
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV
HOLE NO. B-1

GROUND WATER OBSERVATIONS
AT 2.0 FT AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 10/7/02
FINISH DATE 10/7/02

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	4-13-20-60	0.00'-1.50'		ASPHALT .10 BR. FINE-CRS. SAND AND FINE GRAVEL - FILL .80 GRAY ROCK FRAGMENTS, LITTLE SILT AND FINE SAND 1.5 GRAY ROCK FRAGMENTS 2.0 CORED ROCK -	
5					RUN #1 2.0' - 7.0' RECOVERED 50" RUN #2 7.0' - 12.0' RECOVERED 60"	
10					12.0 BOTTOM OF BORING @ 12.0' NOTE: BORING WAS DRILLED 11.0' WEST OF TOWER LEG	
15						
20						
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: BROMLEY
INSPECTOR:

SHEET 1 OF 1 HOLE NO. B-1

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT URS CORPORATION	PROJECT NAME CELL TOWER SITE LOCATION 880 POST ROAD WESTPORT, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.5"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. B-2

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 10/7/02
FINISH DATE 10/7/02

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-8-12-60	0.00'-1.50'		DARK BR. FINE-CRS. SAND, SOME FINE-MED. GRAVEL, TRACE SILT - FILL	1.0
					BR./GRAY ROCK FRAGMENTS, SILT AND FINE SAND	1.5
					GRAY ROCK FRAGMENTS	2.0
					AUGER REFUSAL @ 2.0'	
					NOTE: BORING WAS DRILLED 15'WEST OF TOWER LEG	
5						
10						
15						
20						
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: BROMLEY
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. B-2

DR. CLARENCE WELTI, PE, PC
P.O. BOX 397
GLASTONBURY, CONNECTICUT 06033 • (860) 633-4623

CLIENT URS
PROJECT Communication Tower Mc Neil Island
SUBJECT Axial Capacity
BY CW DATE 10/ /02 SHEET NO.

References: Drilled Shafts Construction Procedures & Design Methods PUBLICATION NO FHWA-IF-99-025

Material: Intermediate Geo-material " N > 50 B/12"

(1) $f_{max} = \sigma_{vi} K_{oi} \tan \delta_i'$ (IGM)

σ_{vi} = vertical effective stress at mid-layer $i \approx 1.0$ ksf

K_{oi} = design value of earth pressure coefficient at i

δ_i = design value of angle of interface friction for layer i

(2) $\phi_i' = \tan^{-1}\left[\frac{N_{60}(\text{LAYER } i)}{12.3 + 20.3\left(\frac{\sigma_{vi}}{p_a}\right)}\right]^{0.34}$ p_a 2 ksf ≈ 14.7 psi

N_{60}(LAYER 6) = 60

$= \tan^{-1}\left\{\left[\frac{60}{12.3 + 20.3(1.0)}\right]^{.34}\right\} = \tan^{-1}(1.96)^{.34} = 51.5°$

(3) $K_{oi} = (1 - \sin\phi_i')\left[\frac{0.2\, p_a\, N_{60}(\text{layer } i)}{\sigma_{vi}}\right]^{\sin\phi}$

$= (1 - .78)\left[\frac{.2 \times 2 \times 60}{1.0}\right]^{.78} = 1.65$

$f_s = f_{max}(1) = 3.73$ ksf $\times$ 0.75 $^{L'}/_{UNIT}$ = 2.8 ksf

21' x 4.5 x π x 2.8 = 831 KIPS ULTIMATE SIDE FRICTION

FOR SHAFT IN ROCK

$f_{max} = 0.8\left[\frac{4R}{R}\left(\frac{L'}{L}\right)\right]^{0.45} f_a$

f_{max}: 5.37 TSF = 10.78 ksf

γ_{wet} = 5200 psi x 333 TSF

L = 21'

4R = 0.5' L' = 0.2'

21' x π x 4.5 = 296 SF

Assume 1/3 for f_{all} = 3 ksf. Q = 888 KIPS

About AECOM

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

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1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the 180' self-supporting lattice tower located at 880 Post Road East in Westport, Connecticut. The analysis was conducted in accordance with the 2005 Connecticut State Building Code, the TIA/EIA-222-F standard and the Connecticut State Police Requirements for wind velocity of 90 mph (fastest mile) and 90 (fastest mile) concurrent with 0.5" ice. Twist (rotation) and sway (deflection) were determined in accordance with Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) concurrent with 0.5" ice. The antenna loading considered in the analysis consists of all existing, future, and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction of this report.

The proposed T-Mobile antenna modifications are listed below:

Antenna and Mount	Carrier	Antenna Center Elevation
Remove: **(3) Existing Antenna Mounts**	**T-Mobile (existing)**	**@ 125'**
Install: **(3) Commscope LNX-6515DS-VTM Panel Antennas** **(3) Ericsson RRUS-11 Remote Radio Units** **(3) Antenna Frame Mounts (Valmont Site Pro 1 part # LTF12-372)**	**T-Mobile (proposed)**	**@ 125'**

The results of the analysis indicate that the tower structure has sufficient capacity to support the proposed loading conditions. **The tower and its foundation and anchor bolts are considered structurally adequate for the proposed antenna loading with the wind load classification specified above.**

The tower deflection (sway) is 0.5029 degrees, and the tower rotation (twist) is 0.1975 degrees with a wind velocity of 90 mph concurrent with 0.5" ice. **The tower deflection and rotation are within the Connecticut State Police specification of 0.75 degrees for combined deflection (sway) and rotation (twist).**

1. EXECUTIVE SUMMARY *(continued)*

This analysis is based on:

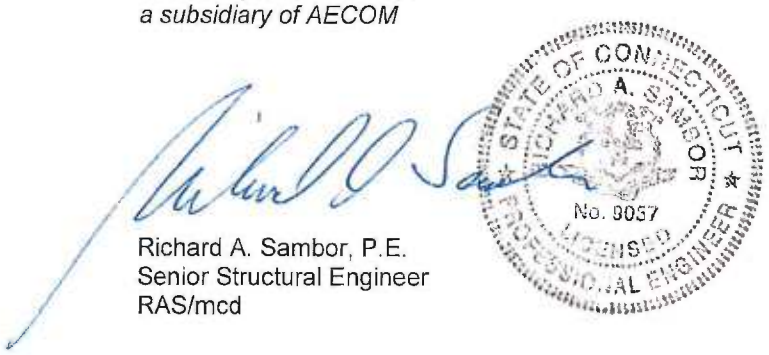
1) The tower structure's theoretical capacity not including any assessment of the condition of the tower.
2) Original tower report prepared by Rohn Industries, Inc., engineering file 26263DL and drawing C910693 dated February 1, 1991.
3) Soil investigation and foundation capacity report prepared by Dr. Clarence Welti, P.E., P.C., dated October 10, 2002.
4) Tower Mapping and Inventory by Northeast Towers Inc., tower climb and report dated October 2, 2013.
5) Structural analysis performed by URS Corp., project number SAI-081 / 36931200, signed and sealed on July 7, 2014.
6) Antenna inventory provided by Connecticut State Police via email dated February 1, 2015.
7) Proposed antennas via T-Mobile RFDS form, dated February 5, 2015.
8) 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. 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

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: CT11612B

CT State Police Tower
880 Post Road East
Westport, CT 06880

March 6, 2015

EBI Project Number: 6215001357

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	41.06 %

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March 6, 2015

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

Emissions Analysis for Site: **CT11612B – CT State Police Tower**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **880 Post Road East, Westport, 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 **880 Post Road East, Westport, 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** 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** has a maximum gain of **15.9 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **125 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):	125	Height (AGL):	125	Height (AGL):	125
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%	1.19	Antenna B1 MPE%	1.19	Antenna C1 MPE%	1.19
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):	125	Height (AGL):	125	Height (AGL):	125
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%	1.19	Antenna B2 MPE%	1.19	Antenna C2 MPE%	1.19
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):	125	Height (AGL):	125	Height (AGL):	125
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%	0.47	Antenna B3 MPE%	0.47	Antenna C3 MPE%	0.47

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**8.52**
AT&T	8.69 %
Verizon Wireless	21.92 %
State Police	1.93 %
Site Total MPE %:	**41.06 %**

T-Mobile Sector 1 Total:	2.84 %
T-Mobile Sector 2 Total:	2.84 %
T-Mobile Sector 3 Total:	2.84 %
Site Total:	41.06 %

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Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	2.84 %
Sector 2:	2.84 %
Sector 3 :	2.84 %
T-Mobile Total:	8.52 %
Site Total:	41.06 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **41.06%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

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